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Yellowcake: A Nuclear Industry

Uranium is a radioactive element that has a vital importance in this nuclear age. The nuclear industry refers to uranium as Yellowcake, for the yellow cake-like appearance once the uranium is processed (Amundson, Michael A. xv). Yellowcake provides nuclear power for electricity, helps to develop x-rays, nuclear weapons, ammunition and many other common uses. The value of uranium is at our fingertips, such as using it to turn on the lights. It is also commonly used medically to create x-ray technology. One of the most famous uses of it in our country today is to provide ammunition in wars. The everyday use of uranium is often misinterpreted due to its highly unstable composition. During World War II and the Cold War, uranium was extremely popular. After two worldwide radiation incidents, it lost its popularity. With increased attention on nuclear energy as a solution to both energy and climate change issues, uranium is being reintroduced and mines are reopening. Reopening uranium mining in Utah, Colorado, New Mexico, and Arizona, including the Colorado Plateau area, will have a significant impact on the whole of the United States. History shows that there has been a negative social, health, and environmental impact in this area due to the uranium industry; understanding our past should help with our present approach on the development of this energy source.

To truly understand the future impact of uranium in this area, it is first important to explain uranium and the U.S. uranium history. Uranium mining is much like other

mineral mining. First there is exploration of areas, and then the mining occurs, followed by milling the uranium. After the milling, uranium is called yellowcake, which is processed into a gaseous form. The gaseous form is then enriched and fuel fabricated and put into the fuel assembly and reactor. The repeat of the enrichment and fuel fabrication is called reprocessing. The reprocessing results are allotted to different uses, such as electricity, x-rays and ammunition. The final matter that cannot be used is considered High Level Nuclear Waste (HLW). Currently the U.S. does not operate any HLW repositories so the returning mining companies and mines do not have any HLW repositories (Endres, Danielle). This brings about many concerns in the areas where the companies are choosing to explore and develop mines. These include the social, health and environmental impacts. Such “boom” towns have existed before and have either “busted” or have succeeded in alternative workforces (Amundson, Michael A. xv).

In 1946, a federal program opened for uranium mining, which created many mining towns throughout the country. The last “boom” for minerals in the U.S. was in 1951 when the Atomic Energy Commission (AEC) announced it would pay anyone who could develop a productive mine. The AEC provided construction for roads, ore-buying mills, and geology, to anyone who would develop a source of uranium in the Mid-West (Zoellner, Tom 131). The “boom” went on for decades, expanding coast to coast (Amundson, Michael A. xvii), (*Three Mile Island*). Then in 1979 a nuclear power plant called Three Mile Island almost exploded. This happened when the failure of the cooling system of one of the nuclear reactors led to overheating of the uranium core, which led to a possible explosion and dispersal of radioactivity. This incident created enough scare in the country that uranium production came to a standstill (*Three Mile Island*). Now,

companies are reopening mines in the Colorado Plateau region, such as the Denison Mines Company, which reopened the Pandora mine in 2006 (*Madre Line Inc.*).

The AEC originally meant to promote the use of nuclear energy for both peaceful and defensive purposes. The Atomic Energy Act stated its goals were, “improving the public welfare, increasing the standard of living, strengthening free competition in private enterprise and promoting world peace” (Amundson, Michael A. 20). One town that experienced the “boom and bust” scenario was Uravan, Colorado. The AEC thought that Uravan was just the place for the beginning of the nuclear age in the U.S. along with the creation of the Atomic Bomb. In 1936, a company called U. S. Vanadium Corporation developed the town, combining the mined minerals, uranium and vanadium, calling the town Uravan (Hessler, Peter). According to the article, “*THE URANIUM WIDOWS*”, Uravan residents and workers had no idea that they were contributing to the Manhattan Project (Hessler, Peter).

During World War II, the knowledge about the safety and health of mining workers wasn’t very developed. The mines lacked proper ventilation, the mill tailings (about 40% hazardous metals and 60% liquid water ponds) were used throughout the community, and old uranium contaminated mill equipment was tossed on a hill above the town, which was easy access to anyone. In 1981, a public meeting of all the past Uravan residents was held. During this meeting, Daryl Hannah argued that reopening uranium mining in the Colorado Plateau would become a possible repeat of Uravan. He states, “But you look at Uravan now and it’s completely fenced off, and it says, ‘Radioactive, Do Not Enter, Dangerous, Use Caution’” (Hessler, Peter). Michael A. Amundson explained that this town along with other “boom” towns became “Creatures of Uncle

Sam”, because everyone in the community was dependent on either the uranium industry or a uranium- associated business (Amundson, Michael A. 115).

