

**H.R. 644,  
GRAND CANYON WATERSHEDS  
PROTECTION ACT OF 2009**

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**LEGISLATIVE HEARING**

BEFORE THE

SUBCOMMITTEE ON NATIONAL PARKS, FORESTS  
AND PUBLIC LANDS

OF THE

COMMITTEE ON NATURAL RESOURCES

U.S. HOUSE OF REPRESENTATIVES

ONE HUNDRED ELEVENTH CONGRESS

FIRST SESSION

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**LEGISLATIVE HEARING ON H.R. 644, TO WITHDRAW THE TUSAYAN RANGER DISTRICT AND FEDERAL LAND MANAGED BY THE BUREAU OF LAND MANAGEMENT IN THE VICINITY OF KANAB CREEK AND IN HOUSE ROCK VALLEY FROM LOCATION, ENTRY, AND PATENT UNDER THE MINING LAWS. (GRAND CANYON WATERSHEDS PROTECTION ACT OF 2009)**

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**Tuesday, July 21, 2009**

**U.S. House of Representatives  
Subcommittee on National Parks, Forests and Public Lands  
Committee on Natural Resources  
Washington, D.C.**

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The Subcommittee met, pursuant to call, at 10:02 a.m. in Room 1324, Longworth House Office Building, The Honorable Raúl M. Grijalva [Chairman of the Subcommittee] presiding.

Present: Representatives Grijalva, Hastings, Kildee, Bishop, Heinrich, Shea-Porter, Coffman, and Lummis.

**STATEMENT OF THE HONORABLE RAÚL M. GRIJALVA, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ARIZONA**

Mr. GRIJALVA. Let me call the Subcommittee on National Parks, Forests and Public Lands to order. This is a legislative hearing on H.R. 644, and I'd like to welcome everyone, particularly our witnesses—some of whom had to go through considerable lengths to be here with us. We are very appreciative of your presence and look forward to your testimony.

Like the Statue of Liberty, or the Dome of the U.S. Capitol Building just across the street from us, the Grand Canyon is one of the most instantly recognizable icons in the world. The canyon's walls and jagged formations are shorthand for what makes this country exceptional, and what we stand for as a people.

Grand Canyon National Park evokes nostalgia for family vacations and park rangers spinning yarns about the canyon lore over a campfire. It reminds us that those who came before us had the foresight to save this place for us and we, in turn, bear the heavy responsibility of preserving this place for those who will come after us. Like the Grand Canyon itself, this kind of large landscape preservation is uniquely American and also worth preserving.

However, in the past several years, in response to booming demands for uranium, thousands of mining claims have popped up along the park's edge, threatening the natural and cultural resources of the park as well as its watershed. This is deeply troubling to the business people who depend on the park for their

livelihoods, its visitors, the millions who rely on the Colorado River for water, those who value the distinctive wildlife and plant sustained by the canyon's waters, and the native communities who revere the canyon and are still reeling from the last uranium mining boom.

Last year the Natural Resources Committee notified the previous administration that the pressure placed on the canyon and its resources by exploding demand for uranium constituted an emergency. Unfortunately, the previous administration refused to act. In contrast, the Obama Administration has announced a decision to segregate one million acres of critical lands adjacent to the park to conduct a thorough study of the appropriateness of allowing mining on these lands.

This is a vital step. I commend the President and Secretary Salazar for their leadership on this issue, and thank them for responding to the Committee's notification. Until we have a better understanding of the impact the uranium boom will have on this American landmark, and what impact it will have on the water source of the West, the Colorado River, the Administration is right to provide a timeout, to take a hard scientific look.

Now it is time for Congress to do its part by devising permanent protection for this national treasure. Extending the work begun with the field hearing this Subcommittee conducted at Flagstaff, we will continue today to build a record documenting what is at stake if uranium mining goes forward on these lands. We will hear testimony from witnesses about the risks of uranium mining to the Grand Canyon's ecosystem, to the Colorado River, and we will hear the sometimes tragic impacts of past mining projects such as the Church Rock mining disaster whose thirtieth anniversary was silently marked last week with a prayer walk, and we will gain insight into the future of the canyon envisioned by conservation leaders of the recent past, such as Mo Udall and others.

I would note that my decision not to invite the Administration to testify at today's hearing has been questioned. For the record, such participation in today's meeting would be inappropriate for a variety of reasons.

These include the pendency of litigation, desire to avoid repetition, and the fact that thanks to some partisan gamesmanship that is going on, the Interior Department still lacks a full leadership staff. I am eager to allow the Administration to testify regarding the decision announced yesterday, their reactions, and their recommendations regarding the legislation before us today, and we will be scheduling hearings for that particular purpose in the future.

I thank all the witnesses for traveling here to D.C. to speak out on what I believe to be a very, very important issue. I look forward to your comments. With that, let me turn to our Ranking Member, Mr. Bishop, for any comments he may have.

**STATEMENT OF THE HONORABLE ROB BISHOP, A  
REPRESENTATIVE IN CONGRESS FROM THE STATE OF UTAH**

Mr. BISHOP. We meet today in a hearing that may actually be a moot issue, which is legal talk for useless. Since Secretary Salazar's actions on Monday, it actually takes the place of what

this legislation was intending to do without ever having gone through the process of input hearings or understanding the situation.

Secretary Salazar was given a letter of questions that we thought were imperative to be answered before any kind of action took place. Not only was the letter ignored, but there were no answers to any of those questions given before his unilateral action.

I could do an entire Red Buttons' monologue on the people who aren't here that should be here. Yes, the Administration should be here to answer why they did what they did, and what the rationale is for doing it, but they are not here. The Member who represents this area should be here to give her input on what she wants to do, but once again she is not here.

In 1983 and 1984, this issue was solved by bringing the special interests together—government leaders and the businesses impacted—in something that Mo Udall himself called an amazing process that was built from the bottom up in Arizona, not imposed on Arizona from Washington—something that didn't happen on Monday.

He went on to say that this was an extraordinary example of what cooperation and compromise between business and conservation groups can produce. He was accurate when that took place. He went on to say that, yes, this decision by an informed wilderness and non-wilderness contingent could be extended and delayed by years, but it was unlikely to result in any new data becoming available.

Now, they produced a compromise back there. Many Members of Congress that are here today were part of that process, and they will say the same thing—that the compromise worked back then.

I am assuming we are going to hear others today that will tell us that the conditions have changed since 1983 and 1984. They are wrong. There are some that will say that water conditions have changed. They will be wrong. There will be some that will say that energy demands have changed, and those people are spot on accurate.

This bill is having a hearing. If this issue was to go through the process in regular order, the way it was intended to do, we would have a hearing here and in the Senate. There would be votes here and in the Senate. If you went through that process, you might be able to replicate what former Congressman Udall was able to do in the 1980s. But we didn't do that because the Secretary of the Interior unilaterally and arbitrarily made a multi-year decision for a moratorium without input, without science, and obviously without understanding. He also did not take away a takings issue from these people who are involved because he didn't necessarily take it. He just put on hold any kind of development of new areas until the costs can possibly run out the time so that those businesses will have no opportunity to become involved again.

It is interesting to note that the State Legislature of Arizona passed a resolution that condemned the action the Secretary of the Interior took on Monday, condemning this bill. The county where this will be residence passed a resolution condemning this bill, and this particular action of this Interior Secretary.

Now, when Aristotle started writing about governments, he had this penchant for always trying to come up with lists and giving names to those lists. He said the only difference between good and bad government was the attitude of the person involved, and then he divided them into governments of the one, the few, and the many, and to each of those he gave a name. He said the worst form of government, the government of the many in which there was a bad attitude, was called a democracy because in a democracy property can be taken by a vote of the many.

This did not happen. This was property that was taken by the decision of one. Aristotle had a name for that as well. He decided that kind of government was called a tyranny. Secretary Salazar participated on Monday in making that kind of unilateral decision. It was wrong. If this bill should go forward, it needs to have hearing, it needs to have input, not what Secretary Salazar did.

I yield back.

Mr. GRIJALVA. I now turn to my colleague, Mr. Kildee. Do you have any opening comments?

**STATEMENT OF THE HONORABLE DALE E. KILDEE, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MICHIGAN**

Mr. KILDEE. Just briefly. We are today discussing one of America's and one of the world's greatest treasures, and I want to make sure that we do keep that in mind, but also wish to keep in mind the lives of people whose ancestors admired the hand of God in the Grand Canyon. To that, we should add that we want to make sure that we do no harm.

And Mr. Chairman, I yield back.

Mr. GRIJALVA. Thank you.

The Ranking Member of the full Committee, Mr. Hastings, any comments?

**STATEMENT OF THE HONORABLE DOC HASTINGS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF WASHINGTON**

Mr. HASTINGS. Thank you, Mr. Chairman, and thank you for your courtesy in allowing me to be here today.

We are here today to discuss legislation that would permanently remove a million acres of land in Arizona from the development of uranium resources. Now, I do strongly oppose this bill, but I want to focus this morning on the troubling and unacceptable actions taken by the Obama Administration on this issue, that which Mr. Bishop alluded to.

Yesterday, Secretary Salazar announced a two-year timeout on new uranium mining on this land in Arizona. This decision, which would lock up 40 percent of our country's uranium supply, will cost American jobs at a time when the employment rate is 9.5 percent, over a quarter-century high, and make the United States more dependent on foreign countries for our energy. In the end, this decision will move our economy backward, not forward.

Once again, this is another example of the Obama Administration saying no to American energy and no to American jobs. In just six short months, this Administration has blocked new offshore



drilling, blocked oil and natural gas leases in Utah, and is now blocking uranium mining in Arizona. It is ironic that the same Administration that is pushing through a national energy tax in order to supposedly reduce our country's carbon footprint is now blocking mining of uranium that is used to generate nuclear power.

Nuclear is a clean, noncarbon-emitting energy source. If the President is serious about reducing carbon emissions, he would support increased American uranium development and embrace nuclear power to help us meet our growing energy needs.

In this Congress, we really need to enact an energy plan that responsibly uses our natural resources and makes our environment cleaner. This includes, of course, renewable carbon-free energy sources such as nuclear, wind, solar, and hydropower, but also it needs to include producing more American-made oil and natural gas. Unfortunately, this Administration has chosen to adopt a high-priced gourmet plan that only uses certain types of American energy and focuses almost solely on green jobs.

Now, I can say that we all support green jobs. However, the 14.7 million Americans who are unemployed aren't just looking for green jobs. We need green jobs, nuclear jobs, drilling jobs, oil and gas jobs, manufacturing jobs, and thousands of jobs that depend on uranium development.

But what is even more troubling about yesterday's announcement is that the Administration made this unilateral decision, as Mr. Bishop alluded to, without consulting with Congress and without providing answers to detailed questions asked by House Republicans last March. It appears we will have to keep waiting for answers to these questions because there is not one official from the Obama Administration here today to testify. It is outrageous that while the Administration is singlehandedly making decision that will cost jobs and block energy development they are not even here to explain what their position is on this particular bill. For an Administration that promised to be open and transparent, I am really troubled by their actions yesterday, and I just hope that this is not a prelude to their arbitrary and heavy-handed approach to crafting our national energy policy.

With that, Mr. Chairman, thank you, and I yield back.

Mr. GRIJALVA. Thank you, sir. Mr. Heinrich, any comments?

**STATEMENT OF THE HONORABLE MARTIN HEINRICH, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW MEXICO**

Mr. HEINRICH. Thank you, Mr. Chairman. I will keep my comments short.

I want to welcome our panelists this morning, and I would note that a great much ado has been made about process this morning already, and I will simply note that it was the previous administration's efforts to avoid the NEPA process that lands us in this mess in the first place, and that we could have had a lot more transparency for a great deal of the last few years.

And I actually have a slightly more pro-nuclear approach than many of my Democratic colleagues. I have worked in a nuclear reactor. I think nuclear power is an important part of our energy mix moving forward, but I also live in a state where the costs of ura-

nium mining have been an enormous burden to many of our poor communities for a very long time.

Like Arizona, New Mexico has been through this uranium boom and bust before, and we have not cleaned up the legacy of our previous economic activity. We still have enormous burdens on local communities in terms of water contamination, in terms of areas that are simply fenced off where the public cannot go, in terms of needs for reclamation, and I think it is important to make sure that we don't make the same mistakes twice; that as we move forward, we pick and choose the places where it is most appropriate to do development, and make sure that that development is in keeping with not only protecting our environment but also protecting the religious and cultural sites that our tribes and pueblos feel so strongly about.

So, I think this is a perfectly appropriate hearing. I look forward to hearing from our guests today, and I would thank the Chairman for bringing this issue to the fore.

Mr. GRIJALVA. Thank you, and let me invite the first panel up, if I may.

Let me thank the panel, and welcome you here. Your full comments and any other extraneous information that you would want to leave with us will be made part of the official record of the hearing. I would hope that we could limit our comments today to five minutes. That will give the Members here ample time to have time for questions.

With that let me begin with Mr. Matthew Putesoy, Vice Chairman of the Havasupai Tribe, and Mr. Vice Chairman, if you would also introduce the council member that is with you here today, that would be appropriate. Welcome, sir, and thank you for being here. We look forward to your comments.

**STATEMENT OF MATTHEW PUTESOI, VICE CHAIRMAN,  
HAVASUPAI TRIBE, SUPAI, ARIZONA**

Mr. PUTESOI. OK, thank you, Chairman and committee members. I am here today with Diana Sue Uqualla. She is a Havasupai Tribe council member.

[Native greeting.] Hello, my name is Matthew Putesoy. I am the elected Vice Chairman of the Havasupai Tribe. I live in the Grand Canyon.

H.R. 644 will protect the Grand Canyon. It will also protect my tribe's aboriginal home inside the Grand Canyon. The Havasupai People have lived in and around the Grand Canyon since before there was a United States of America. We have lived in the canyon at least 500 years before Christopher Columbus was born.

I have listened to a lot of people talking about the Grand Canyon. Well, you are looking at it, I am the Grand Canyon. I am the Grand Canyon.

The Havasupai are known as the "Guardians of the Grand Canyon" and Havasu Baa'ja—the People of the Blue-Green Water. The water in Havasu Creek forms beautiful waterfalls in our village. This water springs out of the canyon floor above our village. The source of our water is called the Redwall-Muav aquifer. The area of this aquifer is very large. It extends underneath about 5,000 square miles of the Coconino Plateau on the South Rim. About 98

percent of the water in this aquifer comes out at Havasu Springs. The rest discharges at the springs at Indian Gardens, Hermit Springs, and other springs in the Grand Canyon.

Hundreds of existing mining claims on the land identified in H.R. 644 are directly on top of this aquifer. If uranium or mining poisons our water, our thousand-year life in the Grand Canyon will end. As a tribe, we will die. We cannot relocate to Phoenix or someplace else and still survive as the Havasupai Tribe. We are the Grand Canyon.

Mining not only threatens our water and life, but many of the mining claims, including the Canyon Uranium Mine set to go into operation, are located right next to traditional Havasupai religious areas in the forest that my people have used for centuries. Would you want an operating uranium mine next to your church or synagogue?

In 1975, Congress, led by Senator Barry Goldwater, returned to us some—but not all—of our aboriginal canyon lands. In the statute that did this, Congress said that our land and all of the Grand Canyon was ‘a natural feature of national and international significance.’ In returning our land to use, Congress said it recognized the need for ‘further protection...of the Grand Canyon in accordance with its true significance.’ My tribe listened to these words and took action to further protect our canyon home. My people adopted a provision in our constitution that bars uranium mining on our reservation.

Well, the Grand Canyon has not changed much in the 34 years since Congress expressly recognized a need to further protect it. But something has changed. Over 10,000 new claims have been filed on the land identified in H.R. 644.

H.R. 644 would prohibit the filing of any more mining claims on the lands identified in the bill. Section 2[b] would protect valid existing rights. My tribe opposes the existing 10,000 mining claims. We do not need more. The mining industry does not need more. The Grand Canyon cannot survive more.

I urge you to do the right thing. Protect the Grand Canyon and the Havasupai people—for those living now and those yet to be born.

Please adopt the Grand Canyon Watersheds Protection Act of 2009.

Thank you. Council Member Diana Sue Uqualla, behind me, and I would be happy to answer any questions you may have.

[The prepared statement of Mr. Putesoy follows:]

**Statement of Matthew Putesoy, Vice Chairman,  
Havasupai Tribe, Supai, Arizona**

[Brief greeting in the Havasupai language.]

Hello. My name is Matthew Putesoy. I am the elected Vice Chairman of the Havasupai Tribe. I live in the Grand Canyon.

H.R. 644 will protect the Grand Canyon. It will also protect my Tribe’s aboriginal home inside the Grand Canyon. The Havasupai People have lived in and around the Grand Canyon since before there was a United States of America. We have lived in the Canyon at least 500 years before Christopher Columbus was born!

I have listened to a lot of people talking about the Grand Canyon. Well, you are looking at it. I am the Grand Canyon.

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In 1975, Congress, led by Senator Barry Goldwater, returned to us some—but not all—of our aboriginal Canyon lands. In the statute that did this, Congress said that our land and all of the Grand Canyon was “a natural feature of national and international significance.” In returning our land to us, Congress said it recognized the need for “further protection...of the Grand Canyon in accordance with its true significance.” My Tribe listened to these words and took action to further protect our Canyon home. My People adopted a provision in our Constitution that bars uranium mining on our Reservation.

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H.R. 644 would prohibit the filing of any more mining claims on the lands identified in the bill. Section 2(b) would protect valid existing rights.

My Tribe opposes the existing 10,000 mining claims. We do not need more. The mining industry does not need more. The Grand Canyon cannot survive more.

I urge you to do the right thing. Protect the Grand Canyon and the Havasupai People—for those living now, and those yet to be born.

Please adopt the Grand Canyon Watersheds Protection Act of 2009

Thank you. Council Member Diana Sue Uqualla, behind me, and I would be happy to answer any questions you may have.

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Mr. GRIJALVA. Thank you, Mr. Vice Chairman.

Let me now ask Ms. Elizabeth Archuleta, Supervisor, District 2, Coconino County Board of Supervisors. Madam Supervisor, comments?

**STATEMENT OF ELIZABETH C. ARCHULETA, SUPERVISOR, DISTRICT 2, COCONINO COUNTY BOARD OF SUPERVISORS, FLAGSTAFF, ARIZONA**

Ms. ARCHULETA. Thank you very much, Chairman Grijalva, Members of the Subcommittee on National Parks, Forests and Public Lands. I appreciate the opportunity to provide testimony today. I am here representing the Coconino County Board of Supervisors. We certainly appreciate the efforts of the Chairman and the committee to hold this important hearing, to discuss the community impacts of proposed uranium mining near the Grand Canyon National Park.

As you know, Coconino County is the second largest county in the nation, encompassing more than 18,000 square miles. It includes many national treasures, including Oak Creek Canyon, Sunset Crater National Monument, Walnut Canyon National Monument, and most notably, Grand Canyon National Park. Our county includes 13 percent private land, with the remaining land owned by the Federal government, five Native American tribes, and the State of Arizona.

In Coconino County, we pride ourselves on the relationships that we have with Native American tribes, state and Federal land managers as well as our neighboring counties and communities in Arizona and Utah. However, we are very concerned when decisions are made by agencies that may affect the health and safety of our residents in Coconino County.

Once such decision was made on January 10, 2008, by the Tusayan Ranger District of the Kaibab National Forest. The Tusayan Ranger District issued a decision that VANE Minerals, LLC, could begin joint exploration holes for uranium at seven project sites within the district. According to the Kaibab National Forest the primary purpose of the project is for VANE Minerals to locate and assess quantity and commercial resource potential for uranium ore deposits within the Tusayan Ranger District. The location of the drill exploration site is less than two miles from Grand Canyon National Park within Coconino County.

According to the Kaibab National Forest, because the 1872 Mining Law authorizes the taking of valuable mineral commodities from public domain lands, a no action alternative was not an option for the Kaibab National Forest. Therefore, the decision by the Kaibab National Forest is based on whether mitigation measures are sufficient to reduce or eliminate environmental impacts at the surface, but not on whether or not to allow the exploration activity.

It is important to point out that 2,000 mining claims have been filed within the Tusayan Ranger District of the Kaibab National Forest since 2003. The majority of these claims are within 10 miles of Grand Canyon National Park.

In response to this decision, on February 5, 2008, the Coconino County Board of Supervisors adopted a resolution opposing uranium development in the vicinity of the portions of the Grand Canyon National Park and its watershed within Coconino County, and that decision has not been rescinded. That resolution still stands.

Coconino County has witnessed serious health and environmental impacts associated with the long-term impacts of uranium mining. Uranium development operations in Coconino County have caused considerable contamination and environmental degradation, particularly on the Navajo and Hopi Nations. On the Navajo nation alone five mill sites and over 500 mines have been abandoned since the 1940s and 1950s, and to this date clean up of these sites have not occurred.

Coconino County has witnessed the contamination of creeks and aquifers providing public drinking water. In the Grand Canyon National Park, the Orphan Mine operated within the park in 1969, the remnants from the Orphan Mine are approximately two miles northwest of the South Rim Village between Maricopa Point and the Powell Memorial. The presence of radioactive materials from the mine is being blamed for the contamination of Horn Creek in the Grand Canyon National Park.

In addition, in Tuba City, decommissioned uranium mining sites were capped with clay and rock causing groundwater contamination. The decommissioned mine and sites continue to put the resident of Tuba City as well as the surrounding areas at risk of contaminated drinking water.

Grand Canyon National Park is a national and international treasure attracting almost 1.5 million visitors to northern Arizona each year. The park encompasses more than 1.2 million acres, and contains extensive geological, paleontological, archeological and biological resources.

With the millions of visitors to the Grand Canyon National Park comes significant tourism revenue to our communities in northern Arizona. It is estimated that the total annual impact of all Grand Canyon National Park visitors to the north and south rim is approximately \$687 million.

The economy in Coconino County is primarily based on revenue generated by tourism. Therefore, the potential negative impact to tourism in northern Arizona from uranium mining near the Grand Canyon Park cannot be overstated. In 2009, Coconino County alone generated almost \$12.5 million in sales tax revenue, a large portion of which is generated by tourism-related industries. You combine this with the state sales taxes collected and distributed to counties and municipalities, the sales tax revenue accounts for 58 percent of Coconino County's general fund revenues.

While Coconino County continues to support regional economic development opportunities, we are also cognizant of potential impacts from industries. Uranium mining in certain portions of the county has always remained a concern in Coconino County.

As outlined in our resolution passed on February 5, 2008, the Coconino County supports the permanent withdrawal of lands in Coconino County from uranium development on the Tusayan Ranger District and House Rock Valley. While we certainly support the recent action by the United States Secretary of the Interior, Ken Salazar, to temporarily bar the filing of new mining claims in the vicinity of the Grand Canyon Park, we support the permanent withdrawal of the lands within Coconino County.

The past mistakes of the uranium mining industry will have ever-lasting effects on areas within Coconino County. While Coconino County, and particularly the Navajo and Hopi Tribes, have faced significant financial costs, we cannot place a long-term health effects left by uranium mining. We cannot place a cost on that at all.

Thank you, Mr. Chairman, for the opportunity to testify this morning. The Coconino County Board of Supervisors wants to extend our gratitude to you and we want you to know very clearly that Coconino County is certainly concerned about the community impacts of proposed uranium development near Grand Canyon National Park.

[The prepared statement of Ms. Archuleta follows:]

**Statement of Supervisor Liz Archuleta,  
Coconino County Board of Supervisors**

Chairman Grijalva and members of the Subcommittee on National Parks, Forest and Public Lands, I appreciate the opportunity to provide testimony on H.R. 644, the Grand Canyon Watersheds Protection Act of 2009. My name is Liz Archuleta and I represent District Two on the Coconino County Board of Supervisors. I am here today representing the Coconino County Board of Supervisors.

