

Uranium Mining in Virginia: Opening the Door to a Host of Problems

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Presentation to:
Committee on Uranium Mining in Virginia
National Academy of Sciences
Washington, D.C.
November 16, 2010



Topics Covered

- Historical overview of uranium recovery
- Regulatory treatment and inadequacies
- The market for uranium

A Brief Overview of Uranium Recovery

- Essentially unregulated for decades.
- Primarily in Western States.
- The United States is still paying billions of dollars to address the environmental and public health impacts.
- Regulatory treatment of uranium recovery remains splintered and inadequate, decades after the harms were apparent.

Environmental Harms from Conventional Uranium Mining and Milling

- Tailings formed when uranium ore is crushed and chemically treated (with sulfuric acid and other chemicals) to “leach out” the uranium.
- Huge amounts of wastes (tailings) from this process normally transferred in a slurry pipeline and dumped in expediently engineered impoundments.
- Leach residues contain most of the radioactive decay products of uranium: e.g. Thorium-230, Radium-226, Radon-222 (radon gas).

Environmental Harms, cont.

- Because Thorium-230 is long-lived, radium and radon are continually produced in the tailings and released over a long period.
- Tailings also contains sulfuric acid, ammonia, other process chemicals, arsenic, and heavy metals.
- There is a strong exposure-dependent link between uranium mining and cancer/other lung diseases as well as direct harms from uranium and heavy metals as nephrotoxins (harmful to the kidney if ingested in any amount).

Overview of Regulation

- Conventional uranium mining not regulated under the Atomic Energy Act of 1954.
- Unless mines are on federal or tribal administered lands, uranium mines fall completely under state regulations and agencies.
- In the case of Virginia, the Virginia Department of Mines, Minerals, and Energy (DMME).
- Some state agencies have specific regulations applicable to uranium mining and reclamation of mines, but most do not.

The Federal Government's record of regulating this industry is abysmal

- The BLM has allowed older uranium mines to operate under grossly inadequate early-1980's Environmental Assessments.
- There has never been a Programmatic Environmental Impact Statement for uranium mining on federal lands.
- Thousands of old mines have not been remediated, and others have been inadequately remediated.
- No federal uranium mine reclamation standards for:
 - protection of groundwater;
 - clean-up of contaminated soil and rock; and
 - long term remediation of waste rock piles and other contamination at mine sites.

Regulatory issues continued...

- Lack of Federal public notice of exploratory drilling.
- States often do not require public notice of uranium exploration drilling, and the public must continually file records act requests to obtain documents.
- States have authority to establish tighter air and water quality standards for radionuclides/other pollutants from uranium mining/processing, but fail to do so.
- Colorado is a recent welcome exception, but has been sued by the industry for its trouble.
- State agencies often not adequately funded, hence: infrequent inspections; cursory application reviews; reluctant enforcement actions.

Radon Emissions as just one example of regulatory inadequacy.

- Radon emissions are hazardous air pollutant under Section 112 of Clean Air Act.
- EPA established radon emission standard for underground uranium mines in 1989, 40 C.F.R. Part 61 Subpart B (exposure standard, not radon release standard).
- Subpart B applies to mines that have or will produce >100,000 tons of ore over the life of the mine. For <100,000 tons, radon emissions do not have to be monitored, no matter how close to human habitation or how high radon levels.
- Underground mining in the West started up again in 2006, and the EPA is only now working on developing an adequate program to administer and enforce the standard.

Some of the issues presented by inadequate regulation of radon at uranium mines

- No radon standard for the emission from open pit mines.
- Lack of clarity and proper enforcement; from 1989 to 2010 radon vented by natural airflow (rather than by mechanical means) not measured.*
- EPA has not reviewed Subpart B standard by 2000, as required by Clean Air Act.
- EPA has not established fees and designated Part 61 radionuclide regulated sources as "major" sources.
- No requirement for fences and warning sign at radon vents,

*Source Uranium Watch, Utah.
<http://www.uraniumwatch.org/index.htm>.