Moab, UT experienced the “boom” as well but this town was already established so the “the Creature of Uncle Sam” did not exist. This allowed Moab to flourish once the uranium industry in the area had stopped. Unlike Uravan, the new social atmosphere slowly created a productive community. They constructed new subdivisions, which caused the town to create a new system of water and electricity to include the new residents. Trailer courts, retail centers and new schools were also constructed during this time (Amundson, Michael A. 56). This re-construction of Moab did not happen overnight. Like any town that experiences an immediate arrival of people, there were problems.

“The streets were full of people. You’d drive around the streets of Moab and you’d see literally people living in tents, small trailer homes...”(Amundson, Michael A. 58). Moab had difficulty providing the personal needs that their new population required. During this time, sanitation was a problem. A state commissioner reported that many of the tent and trailer towns did not have garbage or sewage and they were using water from ditches (Amundson, Michael A. 58). This health concern was one of many that Moab faced during these years. One social concern was the housing shortage. One of the Uranium companies, Utex Exploration Company purchased land and built new homes for company personnel. This housing shortage also raised competition in the available housing of motels, trailers, and apartments. Because Moab took long- term steps to provide housing, the housing shortage was temporary. These steps also provided the community with a future security of housing.

Environment in this area became a huge problem when the uranium mining occurred. The lack of housing created a failure in Moab's current water system. Contamination of the water sources and new well sites occurred. The Colorado River became the main supply for many new residents, but their contamination to the water and the Colorado River's unfiltered water raised environment and health concerns (Amundson, Michael A. 59-61). This low supply and high demand society would have created more problems but Moab planned its future for the possibility that the uranium industry might not last forever. The success Moab had over the uranium industry contributed to the nickname "The Uranium Capital of the World" that Moab received during the late 50's (Amundson, Michael A. 53).

In the southern region of the Colorado Plateau, in New Mexico, the Yellowcake industry accelerated at a rate that is still causing problems. The Navajo Nation became a part of the uranium industry in the 1940's and hundreds of mines were excavating uranium into the late 70's. The Navajos had the same concerns with uranium mining as the mines in the Colorado Plateau that were not on the Indian reservation. Questions such as, what will happen to our communities and how will it effect the health of our people, were very common concerns. However, this "boom" created many other concerns to the Navajo people. Religious practices and some sacred sites were taken over by uranium companies. This affected the communities as well as the environment of the area. The term to describe the behavior of the uranium companies towards the Navajos is called Nuclear Colonialism (Ringholz, Raye C. 33). "This is a phenomenon in which indigenous peoples are disproportionately targeted and harmed by the effects of nuclear power and weapon production" (Meiklejohn, Douglas).

The Article, *“From Wasteland to Waste site: The Role of Disclosure in Nuclear Power’s Environmental Injustices”* defines Navajo’s uranium disputes as common examples of how marginalized communities are more likely to host polluting and toxic industries, including power plants, than non-marginalized communities (Endres, Danielle). The worst examples of problems with social, health, and environment in the uranium “boom” towns are towns located in the Navajo Nation. The Nuclear Regulatory Committee (NRC) lacked the understanding towards the Navajos, which led to more problems.

In Church Rock and Crown Point, New Mexico, the residents experienced Nuclear Colonialism. Leaching tests were done for the area in which metallurgical wastes and ore samples from the uranium and other mined mineral sites were processed over a 142-day period. The results showed that uranium was being released as a slow-steady rate by surface wash-off and diffusion (V.D. Puranick, et al.). That contamination wasn’t the worst that these two towns experienced. In 1979, a uranium tailings dam breached. This “liquid uranium” spilled and contaminated all the water sources in the area (LaDuke, Winona). These two towns formulated the Eastern Navajo Dine Against Uranium Mining group (ENDAUM) to fight against the mining companies for compensation for the contamination and their land rights (Meiklejohn, Douglas). The hearing was between NRC and ENDAUM. ENDAUM lacked the funds for proper expertise and experiments to be done to show the negative impacts of the uranium industry. Therefore, the NRC knew little about the demographics, the Navajo culture and the data that showed how much contamination affected the social, health, and environment in the Navajo Nation. The NRC did not revoke the licenses to the uranium companies and the hearing was