The Coconino County Board of Supervisors appreciates the efforts of Chairman Grijalva and the Committee to hold this important hearing to discuss the community impacts of proposed uranium mining near Grand Canyon National Park.

Coconino County is the second largest county in the nation encompassing more than 18,000 square miles. In Coconino County, we are proud to be the home to national treasures, including Oak Creek Canyon, Sunset Crater National Monument, Walnut Canyon National Monument and, most notably, Grand Canyon National Park. Our county includes thirteen percent private land with the remaining land owned by the Federal government, five Native American Tribes and the State of Arizona.

In Coconino County, we pride ourselves on the relationships we have fostered with Native American Tribes, state and federal land managers, as well as our neighboring counties and communities in Arizona and Utah. However, we are certainly concerned when decisions are made by agencies that may affect the health and safety of our residents in Coconino County.

#### **FOREST SERVICE DECISION**

One such decision was made on January 10, 2008, by the Tusayan Ranger District of the Kaibab National Forest. The Tusayan Ranger District issued a decision to allow VANE Minerals, LLC, to begin drilling exploration holes for uranium at seven project sites on the Tusayan Ranger District. According to the Kaibab National Forest, the primary purpose of the project is for VANE Minerals, LLC, to locate and assess the quantity and commercial resource potential for uranium ore deposits within the Tusayan Ranger District. The location of the drill exploration sites is less than two miles from the Grand Canyon National Park within Coconino County.

According to the Kaibab National Forest, because the 1872 Mining Law authorizes the taking of valuable mineral commodities from Public Domain Lands, a “no action” alternative was not an option for the Kaibab National Forest. Therefore, the decision by the Kaibab National Forest is based on whether mitigation measures are sufficient to reduce or eliminate environmental impacts at the surface, but not on whether or not to allow the exploration activity.

It’s important to point out that more than 2,000 mining claims have been filed with the Tusayan Ranger District of the Kaibab National Forest since 2003. The majority of these claims are within ten miles of Grand Canyon National Park.

#### **BOARD RESOLUTION**

In reaction to concerns raised by the VANE Minerals, LLC, decision, on February 5, 2008, the Coconino County Board of Supervisors adopted a resolution opposing uranium development in the vicinity of the portions of the Grand Canyon National Park and its watershed within Coconino County in the Tusayan Ranger District and additional claims filed on lands managed by the Bureau of Land Management in House Rock Valley.

Coconino County has witnessed serious health and environmental effects associated with the long-term effects of uranium mining. Uranium development operations in Coconino County have caused considerable contamination and environmental degradation, particularly on the Navajo and Hopi Nations in northern Arizona.

Coconino County has witnessed the contamination of creeks and aquifers providing public drinking water. In the Grand Canyon National Park, the Orphan Mine operated within the park until 1969. The remnants from the Orphan Mine are approximately two miles northwest of the South Rim Village, between Maricopa Point and the Powell Memorial. The presence of radioactive materials from the mine is being blamed for the contamination of Horn Creek in the Grand Canyon National Park.

In addition, in Tuba City, decommissioned uranium mining sites were capped with clay and rock causing groundwater contamination. The decommissioned mine and sites continues to put residents of Tuba City as well as the surrounding areas at risk of contaminated drinking water. For example the Tuba City landfill, which received refuse from the

#### **TOURISM/ECONOMIC DEVELOPMENT**

Grand Canyon National Park is a national and international treasure attracting almost 1.5 million visitors to northern Arizona each year. The Grand Canyon National Park encompasses more than 1.2 million acres and contains extensive geological, paleontological, archeological and biological resources.

With the millions of visitors to Grand Canyon National Park comes significant tourism revenue for communities and counties in northern Arizona. It’s estimated that the total annual economic impact of all Grand Canyon National Park visitors to the north and south rim is approximately \$687 million.

The economy in Coconino County is primarily based on revenue generated by tourism. Therefore, the potential negative impact to tourism in northern Arizona from uranium mining near Grand Canyon National Park cannot be overstated. In

Fiscal Year 2009, Coconino County alone generated almost \$12.5 million in sales tax revenue, a large portion of which is generated by tourism and related industries. Couple this with state sales tax collected by the state and distributed to counties and municipalities, sales tax revenue accounts for fifty eight percent of Coconino County's general fund revenues.

While Coconino County continues to support regional economic development opportunities, we are also cognizant of potential impacts from industries. Uranium mining in certain portions of the County has always remained a concern in Coconino County. In the Coconino County Comprehensive Plan, adopted by Coconino County on September 23, 2003, planners discouraged industrial uses, including mining, along scenic corridors or at community gateways, including the Grand Canyon National Park.

### **CONCLUSION**

As outlined in our resolution passed on February 5, 2008, the Coconino County Board of Supervisors supports the permanent withdrawal of lands in Coconino County from uranium development on the Tusayan Ranger District and House Rock Valley. While we certainly support the recent action by the United States Secretary of the Interior Ken Salazar to temporarily bar the filing of new mining claims in the vicinity of the Grand Canyon National Park, we support the permanent withdrawal of the lands within Coconino County.

The past mistakes of the uranium mining industry will have ever-lasting effects on areas within Coconino County. While Coconino County, and particularly the Navajo and Hopi Tribes, have faced significant financial costs associated with past uranium development, we cannot place a cost on the long-term health effects left by uranium mining.

Thank you for the opportunity to address the House Natural Resources Subcommittee on National Parks, Forests and Public Land in support of H.R. 644, the Grand Canyon Watersheds Protection Act of 2009. The Coconino County Board of Supervisors would like to extend our gratitude to Chairman Grijalva and the Committee for their continued efforts to address this important issue. Coconino County is certainly concerned about the community impacts of proposed uranium development near Grand Canyon National Park.

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Mr. GRIJALVA. Thank you, Madam Supervisor.

Let me now ask Ms. Kay Brothers, Deputy General Manager, Engineering and Operations, Southern Nevada Water Authority, welcome and thank you for being here. I look forward to your comments.

### **STATEMENT OF KAY BROTHERS, DEPUTY GENERAL MANAGER, ENGINEERING AND OPERATIONS, SOUTHERN NEVADA WATER AUTHORITY, LAS VEGAS, NEVADA**

Ms. BROTHERS. Thank you. Good morning, Mr. Chairman and Subcommittee Members.

My name is Kay Brothers. I am Deputy General Manager of Engineering and Operations from the Southern Nevada Water Authority, a cooperative seven-member agency formed in 1991 to address southern Nevada water resource issues on a regional basis.

Among other things, the authority is responsible for the operation and management of water treatment and delivery facilities which supply Nevada's Colorado River allocation to nearly two million residents in the Las Vegas Valley as well as approximately 250,000 visitors.

I appreciate the invitation to testify in support of H.R. 644, which has one of its major goals, the protection of water quality in the Colorado River. This Southern Nevada Water Authority withdraws its Colorado River allocation from Lake Mead. The Colorado River represents approximately 90 percent of southern Nevada's available water supply source. Drought conditions in the Colorado River Basin have had a significant effect on water management ac-



tivities both in terms of supply access and water quality. As of July 2009, Lake Mead's storage volume is down to 43 percent of capacity and will reach a low elevation of 1092 this year. This poses a number of challenges for water managers that depend on Colorado River flows.

The Authority has two intakes in Lake Mead: the upper one located at elevation 1050 and the other at elevation 1000. If the drought continues, our upper intake could very well be dry by as early as 2012 reducing our pumping capacity. Also, among these challenges is our ability to continue to provide a high-quality, safe drinking water supply that meets applicable state and Federal drinking water quality standards. As the lake declines the upper warmer water is captured by our intakes, resulting in water treatment challenges. The Authority has begun construction of a third intake in Lake Mead which will draw water from elevation 860. This intake is scheduled to be completed by 2013.

In addition, drought-induced reductions to Colorado River inflows, combined with substantially reduced Lake Mead storage, have increased the concentration of undesirable water quality constituents. This could require higher levels of treatment and implementation of enhanced operational management strategies.

In regards to H.R. 644, the subject of uranium mining and disposal has been an issue of consternation for many years. A decades-old tailing pile located near the Colorado River in southern Utah has contributed contaminations to the river system. We are pleased with efforts underway to address this issue, and appreciate the concern and care the Federal government has demonstrated in its investments toward remediation.

Recently, there have been concerns raised about the increase in uranium mining claims filed in the Colorado River Basin, including areas around the Grand Canyon National Park. This increase in mining claims raises fear of potential contamination of the Colorado River if, and when, active mining begins. Authorizations for exploration of mining should be contingent on a comprehensive environmental impact analysis that includes broad stakeholder review, including that of downstream users of Colorado River Water.

The Southern Nevada Water Authority supports the development of sufficient controls and oversight measures to ensure that any future mining activities in the Colorado River basin do not impact downstream water quality or otherwise impede our ability to deliver a safe and reliable water supply for the communities that we serve.

To this end, we ask for your continued support to ensure that any future mining activities, if authorized, are appropriately managed and monitored to protect Colorado River Basin flows. The importance of maintaining water quality in the Colorado River Basin is a critical priority for southern Nevada and other downstream users.

This concludes my testimony. Thank you for the opportunity to address you.

[The prepared statement of Ms. Brothers follows:]

**Statement of Kay Brothers, Southern Nevada Water Authority,  
Deputy General Manager of Engineering and Operations**

Good morning Mr. Chairman and Subcommittee members. My name is Kay Brothers. I am the Deputy General Manager of Engineering and Operations for the Southern Nevada Water Authority, a cooperative seven-member agency formed in 1991 to address southern Nevada water resource issues on a regional basis. Among other things, the Authority is responsible for the operations and management of water treatment and delivery facilities which supply Nevada's Colorado River allocation to nearly two million residents in the Las Vegas Valley, as well as approximately 250,000 daily visitors. I appreciate the invitation to testify in support of H.R. 644 which has as its goal the protection of water quality in the Colorado River.

The Southern Nevada Water Authority withdraws its Colorado River allocation from Lake Mead. The Colorado River represents approximately 90 percent of southern Nevada's available water supply source. Drought conditions in the Colorado River Basin have had a significant effect on water management activities, both in terms of supply access and water quality. As of July 2009, Lake Mead's storage volume is at 43 percent of capacity and will reach a low elevation of 1092 this year. This poses a number of challenges for water managers that depend on Colorado River flows.

The Authority has two intakes in Lake Mead; the upper one located at elevation 1050 and the other at elevation 1000. If the drought continues, our upper intake could be dry by as early as 2012 reducing our pumping capacity. Also, among these challenges is our ability to continue to provide a high-quality, safe drinking water supply that meets applicable state and federal drinking water quality standards. As the lake declines the upper, warmer water is captured by our intakes, resulting in water treatment challenges. The Authority has begun construction of a third intake in Lake Mead which will draw water from elevation 860. This intake is scheduled to be completed by 2013.

In addition, drought-induced reductions to Colorado River inflows, combined with substantially reduced Lake Mead storage, have increased the concentration of undesirable water quality constituents. This could require higher levels of treatment and implementation of enhanced operational management strategies.

With regards to H.R. 644, the subject of uranium mining and disposal has been an issue of consternation for many years. A decades-old tailing site in southern Utah has contributed contaminants into the Colorado River system. We are pleased with efforts underway to address this issue, and appreciate the concern and care the federal government has demonstrated in its investments toward remediation.

Recently, there have been concerns raised about the increase in uranium mining claims filed in the Colorado River Basin, including areas around the Grand Canyon National Park. This increase in mining claims raises fear of potential contamination of the Colorado River if, and when, active mining begins. We know that the Department of the Interior and its agencies, including the Bureau of Land Management, will do all that is possible under applicable laws and regulations to address these concerns and protect the environment. We are also aware that the Environmental Protection Agency has considerable authority to regulate the discharge of any potential pollutants to the Colorado River. We will support the Department of the Interior in any way we can as you carefully evaluate the implications on Colorado River water quality prior to any federal authorization of mineral exploration or mining in areas near the Colorado River or its tributaries. Future authorizations for exploration or mining should be contingent on a comprehensive environmental impact analysis that includes broad stakeholder review, including that of downstream users of Colorado River Water. The Southern Nevada Water Authority supports the development of sufficient controls and oversight measures to ensure that any future mining activities in the Colorado River Basin do not impact downstream water quality or otherwise impede our ability to deliver a safe and reliable water supply for the communities that we serve.

To this end, we ask for your continued support to ensure that any future mining activities, if authorized, are appropriately managed and monitored to protect Colorado River Basin flows. This includes developing a more comprehensive understanding of potential water quality impacts associated with uranium mining activities, the development of management strategies, and policies to avoid impacts.

The importance of maintaining water quality in the Colorado River Basin, particularly Lake Mead, is a critical priority for southern Nevada and other downstream users. This concludes my testimony. Thank you for the opportunity to address you. I am happy to answer any questions you may have.

Mr. GRIJALVA. Thank you very much.

Let me now ask Dr. Madan Singh, Director, Department of Mines and Mineral Resources from the State of Arizona, welcome, Doctor, and look forward to your comments.

**STATEMENT OF MADAN M. SINGH, PH.D., P.E., DIRECTOR,  
DEPARTMENT ON MINES AND MINERAL RESOURCES, STATE  
OF ARIZONA, PHOENIX, ARIZONA**

Dr. SINGH. Thank you very much, Mr. Chairman, Members of the Subcommittee, Ladies and Gentlemen, good morning.

My name is Madan Singh. I am the Director of the Department of Mines and Mineral Resources for the State of Arizona. At the very outset I might state that this testimony is against the withdrawal of uranium-bearing lands from around the Grand Canyon National Forest.

The Arizona Wilderness Act of 1984 was negotiated between various environmental groups, industry, and other stakeholders. It was agreed at that time that the areas designated in the bill as wilderness would be removed from mineral entry, but the remaining areas would remain open to multiple use.

Currently, over 55.6 percent of the total area of the State of Arizona is already withdrawn from mineral exploration and mining, and this does not include the one million acres that was segregated that we referred to earlier this morning. A continual withdrawal of land from mining deprives the state of revenues and the country of critical raw materials.

A few groups claim that the groundwater of the Redwall-Muav aquifer and the Colorado River would be contaminated by uranium mining. Based on U.S. Geological Survey data, the Colorado River enters and leaves the mineralized breccia zone and the uranium concentration of between four and five parts per billion. The EPA safe drinking water concentration is markedly higher, at 30 parts per billion.

Researchers at the University of Arizona and New Mexico, with funding from the Arizona Water Sustainability Program and agricultural interests, have used isotopic methodologies along with elemental analysis to study metal contamination sources in the Colorado River water. The methodology is new, and can directly target anthropogenic sources such as mining or show that the source of uranium absorbed in the Colorado River is not from mining activity.

Based on the preliminary results to data, the isotope data rule against major contamination from uranium mines. Studies such as these allow us to separate real contamination issues from perceived contamination.

A U.S. report 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 uranium bearing. The existence of these has not affected the number of visitors coming to the park.

According to the USGS estimates, there are 375 million pounds of uranium oxide in the area. This is equivalent to 27 billion kilowatt hours of electricity, which is the power generated by all coal plants in the United States in a decade, or 13.3 billion barrels of

oil, the total amount of recoverable oil in the Prudhoe Bay oil field. At a price of \$50 per pound for this oxide, this resource is worth \$18.75 billion.

There will be approximately 12 mines in operation at any one time over the 20-year period. During operation, there will be 1,000 new jobs in the community. The total economic impact ranges between \$23.5 and \$29.4 billion, or more than \$1.3 billion annually. Shipping the ore will generate another billion dollars for the local area. The per capita income in Fredonia is \$17,600, and it is still lower in the rural areas. The income for miners varies between \$60,000 and \$80,000 per annum. The operations will be fully permitted in compliance with state and Federal regulations, and bonded to ensure reclamation.

There is concern about uranium mining because of the legacy of mining left by mining of minerals during the 1940s for the war effort. The dangers associated with uranium were not well understood at that time. Those circumstances do not apply to the Arizona Strip. Mining in the 1980s and 1990s in the region has demonstrated that there was no damage to the environment, and that the health and safety of the miners was not compromised.

The number of claims in the Strip has also created an atmosphere of trepidation. Every claim does not imply the existence of breccia pipes in it and every pipe does not have uranium in it. Only a very small fraction of the breccia pipes are sufficiently mineralized to be mined profitably. Over 92 percent of the uranium required for nuclear plants in the United States is imported. Sixty-four percent of that uranium is being mined from just eight mines. That makes the supply prone to disruptions. Foreign countries are now exerting considerable control over uranium deposits worldwide. These issues underscore the need for domestic production from a national and homeland security viewpoint.

There are 436 reactors in operation in the world, another 433 are in development or on the drawing boards. It is evident that the demand for uranium will be strong in the coming years, especially with the emphasis on control of greenhouse gases. There will be fierce competition for the material. There are currently 104 reactors in operation in the United States, the largest number of any country in the world. Nuclear reactors would also be used by the navy for the last 60 years. There has been only one significant accident. This is proof that nuclear power is safe and environmentally acceptable.

The Arizona Strip provides the richest source of domestic uranium. It would serve the Nation best if it were permitted to be mined. More details of all of the above are written in the testimony.

Thank you for the opportunity to present my remarks and I would be pleased to answer any questions. Thank you, sir.

[The prepared statement of Dr. Singh follows:]

**Statement of Madan M. Singh, Ph.D., Department of Mines and Mineral Resources, State of Arizona, Phoenix, Arizona**

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, 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.

This testimony is presented against the withdrawal of the uranium-bearing lands around the Grand Canyon National Park.

The Arizona Strip is the part of the State of Arizona that lies above the Grand Canyon and the Utah border. The Strip occupies a total surface area of 20,404.2 km<sup>2</sup> (7,878.11 mi<sup>2</sup>). Of this, 20,348.12 km<sup>2</sup> (7,856.45 mi<sup>2</sup>) is land, and only 56.08 km<sup>2</sup> (21.653 mi<sup>2</sup>) is water. Its land area comprises 6.9 percent of Arizona’s land area. About 64.4 percent of its area is in Mohave County and 35.6 percent in Coconino County. The region is typical of the Colorado Plateau with an arid climate and sagebrush vegetation. The Kaibab National Forest also is being considered for withdrawal and these remarks apply equally to that area. A significant part of the area is already withdrawn from mineral entry:

#### **National Monuments**

**Grand Canyon-Parashant**—Covers an area of 4,115 km<sup>2</sup> (1,017,000 acres); about 81 km<sup>2</sup> (20,000 acres) within Lake Mead National Recreation Area. It was established by Presidential Proclamation 7265 on January 11, 2000. There are no paved roads into the monument and no visitor services.

**Pipe Spring**—Comprises an area of 0.16 km<sup>2</sup> (40 acres), and was established on May 31, 1923. The monument was listed in the National Register of Historic Places on October 15, 1966.

**Vermillion Cliffs**—This 1,189 km<sup>2</sup> (294,000 acre)-monument was established by proclamation on November 9, 2000.

#### **National Park**

**Grand Canyon**—Is one of the oldest national parks, having been established as national monument on January 11, 1908 and designated as a national park on February 26, 1919. It extends over 4,927 km<sup>2</sup> (1,902 mi<sup>2</sup>) and is considered one the natural wonders of the world, the gorge of the Colorado River.

#### **National Recreation Areas**

**Glenn Canyon**—Covers 5,076 km<sup>2</sup> (1,254,429 acres) of primarily desert land surrounding Lake Powell. A part of the recreation area is in Utah. It was established in 1972.

**Lake Mead**—The area was established as the Boulder Dam Recreation Area on October 31, 1936 but the name was changed to Lake Mead Recreation Area on August 11, 1947. It covers 6,053 km<sup>2</sup> (1,495,665.69 acres) with water over 756 . (186,000 acres). Nearly 81 km<sup>2</sup> (20,000 acres) overlaps the Grand Canyon-Parashant National Monument. A small portion is in Nevada.

#### **Wilderness Areas**

**Beaver Dam Mountains**—The wilderness area, designated as such in 1984, comprises 71 km<sup>2</sup> (17,600 acres) of which 61 km<sup>2</sup> (15,000 acres) lies in Arizona and the rest in Utah.

**Grand Walsh Cliffs**—Occupies 323 km<sup>2</sup> (37,030 acres), selected as a wilderness in 1984.

**Kanab Creek**—Covers 305 km<sup>2</sup> (75,300 acres) and was established in 1984.

**Mount Trumbull**—Was also established in 1984 and comprises 31 km<sup>2</sup> (7,880 acres).

**Mount Logan**—Occupies 59 km<sup>2</sup> (14,650 acres) and was designated as a wilderness in 1984.

**Paiute**—Has witnessed very little incursion by humans and covers 356 km<sup>2</sup> (87,900 acres); chosen to be a wilderness in 1984.

**Paria Canyon-Vermillion Cliffs**—Established on August 28, 1984 and occupies 455 km<sup>2</sup> (112,500 acres); partly in Utah.

It should be noted that all of the above wilderness areas were established in 1984. This was the result of the Arizona Wilderness Act of 1984, which had been negotiated during 1983 and 1984 between various environmental groups, industry, and other stakeholders. It was agreed at that time that the areas designated in the bill as wilderness would be removed from mineral entry, but that the remaining areas would remain open to multiple use. Senators McCain (then Congressman and party to the discussions) and Kyl have written a letter (Attachment 1) to Representative

Grijalva stating this to be the case. Senators DeConcini and Hatch (who were also involved in the negotiations at the time) have written to Secretary Salazar, outlining the results of those meetings (Attachment 2). Thus it seems that the sections of the Arizona Strip not specifically withdrawn as noted above were to remain open to mineral entry. A Resolution adopted by the Board of Supervisors of Mohave County supporting the mining of uranium on the Strip is also attached (Attachment 3).

Currently over 55.6% of the total area of the State of Arizona is already withdrawn from mineral exploration and mining. The State is fortunate enough to be blessed with considerable mineral wealth. According to the U.S. Geological Survey Arizona was the No. 1 non-fuel mineral producing state in the country in 2008. However, continual withdrawal of land from mining is depriving the state of revenues that it direly needs, and the country of necessary raw materials.

In recognition of this fact the Arizona Legislature has recently passed HCM 2006 (Attachment 4) requesting Congress to refrain from enacting any legislation that affects Arizona public lands.

### **Economic Impact**

Mohave County has an area of 34,886 km<sup>2</sup> (13,470 mi<sup>2</sup>) and had an estimated population of 196,281 in 2008. The median household income in 2007 was \$39,669 compared with \$49,923 for the State of Arizona. In the county, 13.5% of the persons were living below the poverty line. The household income figure for Fredonia, the largest town, is \$39,295; the per capita income is \$17,616 and it is even lower in the rural areas. For Kanab, Utah, across the border, the comparative figures are \$43,025 and \$20,153 respectively. The average household income for Utah in 2007 was \$55,109. Coconino County had an estimated population of 128,558 in 2008. The median household income was \$48,546 in 2007, and 16.2% of the population lived below the poverty line. The county is spread over 48,332 km<sup>2</sup> (18,661 mi<sup>2</sup>). The income for miners in the area varies between \$60,000 and \$80,000 per annum.

The occurrence of breccias pipes, which may host uranium deposits, make it possible to operate mines with a footprint of 10 to 20 acres. The mines are small and generally are in production for about two years. There may be a year of pre-production activity and then there is dismantling and reclamation. During the 1980s and early 1990s there were seven mines in operation in the area. These have now been reclaimed so well that it is difficult to locate them without prior knowledge of their existence.

According to U.S. Geological Survey estimates (USGS Circular 1051) there are probably 375 million pounds of yellowcake (uranium oxide, U<sub>3</sub>O<sub>8</sub>) in the area that is to be removed from mining by H.R.644. This result was based on work performed in 1987, when the presence of the breccia pipes was only detected by their visibility on the surface. Recently some mineralized pipes have been located by geophysical means that are not evident on the surface. So it is probable that the amount of uranium present is greater. The ore from these pipes have an average grade above 0.6% which is the highest grade ore in the United States. Even if we accept the 375-million pound figure this is the equivalent of 27 billion kilowatt-hours of electricity. At the present rate of generation, this could replace all the power generated by coal plants in the United States for a decade. Another way to look at this—it is the equivalent of 13.3 billion barrels of oil. That is the total amount of recoverable oil in the Prudhoe Bay oilfield, the largest in the U.S. At a price of \$50 per pound of U<sub>3</sub>O<sub>8</sub>, this resource is worth \$18.75 billion.

