

Testimony for The Subcommittee on National Parks, Forests and Public Lands and Subcommittee on Water and Power of the Committee on Natural Resources.

April 8, 2010

Chairs Grijalva and Napolitano, Members of the Subcommittee, Ladies and Gentlemen, Good Morning:

My name is Dr. Madan M. Singh and I am Director of the Department of Mines and Mineral Resources, State of Arizona. I have been in this position since August 2005. I have served on five (5) Committees of The National Academies; one in 2007 which resulted in the report entitled “Managing Materials for a 21st Century Military.” I have received awards and recognition for my work by my alma mater, The Pennsylvania State University (including being selected as Centennial Fellow by the College of Earth and Mineral Sciences in 1996), and the premier mining society in the United States, the Society for Mining, Metallurgy and Exploration, Inc., and was selected as its Distinguished Member in 2004. In 1997, I was elected Fellow of the American Consulting Engineers Council (ACEC) and a Fellow of the American Society of Civil Engineers (ASCE) in 1985. I have chaired six (6) national conferences and have authored over 120 technical publications, many of them peer-reviewed.

H. R. 644, Grand Canyon Watersheds Protection Act of 2009, has been introduced “To withdraw the Tusayan Ranger District and Federal land managed by the Bureau of Land Management in the vicinity of Kanab Creek and in the House Rock Valley from location, entry, and patent under mining laws, and for other purposes.”

Ostensibly the rationale for the withdrawal is the detrimental environmental impacts on the Grand Canyon. Some of the reasons presented are:

1. Adverse effects on tourism in the vicinity.
2. Contamination of the water in the region.
3. Past history of damage in the Four Corners district.
4. Negative impact on wildlife habitat.

As outlined below most of these are not significant, so there is little cause to withdraw over one million acres from mineral entry.

It is recognized that some environmental organizations have issued rather strong rhetorical and emotional statements to the media about the “dangers” of uranium mining, without any credible back up data. The statements are based on fear not fact; the intention is to raise sufficient concern in the minds of the public to create an outcry against mining – what might be termed scare tactics. Additionally, the reference in the releases and the media are to the Grand Canyon, leaving the impression that the mining would occur in the Grand Canyon National Park (which is prohibited); actually the mining is several miles away – well outside the boundaries of the Park.

It should be noted that since the passage of the National Environmental Policy Act (NEPA) of 1969 and Federal Land Policy and Management Act (FLPMA) of 1976 there have been seven (7) mines that have operated in the Arizona Strip between 1980 and 1991 producing over 19 million

pounds of U₃O₈ without any recorded damage to the environment, wildlife, and the health of the workers or neighboring communities.

Adverse Effects on Tourism

The theme of this meeting is “On the Edge: Challenges Facing the Grand Canyon National Park,” so it would be appropriate for me to start with a feature that was literally on the southern edge of the Grand Canyon – the headframe of the Orphan Mine. During the latter part of the period 1956 through 1969 the Orphan Mine actually operated within the Grand Canyon National Park. In fact, it is worthy of note that mining of uranium at the Orphan Mine began in 1956, a half century after the Grand Canyon was declared a Game Preserve and 24 years after it was proclaimed to be a Monument for the second time. In 1960, Senators Hayden and Goldwater introduced a bill (S-3094) giving the mining company the right to mine in the Park adjacent to the claims. No action was taken, so the bill was re-introduced as S-383 the next year. In May 1962, President John F. Kennedy signed Public Law 87-457 permitting the company to mine in the Park near the claims, in exchange for the title to the claims in 25 years (i.e. 1987).

During the period 1956 through 1969, while the Orphan Lode was being mined, the number of visitors to the Park steadily increased from 1 million to 2.2 million, according to data from the National Park Service. It was evident that uranium was being mined since the headframe was clearly visible and no attempt was made to conceal the mineral being extracted. Again when the uranium mines were operational, 1980 through 1991, the number of visitors to the Grand Canyon National Park grew from 2.3 million to 3.9 million. It is doubtful that if the number of visitors in the Park increased in those periods of time that the tourists in the rest of Coconino County would have experienced any detrimental effects.

