

*Arvin Trujillo is the current Executive Director for the Navajo Nation's Division of Natural Resources located in Window Rock, AZ. The Division of Natural Resources consists of eleven departments, which oversee all aspects of natural resource management and development on the Navajo Nation. Arvin has held this position since 1999 and during a six-month period, he also was the interim Chief of Staff for President Kelsey Begaye in 2001. Before joining the Navajo Nation, he worked for both Broken Hills Proprietary, Ltd (BHP) and Mobil Coal Producing, a branch of Mobil Oil, as a mining engineer. Arvin has been a past Board of Directors member for the American Indian Science and Engineering Society, and he has also been an interim Executive Director for the organization. Arvin attended Oral Roberts University for his undergraduate work and Pennsylvania State University for his post-graduate work.*



## WATER QUALITY ISSUES ON THE NAVAJO NATION

Arvin Trujillo  
 Division of Natural Resources  
 Navajo Nation  
 PO Box 9000  
 Window Rock, AZ 86515-9000

Thank you. Good morning everyone. I am the executive director for the Division of Natural Resources. The division is comprised of 11 departments within the Navajo Nation. We have about 550 to 600 employees taking care of all aspects of natural resources within the Nation, including water. Water is one of our areas of responsibility. Many of you are aware of the Navajo Nation and what it is comprised of, but I'll give you a brief introduction. The Navajo Nation is located within New Mexico, Arizona, and Utah. We have about 17 million acres of land within the three states area. We have 110 chapters, which are local communities and political entities at the local level. The last census determined that there are about

170,000 people living on the reservation. In terms of looking at water quality, what I want to do is develop a presentation that looks at water use and how use affects quality and how we want to define water quality.

There are three basic water uses on the Nation: domestic use, agricultural and livestock use, and industrial use. Two primary departments are involved with water quality: the Department of Water Resources, which is under the Department of Natural Resources; and the Navajo Nation Environmental Protection Agency, which is a division unto itself. I want to discuss the three basic areas where we utilize water and how they have developed.

In terms of domestic use, most of the water systems within the Nation are under the authority of the Navajo Tribal Utility Authority (NTUA). About 60 percent of the population has water systems under this authority. Water quality is not nearly as much of an issue as water quantity is for the authority. Most of the water that is obtained in these systems is

**About 40 percent of the population does not have access to running water.**

groundwater. Because we are working through the authority, they have to meet certain federal regulations, specifications, and requirements. Again, there are other areas within the Nation that do not have adequate groundwater in order to use these systems and that is an issue that must be looked at. We have some privately owned systems. Some

businesses have their own systems that are permitted through the Nation. The National Park Service has a couple of parks that have their own systems. Some church entities have their own well systems. The Department of Water Resources has about five small domestic systems that they take care of.

There is also another part to this. About 40 percent of the population does not have access to running water. These people haul water on almost a daily basis. There are two ways to haul water. One is to obtain water from designated water points within the Nation that are administered by NTUA through the chapter houses. But some of these homes are far from these water points. We do have livestock watering areas throughout the Nation. Many people go to those areas to pull their water from the wells. The constraining aspect of this is the cost. How much does it cost to haul that water and what distance are they hauling it? These stock wells and windmills are not monitored by any regulations or criteria, and there are issues in terms of pathogens and contaminants. About 95 percent of these systems are from groundwater; there are very few that use surface water for their domestic systems. Even there, some issues with fire and floods exist, and we have seen that in recent years. In particular the Navajo Mountain area, which is located along the Arizona/Utah border, has had some major fires and flooding that has led to contamination of surface water collection systems. In both areas for about the past six months, we have had to haul water to the residents.

What are we doing to address these quality issues? The Navajo Nation Environmental Protection Agency

(NNEPA) has obtained primacy to begin developing a safe water drinking program. We do have primacy through the act that passed in 2005. We are at the beginning stages of developing a program not only regarding the necessary regulations, but also how to monitor the different systems throughout the Nation. One of our concerns that we see in terms of water quality is that there are several areas where drilling, whether it be for energy purposes or livestock use, has been abandoned but well heads are still in place. Those well heads have not been properly closed, allowing the groundwater systems to become contaminated. There is a well head protection program that the NNEPA has instituted, and they are beginning to address that issue.

The Navajo Nation has a memorandum of understanding with the Bureau of Reclamation to begin partnerships not only with the bureau but also with the Indian Health Service and the Corps of Engineers to look at how we can develop and expand water lines connected to the groundwater systems within the Nation. We have been better able to identify the sources for these systems and have developed what we call the Navajo Nation Water Strategy. This strategy has helped us identify areas that we need to look at for groundwater efforts as well as surface water aspects.

How do we develop surface water aspects? I know many of you here in New Mexico are aware of the work that the State of New Mexico and the Navajo Nation are doing in terms of the San Juan Basin area and the Water Settlement Act. We are working on the western portion of our reservation to address issues in that area and to develop surface water sources for further water development.

