

March 14, 2014

297 Davis-Hyman Road  
Norlina, NC 27563

The Honorable Governor of Virginia Terry McAuliffe  
Office of the Governor  
State Capitol  
Third Floor  
Richmond, Virginia 23219

Dear Governor McAuliffe:

I understand that that you have stated your opposition to uranium mining. I therefore assume that you have been briefed on the controversial and potentially explosive issues.

I am attaching the following two-part documented analysis titled *The Mining of Uranium in Virginia: The Search For Science, Technology, Liability, Logic, and The Core Values of America's Founding Documents (the Declaration of Independence and the Constitution of the United States of America)* to strengthen the case against uranium mining and against the exploration of potential uranium mining sites in Virginia.

Part 1 focuses on a concern you have stated publicly: safety, and Part 2 on the absence of standards of principle consistent with core values of America's founding documents and on states'-rights issues regarding cross-border and interstate radioactive contamination. To quote the conclusion:

Best Practices regulatory frameworks for the mining of uranium lack an empirically reliable and interpersonally available verification basis for believing the fundamental ALARA assumptions on which the regulatory frameworks are based and for shifting the regulatory emphasis from containing to monitoring radioactive waste.

A permanent ban against the mining of uranium in Virginia and against the exploration of potential uranium sites throughout Virginia is needed to protect and defend the general welfare of Virginia, North Carolina, this region of the South, the Eastern Seaboard, and beyond, and to preclude a Constitutional crisis concerning the most serious and potentially explosive states'-rights issues inherent in the proliferation of nuclear waste and in the prevailing toxic, hazardous, and nuclear waste model for economic development.

I have provided a table of contents, in-text parenthetical citations, and a works-cited page. I have reiterated selected main points at the end of Part1 and Part 2 for a quick overview.

Thank you for your stand against uranium mining.

Respectfully,

Ken Ferruccio, North Carolina Citizens Against Uranium Mining; Past Spokesman /  
President, Warren County Citizens Concerned About PCBs; and past Co-Chair, Joint  
Warren County/ State (NC) PCB Landfill Working Group

Copies: The Honorable Governor of North Carolina Pat McCrory  
Members of the Virginia and North Carolina Legislatures  
North Carolina Attorney General Roy Cooper  
Environmental and Civil-Rights Leaders  
Members of Local, State, and National News Media

***The Search for Science, Technology, Logic, Liability, and  
The Core Values of America's Founding Documents***  
**By Ken Ferruccio**

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## PART 1: SAFETY

### REGULATORY SHIFT OF EMPHASIS FROM CONTAINMENT TO MONITORING

The waste management frameworks of the Environmental Protection Agency (EPA) and the Nuclear Regulatory Commission (NRC) lack an empirically reliable and interpersonally available verification basis for believing that radioactive waste can be isolated from persons and properties during and after uranium mining and milling operations and contained in perpetuity during and after waste disposal operations.

It is an inescapable reality, an empirical fact, that waste containment structures continue to fail and contribute to the pervasive contamination of the public health and environment. It is therefore not surprising that the rationale informing the Virginia Uranium Mining Working Group's *Final Report* is not a rationale emphasizing regulations for containing waste. It is a rationale emphasizing monitoring waste based on the ALARA standard: "Radiological exposures to workers and environment will be as low as reasonably achievable" ([Final Report]*The Commonwealth of Virginia 2012 Uranium Working Group Report*, November 30, 2012. Print. 26).

### REGULATORY SHIFT OF EMPHASIS FROM CONTAINMENT TO MONITORING UNACCEPTABLE

The shift of emphasis in the *Final Report* from containing to monitoring radioactive waste is not acceptable. It is common knowledge that the nuclear industry's greatest vulnerability is that it has not been able to solve its waste management problem. Containment structures continue to fail and cannot be plausibly defended.

The shift of emphasis from containment to monitoring does not solve the waste management problem. Safety standards must take precedence over all other concerns, but the NRC legally authorizes radiological exposures within allegedly safe maximum contaminant levels that continue to be scientifically controversial, instead of protecting persons and properties from contamination to begin with.

### REGULATORY SHIFT FROM CONTAINMENT TO MONITORING BASED ON UNVERIFIABLE ASSUMPTIONS

The ALARA "standard" is unacceptable also because the NRC waste management regulatory framework lacks an empirically reliable and interpersonally available verification basis for believing the two fundamental assumptions upon which the regulatory shift of emphasis from failed containment to monitoring is based: (1) that safe maximum contaminant levels can be known and (2) that, theoretically speaking, radiological exposures can be kept from exceeding allegedly safe maximum contaminant levels.

## THE FIRST ASSUMPTION

The first assumption (safe maximum contaminant levels can be known) is not believable because even assumptions concerning what were legally permissible and thought to be safe radiological exposure levels for routine diagnostic purposes and medical treatments have been found to be unsafe and harmful to health, for example, “past permissible levels of x-rays” linked to “incidence[s] of childhood leukemia “ (Harding 93).

In fact, permissible radioactive levels tend to keep changing. According to Harding, ““permissible radiation levels have had to be reduced ten-fold since the 1990s” (93), hence the tentative nature of setting theoretically safe maximum contaminant exposure levels, perhaps because safe radioactive doses do not exist and therefore cannot be known, or because, supposedly, epidemiology has yet to establish evidence that low and moderate radioactive exposures over extended periods of time are not harmful to health.

Vakil and Harvey state that “standards of acceptable exposure in Canada and elsewhere have been reduced many times in past decades, as evidence has mounted of more deleterious health effects” (4).

Furthermore, the Health Physics Society mentions “the inconsistent application of risk assessment in the establishment of radiation protection regulations . . . not well coordinated among federal agencies and therefore [causing] public confusion and concern,” for example, “100-1000-fold discrepancies in permissible exposure levels among various regulations, all based on much the same scientific risk assessment data” (“Uncertainty in Risk Assessment”).

## RADIOACTIVE RISK ASSESSMENT: THE THRESHOLD MODEL, THE LINEAR NO-THRESHOLD MODEL [ALARA] AND THE SUPRALINEAR MODEL

Belief or disbelief in the ALARA assumption that safe exposure levels can be known depends on sources chosen: (1) the scientist ; (2) the regulatory agency; (3) the presence, absence, reliability or unreliability of epidemiologic studies - - especially concerning the significance, or lack of significance, of moderate and low doses of radiation) and (4) assumptions informing radioactive risk assessment models: the threshold model, the linear no-threshold model (LNT), and the Supralinear model.

## Karl Morgan: From Threshold to No Threshold to Supralinear to NRC Ostracism

Karl Z. Morgan, the founder of Health Physics and founding member of the International Commission for Radiation Protection, which sets standards that the Atomic Energy Control Board (AECB) uses and defends, concluded from a study that “ ‘there [were] more radiation induced cancers per unit dose [ . . . ] at low doses than at high doses [especially regarding the inhalation of lower levels of ionizing alpha radiation] . . . . All mixed models tested did much better than the linear models’ ” (qtd. in Harding 93). According to Harding, “the linear models suggest the risks are proportionate to the dose [an ALARA assumption], whereas the mixed models test assumptions about disproportionate risks at lower levels” (93).

Morgan therefore departed from the threshold model (Moore 30), which is based on the assumption that radiation “is safe up to some threshold dose” (Cameron), in favor of the linear no threshold model, assuming there may be a risk at all levels and the risk “is proportionate to the dose down to zero dose” (Cameron).

Eventually, Morgan rejected also the linear no-threshold model [ALARA] in favor of the supralinear approach, assuming that “ ‘ Down at the very low doses . . . you actually get more cancers per person-rem than you do at high doses [ . . . ] High levels will more often kill cells outright, whereas low levels of exposure tend to injure cells rather than kill them, and it is the surviving injured cells that are cause of concern’ ” ( qtd. in Moore 30). Moore explains that “a damaged cell may become cancerous over time” and continues to quote Morgan: “It divides, it divides again, and again, and, on the average, if it is leading to a solid tumor, after 30 years it will be large enough that it will be recognized as a malignancy”(Moore 30).

Moore argues that Morgan realized “more stringent protective measures were needed [than the linear no threshold approach]. But once he rejected the LNT [ALARA approach] in favor of the supralinear approach, he had moved beyond the [NRC] establishment paradigm, and the industry ostracized him for it” (30).

It should be noted that “in a 2012 study on atomic bomb survivor mortality data, low-dose analysis revealed unexpectedly strong evidence for the applicability of the supralinear theory. From 1950-2003, more than 80,000 people studied revealed high risks per unit dose in the low dose range from 0.01 to 0.1Sv (Beyea).