USGS Open File Report OFR-89-550 shows the location of 1,296 breccia pipes. More than 400 of these pipes occur within the boundaries of the Grand Canyon National Park; of these an estimated 30 to 50 are probably mineralized (that is, uranium-bearing). Water passing through these, because of erosion, is flowing into the Colorado River, even though these have never been touched by mining. One of these pipes, approximately three miles from the Park Service Phantom Ranch lodge, shows high grade uranium mineralization at the surface. Dissolved uranium from these exposed or near surface pipes would flow into nearby streams and the Colorado River. These uranium occurrences in the Park have not had any adverse effect on the number of visitors coming to the Park.

Contamination of Water

The foremost concern is that of having uranium contamination in the Redwall-Muav aquifer and the Colorado River. The U. S. Geological Survey (USGS) and others have conducted several studies in the area and not found this to be the case.

The occurrence of uranium is ubiquitous in Arizona, as it is in other regions of the world. It is found in most rocks and sediments, though generally not in concentrated form. Because of this, most waters contain some amount of uranium. This is generally well below the drinking water Maximum Contaminant Level (MCL) set by the Environmental Protection Agency (EPA) of 30

ppb (parts per billion) ($\mu\text{g/L}$, micrograms per liter). This also underscores the fact that the tolerance level of zero advanced by some proponents will be almost impossible to attain.

The USGS released their latest studies (February 2010) of the water chemistry of the areas slated to be withdrawn from mineral entry under the segregation order issued by Secretary of the Interior Ken Salazar on July 21, 2009. This document reviewed all past available data as well as presenting data from the sampling performed in August and September 2009. The data encompassed 1,014 water samples from 428 sites. Of these, new samples were collected from 20 springs and 3 wells north of the Colorado River and from one well south of the River.

The report (USGS SIR 2010-5025) states “Water discharging from the perched water-bearing zones and the Redwall-Muav aquifer in northern Arizona are generally of good quality for most intended uses.” In a few locations the constituent concentrations exceeded the drinking water criteria. “In many cases, the elevated concentrations of these elements are from natural sources.”

The USGS (SIR 2010-5025) investigations found that “Nearly 95 percent of all spring samples have uranium concentrations less than the USEPA maximum contaminant level (MCL) of 30 $\mu\text{g/L}$; most (72 percent) are less than 5 $\mu\text{g/L}$.” “In all, water collected from 15 of 288 spring sites had uranium concentrations greater than or equal to 30 $\mu\text{g/L}$, and nearly all observations were in the NURE (National Uranium Resource Evaluation) studies.” Most stream samples were below the EPA MCL; two NURE and one Horn Down site samples were higher. Uranium concentrations in the 26 Hermit Mine and 26 Pinenut Mine monitoring-well observations were all below the EPA MCL and only one sample out of 11 at the Canyon Mine monitoring well exceeded the MCL. Four other wells, 3 in the Kanab plateau and one in the Kaibab plateau, were above the MCL; all of these were part of the NURE investigations. The report states “Some samples with concentrations above the high threshold may be unaffected by anthropogenic activities and, in fact, reflect natural geochemical conditions favorable to elevated dissolved-uranium concentrations.” Further, “the range in uranium concentrations at sites in areas without mining activities (0.57 – 20.6 $\mu\text{g/L}$) was similar to that of sites associated with active or reclaimed mines (2.14 – 19.5 $\mu\text{g/L}$).”

The water section of the study (USGS SIR 2010-5025) concludes:

- “Relations of uranium and 13 trace elements with mining activity were few and inconclusive.”
- “Surface water in the Colorado River in the Grand Canyon region contains dissolved uranium concentrations typically less than 5 $\mu\text{g/L}$.”
- “Observation of groundwater-chemistry relations between concentration and mining condition (no mining activity, active mines on standby, or reclaimed mine areas) were limited and inconclusive.”