Based on a recent study conducted by Tetra Tech, Inc., there will be approximately six (6) mines in operation at any one time with another six (6) being reclaimed over roughly a 20-year period. These mines will generate an average of 552 direct jobs and another 432 indirect jobs, primarily in the service sector. The average wages for miners was \$65,741 in 2008. The direct construction costs will range from \$2.97 billion to \$3.67 billion; the indirect impact will range from \$2.13 billion to \$2.63 billion. Thus the total economic impacts will be from \$5.06 billion to \$6.29 billion during the construction period. During the mine operation period there will be 366 direct and 646 indirect jobs resulting in 1,012 new jobs in the community. The total economic will range between \$23.53 billion and \$29.41 billion, that is, \$1.31 billion to \$1.34 billion annually. Some of the jobs may be for persons residing in Kane or San Juan Counties in Utah, in which case the impact on Mohave and Coconino Counties in Arizona will be reduced somewhat. The tax implications for Federal, state, and local governments is estimated to be \$360 million per year, or \$7 billion for the two-decade period under consideration.

The ore that is produced from the mines is planned to be trucked to the White Mesa Mill in Blanding, Utah. The mill employs 150 persons, which implies an economic impact of \$2.9 billion to San Juan County, Utah and the surrounding commu-

nities. However the shipping will benefit trucking companies in the vicinity and generate \$1.01 billion for the local area.

#### **Environmental Considerations and Safety**

Since the ore is transported to Blanding, Utah there will be no local impact from the tailings. The rock from the shaft and other excavations for the mine will be poured back into the openings after the ore has been removed. Without tailings, there will be no dust problems that would be a concern. The surface facilities and roads are removed, and the sites reclaimed.

It should be mentioned that the Arizona Department of Environmental Quality will investigate the mining operations before they issue any permits, as will all the other state and Federal agencies that are involved. This includes the U.S. Nuclear Regulatory Commission. The operations are fully permitted in compliance with State and Federal regulations and bonded to ensure reclamation.

Nuclear power plants produce no air pollutants such as sulfur, mercury, greenhouse gases, or particulates. Dr. El-Baradei, Director General of the International Atomic Energy Agency and Nobel laureate, has stated (2005), "Nuclear power emits virtually no greenhouse gases. The complete nuclear power chain, from uranium mining to waste disposal, and including reactor and facility construction, emits only two to six grams of carbon per kilowatt-hour. This is about two orders of magnitude below coal, oil, and even natural gas."

A few environmental groups claim, without providing any scientific supporting data, that the groundwater of the Redwall-Muav aquifer and the Colorado River would be contaminated by uranium mining. The occurrence of the uranium deposits in the breccias pipes is a few hundred feet below the surface and generally about 1,000 feet above the aquifer, separated by the impermeable Supai formation. Hence there is little chance of the water being contaminated.

The area in question, as mentioned above is desert; the annual precipitation varies from 20 inches at the higher elevations to 12 inches in the low regions. The area where the mining will be is in the low section. There is little runoff to be concerned about, however the operators ensure that no water gets off the mine property, and all of it is contained in a lined pond.

Based on USGS data for November 1990 and June 1991, published in 1996 (USGS OFR 96-614), the Colorado River water enters and leaves the mineralized breccia zone at uranium concentration of between 4 and 5 parts per billion (ppb). This level continues to decrease as it goes down the river. The EPA safe drinking water concentration is 30 ppb—so the level is significantly lower! It is worth noting that the average concentration of uranium in the Colorado River is 4.6 ppb, lower than that of fresh water in an arid region, which is 5.0 ppb.

Water taken in a two-week period in April and May 1991 from a well in the Redwall-Muav aquifer near the Kanab North Mine, which was in operation at the time, had uranium concentrations between 0.8 and 5.9 ppb; again much lower than the safe drinking water level.

Modeling of the groundwater during its transitory passage through the Orphan Mine, which was mined prior to its inclusion in the National Park, contributes very small amounts of uranium to the Redwall-Muav aquifer and the Colorado River compared to the mineral existing in the river and the aquifer. Data accumulated by the USGS and others indicate that the springs around the mineralized breccia pipes in proximity to the rim of the Grand Canyon contribute insignificant amounts of uranium to the Colorado River because the flow rates from the springs is very low. This also applies to Horn Creek, the spring closest to the historic Orphan Mine. It is safe to conclude that springs further away from the River, beyond even the boundaries of the National Park, would have even less impact on the waters of the Colorado River and would not pose any health hazard to the people using the water.

Dr. Charles Sanchez and Dr. John T. Chesley at the University of Arizona, and Dr. Yemane Asmerom at the University of New Mexico, with funding from the Arizona Water Sustainability Program and agricultural interests, have used isotopic methodologies along with elemental analysis to study metal contamination sources in Colorado River water. The methodology utilized is relatively new, but can help discriminate between natural and anthropogenic input. It can directly target anthropogenic sources such as mining or it can be used (as was done for uranium by the investigators) to suggest that the source of uranium observed in the Colorado River in their study is not from mining activity. Based on the preliminary results to date for a single set of samples along the Colorado River from 2007, Drs. Sanchez, Chesley and Asmerom state: "Although we did not sample on a spatial scale to rule out temporary local contamination, or on a temporal scale to rule out transitory plumes, the isotope data (uranium, strontium, and lead) in the main channel of the Colorado River are generally consistent with the normal weathering of uranium con-

taining geomechanics within the area of interest and rule against major contamination from uranium mines or tailings.” As a minimum the study has established a baseline to which longer term studies of potential uranium contamination in the Colorado River can be evaluated. As well, studies such as these may allow us to separate “real” contamination issues from “perceived” contamination.

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. All of these have not affected the number of visitors coming to the Park.

A major concern in the mining of uranium is safety and radiation exposure. In general the impacts of mining uranium are not much different than other mining. Natural uranium ore is about as radioactive as the granite countertops that many people have in their kitchens. The risk comes from the associated radon gas and radium. Since this is now well understood, mining companies protect the workers with excellent ventilation. Epidemiological studies have established that the risk of lung cancer among smokers is between 10 and 20 times higher than with persons who have never smoked. The industry appreciates this risk and does not permit smoking.

It should also be remembered that the industry now has over half a century of experience with uranium mining and has adopted internationally recognized standards. The radiation safety regulations used in the United States, Australia, and Canada are the most comprehensive and stringent in the world, and the radiation doses are well within the regulatory limits. Uranium mines are probably the most highly regulated industrial operations in the world; both by state and Federal agencies. Frequent inspections ensure that employees and environment are duly protected. The industry has long accepted that it is much more efficient to prevent pollution than to remediate it later.

Everyone receives small amounts of radiation from natural sources such as cosmic radiation, rocks, soil, and air. Uranium mining does not increase this noticeably for the surrounding communities and the public at large. The objective of the nuclear industry—from mines to reactors—is to control and limit the release of potentially harmful substances into the environment.

### **Supply and Demand**

Over 92 percent of the uranium required for the nuclear plants in the United States is imported, a significant amount of that from Russia. A part of this comes from the decommissioning of nuclear warheads in accordance with the START treaties. Russia has stated that it will not supply this secondary uranium beyond 2012. This source is dwindling from all countries. The demand for the fuel will expand in the future, especially with the emphasis on control of greenhouse gases. China, for example plans to increase the power from nuclear plants from 9 gigawatts per year at the present to 75 gigawatts by 2020. Other countries, such as Russia, India, and other Asian nations are also increasing the capacity for power from this source. There are 436 reactors in operation in the world; another 433 are in development or on the drawing boards. It is evident that the demand for uranium will be strong in the coming years.

At this time 64 percent of the uranium is being mined from just eight mines. This makes the supply prone to disruptions. The flooding of Cigar Lake mine in Canada, which is now expected to become operational in 2014, and the delays in the Olympic Dam project in Australia, which will be commissioned with increased production in 2016, serve as examples of the type of setbacks that may be expected. These are two of the larger mines.

Recently China has made an agreement with Australia to buy uranium from it; even though there is the danger of China diverting some of it for military purposes. In Kazakhstan, JSC Atomredmetzoloto (ARMZ) has agreed to acquire 16.6 percent of Uranium One, for a stake in its Karatau mine; this could rise up to 19.95 percent in the next five years. ARMZ will take 50 percent of the production from Karatau or 20 percent of Uranium One’s total production, whichever is larger. Uranium One’s partner in Karatau will be Kazatomprom, a Kazakh state-owned company. The money for the deal comes from a Japanese consortium, which has the option to purchase 20 percent of Uranium One’s production. This appears to provide Uranium One with strategic partners in Russia, Japan, and Kazakhstan. However, it may be recalled that Kazakhstan’s president recently arrested the president of Kazatomprom on charges of improper uranium sales. These are just a couple of ex-



amples of the control that foreign companies and countries are now exerting over uranium deposits worldwide.

This also points to the importance of obtaining the mineral domestically from a national and homeland security viewpoint.

#### Other Concerns

There is concern about uranium mining because of the legacy of mining left by mining of the mineral during the 1940s for the war effort. It should be borne in mind that the dangers associated with uranium were not well understood at the time. Persons were permitted to watch atomic blasts without protective gear and seamen were ordered to scrub the decks of ships after test were conducted in the atolls. "Fiesta ware" was openly sold and watches with radium dials were worn with pride. Significantly, the formations that contained the uranium were quite different, as was the mining practice. The government was more interested in obtaining the uranium and provided incentives that encouraged lack of safety. The contracts were suddenly terminated when the need declined. Those circumstances do not apply to the contemplated mining in the Arizona Strip. Mining in the 1980s and early 1990s in the region has shown that there was no damage to the environment and the miners have not been injured or wronged in any manner.

The number of claims in the Strip have also been used to create an atmosphere of trepidation among the general public. Every claim does not imply the existence of breccia pipes in it and every pipe does not signify that there is even mineralization in it. Further, the amount of minerals has to be economically workable. Historically, only 1 to 5 percent of the breccia pipes are sufficiently mineralized to be mined profitably. Both the discovery and marketability criteria need to be met to establish the validity of a claim.

It may be mentioned that there are currently 104 reactors in operation in the United States, the largest number in any country in the world. Nuclear reactors have also been used in the Navy, in ships and submarines, for the last 60 years. There has been only one accident, Three Mile Island (TMI), in all that time; even at TMI there was no significant release or fatality. Thus, the use of nuclear power is probably the safest and most environmentally appropriate; even Mr. Patrick Moore, the co-founder of Greenpeace has advocated its use. For that to continue, uranium is required for fuel. The Arizona Strip provides the richest source of domestic uranium. It would serve the nation best if this was permitted to be mined.

Thank you for the opportunity to present my remarks today.

[NOTE: Attachments have been retained in the Committee's official files.]

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Mr. GRIJALVA. Thank you, sir. We appreciate your portion of testimony.

Let me begin my portion of the questioning with asking the Vice Chairman, I have been told that the Havasupai Tribe is organizing a protest later this week. Can you tell us the significance of the site where you are gathering and the purpose for the gathering if you don't mind.

Mr. PUTESOY. Right. Thank you, Chairman.

The gathering is scheduled for July 25 through 26, and it is south of the Grand Canyon at a sacred refuge. This place is sacred to the Havasupai people. Stories were told that we originated from there, from this area, from way back. After the Great Flood we have been told that people were raised from there, from the ground, from the ground up, so that is a very sacred place to us. We say that is the area where the Mother Earth is tied to the umbilical cord, and there to the son, so that is a very sacred area for us, and we would like to protect that site.

Right now, mining is set to go into operation there near Red Butte. That is the Canyon Mine, and tomorrow they are going to have hearings down in Fredonia for ADEQ to get water permits for that particular mine. So in doing that we want to create some awareness and support from the communities around there in the

area—Flagstaff, Williams, Grand Canyon, and we invite you to come down and be a part of it.

Mr. GRIJALVA. Thank you. Can you tell us also, Mr. Vice Chairman, about the impacts to the health of your people from past mining in the region?

Mr. PUTESOY. There really hasn't been any mining impact yet. You know, this is the first site that they are trying to mine at, the Canyon Mine. If the mining goes ahead and if they get the approval to do that, then they will contaminate our source of water at the Redwall-Muav aquifer. It will eventually seep into the groundwater and destroy the water and our way of life is going to be destroyed. The water is very sacred to our people, and it is how we came to be. Our stories tell us that is where we came from, water.

Mr. GRIJALVA. One more question, Mr. Vice Chairman. Has the Forest Service provided the tribe with the government/government consultation that you would consider to be adequate?

Mr. PUTESOY. It has been, yeah. We have been meeting with the Forest Service, Kaibab National Forest. They do provide some information on the drillings, the EIS that they go through, and we have had some meetings with them, and they will be coming down to Supai next week to talk more about the drillings and the mining, Canyon Mine that is set to go into operation.

Mr. GRIJALVA. Thank you.

One quick question for the supervisor. The resolution that you talked about that is still in effect that the Board of Supervisors passed, one of the questions, did you hear from constituents before the action, and what has been the reaction since to that resolution?

And I should note—I will afford myself the opportunity to say that Member of Congress, Ms. Kilpatrick is the co-sponsor in this session of the legislation from that area and has been on it since we filed it, but if you could tell me how the constituents reacted then and now.

Ms. ARCHULETA. Thank you, Mr. Chairman. Yes, actually this has been an issue for Coconino County for decades. You may recall my former colleague, former Supervisor Louise Yellowman, who served on the board for 28 years, this has been a constant part of her agenda, now Coconino County's agenda for decades.

When we had our hearing to consider our resolution, we had tremendous support for the resolution. We had members of the environmental community, we had constituents, regular residents, citizens of Coconino County that supported our resolution. We have heard from members of the medical community speak about the effects of uranium, especially to those on the Navajo Nation, and in the Navajo Nation's resolution it does cite health impacts that have been detrimental to their members from uranium mining.

Since then there has been continued support. I have not received one phone call, one e-mail to the contrary of our resolution. I have only received comments of support for it, and so Coconino County has made it very clear in our resolution us, being the local government, and being connected with the citizens that we serve, where the Grand Canyon resides, we believe in our resolution and stand by it.

Mr. GRIJALVA. Thank you.

Mr. Bishop.

Mr. BISHOP. Thank you. Dr. Singh, there was a recent study done by the University of Arizona with respect to the source of Colorado River uranium.

Dr. SINGH. Yes, sir.

Mr. BISHOP. Can you just tell me the significance of that study?

Dr. SINGH. Actually, the study was done not with respect to—it was done with respect to uranium but not because of mining concerns but because of agricultural concerns, and it is still an ongoing study. It is a multi-year study. But within the amount of data they have gathered, they have found out that they can tell between uranium that is coming from natural erosion sources versus what is from mining. From the information they have at this point, they say that there is very little, almost no, contamination from the mining. Most of it is from natural erosion of uranium.

Mr. BISHOP. And you were saying that the parts per billion were significantly lower than what EPA considers to be safe—

Dr. SINGH. That is correct.

Mr. GRIJALVA.—for water condition?

Dr. SINGH. That is USGS data.

Mr. BISHOP. There are places in the canyon, like Orphan Mine, that the government has refused to reclaim. It is still there, and other sources are there. Has that had any impact upon visitation to Grand Canyon?

Dr. SINGH. No, sir, and in fact actually my understanding the shaft, and so forth, of the mine has been a draw, and a lot of people have come to see that specifically. So to my knowledge, there have not been any distractions, and people obviously if they see the shaft, they know that this is for uranium mining, but this has not hurt visitors coming into the park.

Mr. BISHOP. So the good supervisor will still get her tourism dollars going into that area.

Dr. SINGH. I would imagine she would.

Mr. BISHOP. She did mention a study about Horn Springs. Has that particular city that was mentioned by one of the other witnesses had any peer review or had been replicated by other scientific efforts?

Dr. SINGH. As far as I know, that has not been replicated, and later on maybe somebody else can testify to the amounts, but actually the amount of uranium coming out from Horn Spring is very small, and it is again well within the drinking water levels that have been established by EPA.

Mr. BISHOP. Thank you very much.

Ms. Archuleta, you have been here before. You are one of the usual suspects we round up to bring here, but you have spoken on behalf of NACO, National Association of Counties, and those situations.

Is it my understanding you are not speaking on behalf of NACO today but only as Coconino County?

Ms. ARCHULETA. That is correct.

Mr. BISHOP. And you are not speaking on behalf of Mojave County either?

Ms. ARCHULETA. No, I am not.

Mr. BISHOP. I understand that you are probably supposed to be in Philadelphia right now, aren't you?

Ms. ARCHULETA. Actually, no, in Tennessee in a couple of days.

Mr. BISHOP. Is there not a uranium mining resolution that will be considered at that NACO meeting?

Ms. ARCHULETA. There will be uranium—yes.

Mr. BISHOP. Thank you. I appreciate that very much.

Dr. Singh, how does the withdrawal of this—the proposed withdrawal impact dependence on foreign countries, impact U.S. dependence on foreign countries?

Dr. SINGH. As I said earlier in my testimony that 92 percent of the uranium is being imported right now that is being used by our uranium plants, and we have almost one-fourth of the number of plants in operation or reactors in operation at this time. China, Russia, Kazakhstan, France have been buying a number of mining operations and uranium deposits elsewhere in the world, and China, for one, has a number of plants that are going up. In fact, they plan to increase their output from nuclear plants from 9 gigawatts at this point to 72 by 2020. So they will be requiring a lot of this uranium so it will become very difficult for us to get that and, therefore, it will expose us to security problems also.

Mr. BISHOP. We import the 92 percent of the uranium that we use in this country. I understand about 25 percent of that comes from Russia?

Dr. SINGH. Yes, sir.

Mr. BISHOP. As part of the start program—

Dr. SINGH. That is right.

Mr. BISHOP.—that should end in 2012?

Dr. SINGH. That is right, and they have already said that after 2012 they will not be exporting anything from that to us.

Mr. GRIJALVA. And the Chinese are making treaties and buying into some of the mining entities abroad which we are relying upon?

Dr. SINGH. That is right, but in the last few weeks actually they bought large properties in Mihir, and so has Riva for that matter.

Mr. BISHOP. Does this proposal have an impact on our grid system?

Dr. SINGH. Nuclear power is a baseboard type of power, so we would be able to supply power once we put the plants up throughout where we need it whereas if we depend more on solar and wind power, which is what is being talked about more these days, those are intermittent and, therefore, there will be a problem there.

You know, many of the plants that we have right now, if they are expanded, that would not create too many problems on the grid system because the grid is already existing. If we put plants elsewhere, there may be some more lines that would be needed.

But in contrast as far as renewable energy is concerned, and I think that there should be some renewable energy by the way, most of them will be away from urban areas and, therefore, new lines will need to be put in to convey that power from places to urban areas where it is needed.

Mr. BISHOP. Thank you. My time has expired. Dr. Singh, I appreciate you giving—

Dr. SINGH. Thank you very much.

Mr. BISHOP.—your perspective on this, and to all four of our panelists. I appreciate you coming all the way back to Washington. Thank you so very much.

Mr. GRIJALVA. Mr. Kildee.

Mr. KILDEE. Thank you, Mr. Chairman. We all know that water is essential for life. As a matter of fact, as we sit here we are eagerly looking for water in space. As we know it now, it depends upon water. As a matter of fact, if we find water in space, on Mars for example, we could establish bases there, and we could have a hearing there or a CODEL, and Mr. Bishop could share those hearings. I would welcome you to do that.

But we must—this water is so essential. I mean, it is just the very basis of life as we know it. Therefore, we must protect that water on earth, protect early in strategic places. Water is essential to a way of life for the people who have lived there for hundreds of years.

Mr. PUTESOY, what danger does mining have for the environment in your land? Particularly what danger does it have for water and how might that danger come to be?

Mr. PUTESOY. Well, like I said, yes, eventually the uranium will seep into the aquifer, Redwall-Muav Aquifer, and contaminate the rivers and waters, the springs that are in the area, and a lot of wildlife are dependent on that force of water springs, such as elks, big-horn sheep, the Havasupai people, and we get our revenues from tourism in the canyon. We are the most restricted tribe in the United States, we don't do any mining, timber, no development on rim, so that is our main economic base is our water or the waterfalls. People come from all over to visit, and camp and swim in our water, our waterfalls. Eventually if the mining goes through, it will seep down into the river and eventually pollute the Colorado River, and it will flow further down west where we have a major city downriver, like Las Vegas, San Diego, Phoenix. So it is not just us in the canyon itself, but further down river will eventually become polluted too as well.

Mr. KILDEE. And Dr. Singh, you mentioned an unrelated accident, but an accident apparently at sea.

Dr. SINGH. No, sir. I was referring to the Three Mile Island accident.

Mr. KILDEE. Three Mile Island, OK.

Dr. SINGH. Yes.

Mr. KILDEE. I was in Congress when that took place, I can recall, and that accident, how much of a misuse or an accident there at the Grand Canyon would pose a danger of any nature to the land?

Dr. SINGH. Well, it is quite a different situation. First of all, at Three Mile Island we are talking about a release from a reactor, but as in the Grand Canyon we are not talking about putting up reactors. We are just talking about mining. And when we get out all from the mine, it has very little radiation. In fact, many of the granite countertops that people have in their homes in their kitchens probably have as much radiation as that from the core. So there is really not much radiation from that point.

The only radiation problem in the mining aspect is from the radon gases and we now understand that, and we ventilate the mines very well, and we have proof, because there were eight

mines that were operated in the 1980s and 1990s in that area and there was no damage done to the environment or to the health of the people, the miners.

Mr. KILDEE. Is there an environmental impacts statement accomplished or finished on impact of mining in that area on the surrounding land?

Dr. SINGH. There will be impact statements if there is mining, and currently the VANE Company is preparing one. They will be submitting it later this year, I believe.

Mr. KILDEE. But they have none completed at this point?

Dr. SINGH. No, because at this point they were only doing exploration, and the first instance the Forest Service didn't think that they needed an environmental statement for completing just the exploration, but now the courts have ruled that they needed to, and they are doing it.

Mr. KILDEE. Do you think it is prudent that they do that?

Dr. SINGH. For exploration actually, as I said earlier, the amount of damage or ore that comes out it is shipped directly to the laboratory for testing and so forth, and it has no radiation or no uranium effects to the environment or to the people. So I personally don't think that it is necessary to do that just for exploration.

For mining, yes, it would be necessary, and it would be prudent to do that, yes, sir.

Mr. KILDEE. That would be my next question. If they actually—in mining there is a certain disturbance that takes place, sometimes massive disturbance, you would want to have clearly a very valid environmental impact statement.

Dr. SINGH. That is correct, and if we were mining then we would need one. There is no question about that, in my mind anyway.

Mr. KILDEE. It is extremely important that we know what might happen before we do something that may cause that to happen, and I appreciate very much your testimony, Dr. Singh, and everyone else—no, I am out of time. Thank you very much. Thank you, Dr. Singh.

Dr. SINGH. Thank you, sir.

Mr. GRIJALVA. Mr. Coffman.

Mr. COFFMAN. Thank you, Mr. Chairman.

Dr. Singh, just a point of clarification. The environmental impact statement that is underway now, is that both for exploration and for mining itself?

Dr. SINGH. Well, yes, at this point they will complete the exploration, and I don't know the effects of the segregation that took place yesterday on that. But yes, after that if there was a deposit that was validated, and then they would be mining yes.

Mr. COFFMAN. OK. But what evidence do you have at this point that there is potential contamination given the mining technology that we have today, given the regulatory framework that we have today, what evidence do you have that this mining could potentially damage water resources in the region?