### JAN BEYEA: Repeated Low Doses of Radiation Can Cause More Damage than High Doses.

Writing as guest editor for *The Bulletin of the Atomic Scientist*, Jan Beyea, PhD in nuclear physics, theorized as Morgan had that small doses could actually be disproportionately



worse” and challenged also the linear no-threshold theory that “the relationship between dose and effect is linear - that is, if a big dose is bad for you, half that dose is half that bad, and a quarter of that dose is one quarter as bad . . . .”

According to Beyea, “doses spread out over time might be more dangerous than doses given all at once and suggested two reasons: first, some effects may result from genetic damage that manifests itself only after several generations of cells have been exposed, and, second, a “bystander effect” in which a cell absorbs radiation and seems unhurt but communicates damage to a neighboring cell, which can lead to cancer.

Beyea discussed three studies suggesting the risk from doses spread out over time “is no lower, and in fact may be higher, than from single exposures.”

### THE NO-THRESHOLD MODEL SETS THRESHOLDS

ALARA -- subscribed to by the National Research Council and the U.S. Department of Energy -- (Matanoski et.al. S94) is based on the the linear no-threshold risk assessment model (United States Department of Energy [DOE]).

The names of the threshold model and ‘the linear no-threshold model’ are misleading because the linear no-threshold model (ALARA), sets thresholds. But while the threshold theory assumed “zero risk” up to a threshold, the no-threshold theory assumes (1) that “there may be some risk at any dose,” (United States Department of Energy [DOE]), (2) that the “the risk is proportionate to the dose down to zero dose” (Cameron), and (3) that to reduce the exposure is to reduce the risk (DOE). The threshold dose is set, based on epidemiological studies when available, and “ALARA is applied to reduce the risk “(Matanoski et al, S94).’

### JOHN GOFMAN: NO THRESHOLD DOSE

John Gofman challenged the ALARA assumptions that to reduce the exposure is to reduce the risk. According to George Washington’s Blog, “*The Bulletin of Atomic Scientists* reported that one of the best known scientists of the 20th century, -- Doctor John Gofman -- also believed that chronic low level radiation is more dangerous than acute exposures to high doses.” Gofman stated his position clearly and unambiguously:

By any reasonable standard of scientific proof, human evidence demonstrates that there is no safe dose or dose rate below which dangers disappear. No threshold dose. Serious lethal effects from minimal radiation doses are not “hypothetical,” “theoretical,” or “imaginary.” They are real” (“What is Factually Wrong?”)

Gofman found nine studies of cancer produced by minimal radiation doses and presented the evidence to the American Chemical Association in Anaheim:

And I came up with nine studies of cancer being produced . . . .Four involved breast cancer. With those studies, as far as I'm concerned, it's not a question of "we don't know." The DOE [Department of Energy] has never refuted the evidence. They just ignore it because it's inconvenient. We can now say, there is no safe threshold. If this truth is known then any permitted radiation is a permit to commit murder ( On the Health Effects of Radiation: "There is no safe threshold").

Based on scientific studies, Gofman opposed the DOE's attempts to convince the public that exposures to low levels of radiation are safe:

If the public should come to learn the truth about ionizing radiation, nuclear energy and the atomic energy program of DOE is going to be dead. Because the people of this country -- and other countries -- are not going to tolerate what it implies. The key thing -- it's everything in the DOE program -- is " we must prove that low doses of radiation are not harmful." They have been conducting a Joseph Goebels propaganda war, saying there's a safe dose when there has never been any valid evidence for a safe dose of radiation. Yet the DOE continue to talk about their zero risk model [before the DOE changed to the linear no-threshold model] (On The Health Effects of Radiation)

#### GOFMAN'S PREDICTION REGARDING THE SAFE-DOSE CONCEPT

Concerning the implications of the allegedly safe-dose concept, Gofman made the following prediction:

[The Department of Energy doesn't] have to worry about nuclear waste. No problem-there's a safe dose . The cleanup and disposal of waste has been estimated to be in the billions if they're really going to clean up Hanford and the Savannah river and all the rest. You won't have to bury things in these fancy vaults. You won't have to worry about transport. You can even dispose of it in ordinary landfills. That will be the result. That's what the future will be. If low doses don't matter, the workers can get more and their families can get more by being in the vicinity. That's what we face. (On the Health Effects of Radiation)

#### LOW DOSES OVER TIME MAY HAVE HEALTH CONSEQUENCES

Setting the dose limit "as low as reasonably achievable" may have health consequences, an assumption consistent with (1) Morgan's study mentioned above that found

disproportionate risks at lower levels - -the study that found “ more radiation induced cancers per unit dose [ . . . ] at low doses than at high doses “[Harding 93]; consistent with (2) Morgan’s rejection of ALARA in favor of the supralinear approach to risk assessment; consistent with (3) the nine studies cited by Gofman, linking the lowest doses of radiation to cancer; consistent with (4) other experts, including Beyea, who, as stated above, argued that small doses could be disproportionately worse, who challenged the ALARA assumption that the relationship between dose and effect is linear, and who cited studies suggesting “doses spread out over time might be more dangerous than doses given all at once.”

That low doses may have health consequences is consistent also with (5) at least “some nuclear industry employed scientists” who “by the mid-1980s had to acknowledge the new research on the greater relative risks from lower levels of radiation” (Harding 94).

The assumption that low doses may have health impacts is also consistent with (6) regulatory frameworks authorizing and facilitating the ALARA standard, which includes the assumption that there may be risks at any level of exposure. According to Matanoski et al., “ there will always be some imprecision in radiation risk and uncertainty associated with models used to derive the estimates” (S93-S94).

So it seems to follow that a fundamental question is how much risk will the public continue to accept from the nuclear industry’s experimental world of limited knowledge, scientific uncertainties, and controversies, how much risk from (1) the allegedly “safe dose’ concept” (2) from continued global contamination because of nonexistent safe nuclear waste disposal systems (3) and from the ALARA “ low-dose standard,” more likely to protect the nuclear industry from liability than the safety of workers and the environment because of the alleged absence of conclusive epidemiological studies and alleged absence of, or refusal to acknowledge the policy significance of, studies linking low and moderate doses of radiation to health effects over time?

#### INCREASED RISK OF LUNG CANCER FROM RADON IN URANIUM MINERS

The national Institute of Occupational Safety and Health (NIOSH) “found strong evidence for an increased risk for lung cancer in uranium miners” (*Final Report 47*). Radon “ is vented from underground mine workings (*Final Report 48*) and ‘emanates from exposed ore in pits (*Final Report 48*) and “from waste rock with slightly elevated uranium concentration” (*Final Report 49*). “EPA says that intake of uranium exceeding EPA standards [based on unknown safe exposure levels to radon (*Final Report 58*)] can lead to increased cancer risk, liver damage, or both”( *Final Report 47*) and that “radon is released during ore crushing (*Final Report 50*).

#### PERMISSIBLE RADON DOSE BASED ON RADIOACTIVE EXPERIMENTS WITH MINERS

“Radon, the second leading cause of lung cancer after smoking, is an alpha emitter “ (Vakil and Harvey 13) . . . capable of displacing electrons from atoms and molecules and [along with beta and gamma radiation] is referred to as ionizing radiation” (13), and although “there is no known safe level of exposure to radon, EPA has set maximum “required monitoring frequencies” (*Final Report* 58).

Alpha and beta radiation “can discharge their alpha particles directly into the structures of the cell, damaging the cell’s content, including its DNA . . . Damaged DNA can trigger many diseases in humans such as cancer, mental retardation, birth defects, chromosomal abnormalities and inheritable diseases” (Vakil and Harvey 13).

The National Institute for Occupational Safety and Health (NIOSH) recommended maximum allowable annual “radon decay product exposure to . . . underground miner[s] . . . based on results of epidemiologic studies of lung cancer in miners . . . “(*Final Report* 58).

But because of the health implications of exposure to radon, and because there are no known safe exposure levels to radon, shouldn’t underground miners have been isolated from it, instead of being exposed and monitored for the epidemiological purposes of the uranium mining industry or for any other purpose, when possible?

#### INFORMATION MEETINGS MISLEADING ABOUT RADON

Furthermore, information concerning the danger of radon is sometimes misleading. For example, at an Atomic Energy Control Board information meeting in Baker Lake, Saskatchewan, Canada, (March 1-2, 1989) concerning the pervasive contamination from uranium mines, the “short half-life (3.5 days)” [of radon was discussed], “as though its danger disappeared in a short time” (Harding 96).