The USGS, in cooperation with the U.S. Bureau of Reclamation, made two water-quality synoptic studies in the Colorado River in the vicinity of the Grand Canyon. Field measurements and water sample analyses were made at 14 mainstream and tributary sites on November 5-6, 1990 and June 18-20, 1991. In November the range of uranium ranged between 3.63 and 6.25

bbp, except at the mouth of the Little Colorado River where the readings were 18.7 to 25.6 ppb on the second day. In June the range was between 0.53 and 7.8 ppb; there were no high values (USGS OFR 96-614). Some uranium mines were operating during this period.

In April and May 1991, Titan Environmental, Inc. collected water samples from the Redwall-Muav aquifer near the Kanab North Mine, while it was in operation. The uranium concentrations were found to vary between 0.8 and 5.9 ppb (Titan 1994).

The summary statistics of the Colorado Basin Water Study data, taken above Diamond Creek near Peach Springs, AZ during the period 1997 to 2000, shows that the dissolved uranium was in the range of 2.8 to 3.9 ppb (USGS National Stream Water Quality Accounting Network, NASQAN, Kelly, et al.)

During the period May 2000 to September 2001 water samples from 20 spring and creek sites discharging from the Redwall-Muav Limestone aquifer indicated dissolved uranium from 1.1 to 9.3 ppb. However, Horn Creek had one sample at 29 ppb and Salt Creek Spring had values of 29-31 ppb. Horn Creek is near the Orphan Mine while Salt Creek is about 1 mi west (USGS SIR 2004-5146, 2005). This study was conducted by the USGS in cooperation with the National Park Service. The main objective of this study was “to determine baseline water quality and the residence times and flow paths of water discharging from the Redwall-Muav Limestone aquifer along the south rim of the Grand Canyon.” It should be noted that the Orphan Lode was mined before the National Environmental Protection Act (NEPA) of 1969 and Federal Land Policy and Management Act (FLPMA) of 1976 were in effect.

Dr. David K. Kreamer (2009) of the University of Nevada, Las Vegas claims that “In 1995 we discovered elevated uranium levels in Horn Creek (92.7 ppb).” This was based on the thesis of one of his master’s degree students, which indicated water coming from the Orphan Mine. This was not corroborated by the later work of the USGS (SIR 2004-5146). Dr. Karen J. Wenrich (2008), formerly of the USGS and International Atomic Energy Agency (IAEA), has indicated that there is artesian pressure in most of the springs which would prevent any external water from entering.

It should be borne in mind that the Arizona Department of Environmental Quality (ADEQ) has some of the most stringent requirements for mines in the nation. After a thorough review of the situation, and public hearings as required, the agency has issued air and water quality permits for Arizona 1, which is operational since December 2009, and an aquifer protection permit for the Pinenut and Canyon mines.

History of the Four Corners Region

There is little doubt that the mining of uranium in the Four Corners area has resulted in causing cancer and other problems with the local population, both native and Caucasian. But before we lay the entire blame on the industry, the atmosphere of the era should be scrutinized. This was the time right after World War II, when the race for military supremacy against the Soviet Union was the main consideration. It was considered patriotic to locate and mine uranium so the country could build the largest nuclear arsenal in the world. The Atomic Energy Commission

(AEC) had set up a monopsony – it was the only buyer while there were numerous sellers. The agency provided guidebooks for people to find uranium deposits. The AEC would buy the uranium, no questions asked. People had precious little understanding of the dangers of handling uranium, and the government did not disclose what little it knew, lest that discourage people from searching for new deposits.

Uranium was first mined in Arizona in 1918 in the Carrizo Mountains (Wikipedia a). It was mined until 1921 and then mined again from 1941 to 1966, producing 360,000 pounds of U_3O_8 . In 1942 a Navajo found uranium in Monument Valley on the Navajo reservation, which was mined between 1948 and 1969. This district produced 8.7 million pounds of uranium oxide. Hosteen Nez, a Navajo prospector discovered uranium near Cameron, Coconino County. This district yielded 1.2 million pounds of U_3O_8 in the period 1950 and 1963. From 1948 through 1968 mining was active in the Lukachukai Mountains of Apache County, resulting in 3.5 million pounds of the oxide.

