Uranium Mining in Virginia

The Threat to Your Water is Still There

Attachment 7

Apologies and Thanks from Mike Pucci, President of Roanoke River Basin Association

- Mike Pucci, President of the Roanoke River Basin, sends his apologies to you all. He has ended up being required to appear for depositions regarding the affects of Duke Energy's coal ash situation on the Roanoke River Basin. He is in depositions in that case in Chapel Hill as we speak.

- Mike also thanks you all very much for agreeing to meet and discuss the mutual concerns of maintaining clean water for use by our citizens. He thanks you as well for working in concert with RRBA to protect against uranium mining in the past.

A Little Bit About Mike Pucci

Mike Pucci is President of the Roanoke River Basin Association, a 71 year old advocacy organization created to monitor the water quality in the Roanoke River Basin. he is the third President in the history of the group started by Harold Carowan and succeeded by former IBM executive, Gene Addesso.

Mike is a graduate of the University of the University of Wisconsin at Stevens Point with degrees in Biology, Natural Resource management and Secondary education.

Mike was hired by Glaxo Inc. shortly after his graduation and moved up rapidly from sales representative in 1982 to VP of Sales in 1992. Mike's career moved into strategic management of the Sales training and leadership development programs and finished as VP of Advocacy in the Federal Government Affairs group where he led an industry initiative to support the value of medicine, interacting with all the major companies in the industry and working with the leading PR firms in the world to get our message of value out.

Mike retired in 2010 and moved to his lake home at lake Gaston. He is now the Head of the RRBA, member of the Lake Gaston Chamber of Commerce, President of his home owners association, and CEO of a start up company with innovations that hold promise to cure breast and colorectal cancer. He led the North Carolina coalition Against Uranium mining and gained the support of governor McCrory And the NC legislature to oppose Uranium mining in the Roanoke River basin.

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A LONG LOOK AT URNAIUM MINING THROUGH THE 1980's

Beginning in 1981 with HJR 324 – the Virginia General Assembly looked at the notion of allowing uranium mining in Virginia. The Coal and Energy Commission's Uranium Subcommittee was tasked with evaluating the potential environmental effects of all associated uranium mining activities, including mining, milling, and exploration. It spent the next several years doing so and with the assistance of outside consultants, produced a number of reports.

- In 1982, legislation was passed establishing a temporary moratorium by prohibiting state agencies from accepting applications for mining was established until July 1, 1983.
- During the 1983 Legislative Session, legislation was passed that established the Uranium Advisory Group (UAG). Additionally, legislation was passed extending the moratorium until July 1, 1984 and added the provision and "until a program for permitting uranium mining is established by statute."
- In 1984, the Uranium Subcommittee and UA submitted their draft legislation ***without endorsement*** for consideration during the 1985 Legislative Session. Ultimately, that legislation was re-referred to the Mining and Mineral Resources Committee where no action was taken on the legislation.
- No further action was taken by landowners until 2007, which was the impetus for the 2008 legislation.

RECENT PAST LEGISLATION ON URANIUM MINING

2008 General Assembly Session:

- SB 525 Uranium Mining Commission; established, report. Introduced by: **Frank W. Wagner** (Tabled in Rules by voice vote.)
- SJ 107 Uranium; joint subcommittee to study mining in State. Introduced by: **Richard L. Saslaw** (Stricken at Patron's request in Senate Rules Committee.)
- 133 Radioactive waste, low level; Department of Health to study long-term options for disposal thereof. Introduced by: **A. Donald McEachin** (SJ100-Cuccinelli incorporated into SJ133 – ***Passed*** on voice vote in Senate Rules.)

2013 General Assembly Session:

- SB 1353 Uranium; establishes process for DMME to issue permits for mining of uranium ore, report. Introduced by: **John C. Watkins** | **Richard L. Saslaw** (Stricken at the request of Patron, in Senate Agriculture, Conservation and Natural Resources Committee.)
- SB 919 Uranium; 3% state severance tax on receipts of any severed from earth in State, proceeds. Introduced by: **John C. Watkins** (Stricken at the request of Patron in Senate Finance Committee)
- HB 2330 Uranium; establishes process for DMME to issue permits for mining of uranium ore, report. Introduced by: **Jackson H. Miller** (Left in House Commerce & Labor Committee)
- HB 1804 Uranium; establishes 3% state severance tax on receipts of any severed from earth in State. Introduced by: **Jackson H. Miller**

What's Happened Since Defeating Efforts to Mine Uranium?

Following the election of Governor McAuliffe, the Canadian mining company switched tactics to attempt to lift the ban in the courts.

- The first suit filed (against the State of Virginia) in Danville Federal court was heard and the case was summarily dismissed after one hearing that lasted less than an hour. The Canadians have appealed and we do not expect a different outcome given the lack of evidence in their position and the overwhelming decision against them in the first trial.
- A second suit was filed in the Coal mining region of Wise county in state court by the Canadians with a different approach, arguing that Virginia, by its moratorium has "stolen property rights" from the company (disregarding that they bought the property knowing full well there was a moratorium in place at the time of acquisition and no regulatory framework for such an activity was provided in the State of Virginia) that part of the suit was also thrown out in the first hearing.
- A second hearing will be held in Wise county with the Canadians suggesting the The State of Virginia is obligated by law to create regulations for Uranium mining and milling. That case will be heard in the fall of 2016. We cannot handicap the outcome at this time, but regardless of the outcome it will likely be appealed by the losing party and the case will continue into the future.
- The same Canadian company filed a $25M settlement in Quebec for similar circumstances and one opinion on this matter is that the mining company is trying to reclaim its costs due to the moratorium.

OTHER REASONS FOR VIRGINIA URANIUM TO CONTINUE CURRENT EFFORTS

The market for uranium globally has plummeted due to:

- The planned closing of 8 nuclear plants in the US;
- Closing of 25 plants in Japan following the Fukushima disasters at 2 reactors;
- The far lower cost of plentiful natural gas, without having the concerns of nuclear waste disposal and meltdown threats.

Currently the spot price for a pound of processed Uranium stands at $28/pound.

- It costs about $30-$40 per pound to mine and mill the product.
- Essentially, the value of the uranium in Chatham Virginia stands at $0.00.

This is why it is believed the mining company is tying up the state of Virginia in court, ostensibly to recoup its costs in the failed effort to lift the ban.

The Roanoke river Basin Association continues to monitor and focus resources and time on this important matter and will continue to update parties in Virginia and North Carolina who depend on the Roanoke River for their drinking water.