However, not discussed was “that it was possible for radon gas to travel 1,000 km with a wind of 10 km/hour before one half of it had decayed . . . . Nor was it mentioned that this radon gas was constantly being replenished from the radium in the tailings (with a half life of 1600 years), nor that the radium was constantly being replenished from the decay of thorium (with a half life of 76,000 years)” (Harding 96).

For other “constituents of concern, routes of exposure, principal affected organ(s) and potential Adverse Health Effects” see *Final Report* 51-52 . For “Potential Pathways of Public Exposure by Source,” see 48-50.

#### **THE SECOND ASSUMPTION: RADIOLOGICAL EXPOSURES CAN BE KEPT WITHIN SAFE MAXIMUM CONTAMINANT LEVELS**

The second assumption (that radiological exposures can be kept within safe maximum contaminant levels) depends on the first assumption -- that safe exposure levels can be

known in the first place, and it presupposes some sort of control of exposure levels. But control of exposure levels would seem to require an emphasis on containing the waste, but the containment emphasis has shifted to the monitoring emphasis because of the scientific consensus that the containment principle continues to fail, a position supported in the *Final Report*.

## FAILURE OF CONTAINMENT

Concerning containment of radioactive waste, although an “encapsulating design” with the same components and design as failed modern landfills is illustrated in Section G of the on-line Virginia Uranium Mining Working Group’s *Final Report*, the regulatory frameworks make it unambiguously clear that the components of encapsulating designs fail and that uranium mining cannot be done without contamination. Another containment alternative would be “disposal of tailings in mine workings” but “ would also have the potential to impact groundwater” (*Final Report* 26. See also “*Why Best Practices” Do Not Justify Lifting the Ban on Uranium Mining, and Milling [and disposal]: A Response to the Washington Post,*” Deborah and Ken Ferruccio. January 5, 2013. Print/Web.; and *Deconstructing EPA and NRC Waste Management Regulatory Frameworks,* Ken Ferruccio. July 13, 2013 *ej-pp.org* Web: 11 Mar. 2014).

## THE INSIDE-OUTSIDE CONTAINMENT-STRUCTURE HYPOTHESIS

[The Department of Energy doesn’t] have to worry about nuclear waste. No problem-there’s a safe dose. -- John Gofman

Since the containment principle continues to fail and has therefore lost all credibility as a safety standard, it would seem that the only alternative the nuclear waste management industry has for trying to convince the public that uranium mining can be done safely is to argue that levels of radiation monitored outside of containment structures will pose no greater risk to the public health, natural resources, environment, quality of life, and the economy than radiation inside containment structures if contaminants do not exceed allegedly safe (but legal) maximum contaminant exposure levels as high as legally achievable and as low as reasonably achievable -- hence the regulatory shift of emphasis from containment to monitoring and the use of the allegedly safe (but legal) maximum contaminant exposure level concept, and the “as low as reasonably achievable “safe-dose” standard to protect companies from liability while contaminating persons and properties in perpetuity, even while ALARA is based on the assumption that there may be some risk associated with any dose.

Given the failed history of containment, radioactive waste, whether inside or outside containment structures, will lead to the same result: pervasive and destructive radioactive contamination of persons and properties. The inside-outside containment hypothesis leaves the public with no believable safety standard at all. The regulatory shift of emphasis from containment to monitoring is unacceptable because monitoring cannot

prevent radioactive contamination to workers and environment, It can only detect contaminants.

However, monitoring cannot detect safe maximum contaminant levels because they have yet to be proved to be more than a theoretical concept. Since the NRC has abandoned the “zero percent discharge” standard for containment facilities, the regulatory rationale has shifted to monitoring.

The Myth of Containment: “Water, water, every where,  
Nor any drop to drink”  
- Samuel Taylor Coleridge

According to the *Final Report*, waste water from radioactive containment facilities would be discharged into state waters used for drinking and recreation if the ban against uranium is lifted.: **“While it may be possible to prohibit the discharge of process water from a potential mill, some dewatering of mill tailings ponds may be necessary [into state waters]” (34). An appointed State Advisory Committee would establish “any special standard water quality criteria to protect waters downstream from any potential mining and milling operation “ (34).**

What procedures could possibly assure the reliability of monitoring data and the truthfulness of those who control it, even if safe exposure levels could be known? For example, “The Texas Commission on Environmental Quality (TCEQ) spent two decades under-reporting radiation levels in local water supplies, which helped water districts avoid fines but which exposed residents to potentially harmful radioactive elements” (“Texas”).

When waste containment structures fail (usually built near drinking water sources), as when Duke Energy’s coal ash pond in Eden, NC, leaked an estimated “ 50,000 to 82000 tons of ash [later estimated at 39,000 tons] into the Dan river with at least 27 million gallons of water ” (Henderson, “Duke Energy’s Eden plant reports coal-ash spill ”), principal responsible parties shifted responsibility, claiming they didn’t know that “a 48-inch stormwater pipe beneath an unlined ash pond was not reinforced with concrete” (Henderson, “Broken pipe metal, not concrete”). But wasn’t it their responsibility to know?

According to *The News and Observer*, “Federal officials said “ . . . it’s unclear how big a risk the spill poses for Kerr Lake, one of the Southeast’s largest reservoirs and the first lake below the spill,” (Henderson, “Duke Energy, EPA work to halt spill ”) and later that “ the spill resulted in sludge and silt coating more than 70 miles of the Dan River, from Eden to Kerr Lake,” (Murawski, “Duke Energy faces spill fine”).

The public may never know for sure the extent of contamination in the Dan River, Kerr

Lake and Gaston Lake because of the discharge of contaminated waste water from Duke Energy's coal ash container in Eden. If the ban against uranium mining in Virginia were lifted, the public would never know for certain if waters from the Dan River, Kerr and Gaston Lakes were safe for drinking and recreation..

#### THE STANDARD FOR CONTAINMENT FACILITIES MUST BE ZERO PERCENT DISCHARGE

The public must insist that the ban against uranium mining in Virginia be permanent, that the exploration of potential uranium sites cease and desist permanently, and that there be "zero percent discharge" of contaminants into clean water sources, including existing and potential sources of drinking and recreational waters. In other words, the Environmental Protection Agency's *Clean Water Act* needs to protect clean water sources and not permit dewatering of waste facilities into clean drinking and recreational waters based on allegedly safe contaminant levels or on any other basis.

One thing is certain: Duke Energy set the precedent for discharging water contaminated with coal ash and toxic metals from a "containment" facility into the Dan River, which seems to have been standard operating procedure for a long time. According to D.J. Gerken, lawyer for the Southern Environmental Law Center, "DENR has known since 2009 that Duke has been dumping stormwater contaminated by industrial pollutants into the Dan River without a permit" (Murawski, "Duke Energy faces spill fine").

#### DUKE ENERGY MUST DREDGE UP COAL ASH

The contamination of drinking and recreational waters will continue if the public does not insist that the very first and immediate step for Duke Energy must be to dredge up the coal ash and other contaminants. It took Duke Energy to pave the way, intentionally or unintentionally, for the mining of uranium in Virginia by discharging coal ash, which, according to Havistendahl, is "more radioactive than nuclear waste," into state drinking and recreational waters along with toxic metals.

The second step is to secure the safety of the waters by ending the plan to mine uranium in Virginia, forever. Had the contaminants into the Dan River been tailings from uranium encapsulating structures polluting the Dan River, Kerr and Gaston lakes, one wonders if the environment, health, and natural resources, the economy, and quality of life would have ever recovered, or whether this region of the South would have become, by Duke's intentional or unintentional fait accompli, a forced radioactive wasteland for the convenience of Duke's industrial waste, the uranium mining industry and, potentially, the national and international dumping ground for disposal of radioactive and hazardous waste in perpetuity.

To quote Harding: "What nuclear country wouldn't jump at . . . a chance to dump its nuclear wastes and make money at the same time?" ( Harding 230). Furthermore, a

dumping ground for the global nuclear system has yet to be found, nor has one been found for the Southeast Regional Low-Level Radioactive Waste Compact since North Carolina withdrew as potential host state. Virginia is a member of the compact. A place to store radioactive waste is becoming critical. The Barnwell **low-level regional** radioactive waste facility consists of approximately **235 acres** but Barnwell's leaking landfill has reached more than ninety-two percent of its storage capacity and is not serving the needs of the region.

The proposed uranium site in Virginia has potentially approximately **3,400 acres**, and the tendency has been to establish the foothold, then expand outward from it. The establishment of the dewatering foothold seems to have already begun as a fait accompli, a gradual acceptance of the use of state waters for dewatering waste facilities. Virginia's uranium is not even needed, but would necessitate a proliferation of landfills (encapsulating designs) and the "safe dose concept" for the dewatering of radioactive waste facilities into Virginia's and North Carolina's drinking and recreational waters.