Uranium in the Four Corners area was discovered by a Navajo shepherd named Paddy Martinez near Haystack, NM in 1950 (Wikipedia b). Mining of the substance in the region continued from then through the 1980s. The deposits were the rolling front type in a sandstone host. The objective was to mine as much uranium as possible in the shortest amount of time. Without the knowledge of the decay daughters of uranium, many of the local people built huts with the tailings and let the dust float in the ponds. Both animals and humans consumed water from these ponds. Now it is known that smoking accentuates the ill effects of uranium; at the time many workers smoked. Perhaps because the material had been used in the past as a war paint by tribes and as a pigment for colorful pottery, its risks were not fully comprehended.

It might be recalled that at the time the military allowed people to watch atomic blasts in the New Mexico desert without adequate protection and that unshielded Seabees were ordered to scrub the decks of ships near the tests conducted on the atolls. Radium-dial watches and aviation instrumentation were in vogue.

Now, half a century later, there is a considerable amount of information on the behavior of uranium and radon; the mining companies take all necessary precautions to prevent hazards to the health and safety of the workers, wildlife, and the environment. In addition, there are a number of federal and state regulations, which are strictly enforced.

Impact on Wildlife Habitat

The footprint of the mines in the Northern Arizona Uranium District (NAUD) is relatively small, generally around 10 to 20 acres (the equivalent of 2 to 4 city blocks). This area is completely fenced off so that no ground animal or human can enter the property without the knowledge of the workers or guards. Most animals can readily go around the area. Each mine only lasts for about 5 years (with only 2 years of active production) including reclamation. Then the area is restored and wildlife can re-inhabit.

If a condor, eagle, or hawk is sighted this is reported immediately to the overseeing agency and any activity likely to harm the bird is ceased, until the bird leaves or is driven away by permitted

personnel (i.e. U.S. Fish and Wildlife Service or Peregrine Fund personnel). Project personnel are strictly forbidden to interfere with condors or eagles.

Arizona Wilderness Act of 1984

Energy Fuels Nuclear, Inc. (EFN) was the only mining company that was actively mining and exploring for uranium in the Arizona Strip in the early 1980s. Mining of the Hack 1, 2, and 3 mines was underway. However, difficulties were experienced in getting approvals for Kanab North because it was located in a Wilderness Study Area (WSA). It was concluded that some steps needed to be taken for mining in the future.

In 1982, Bob Adams, Chairman of Energy Fuels Nuclear, Inc., decided to forge a coalition with various groups, including:

- Wilderness Society
- Sierra Club
- Audubon Society
- Arizona Wildlife Foundation
- National Parks and Conservation Association
- Southwest Research Council

There were also representatives from:

- Mining
- Forest Interests
- Ranching

Several meetings over many months resulted in the Arizona Strip Wilderness Act of 1983 – HR 3562. The bill was introduced in the House of Representatives by Congressman Bob Stump of Arizona on July 13, 1983. However, the legislation did not come to fruition. The bill was reintroduced in the House by Congressman Mo Udall, who was Chairman of the Natural Resources Committee, as Title III of a more comprehensive bill, HR 4707, in the next Congress. Senator Barry Goldwater introduced bill S 2242 in the Senate. After some negotiations between the parties, identical bills were passed by Congress. Senator Dennis DeConcini and Congressmen Jim McNulty and John McCain all contributed to the final bill. The final bill was approved on August 28, 1984.

The Arizona Wilderness Act of 1984 (PL 98-406) was passed by the 96th Congress and was supported by the entire Arizona and Utah congressional delegations. A few extracts of testimony by some of the members of various groups are presented here to acquire a flavor of the occasion.