Another example where problems have cropped up – water quality.

- EPA and some states have effluent discharge standards applicable to discharge of uranium mine water that must be pumped from wet mines. 40 C.F.R. Part 440 Subpart C, Section 440.30-440.35.
- Some mines have ponds for evaporation, rather than discharge. The discharge or leaching of large amounts of water can have an adverse impact on local riparian areas.
- Untreated mine water is historical source of much soil and water contamination, vegetation uptake, and ingestion of radionuclides by humans and domestic animals.

Some of the Concerns for Virginia

- Inadequate state and federal regulatory programs for uranium mining.
- Inadequate federal regulatory program for control of radon and other radionuclides from uranium mining.
- Historic regulatory irresponsibility of the uranium industry.
- Federal standards for uranium mining have not changed in the last 20 years.

And more to consider...

- EPA review of the radon standard for underground uranium mines is 10 years over due.
- Uranium mines will emit large amounts of radon gas and radioactive and hazardous particulates into Virginia communities.
- Where particulates end up and their impacts on human health and the environment next to the vents and in the community have not been adequately studied.

And even more ...

- Some health hazards to nearby communities – silica from waste rock – are not regulated.
- Large piles of waste rock from mining operations. Currently EPA does not regulate emission of radon from low-grade ore and waste rock piles.
- Uranium and radium from waste rock piles and contaminated areas can and will leach into ground and surface water during operation and post-closure.
- Uranium mines are ugly, messy places and contamination is permanent.
- Few academic investigations into long-term health and environmental impacts from continued presence of radioactive materials at the mine sites.
- Uranium mining requires extensive exploration drilling throughout life of mine, with attendant surface disturbance.

Boom and Bust Cycle

- Volatility of uranium supply and demand lends itself to boom and bust cycles. Resulting expansion and abandonment cycles wreaked havoc on affected communities.
- In recent years, market “spot price” rose to a historic high of \$137 per pound in summer of 2007, but lost more than half of its value by late 2009 when it fell to \$51 per pound.

The U.S. does not produce a significant share of the market.

- For past ten years, U.S. nuclear power reactors have purchased about 15% of their needed uranium from U.S. sources.
- Worldwide identified uranium reserves as reported by the OECD show that in 2007, U.S. had about 6% (339,000 tons) of the world's uranium resources.
- None of these resources fall into lowest cost-of-recovery category for uranium (< \$18 per pound), under which 642,000 tons of world resources fall.

Uranium mine claims reflect the boom and bust cycle.

- In 2007 the Environmental Working Group, using information collected from the Bureau of Land Management, found that in 12 Western states, the total number of active mining claims has increased from 207,540 in January 2003 to 376,493 in July 2007— a rise of more than 80 percent. Between September 2006 and May 2007 alone, companies and individuals staked more than 50,000 claims across the West.
- Many of these claims are for uranium, sparked by global demand for nuclear power. Government data from just four states (Colorado, New Mexico, Utah, and Wyoming) reveal a surge in uranium claims from an estimated 4,300 staked in fiscal year 2004 to more than 32,000 staked in fiscal year 2006 (BLM Uranium 2007).

Will it be worth it for Virginia?

- Uranium production determined by nuclear energy development and global uranium market.
- Broader need for expanded domestic extraction in addition to current projected world production is questionable, an unstable variable for U.S. uranium producers.
- Uranium supplied not only by primary mining operations, but also by secondary sources of already mined and processed uranium. In 2008, the ratio was approximately 55% to 45%.

Considerations for Tradeoff

- Longevity of proven uranium resource at “current” production rate and market price is a function of supply and demand.
- NRDC believes likely measured increase for mined uranium due to termination of “megatons to Megawatts” and growth of Asian commercial nuclear industry.
- Key question is whether future supply outside U.S. will keep uranium prices below current levels. We think it will.
- Guarantees continuing industry’s history of leaving environmental and public health mess with taxpayer after operations cease.

END