Dr. SINGH. There is no data to prove that there is any damage, and they are continually testing everything around them just to make sure that there is no damage.

Mr. COFFMAN. Can you give me an example of the difference in technology from—when were there mines where the technology was

such and the regulatory framework was such that there was in fact damage to the aquifer?

Dr. SINGH. Back in the 1940s and early 1950s, there was mining being done on the east side in the Navajo region and so forth, but then, first of all, the formations are quite different. That was also surface mining or very close to the surface, and the techniques and so forth were quite different.

The mines and the pipes that we are talking about are around six or eight hundred feet below the surface, and then between the deposit itself and the aquifer that we keep talking about, there is 1,000 feet of the Supai formation which is a very impermeable formation, so the water, to be able to go through that, is not possible. It will not happen.

Mr. COFFMAN. Now, when is this environmental impact statement, the first one I guess for exploration, when is that supposed to be finished?

Dr. SINGH. I think by the end of this year it should be finished.

Mr. COFFMAN. OK. Thank you, Mr. Chairman. I yield back the balance of my time.

Mr. GRIJALVA. Mr. Heinrich.

Mr. HEINRICH. Thank you. Supervisor Archuleta, I wanted to ask you from sort of a local government perspective. I used to sit on the city council in Albuquerque, and I know that one of the things local governments always struggle with is just basic infrastructure, especially when you go through a substantial economic change in the region, and I wanted to get your take on if full development were to occur in this area within your county, would you have the basic infrastructure, the roads and the other things necessary to deal with just the change in use patterns that you would see from additional people to trucks to vehicles on the roads, all of those sorts of things, water that would be necessary for those, and how would you finance that?

Ms. ARCHULETA. Well, thank you very much for the question.

Well, as you know, Coconino County having 18,000 square miles within its region, it is a challenge for us to be able to keep up with roads and infrastructure. In addition to that, so this would be a tremendous impact to us, but in addition to that the sheriff's office is responsible for law enforcement on public lands and ensuring the safety of our citizens. That would be very taxing to them as well, and he has indicated so to us.

In addition to that, we struggle with revenues just like everyone else, and we would see that if the—as I mentioned, if uranium mining was to occur on lands in the Grand Canyon, we would see a impact to tourism, we would see an impact to dollars, and right now the only dollars we have right now to be able to take care of our public lands is dollars that we get through forest fees and secure rural schools, and that—secure rural schools is only authorized for another three years, and that continues to diminish. And so we are very concerned about that.

But I appreciate the question. I believe that even with the funds that we get from the state for roads and infrastructure we cannot keep up with what we have at this time and so we would need to have some additional revenue if there was going to be increase on our infrastructure.

Mr. HEINRICH. In a slightly related question, if I understand the geographic boundaries of the counties in this area, both the North Kaibab Ranger District and the Tusayan Ranger District are in Coconino County, is that correct?

Ms. ARCHULETA. It is within our borders, yes.

Mr. HEINRICH. What role do sportsmen and particularly regarding the elk herd in unit 9, what role does that play in your current economy in Coconino County?

Ms. ARCHULETA. Well, hunting and sportsman recreation is actually one of the highest revenue generators for Coconino County. I don't know specifically to that region if we would experience the loss. I wouldn't be able to say that, but I do know that tourism is actually probably higher than hunting, and so in terms of recreation and national visitation to the canyon, I would rate that as the highest source of revenue generation.

Mr. HEINRICH. Do you know, has any analysis been done on the potential impact of fragmentation of the elk herds on the north rim and the south rim?

Ms. ARCHULETA. I am not aware of that. I am sorry, I cannot answer that.

Mr. HEINRICH. OK. Thank you.

Ms. ARCHULETA. Thank you.

Mr. GRIJALVA. Thank you. Ms. Lummis.

Ms. LUMMIS. Thank you, Mr. Chairman.

Ms. Archuleta, thanks for being here today to represent the county.

Ms. ARCHULETA. Thank you.

Ms. LUMMIS. And I may be asking questions that have already been asked. I came in a little late so I apologize if that is the case.

I understand that the Arizona Legislature recently passed a concurrent resolution requesting Congress to hold off on enactment of legislation that would remove any acres from uranium development, and obviously your county board differs. What is the reason for that divergence of opinion?

Ms. ARCHULETA. I don't know. All I can say is that Coconino County is a rural area. We are a large area of the state, but the majority of the legislators in our Legislature come from the metropolitan areas, mainly Phoenix and Maricopa County, and I would say that they certainly didn't consult with Coconino County, and perhaps they are not in touch with our constituency.

Ms. LUMMIS. Could you tell me how far the uranium development is from the Grand Canyon, the actual Grand Canyon?

Ms. ARCHULETA. Some of it that is proposed is two miles within the national park. Others is 10 miles, so within a two to 10-mile radius.

Ms. LUMMIS. And what environmental analysis is currently taking place by land managers regarding the potential mining activity?

Ms. ARCHULETA. I don't know the specific activity that is taking place, so I can't speak to that in terms of an EIS.

Ms. LUMMIS. Dr. Singh, do you know why the Arizona Legislature chose to depart from the view of the county on this issue?

Dr. SINGH. Well, there are a couple of reasons. One is, of course, we have come to realize and several of them have visited the area



where mining was taking place and realized that it has been reclaimed. In fact, you can't hardly discern these areas anymore. And the second reason is that impacts the revenues of the state and there is really no reason, and we need jobs right now. We are in a desperate position. You know, we are having a lot of difficulty meeting our revenue projection.

Ms. LUMMIS. Mr. Chairman, Dr. Singh.

Dr. SINGH. Yes.

Ms. LUMMIS. Would this uranium be recovered by in situ processes or by conventional mining?

Dr. SINGH. By mining—it is underground mining. It is not surface mining. But, no, it is not by in situ.

Ms. LUMMIS. OK. Isn't the purpose of NEPA analysis to determine the environmental impacts on Federal lands of proposed projects just like these, Dr. Singh?

Dr. SINGH. Yes, it is, and during the EIS process that will be part of that, you know.

Ms. LUMMIS. And here is a follow-up question. You know, there are a number of options to help us diversify our current energy portfolio, which requires strategic metals—germanium for solar, photo-voltaic technology, neodymium for wind turbines and, of course, uranium for nuclear. From a carbon aspect, however, the only zero emission alternative to traditional fossil fuels that could meet our nation's baseload is nuclear.

While my home State of Wyoming contributes the majority of domestic uranium mined for this purpose, our nation currently is more than 90 percent dependent on imported uranium for nuclear power plants within our own borders, and I would like to ask each of the panelists, are you supportive of increasing the foreign dependency as we ramp up nuclear energy usage of America? And I would offer anyone an opportunity to answer that. Foreign versus domestic is my question, uranium production. Dr. Singh?

Dr. SINGH. Yes, I have essentially referred to that in my testimony, but yes, we cannot afford to be dependent; otherwise all we are doing is trading our dependence on oil for dependence on uranium or other minerals, and that is not in the best national interests, and especially not in the national security interests of our nation.

Ms. LUMMIS. Mr. Chairman, just to comment, being from Wyoming, there was a proposal in the nineties for gold mining operation at the New World Mine just over the border from Yellowstone National Park in Montana, and at the time I was doing natural resource policy for our Governor. I went up several times and looked at the New World Mine site, and came away with the conclusion personally that the tails, the tailing ponds would be potentially disruptive to water sources that get into Yellowstone National Park, and I came away thinking that that was an inappropriate site for gold mining because of the potential impairment on water resources in the Yellowstone National Park.

So I understand the concerns that you may have about this, and I would hope that those kinds of things could be fleshed out in a NEPA process rather than have Congress interject its—rather than having us micro manage, but nevertheless I do appreciate the po-

tential concerns you have, and I thank you for being here today and testifying.

Thank you, Mr. Chairman.

Mr. GRIJALVA. Thank you. You are talking about the NEPA process and I couldn't agree more with your comments. But it should be noted that the beginning of these claims, including the one in Redwall-Muav, that Forest Service was trying to exempt the NEPA process for many of these claims, and the fact that now due to this new policy perspective NEPA is going to be looked at. I think this is an important step as well. But at the beginning of this whole process they were going to be exempt, and that was—but Ms. Brothers, just let me, and I will afford my colleagues additional questions as well.

You mentioned that the Colorado River, 90 percent of southern Nevada's water supply. Since we have been speculating about jobs and other stuff, so let us speculate a little bit more. If a major disaster were to contaminate the Colorado River, where would your authority go to find the next best water source?

Ms. BROTHERS. That is just the issue, sir. We do rely heavily on the Colorado River, and if there was any disaster we would in essence be out of water. We are trying to diversify our water resources by constructing a groundwater project that would bring in water from eastern and central Nevada to buffer us against drought or any type of catastrophe on the Colorado River, but that is why we are so concerned, and I think the issue here is proximity to the Colorado River. I think that is our issue that we need to be looking at any potential that would contaminate that because of the reliance that we have on the river.

Mr. GRIJALVA. And one of the things we are hopeful in this two-year period to look at is the impacts of uranium mining on water quality, and thanks to the Department of the Interior's recent decision we might be afforded that opportunity.

Based on what you know now, are there controls, oversight measures that you would like to see tested or put in place to protect that water supply?

Ms. BROTHERS. I think we have been talking about the NEPA process and the fact that this mining was exempt. It should not be exempt from the process. I think you have to have a total look at what potential there might be for contamination to reach the river.

Each individual mining operation might have a different set of circumstances. Some of the uranium occurs in aquifers. You have to de-water that aquifer to be able to extract it, and those waters do have radionuclides in them that have to be removed. So it can be on a case-by-case basis, but these analyses need to be done in depth to look at their impact on water quality, especially the Colorado River.

Mr. GRIJALVA. Thank you.

Dr. Singh, can your department provide to the Committee of the claims that—let us just concentrate on the claims around the Grand Canyon. Of the companies placing those claims or individuals, the companies, how many are foreign owned? Do you know?

Dr. SINGH. No, I don't know offhand. A number of them probably are.

Mr. GRIJALVA. Is the VANE foreign owned?

Dr. SINGH. Pardon me?

Mr. GRIJALVA. Is the VANE Company foreign owned?

Dr. SINGH. Yes, sir, and a number of others may also be foreign owned, but this business of being foreign owed is really not much—

Mr. GRIJALVA. The point that is being made today is exporting, domestic use, my colleague made it, you made it in your testimony, so what guarantees do we have from a foreign-owned company that is the major company in the area that the extraction on our public lands are going to be domestically used or exported? We have no guarantees or do we have guarantees?

Dr. SINGH. No, we do not have any guarantees, but I would like to point out that all the workers that are there are Americans. All the supervisors there are Americans, and in many cases the presidents of the companies are also Americans, and also the shareholders, the shareholders, about 50 percent or more of them are Americans. So the fact that they are owned by foreign companies, and in this case most of these—well, VANE is British, but the rest are Canadian.

Mr. GRIJALVA. The issue for me of guarantee of energy independence if that is what we are touting and national security, then that extraction appropriately belongs here.

Dr. SINGH. Canada right now is exporting uranium to the United States, and it has much more uranium than it is ever going to need and, therefore, I do not think that they are going to be mining in the Grand Canyon and then exporting that to Canada or anywhere else. I think if we need it here, we will be able to use it here.

Mr. GRIJALVA. Well, that is good for you to believe that or think that or speculate that, but if that is the argument, that is the argument that I think the guarantee needs to be a lot more profound.

Mr. Bishop.

Mr. BISHOP. I do have a couple, yes, and in fact, Mr. Grijalva, if you would write that guarantee in your bill, it might be a better bill, obviously.

There are a couple of things. First of all, let us get something very clear. NEPA has not been waived in any of this process. Categorical exclusions are part of the NEPA process.

Dr. SINGH. Yes.

Mr. BISHOP. There is a vast difference between exploration and mining. Giving a categorical exclusion for an exploration just to drill a hole is not the same thing as a categorical exclusion from a mining operation which would have to have a further EIS. So, please, when you talk about NEPA being excluded, make sure you are exactly right what you are talking about. Categorical exclusion is part of NEPA.

Ms. Brothers, I hope you recognize that when you go after that water in central and eastern Nevada you leave western Utah alone. It is the same aquifer but it is our water. So be very careful on that, and I appreciate your concern about the water coming down the Colorado, and I hope you were also listening to the studies that Dr. Singh was talking about on how those levels are so significantly below what EPA standards would be in there.

Now, there was one question that Representative Lummis brought up that I would like to come in here. Dr. Singh, when she

was talking about that, would wind or solar farms harm or have a greater impact on elk than mining?

Dr. SINGH. On elks?

Mr. BISHOP. Sure. Yes.

Dr. SINGH. Well, obviously if they are going to be occupying all this land, then amount of land that is required by solar or wind is many times larger than that of conventional plants or nuclear plants. So this would be interference in their paths or whatever, and we found that out even for birds in California. We have had instances where there have been problems with birds because they are on the route that the birds fly.

Mr. BISHOP. Thank you. I do have a question about the footprint that we are talking about with this kind of mining but let us wait until the next panel to do that. I will yield back.

Mr. GRIJALVA. Thank you very much. Since the Ranking Member and I afforded extra questions, Mr. Heinrich, any follow ups?

Mr. HEINRICH. No, I think I will wait for the next panel.

Mr. GRIJALVA. Ms. Lummis.

Ms. LUMMIS. Well, just to comment, Mr. Chairman.

In Wyoming, we have the only natural trona deposit outside of a small deposit in California that exists in North America, and now all of the trona mines in southern Wyoming are dominated by foreign-owned companies, but it is true that they have American workers, American management, and I asked some local people in Rock Springs, Wyoming, where these trona mines are located, if the community of Rock Springs was uncomfortable with the fact that now a majority of the trona mines in southern Wyoming are owned by foreign companies.

I got the exact opposite reaction that I expected. What they told me was foreign-owned companies tend to take a longer view because they are not publicly traded on U.S. exchanges and so they are not chasing quarterly projections and profit numbers. Foreign-owned companies tend to take a longer-term view with regard to their employee base, their profit considerations, and what I heard in Rock Springs, Wyoming, what a stunner, was that they actually felt that having a majority of the trona companies in Wyoming being owned by foreign companies to be potentially beneficial.

So that was counter-intuitive to me too, but that was the reaction I got even from local people.

Mr. GRIJALVA. Mr. Heinrich, did you reconsider?

Mr. HEINRICH. Yes, I will keep this short.

I just think what Ms. Lummis brings up is actually something we should keep in mind. It is easy to paint a broad brush when we are talking about energy independence, but I think there is a fundamental difference between being reliant on uranium from Canada and being reliant on Venezuela for oil. These are not equal situations, and today while we import 90 percent of our uranium the vast bulk of it comes from places like Canada and Australia, that I think hardly pose the kind of strategic challenges that places like Iran and Venezuela pose for us in the international stage.

Mr. GRIJALVA. Thank you.

Panelists, thank you very much, and let me invite the next panel up, please.

Thank you very much for being at the hearing. We appreciate it very much and, at the outset, let me once again remind that your written testimony and any other extraneous information will be part of the record and, if humanly possible, to try to get your oral testimony to five minutes, that would be helpful as well.

Let me begin with Mr. Mark Trautwein, former staffer to Congressman Mo Udall. Welcome, sir, and your comments.

**STATEMENT OF MARK TRAUTWEIN, FORMER STAFFER TO  
CONGRESSMAN MORRIS UDALL, SAN ANSELMO, CALIFORNIA**

Mr. TRAUTWEIN. Mr. Chairman, it is a great pleasure to be back in this historic room, albeit on the opposite side of the witness table, where I was privileged to work for more than 15 years. From 1979 until 1991, I had the great honor of serving Mo Udall and, until 1995, George Miller, as the full Committee staffer responsible for jurisdiction over public lands, wilderness, and national parks.

In that capacity, Chairman Udall designated me, in 1983, as the staff responsible for the Arizona Wilderness Act. I am here today because four members of the other body, in two separate letters, have cited that Act as the basis for their opposition to H.R. 644. Their theory is that the Act was a final disposition of the status of all lands on the Arizona Strip and that to tinker with that formula not only violates the agreement but also the entire spirit of Mo Udall's work.

That is simply not the case, factually, and it is perverse to suggest that Mr. Udall would have found it inappropriate that others would seek to add to his conservation legacy. In fact, he hoped for nothing less.

Mr. Chairman, I lay out the relevant legislative history of the Arizona Strip provisions of the 1984 Act for the record in my written statement.

There are at least four factual reasons why the Arizona Wilderness Act and H.R. 644 are not comparable.

First, they deal with entirely different questions. One is a wilderness act that sorted out which lands met the criteria for protection as wilderness. The other addresses the impact of a particular activity on the hydrology of the Grand Canyon, specifically, its water quality. That issue was never part of the wilderness process at all.

Second, they cover different lands. Many, even most, of the lands addressed by H.R. 644 were never part of even the wilderness review process that culminated in the Arizona Wilderness Act.

Third, the so-called "release language" of the 1984 law makes it clear that it was not even a final disposition of the wilderness review question. So even if Mr. Grijalva were proposing to designate additional wilderness on the Strip, which he is not, it would not violate any understanding codified in that law.

Fourth, there have already been extensive changes to land status on the Strip since passage of the Arizona Wilderness Act, ACECs and large national monuments, all with the implicit approval of Congress. So if there was an understanding that the Act was a final disposition of land status, which it was not, it has long since been amended.

This is, in fact, what Mr. Udall hoped for, that the Arizona Wilderness Act would serve as the catalyst for continuing attention to

the protection of the Grand Canyon. If there is an “understanding” implicit in the Arizona Wilderness Act that Mr. Udall’s work would be the final word on the Arizona Strip not to be rewritten by those who came after him, which is the underlying thesis of the Senate letters, I am quite certain Mr. Udall did not share it. In fact, I can think of no idea more contrary to Mo’s most fundamental beliefs about the work he cared about so deeply.

Mr. Chairman, Mo Udall was my hero and my mentor. I worked with him daily for 12 years crafting legislation that became his conservation legacy. It is highly distressing to me to see Mo’s name invoked in support of a position I know, to an absolute certainty, he never would have taken. It is contrary to his core values, the values he taught me, the values he expected me to bring to every piece of legislation I was honored to staff for him, the values that made him the most remarkable man I have ever known and one of the most remarkable legislators this Congress has ever known.

At every step of assembling that legacy, Mo’s work was informed by what he often called his “love of the land.” He believed it was the duty of every generation to exercise its own love of the land to meet future challenges he could never anticipate. The suggestion that he would have thought that anyone, especially the Congress of the United States, was precluded by some deal or some judgment he had made a generation earlier from taking new action to express that love on the basis of new information and new evidence in an entirely different context is just utterly antithetical to everything he believed.

I do not know what position Mo would have taken on the bill before the Subcommittee, but I do know the charge Mo would have given me. He would have wanted to know two things: Is there credible evidence of a problem that requires Congress to act, and is the solution proposed reasonable and effective? Those are the questions that Members of this Subcommittee and this Congress, in the House and the Senate, should address. No false fealty to a man or his work should serve as the pretext for refusing to do so.

Mo’s legacy is, and always will be, an enduring one, but Mo did not legislate on stone tablets, and he did not protect lands to prevent others from loving the land but to inspire them to carry on the great work. In the end, that is his true legacy, and if his name is to be invoked, let that be the cause it serves.

Mr. Chairman, I am grateful for the opportunity to defend that legacy before you today.

[The prepared statement of Mr. Trautwein follows:]

**Statement of Mark Trautwein, San Anselmo, California**

Mr. Chairman, it is a great pleasure to be back in this historic room, albeit on the opposite side of the witness table, where I was privileged to work for more than 15 years. From 1979 until 1991, I had the great honor of serving Mo Udall and, from 1991 to 1995, George Miller, as the full committee’s staffer responsible for its jurisdiction over public lands, wilderness and national parks.

I am here today, representing myself only and not affiliated with any interest group, to address certain assertions made in two separate letters by four current or retired members of the other body in which they point to the Arizona Wilderness Act of 1984 as their basis for opposing the bill before you today. Their theory is that the Act was a final disposition of the status of all lands on the Arizona Strip and that to tinker with that formula not only violates that agreement but also the entire spirit of Mo Udall’s work. I am intimately familiar with that Act because Chairman Udall made me responsible for managing it, including gathering information, negoti-

ating with all interested parties, and drafting bill and committee report language. I know of nothing, either implicit or explicit, in the Arizona Wilderness Act, Mr. Udall's sponsorship of it, or the events leading to its passage, that would support opposition to H.R. 644. Moreover, it is simply perverse to suggest that Mr. Udall would have found it inappropriate that others would seek to add to his conservation legacy. In fact, he hoped for nothing less.

Let me briefly describe the relevant legislative history of the Arizona Wilderness Act. In 1983, Mr. Udall began the process of preparing legislation to resolve the Forest Service RARE II wilderness issue across Arizona. Simultaneously, but entirely independently of that process, negotiations were initiated by a mining company, Energy Fuels Nuclear, with other stakeholders to address wilderness questions specifically on the Arizona Strip. These negotiations considered the wilderness suitability not only of Forest Service lands on the Strip, but also BLM lands. The company believed it had identified valuable uranium deposits and that their development might be impaired by future wilderness designations. This was especially problematic on the BLM lands because that agency, unlike the Forest Service, had not completed review of its wilderness study areas, and was years away from formulating wilderness recommendations to the President and the Congress.

Those private negotiations were conducted without any direct Congressional involvement at all. They eventually resulted in stakeholder agreement about which Strip lands would be designated wilderness and which would not. The package was introduced as separate legislation by then-Rep. Bob Stump, but was incorporated by Chairman Udall into the Arizona Wilderness Act at markup as Title III.

Neither the history nor the provisions of Arizona Wilderness Act support the idea expressed in the Senate letters that these events settled issues raised by H.R. 644. On the contrary, the two acts are entirely different in scope and purpose. The Arizona Wilderness Act is a wilderness act. It considered whether certain lands met the conditions set forth in the 1964 Wilderness Act for inclusion in the wilderness system. Mr. Grijalva's bill addresses the hydrology of the Grand Canyon ecosystem and the impact of one particular activity, uranium mining, on water quality. It is simply incorrect to state, as one letter does, that the Arizona Wilderness Act was designed to "ensure that the Grand Canyon watershed was fully protected". It was designed to ensure that wilderness resources and values were protected. Watershed issues were never considered or addressed anywhere in the process leading to passage of the Arizona Wilderness Act and are beyond the scope of the wilderness process.

The 1984 law and H.R. 644 do not even cover the same inventory of lands. The Arizona Wilderness Act considered only those lands in BLM and Forest Service wilderness study areas. It never examined at all vast tracts affected by H.R. 644 because those lands did not meet the criteria required to receive interim protection while they were studied for their wilderness suitability. While it is true that some of those lands that were studied and not designated wilderness in 1984 are included in Mr. Grijalva's bill, many were not. The majority of lands covered in the current bill were never reviewed at all, for anything, not even for wilderness, in 1984.

Even if Mr. Grijalva were proposing to designate more wilderness, which he is not, the bill would not violate what the Senate letters call "the understanding" of the Arizona Wilderness Act. That act, by its own language, is not the final disposition even of the wilderness question on the Strip, much less land use questions of entirely different scope and impact. The statute's release language clearly requires the Forest Service to reconsider in subsequent planning cycles, which are supposed to be every ten years, the wilderness suitability of all lands not already designated. This is no accident. Release language was an extremely contentious issue that held up the passage of several statewide wilderness bills for a considerable time. Opponents argued persistently that lands not designated wilderness should be barred from future wilderness consideration. Some went even further with proposals that amounted to a Congressional directive that multiple use lands be free of any conservation protections. Mr. Udall was the prime advocate of the position that such lands could and should be reconsidered for wilderness at some future time. The bill as enacted adopted his position, as did all other RARE II wilderness bills.