Congressman Udall, when he introduced the final bill to the House, stated (Congressional Record, 1984):

“Mr. Speaker, it gives me great pleasure today to ask the House to give final approval to H.R. 4707, the Arizona Wilderness Act. This omnibus legislation has just been considered by the Senate, and I urge my colleagues to accept the Senate amendment without change.

If we pass this bill today and the President then signs it Arizona will have proudly contributed more than 1 million additional acres to the national wilderness preservation system and *the great bulk of the controversy over which forest lands in our State should be managed as wilderness will be terminated.*

The language releasing Forest Service lands not designated as wilderness is the formula that Representative JOHN SIEBERLING, Senator JAMES McCLURE and I were able to work out this spring and which ended a lengthy controversy that had held up enactment of the RARE II bills for many years. This language has now become the standard formula for all statewide Forest Service wilderness bills. I would *note here that in Arizona the release language applies equally to Forest Service lands not designated as wilderness north of the Grand Canyon on the so-called Arizona Strip*, as well as to such lands elsewhere in the state.

Mr. Speaker, this is a day that many people thought would be a long time coming in Arizona, indeed a day that some said would never come. But *Arizonans throughout the State, of wildly differing political views and economic interests, rallied to work out their differences to produce a bill that is in everybody's interests. I am very proud to support their efforts.*"

The emphasis has been added, to underscore that the statements being made by some persons that the Wilderness Act did not consider the controversy over the management of the Arizona Strip ended, even though Senator McCain and Senators DeConcini and Hatch (of Utah), all of whom were involved in the formulation and passage of the legislation, have written letters stating that this was "the understanding." Although Mr. Mark Trautwein (2009), for example, admits that:

"It is true, of course, that the lands in wilderness study areas not designated wilderness by the Act lost their interim protections, to be managed for multiple use under applicable law. It is also true that the committee report accompanying the Arizona Wilderness Act contains rather detailed and extensive language laying out how uranium mining might proceed with respect to lands outside BLM's Grand Wash Cliffs Wilderness and the Forest Service's Kanab Creek Wilderness. *But that language reflects an understanding of specific facts related to specific actors 25 years ago that no longer apply.*"

Again the emphasis has been added. The last sentence is clearly his own thinking, but then he invokes the name of Congressman Udall, since he worked for him at one time and, therefore, professes to fathom how the Congressman would have responded.

In oral testimony (Congressional Hearings, 1983) given by Mr. Gerald W. Grandey, Vice President of Energy Fuels Nuclear, Inc., after citing the various diverse groups that were invited to participate in the discussions, said:

"Clearly our objective, being in the mining business, was to obtain the release to multiple use those areas that we considered to have a high degree of mineral potential. Based upon the number of years of exploration that we have done in the area, we believe we have accomplished this purpose and this objective through the negotiations and consensus that we embarked upon.

The benefits to be had from the passage of the Arizona Strip Wilderness Act are clear. The wilderness question will be decided once and for all, ending many years of potential controversy
Department of Mines and Mineral Resources, State of Arizona

and debate. In the areas released, our company and others will be able to conduct exploration in a cost-effective and responsible manner. The discoveries that we have in the area will also be capable of being developed without uncertainty.

The Arizona Strip Wilderness Act represents the consensus of opinion of a very broad base of constituents. We have come to grips with the complex and controversial issues associated with the wilderness debate, we have succeeded in satisfying the concerns of almost everyone involved.”

In response to a question by Mr. Sieberling about the release formula, Mr. Grandey stated:

“...we finally got to the issue of continuing management on the part of the Bureau of Land Management, and indicated the nonimpairment standard would no longer be applied, even though the area could continue to be studied in the future, that as long as we were not facing the yoke of the nonimpairment standard we were then free to conduct our exploration programs in a cost-effective and responsible manner. More importantly, many of the discoveries we have right now, which are being held up as a result of the WSA program, could go forward.”

The remarks clarify at least what Mr. Grandey’s understanding was at the time, and it was not contradicted by anyone else (including the Chairman) during the testimony.

Mr. Michael D. Scott, Regional Southwest Director, The Wilderness Society testified:

“It is a unique piece of legislation, one which, as you correctly pointed out, represents a compromise between a variety of competing interests.