POSSIBLE MUTUAL CONCERNS

The Coal Ash Threat

- Following the largest coal ash spill in history into the Dan River, Duke Energy is moving quickly to excavate the Dan river site and move the coal ash to lined facilities in their own property in North Carolina and in a facility in Virginia.
- Duke has agreed to do the same at 7 other sites in the state, but is balking at cleaning up sites that represent a similar threat as the Dan River at their Mayo and Roxboro Steam stations in the Roanoke River Basin. With the support of the Southern Environmental Law group, the RRBA is suing Duke to excavate both sites and move the ash to lined facilities. RRBA believes it is an open and shut case and expects to prevail in court to force Duke to do the right thing and clean up these sites which are leaking toxins into the Roanoke as we speak, illegally and without permit, with data verified by the NC DEQ and their own data at Duke. The largest utility in the world cannot avoid the facts against them in these cases.

Future Threats

- RRBA is also concerned about nutrient pollution from high volume chicken and pork production that may move into the area, and is planning to develop a strategy to manage risks from these activities should they become reality. The primary reason the Hampton Roads region is drawing its water from Lake Gaston today emanates from this sort of unmitigated threat in the Chesapeake Bay over the last several decades. RRBA will develop a strategy for effective buffers to built into regulations to manage this issue if it arrives at its riverfront.

TODAY'S ASK

Following the recent sudden death of our Executive Director, Andrew Lester, who was a former employee of the City of Virginia Beach and a longtime resident of Danville, Virginia, we are seeking a full time executive director to engage on the issues we have outlined. Andrew was essentially a volunteer, accepting a $1,000 paycheck per month. We were blessed to have someone so devoted and in a position to accept so little to do so much.

RRBA is now seeking a fulltime person to organize our efforts in Virginia and North Carolina, and we are seeking your help in raising $50,000 for the person and resources necessary to continue Andrew's efforts.

RRBA is currently raising funds for its operations from the local county governments and cities and its member base, and that effort will continue. Most of the rural counties in the region in both NC and VA are very poor. However, this is so important that they have contributed a combined total of $21,000 this year so far - $10,000 from Pittsylvania, and $2500 from two other counties. By the end of this year, RRBA anticipates $20-$30 thousand in contributions from the local counties. ***(During the most recent uranium fight, RRBA aggressively reached out to everyone, everywhere. These communities understood the implications of uranium mining on their lives and livelihoods and dug deep - in the neighborhood of $200,000.)*** Your generosity toward this request will guarantee Hampton Roads a full time director to work on your behalf to protect your drinking water from the threats discussed. This person will be your "boots on the ground."

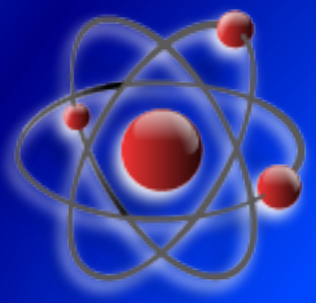
The RRBA has the highest reputation for success on these issues and we seek to continue to win with your help. We suggest perhaps 25K from VA Beach 15K from Norfolk and 10K from Suffolk and Chesapeake, to start the discussion. Our finances are managed by a professional accounting firm in Gasburg, VA (B&B Accounting), our books are audited each year, and our reputation and integrity match our record of operational success.

Attachment 7

THANK YOU!

CommonHealthVA – Oppose Uranium Mining

City of Virginia Beach Uranium Mining Impact Study



July 25, 2016

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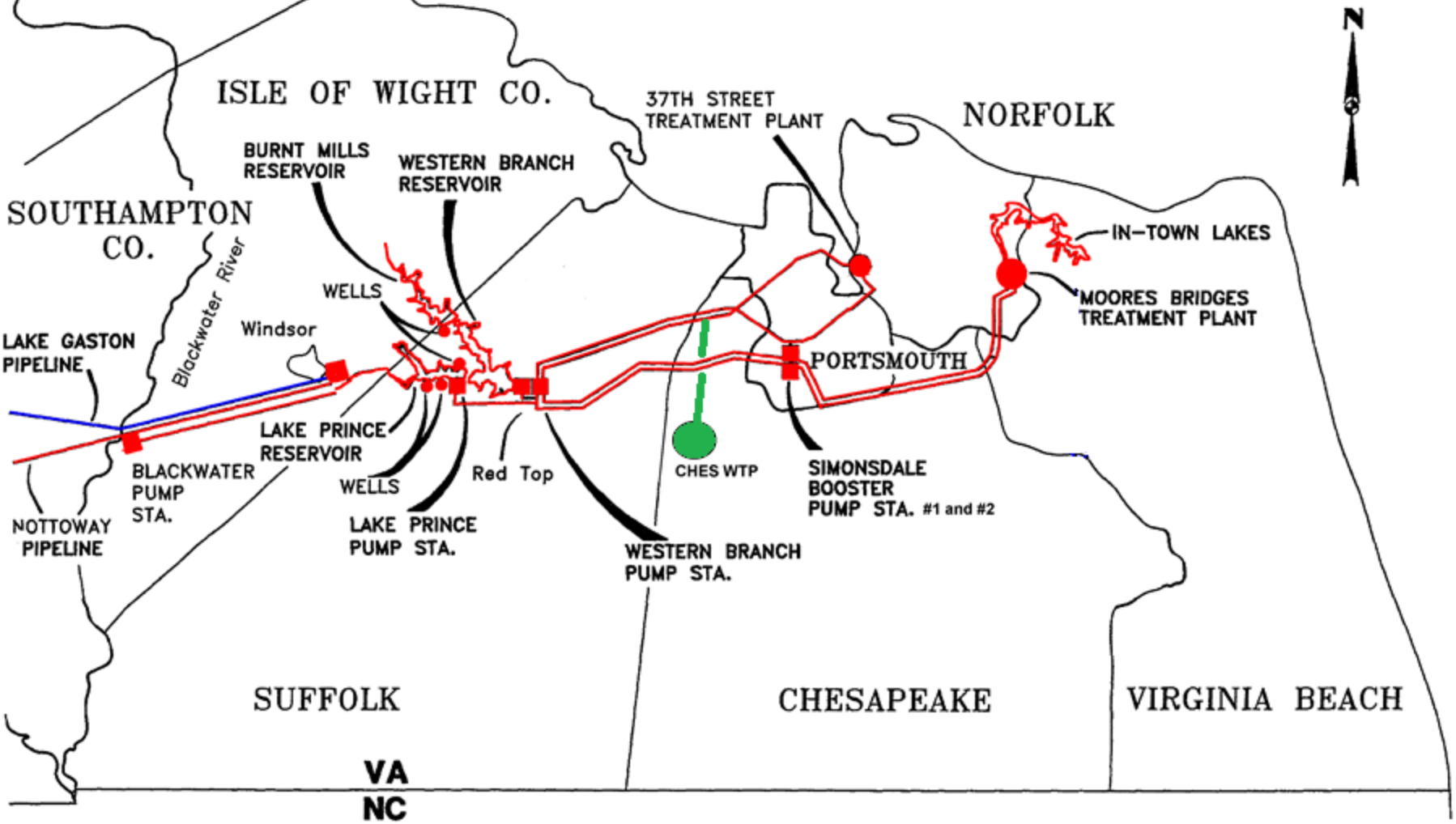
Water Systems Receiving Lake Gaston Water