BLM lands are not subject to the same statutory cyclical planning process as Forest Service lands. Therefore, they did not require any comparable release language. Had it been necessary, however, Mr. Udall obviously would have taken the same position, that future reviews of land status are necessary and proper and that no Act of Congress, either implicitly or explicitly, ought to foreclose the possibility that future citizens, future agencies and future Congresses might propose additional protections on these lands. To see that defeated argument of so many years ago returning in the form of the rewritten history of the Senate letters is, to say the least, discouraging, especially when it has been stretched to argue against a bill that is

not a wilderness bill, that addresses lands not even considered in the formulation of the Arizona wilderness bill and that protects those lands to an entirely different object and in an entirely different way.

It is true, of course, that 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.

In any event, Congress did not direct that such development must actually occur. To release lands back to multiple use, as the Arizona Wilderness Act did, only meant that development might, or might not, take place as determined by the relevant agencies acting in accordance with applicable law. In fact, only one of the mines discussed by the report language—the Hack Canyon mine—was ever developed. Energy Fuels Nuclear went bankrupt not long after passage of the Act. One would have to say that the Act's release language requires the Forest Service to consider anew the possibility of extending wilderness protections to the very lands adjacent to the Kanab Creek Wilderness that were the subject of that report language, where development did not occur and wilderness resources remain intact. Even if Mr. Grijalva were proposing wilderness on lands already considered by the Arizona Wilderness Act, he would not be violating either its language or its spirit. He is not, and the plain language of the Act clearly belies the notion that the Arizona Wilderness Act was intended to be some kind of barrier against new protections, freezing lands use decisions made in 1984 for all time. It should go without saying that nothing in the Arizona Wilderness Act precludes the Congress from imposing additional protections of any kind, based on new facts and new evidence or new values.

And the plain facts are that land status on the Arizona Strip already has changed, and profoundly so, since passage of the Arizona Wilderness Act. ACEC's have been designated and large national monuments proclaimed, and implicitly if not explicitly ratified by Congress, all without any objections that "heavy-handed government interference" from Washington violated a generation-old "understanding" that nothing more would ever change. (In one sense there is irony in this argument, because in the case of the BLM lands on the Strip the Arizona Wilderness Act was itself Congressional interference in BLM's uncompleted administrative wilderness review process under Section 603 of FLPMA.) I am utterly confident that this is exactly what Mr. Udall would have hoped would happen, that the Arizona Wilderness Act would be the catalyst for continuing concern and attention to protection of the Grand Canyon ecosystem, not less.

If there is an "understanding" implicit in the Arizona Wilderness Act that Mr. Udall's work would be the final word on the Arizona Strip not to be rewritten by those who came after him, which is the underlying thesis of the Senate letters, I am quite certain Mr. Udall did not share it. In fact, I can think of no idea more contrary to Mo's most fundamental beliefs about the work he cared about so deeply.

Mr. Chairman, Mo Udall was my hero and my mentor. I worked with him daily for 12 years crafting legislation that set a new standard for stewardship of the lands and resources that sustain us all. It is highly distressing to me to see Mo's name invoked in support of a position I know to an absolute certainty he never would have taken. It is contrary to his core values, the values he taught me, the values he expected me to bring to every piece of legislation I was honored to staff for him, the values that made him the most remarkable man I have ever known and one of the most remarkable legislators this Congress has ever known.

Mo was rightly proud of his legacy as the greatest conservation legislator in American history. Thanks to his leadership, the national park system, the national wildlife refuge system, and the national wilderness preservation system were all more than doubled in size. The Alaska Lands Act, which was forged in this very room that bears his name, was the single greatest stroke of conservation in the history of man. At every step of assembling that legacy, Mo's work was informed by what he often referred to as his "love of the land". He believed it was the duty of every generation to exercise its own love of the land to meet future challenges he could never anticipate. The suggestion that he would have thought that any citizen or group of citizens or the Congress of the United States was precluded by some deal or some judgment he had made a generation earlier from taking new action to express that love, on the basis of new information and new evidence in an entirely different context, is just utterly antithetical to everything he believed.

Mo wouldn't have gone as far as Thomas Jefferson, who believed all laws should expire every 25 years because no generation has the right to impose its rules on



the next. But he was very Jeffersonian in his belief that every generation has the right and the duty to create its own world. He saw conservation as a dynamic process across time, an ongoing story to be written and rewritten every generation. Mo often talked about how as a younger man the mountains that ring Tucson were distant things, and that the city limits didn't even reach a ring of parks and wilderness areas that nearly surround it. But in his lifetime, Tucson had grown up to and beyond those mountains. The natural areas that used to be so distant are now islands in an urban sea. Mo talked about this often because he felt so strongly that you could never be visionary enough when it came to the land and you could never deny to any generation its opportunity and its responsibility to take care of it. It is more than a little appropriate that today you, Mr. Chairman, represent much the same community that he did, that you occupy the chairmanship of a vital subcommittee that Mo entrusted only to his most valued partners, John Seiberling and Bruce Vento, and that you share his love of the land.

I don't know what position Mo would have taken on the bill before the subcommittee and I have no worthwhile opinion on its substantive merits. But I do know the charge Mo would have given me. He would have wanted to know two things—is there credible evidence of a problem that requires Congress to act, and is the solution proposed reasonable and effective. In the matter before you today those are the questions members of this subcommittee and this Congress, in the House and the Senate, should address. No false fealty to a man or his work should serve as the premise for refusing to do so.

Mo's legacy is and always will be an enduring one. But Mo did not legislate on stone tablets. And he did not protect lands to prevent others from loving the land but to inspire them to carry on the great work. In the end, that is his true legacy, and if his name is to be invoked, let that be the cause it serves.

Mr. Chairman, I am grateful for the opportunity to defend that legacy before you today.

[NOTE: Attachments have been retained in the Committee's official files.]

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Mr. GRIJALVA. Thank you very much. Before the next witness, in 1974, I got elected to a school board back home, and Mo was my congressman for forever, and he wrote me a congratulatory note: "Raúl, congratulations," and then underneath it, "Are you sure about this?" I have kept that forever.

Let me now ask Professor David Kreamer, hydrologist and university professor, Las Vegas, Nevada. Welcome, Doctor, and I look forward to your comments.

**STATEMENT OF DAVID K. KREAMER, PH.D., PROFESSOR OF  
HYDROLOGY, UNIVERSITY OF NEVADA, LAS VEGAS, NEVADA**

Dr. KREAMER. Thank you, Chairman Grijalva, and thank you, Committee. My name is David Kreamer. I am a Professor of Hydrology at the University of Nevada, Las Vegas, Department of Geoscience. I have taught at Arizona State University and the University of Arizona. I am an officer in the International Association of Hydrogeologists and director of the National Ground Water Association's Association of Ground Water Scientists and Engineers. The National Ground Water Association is the largest groundwater association, not only in the United States, but in the world.

I am not speaking on behalf of any of those institutions or professional organizations but as a professional hydrogeologist.

I have been studying the Grand Canyon since the 1980's. I first visited it in the 1960's. My research team was the first to find elevated uranium concentrations in Horn Creek below Orphan Uranium Mine in the Grand Canyon, as a result of which, in the Horn Creek area, there was a sign put up to warn people about the high uranium concentrations in the water.

We looked at the isotopes Dr. Singh mentioned, the environmental isotopes, back in the eighties and nineties, uranium isotope disequilibrium, and other elements to try and link groundwater and see where it was moving in the Grand Canyon.

I am concerned about the potential contamination of uranium mining in the Grand Canyon, and I support House Bill 644. I am not only concerned about water contamination and water quality but also water quantity. Mining in breccia pipes would necessarily pierce perched aquifers in the Grand Canyon that feed high springs on the Hermit Shale-Coconino Sandstone contact.

In addition to that, the uranium activities themselves require water. One uranium mine alone, if you look at the Canyon Uranium Mine EIS in the 1980's, the amount of water they would use would be enough to supply several small springs and seeps in the Grand Canyon, and if that water was taken away from the groundwater system, it would eradicate those springs.

The mining works on top of uranium mines build dikes and dams and berms to prevent ore on the surface and spoils on the surface from contacting surface water floods. These breccia pipes are historical recharge areas. The mining works themselves would reduce recharge by impounding water that would normally recharge the Redwall-Muav aquifer down below. So I am concerned about water quantity as well in the Grand Canyon.

The science has shown that it is unreasonable to assume that there is no connection between groundwater in the Grand Canyon in the rims and the springs. The isotopes show that it is likely that those are connected.

It is unreasonable to assume that water supplied to mining is trivial, particularly if more than one mine begins mining in the Grand Canyon region.

It is unreasonable to assume that the surface structures—the dams, dikes, and berms—will not reduce recharge to the Redwall-Muav aquifer, and that is if they do not fail and flood the subsurface with contaminated water.

It is unreasonable to assume that mining in the Hermit Shale aquifer will not pierce the perched aquifer system in the Grand Canyon.

It is unreasonable to assume that potential pollution to drainages in the Grand Canyon will not occur, and it is unreasonable to assume that no potential huge cleanup costs will be associated with any pollution that does occur. Orphan Uranium Mine surface cleanup alone, under circle of the Superfund, is \$15 million. There is no estimate yet for what the underground water cleanup would be and what the cleanup would be for the Horn Creek down below.

By allowing uranium mining in the Grand Canyon, we are really like the sorcerer's apprentice, opening up an environmental box that does not follow precautionary principles that we often follow in the environment.

The hydrologic indications are that the springs will be impacted in some way, that the ecosystems that depend on those springs will be impacted, and that there is a potential for water quantity and quality impact in the Grand Canyon.

I would like to thank the Committee very much for allowing me to testify this morning. Thank you very much.

[The prepared statement of Dr. Kreamer follows:]

**Statement of David K. Kreamer, Professor, Department of Geoscience,  
University of Nevada, Las Vegas**

I wish to thank Chairman Grijalva and the Subcommittee for the opportunity to testify, and for your leadership in addressing this important issue. This testimony is in support of the Grand Canyon Watersheds Protection Act of 2009 (H.R. 644). I am a Professor of Hydrology at the University of Nevada, Las Vegas (UNLV) where I have been studying groundwater—surface water interaction in the Southwest, and in the national parks in particular. I have visited the Grand Canyon since the 1960s and have conducted research on Grand Canyon springs for over 25 years. I have authored several publications related to Grand Canyon springs. This testimony does not represent the views of the University of Nevada, or any of the institutions with which I have past or present affiliation. My past affiliations include Director of Water Resources Management Graduate Program at UNLV, and I have taught at Arizona State University and the University of Arizona in the 1970s and 80s. I also serve as Secretary of the U.S. National Chapter of the International Association of Hydrogeologists, and on the Board of Directors of the National Ground Water Association, Association of Ground Water Scientists and Engineers.

My research group was the first to study uranium concentrations in water from various springs in the Grand Canyon, including Horn Creek (which is below the site of the abandoned Orphan Uranium Mine on the Rim). In 1995 we discovered elevated uranium levels in Horn Creek (92.7 ppb), which is above the EPA Maximum Contaminant Level Goals (0 ppb), and in excess of the EPA Maximum Contaminant Levels (30 ppb). This provided part of the impetus for the Park Service to clean up the Orphan Mine site under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The cost for remediation of the Orphan Mine's surface area is estimated at \$15 million (Phase 1), but costs to remediate contamination in the underground portion of the mine and in Horn Creek are unknown (Washington Independent July 22, 2008).

My comments in this testimony are restricted to my areas of professional and academic experience in hydrology, water quality, and geology. Specifically, I would like to address the potential that mining, in or near the Tusayan Ranger District and Federal land managed by the Bureau of Land Management in the vicinity of Kanab Creek and in House Rock Valley, can negatively impact the quantity and quality of spring water issuing in the Grand Canyon, and thereby impact human health and safety, and wildlife habitat that those springs support.

**Background**

I have researched spring water quality and quantity in the Grand Canyon with my graduate students since the 1980's, particularly looking at environmental tracers and groundwater-surface water connections. Environmental tracers are water quality parameters which are useful in understanding groundwater movement and flow. The value of these tracers includes: tracking subsurface water migration, revealing evidence to show hydrologic connection between aquifers and springs, dating the entry of rainfall infiltrating into the subsurface, and specifying ground water recharge areas and amounts of recharge.

On the basis of this research and that of others, I am profoundly concerned that mining in or near the Tusayan Ranger District and Federal land managed by the Bureau of Land Management in the vicinity of Kanab Creek and in House Rock Valley will damage the quantity and quality of Grand Canyon springs, and the plants and animals that depend on those springs. The springs support a rich diversity of animals, birds, insects and plants, and provide water for backcountry hikers and Native Americans.

Uranium mines in the arid Southwest use water, which is usually supplied from wells or imported from springs. These types of mines in the Grand Canyon area typically excavate vertical and horizontal shafts into, or near, breccia pipes, which are geologic collapse features and zones of historical groundwater recharge. Breccia pipes are abundant in the region, form vertical zones of angular clasts surrounded by a consolidated rock matrix originally formed by the caving-in of paleochannels in underlying rock, and can form ground surface depressions and sink holes (Huntoon, 1996). Many potential mine sites are located in these sinkholes which can be subject to surface flooding. This type of uranium mine generates ore and waste rock which is typically stockpiled on the land surface until shipment to a mill takes place. Local precipitation and surface runoff waters can be in contact with this surface uranium ore. Certain mining activities, such as the interception of water by wells, creation of vertical shafts, the diversion of surface water, and the collection

of surface water into holding ponds, has the potential to alter the amount and quality of water recharging the aquifers surrounding Grand Canyon National Park.

#### **Diminishment of Spring Water Quantity**

Water is necessary at mining operations to support drilling, potable water supply and sanitary needs. Wells in the Grand Canyon region typically are over 2000 feet deep, tapping the Redwall-Muav aquifer. This same Redwall-Muav formation is the level in the Canyon where the large majority of springs discharge (approximately halfway down the Canyon vertically). Previous uranium mining in the Grand Canyon region estimates that this water usage would be, at a minimum, over 2.5 million gallons per year for one mine (Canyon Uranium Mine EIS, 1986). There are many springs and seeps in the Grand Canyon that, according to the U.S. Geological Survey and other investigators, have discharge similar to these amounts, or even much less. Some of these springs and seeps are ephemeral, and the biotic communities associated with them are very vulnerable to the abstraction of water and reduction of flow. Multiplying potential mining water use by the number of potential mine sites, coupled with the up-gradient location of potential mine sites, a majority of springs and seeps in the Grand Canyon could be eliminated and/or critically diminished in flow. The work of our research group at the University of Nevada, Las Vegas with environmental tracers (including stable and radiogenic isotopes, trace elements, chlorofluorocarbons, and uranium isotope disequilibrium measurements) shows compelling supporting evidence for existence of a hydrologic connection between the aquifers surrounding the Canyon and the springs within the Canyon (Goings, 1985; Zukosky, 1995; Fitzgerald, 1996; Ingraham et al., 2001).

Also, the deep, drilled wells associated with projected mining operations throughout the Grand Canyon region, and the mine shafts themselves, have the potential to pierce smaller perched aquifers in the overlying Coconino Sandstone (approximately one-quarter of the way down the Canyon vertically), which supplies water to springs higher up on the wall of the Canyon. In one uranium mine in the Grand Canyon region, a perched aquifer was encountered during exploratory drilling operations. Long-term downward drainage and water disruption potential of the mining operation was estimated to be over 1.3 million gallons per year (Canyon Uranium Mine EIS, 1986). Piercing a perched aquifer would have the effect of draining the perched aquifer, and disrupting flow to springs issuing from the Coconino Sandstone-Hermit Shale contact and the underlying Supai Group.

The historical water recharge to the subsurface in potential mining areas could be altered by surface mining structures. These structures include diversion channels, berms, dikes, or barriers to surface flow. These structures are designed, in part, to minimize contact of surface ore piles and waste rock with surface water runoff. Eventually this impoundment of surface water would manifest itself as diminished groundwater recharge and spring flow. Retention of surface water would unbalance the groundwater equilibrium between recharge and spring discharge, and could also affect the timing of downward water percolation, and eventually spring water quality.

#### **Diminishment of Spring Water Quality**

The disruption to the normal recharge processes (vertical water flow in the subsurface) by mining operations will not only change the underground pathway and quantity of spring and creek flow within the Grand Canyon, it is likely to also change the quality of those waters. As may be obvious, lower flows may produce less dilution of dissolved components, but surprisingly, high flows coupled with a change in water's oxidation level as it descends in the subsurface, can increase sulfate, magnesium, carbonate, and even uranium concentrations (Hockley et al., 2000). Elevated uranium concentrations in spring water that my research team observed in Horn Creek, below the rim of the Grand Canyon, were at a time of high flow.

Vertical and horizontal shafts built with uranium mining will be expected to change water quality in the Canyon. The effects on water quality of expanded uranium mining near the Rim of the Grand Canyon, irreversible environmental impacts of those changes, and the cost of cleaning up contamination from those operations is not defined at this time for receiving waters.

#### **Summary**

Scientific evidence suggests that the exploitation of uranium resources near the Grand Canyon will be intimately connected with the groundwater aquifers and springs in the region. The hydrologic impacts have a great potential to be negative to people and biotic systems. I believe that an assumption that uranium mining will have minimal impact on springs, people and ecosystems in the Grand Canyon is unreasonable, and is not supported by past investigations, research, and data. Therefore, I support passage of H.R. 644. In my best professional judgment, I believe

H.R. 644 will help preserve clean water and the sustainable natural resources that water supports, in this treasured region of our country. In my view, at the same time it will support recreational economic interests and indigenous peoples of the region.

I greatly appreciate the opportunity to address this issue and wish to thank the Subcommittee.

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Mr. GRIJALVA. Thank you. Mr. Bill Hedden, Executive Director, Grand Canyon Trust, welcome, sir.

**STATEMENT OF BILL HEDDEN, EXECUTIVE DIRECTOR,  
GRAND CANYON TRUST, FLAGSTAFF, ARIZONA**

Mr. HEDDEN. Thank you, Chairman Grijalva, Mr. Bishop, and Members of the Subcommittee. It is an honor to be here today.

I need to begin by amending my written testimony to thank Secretary Salazar for his action yesterday segregating lands from uranium mining in direct response to the resolution of the House Resources Committee. I am here today to urge you to make those protections permanent.

Various actions, beginning with Theodore Roosevelt's 1908 designation of Grand Canyon National Monument, have ended mining in most of the watersheds draining into the canyon. Only the areas around Kanab Creek, House Rock Valley, and the Tusayan District of the Kaibab National Forest remain unprotected, but those areas are awash in 11,000 uranium mining claims, most filed in the last few years, the 21st century claim-staking frenzy conducted under the 19th century auspices of the 1872 Mining Law.

From bitter experience, we, in the Southwest, know what uranium mining looks like close up. Native people are still suffering from the illness and poisonous waste left behind by the last boom, prompting every tribe with cultural ties to the Grand Canyon to oppose new uranium mining there.

Wherever the mess has been cleaned up, the taxpayers have been stuck with the bill. Near my home in Moab, Utah, DOE has just begun to remove 16 million tons of toxic uranium waste from the bank of the Colorado River. The company that left the tailings and pocketed the cash fled into bankruptcy, leaving the taxpayers with a remediation bill of a billion dollars, but what other choice was there? The mess was draining into the water supply for 25 million people.

In 1979, an earthen dam breached, dumping 1,100 tons of radioactive wastes and 90 million gallons of poison water into a tributary of the Little Colorado River.

In 1984, a flash flood sent four tons of high-grade ore down Kanab Creek and into the Grand Canyon.

Today, you have heard about the concerns of the Havasupai Tribe. A year ago, a notorious flood caused the evacuation of 400 hikers in the Grand Canyon from Havasu Canyon, and they are rightly concerned about the water and about their sacred places and their way of life in the canyon.

If you take a short walk west along the rim from the El Tovar, you come to the remains of the Orphan Mine, aptly named. For years, tourists were cordoned off from the head frame and other structures by yellow tape, making it look like the crime scene that it, arguably, was. The Park Service has been investing \$15 million

of our money to remove the surface remains but can do nothing about the contamination that is polluting Horn Creek far below in the canyon.

The 1872 Mining Law was administered to allow private companies to mine on any public lands that have not been formally withdrawn. Government solicitors have recently argued that once a valuable deposit has been established, there is virtually nothing that can be done to prevent mining, even in the case where undue degradation is anticipated.

Two years ago, the Forest Service began approving uranium exploration projects within scant miles of the visitors' center at the South Rim through so-called "categorical exclusions" with no analysis of public involvement. My group and our environmental colleagues challenged this lack of scrutiny in Federal court and secured a favorable settlement requiring environmental assessments in the future.

During the court proceedings, a typically optimistic lawyer for the mining company said to the judge, "With all due respect, Your Honor, there is probably more radiation in this courtroom than there is at one of our drilling sites," to which the judge replied, "With all due respect, Counselor, my courtroom is not one of Seven Wonders of the World."

Whatever your thoughts on the future of nuclear power, a uranium boom that defiles the Grand Canyon is in nobody's best interests. We do not need the relatively small amount of the uranium to be found there. Arizona has less than eight percent of America's assured reserves, or four-one-thousandths of one percent of the world's supply. Wyoming and New Mexico have five times as much and our close allies, Australia and Canada, are leading world producers.

Yesterday, the Grand Canyon Trust released a poll reporting that two-thirds of the voters in Arizona, including the two counties surrounding the Grand Canyon, support stopping future mining on public lands near the park. Arizonans clearly agreed that the Grand Canyon Watershed Protection Act should be passed before yesterday's secretarial withdrawal expires. Thank you.

[The prepared statement of Mr. Hedden follows:]

**Statement of Bill Hedden, Executive Director,  
Grand Canyon Trust, Flagstaff, Arizona**

Thank you, Mr. Chairman and members of the subcommittee for convening this hearing. It is an honor to testify before you today.

My name is Bill Hedden. I am the executive director of the Grand Canyon Trust. I am also president of the North Rim Ranch LLC, which owns and operates an 850,000 acre public lands cattle ranch adjacent to the Grand Canyon.

The Trust is a regional conservation group dedicated to protecting and restoring the Colorado Plateau, which encompasses more than 120,000 square miles of spectacular canyon country formed by the upper Colorado River and its tributaries. It includes the Grand Canyon and the largest concentration of national parks, monuments, and recreation areas in the United States. It is also home to some of our country's most diverse and vulnerable populations of plants and animals.

Throughout our history, the Trust has sought to protect Grand Canyon National Park from threats within and outside of the Park's boundaries. We worked closely with Senator McCain in passing the 1987 Grand Canyon Overflights Protection Act to restore the Canyon's "natural quiet" by reducing noise from aircraft tours over the Park. In 1991, we successfully negotiated with owners of Navajo Generating Station a decision to reduce by 90 percent the coal plant's sulfur emissions that were impairing visibility within the Grand Canyon. The Trust later assisted in pass-

ing the Grand Canyon Protection Act of 1992 to assure that water releases from Glen Canyon Dam would minimize adverse impacts to ecological, cultural, and recreational values along the Colorado River. Today I encourage you to continue that tradition of protecting this unique place.

#### **Need for Immediate Action**

There really is only one Grand Canyon. There are places where we shouldn't allow industrial developments like uranium mining, and the Grand Canyon is preeminent among those special places.

The Grand Canyon Watersheds Protection Act would prevent new mining claims in the last unprotected watersheds that drain directly into the Park. The bill will withdraw from mining federal lands in the Kanab Creek area and in House Rock Valley managed by the Bureau of Land Management, as well as in the Tusayan Ranger District of the Kaibab National Forest south of the Canyon. A small portion of the proposed withdrawal area located in the Tusayan District lies within the Little Colorado Watershed.