It also has a couple of firsts. It marks the debut of a significant piece of BLM wilderness, the first one, at least to our knowledge, that has come before this subcommittee and, in fact, has the opportunity of becoming law. We at the Wilderness Society are very pleased to have this come before you as BLM wilderness is a top priority of ours.”

The testimony of Mr. Russell D. Butcher, Southwest Regional Representative, National Parks and Conservation Association, and also on behalf of The National Audubon Society, was:

“As one of the key negotiators for the Arizona Strip Wilderness consensus proposal, we support with great enthusiasm H.R. 3562. We are pleased with the substance of this legislation, and we are pleased with the way in which this proposal was reached. For all of us who participated in the negotiating process, this has been an enjoyable experience – in fact, an exciting adventure in the democratic process.”

Ms. Debbie Sease, Washington Representative of The Sierra Club, testified:

“H.R. 3562 is the product of a long and arduous process of compromise and consensus. It is supported by the entire Arizona delegation and by virtually all interested constituencies.”

The Arizona Republic published two editorials, complimentary to the bill, on July 28 and September 8, 1982. One of them reads in part:

“The Arizona Strip Wilderness bill now before Congress is a triumph of compromise over environmental conflict. It is a rare species on the environmental landscape – a wilderness proposal that both environmentalists and industrial leaders support.... It could prove a model for future accords here and elsewhere in the Nation....It is a beautiful compromise.”

It is fully realized that H.R. 644 is not intended to create more wilderness; it is simply to withdraw the land from mining. It is difficult to not conclude, however, that this is not the first step towards expanding the boundaries of the National Park.

Economic Impact

A recent economic study (September 2009) has been conducted by Tetra Tech, a consulting engineering firm, for the American Clean Energy Resources Trust (ACERT). This analysis indicates that there would be six (6) mines in production at any one time for a period of 42 years. It would generate 1,078 new jobs (390 direct and 688 indirect) resulting in a payroll of \$40 million annually. The long-term duration of the entire project should eliminate any fear of a short-time boom followed by a bust. There is little chance of the price of uranium falling drastically, since as of April 1, 2010 there are 438 operable nuclear reactors in the world, 52 under construction, 143 planned, and 344 proposed for operation by 2030. All of these plants will require 68,646 tons of uranium (World Nuclear Association, 2010). China has 11 plants operating, 20 under construction, 37 planned and 120 proposed. Russia has 32 reactors operating, 8 under construction, 16 planned and 30 proposed. In addition Russia plans to export 25 reactors to 9 countries by 2025. India also has an ambitious plan for increasing nuclear capacity; it has 19 reactors in operation, 4 under construction, 20 planned and 34 proposed. India was being held back because it had not signed the Nuclear Proliferation Treaty (NPT), but the civilian nuclear agreement with the U.S. in 2008 has removed that barrier. The United States has 104 operating reactors, one under construction, 9 planned and 23 proposed. The total direct impact of the sales of uranium from the Northern Arizona Uranium District (NAUD) will be \$18.9 billion over the 42-year span, while the indirect impact will be another \$10.5 billion, giving a total of \$29.4 billion, which computes to an impact of \$700 million every year. This will result in \$2 billion in federal and state corporate income taxes, \$168 million in Arizona's severance taxes and \$9.5 million in claims payments and fees to local governments. In addition, local trucking companies will be transporting the ore to the White Mesa Mill in Blanding, UT for processing, generating \$1.6 billion for the local economy. The local property tax base will increase and local and state sales taxes will expand.

The above computations were made with the price of uranium oxide (U_3O_8) at \$50 per pound. Recently the spot price is around \$42 per pound, maybe because the U.S. has released some of its uranium stocks from the stockpile, but this is a transitory dip. It should be borne in mind that most large users get their supplies under long term contracts, where the price differs.