Norfolk, Chesapeake, VA Beach



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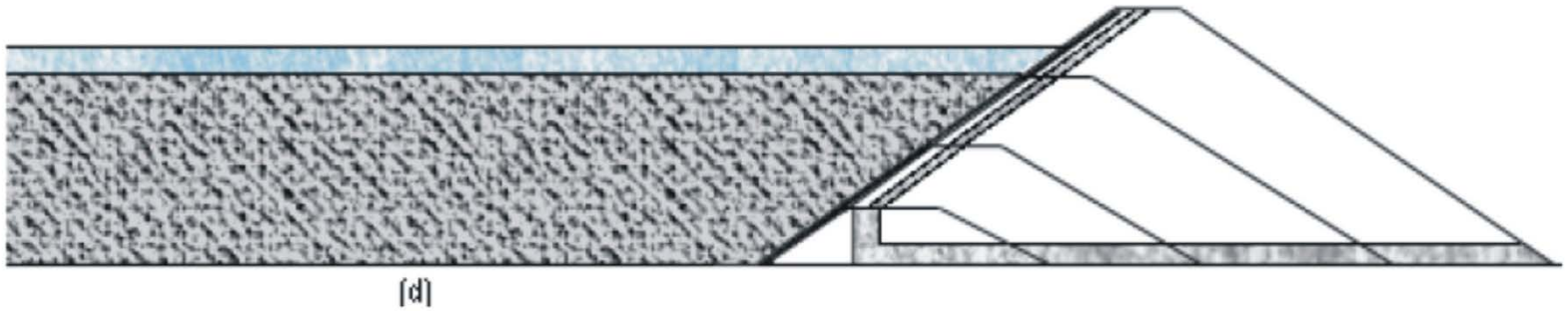
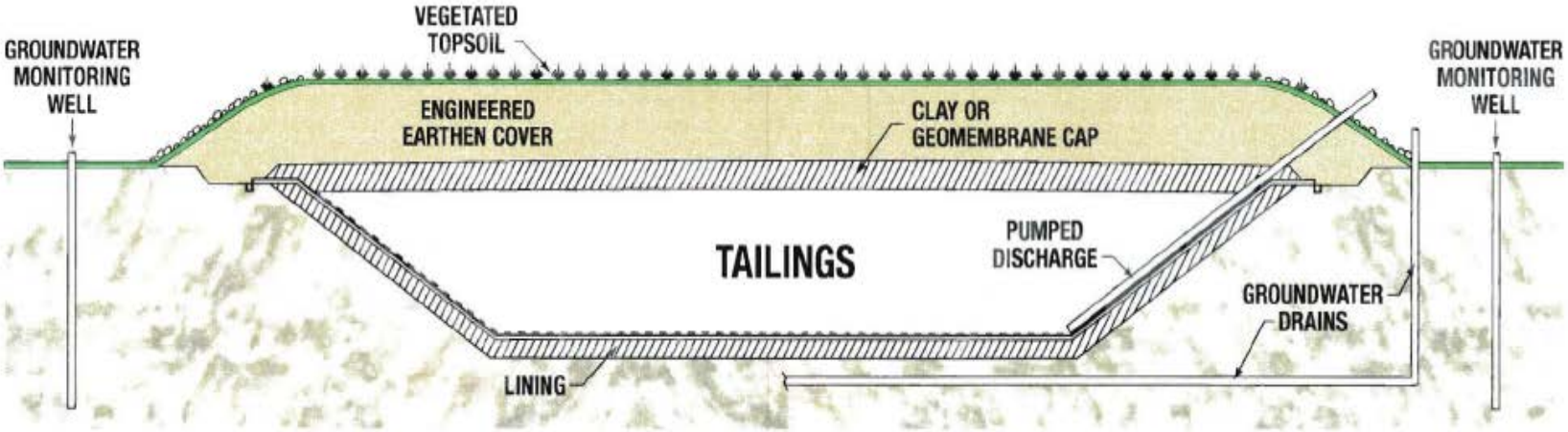
Uranium Mining in Virginia

- Excavate uranium ore: 25-100 M tons of rock
- Grind ore into sand and clay-like particles
- Leach out uranium – about 0.1% of the ore
- Dispose of tailings – about 99.9% of the ore
  - Tailings retain 85% of the total radioactivity for hundreds of thousands of years
  - Unlike original ore (buried solid rock), tailings are highly mobile via air and water
  - 20 – 76 MCY of tailings must be secured in disposal cells that may be above or below grade