Duke Energy established a foothold for discharging industrial contaminants from a containment structure into waters used for drinking and recreation, and with the foothold could come a mindset of public indifference if Duke Energy does not **(1) restore the contaminated waters to the environmental quality prior to the coal ash spill (2) remove all coal ash ponds from proximity to drinking water sources; (3) stop discharging its contaminated waste water into drinking water sources, (4) find a way to pay for the cleanup and related waste management operations without passing the costs on to the consumers by raising the price of energy, and (5) and commit to zero percent discharge of contaminants from waste facilities into clean water sources.**

#### POWER WITHOUT ACCOUNTABILITY: BEHAVIOR WITHOUT CONSEQUENCES

Power without accountability, behavior without consequences and without unfettered, independent oversight, is not acceptable. The NC Department of Environment and Natural Resources (DENR) must not be permitted "to reopen a permit for Duke to drain water from its ash ponds into the Dan River," which, *according to the News & Observer*, is being considered (Henderson, "Agency May Order Duke Energy to Clean Up").

There are several ways to avoid legal liability for discharging waste facilities into actual and potential sources of drinking water, as if clean water sources were infinite. For example, companies responsible for polluting can go bankrupt like the company responsible for polluting the Elk River in West Virginia and start up polluting elsewhere under another name in this seemingly endless shell game. Or companies can simply pollute without significant consequences because of the EPA's *Clean Water Act*.

For Duke it's all about profit. The idea is to make money, not to lose it. Although "Duke Energy CEO Lynn Good said . . . that Duke won't pass along cleanup



costs to its customers (Jarvis “Dan River Damages Still Unfolding ), “Duke is likely to draw a line between cleanup costs of the Dan River spill, which it says customers won’t have to pay for, and the cost of removing ash from its ponds” (Henderson, “Agency May Order”).

Good is reported to have said also that “Duke expects to recover the cost of meeting upcoming federal rules on ash, and of closing retired ash ponds, through rates charged to customers ( Henderson, “Agency May Order Duke Energy to Clean Up.”).

Duke cannot be permitted to oversee itself regarding waste management operations. Unfettered, independent scientific oversight will be needed for the cleanup, if such oversight is even possible. Without such oversight, the destruction of environmental life support systems and the public health will most likely continue.

When a citizen at one of the Chatham, Virginia NRC public hearings asked the NRC how contaminants would be contained during mining, milling and disposal operations, the NRC official did not say that contaminants would be contained or controlled. He said they would be monitored. He could well have said that waste facilities would be discharged into Virginia’s and North Carolina’s drinking water (*Final Report* 34).

### Monitoring: Unreliability of Test Data and Those Controlling It

What procedures could possibly assure the reliability of monitoring data and the truthfulness of those who control it, even if safe exposure levels could be known? For example, “The Texas Commission on Environmental Quality (TCEQ) spent two decades under-reporting radiation levels in local water supplies, which helped water districts avoid fines but which exposed residents to potentially harmful radioactive elements” (“Texas”).

### PURPOSE OF MONITORING

It would seem that the alleged absence of (or refusal to acknowledge) epidemiologically-linked health impacts from low and moderate radioactive exposures over time would mean that the purpose of monitoring is not to protect workers and environment, but (1) to establish baselines and (2) to attempt to base maximum contaminant levels on human evidence.

If the moratorium is lifted, VDH should conduct an ecologic study of multiple cancer types in populations living near the facilities and a case-control study of cancers in children born near such facilities. (*Final Report* 48)

That the purpose of monitoring is to measure radiological exposures to workers and environment for epidemiological studies, and for data supporting a mining company’s regulatory compliance, and not to protect workers and environment, would seem quite

obvious in such regulations as the one stating that when harmful airborne emissions cannot be contained at the source,” Institutional controls, such as extending the site boundary and exclusion area may be employed to ensure that offsite exposure limits [regulations] are met, but only after all practical measures have been taken to control emissions at the source” (*Final Report* 3.4.2.: Air Monitoring).

The “institutional controls” do not pertain to “containment” of air emissions, but to “extending the site boundary and exclusion area” so that monitoring can demonstrate that the emissions remain within expanded site boundaries and are therefore in regulatory compliance. The purpose of this regulation is obviously not to protect persons and properties, but to protect the company from liability while it contaminates the environment. Given the inevitable failure of containment structures, the site boundary and exclusion area would need to be perpetually expanded so that airborne contamination would be in compliance with regulations.

Regarding radon gas, how far would the site boundary and exclusion area need to be extended when harmful air emissions are traveling at high winds far beyond designated areas, before one half of it decays, and when radon gas is being constantly replenished from the radium in the tailings (with a half life of 1600 years), and when the radon is constantly being replenished from the decay of thorium (with a half life of 76,000 years)” (Harding 96. See also *Best Practices*),

#### THE NUCLEAR INDUSTRY’S REGULATORY HIGH DOSE / LOW DOSE PROTECTION FROM LIABILITY STRATEGY

Gofman’s prediction seems to have come true: “ [The Department of Energy doesn’t] have to worry about nuclear waste. No problem-there’s a safe dose .”

Shifting the regulatory emphasis from containment to monitoring requires a legal defense on which to base the nuclear industry’s absolute freedom from liability, a legal defense authorizing “safe” maximum contaminant levels as high as legally achievable (AHALA) and authorizing “safe” radiological exposures as low as reasonably achievable (ALARA).

#### FREEDOM FROM LIABILITY: MAXIMUM CONTAMINANT LEVELS AS HIGH AS LEGALLY ACHIEVABLE

A uranium mining company may not be held legally liable for contamination if contamination does not exceed legally authorized and allegedly safe maximum contaminant levels (the whole freedom-from-liability game). For example, although it was discovered that the low-level radioactive waste facility in Barnwell, South Carolina, was contaminating a nearby stream and the Savannah River, the company’s license was renewed because the contamination was in compliance with regulations (The South Carolina Environmental Law Project).

It logically follows that the nuclear industry has an incentive to ensure that a uranium mining company can avoid liability and revocation of license while it contaminates the environment by setting the permissible and theoretically safe maximum contaminant levels as high as legally achievable (AHALA) to circumvent the failed waste containment problem.

It would seem that setting high exposure levels would undermine the company's freedom from liability because "cancer risks are **demonstrably** increased by exposure to exceptionally high radiation doses" (Risks) and therefore it would seem that high doses of radiation linked to health effects could be easier to link to company liability than low doses.

However, "natural" background levels of radiation are continuing to increase above what were considered low or moderate exposures. Because permissible exposure levels are added to natural background levels ("Risks"), it would seem obvious that as background levels increase so do permissible exposure levels.

Conducive to the nuclear industry's freedom from liability is the difficulty, if not the impossibility, of differentiating "natural" background levels from (1) "military and industrial [background levels added] during the atomic age . . . ((2) atomic testing; (3) mining and milling of uranium; and (4) the buildup of nuclear waste and reactor emissions and leaks" (Harding 93). How would the liability of the industry be contradistinguished from such a complexity of alternative explanations?

It is therefore to the nuclear industry's advantage to have radioactive background levels of radiation (baselines), as high as legally achievable, to circumvent the containment problem, even when invalidated by empirical data. Independent scientific oversight unfettered from the nuclear industry would seem unlikely, considering what has been called a self-regulatory, "highly integrative and secretive industry" (Harding 130).

#### FREEDOM FROM LIABILITY: RADIOLOGICAL EXPOSURES AS LOW AS REASONABLY ACHIEVABLE

The uranium mining industry has a freedom-from-liability incentive to set theoretically safe levels of exposures to workers and environment not only as high as legally achievable but as low as reasonably achievable as well.

The poison is in the dose: The lower the dose, the lower the risk. The lower the risk / dose, the greater the difficulty in detecting any increase in the number of cancers possibly attributable to radiation.  
(Final Report 57)

The ALARA standard is based on the low safe-dose assumption, but cause and effect

relationships between doses as low as reasonably achievable and health effects transcend present epidemiological knowledge.

According to Matanoski et. al. "The most contentious issue in radiation risk assessment revolves around the estimation of risks at very low doses and dose rates - - small increments of exposure only slightly above background radiation" (S93).