When you look at agriculture and livestock, you are immediately looking at rangeland water quality issues. Like any area in the West, there are four aspects to look at: sedimentation, nutrient loading, pathogens, and heat transfers. A lot of this is tied to overgrazing, the effects of erosion, and the effects of large precipitation events that occur. It is a cycle that we are beginning to see. First there is overgrazing and then we get to the monsoon season and experience flooding. The low-wash areas become flooded and sedimentation occurs. As that happens, nutrient loads and algae growth increase in our lakes and streams. As that begins to happen, the drought that we have been experiencing also comes into play as animals congregate in areas around lakes, watering holes, and

low-lying streambeds. As they do gather, their waste is deposited in one area. With precipitation, all of these contaminants are flushed downstream. With reduced land cover, streams and lakes will increase in temperature and that affects the recreational capabilities of many of our stream areas.

Another factor to look at is farming. Individual farms do not have a large impact as most of the farms on the Navajo Nation are anywhere from 15 acres to much smaller plots. The only real impacts that we see are collective: if areas are laid fallow because of drought or because of an inability to get water to certain areas, then we start seeing sediment and nutrient loading from fertilizers and pesticides. In contrast to the small farms, we have the Navajo Agricultural Products Industry (NAPI) farm in Farmington. Right now, there are currently between 60,000 to 70,000 acres in production. The potential for production is about 110,000 acres. As with any commercial farming endeavor, there are issues with fertilizer and pesticide use, selenium leaching, drainage, erosion, and sedimentation. We also have a feedlot operation. The NNEPA has been working very closely with our farming operation to monitor those areas and to make sure that we address any detrimental effects from the runoff or discharge from the irrigation system.

What is the Nation doing regarding rangeland? It is an education process. We are looking at how to amend our grazing laws and how to improve our grazing practices. With the Navajo Nation, when you begin to talk about grazing, you begin to touch a very sensitive area for many of our people. When you begin to talk about changing grazing laws, you immediately hear, especially from the elderly, talk about BIA superintendent Collier at the time when livestock was being reduced without their input. A lot of these stories begin to circulate. Again, it is an education process on our part to improve grazing practices.

How do we begin to address watersheds? How do we begin to address grazing? The NNEPA has become more involved in non-point source pollution. We are now looking at the restoration of watersheds and we are working more closely with state and federal agencies. We have been working very cooperatively, and it is taking a lot of coordination to achieve some of the things we have been able to achieve, especially in the Asaayi watershed, which is along the Arizona/New Mexico border. We have had three agencies, two chapters, and three of my departments working on the

Asaayi lake watershed effort. We have it completed. We not only had to coordinate efforts but also funding in order to fix the lake and the recreational areas and to reestablish the watersheds downstream so that families can begin farming in those areas. People are beginning to come back and farm those areas again. We are beginning to see good success in that effort. The NNEPA continues to work closely with our NAPI operations to monitor their operations to make sure that discharges are being maintained and that they are meeting regulations. We also are working with the Environmental Quality Incentives Program (EQIP). It is a learning process for our people. It is teaching our folks how to begin to take

hold of their particular ranch, farm, or other land use area, to work on conservation efforts, and to provide labor in the cost-sharing effort so that we can improve all watersheds, improve grazing and land cover.

We are working very hard to establish a good relationship with the Department of Agriculture. From my experience working in this position, Indian country has not really gotten involved with the Department of Agriculture. We are learning a lot. When I first started in this position in 1999, I would go to Washington and talked about trust and responsibility. When we talked about that, most of the departments would look at me and tell me to go talk to BIA. It was a teaching process. We had been very used to working with the Department of the Interior, the BIA, the Bureau of Reclamation, and the Bureau of Land Management, and there is a culture and a way to work through the Department of the Interior that is different from the way that you work with the Department of Agriculture, which deals with producers. It is a whole different concept, but Indian country is beginning to learn how to do that. We are beginning to develop better relationships. We are learning how to work with states. We are learning how to compete, how to bring projects forward, how things work.

**In contrast to the small farms, we have the Navajo Agricultural Products Industry (NAPI) farm in Farmington. Right now, there are currently between 60,000 to 70,000 acres in production. The potential for production is about 110,000 acres.**

We are also looking at the industrial use area. Compared to domestic and agricultural use, this area is not as extensive on the reservation as we would like to see it. We must prepare ourselves to look at further development, especially power plants. We have two working power plants: the Four Corners Power Plant, which is just 30 miles outside of Farmington, and the Navajo Cogenerating Station, which is about seven or eight miles out of Paige, Arizona. Those two operations utilize about 30,000 acre-feet of water. It is a closed

**...we are trying  
...to achieve a  
better quality of  
life for our people.**

system. We continue to monitor them along with the Office of Surface Mining (OSM) and EPA. We have not seen real impacts in that whole aspect, but it is an issue of water quantity being utilized and not quality. We are now

in the process of permitting the Desert Rock Project, also in the Farmington area. We are looking for a dry-cool system. Instead of 30,000 acre-feet, they are looking at about 4,000 acre-feet per year of usage. We are studying how we can begin to improve in that area. As I said, water quality is monitored closely and we have not seen any significant issues as far as water quality goes.