Above Grade vs Below Grade



downstream tailings dam design
(a) start up state
(d) final state



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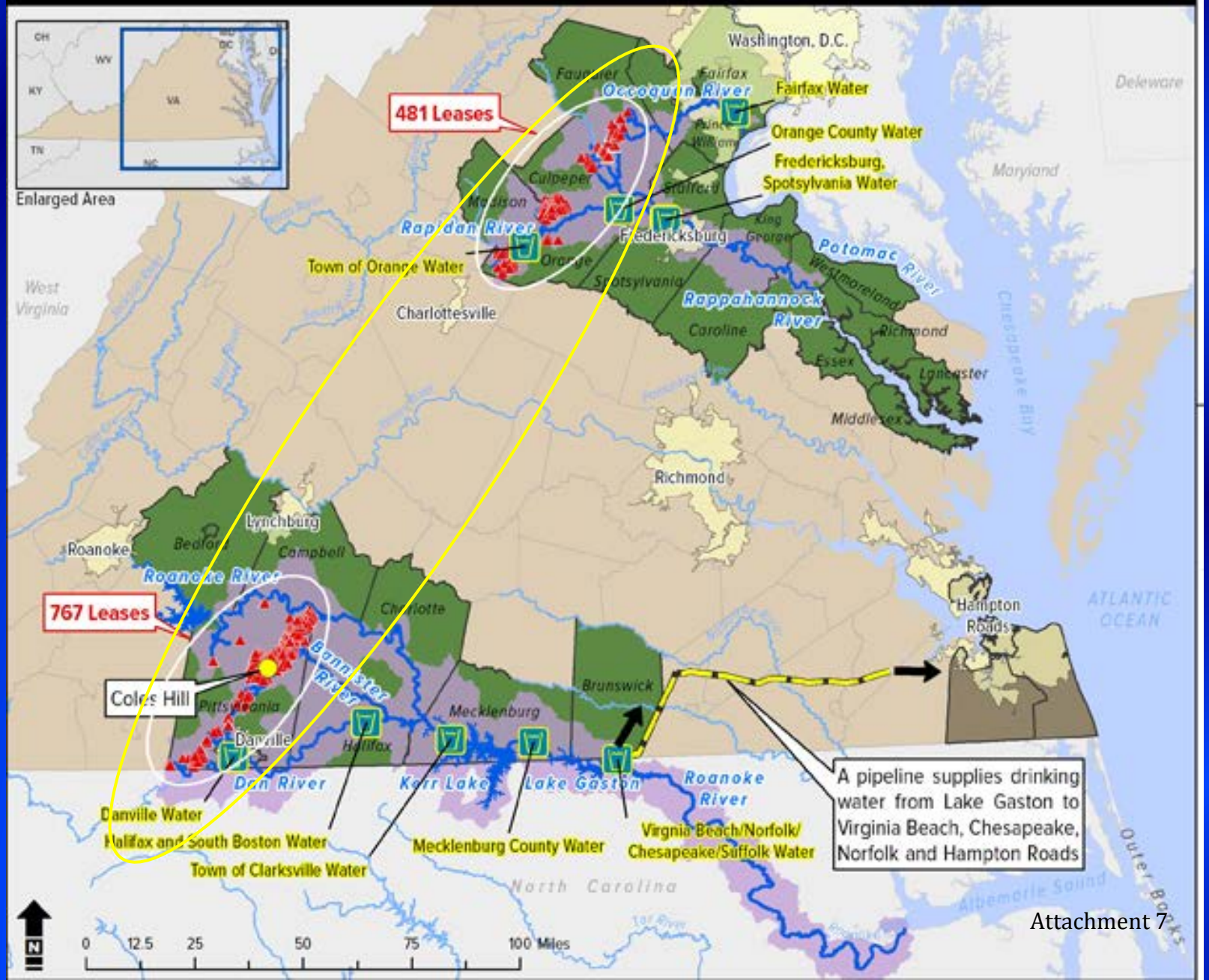
Localities Downstream From Possible Uranium Exploration



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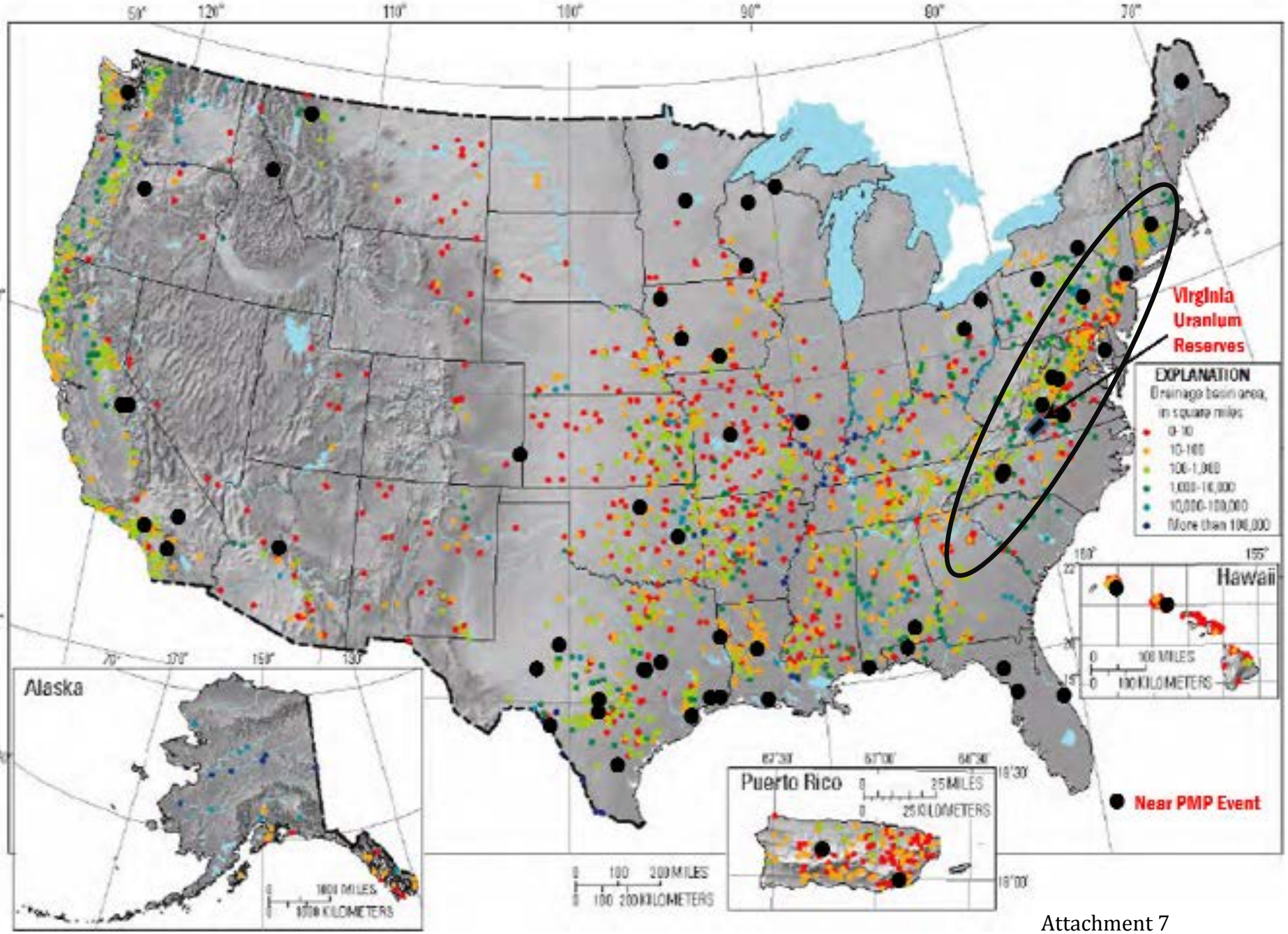