In 1908, President Theodore Roosevelt established Grand Canyon National Monument. According to historian Donald Hughes, the "primary effect" of establishing the monument "...was to forbid prospecting and mining on all lands in the Grand Canyon." Other actions by federal and tribal governments now prohibit uranium mining in major watersheds of the Colorado River within Grand Canyon. These include the Paria, Little Colorado, Diamond, Spencer, Whitmore, and Separation Canyon watersheds.

More than a year ago, administration officials testified that there were nearly 11,000 uranium mining claims, most filed in the last few years, within the area proposed for withdrawal. Under Secretary of Agriculture Mark Rey testified to this subcommittee on June 5, 2008 that there are "...approximately 8,500 mining claims filed in the portion of the proposed withdrawal under the Bureau of Land Management's management and 2,100 claims have already been filed in the portion of the proposed withdrawal under the Forest Service's management."

New claims are still being filed, placing the Grand Canyon and the Colorado River, which supplies drinking water for nearly 25 million people, at risk. Letters of concern about new uranium mining have been submitted by directors of the Metropolitan Water District of Southern California, the former Governor of Arizona, and the Southern Nevada Water Authority.

Last year, members of the House Committee on Natural Resources recognized these risks and passed an Emergency Resolution to forestall another uranium boom. On June 25, 2008, the U.S. House of Representatives Committee on Natural Resources issued an Emergency Resolution directing the Secretary of the Interior to withdraw nearly one million acres of federal land near Grand Canyon National Park, referencing the map associated with the Grand Canyon Watersheds Protection Act of 2008.

Chairman Grijalva, thank you for your leadership and thanks to those members of the Committee who joined in taking this decisive action to halt new mining claims. Regrettably, threats from uranium mining around the Grand Canyon have accelerated since your vote.

The Secretary of Interior ignored the Resolution and changed the rules that required his compliance. Despite our lawsuit challenging this failure to act, authorizations for exploratory drilling are continuing in direct violation of the Emergency Resolution. We are challenging these actions in court. The Resolution was based on the Committee's finding that an emergency exists due to the potential development of hundreds of uranium claims within a few miles of the Park. A Secretarial withdrawal pursuant to the Resolution would prevent the development of mining claims for three years after the date of the withdrawal and not affect valid and existing mineral rights.

New state permits are now being issued to begin operations at three uranium mines located within the proposed withdrawal area. Arizona state aquifer and air permitting has been reinitiated on three existing mines in the Grand Canyon area—the Canyon, Pinenut and Arizona One mines. The deadline for public comment is tomorrow. All three mines were built in the 1980s, are owned by Denison Mines, a Canadian and Korean-owned company, and are not subject to the emergency resolution.

This weekend, Havasupai tribal members are planning to protest the opening of one of these mines located near the base of Red Butte. It is their sacred place of emergence and a prominent landmark for visitors when entering Grand Canyon National Park.

Uranium mining is threatening the sacred places and waters of people who have lived in the Grand Canyon for centuries. We must not further industrialize the

lands around the park and we cannot risk poisoning the waters that drain directly into it. We have seen that happen before.

#### **Damages Caused by Uranium Development**

Damages caused by prior uranium development in our region are well-documented. Native people are still suffering from the poisonous filth left behind during the last big uranium boom. In 2005, the Navajo Nation outlawed uranium mining and processing on its 27,000 square-mile reservation.

At Chairman Grijalva's March 28, 2008 hearing in Flagstaff, Navajo President Joe Shirley said: The tragedy of uranium's legacy extends not only to those who worked in the mines, but to those who worked and lived near the mines that also experienced devastating illnesses. Decades later, the families who live in those same areas continue to experience health problems today. The remnants of uranium activity continue to pollute our land, our water, and our lives. It would be unforgivable to allow this cycle to continue for another generation. Hopi, Kaibab Paiute, Hualapai, and Havasupai leaders joined President Shirley in testifying to ban uranium mining on public lands surrounding the Grand Canyon.

Hundreds of mines and mills were developed in watersheds upstream from Grand Canyon. In 1979, an earthen dam breached, releasing eleven hundred tons of radioactive mill wastes and ninety million gallons of contaminated water into a tributary of the Little Colorado River. The EPA and the U.S. Department of Interior acknowledge that contaminated water from many additional impoundments of toxic tailings has washed into our region's watercourses. Collectively, these events correlate with documented risks and harm to people's health.

Near my home in Utah, DOE contractors are just now beginning to remove a 16-million ton pile of uranium mill tailings from the Colorado River's floodplain. Following bankruptcy of the responsible company, more than \$1 billion in taxpayers' dollars will be spent to restore the land and water at the site, where milling operations, but not contamination of the river, ceased twenty five years ago.

Grand Canyon watersheds form steep tributaries and narrow canyons that become torrents during downpours, such as occurred in Havasu Canyon less than a year ago. In 1984, a flash flood washed four tons of high-grade uranium ore down Kanab Creek and into the Grand Canyon. Extreme weather events such as these are becoming more frequent, and flooding risks will increase in the Southwest as the climate warms. According to the most recent government report on climate change, "...a warmer atmosphere and an intensified water cycle are likely to mean not only a greater likelihood of drought for the Southwest, but also an increased risk of flooding."

The Orphan Mine continues to contaminate springs below Grand Canyon's South Rim. National Park Service contractors recently removed the mine's surface structures within the fenced industrial area adjacent to Powell Point, a popular Canyon overlook. The price tag to complete the cleanup is estimated to exceed \$15 million.

New uranium mining similarly threatens groundwater and springs throughout the Grand Canyon. Radioactive residues from previous mining activities continue to contaminate Grand Canyon's springs and streams. The National Park Service advises against "drinking and bathing" in Kanab Creek, Horn Creek, and the Little Colorado River where "excessive radionuclides" have been found.

Precipitation falling on plateaus north and south of the Park creates Grand Canyon's only native waters—waters derived in place—as they percolate through porous, faulted, and fractured rock units to discharge later as springs and seeps below the canyon's rim. Mining mobilizes uranium that has been trapped in sedimentary layers for millions of years. When oxidized, it readily dissolves and can become a persistent poison in springs such as those feeding Vasey's Paradise, Thunder River, and Elves Chasm.

The National Park Service also reports, "Spring discharge" provides base flow to the Colorado River, and provides drinking water to wildlife and Park visitors in an otherwise arid environment. Springs also support valuable riparian habitats, where species diversity is 100 to 500 times greater than the surrounding areas. Grand Canyon springs are often locations of exceptional natural beauty and many hold cultural significance to Native Americans in the region."

I believe that mining and industrialization are incompatible with protecting the experiences of millions of annual visitors from around the world, and I am also concerned about cumulative threats to wildlife. Exploratory drilling and uranium mining in Grand Canyon's watersheds increase construction and heavy vehicle traffic on crowded roads and in remote areas, producing visibility-impairing dust and disruptive noise. New roads and power lines fragment the landscape, interrupt wildlife movement, and reduce natural habitat for endangered species such as the California condor. Native vegetation is destroyed, increasing opportunities for invading species.



Remember that many of the claims at issue are within a mile or two of the Park visitor center.

#### **Why H.R. 644 is Needed**

The Grand Canyon Watershed Protection Act is needed because the 1872 Mining Law is generally administered as allowing private companies to mine on all public lands that have not been formally withdrawn. Once valid rights are established, regulations do little to prevent the potential for long-term contamination. And rosy scenarios about how mining has improved must bear a difficult burden of proof. In a study comparing predicted to actual water quality impacts from hard rock mining, 100 percent of mines predicted compliance with water quality standards, but 76 percent of those mines exceeded water quality standards after operations began.

Agency policies also tend to favor mining interests in expediting mineral development. In 2007, the Kaibab National Forest used a so-called categorical exclusion to approve exploratory drilling of 39 test holes in the Havasu watershed without any analysis of environmental impacts and little public notice or input. When it approved the exploration, the Forest Service said the 1872 Mining Law specifically authorizes mining on public lands, and it could not prohibit the activity.

The Trust joined with the Center for Biological Diversity and Sierra Club in filing a suit to challenge this abrogation of duties under the National Environmental Policy Act. The case was settled last year when the Forest Service agreed to rescind the approval and prepare environmental assessments for public review before authorizing any further drilling activities. The Forest Service has begun the NEPA process. In November, the Grand Canyon Trust joined others in submitting extensive "scoping comments."

As described earlier, the Arizona Department of Environmental Quality is issuing final permits for three uranium mines in the area. Federal agencies granted approval in the 1980s, and state permits issued more than a decade ago are still considered valid despite the enormous subsequent increase in claims in the immediate area. Mining will be allowed to proceed, even though little research has ever been done to evaluate the likelihood of groundwater contamination. Without baseline data, it is impossible to assess contamination to aquifers that supply springs in Grand Canyon National Park.

A June 5, 2009 letter sent to Secretary of Interior Ken Salazar by former U.S. Senator Dennis DeConcini representing Arizona and Senator Orrin Hatch from Utah said: "It is important to note that research conducted by the USGS and preliminary findings by the University of Arizona confirm that uranium mining and exploration pose no threat to the Grand Canyon watershed or to the Park." Their statement mischaracterizes the Final Report submitted to the Water Quality Center in December 2008. We agree with what the report actually says: "Continued measurements should be made such that a baseline can be made before future mining activity commences or accidental release occurs." In the absence of such data, all uranium development in Grand Canyon watersheds should stop.

We also reject the Senators' proposal that mining and exploration be permitted while a National Academy of Sciences Research Council conducts a public process to review impacts of uranium mining in the region. Such a process would allow private interests to profit as known risks and liabilities to public interests accumulate.

The Grand Canyon Watershed Protection Act is an appropriate response to the recent surge in unproven uranium claims on the very borders of Grand Canyon National Park.

#### **Our National Interest**

President Theodore Roosevelt considered the Grand Canyon to be the natural wonder in America. He firmly believed that the national interest requires protecting it from the pressures of industrial exploitation.

Whatever your thoughts on the future of nuclear power, a mining boom that depletes the Grand Canyon in search of small amounts of uranium is in nobody's best interest. Uranium deposits around the Grand Canyon are not needed to meet our energy needs. Uranium deposits in all of Arizona represent only .004% of the world's reasonably assured uranium supply. Uranium reserves in the region comprise less than eight percent of our domestic reserves, while more than 80 percent of U.S. reserves are found in Wyoming and New Mexico. Uranium is also abundant in such closely allied countries as Canada and Australia.

Many of our region's leaders and citizens are expressing concerns about this issue. Today, the Grand Canyon Trust is releasing a poll reporting that two-thirds of voters in the counties that surround Grand Canyon, and virtually the same number throughout Arizona, support stopping future mining claims on publicly owned lands

near the Park. Clearly, Arizonans agree that we should protect the Grand Canyon for future generations.

The Grand Canyon Watersheds Protection Act complements a series of foresighted actions that began in 1908, when President Roosevelt designated the Grand Canyon as a National Monument.

We join him today in asking that “in the interest of the country...keep this great wonder of nature as it now is.—man can only mar it. Leave it as it is.”

Thank you. I would be pleased to answer any of your questions.

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Mr. GRIJALVA. Clarinda Vail, Properties Manager, Red Feather Lodge, welcome, and thank you for being here, and I look forward to your comments.

## STATEMENT OF CLARINDA T. VAIL, PROPERTIES MANAGER, RED FEATHER LODGE, INC., TUSAYAN, ARIZONA

Ms. VAIL. Good morning, Mr. Chairman and Members of the Committee. It is an honor to be speaking in front of you today. My name is Clarinda Vail. I am a lifelong resident and third-genera-

tion business owner in Tusayan, the gateway community located one mile south of Grand Canyon National Park.

I, many of my colleagues, and local entities support H.R. 644. We are concerned about potential uranium mining on public lands located in the Kaibab National Forest. We do not believe that an area so close to such a natural wonder as the Grand Canyon should be open to mining on public lands. Mining on this Federal property would negatively impact our area, and I am in full support of a withdrawal of this land from mining.

The Mining Act of 1872, in my opinion, should be revised because it allows mining companies to run roughshod over public lands. Uranium mining would impact our area in many ways and provide no funds for the impacts that they would cause to things such as schools, emergency services, fire protection, and roads. Our area cannot afford more improvements on Federal lands that do not pay property taxes to our local needs.

As president of our local school board of the only K-12 school inside of a national park, I know firsthand the impact of a National Park Service Concessionaire conducting business on Federal property without paying property taxes needed, both for the current operation and to pay off bonds that their past valuations were used for. It has created a massive tax burden, since these properties came off the tax rolls a few years ago. Our local property owners cannot afford another burden like this.

If companies want to do business of any kind on Federal property, they should pay for the impact they cause. When they do not pay property taxes, they have an unfair market advantage over the companies on private property. This is an unfair market advantage that the Federal government has created for them.

As an active citizen in my community, county, state, and country, I am appalled, almost in disbelief, that it is 2009, and mining companies are still allowed to mine on Federal property without paying a penny to the Federal government or local entities. The Mining Act should be changed to make them pay as if they were on private property. If these companies are good corporate citizens, they should offer it up and agree that this is the right thing to do.

There is only one Grand Canyon National Park. It is special, and the area should not be desecrated. When you look at a map of all of these test sites that the Kaibab National Forest Service is dealing with in some form or another, even a small percentage of these becoming mines could be just too much for our area to handle for free.

I am also concerned that this large-scale mining will impact wildlife in the area. Unit 9, which is located in the Kaibab National Forest, is an area known for producing world-class elk. The large acreage that could be affected would likely destroy habitat and disrupt wildlife populations and migration patterns.

I would think that this mining would directly contradict the Arizona Game and Fish and Rocky Mountain Elk Foundation goals for wildlife in the area. They have achieved many of these goals and paid for many improvements for the wildlife around Grand Canyon. An EIS should be conducted on impacts to wildlife if these lands are not withdrawn from new mining development. The area cannot handle a major influx of new residents. Housing is extremely lim-

ited near the Grand Canyon, and Tusayan's private property taxes are already some of the highest in the State of Arizona.

More recreation facilities are needed just for the current residents. Phone and power needs are already stretched, and our water is limited and valued like gold. Tusayan has done everything it can to conserve water with our expensive, A+ quality and award-winning reclaimed system. Tusayan has reduced its potable water usage by 50 percent. Caring about this precious natural resource should matter to us all and especially to this Subcommittee. I do not know what all of the impacts could be to water but know that an EIS would be needed with regards to it if these lands were not removed.

We are a rural area with its entire economy based on tourism. The communities of Tusayan and Grand Canyon Village and our entire region are set up to accommodate those services. An EIS study would need to be conducted on the economic and road impact to the region if this property were not removed. This would mean more costs for the Forest Service.

It is unknown what extra truck traffic could be created with this mining. I imagine extra semi-trucks along the winding areas of Highway 180 or Highway 64, highways that are already busy, especially during our high-season months, with tourism-related traffic, roads that do not have enough passing lanes for the motor homes and buses already on them.

The proponents may say that this will create jobs during the recession. Do not believe it. Grand Canyon National Park is one of the most important tourist attractions America has to offer. Millions come from around the world each year. We hear all languages being spoken daily at our hotel and on the rim. To permit anything that could intrude on this experience could cost far more jobs via reduced tourism than any gain with free uranium mining.

All of these concerns make me think that government must do its job here, care about what impacts they could be creating, and care about the possible experience of the Grand Canyon being tarnished. The tourist experience means everything to us at Grand Canyon, and it should mean the same to all of our elected officials in the United States.

Thank you for bringing this issue to the forefront, for listening to my concerns, for your service to our great country, and I am happy to answer any questions you may have.

[The prepared statement of Ms. Vail follows:]

**Statement of Clarinda T. Vail, Properties Manager, Red Feather, INC. & Tusayan Land and Cattle Company, Grand Canyon, Arizona**

Honorable Members of the Committee,

As a lifelong resident and third generation business owner in Tusayan, the gateway community located one mile south of the Grand Canyon National Park, I, many of my colleagues and local entities support H.R. 644. We are concerned about potential uranium mining on public lands located in the Kaibab National Forest.

We do not believe that an area so close to such a natural wonder, as the Grand Canyon, should be open to mining on public lands. Mining on this federal property would negatively impact our area and I am in full support of a withdrawal of this land from mining.

The mining act of 1872, in my opinion, should be revised because it allows mining companies to run roughshod over public lands. Uranium mining would impact our area in many ways and provide no funds for the impacts they would cause to things such as schools, emergency services, fire protection and roads. Our area cannot af-

ford more improvements on federal lands that do not pay property taxes to our local needs.

As president of our local school board of the only K-12 school inside of a national park, I know first hand the impact of the National Park Service Concessionaires conducting business on federal property without paying property taxes needed, both, for current operations and to pay off bonds that their past valuations were used for. It has created a massive tax burden, since these properties came off of the tax rolls a few years ago. Our local property owners cannot afford another burden like this. If companies want to do business of any kind, on federal property, they should pay for the impact they cause. When they don't pay property taxes, they have an unfair market advantage over the companies on private property. This is an unfair market advantage that the federal government has created for them.

As an active citizen in my community, county, state and country I am appalled, almost in disbelief, that it is 2009 and mining companies are still allowed to mine on federal property without paying a penny to the federal government or the local entities. The mining act should be changed to make them pay as if they were on private property. If these companies are good corporate citizens they should offer it up, and agree this is the right thing to do.

There is only one Grand Canyon National Park. It is special, and the area should not be desecrated. When you look at a map of all of the test sites that the Kaibab National Forest Service is dealing with, in some form or another, even a small percentage of these becoming mines could be just too much for our area to handle for free.

I am also concerned that this large-scale mining will impact wildlife in the area. Unit 9, which is located in the Kaibab National Forest is an area known for producing world-class elk. The large acreage that could be affected would likely destroy habitat and disrupt wildlife populations and migration patterns. I would think that this mining would directly contradict the Arizona Game and Fish and Rocky Mountain Elk foundation goals for wildlife in the area. They have achieved many of these goals and paid for many improvements for the wildlife around Grand Canyon. The area is special to the wildlife. An EIS should be conducted on impacts to wildlife if these lands are not withdrawn from new mining development.

The area cannot handle a major influx of new residents. Housing is extremely limited near the Grand Canyon, mainly, because of all the federal property. Tusayan's private property taxes are already some of the highest in the state of Arizona, more recreational facilities are needed for just the current residents, phone and power needs are already stretched and our water is limited and valued like gold. Tusayan has done everything it can to conserve water with our expensive, A+ quality and award winning, reclaimed system. Tusayan has reduced its potable water usage by 50%. Caring about this precious natural resource should matter to us all and especially to this subcommittee. I don't know what all the impacts could be to water, but know that an EIS would be needed with regards to it if these lands were not removed.

We are a rural area with its entire economy based on tourism. The communities of Tusayan the Grand Canyon Village, and our entire region, are set up to accommodate those services. An EIS study would need to be conducted on the economic and road impact to the region, if this property were not removed. This would mean more costs for the Forest Service.

It is unknown what extra truck traffic could be created with this mining. I imagine extra semi-truck traffic along the winding areas of HWY 180 or HWY 64. Highways that are already busy, especially during our high season months, with tourism related traffic. Roads that don't have enough passing lanes for the motor homes and buses already on them.

All of these concerns make me think that government must do its job here, care what impacts they could be creating and care about the possible experience of the Grand Canyon being tarnished. The tourist experience means everything to us at Grand Canyon and it should mean the same to all of our elected leaders in the United States.

Thank you for bringing this issue to the forefront, for listening to my concerns, for your service to our great country and I am happy to answer any questions you may have of me.

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Mr. GRIJALVA. Thank you. Let me now ask Dr. Karen Wenrich, Research Geologist, U.S. Geological Survey, Retired. Welcome.

**STATEMENT OF DR. KAREN WENRICH, RESEARCH GEOLOGIST,  
U.S. GEOLOGICAL SURVEY, RETIRED, GOLDEN, COLORADO**

Dr. WENRICH. Thank you, Mr. Grijalva. I am Karen Wenrich, and I received a Ph.D. I am a research geologist, and I worked for 25 years for the U.S. Geological Survey on both mining-related and environmental projects. After my retirement, I worked for the International Atomic Energy Agency in Vienna, Austria, on peaceful uses of atomic energy, and while I was at the IAEA, I was a co-recipient of the Nobel Peace Prize in 2005.

The race for military nuclear supremacy during and following World War II resulted in the rapid development of a worldwide uranium-production industry. The frantic pursuit of these early military programs created environmental hazards and health risks throughout the world that left a multi-billion-dollar, Cold War uranium-production legacy. Lessons learned from this legacy have had a profound influence on modern uranium production. The industry has come a long way from the time when tailings were left unprotected on the Navajo Reservation and allowed to be transported by water and wind into nearby streams and rivers.

The mining industry has since learned to embrace the philosophy that it is more effective to prevent pollution than to clean it up. This can readily be seen by the reclamation of the Hack 1, 2, 3 mines over here on this poster, the Pigeon mine, which is underneath on another poster, and the Hermit mine. Not only can one no longer tell there was ever a mine present, but, in the case of the Hack 1 mine, the former mining company actually cleaned up the sprawling mine debris left over from the late 1800's through the 1940's.

The mining ventures of the Navajo Reservation of the 1940's through 1960's are not relevant to the breccia pipe province because the Navajo mines were surface mines into an entirely different geological and hydrological environment and because mining technology and environmental practices used in the breccia pipe province are 21st century technology.

Data from the 1980's and 1990's mines are available, and they need to be used rather than mere speculation on what might happen in the future. Mine safety for employees was strictly enforced in the breccia pipe mines in the Arizona Strip. During the previous mining operations of the 1980's and 1990's, there were never any mine fatalities. In fact, the worst accident was an employee smashing his son with a hammer.

Ventilation within the mines was excellent because there was minimal exposure of miners to radon gas and its daughter products. Smoking was strictly prohibited.

It is interesting to note that the cancer incidence rate among Native Americans from McKinley and San Juan Counties with uranium mines is far lower than the average rate among Native Americans in other New Mexico counties where there is no known occurrence of uranium or history of uranium mining. This does not support the claim of increased cancer due to uranium mining.

It is natural for people to fear what they do not understand. A common comment against uranium mining has been that pollution around homes in old uranium districts has been as high as 100

parts per million. Such a level is no more than what is emitted by massive granite cores to many mountain ranges.

A good frame of reference for the average American concerned about uranium contamination is to remember that a rock containing one percent natural uranium, ten-thousand parts per million, or what is a maximum average grade of breccia pipes, can be held on a person's head for four hours, and the person will receive no more radiation than they would from a medical x-ray.

In the Athabasca Basin, Saskatchewan, Canada, more than 50 percent of Cogema's uranium mine staff are native people. Local tribes in Northern Arizona could, likewise, prosper from the mining. The royalties that the State of Arizona receives from these mines should not be dismissed by a state that is in financial strife. Previous uranium mining in 10 separate mines has had absolutely no detectable negative impact on tourism. Quite the contrary: The old head frame of the Orphan Mine that was located within the Grand Canyon National Park was a tourist attraction, a symbol of the powerful magnet that brought early settlers westward.

This Orphan Mine has subsequently been used as an example of uranium contamination as a result of mining. It was actually the National Park Service itself that integrated the mining claims into the park in 1988 and allowed the mine to remain unreclaimed until the present, despite an offer from Energy Fuels Nuclear to reclaim the mine for free. Now, there are claims of millions of tax dollars needed to clean it up when there should have been no cost to taxpayers, only to the industry that offered to clean it up for free.

These are the highest-grade uranium deposits in the U.S. Prior to 1989, over 71 breccia pipes were drilled and identified to have ore-grade mineralization, ore bodies on the average of five million pounds of uranium each, which brings its total value to \$200 million per pipe after expenses. This times 71 pipes comes to \$14 billion. If this bill goes through as requested, is the government prepared to pay \$14 billion for the takings plus whatever has been discovered since 1989, which could bring the total to \$28 billion? Could not such money be better spent on educating our children or on medical research?

