Virginia Department of Health

Summary of Public Meetings:
Impact of Uranium Mining and Milling on Public and Private Water Supplies and Recreational Waters

September 17, 2012

VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

Agenda

- Welcome and Introductions
- Presentation by VDH summarizing the comments and questions received to date by VDH regarding private wells and recreational water issues related to uranium mining and milling.
- Break
- Presentation by DEQ on ground water, surface water and air quality issues related to uranium mining and milling.
- Break
- Opportunity for public comments/input.

Overview

- UWG agency members have been present at all meetings
- Public input is exceptionally valuable
  - Public attendees/participants are very well informed/prepared.
  - Detailed information and data.
  - A significant number of questions, comments, and concerns were gathered.
- Input informs the UWG work plans and necessary regulatory changes should the moratorium on uranium mining and milling be lifted.
- Audio/video recordings and narrative summaries of the meetings will be placed on the UWG website www.uwg.vi.virginia.gov/
- A Final Summary Report will be published.

Summary of Public Meetings

- Six Meetings
  - Three public comment sessions
  - Three small group discussions
  - Chatham, Warrenton, Virginia Beach

- Total number of attendees
  - Public comment sessions
    - 177 attendees, 52 speakers
  - Small group discussions
    - 47 participants, 20 public observers

Purpose of Meetings

Four Questions

- What are the public's concerns related to the impact of uranium mining and milling on water quality and quantity of private wells?
- What are the public's concerns related to the impact of uranium mining and milling on recreational use of surface water?
- What role should VDH play in assuring that public health is protected in regard to private wells and recreational water use in regard to uranium mining and milling?
- What safeguards should be in place to protect private wells and recreational water?

Overarching Themes

- Impacts to agriculture (economic and health)
- Impacts to groundwater and surface water supplies (quality and quantity)
- Baseline testing and monitoring (pre-mining, during operations, and long term)
- Catastrophic events (weather related and operational failures)
- Current regulatory structure and necessary changes (authority, expertise and resources, public input)
- Overall Economic Impacts

Impacts to Agriculture

Questions, Comments, Concerns Gathered from the Public

- Several participants commented on historical events at nuclear facilities, such as at Three Mile Island and Fukushima, and
  - impact of negative perceptions of local agricultural products.
- Participants questioned:
  - Compensation to farmers for lost income and decreased land values due to real or perceived contamination.
  - Whether organic farmers would be required to test for radioactive material to maintain certification?
  - How would uranium mining and milling impact the “Virginia Grown” brand?
  - Would new sampling and monitoring protocols be set for agricultural products?
  - How would products be handled following a contamination event?

Impacts to Agriculture

Summary of Concerns for UWG Consideration

Would uranium mining and milling have an effect on agricultural products, due to contamination or consumer perception?

Impacts to Surface Water Supplies

Questions, Comments, Concerns Gathered from the Public

Participants questioned:

- Whether any streams in Virginia are currently impaired from radionuclide contamination?
- What are the natural levels of contaminants?
- Could contamination impact biodiversity in the area?
- Could contamination impact surface waters in North Carolina, causing North Carolina to sue Virginia?
- Could the proposed mine and mill at Coles Hill use 5 billion gallons of water, reducing the quantity of water in Smith Mountain Lake and Leesville Lake?
- Could contamination impact the recreational uses of the Dan River as a scenic byway?

Impacts to Surface Water Supplies

Summary of Concerns for UWG Consideration

- What impact would uranium mining and milling have on the quality and quantity of surface water?
- How would contamination of resources such as the Bannister River, Smith Mountain Lake and Lake Gaston be prevented?
- Since uranium operations use large quantities of water, how would that affect the amount of water available for other uses?
- What will be done to prevent contamination of surface water that would render the waters unusable for recreation?

Impacts to Surface Water Supplies
Ongoing UWG/WES efforts

- The UWG and WES are evaluating the potential impact of uranium mining and milling on local surface water quantity and quality.
  - Source of water utilized for milling
  - How water is used/re-used
  - Applicant rights to water for consumptive use or diversion within a licensed boundary, and
  - Proposed management of mine dewatering and mill water balance.
    - Amount and degree of potential impact site specific.

Impacts to Surface Water Supplies
Ongoing UWG/WES efforts

Regulatory oversight and audits:

- Assess applicant characterization of depletion impact.
- Assess engineering and administrative controls for mitigation of potential SW and GW impacts.
  - tailings disposal,
  - containment liners,
  - leak detection/collection systems,
  - monitoring,
  - inspections,
  - training, etc.