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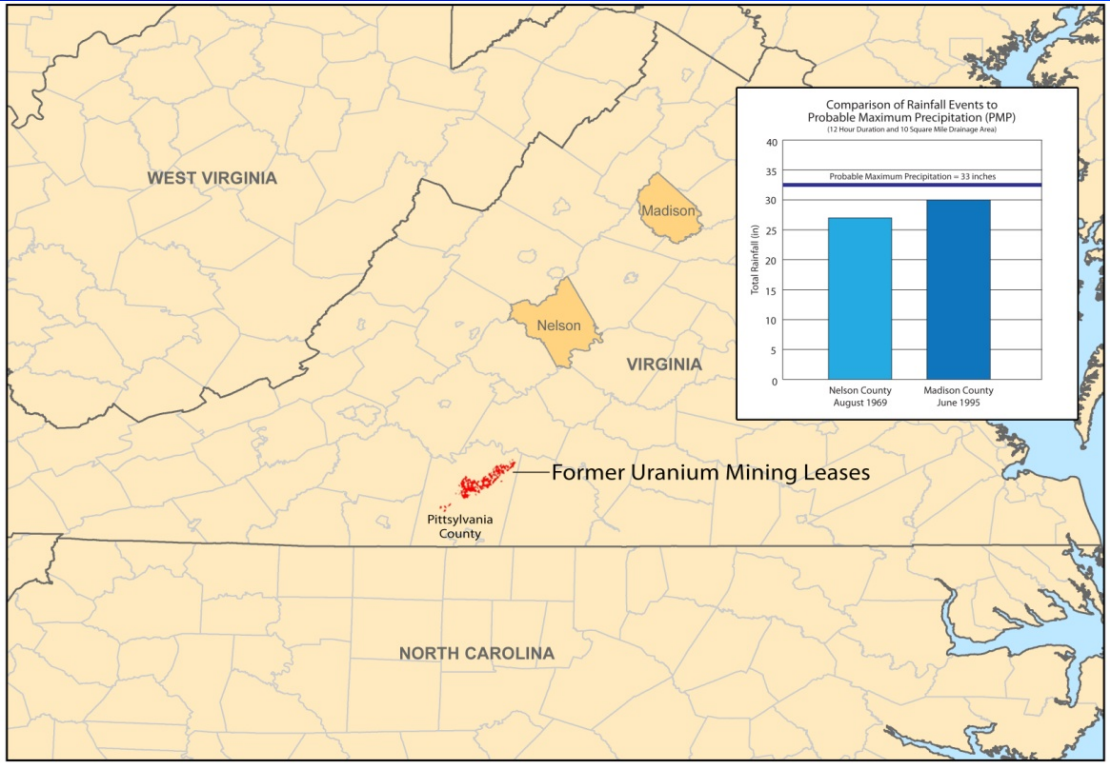
Near PMP Storms in Virginia

- **Examples:**
  - Nelson County – August 1969
    - 27 – 31 inches in 8-hours (Hurricane Camille)
  - Madison County – June 1995
    - 30 inches in 14 hours



National Academy of Sciences Study

- Uranium mining in VA has the potential for significant, long-term environmental impacts
- Tailings disposal cells represent significant long-term risks and may release tailings if not designed, constructed and maintained to withstand such events, or fail to perform as planned

NAS on the Existing Regulatory Framework

- Virginia has no experience with uranium mining
- Nuclear Regulatory Commission has no experience in wet climate states and high precipitation events
- *"there are gaps in legal and regulatory coverage for . . . uranium mining, processing, reclamation, and long-term stewardship."*
- *"there are steep hurdles . . . before mining and/or processing could be established within a regulatory environment that is . . . protective of the health and safety of workers, the public, and the environment."*

What if a Catastrophe Happened?

- Will the concentrations of radioactive pollutants increase above standards and for how long?

Virginia Beach/Michael Baker Computer Model Study

- The model simulates the downstream impacts if a tailings cell failed as a result of a catastrophic precipitation event
- Worst case scenario for a single, above grade cell failure on the Banister River
- The event is very unlikely and one that technology and regulations should prevent

But Technology and Regulations Don't Always Prevent Catastrophes

- 1976: Grand Teton Dam – Failed while being filled
- 1979: United Nuclear Corp – 0.5 million cubic yard (MCY) radioactive tailings spill
- 2000: Massey Energy – 1.5 MCY coal ash spill
- 2008: TVA Kingston Fossil Plant – 5.0 MYC coal ash spill
- 2010: Deep Water Horizon – Oil well blowout
- 2011: Fukushima Daiichi Nuclear Plant – Tsunami
- 2014: Duke Energy – Sunny-day coal ash spill

Below Grade vs Above Grade Disposal Cells

- The threat to surface water will be dramatically reduced if the tailings are stored below grade
  - Nuclear Regulatory Commission (NRC) regulations strongly encourage below grade disposal, but make exceptions for groundwater conditions or economic feasibility issues
  - Engineering study ruled out below-grade storage at Coles Hill because of groundwater conditions

Below Grade Disposal is not Assured

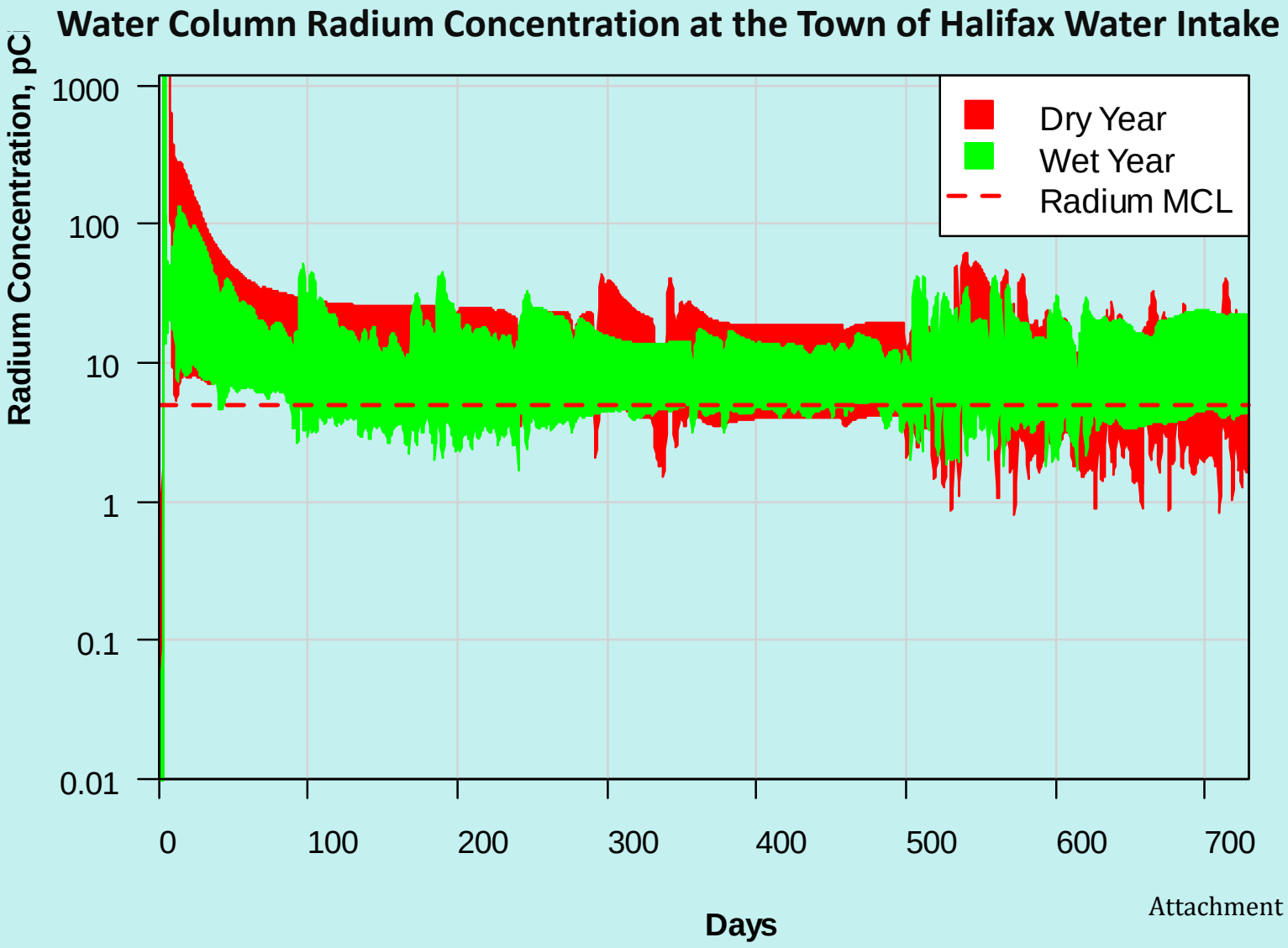
- Although NRC Regulations strongly encourage below- grade disposal, the Piñon Ridge, CO mine – only mine permitted in 30 years – was approved with above grade disposal
- VA Uranium studies (DEC 2010, Jun 2012) are both based upon above grade storage
- No assurance that the NRC (or groundwater conditions) will allow below grade storage
- Proposed 2013 legislation would not have guaranteed below grade storage