"Risks in this dose range cannot be studied with sufficient precision by direct epidemiological investigation, although epidemiologic studies of populations accumulating moderate to high doses of radiation over an extended time can inform the discussion of risks at low doses (S93)

The World Nuclear Association states in an article titled "Risks of Low-Dose Ionizing Radiation" "that as a matter of scientific evidence, cancer or other adverse health effects have not been clearly and consistently discerned in connection with low doses of radiation (below approximately 100 mSv.[According to the World Nuclear Association, biological impact of radiation is measured in a millisievert, "a unit that expresses both the amount of exposure and its potential damage to human health."]) In fact, the risk [of adverse health effects from low radiological exposures] is so low, even theoretical, that it cannot be unambiguously detected by the methods currently available to epidemiology. . . ." (Risks).

Furthermore, "also controversial is the concept of a "collective dose" of radiation that aggregates possible tiny doses of exposure over long periods of time and across wide areas to postulate a potential health risk to a wide public. Application of the "collective dose" concept carries both dose assessment and health risk assessment far beyond their ranges of proven scientific validity and cannot provide a legitimate basis for public policy." (Risks)

The argument that "as a matter of scientific uncertainty, cancer or other adverse health effects have not been clearly and consistently demonstrated in connection with low doses of radiation" (Risks) would seem to be an industrial incentive for keeping doses as low as reasonably achievable because the absence of epidemiological evidence connecting low and moderate doses and health effects over an extended period of time would seem to ensure a freedom from liability when attempts are made to attribute health impacts to low and moderate doses from the mining operation over time.

It should be noted that as stated above, Gofman found nine studies of cancer produced by minimal radiation doses and presented the evidence to the American Chemical Association in Anaheim. Morgan found more radiation induced cancers per unit dose at low doses than at high doses, especially regarding the inhalation of lower levels of ionizing alpha radiation]. Beyea also challenged fundamental assumptions of ALARA, citing human evidence.

However, it does seem that the ALARA concept was formulated precisely because until risks at low and moderate doses have been repeatedly correlated with cancers and other diseases over long periods of time, the uranium mining industry's freedom from liability is assured.

Since permissible maximum contaminant levels are added on top of background levels of radiation that continue to increase while epidemiological evidence linking low or moderate doses of radiation to health effects over time continue to remain allegedly inconclusive or in absentia, it would seem to be the task of nuclear epidemiologists, nuclear lawyers, and other nuclear scientists to provide the calculus needed for the high-low regulatory exposure strategy to sustain not the environment, health, and natural resources, but the freedom from liability the nuclear industry continues to enjoy while legally and pervasively contaminating the globe in perpetuity.

### REGULATORY INCENTIVES

The incentives of the NRC regulatory framework are **(1) to avoid liability** by authorizing allegedly safe radiological contaminant levels **as high as legally achievable** external to waste containment facilities to circumvent the fact that radioactive waste can be neither contained nor controlled over time and **(2) to avoid liability** by authorizing radiological exposures to workers **as low as reasonably achievable** because the health impacts of incremental exposures to low and moderate doses of radiation over an extended period of time transcend present epidemiological knowledge (Risks; Matanoski et al.), transcend evidence connecting liability to uranium mining based on the ALARA standard.

The link between epidemiological science and the ALARA strategy exempting uranium companies from liability would seem to be this: The absence of epidemiological evidence is not evidence that low and moderate doses of radiation over time do not have significant risks. The evidence may yet be found. The search for knowledge must continue by exposing persons and properties, miners and environment, to low and moderate doses over extended periods of time to establish an epidemiological basis for "consistency of application of risk assessment in the establishment of radiation protection regulations . . . not well coordinated among federal agencies and therefore **[causing] public** confusion and concern," for example, "100-1000-fold discrepancies in permissible exposure levels among various regulations, all based on much the same scientific risk assessment data" (Uncertainty in Risk Assessment).

But because of a multiplicity of alternative explanations concerning theoretical cause and effect relationships between doses of radiation and health impacts, the studies can go on in perpetuity -- legalized, authorized, and facilitated by NRC and EPA regulatory frameworks, while uranium companies enjoy a profitable and absolute freedom from liability destroying persons and properties and environmental life support systems?

**Precisely where is the scientific basis for ALARA's assumptions that safe exposure levels during mining and milling and during and after disposal operations can be known and controlled in perpetuity, that risk is proportionate to the dose, and that low doses of radiation over time are not significant?**

**Precisely where is the rationale for safety that would justify the mining of uranium in Virginia based on verifiable assumptions, instead of on assumptions which may never be verified? The rationale is not to be found because of the limits of epidemiological investigation and, therefore, the absence of statistical power to predict.**

**The cornerstone of uranium mining, the cornerstone of the nuclear industry, is not based on a science for the people. It is based on a pseudo science for exempting companies from liability. It is based on ALARA.**

FREEDOM FROM LIABILITY: ABSENCE OF EPIDEMIOLOGICAL  
EVIDENCE OF  
CAUSE AND EFFECT RELATIONSHIPS BETWEEN RADIOACTIVE DOSES AS  
LOW AS REASONABLY ACHIEVABLE AND HEALTH IMPACTS IS NOT PROOF  
OF LIABILITY

It would seem to logically follow that nuclear scientists and lawyers defending companies from liability are likely to make some of the following arguments:

- (1) Radiological exposures to workers and the environment do not exceed theoretically safe but legal maximum contaminant levels,
- (2) Attributing cancers or other diseases to low or moderate doses of radiation over time is based on nonexistent epidemiological studies or on available but inconclusive studies, or on-going studies or on studies scientifically invalid, inconclusive by design, or flawed methodology.
- (3) There are many possible alternative explanations, a multiplicity of variables, (background levels of radiation indistinguishable from the company's radiological exposure levels) as well as behavioral, genetic, lifestyle, socio-economic, industrial explanations other than uranium mining, etc.
- (4) Therefore cause and effect relationships linking the uranium mining company to liability are purely hypothetical, without an empirically reliable and interpersonally available verification basis. **The absence of evidence is not proof of liability.** It is no cause for wonder that according to Harding, the nuclear industry has "absolute freedom from liability" (164).

However, as scientist Carl Sagan stated, “The absence of evidence is not evidence of absence.” The evidence may yet be available, but only by exposing human beings to levels of radiation over time, without knowledge of the consequences.

Best practices regulations for the uranium mining industry are based on fundamental assumptions concerning the ALARA standard that have not been, nor are likely to be, scientifically validated and therefore cannot be proved invalid in a court of law, hence the industry’s absolute freedom from legal liability, its absolute power without accountability.

#### THE NRC’S USE OF LOGICAL FALLACIES TO SHIFT THE REGULATORY EMPHASIS FROM CONTAINING TO MONITORING WASTE

The *Final Report* consists of logical fallacies such as contradictions, overgeneralizations, circular reasoning, as well as the red herring that shifts the emphasis from the fundamental necessity of containing the waste to monitoring it.

The *Final Report* would have the public believe **(1)** that safe maximum exposure levels can be known, but discusses radioactive constituents intrinsic to uranium mining for which safe exposure levels are neither known nor regulated, or are purely speculative and scientifically controversial, and for which arbitrary maximum contaminant levels are set. Even if safe exposure levels could be known, they could not be sufficiently contained, isolated from persons and properties.

The *Final Report* would have the public believe **(2)** that radioactive contamination can be kept within **unknown but safe** maximum contaminant levels, **(3)** that waste **can be contained in structures that continue to fail** (*Final Report*, Section G), and **(4)** that workers will be safe because although containment of waste continues to fail and consequently workers will be exposed to radiation, **they will be safe because they will be monitored.**

**(5)** Although monitoring can detect radiation, it can’t protect persons and properties from radiation. It cannot give reliable knowledge regarding safe exposure levels because they may be nothing more than a convenient concept to justify the industry’s continued failure to contain nuclear waste, but not an accurate description of reality.

Ironically, the public is expected to believe that ALARA will allegedly protect workers and environment because (1) the safety of low levels of radiation over time is unknown and perhaps unknowable (2) because the knowledge of health impacts from radiological exposures as low as achievable over time transcends direct epidemiological investigation; (3) because according to Matanoski et. al, ” The most contentious issue in radiation risk assessment revolves around the estimation of risks at very low doses and dose rates - - small increments of exposure only slightly above background radiation” (S93); (4) because there are among federal agencies “100-1000-fold discrepancies in permissible exposure levels among various regulations, all based on


much the same scientific risk assessment data” (Uncertainty in Risk Assessment) and (5) Because the argument for containment has been abandoned by the industry!