The Arizona counties that will benefit the most from the mining operations will be Mohave and Coconino. Benefits will also accrue to Kane and Washington Counties in Utah and to San Juan County, Utah which hosts the uranium processing mill and employs 150 workers. The average wage in the two Arizona counties is around \$30,000 to \$40,000. The three Utah counties have a similar range for wages. The per capita personal income (PCPI) in all these areas is about

\$5,000 less. Miners are generally paid between \$60,000 and \$80,000. This would help the local economy significantly.

This economic activity is of critical importance to Arizona which is currently in the midst of a severe economic crisis.

Arizona is fortunate enough to have been blessed with substantial mineral wealth; this was the initial impetus for prospectors to come and settle the land. Already well over half the land in the state (55.6 percent of the area) is constrained from mineral entry. This was before the segregation order issued on July 21, 2009 by Interior Secretary Ken Salazar removing another 1,075,384 acres; this would increase the restriction to 57 percent.

National Security

According to the USGS (SIR 2010-5025) the Northern Arizona Uranium District (NAUD) hosts an estimated 326 million pounds of U_3O_8 (which is the energy equivalent of 11.6 billion barrels of oil, which is only slightly less than all the recoverable oil (13.3 billion barrels) from Prudhoe Bay – the largest oilfield in the U.S.). It should be noted that the USGS estimate does not account for the fact that some of the mineralized breccia pipes are not visible on the surface, but have been recently discovered with geophysical techniques. So there could be more uranium in the region than estimated. In 2008 the U.S. used 53.4 million pounds of U_3O_8 , of which only 14% was produced in the country; 86% was imported, much of it from Canada, Australia, Namibia, Russia and now Kazakhstan. The production of U_3O_8 in the United States has continued to decrease over the years – it was 6.3 million pounds in 1996, 4.5 million pounds in 2007, 3.9 million pounds in 2008, and an estimated 3.7 million pounds in 2009 (EIA, 2010). To wean the nation from foreign oil only to become dependent on imported uranium is not wise policy.

Some persons are under the misconception that the United States can always purchase its uranium from Canada, since it is a good neighbor. It might be borne in mind, however, that the Cigar Lake mine, Canada's largest uranium mine, was flooded in 2006 and again in 2008 and will probably not become operational until 2014. Besides, Cigar Lake is owned 50 percent by Cameco (Canadian), 37 percent by AREVA (French), 8 percent by Idemitsu Kosan and 5 percent by TEPCO Resources (both Japanese)(Mineweb, 2010). Similarly, Australia is friendly but its largest mine, Ranger, is leaking significant amounts of uranium contaminated water into the World Heritage-listed Kakadu National Park, and one of its pit walls is unstable. Energy Resources of Australia, the proprietor of the Ranger Uranium Mine, with 68.4 percent ownership by Rio Tinto, has signed an agreement to supply uranium to a Chinese electric utility (Ranger, 2010).

In 2008, the worldwide demand of uranium for power generation was 114 million pounds. This is expected to grow to 170 million pounds by 2030. This implies an increase of 599 million pounds over the next 22 years (Tetra Tech, 2009). The NAUD could supply a significant portion of that requirement.

The uranium in the NAUD is the highest grade in the United States, at 0.65%. Thus it is produced at low cost, and will be competitive in the world market. As stated at the beginning of

this testimony during the 1980s there were seven (7) operating mines that produced 19 million pounds of U₃O₈. Thus the production methods and costs are well established.

Closure

In closing, based on the factual information presented above, it is evident that removing over one million acres of lands to mineral entry is not warranted.

Thank you for the opportunity to make a presentation to this committee.

References

Congressional Hearings, Subcommittee on Public Lands and National Parks, Committee on Interior and Insular Affairs, House of Representatives, September 13, 1983.

Congressional Record, House, August 10, 1984, pp. 123934-23945.

EIA, 2010, Energy Information Administration, Domestic Uranium Production Report, Mar 10, 2010, http://www.eia.doe.gov/cneaf/nuclear/dupr/qupd_tbl1.html (last viewed on Apr 04, 2010).