NAS on Below Grade Disposal

[T]he use of partially above-grade tailings facilities cannot be discounted. For example, the uranium mill, the first new uranium mill in the United States in a generation, recently received license approval from the state of Colorado. At that site, full below-grade tailings disposal was considered the best option, but a partially above-grade design with perimeter berms satisfied the relevant regulations and was recommended following detailed site-specific characterization. Therefore, the potential hazard of a sudden release resulting from the failure of a constructed retaining berm remains. An aboveground tailings dam failure (e.g., due to liquefaction associated with a seismic event, an exceptionally high rising rate from local precipitation, improper spillway design leading to overtopping) would allow for a significant sudden release of ponded water and solid tailings into receiving waters.

Source: Uranium Mining in Virginia, NAS Committee on Uranium Mining, December 2011, responding to arguments lodged against the Baker model. Emphasis added.

Impacts to Banister River



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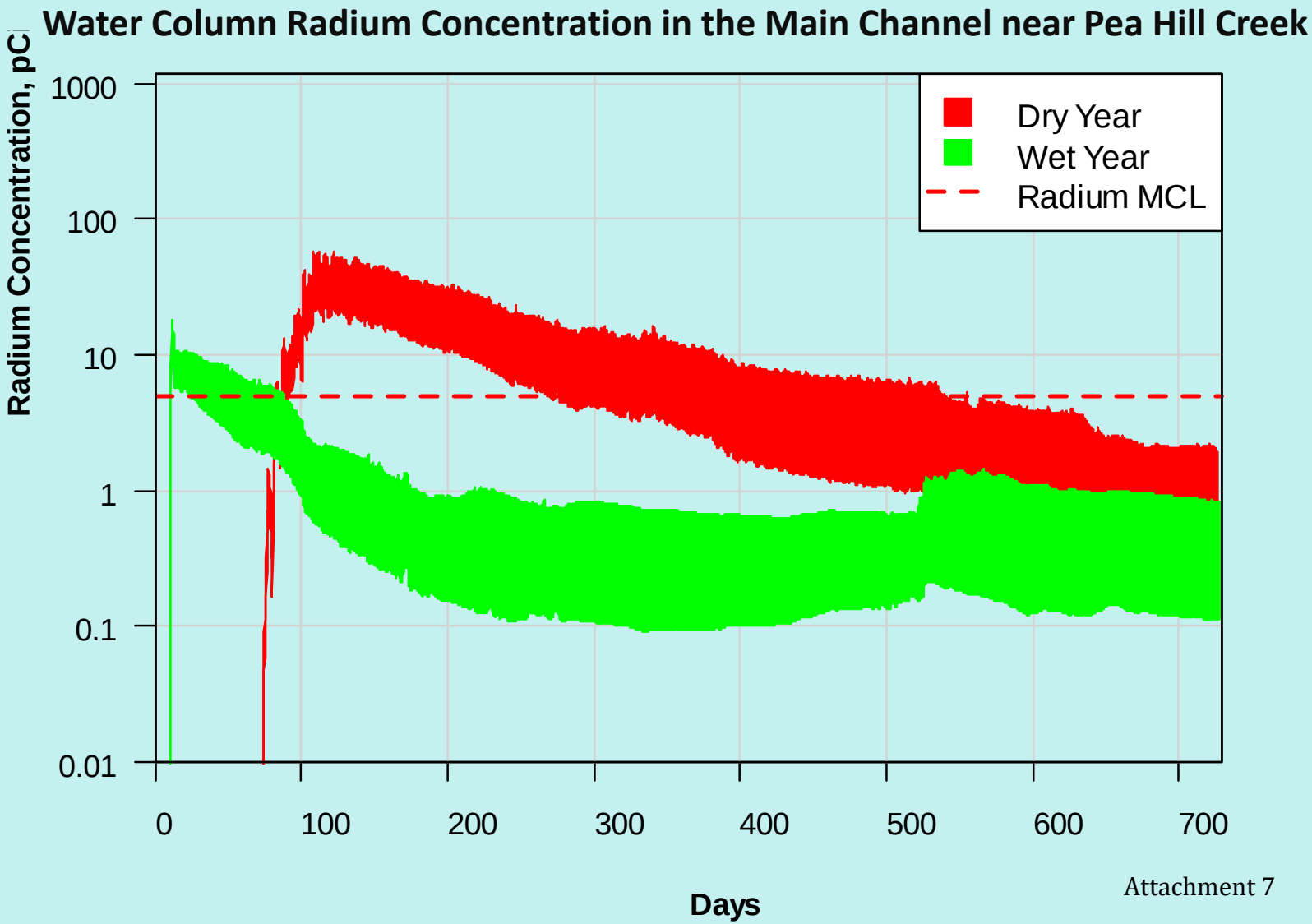
Impacts to Lake Gaston