## HUMAN EVIDENCE

The assumptions on which the *Final Report's* regulatory shift of emphasis from containing waste to monitoring it need scientific support based on epidemiological studies. So the uranium industry is targeting Virginia for corporate profit and to gather more epidemiological data, more “human evidence,” by exposing persons and properties to radiation in order (1) to test the theory that safe maximum contaminant levels are more than a concept (2) that they are real (3) that they can be known (4) that radiological exposures will not exceed maximum contaminant levels and that exposures can be controlled, even though Section G of the *Final Report* discusses why components of containment facilities fail.

And the uranium mining industry is targeting Virginia to test the feasibility of a fait accompli uranium Trojan Horse.

## THE URANIUM MINING INDUSTRY’S FAIT-ACCOMPLI TROJAN HORSE

There is reason to believe that the mining of uranium is simply a Trojan Horse to open Virginia’s door to national and international radioactive and hazardous waste (Anthony J. Thompson and Christopher S. Pugsley [Tompson and Simmons, PLLC, *United States Federal-State Licensing Permitting Regime Implicated by Uranium Development*])

## THE URANIUM MINING INDUSTRY’S REVERSAL OF VALUES

Radiation data are mainly from human studies . . . such as the atomic bomb survivors, uranium miners, and patients medically exposed to radiation.

Matanoski et al. (S93)

Monitoring workers and the environment deliberately exposed to unpredictable levels of radioactive contamination (and with considerable scientific uncertainty concerning allegedly safe maximum contaminant levels and with foreknowledge that exposures can neither be controlled nor contained) represents a deeply disturbing and unacceptable reversal of values. But the underlying reversal of values would be the use of uranium mining as a fait-accomplis Trojan Horse to open the doors of Virginia to regional, national and international radioactive, toxic, and hazardous waste

## VALUE OF VIRGINIA

The value of Virginia is not to be found in a uranium mining industry. It is not to be found



in the use of Virginians for experimental data to attempt to support theoretical assumptions concerning allegedly safe maximum contaminant levels. It is not to be found in delusional language games that seem like sound science and sound technology but which are only language games to dupe the public.

The value of Virginia is not in a decision to mine uranium that would determine the destinies of many Virginians without their consent and determine the destinies of other states and regions by exposing them without their consent to cross-border, interstate, and international radioactive contamination.

The value of Virginia, its future, its destiny, is not to be found in the *Final Report*. It is not to be found in best practices, nor in the transformation of Virginia into a national or international radioactive wasteland. The value of Virginia resides in the character, the courage, the reason and common sense, in the wisdom, the compassion, and the determination of its citizens, in their core values, their leadership and their stand against uranium mining -- in their absolute and unyielding resistance to the mining of uranium in Virginia and in their resistance to the exploration of potential sites for uranium mining.

Yet the destiny of Virginia does not reside in the people alone, but in their hopes, their trust, their faith, and their belief in you, Governor McAuliffe, in your core values, in your care, your character, your courage, and your leadership.

Their desire is that through your leadership, and the leadership of governors that follow you, the iconic state of Virginia will continue to be worthy of the immortal words that inspired this nation to affirm its sovereignty, its freedom, its dignity, equality, and self-government, its unalienable rights-- words that may yet be heard and known in the character, courage, and aspirations of Virginians, words that must continue to be heard in the Jeffersonian Capital on a hill in Richmond. The future of Virginia resides not only in words but in actions that facilitate a permanent ban against the mining of uranium and against the continued exploration of potential uranium sites.

I do hope, Governor McAuliffe, that the previous analysis and the analysis that follows will contribute to the case against mining uranium in Virginia.

Opposition to the mining of uranium will continue, not only because safe mining, milling, and radioactive waste disposal are impossible, but also because of the absence of standards relating to Constitutionally protected core values that are at odds with in-state, cross-border and interstate contamination, contamination having the most serious implications because of conflicting states'-rights.

## SELECTED MAIN POINTS OF PART 1

(1) The waste management frameworks of the Environmental Protection Agency (EPA) and the Nuclear Regulatory Commission (NRC) are unacceptable because they lack an empirically reliable and interpersonally available verification basis for believing that radioactive waste can be isolated from persons and properties during and after uranium mining and milling operations and contained in perpetuity during and after waste disposal operations.

(2) The ALARA “standard” is unacceptable because the NRC waste management regulatory framework lacks an empirically reliable and interpersonally available verification basis for believing the two fundamental assumptions upon which the regulatory shift of emphasis from failed containment to monitoring is based: (1) that safe maximum contaminant levels can be known and (2) that, theoretically speaking, radiological exposures can be kept from exceeding allegedly safe maximum contaminant levels.

(3) The regulatory shift of emphasis from containment to monitoring is unacceptable because monitoring cannot prevent radioactive contamination to workers and environment, It can only detect contaminants. But monitoring cannot detect safe maximum contaminant levels because they have yet to be proved to be more than a theoretical concept.

(4) Furthermore, the health impact from low doses of radiation over an extended period of time transcends present epidemiological knowledge, and “the most contentious issue in radiation risk assessment revolves around the estimation of risks at very low doses and dose rates . . . ” (Matanoski).

(5) The contradictory assumptions and conclusions of models for risk assessment on which to base decisions concerning safe maximum contaminant levels; the many safe-exposure level inconsistencies among regulatory agencies using the same risk assessment data; and the tentative, inconclusive, and purely speculative status of allegedly safe maximum contaminant levels do not justify radiological exposures to persons and properties, to workers and environment.

(6) The NRC ALARA regulatory framework cannot meet the kind of criteria the public has a right to expect and militates against the core values of the nation’s founding documents. The purpose of the regulations is clearly to legally exempt uranium companies from liability for contaminating workers and the environment in perpetuity and to provide epidemiologic data (human evidence) upon which to base allegedly safe maximum contaminant exposure levels in the future for the nuclear waste industry.

(7) Based on proposed regulations, it now seems that the ultimate intention is to use uranium mining as a fait accompli trojan horse into Virginia to proliferate waste containment facilities for national and international hazardous and radioactive waste.

(8) The difficulty if not the impossibility of contradistinguishing “natural” background exposures from legal maximum contaminant levels may be conducive to the company’s freedom from liability, especially when high exposure levels are at issue.

To complicate the liability issue “natural” background levels of radiation are continuing to increase above what were considered low or moderate exposures. Because permissible exposure levels are added to natural background levels (World Nuclear Association), it would seem obvious that as background levels increase so will permissible exposure levels.

(9) And since health impacts from **low radiological exposures** are scientifically controversial, inconclusive, and purely speculative, and transcend empirically-based epidemiological knowledge (World Nuclear Association), cause and effect relationships beyond a reasonable doubt are not likely in cases involving liability. ☒

(10) The incentive of the regulatory framework is **(1) to avoid liability** by authorizing as high as legally achievable and allegedly safe radioactive contaminant levels external to containment facilities to circumvent the fact that radioactive waste can be neither contained nor controlled, and **(2) to avoid liability** by authorizing radiological exposures to workers and environment **as low as reasonably achievable** because the health impacts of incremental exposures to low doses of radiation over time “transcend present epidemiological knowledge” (Risks; John’s Hopkins).

(11) The epidemiological-ALARA strategy exempting the nuclear industry from liability is this: The search for knowledge of health impacts from low and moderate radiological doses to workers and environment must continue by exposing persons and properties, miners and environment, to low and moderate doses over extended periods of time, perhaps, as stated above, to establish a needed “consistency of application of risk assessment in the establishment of radiation protection regulations . . . not well coordinated among federal agencies and therefore [causing] public confusion and concern,” for example, “100-1000-fold discrepancies in permissible exposure levels among various regulations, all based on much the same scientific risk assessment data” (Uncertainty in Risk Assessment).

(12) But since “the study of health impacts from exposures to low doses of radiation over time “carries both dose assessment and health risk assessment far beyond their ranges of proven scientific validity and cannot provide a legitimate basis for public policy” (Risks), studies can go on in perpetuity, legalized, authorized, and facilitated by the NRC while uranium companies enjoy a profitable and absolute freedom from liability.

(13) Although monitoring can detect radiation, it can’t protect persons and properties from radiation. It cannot give reliable knowledge regarding safe exposure levels because

they may be nothing more than a convenient concept to justify the industry's continued failure to contain nuclear waste, but not an accurate description of reality.

Nevertheless, ironically, the public is expected to believe that ALARA will allegedly protect workers and environment because (1) the safety of low levels of radiation over time is unknown and perhaps unknowable (2) because the knowledge of health impacts from radiological exposures as low as achievable over time transcends direct epidemiological investigation; (3) because according to Matanoski et. al, "The most contentious issue in radiation risk assessment revolves around the estimation of risks at very low doses and dose rates - - small increments of exposure only slightly above background radiation" (S93); (4) because there are among federal agencies "100-1000-fold discrepancies in permissible exposure levels among various regulations, all based on much the same scientific risk assessment data" (Uncertainty in Risk Assessment) and (5) Because the argument for containment has been abandoned by the industry!