On the Kanab Plateau, where eight of the producing mines are located, down-hole data indicates that the Redwall-Muav aquifer is the only significant source of groundwater within the area and is under significant artesian pressure. The high artesian pressure is an excellent safeguard, preventing seepage from the mines on the Kanab Plateau from entering the Redwall-Muav aquifer. Additionally, a 1,089-foot thick, unsaturated, practically impermeable layer of Supai Group Sandstone protects the aquifer.

Water analyses were taken actually between April 29th and May 15th, 1991, in a water well above the Muav Redwall aquifer adjacent to the producing Kanab North Mine, and it shows that the uranium concentrations varied between 0.8 and 5.9 micrograms per liter. This is actual data done by Titan Environmental that was done during the mining, so we have actual data from this period of the 1980's to the 1990's. I encourage the Committee to look at data from that period, not old data.

This is lower than the uranium concentration in much of the nation's public drinking water and one to two orders of magnitude

lower than the EPA's safe drinking level. The environmental footprint from each mine is small, smaller than—

Mr. GRIJALVA. I think we need to wrap it up pretty soon.

Dr. WENRICH.—I am going to—is smaller than a K-Mart parking lot and short lived, as the mine life was only five to seven years, with a temporary disturbance of only 15 acres. The water table seeps well below the level of mining. The mine is dry. There is no circulation of major Northern Arizona aquifers in any of the mining levels, so there is essentially little chance of contamination of the groundwater.

There is no on-site processing, no chemicals, and all mining is above the water table. Underground mining emits very little dust. Waste rock is backfilled into the abandoned mine shafts and tunnels. Even the concrete from the former mining structures is broken up and backfilled into the uranium mine.

Uranium mining in the region around the Grand Canyon—

Mr. GRIJALVA. A pretty long wrap-up.

Dr. WENRICH.—during the 1980's and 1990's clearly demonstrates that it can be done with no impact on the Grand Canyon watershed. Thank you.

[The prepared statement of Dr. Wenrich follows:]

#### **Statement of Dr. Karen J. Wenrich, Research Geologist**

The race for military nuclear supremacy during and following World War II resulted in the rapid development of a worldwide uranium production industry. The adage, "haste makes waste", created this legacy. The frantic pursuit of these early military programs created environmental hazards and health risks throughout the world that left a multi-billion dollar Cold War uranium production legacy. Above ground military nuclear testing at the Nevada Test Site before and during the Cold War resulted in radioactive fallout in a trackway that runs across the Arizona Strip. These manmade radioactive isotopes can still be found in the soil today at levels far exceeding those of naturally occurring uranium or its daughter products from mining.

Lessons learned from this legacy have had a profound influence on modern uranium production, thereby minimizing long-term environmental impact and health risks during uranium exploration, mining and milling. The industry has come a long way from the time when tailings were left unprotected and allowed to be transported by water and wind into nearby streams and rivers. The mining industry has since learned to embrace the philosophy that it is more effective to prevent pollution than to clean it up. This can readily be seen by the reclamation of the Hack 1, 2, 3 mines, the Pigeon Mine and the Hermit Mine, where not only can one no longer tell there was ever a mine present, but in the case of the Hack 1 mine the former mining company actually cleaned up the sprawling mine debris left over from the late 1800s through the 1940s.

#### **Geological & Historical Background**

Mining activity in the Grand Canyon breccia pipes began during the nineteenth century, although at that time production was primarily for copper with minor production of silver, lead, and zinc. It was not until 1951 that uranium was first recognized in the breccia pipes. Despite periods of depressed uranium prices, the breccia pipes commanded considerable exploration activity in the 1980's because of the high-grade nature of their uranium ore. During the period 1956-69, the Orphan Mine produced 4.26 million lb of  $U_3O_8$  with an average grade of 0.42%  $U_3O_8$  (Chenoweth, 1986). The Orphan Mine is located within Grand Canyon National Park where the head frame projects above Powell Point commemorating our U.S. heritage through mining history. This history includes one of Teddy Roosevelt's Rough Riders packing his burro down the trails of the Grand Canyon to his Orphan mine where he dug for copper and silver during the end of the 19th century. In addition to uranium, 6.68 million lb of copper, 107 oz of silver, and 3400 lb of  $V_2O_5$  (vanadium oxide) were recovered from the ore (Chenoweth, 1986). Between 1980 and 1988 four breccia pipes (Pigeon, Hack 1, Hack 2, Hack 3) were mined for uranium in northern Arizona with grades averaging 0.65%  $U_3O_8$  and total production



of 13 million lbs of  $U_3O_8$  (Mathisen, 1987). During the end of the period of breccia pipe mining by Energy Fuels Nuclear, they had refined their mining methods and the average grade of ore production approached 1% (I.W. Mathisen, oral commun., 1990).

These breccia pipes are vertical pipe-like columns of broken rock (fig. 1); the breccia formed when layers of sandstone, shale and limestone collapsed downward into underlying caverns. Brecciation of overlying sedimentary strata formed thousands of pipe-shaped columns of breccia (fig. 2). Upward stoping through the upper Paleozoic and lower Mesozoic strata, involving units as high in the section as the Triassic Chinle Formation, produced vertical, rubble-filled, pipe-like structures (fig. 1). A typical pipe is approximately 300 ft in diameter and extends upward as much as 3000 ft (Wenrich and Sutphin, 1989).

Breccia pipes extend across most of the Colorado Plateau in northwestern Arizona and into the Basin and Range Province (Wenrich and others, 1989). The potential for additional economic uranium mineralized breccia pipes is greatest beneath the flat plateaus where erosion and oxidation of the ore have been minimized (Wenrich and Titley, 2009). It is only on the Colorado Plateau, with its history of tectonic stability, that the uraninite has been preserved (fig. 3). Along the edges of the plateau and in the canyons, the ore-bearing minerals are usually oxidized to colorful secondary minerals (fig. 4) that are popular with mineral collectors. These mineral specimens lie in homes of mineral collectors and in most museums across the country and pose little threat to the casual viewer.

### Human Impact

The mining ventures of the Navajo Reservations of the 1940s through 1960s are not relevant to the breccia pipe province, because the Navajo mines were surface mines into an entirely different geological and hydrological environment, and because mining technology and environmental practices used in the breccia pipe province are 21st century technology. Even if one does not trust the mining companies to self regulate, they are under strict control and monitoring by Arizona regulators governed by modern legislation and laws.

It is natural for people to fear what they don't understand. One comment made against uranium mining has been that pollution around homes in old uranium districts has been as much as 100 ppm. Such a level is no more than what is emitted by massive granite cores to many mountain ranges. A good frame of reference for the average American concerned about uranium contamination is to remember that a rock containing 1% natural uranium (10,000 ppm) can be held on a person's head for 4 hours and the person will receive no more radiation than they would from a medical X-Ray (Paul Hlava, written communication, 2008). The average breccia pipe ore is less than 1% uranium.

Mine safety for employees was strictly enforced in the breccia pipe mines of the Arizona Strip. During the previous mining operations of the 1980s and 1990s there were never any mine fatalities. In fact, the MSHA records show that for one of the 5 reclaimed mines about the worst accident was an employee smashing his thumb with a hammer. Ventilation within the mines was excellent, so there was minimal exposure of miners to radon gas and its daughter products. Smoking was strictly prohibited within the mines. Radon in itself is not the problem with its 3.8-day half-life; the miner breathes it in and breathes it out. It is actually the radon alpha emitting progeny (lead and polonium) in the form of aerosols that are the nasty devils. They attach themselves to various areas of the respiratory system. Epidemiological studies have shown that the lung cancer risk to smokers is 10-20 times greater than "never" smokers at exposures to environmental levels of radon (such as 20-150 Bq/m<sup>3</sup>). The uranium industry now understands this increased risk that smoking miners have, and have adjusted their operations accordingly.

It is interesting that the University of New Mexico Cancer Research Center records confirm that the cancer incidence rate among American Indians for McKinley and San Juan counties (with uranium mines) is far lower than the average rate among American Indians in other New Mexico counties where there is no known occurrence of uranium or history of uranium mining. This does not support the claim of increased cancer due to uranium mining. The U.S. Department of Health and Human Services, Indian Health Service (IHS) 2006 report "Facts on Indian Health Disparities" states "The American Indian and Alaska Native People have long experienced lower health status when compared with other Americans. Lower life expectancy and the disproportionate disease burden exist perhaps because of inadequate education, disproportionate poverty, discrimination in the delivery of health services and cultural differences. These are broad quality of life issues rooted in economic adversity and poor social conditions." Breccia pipe mining would offer Indians a chance at improved economic status just as uranium mining has in the

Athabasca Basin, Saskatchewan, Canada, where 50% of the staff for Cogema's uranium mines is native people.

### **Economic Impact**

Uranium mines have a significant impact on the economic condition of Northern Arizona. The opportunity for employment in economically ravaged towns such as Colorado City is enormous. During the 1980s and 1990s this town as well as Fredonia, Arizona and Kanab, Utah saw reduction in poverty and welfare from wages earned by their citizens from the mines and associated jobs. The royalties that the State of Arizona receives from these mines should not be dismissed by a state that is in financial strife. Previous uranium mining in 10 separate mines has had absolutely no detectable negative impact on tourism. Quite the contrary—the old head frame of the Orphan Mine, located within Grand Canyon National Park, is a tourist attraction, a symbol of the powerful attraction that brought early settlers westward. The Orphan mining claim was first located in 1893 by a prospector named Dan Hogan who discovered copper on the south wall of the Grand Canyon, 1100 feet below the rim. After serving as a Rough Rider during the Spanish American War, Dan Hogan returned to prospecting. In 1906 he filed for a mining claim patent on the Orphan Mine and his old Commandant, Theodore Roosevelt, signed it himself. From this it might be construed that Teddy Roosevelt believed in multiple land use, and that the beauties of the Grand Canyon could coexist with mining. The Orphan Mine was mined for uranium within Grand Canyon National Park from 1953 to 1969. The mine was situated off the scenic and well-traveled routes, resulting in most park visitors being unaware of the mine's existence. Similarly, the other 9 mines, 8 on the North Rim, are far from the view of most tourists. Mining has occurred for over 4 decades in the breccia pipe province, with only a positive financial impact on the economy of Arizona.

The highest-grade uranium deposits in the United States, and some of the highest in the world, occur in a breccia pipe environment in northwestern Arizona. Prior to 1989 over 71 breccia pipes were drilled and identified to have oregrade mineralization (Sutphin and Wenrich, 1989). These orebodies would have on the average of 5 million pounds of uranium each, which brings their total value, based on \$100/pound uranium average this past year, to \$500 million, or roughly \$200 million/pipe after expenses. This times 71 pipes with ore comes to \$14 billion. If this bill goes through as requested, is the government prepared to pay \$14 billion for the takings, plus whatever has been discovered since 1989, which could bring the total to \$28 billion? A precedent has been set for such remuneration for a takings: in United Nuclear Corporation vs BIA in 1983 the company asked for \$75 million for a mining property that had been withdrawn and the court awarded the Plaintiff \$67 million.

Electricity generation in the U.S. is 19% nuclear power; providing domestic U.S. uranium to those plants would provide more jobs and cash flow for U.S. citizens. Such deposits give the U.S. a unique opportunity for energy self-sufficiency with fuel that is clean and emits no CO<sub>2</sub> gases. This is critical at a time when (1) there is intense global pressure for the U.S. to reduce its greenhouse gases, and (2) we are being held financially hostage by dependence on imported oil. Such dependence jeopardizes our national security, and if the trade routes are severed our country's economy could shut down. We send off our youth to fight patriotically in wars in foreign countries to defend our access to oil. Would it not be best to save thousands of their lives by demonstrating patriotism at home through support for uranium mining that is clean, safe and will put us on the path to energy independence? There would be no more need to find oil or to fight for oil in the Middle East, supporting regimes that we would not normally support. True patriotism is the ability to use our own resources to become free of foreign economies whose goal is to dominate our own.

### **Environmental Impact**

These deposits are higher grade than most uranium deposits elsewhere in the world, with the exception of the Canadian deposits (with an average grade around 20% uranium). However, the word uranium brings fear to many who live in Arizona because of the uranium legacy that was left behind on the Colorado Plateau over 50 years ago. Yet, these breccia pipe mines are different—the uranium is deep beneath the plateau surface, the mines are underground, and nothing extraneous is left on the surface after mine closure. The breccia pipe deposits were so successfully mined and reclaimed in the 1980s and early 1990s that few people even realize that there were eight producing mines in the Arizona Strip near the end of the 20th century. Today even uranium geologists can no longer find the location of the three former producing uranium mines that are located in Hack Canyon (figs. 6-7).

An example of the distorted allegations against the clean safe mining that was carried out during the 1980s and 1990s on the Arizona Strip is manifested in testi-

mony from one of the witnesses in the March 2008 hearing in Flagstaff, AZ before this subcommittee. The witness alleged that there was a massive uranium spill of over 4 tons of high-grade ore from the Hack Canyon mine, which flowed downstream into Kanab Creek. Yet, employees of the mine picked up all of the ore in 2 wheelbarrows (that is hardly 4 tons). Additionally, they scanned the entire width of the canyon with scintillometers down the 8 miles to Kanab Creek, and found no anomalous radioactivity.

**Watershed Impact:** The major aquifers in the Grand Canyon are the Mississippian-age Redwall and Cambrian-age Muav Limestones. The breccia pipe orebodies extend no deeper than the Esplanade Sandstone of upper Pennsylvanian age (fig. 5). On the Kanab Plateau (where 8 of the producing mines are located) down hole data (Titan Environmental, 1994) indicate that the Redwall-Muav aquifer (fig 5) is the only significant source of ground water within the area. No other continuous ground water sources were encountered on the Plateau in the overlying formations because these strata have been intersected and drained by the deep canyons and the large-scale faults associated with the formation of the plateaus (USGS, 1979). Additionally, on the Kanab Plateau, the only other aquifer in the Grand Canyon region of any significance above the Redwall Limestone is the Permian Coconino Sandstone, which pinches out in this area to a thickness of 0 north of the Hack Canyon Mine, where dissection is less. Within the Kanab Plateau area, the Redwall-Muav aquifer is under significant artesian pressure. This high artesian pressure is an excellent safeguard preventing seepage from the mines on the Kanab Plateau from entering the Redwall-Muav aquifer. Additionally, a 1,089-foot thick unsaturated, practically impermeable, layer of Supai Group Sandstone protects the aquifer (fig. 5). "Therefore, it is inconceivable that mine seepage of substantially lower hydraulic head (20 ft) will ever seep through the Supai Group, even when geologic time is considered" (Titan Environmental, 1994). Similarly on the south rim in Kaibab National Forest, the Environmental Impact Statement (1986, U.S. Dept of Agriculture) on the Canyon Uranium Mine concluded "construction and operation of the Canyon Mine will not impact the Redwall-Muav aquifer, which is well below the shaft depth."

Statements were made that water from the Orphan Mine has been polluting Horn Creek. These are false statements intended to defame the mining operation. Rare can one see water coming from the Orphan Mine and going into Horn Creek. Most important though, is that actual data from a comprehensive USGS water report (Monroe and others, 2004) of the Grand Canyon shows no such pollution. Water analyses from 2000-2001 show uranium concentrations at Horn Creek to be between 8.6-29 ppb. These values are within the EPA level of safe drinking water.

The Orphan Mine has been used as an example of uranium contamination as a result of mining. It was actually the National Park Service that integrated the mining claims into the park in 1988 and allowed the mine to remain un-reclaimed from 1988 until the present despite an offer from Energy Fuels Nuclear to reclaim the mine for FREE. NPS rejected the offer and allowed the claims to remain un-remediated for 20 years. It is important to note that this continued contamination was the result of government agency negligence, not that of a mining company. Despite all of this alleged contamination preliminary results from a new 2009 study by the University of Arizona show that uranium-mining activities near the Colorado River do not lead to contamination in the Colorado River. The study shows that what uranium is in the river occurs from natural uranium occurrences that are undisturbed by man.

Water analyses taken between April 29, 1991 and May 15, 1991 in a water supply well into the Redwall-Muav aquifer adjacent to the producing Kanab North Mine shows uranium concentrations varying between 0.8-5.9 ppb ( $\mu\text{g/l}$ ) (Titan Environmental). This is lower than the uranium concentration in much of this nations public drinking water and 1-2 orders of magnitude lower than the EPA safe drinking level of 30 ppb. Water well samples from the Redwall/Muav aquifer (sampled between June, 1988 and October, 1994) adjacent to the Pinenut Mine on the Kanab Plateau had an average Total Dissolved Solids (TDS=the sum of dissolved calcium and other major elements such as magnesium, sodium) content of 1695 ppm (parts/million or  $\text{mg/l}$ ). The EPA maximum allowable amount for drinking water is 500 ppm. Hence, the natural water in the Redwall/Muav aquifer on the Kanab Plateau of the Arizona Strip is not fit for human consumption. The mining company could only use the water for showers for the miners; drinking water had to be hauled from Kanab. Furthermore, the well only produced about 10 gallons/minute (Donn Pillmore, written communication, 2008). From this it can be seen that the contribution of any water into the Colorado River from the Kanab Plateau is essentially negligible, and what is discharged is naturally contaminated with excessive amounts of dissolved solids and does not qualify as potable water.

Even in the parts of the Grand Canyon region where the Redwall-Muav Fms provide a good drinking water supply their contribution, even when the entire Grand Canyon is considered in total, is almost imperceptible to the mighty Colorado River itself.

The surface water impact of the mines is negligible even at Kanab Creek, because the level of the mine workings, at such mines as Kanab North that sits at the edge of Kanab Creek, is below the Kanab Canyon floor. All ore is trucked 300 miles into Utah, so little uranium-mineralized rock will remain on the surface even during the mining operation.

The uranium production industry is well aware that they are faced with the environmental legacy of early uranium production. The uranium industry has undergone a significant evolution in the level of environmental understanding and management practices over the past 30 years. Experience has shown that there has been, and continues to be, ongoing development of enhanced environmental management practices in order to meet the call from the public and the regulatory agencies for long-term environmental protection, and socio-economic benefits sharing with communities adjacent to the operations. Failure to incorporate best environmental practices in initial mining and milling plans can lead to such uranium legacies as we have witnessed in the past. The nuclear industry knows they cannot afford any more environment-damaging legacies.

Higher-grade deposits, such as the breccia pipes, produce more uranium with less environmental footprint. The environmental footprint duration for each mine is short as the life for each mine in the past was only 5-7 years. There is only a temporary disturbance of three or four acres per mine, as the mines are underground. The water table is deep, well below the level of mining. The mines are dry. There is no circulation of major northern Arizona aquifers within any of the mining levels so there is essentially little chance of any contamination to the ground water. There is no on-site processing, no chemicals and all mining is above the water table. Underground mining emits very little dust. Waste rock and tailings can always be, and have been, back-filled into the abandoned mine shafts and tunnels. Even the concrete from the former mining structures was broken up and backfilled into the old mine workings. As in the past the area to be disturbed would be searched by an archeologist and any cultural features found will be either avoided or mitigated by detailed study. The area will also be studied by a biologist to see if there are threatened, endangered, protected, or other special status species or critical habitat present. There is no greater testimony to the mining and environmental success of these breccia pipe operations than a view of the previous operations in comparison to the current environment of the terrain (figs 6-9). This former mining company followed the modern mining philosophy: "It is more effective to prevent pollution during mining operations than to clean it up later."

The mining impact from 1980-1995 when all mining ceased on the Kanab and Coconino Plateaus is so negligible that visitors today can no longer find where the 3 former reclaimed mines were located. Water analyses show no alteration to any of the aquifers. In testimony before the House Subcommittee the chairman of the Kaibab Piute Tribe claimed that "the mining company went bankrupt and left leaving them with the mess". Such a statement is irresponsible and has no factual basis, and can only be intended to mislead uninformed citizens to turn against the mining industry. "Energy Fuels Nuclear ("The company") did not go bankrupt. Its assets were sold to International Uranium Corporation. During that time all environmental required monitoring and sampling was continued. There was never any lapse in meeting these requirements. All of the mines that had been depleted were reclaimed as per BLM requirements and signed off on by the BLM and the bonds were released. The BLM made a documentary file of the Pigeon Mine reclamation to show other companies what ideal reclamation looked like. The mines that were not reclaimed were placed on standby and requirements for sampling and monitoring these facilities on standby has been performed on a regular basis. There were never any ore truck accidents that resulted in any spilled uranium on the Arizona Strip. Even though the Mt. Trumble Road, that was used for hauling ore, is a public county road (Mohave Co 109) Energy Fuels Nuclear made special provisions with the Paiute Tribe to haul across a corner of their reservation and offered to give them a college scholarship every year while ore hauling took place. The Tribe declined the scholarship in lieu of a \$25,000 cash payment. That cash payment was made every year while ore hauling was taking place, even though there was no legal or social obligation to do so. Air monitors were placed along the haul road and up close to the village where the Tribe resides to establish a baseline and monitor for any increase in radiation. There never was any increase." (Donn Pillmore, written communication, 2008).

This author challenges anyone to show a “mess” on the Kanab Plateau. What did happen was that the mining company paid the Kaibab Piute Tribe \$25,000/year for the privilege to cross their reservation, on a county road open to the public, as a courtesy to the Indians. So when the company ceased ore hauling across their reservation on the county road no more payments were made to the Paiutes. In response, rather than being appreciative of the money that was provided to the tribe, we must listen to such vicious misleading statements as the money “went away”. Would anyone continue to pay a rental car agency for a car they had returned and were no longer leasing? Then why should the industry be labeled as taking their money and leaving behind a mess. Such statements are false and downright hostile to an industry that has endeavored hard to treat its neighbors in a respectful and friendly manner

### Summary

1. Uranium mining in the region around the Grand Canyon during the past 30 years with its updated technology has clearly demonstrated that it can be done with NO impact on the Grand Canyon watershed. Hence, there is no mining to protect the Grand Canyon watershed from, and the “Grand Canyon Watersheds Protection Act of 2008” is frivolous legislation. Mining was done for 15 years followed by a 13-year hiatus of no mining. During this hiatus no water analyses from in and around the Grand Canyon have detected any contamination with elevated radionuclide concentrations.

2. Mining uranium from the breccia pipe district gives the U.S. a unique opportunity for energy self-sufficiency with fuel that is clean and emits no CO<sub>2</sub> gases. This is critical at a time when (1) there is intense global pressure for the U.S. to reduce its greenhouse gases, and (2) we are being held hostage by dependence on imported oil. This dependence has created wars. If we are truly patriotic we will look away from the “not in my backyard” approach, and salute mining to promote clean energy and independence from other nations who currently supply our fuel. With energy independence we might not be caught in international wars.

3. We learn history in school so we learn from mistakes and can benefit from positive experiences. From 1980 to 1995 there were 15 years of uranium mining from the region around the Grand Canyon with positive economic gains for the northern Arizona communities and the State of Arizona. There was NO negative impact to water, land, vegetation, air, or humans. The spots that were mined and reclaimed show no visible sign of where the mine was located. The history lesson here is that mining can be positive.

4. Figure. 9 shows our dependence on energy fuels and metals. There is no indication that with our ever increasing population there will be any reduction in stresses on the land for mining. Each person in the U.S. will use 9383 pounds of uranium in their lifetime (Minerals Management Institute). The northern Arizona breccia pipes can fulfill this demand leaving no footprint in on the environment.

5. To use the sins of a 60-year old uranium mining legacy to punish mining in a different district, which has clearly demonstrated safe clean mining practices, is like the past punishing of the Navajo Tribe by moving them eastward to Texas because of the sins of a few renegade Apaches.

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#### Author's Background

Karen Wenrich received her Ph.D. from The Pennsylvania State University in Geology. She retired from the U.S. Geological Survey after 25 years of experience working on mining related and environmental projects. Following her retirement from the USGS she worked as a senior uranium geologist for the International Atomic Energy Agency (IAEA) in peaceful uses of atomic energy. While at the IAEA she was a recipient of the 2005 Nobel Peace Prize. She is the author of over 160 published papers.