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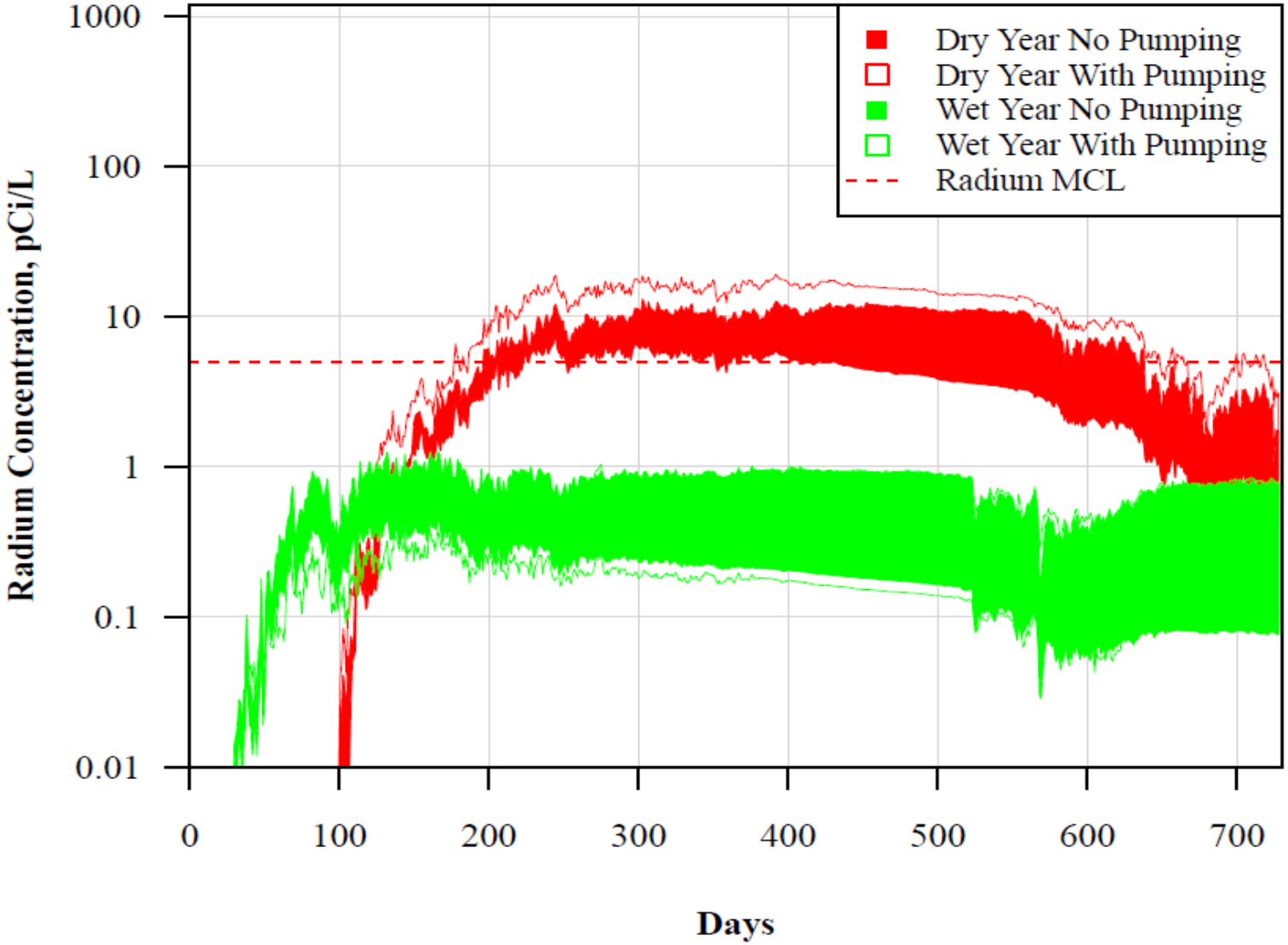
Water Column Radium Concentration (G−Branch−A−Intake)



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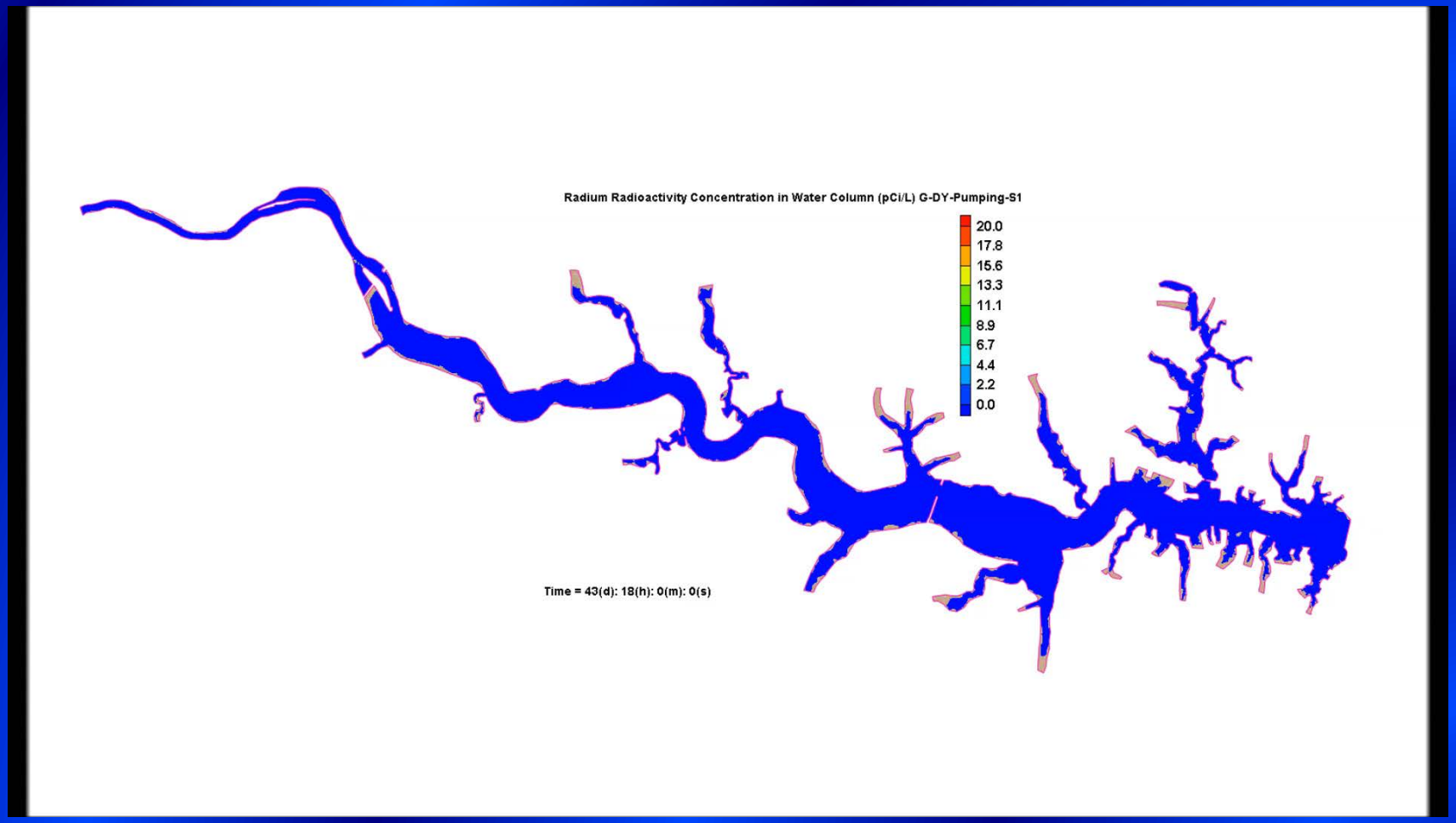
Tailing Cell Failure Model Results
Dry Weather, Radium in Water Column