## **PART 2: THE STATE OF NORTH CAROLINA VS. THE STATE of VIRGINIA: STATES' RIGHTS VS. WASTE SITES**

### **BROADENING THE DISCUSSION**

Is there truly a science for the people? If scientific and technological standards to protect persons and properties don't matter and can't be agreed upon, how can there be harmony and justice in Virginia, North Carolina, the South, the nation, and the world?

Do not standards of principle such as unalienable rights and states' rights belong in the scientific and technological discussion regarding uranium mining and the siting of radioactive waste facilities? Is there not an independent science for environmental justice unfettered from the corporate plutocracy ?

### **CROSS-BORDER AND INTERSTATE CONTAMINATION IMPLICATIONS FOR STATES' RIGHTS**

The following is part of a letter written by the North Carolina Environmental Review Commission to Governor Bob McDonnell, December 13, 2012.

The [Environmental Review] Commission [of the North Carolina General Assembly] learned that the modeled impacts of a catastrophic breach of an aboveground uranium tailings impoundment on downstream water quality in Kerr Lake and Lake Gaston could result in radiation above the United States Environmental Protection Agency Maximum Contaminant Levels for up to three months during wet years and up to sixteen months during dry years. The North Carolina Department of Public Health and Natural Resources stated that a release of radioactive tailings could have devastating adverse socioeconomic impacts on the communities of northeastern North Carolina including

- ☒ Impacts to the public water supply of more than 118,000 North Carolinians
- ☒ Impacts to numerous industrial facilities
- ☒ Impacts on over 60 agricultural operations in Bertie, Granville, Halifax, Vance, and Warren Counties
- ☒ Impacts on recreation and tourism at Kerr Lake and Lake Gaston with possible economic losses of more than 15 million per year.

## STANDARDS OF PRINCIPLE

According to Doris Kearns Goodwin, Abraham Lincoln based his case against slavery on the *Declaration of Independence* and argued that “no man is good enough to govern another man without that other man’s consent” (167). To do so would be “a total destruction of self-government...” (167). Goodwin states further that, for Lincoln, “allowing slavery to spread [would force] the American people into open war with the *Declaration of Independence*,” for Lincoln, “the moral and philosophical foundation work of the nation” (167).

What may be said of men may be said of states, constituted by men and women: No state can determine the destiny of another state without its consent, neither by claims of sovereignty, nor by force, nor by legislation, nor by executive order, nor by words on paper, nor by preemption of rights, nor by any other means without the consent of the other state.

It would be “a total destruction of self-government,” and of the freedom and equality of North Carolina and of other states if Virginia were to determine their destinies by deciding to expose them to cross-border or interstate contamination without their consent. It would be for the government of Virginia to reduce the people of North Carolina and of other states to a condition of involuntary servitude (13th amendment) in perpetuity to a radioactive waste management industry and radioactive way of life destructive to persons and properties (14th amendment). It would be to deny North Carolina and other states due process and equal protection of persons and properties (14th amendment). North Carolina and other states would not even be given the opportunity to hold public hearings on the issue.

## THE 10th AMENDMENT

Therefore, anticipating a states’ rights conflict, the government of Virginia , **under a future pro-uranium mining governor**, may be predisposed **(1)** to formulate and attempt to pass waste management legislation, **(2)** or use the *Administrative Procedures Act*, or the Virginia Nuclear Energy Consortium Authority (operating without transparency and not subject to the *Freedom of Information Act*) to grant sovereignty to the state of Virginia concerning the decision to mine the uranium within its borders and expand radioactive waste facilities or, more likely, **(3)** simply base its right to do so on the 10th

amendment of the U.S. Constitution: **“The powers not delegated to the United States by the Constitution or prohibited by it to the states are reserved to the states respectively or to the people.”**

## COUNTERARGUMENT

For the government of Virginia to take a unilateral decision to mine uranium without the consent of North Carolina and other Eastern Seaboard states would be to preempt the freedom, equality, and individual autonomy of the sovereign state of North Carolina and of other sovereign states that would be impacted by cross-border or interstate radioactive contamination from Virginia’s uranium mining and radioactive waste management industry.

The decision would pose an unresolvable conflict of states’ rights because of conflicting claims related to the 10th amendment and unresolvable states’ rights conflicts inherent in the prevailing toxic, hazardous, and radioactive waste model for economic development, and as was stated, the case would involve also 13th and 14th amendment rights of North Carolina and of other states.

## ENVIRONMENTAL JUSTICE

Although industrial pollution-prevention issues have been present since the beginning of the industrial revolution, the concept of environmental justice (along with the concepts of environmental civil rights and environmental racism) originated from a well-known four-year (1978-1982) research-based multidimensional and interdisciplinary defense against the state of North Carolina’s plan to site a toxic PCB landfill in the predominantly poor and black Afton community of Warren County.

The argument was that because of the racial demographics, there would be a disproportionate impact on one race (the black race) when the landfill failed, which it did, even before it was capped after the 1982 demonstrations that became known for transforming environmentalism (McGurty).

After the movement, the thinking among some black leaders was that if the waste facilities could not be sited in poor and minority communities because of their 13th and 14th amendment rights, another way would need to be found to deal with the waste problem, since toxic, hazardous, and radioactive waste facilities were not likely to be sited in middle- or upper middle-class communities. However, the black leaders this writer worked with were concerned about environmental justice for all communities, not just for poor and minority communities.

## COUNTERARGUMENT

Are 13th and 14th amendment rights to be narrowly interpreted, limited to racial

demographics, or are they to be reinterpreted in the light of historical transformations brought about by the prevailing toxic, hazardous, and radioactive waste model for economic development.

Because of the necessity of considering the implications of the 13th and 14th amendment rights of communities, regions and states, whose destinies would be determined without their consent by in-state, cross-border and interstate radioactive contamination, environmental justice, environmental-civil rights, and environmental racism need to be considered not only within the context of racial demographics (meaning it's okay to site toxic, hazardous and radioactive waste facilities as long as they are not sited in poor black and minority communities [environmental racism]) but considered within a universal context as well.

#### THE UNIVERSAL CONTEXT: ENVIRONMENTAL CIVIL RIGHTS

It is . . . clear that the public is more accepting of radiation risk (as quantitatively determined) in the medical arena than in the environmental arena. Most of this difference is probably attributable to the closer coupling of risks and benefits in the medical uses, involving a voluntary acceptance of risk rather than the external imposition of risk . . . . Qualitatively, the public may be less accepting of non-medical radiation risks based on its relatively strong opposition to nuclear power and its aversion to nuclear waste depositories.

Matanoski et al. Johns Hopkins University  
School of Public Health

In essence, to site toxic, hazardous, or radioactive waste-management facilities involves an “external imposition of risk,” a preemption of freedom of choice, because it discriminates against the host community, region or state, regardless of demographic considerations **(1)** by segregating it within dense pockets of exterminating waste materials, **(2)** by denying it equal protection **(3)** by reducing it to a condition of involuntary servitude to waste management industries and facilities destructive to persons and properties **(4)** by determining the destinies of other states without their consent and **(5)** by exposing other states to cross-border and interstate contamination, thereby preempting their rights of self-government, freedom, and equality.

It would seem to follow from the above perspective that the prevailing toxic, hazardous, and radioactive waste model for economic development can't be reconciled with standards of principle in the *Constitution of the United States* and the *Declaration of Independence* without destroying “the moral and philosophical foundation work of the nation.” If Virginia were to unilaterally decide to mine uranium, the battle lines would be drawn over the meaning of these founding documents regarding conflicting states' rights.

For Virginia to unilaterally decide to mine uranium would be for that iconic state

(birthplace of Thomas Jefferson, the father of the *Declaration of Independence*, and home of eight U.S. presidents) to destroy universal standards of principle relevant to all men and women and for all time. It would be to destroy “the moral and philosophical foundation work of the nation”-- *The Declaration of Independence* -- certainly among the highest moral, philosophical, and political aspirations the mind and spirit has ever conceived and written; it would be to destroy the last defense against extinction: the defense of the unchanging, “inherent and unalienable rights of man” (Thomas Jefferson).