Impacts to Ground Water Supplies

Questions, Comments, Concerns Gathered from the Public

Participants questioned:

- Whether dewatering and water use at a mining and milling operation would reduce the supply of water for private wells?
- Would exploratory drilling negatively impact local residents' private wells.
  - NAS noted that private wells were impacted during exploratory drilling in Wisconsin.
- How well understood is the hydrology and geology (fractured rock) at the proposed Coles Hill site?
- Since sampling and monitoring of private wells is not currently required, how far away from a proposed uranium mine and mill would monitoring need to occur?

Impacts to Ground Water Supplies

Summary of Concerns for UWG Consideration

- What would be the impact on ground water?
- Will dewatering at mines affect the quantity of water in wells and springs?
- Will mining operations affect the geochemistry of the area and negatively impact the quality of ground water?
- How likely is contamination of ground water and what steps will be taken to prevent such contamination?

Impacts to Ground Water Supplies
Ongoing UWG/WES efforts

- Assess open pit, underground and ISR uranium mining impact on geochemical changes
- Assess adequacy of control of all mine and mill effluents.
- Assess hydrologic control of mine related groundwater.
- Assess impact of site-specific ores and mining methods

Water Supply Planning

Questions, Comments, Concerns Gathered from the Public

Participants questioned:

- Whether retrofitting municipal systems to remove radioactive materials and heavy metals would be very expensive and would disposal of the radioactive materials be a problem?
- Whether the regional water supply plan would take mining operations into consideration?
- Where farmers would obtain water for their cattle and crops if a contamination event occurs, until a permanent supply is provided?
- Who would be financially responsible for new water supplies after a contamination event?

Water Supply Planning

Summary of Concerns for UWG Consideration

If water supplies are affected, what is the plan for treatment and providing back-up water supplies to those affected?

What is the cost?

Who will be accountable?

How/when would the public be notified?

Baseline Testing

Questions, Comments, Concerns Gathered from the Public

Participants questioned:

- Whether baseline studies will be conducted over several years, and
  - Encompass normal operations of a uranium mining and milling facility,
  - Encompass areas potentially affected by a catastrophic event,
  - Include data for both a mineralized and non-mineralized baseline.
    - There are waters containing levels above that standard simply because of natural sources of uranium in the environment.
- Whether a model exists for baseline testing in other states that could be adapted for use in Virginia?
- Would there be different baseline standards for different means of mineral extraction?
- Would current monitoring taking place as part of the exploratory drilling process be sufficient to use for a baseline or will that testing need to be expanded?

Baseline Testing

Summary of Concerns for UWG Consideration

- What is the plan for base-line testing to establish current environmental and health conditions in the area of the proposed operation?
- Has the existing data been thoroughly reviewed?

Ongoing Monitoring

Questions, Comments, Concerns Gathered from the Public

Participants questioned:

- How will data quality be addressed?
  - Follow protocols,
  - Assure sample collection protocols are standardized and prevent cross contamination.
- Will monitoring be in real time (in situ)?
- How and when would residents be notified if monitoring shows that water has become contaminated?
- Who will pay for and conduct monitoring of the ground water and wells in perpetuity once a uranium mine is decommissioned?

Ongoing Monitoring

Summary of Concerns for UWG Consideration

What are the plans for on-going monitoring of the uranium mining and milling operations for health and environmental impacts, both during and after operation?

Catastrophic Events

Questions, Comments, Concerns Gathered from the Public

Participants questioned:

- What is the impact to Virginia given the positive water balance?
- Are there other areas where uranium is mined that have a positive water balance?
- What is the impact to Virginia given that the eastern slope of the Appalachians is prone to catastrophic stream flows and near maximum rainfalls?
- What is the impact to Virginia given that the areas where uranium is likely to be mined have been affected by earthquakes and hurricanes?
- Are there/what are historical examples of issues related to catastrophic events due to operational or design failures at mining and milling sites?

Catastrophic Events

Summary of Concerns for UWG Consideration

- Given Virginia's climate, which includes earthquakes, hurricanes and heavy rainfall, how can safe operation of uranium mines and mills be assured?
- How would the environment and public health be protected in the event of a tailings pond failure or similar catastrophic event?

Regulatory Authority & Standards and Practices

Questions, Comments, Concerns Gathered from the Public

Participants questioned:

- Whether drinking water MCLs are “safe” vs. “reasonably safe for most of the population”?
- Whether some groups (i.e. vulnerable populations) might be harmed at the MCL levels?
- Whether occupational exposure limits for radon are out of date?
- Whether NIOSH has recommended lower limits?
- Whether the current EPA standard for uranium in drinking water is technology-based or health-based?
- Whether WHO has a lower standard based solely on health effects?
- Whether there are other toxic elements in uranium ore
- Whether regulatory agencies should monitor and set a standard for daily radon emissions into the ambient atmosphere in the communities near a uranium mine and mill?
- Whether VDH has assessed existing regulations and are additional regulations necessary?