VA Beach/Baker Study Results

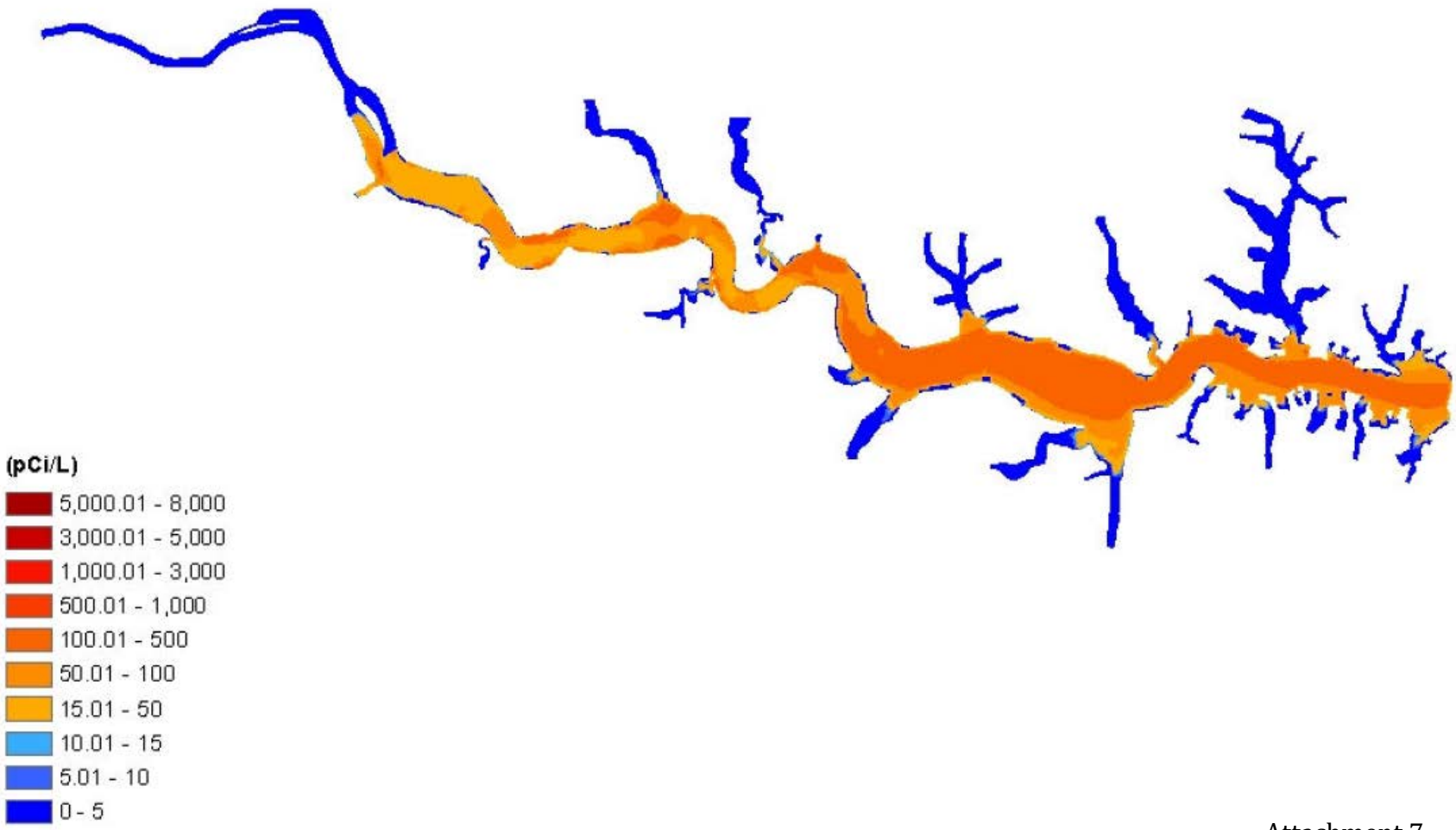
- Of the three contaminants modeled, radium has the most impact in the water column in terms of the SDWA and CWA
- 10-20% of radioactivity goes to the water column and flows downstream, thru Kerr & Gaston
- 80-90% of the radioactivity settles in the river and reservoir beds
- Radioactivity in the sediments is a far more significant and longer-term issue

Attachment 7

Fate of the Tailings

Water Body	Fraction of Contaminants Remaining in Sediments 2 years After Tailings Release		
	Radium	Thorium	Uranium
Banister River	54% - 83%	77% - 84%	67% - 78%
Kerr Lake	0.1% - 3.4%	2.3% - 4.2%	0.4% - 3.3%
Lake Gaston	0.03% - 0.4%	0.2% - 0.5%	0.1% - 0.6%

Radioactivity in Lake Gaston Sediments After 2 Years – Phase 2 Model



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Uranium Mining in VA: Bottom Line

- The necessary regulatory framework is not in place and there are “steep hurdles” to overcome before it could be
- Extreme natural events combined with human errors could result in a significant tailings release from above grade tailing disposal cells
- Long-term impacts are radioactive sediments in Banister River, Kerr Reservoir, and Lake Gaston
- Even small releases could be significant to Banister River and headwaters of Kerr Reservoir

Questions?