We are also working hard on uranium that has the effect of passing radioactivity through parts of our reservation, especially by the mining and milling activities that were active in the 1940s and 1950s. The Uranium Mill Tailings Remedial Action (UMTRA) program is under the Division of Natural Resources. We are looking at four major sites in terms of remediation: Shiprock, Tuba City, Mexican Water, and Cane Valley, which is along the Arizona/Utah border. Most of these sites were dealing with both nitrate and phosphate contamination from groundwater. There are times when we have seen some low-level radiation in some areas of the groundwater. We have not seen anything of significance. We have been going through a cleanup effort. This has been done in conjunction with the Department of Energy. We are working on different processes, some of which are pilot projects with the Department of Energy to determine the best ways to remediate these types of contaminants within the Navajo Nation.

Along with industrial uses, we are looking at mining aspects. Quantity is more of an issue than quality when we look at mining. There are discharges at times, which are being monitored. Most of the water is collected

through sedimentation ponds. Most of that water is reused as dust suppression. Other water used in the plant areas is also being used for dust suppression. Manufacturing uses of water on the reservation are fairly limited at this time. We are beginning to put processes in place to begin to address this aspect.

In closing, the Nation is looking at water quality issues, just like any other community or region within the United States. We are all dealing with very similar issues and learning how to deal with those issues. We are putting the necessary programs and monitoring processes in place to address those areas. The area of most concern is domestic use. What we are trying to tackle at this point is the fact that 40 percent of our people still haul water. That is an area that we are trying to focus on in order to achieve a better quality of life for our people. As we do that, we learn from experiences outside the reservation in order to address those water quality issues inside the Nation.

Question: Is the Nation prepared to provide funding for these water systems to private enterprises?

Arvin: Yes. The Nation is looking at how we can partner with other groups and looking at cost-share development. We are looking to collaborate with the Indian Health Service and the Bureau of Reclamation and some of the other government agencies so that we can all pull funding together to get these water systems in place.

Question: You mentioned that 40 percent of tribal members are hauling water. I know that for some of your chapters it can be up to 90 percent that are hauling water from the livestock ponds that are associated with your windmills. Is the tribe looking at fill stations and closed storage tanks that tribal members could haul water from rather than taking it directly out of the livestock tanks?

Arvin: Right now we are looking at different strategies for how we can address that problem. Now that we have the EPA on board, we are beginning to tackle that. The issue comes back to how we are to develop the funding aspects to achieve that in a timely basis. That is a part of our water strategy. Now we have to figure out how to pay for it.

Question: I have been involved in groundwater hydrology and water development for about 40 years in New Mexico, and I recall about 20 to 25 years ago the director of the Central Tunisian Development went to the Navajo Nation. They were faced with developing rural water supplies for a lot of people. A lot of people were carrying water with carts behind them. The director was so impressed by the Navajo Nation's water development. He was impressed by the similarity in climate and landscape and the distribution of people and the tribal nature of people. He looked at one water system that was about 100 miles long. It was serving houses and homes all along this spine. There were a number of windmills and water sources feeding into it. He left New Mexico with the New Mexico model. He was going to replicate in central Tunisia that which he had seen in the Navajo Nation. The impression I am getting this morning is that nothing has been done. Whatever model he was looking at 25 years ago in the Navajo Nation has not continued. My question is has it continued or are we starting from scratch?

Arvin: That is a good question. Real quickly, there were a number of initiatives and a number of areas that were started in the sixties and early seventies. Water development was one. They were looking at land development. There were a number of areas that were beginning to be addressed by the Nation. We had a lot of cold winters, too. Our population had just grown. Right now, the Navajo Nation has a total population of about 300,000. For better or worse we have about a 22 percent leakage rate, meaning we see our young people leaving for college and they don't come back because there is nothing to come back to. We still have about 170,000 people that must adjust to that. The other aspect is that we have not been able to improve on the per capita income. It runs about \$6,000 a year. The question is how do you begin to develop that necessary infrastructure when we missed it? The western portion of the United States really began to develop in the 1940s. We missed that. We are trying to come and filter the necessary infrastructure needs for the nation at a later date. That and the fact that the population continues to grow are issues that follow. I call it management by triage at times. We address where we are bleeding the most. This is what we need to do over here, but we are bleeding the most there, so we have to address that first. We are looking at new ways of attacking the problem. President Shirley is looking

at how we can do that through capital and economic development. We are seeing some good progress. We have a larger population, but our funding levels have stayed fairly level. If you look at the reservation during the 1960s and compare it to today's reservation, you would see that the number of businesses that have come in is not that great. We are dealing with those constraints as we try to improve the quality of life on the Navajo Nation.