Regulatory Authority
Summary of Concerns for UWG Consideration

- Do Virginia agencies have the authority, the technical expertise and the resources to establish and conduct a regulatory program that will adequately protect the environment and public health if the uranium mining and milling moratorium is lifted?
- Does the UWG process involve drafting a conceptual regulatory framework?

Standards and Practices

Summary of Concerns for UWG Consideration

Are current regulatory standards and industry best practices adequately protective of public health and the environment?

Health Effects

Questions, Comments, Concerns Gathered from the Public

Participants questioned:

- Whether the Chatham area currently has a particularly high cancer rate (based on data collected by independent entities)?
- Whether the particularly high cancer rate (and negative outcomes) will have a disproportionate adverse impact on minorities especially African Americans
- How will the significantly increased lung cancer risk due to radon and tobacco be assessed/managed?
- What other health risks in addition to radiation and cancer risks are present?
- Are there provisions to follow up and look at health outcomes and effects of exposure?

Health Effects

Summary of Concerns for UWG Consideration

- How likely is it that uranium mining and milling operations will affect the personal health of workers and the residents of the surrounding area?
- What health conditions might see an increase?
- What will be done to prevent those conditions?

Health Effects
Ongoing UWG/WES efforts

- Assess monitoring and reporting mechanisms for Radon in homes, schools, and other buildings
- Assess Radon concentrations in areas of naturally occurring uranium.
- Assess impact of airborne radionuclides in dust
- Assess impact of uranium and its decay products on ground and surface water and ingestion,
- Assess impact of diesel fume emissions and silica exposure
- Assess baseline cancer rates (cancer registry)
- Assess current epidemiological/surveillance systems

Health Effects – Mine and Mill workers
Ongoing UWG/WES efforts

Assess Impact and Prevention of:

- Uranium Ore / Uranium Mill Tailings
  - Inhalation of radon decay products (radon daughters)
  - Inhalation of radionuclides (U, Ra, Th) and heavy metals (e.g., lead), in airborne particulate matter
  - Direct gamma radiation from ore and waste rock piles
  - Inadvertent ingestion of radionuclides and heavy metals
- Waste Rock
  - Same as for ore, but at a much lower level
- Silica
- Diesel Fumes

Health Effects – Mine and Mill workers Ongoing UWG/WES efforts

Assess Impact and Prevention of:

- Exposure to organic reagents used in separating uranium
- Inhalation of hazardous materials
  - Arsenic
  - Manganese
  - Selenium
  - Corrosives (acids, bases)
  - Biohazards
- General Mine Safety Hazards
  - Not specific to uranium mining

Health Effects – Mine and Mill workers
Ongoing UWG/WES efforts

- Review epidemiologic studies from the early 1950s to the 1990s when mining conditions were poorly controlled.
- Assess status of epidemiological studies reported for miners under current conditions
- Assess impact of current mining conditions with improved control of exposures
- Assess impact of smoking and lifestyle as confounding factors in epidemiologic studies of miners, particularly for lung cancer and other respiratory effects.
  - Non-work related accidents, alcoholism, homicide, suicide.

Economic Issues

Summary of Concerns for UWG Consideration

- Who will pay for damages to property or personal health?
- What mechanism will be established to ensure that persons affected will be “made whole”?
- Will revenues from operators be sufficient to fund regulatory programs and long-term monitoring of waste sites?

Transportation

Summary of Concerns for UWG Consideration

- If an initial permit is granted for a uranium mill in Virginia could ore and other radioactive materials from Virginia and beyond be transferred to the mill?
- If so how will transportation of ore and other radioactive material be regulated?
- What are the risks from transporting ore?

Public Participation/Transparency

Summary of Concerns for UWG Consideration

How will the public be involved and kept up-to-date on deliberations, decision-making, and monitoring related to uranium mining and milling?

Public Participation/Transparency

- The agencies are assessing improvement in the Environmental Impact Analysis (EIA) process to increase the opportunities for meaningful and timely public input and comment on proposed uranium mining/milling projects.
- Uranium Working Group Web Site
  - http://www.uwg.vi.virginia.gov/
- Additional Public Meetings
  - Uranium Working Group: October 17th, 2012; Chatham
  - Uranium Working Group: November, 2012; TBD