Ranger, 2010, "Issues at Operating Uranium Mines and Mills - Ranger, Australia," last updated Feb 12, 2010, <http://www.wise-uranium.org/umopaura.html>, (last viewed Apr 04, 2010).

Kelly, V.J., Hooper, R. P., Aulenbach, B. T. and Janet, M., U.S. Geological Survey, "Concentrations and annual fluxes for selected water-quality constituents from the USGS National Stream Water Quality Accounting Network (NASQAN)", Summary Statistics - Colorado Basin, Water Years 1997-2000, Colorado River above Diamond Creek near Peach Springs, Arizona (09404200).

Kreamer, D.K., 2009, Testimony to the Subcommittee on National Parks, Forests and Public Lands, Natural Resources Committee, on H.R. 644, the Watersheds Protection Act of 2009, July 21, 2009.

Mineweb, 2010, "Cigar Lake uranium mine now pumped out, Cameco says," Feb 12, 2010, <http://www.mineweb.com/mineweb/view/mineweb/en/page72103?oid=97976&sn=Detail>, (Last viewed Apr 04, 2010).

National Park Service, NPS Stats, National Park Service Public Use Statistics Office, Grand Canyon NP, <http://www.nature.nps.gov/stats/viewReport.cfm> (Last viewed on Apr 04, 2010).

SEC (1998), US Securities Exchange Commission, Registration Statement, Form 20-F, 20FR12G, Filed June 11, 1998.

Tetra Tech, 2009, "Economic Impact of Uranium Mining on Coconino and Mohave Counties, Arizona," submitted to American Clean Energy Resources Trust (ACERT), Sept 2009, 40 p.

Titan Environmental, 1994, Mine Closure Plan, Kanab North Mine.

Trautwein, M., 2009, Testimony to the Subcommittee on National Parks, Forests and Public Lands, Natural Resources Committee, on H.R. 644, the Watersheds Protection Act of 2009, July 21, 2009.

USGS OFR 89-550, 1989, Sutphin, H.B. and Wenrich, K.J., “Map locations of collapse –breccia pipes in the Grand Canyon of Arizona,” 1 plate.

USGS Circular 1051, 1990, Finch, W.I., Sutphin, H.B., Pierson, C.T., McCammon, R.B., and Wenrich, K.J., “The 1987 Estimate of Undiscovered Uranium Endowment in Solution-Collapse Breccia Pipes in the Grand Canyon Region of Northern Arizona and Adjacent Utah,” U.S. Government Printing Office, 19 p.

USGS OFR 96-614, 1996, Taylor, H.E., Peart, D.B., Antweiler, R.C., Brinton, T.I., Campbell, W.L., Garbarino, J.R., Roth, D.A., Hart, R.J., Averett, R.C., “Data from Synoptic Water-Quality Studies on the Colorado River in the Grand Canyon, Arizona, November 1990 and June 1991,” U.S. Geological Survey, Denver, CO, 175 p.

USGS SIR 2004-5146, 2005, Monroe, S.A., Antweiler, R.C., Hart, R.J., Taylor, H.E., Truini, M., Rihs, J.R., and Felger, T.J., “Chemical Characteristics of Ground-Water Discharge along the South Rim of Grand Canyon in Grand Canyon National Park, Arizona, 2000-2001,” U.S. Geological Survey, Reston, VA, 59 p. + map.

Wenrich, K.J. (2008), Field hearing on “Community Impacts of Proposed Uranium Mining Near Grand Canyon National Park,” Flagstaff, AZ, March 28, 2008.

Wikipedia a, http://en.wikipedia.org/wiki/Uranium_mining_in_Arizona (Last viewed on Apr 04, 2010).

Wikipedia b, http://en.wikipedia.org/wiki/Uranium_mining_in_New_Mexico (Last viewed on Apr 04, 2010).

World Nuclear Association, 2010, “World Nuclear Power Reactors & Uranium Requirements,” Apr 01, 2010, <http://www.world-nuclear.org/info/reactors.html>, (Last viewed on Apr 04, 2010).