It is not to be understood that the above argument dismisses the obvious fact that radioactive facilities are among us or that the South has not been referred to as “the nuclear South” **but simply to argue that uranium mining and radioactive facilities should not go where they have not yet been and to eventually dismantle the facilities already established, clean up the radioactive waste sites the facilities have contaminated and continue to contaminate, and work toward an economic model that is democratically and environmentally sustainable** (See Lincoln’s position on the expansion of slavery in Doris Kearns Goodwin’s *Team of Rivals: The Political Genius of Abraham Lincoln*. New York: Simon & Schuster, 2005. Print:167).

The battle lines would most certainly be drawn on the meaning of the *Declaration of Independence* and the *Constitution of the United States* concerning conflicting states’ rights and would most likely lead to a Constitutional crisis with implications perhaps unprecedented in recent American history if the government of Virginia decided to mine uranium and, because of cross-border and interstate contamination implications, **attempted** to determine the destiny of North Carolina and other states without their consent .

#### REGULATORY AGENCIES, LAWS, AND JUDICIAL PRECEDENTS

It may be argued that perhaps policies of regulatory agencies, laws, or judicial precedents will negate all of the above. However, would the policies of regulatory agencies, laws or judicial precedents of Great Britain have negated the *Declaration of Independence*, containing the moral, philosophical, and political rationale for the American Revolution, the revolution that blew the powder keg against tyranny from abroad?

Should we not continue the fight against tyranny and slavery in all of their manifestations here at home as well, including the fight against arbitrary and capricious regulatory frameworks that legally facilitate the destruction of freedom, self-government, and equality of our states, that legally facilitate nuclear contamination in perpetuity, for that is what these regulatory frameworks have done and will continue to do unless we negate them, unless we declare them null and void and insist on regulations that protect our environment, health and natural resources, our persons and properties, our right to life, liberty, and the pursuit of happiness.

Could policies and judicial precedents have extinguished the flames of freedom? No.



They could not have, nor will regulatory agencies, laws, or judicial precedents, nor any government, corporation or entity, foreign or domestic, succeed in extinguishing the principles of freedom, self-government, and equality of sovereign states by creating delusions to control, directly or indirectly, virtually every aspect of life, extinguishing all that would make life possible and worth living?

The *Declaration of Independence* is an existential reality. It lives in our minds and hearts. It moves and breathes in us. It expresses our deepest aspirations. To defend its standards of principle, its moral, philosophical, and political aspirations, is to defend ourselves, our nation and our world.

The mining of uranium in Virginia is hostile to just about everything the *Declaration of Independence* stands for, hostile to just about everything the *U.S. Constitution* is supposed to defend against.

One can hear the goose step in the regulatory framework for uranium mining, marching its way to Chatham, Virginia, under the guise of sound science, sound technology, sound logic and sound standards of principle, but in the underlying reality of that march is seen, known, heard and felt, empirically and historically, the devastation the goose step has left in its wake.

Should the goose step be so misguided as to continue its march toward Chatham, Virginia, it would most certainly be met with litigation backed with the most serious forms of resistance. Not to believe this is not to understand Thomas Jefferson's belief that it is sometimes necessary to remind the government of the spirit of resistance.

## RESISTANCE

It follows from the above analyses that lifting the ban against uranium mining in Virginia, or writing uranium mining regulations, would be considered (1) an arbitrary and capricious act of radioactive intention to transform this region and beyond into radioactive way of life, a radioactive wasteland, (2) a clear intention of radioactive aggression against citizens opposing uranium mining in Virginia (3) a clear intention of radioactive aggression against the sovereign state of North Carolina and of the other sovereign states whose destinies would be determined by cross-border contamination without their consent and therefore would preempt their right to self-government, freedom, and equality, (4) a clear and unambiguous act of radioactive aggression that would be met with litigation backed by the most serious forms of resistance.

This statement is not to be understood as an ultimatum, but rather as a prediction based on common knowledge of human behavior when confronted with governments and industries backed by regulations such as the *Clean Water Act* that facilitate by fait-accompli means the transformation of communities and regions into toxic, hazardous, and nuclear wastelands to promote an economy based on waste expansion and to prepare

over time a mindset of acceptance.

## CONCLUSION

Best Practices regulatory frameworks for the mining of uranium lack an empirically reliable and interpersonally available verification basis for believing the fundamental ALARA assumptions on which the regulatory frameworks are based and for shifting the regulatory emphasis from containing to monitoring radioactive waste.

A permanent ban against the mining of uranium in Virginia and against the exploration of potential uranium sites throughout Virginia is needed to protect and defend the general welfare of Virginia, North Carolina, this region of the South, the Eastern Seaboard, and beyond, and to preclude a Constitutional crisis concerning the most serious and potentially explosive states'-rights issues inherent in the proliferation of nuclear waste and in the prevailing toxic, hazardous, and nuclear waste model for economic development.

It would be wise to remember that in 1982, citizens of Warren County, North Carolina, and citizens from other parts of the state and nation saw in trucks backed by force, and loaded with tons of PCB-contaminated soil, the waste management regulatory frameworks, laws, and judicial precedents that fuel environmental injustice.

By demonstrating some of the same research-based convictions, the same standards of principle that inform the above analyses, the citizens transformed environmentalism. In fact, without the research-based effort (1978-1982) to establish and reaffirm needed universal standards of principle in defense of Warren County and of all targeted communities, regions, and states, these analyses could not have been written (See Eileen Mc Gurty's *Transforming Environmentalism*. Rutgers University Press, 2007).

For four years the conflict between Warren County and the state was a conflict of ideas. Even at the eleventh hour there was a failed behind-the-scenes attempt to push for the formulation of a negotiatory framework to remove the confrontational elements. It was only when efforts to achieve a non-confrontational solution were exhausted and trucks loaded with tons of PCB-contaminated soil were headed for the Warren County PCB-landfill site that the citizens of Warren County and their supporters acted on research-based conclusions and, confident that they had an accurate description of the reality confronting them, went to civil-rights activism in defense of the county.

The state's toxic aggression against the people of Warren County lit the fuse that blew the powder keg of 1982, and, inadvertently contributed to the transformation of environmentalism. It was the state that triggered the events, not the people of Warren County, acting in self-defense.

The tendency to transform an allegedly reliable description of reality into the status of a

hypothesis to be tested, instead of a belief to be unthinkingly acted on, is perhaps one of the most, if not the most, important intellectual characteristics needed at top levels of leadership in this toxic, hazardous, and nuclear world, and certainly not the tendency to permit belief or ideology to trigger action without analysis.

It has been said that the best lack all conviction, that the worst are filled with the passionate intensity of their beliefs, their ideologies that imprison them, causing them to think and act blindly and perhaps trigger detrimental and irreversible events, which sometimes, neither diplomacy nor force can control.

It must be clearly understood that the decision to lift the ban against uranium mining in Virginia or to write regulations for uranium mining would trigger a sequence of events that quite possibly would tear this country apart.

A review of the facts would most likely lead to the conclusion that there would be a gradual expansion of facilities from the foothold, a gradual transformation of Virginia and the South into a nuclear wasteland. The South could become the nuclear waste management nexus for the global nuclear industry because of the failure to understand and to prevent the uranium Trojan Horse.

I believe there are still among us, Virginians and North Carolinians, and people along the Eastern Seaboard and beyond, in and out of government, and all across the political spectrum, who believe as Lincoln that the *Declaration of Independence* remains “the moral and philosophical foundation work of the nation”; people who believe as Jefferson in the unchanging inherent, unalienable rights of man, who still believe in the unalienable rights of Chatham, Virginia, and of all communities, regions, and states targeted for uranium mining, radioactive waste facilities, and nuclear reactors contingent upon failed waste facilities.

## **SELECTED MAIN POINTS OF PART 2**

The best practices regulatory framework represents a deeply disturbing preemption of Constitutionally protected values, is nihilistic, and negates the moral, philosophical and political standards of principle in the *Declaration of Independence*.

A decision to mine uranium in Virginia would determine the destinies of Virginians opposed to the mining of uranium without their consent and determine the destinies of North Carolina and of other states without their consent by arbitrarily and capriciously subjecting them to in-state, cross-border and interstate contamination and therefore would violate the principles of self-government, freedom, and equality of North Carolina and of the other states.

A complexity of conflicting and perhaps unresolvable states' - rights issues inherent in the toxic, hazardous, and nuclear waste management model for economic development, and

in a decision to mine uranium, would set the states of Virginia, North Carolina, and quite possibly other states on a collision course leading to a Constitutional crisis and would cause conflicts over state's rights, perhaps unprecedented in recent American history.

There are other compelling reasons for a permanent ban against the mining of uranium in Virginia, beyond the scope of these analyses.

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