dismissed. Stewart Udall, the Secretary of Interior during the Kennedy and Johnson Administrations, stated, “[The U.S. Government] had needlessly sacrificed the lives of [the Navajo miners] in the name of national security” (Meiklejohn, Douglas).

It wasn’t until 1990 when Stewart Udall passed the Radiation Exposure Compensation Act, which protected all the Navajo miners. Then in 2005 the Dine Natural Resources Protection Act was passed. These acts finally gave the Navajos the protection they needed. In the past 40 years, the Navajos have suffered many deaths related to the uranium mining. Hundreds of the uranium sites still lack proper cleanup and the social impact that the 1900 uranium mining industry did to the Navajo Nation can never be erased. Today, the Navajos are still fighting against uranium mining companies and licenses to mine in the area (LaDuke, Winona).

Present day nuclear energy is mostly foreign, but our government has new plans with alternative energy. Uranium is considered an alternative energy source. Alternative energy is named for its low-emitting amount of greenhouse gases. The production of nuclear energy does not emit as many greenhouse gases as does the production of natural gas or oil. Knowing that still does not compensate for the serious risks involved in uranium mining. The only public attention nuclear energy currently has is towards the high demand of it and the positive mining results it shows. There is no public attention being drawn towards the negative effects of uranium on communities. Looking back on the history of uranium in the U.S. will lead us towards a safer development for future uranium production. The previous negative concerns of social, health and environment, should be addressed before the continuation of uranium production in this country.

Works Cited

- Amundson, Michael A. *Yellowcake Towns: Uranium Mining Communities in the American West*. Boulder, CO: University of Colorado, 2002. Print.
- Blackburn/ Madre Line Inc., Donald A. *Madre Line Inc.* Madre Line Inc. Web. 12 Apr. 2010. <http://www.madrelinc.com/colorado_plateau.php>.
- Endres, Danielle. "From Wasteland to Waste Site: The Role of Disclosure in Nuclear Power's Environmental Injustices." *Local Environment* 14.10 (2009): 917-937. *Academic Search Premier*. EBSCO. Web. 11 April 2011.
- Hessler, Peter. "THE URANIUM WIDOWS." *New Yorker* 86.27 (2010): 30-37. *Academic Search Premier*. EBSCO. Web. 10 April 2011.
- LaDuke, Winona. "Navajos ban uranium mining." *Earth Island Journal* 20.3 (2005): 37-38. *Academic Search Premier*. EBSCO. Web. 13 Apr. 2011.
- Meiklejohn, Douglas. "Representing New Mexico Communities: The Struggle for Environmental Justice." *Human Rights: Journal of the Section of Individual Rights & Responsibilities* 30.4 (2003): 23-25. *Academic Search Premier*. EBSCO. Web. 10 April 2011.
- R.L. Bon and K.A. Krahulec, *Utah, Mining Engineering*, May 2007, p. 121
- Ringholz, Raye Carleson. *Uranium Frenzy: Boom and Bust on the Colorado Plateau*. New York: W.W. Norton, 1989. Print.
- "Three Mile Island." *Columbia Electronic Encyclopedia, 6th Edition*.(2010): 1. *Academic Search Premier*. EBSCO. Web. 10 April 2011.

V. D. Puranick, et al. "Long-term leaching of uranium from different waste matrices."

Journal of Environmental Management 92.3 (2011): 919-925. *Academic Search*

Premier. EBSCO. Web. 11 April 2011.

Wallace, Paula and Vickie Smiles. "Uranium Mining and The Question of Corporate

Social Responsibility." *Ecos* 138. (2007): 20-22. *Academic Search Premier*.

EBSCO. Web. 12 April 2011.

Zoellner, Tom. *Uranium: War, Energy, and the Rock That Shaped the World*. New York:

Viking, 2009. Print.