Uranium: The Dirty Fuel of Nuclear Power

Assertions that nuclear power is a clean energy source that can lead us to energy independence are incorrect. The vast majority of the uranium used to fuel U.S. nuclear reactors is imported. Uranium is mostly found under or near land belonging to indigenous peoples, and they have largely borne the health and environmental impacts.

NUCLEAR POWER ≠ ENERGY INDEPENDENCE

In 2006, only 16.2% of the uranium used for U.S. nuclear power plants was domestically mined.[1] All of the rest was imported from other countries, some of which are not known for political stability or for respecting human rights.

Uranium Imports (2006)		
Origin Country	**Purchased Amount***	**Percent of Total**
Australia	17,052	25.8
Brazil	822	1.2
Canada	13,325	20.0
Kazakhstan	1,628	2.4
Namibia	3,009	4.5
Russia	15,116	22.7
South Africa	725	1.1
Uzbekistan	2,020	3.0
Total Foreign	**55,732**	**83.8**
Total U.S.	**10,807**	**16.2**

*Thousand Pounds U_3O_8 Equivalent
Source: EIA, http://www.eia.doe.gov/cneaf/nuclear/umar/table3.pdf

The U.S. only has the eighth largest uranium reserves in the world[2] and most of it is low to medium grade, which is not only more polluting but also less economical. When uranium prices dropped in the late 1970s, many mines became unprofitable and shut down.

In the US, uranium is currently mined in Nebraska, Texas and Wyoming, and possibly in Arizona and Colorado. Uranium is also located in Alaska, Nebraska, South Dakota, Oregon, New Mexico, Montana and Nevada, Washington, Utah, and Virginia. An increase in uranium prices and proposals for new nuclear reactors, however, have spurred uranium mining claims to increase 7-fold between 2004 and 2006 in Colorado, New Mexico, Utah and Wyoming alone.[3]

The U.S.'s limited resources and price volatility means that our dependence on foreign sources of uranium is not likely to change significantly in the future.

Even a large portion of the uranium that has been mined in the U.S. historically can not be properly considered as domestic supply since it was extracted from indigenous lands, which are sovereign nations. Estimates of known uranium reserves located on Native American reservations vary widely between 10%[4] and 60%.[5] Until the late 1970s, 80% of uranium mining and all uranium processing in the U.S. took place on indigenous lands.[6] The largest U.S. uranium deposit is in the Grants Mineral Belt in New Mexico, which partly covers three different reservations. Half of U.S. domestic uranium production since 1950 has come from this area.[7]

HEALTH AND ENVIRONMENTAL IMPACTS

Indigenous peoples have experienced severe health problems from uranium mining. For example, Navajo miners suffer disproportionately higher rates of lung cancer, tuberculosis and other respiratory diseases. The health effects have been so devastating as to prompt the Navajo President to declare, "I believe the powers that be committed genocide on Navajoland by allowing uranium mining."[8] In April 2005, the Navajo Nation banned uranium mining and processing on all of its tribal land, which contains one of the world's largest uranium ore deposits.[9]

Uranium has an equally destructive impact on the environment of reservations. Over 22 million tons of uranium mill tailings have been produced on or near reservation lands.[10] Tailings, the waste left over after the uranium has been extracted from mined rock, contain radioactive materials. These tailings are often left in sludge piles and not properly contained, causing contamination of nearby rivers and lakes. Some drinking water sources that are located near these tailing piles have been contaminated hundreds of times above accepted safety levels.[11] In 1979, a tailing dam on the

Navajo reservation broke and spilled hundreds of tons of radioactive waste into a nearby river, preventing the Navajo from using the water even today.[12]

Uranium mining also creates serious health and environmental risks in countries from which we import uranium. In Australia, our top importer, two of the three currently operating mines still use conventional mining methods, creating massive land disturbance in addition to more than 100 million tons of radioactive tailings. In 2003, an Australian Senate inquiry found that the uranium industry consistently underperformed and did not comply with regulations, seriously jeopardizing people and the environment. As a prime example, in 2004, 150 uranium miners were exposed to drinking water that contained uranium at levels 400 times greater than the government standard.[13]

Uranium mine on Navajo land in northern New Mexico.
Source: U.S. Environmental Protection Agency,
http://www.epa.gov/radiation/tenorm/other_orgs.htm

The environmental record in Russia, our second biggest importer, is also abysmal. Mines in Siberia have released billions of gallons of untreated wastewater containing radioactive material, in addition to generating millions of tons of waste and tailings.[14] Both of these waste streams have seriously contaminated groundwater sources and produced indoor radioactive pollution in nearby homes.[15] In a mining town that produced uranium for the Soviet Union's first nuclear bomb, more than 95% of the children are mentally challenged and Downs Syndrome rates are four times the national average.[16]

Canada has not fared much better with its uranium production. From 1975 to 1977, 2 million liters of untreated waste from a uranium mine in Saskatchewan spilled into a lake. Then in 1989, two million liters of radioactive water were released into the same lake and went undetected for 16 hours. Only a few months later, another accident released 90,000 liters of dangerous waste at the same site.[17] From the 1950s to 1990s, mining in northern Ontario contaminated the Serpent River system, which was not only central to the way of life for a group of indigenous peoples,[18] but was also declared to be the single largest contributor to radium contamination of the Great Lakes.[19] Most uranium mining in Canada takes place in Northern Saskatchewan, where 87% of the population is made up of aboriginal peoples.[20]

IN-SITU LEACHING THREATENS GROUNDWATER

In the United States, a new method of uranium mining known as in-situ leaching (ISL) is used, which does not produce tailings but instead creates a new set of environmental problems. Rather than taking massive rocks of uranium ore out of the ground as in conventional mining, ISL involves injecting water and chemicals underground that allows the uranium to be extracted.

In-situ leaching also threatens groundwater supplies, as residents of south Texas have experienced firsthand. In 2004, the EPA sent letters informing the town of Ricardo that their drinking water from a well located next to a uranium mine contained 5 to 8 times the acceptable level of uranium. The community was told to stop drinking the water immediately and see their physician.[21] Ingestion of uranium, which is both radioactive and a toxic metal, increases the likelihood of kidney damage, cancer and blood diseases.[22] In 2006, the community responded by passing a resolution opposing all in-situ mining in the county.[23]

EVEN LESS REGULATION OF URANIUM MINES?

The Nuclear Regulatory Commission – the U.S. regulatory body responsible for licensing nuclear facilities – and the uranium industry want to speed up the licensing process for new uranium mills. The NRC is currently proposing to develop a "Generic Environmental Impact Statement" for uranium recovery at mills, which would significantly decrease the amount of site-specific information that the NRC would consider in its licensing process.[24] It would also significantly reduce or eliminate the ability of local residents to participate in the process.

Public Citizen's Energy Program
cmep@citizen.org
www.energyactivist.org
(202) 588-1000
August 2007

References available at:
http://www.citizen.org/cmep/energy_enviro_nuclear/nuclear_power_plants/nukewaste/fuelcycle/articles.cfm?ID=17022