[NOTE: Figures have been retained in the Committee's official files.]

Mr. GRIJALVA. Let me start with Mr. Trautwein. Thank you for being here.

You mentioned in your testimony the release language that was controversial at the time of the AWA, but Chairman Udall fought very hard to include that in the final Act. Could you maybe elaborate on why Mr. Udall wanted to ensure that it was included? Opponents at the time argued that the lands not designated for conservation purposes should be barred from any future consideration, and Chairman Udall did not believe that that was good policy. Both of those points: Why wasn't it good policy, and why did he want to include that release language in there?

Mr. TRAUTWEIN. That is correct, Mr. Chairman. First of all, let me thank you for your "Mo story." Among all of us who knew him and loved him, one of our favorites leisure activities is to collect Mo stories. As you know, they are legion.

In the early part of the eighties, the question of release language was a very significant controversy that held up the consideration of many wilderness bills, statewide wilderness bills, that were being legislated to resolve the, rare to Forest Service, wilderness review process and, as you said, the question was, what is the status of the lands that are not designated wilderness?

Under the National Forest Management Act, the Forest Service has a statutory responsibility to engage in a cyclical planning process. The presumption is it will happen every 10 years. As part of that process, they are required to review any lands that meet the criteria for wilderness set forth in the Wilderness Act for possible recommendation and action by Congress to designate them as wilderness.

So the concern was what would happen to these lands that had been reviewed and not designated? Would they ever be reviewed for wilderness again by the Forest Service?

It was the position of many people who opposed the wilderness bills that they should never be reviewed for wilderness ever again, that Congress should protect those lands, in effect, from ever being

studied for wilderness again. That point of view actually found its way into a number of bills that came over from the Senate side.

Mo strongly opposed that position. His belief was that these lands should be reviewed again periodically under the National Forest Management Act by the Forest Service and, potentially, by Congress, and he eventually won that argument.

The provision in the Arizona Wilderness Act, which became boilerplate and was replicated in every statewide wilderness act, is that the lands that were released were considered to have been sufficiently reviewed in the current forest-planning cycle, but it made them available to be reconsidered in subsequent forest-planning cycles and, obviously, it has been a generation since passage of the Arizona Wilderness Act. We have now gone through several planning cycles since passage of that Act, so your lands would be eligible to be reconsidered as wilderness.

Mr. GRIJALVA. One other point, Mr. Trautwein. As you know, there was a letter to me from Senator Kyle and Senator McCain that specifically said that AWA foreclosed Congress from taking any further action on the lands adjacent to the Grand Canyon. They cite that as the reason, the AWA, for why they choose not to take action on the Grand Canyon watershed issue from the impacts that could occur of uranium mining now.

I think the legislative history you have provided in your testimony was important in disputing that claim, but I am wondering, were there other instances in which Chairman Udall advocated revisiting or expanding on his own legislative efforts?

Mr. TRAUTWEIN. Well, I think you have to look no further than the Alaska Lands Act, which is his signature accomplishment. It is certainly the greatest stroke of conservation in the history of Man. It was forged in this very room. He always felt that the provisions addressing lands in Southeast Alaska on the Tongass National Forest were inadequate, and within, I believe, six or seven years, he was a very strong supporter of the Tongass Timber Reform Act, which would have designated additional wilderness in Southeast Alaska and addressed other questions that the Alaska Lands Act addressed.

Mo viewed conservation as a dynamic process over time to which every generation brought its own understanding of what it meant to love the land, and he lived that belief himself, and certainly the Alaska Lands Act was a good example of it.

Mr. GRIJALVA. Mr. Bishop?

Mr. BISHOP. Mr. Chairman, I would like unanimous consent to have a different issue be presented for the record. It is a letter from one of the key negotiators in that period of time on the Arizona Strip Wilderness Act, which may put a different light on some of the testimony we have had: a letter from myself, Mr. Hastings, and Mr. Beiner to Secretary Salazar; testimony from the Uranium Producers of America; the concurrent resolution passed by the Arizona House and Senate urging Congress to oppose efforts to withdraw lands from mining; a letter to you requesting the Administration to testify; a letter from Senator Hatch and former Senator DeConcini opposing withdrawal; I think the letter from Senator McCain and Senator Kyl, I think, you just referenced; and also the

resolution from Mohave County supporting uranium mining. I would like for those to be put into the record.

Mr. GRIJALVA. Without objection.

Mr. BISHOP. Thank you, sir.

[NOTE: The information submitted for the record has been retained in the Committee's official files.]

Mr. BISHOP. Let me ask just a couple of very quick questions. You are lucky Mr. Young is not here.

Dr. Kreamer, you gave us some speculation there about the damages of mining activities to the Grand Canyon aquifer system. I would like you to try and deal with some hard science, if you could.

During the eighties and nineties, are there any, any, peer-reviewed, published reports on the Arizona Strip that show that there was contamination or discharge damage to the North Rim aquifer system from any previous mining that was done on these pipes in the eighties and nineties?

Dr. KREAMER. Not that I am aware of in the North Rim, and I do object to speculation.

Mr. BISHOP. Don't we all? Dr. Wenrich, would you respond to that same question? Are there any peer-reviewed studies that demonstrate there was damage to the aquifer?

Dr. WENRICH. No, not from the 1980's and 1990's, no.

Mr. BISHOP. Is there damage later on, or is there something that I am not seeing?

Dr. WENRICH. No.

Mr. BISHOP. Do they say, then, quite the opposite?

Dr. WENRICH. Yes, they do. We have a USGS report by the Water Resources Division by Monroe that actually shows the Horn Creek that Dr. Kreamer alleged had ninety parts per million uranium in it. They claimed that they could not reproduce those. They took the samples right from the spring head, which I believe Dr. Kreamer's samples came from down across the Tonto Trail, where there could have been later contamination by humans.

The study by the U.S. Geological Survey covered a period of two years. The data ran from 8.6 ppb to 29 ppb below the EPA safe drinking level.

So I am afraid that the analyses from Horn Creek are a bit misleading, and what I object to is the fact that we have good, hard, peer-reviewed science here, and Dr. Kreamer did not reference it, which I think is a pity.

Mr. BISHOP. I will come back to you on that same issue.

Dr. WENRICH. OK.

Mr. BISHOP. Dr. Kreamer, let me ask you, did you actually do this, or was it a colleague of yours that did the initial study?

Dr. KREAMER. No, no. I was actually involved in the study. It is Dr. Kreamer from the university.

Mr. BISHOP. Just do not call me "senator."

Dr. KREAMER. That is all right, Congressman. Our work was peer reviewed. It was published last year by the University of Arizona Press. We did not sample at the Tonto Trail for our samples. Particularly, one of the high ones we found was 92.7 micrograms per liter. That is three times the EPA limit. The level that Dr. Wenrich just referred to, 29, I believe, micrograms per liter, the EPA standard is 30, so it is just under the EPA limit.



Over the course of a year, we sampled uranium concentrations in Horn Creek. The average was 48 micrograms per liter. We did occasionally go below 30 micrograms per liter.

I might point out that the NCO is 30 micrograms per liter, but the recommended EPA limit is zero.

Mr. BISHOP. I am actually going to come back here, but how do you reconcile the fact that there are three other studies that contradict the findings that you had?

Dr. KREAMER. They do not contradict it, sir.

Mr. BISHOP. Well, Dr. Wenrich, was that what you were saying?

Dr. WENRICH. Well, I am saying these are a more recent study, and they could not replicate those high values, and his studies are his data result, and I have not seen it published.

Mr. BISHOP. I guess "contradiction" was the wrong term to use, but they do not replicate the numbers—

Dr. WENRICH. They could not replicate it, so either somebody magically cleaned up Horn Creek, or we just cannot replicate it.

Dr. KREAMER. May I clarify? There is a reason for that, actually.

Mr. BISHOP. If you can do it in 13 seconds.

Dr. KREAMER. I can do it in 13 seconds. The higher the flow, the higher the concentration generally, from what we have found, as far as the concentrations go, so it was variable according to flow.

Mr. BISHOP. I have 20 seconds left on my time. Dr. Wenrich, is there anything else that you have not been able to cover?

Dr. WENRICH. Yes. I am concerned, more than anything else, about the total misrepresentation that we see so often here, such as Mr. Hedden's reference to this massive spill down Kanab Creek. As it turns out, the reports that were submitted to the Arizona department were the fact that the mine had some rocks that were carried downstream by a flash flood. The mine geologist went down and picked them up with two wheelbarrows, so that is his massive mine spill. So it is a misrepresentation. There were only two wheelbarrows full of ore, and it was just simply rock, no tailings.

Mr. BISHOP. But we, in Utah, look at all rocks as being massive. I apologize for that.

Mr. Chairman, I am running out of time here, and I apologize. I have another meeting, so I apologize if I walk out in the middle of this. It is meant as no disrespect either to you or to the witnesses who have traveled a great deal to be here. Thank you for all of your time and effort to be here.

Mr. GRIJALVA. Thank you, Mr. Bishop. Mr. Heinrich, any questions?

Mr. HEINRICH. You know, actually, I believe Ms. Shea-Porter needs to get back to a markup, and so I would be happy to defer to her first and then come back to my questions.

Mr. GRIJALVA. Thank you. Ms. Shea-Porter?

Ms. SHEA-PORTER. Thank you very much, Congressman. You know, I, too, have a markup in another place, so I have been reading the testimony, and I would use the word "confusing," but what I get from some of the witnesses is that, somehow or another, the Earth just magically contaminates itself, the water just magically gets contaminated, and that human beings do not have any role to play.

So I just wanted to ask a couple of questions based on the first testimony that we heard from Supervisor, and I apologize if I mispronounce your name—is it Archuleta? Did I get that close? She wrote that her county “has witnessed the contamination of creeks and aquifers providing public drinking water.”

I would just like each one to say if they think that that is an accurate statement, that the county has witnessed the contamination of creeks and aquifers providing public drinking water.

Dr. WENRICH. Well, I would say we do not have any published data on that, peer-reviewed published data. There is nothing.

Ms. SHEA-PORTER. You know nothing about that.

Dr. WENRICH. No.

Ms. SHEA-PORTER. Anybody else want to say yes or no?

Ms. VAIL. I would just say that, as a constituent of that board, I would support the Coconino County Board of Supervisors.

Ms. SHEA-PORTER. OK.

Mr. HEDDEN. Yes. We have heard conflicting testimony about that today.

Dr. KREAMER. The studies that we did have been peer reviewed, including by the U.S. Geological Survey and published in the University of Arizona Press. The numbers are consistent with a USGS study that followed later, and those contamination levels go above the MCLs occasionally. So, yes, we have found contamination.

Mr. TRAUTWEIN. I am afraid the question is beyond my expertise, as a former staffer who just listened to other people who knew what they were talking about.

Ms. SHEA-PORTER. So let me go back to the first statement. Everybody else believes it, believes they have seen data to back it up, and you are saying, as a research geologist, no, you have not seen it, and you do not have any data to prove it.

Dr. WENRICH. I have data here that show that there is no contamination in the water of the Grand Canyon area. The only thing we have is one analysis that we have heard about from Horn Creek that was not replicated by the U.S. Geological Survey. People are speculating. We have data from the North Rim that, in fact, was very low, much lower than the EPA safe drinking level.

I want to point out also that, even though the EPA safe drinking level is 30 micrograms per liter, streams across the country are being used all of the time, including the South Platte River at Julesburg, which has 70 parts per billion. Even 70 parts per billion is nothing that is threatening to anybody.

Ms. SHEA-PORTER. OK. My second question. I think the reason I am asking it in such a simple manner is because the public who watches this and will see this on television is saying, “Well, do you have the science, or don’t you?” Let us, at least, agree that there is something out there.

Then I heard the native tribes say that they have had medical problems and, surely, we must have some data about that. So can I ask each one of you, are you aware of data, and does it indicate that there have been health problems, that they have that contaminated water? And I will start with you.

Dr. WENRICH. I would suggest that you take a look at the New Mexico Cancer Research Institute out of Albuquerque. We have data there that show that the counties that have not had mining

or any mining actually have a higher cancer incidence rate with the Native Americans than the counties that did have uranium mining.

Ms. SHEA-PORTER. So would you draw the conclusion, based on what you just told me, that if you have mining, you will probably be healthier?

Dr. WENRICH. I guess that is what that says, if you want to draw that kind of conclusion, but I think the point is that it is close enough that you certainly cannot say that people who have done the uranium mining or lived around it have higher cancer rates.

We do know, though, and I will add this, that people who smoke are very vulnerable to cancer from uranium mining.

Ms. SHEA-PORTER. But based on what you have told me, to begin with, that if you have mining in the area, your data indicate that people would be healthier. Is that—

Dr. WENRICH. That is what we have seen, and we are kind of half-thinking that part of the reason for that is that they received more money and had better medical coverage.

Ms. SHEA-PORTER. But would money and medical coverage take care of a problem—

Dr. WENRICH. If you can get medical treatment, a lot of times you can avert dying from the cancer.

Ms. SHEA-PORTER. The cancer that is caused by the uranium?

Dr. WENRICH. We did not say it was caused by uranium; just cancer in general.

Ms. SHEA-PORTER. I am just asking the questions.

Dr. WENRICH. Yes.

Ms. SHEA-PORTER. I am thinking, what would a constituent of mine wonder, hearing this kind of conversation here?

Dr. WENRICH. The Cancer Research Institute in Albuquerque has the data, and we have tabulated it, and those are the results that have been shown.

Ms. SHEA-PORTER. OK. Can somebody else get in on this as well, the answer to the question, have native populations been harmed, and do you have other data to indicate yes or no?

Dr. KREAMER. Congresswoman, I am not a medical doctor, but I understand that uranium accumulates in the kidney, and it builds up over time.

Some of the data—groundwater springs that come out of the Grand Canyon—are over 50 years' old, according to the groundwater-dating methods that several of the USGS and others have done. Therefore, it is a long-term effect and a time bomb. Disruption, and uranium release would take a long time to manifest at the springs and then take a long time, then, to build up in people's systems. So I am unaware of any data, at this time, but the potential is a long-term one, both with the groundwater system and in the human body, is my understanding.

Dr. WENRICH. Also, I might point out, I remember what we were just saying, that uranium mining in the eighties and nineties was done very differently than what we are referring to even—

Ms. SHEA-PORTER. I am so glad that you brought that up because that is what actually you get to, and thank you for your comments about it.

I think that even though we do not have experts watching TV wondering what we are talking about, they certainly know that they are supposed to stay away from uranium. They understand that.

So what I wanted to ask you is, I am very certain, if I had sat here in the eighties, and certain people had testified before this Committee, they would have said that the methods they were using at the time were appropriate. I will go right back to the 1950's, where scientists, and there was an article in Reader's Digest, at the time, telling the people of St. George, Utah, that they did not have to worry about exposure that collected in the bones.

So the point that I am making is that we hear from certain people, and certainly yourself, that it was bad before, but it is good now. We have it down, it is safe, and there is nothing to worry about. The next generation will come along and say, "Well, that was 20 years ago. We are sorry about that, but we had it wrong, but now we know how to do it." How can we know, sitting here, that you are right?

Dr. WENRICH. Well, I would say that, in the 1950's, we already knew by the 1970's that we had trouble 20 years ago, but we are sitting here looking back 20 years now, into the 1980's, and we do not have any problems from the mining that was done then.

Ms. SHEA-PORTER. Well, I think that we actually have some testimony that there might be problems, but the point that I am making—

Dr. WENRICH. Not from the eighties and nineties.

Ms. SHEA-PORTER.—is it seems to me that the level of confidence that you are expressing your data versus everybody else's data is troubling because when we are dealing with something that we really do not know everything about, that we do not understand fully long term; we know we have seen enough people ill, and we certainly saw that happened to the people of Utah and to the people in other areas that have been exposed, but I do not think we should be so certain that we are not going to do any harm.

I think we need to move very slowly and cautiously and carefully and consider that we do not know everything. They talk about having that fourth parachute on the airplane and, to me, this is what we are talking about, making sure that, in spite of our best beliefs that we are not doing any harm, just in case.

So I do support this legislation, and I appreciate the fact that people are here talking about this because I do not want another generation sitting here saying, "Well, that was 2009. We did not know then."

So what we are trying to do here is to make sure that we do not have to go back and apologize to this generation and to the people who live in this area, and I yield back. Thank you.

Mr. GRIJALVA. Thank you. Mr. Heinrich.

Mr. HEINRICH. Thank you, Chairman.

I want to start by saying I do not think there is any general question, even among the medical community in New Mexico, that there have been impacts from former activity. Whether those apply to today's methods is another issue entirely, but if you go to communities like Pojoaque or Laguna Pueblo, or you talk to people in

the Navajo community who have worked in those mines, there were some very, very serious, real health impacts.

I am a little confused, Dr. Wenrich, by a statement that you did not quite get to because you ran short during your testimony because I just do not quite understand it. You wrote, number five, on page 10 of your testimony: "To use the sins of a 60-year-old uranium mining legacy to punish mining in a different district which has clearly demonstrated safe, clean mining practices is like the past punishing of the Navajo Tribe by moving them eastward to Texas because of the sins of a few renegade Apaches." What exactly did you mean by that statement?

Dr. WENRICH. What I mean is that we keep hearing repeated information about the mining on the Navajo Reservation in the fifties and the forties, and that is not relevant to the breccia pipe mining. As you remember, Mr. Bishop's question to everybody was, was there any evidence for anything that was bad in the 1980's and 1990's, and there is not, and we need to concentrate on the data from the 1980's and 1990's mining, specifically, in the breccia pipes—we have examples of it—rather than looking back at the old uranium.

Mr. HEINRICH. And maybe I am just missing a piece of history. How is that analogous to the Navajo and Apache Tribes?

Dr. WENRICH. Because the mining in the eighties and nineties in the breccia pipe is being punished for the sins of what was done in the forties and fifties during the military race for supremacy.

Mr. HEINRICH. OK. Moving on, Professor Kreamer, I wanted ask you about a statement you made about perched aquifers and, specifically, I am wondering what the legal ramifications are of potential hydrological changes that you see occurring there.

If I have land in the Rio Grande Valley, and I decide, despite the fact that I do not have water rights permits, that I am going to open the floodgates and flood irrigate my fields, I would probably need an armed guard to protect me for the rest of the growing season.

If there is one of these pipes, as a result of mining it, this allows an aquifer to drain and, therefore, you no longer have an active spring someplace in the park or even outside the park, what is the legal ramification of that?

Dr. KREAMER. I am not a lawyer. I do know that there would be impacts to the ecosystem. Some of these springs and seeps are very, very small. It would not take much diminishment of the perch aquifer to impact those springs and the habitat and wildlife that inhabit them. These springs are about a quarter of the way down the Grand Canyon and not in the Redwall-Muav. The uranium mining actually would pierce the underlying aquifer of the Hermit Shale, and flow would go down.

The Orphan Uranium Mine had spontaneous springs begin after they began mining that were below this level that were opened up, and there was drainage downward, according to people who worked the mine in the fifties.

So I think there is a potential, but I am not a lawyer. I do not know what all of the legal implications would be. I just know that there would be impacts to not only water quantity, and probably water quality as well, but species depend upon those springs.

Mr. HEINRICH. Mr. Hedden, I wanted to ask you a question as well. We heard a lot about the unusualness of the Secretary of the Interior's recent decision regarding segregation and a process looking forward in an EIS for the areas. Has that been used by previous Secretaries of the Interior?

Mr. HEDDEN. Yes. It has been used three times before, and it is a provision of FLPMA that the House Resources Committee used last year to instruct the Secretary to do that with—

Mr. HEINRICH. Correct me if I am wrong, but did not Secretary Norton also utilize the exact same process regarding the Dolores and the Green and maybe the Colorado Rivers just a few years ago?

Mr. HEDDEN. Secretary Norton withdrew 200 miles of the Dolores, Colorado River, and Green, and a number of side tributaries, not in response to a directive from the Resources Committee, but she did do that, the withdrawal using her Secretarial authority.

Mr. HEINRICH. With a two-year segregation followed by an EIS estimate.

Mr. HEDDEN. She did a 20-year withdrawal.

Mr. HEINRICH. OK. Thank you very much. Mr. Chair?

Mr. GRIJALVA. Thank you. Just a couple of quick follow-ups.

Professor Kreamer, can you respond to the comments that uranium mining of the eighties and nineties was paying for the sins of the mining of the fifties, sixties, and seventies? That is a clean tablet now, from that point forward, and I am curious about your response to that.

Dr. KREAMER. Well, first of all, I think it is important to recognize that we do not fully understand the system. There are very few in this 100-by-100-square-mile area. We have very few wells and, typically, for a site characterization for a possibly contaminated site, you have several monitoring wells that measure water quantity, quality over a period of time. The flow in these systems takes a long time to get out to the springs very often, and so, therefore, the impacts of mining in the eighties and nineties might not be recognized for decades.

So, therefore, without adequate monitoring of these systems, without a long-term effort to monitor the springs, I think it is a bold claim to say that there are no impacts of the eighties and nineties mining in breccia pipes.

Mr. GRIJALVA. Thank you. Mr. Hedden, it was stated that you misrepresented the Kanab spill. Would you like to clarify that for the record?

Mr. HEDDEN. It was reported at the time that four tons of ore were washed down Kanab Creek and into the Grand Canyon, and I repeated that. I believe the word "massive" was Dr. Wenrich's word, not mine.

Mr. GRIJALVA. Ms. Vail, I have three or four questions dealing with social impacts of mining activity, economic-impact issues. I will be submitting those to you for a written response, and thank you very much for being here.

It has been a good hearing, and the reason is that the backdrop of the Secretary's action to segregate this acreage afforded us an opportunity now to talk about permanency down the road, but some of what we heard today was have-your-cake-and-eat-it-too

kind of discussion, that by segregating and setting up a two-year period of time, all of the questions that were sent to the Secretary about the effects of uranium mining, how much is it going to cost, what are the environmental impacts, on and on and on, well, now time is afforded to us to be able to answer those questions that have been sent to the Secretary and to the Administration.

Number two, the issue of jobs, and how do you balance people's health, the Grand Canyon and its environment and its watershed, and the dependency so many communities have on that? How do you balance that with the potential of 2,000 jobs and the economic loss to surrounding communities?

When this issue first came up, it was about waiving the categorical exclusion and waiving the NEPA process, which afforded no one the opportunity to have input into a decision on claims and initial exploration. Now, we are afforded the opportunity to fully study, and I would assume that all of the panelists, and particularly the scientists on the panel, would agree that science and fact should be a great determiner in how we protect these lands, and I would hope we can agree on that.

The Grand Canyon, to me, and not just from Arizona, is one of the shared treasures of this country. To the people that live in and around the Grand Canyon, it is their life and, to the rest of us, it is a symbol that we each can translate in our own way about what it means to be an American and what it means to be part of this great landscape in the West, and so it needs to be protected.

We are not talking about some isolated BLM land where drilling and mining extraction is going on. We are talking, ladies and gentlemen, about the Grand Canyon, and the consternation. That we are going to kill nuclear power—the aspersions that are being used about this legislation are false. The intent of this legislation, from the onset, and it continues to be its intent, is to protect and preserve the Grand Canyon for future generations.

That intent has not changed, and will not change, and as this legislation moves forward, and more and more people—initially, that poll in Arizona, I thought, was very telling—64 percent of the people said it should be withdrawn—as it moves forward, and it needs to move forward, we will continue to make the case, not only on the health, the environment, the watershed, the people, but we are going to make the case very strongly that this is one of the treasures that needs to be protected.

This is not about yes on mining, no on mining; this is about yes on the Grand Canyon, and you either want to protect the Grand Canyon, or you do not, and that is the way we are going to pose the question to our colleagues, and that is the way we are going to pose it to the senators, and as we move forward, we expect to hear from you often, and thank you very much. It has been a good hearing. The meeting is adjourned.

[Whereupon, at 12:25 p.m., the Subcommittee was adjourned.]

