

Hearing Statement for the Public Meeting regarding Proposed Rule  
R313-25-8 *License Requirements for Land Disposal of Radioactive  
Waste - Technical Analyses*

January 26, 2010

Good evening Ladies and Gentlemen, I call this meeting to order. This is a public hearing convened under R313-17 of the Utah Radiation Control Rules to receive oral comments on the proposed rule R313-25-8; *License Requirements for Land Disposal of Radioactive Waste - Technical Analyses*.

My name is John Hultquist, and I am the Low-Level Waste Section Manager in the Department of Environmental Quality, Division of Radiation Control.

This proposed rule added language to Section 8 of Chapter 25 regarding land disposal of significant quantities of depleted uranium (more than one metric ton in total accumulation) and the requirement to submit for the Executive Secretary's review and approval a Performance Assessment (PA) that demonstrates that the performance standards specified in 10 CFR Part 61 and corresponding provisions of Utah rules will be met. Revision to R313-25-8, *License Requirements for Land Disposal of Radioactive Waste - Technical Analyses* was submitted to the Division of Administrative Rules in December, 2009 and was published in the January 1, 2010 issue of the Utah State Bulletin, which initiated a 30-day public comment period. In addition to being published in the Utah State Bulletin, the public notice was published in the SL Tribune, Deseret News, and Tooele Transcript-Bulletin as well as on the DRC web page.

If anyone desires to make a statement or comment for the record, please write and sign the Public Participation Sign-In Sheet located on the table near the entrance door. This hearing is being recorded and the proceedings will be available as part of the Public Participation document prepared for this rule making. Written statement dealing with the proposed rule and dated postmarked no later than February 2, 2010 will be accepted for the record, as will oral statement or comments made this evening. Relevant comments

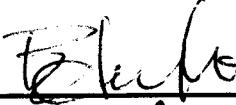
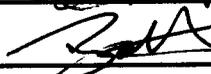
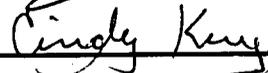
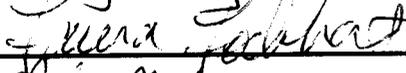
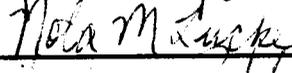
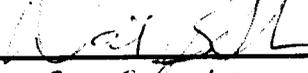
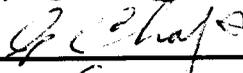
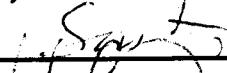
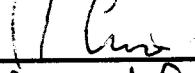
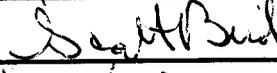
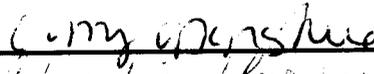
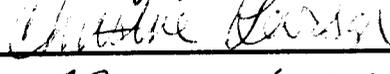
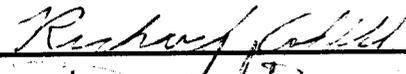
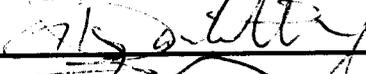
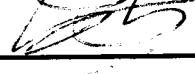
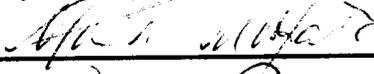
will be considered in the final decision of the proposed rule. This is a hearing to receive oral comments and as such, there will be no questioning of the participants. I ask that you confine your remarks to the matter at hand.

We will now proceed to hear comments.

Signed:  \_\_\_\_\_

## Public Participation Sign-In Sheet

### Proposed Rule R313-25-8 License Requirements for Land Disposal of Radioactive Waste - Technical Analyses Depleted Uranium

Name	Signature	Comment (y/n)
1. Ed Firmage		Yes
2. ROBERT HENNING		YES
3. Cindy King		yes
4. Laura Lockhart		no
5. Nola Lucke		N
6. Dan Shrum		N
7. George Chapman		yes
8. Suzanne Wilkes		N
9. John Cuomo		Yes
10. Scott Bird		N
11. Claire Meddes		X
12. Amy O'Rourke		no
13. Christine Larson		N
14. Richard Collet		N
15. Green Dabill		N
16. Steve Nielson		N
17. Kent Boardman		N
18. Eric Spreng		N
19. MARK WALKER		N
20. Sam Adams		Yes
21.		

# Public Participation Sign-In Sheet

Name	Signature	Comment (y/n)
Bob Briston	<i>Bob Briston</i>	NO DU!
Christopher Thomas	<i>Christopher Thomas</i>	Yes
<del>Kristen Powers</del>	<del>Kristen Powers</del>	No
AMY O'CONNOR	<i>AMY O'CONNOR</i>	Yes
Dobras Scott	<i>Dobras Scott</i>	No
Jim + Coral Coffey	<i>J. Coffey</i>	No DU!
Joe Nickols	<i>Joe Nickols</i>	yes
Mandee Haycock	<i>Mandee Haycock</i>	No DU!
Steve Haycock	<i>Steve Haycock</i>	No DU!
Joe Andrade	<i>Joe Andrade</i>	Yes DU
Richard Lane	<i>Richard Lane</i>	NO DU
Bob Briston		yes



Governor Gary Herbert  
Utah State Capitol Complex  
350 North State Street, Suite 200  
PO Box 142220  
Salt Lake City, Utah 84114-2220

Jan. 12, 2010

Re: Utah, Safety, Fear, and Radioactive Waste

(please acknowledge that you have received this: 801-706-6747 joe.andrade@utah.edu)

Dear Governor Herbert

We have met. Thanks for your remarks at the Governor's Medal festivities last week and at the Utah Rural Summit last fall.

I am an engineer, professor, and teacher with 40+ years on the University of Utah faculty. During 1983-1987 I served as Dean of the UU College of Engineering. My office was almost directly above the U's small teaching nuclear reactor. I have used radioactive isotopes as research aids for my studies on blood proteins in the early part of my career – in the 70s. I am familiar with radiation, radioactive isotopes, their hazards and risks, and safety and disposal issues. I am also a science educator, having developed The Leonardo's unique Leo on Wheels traveling science program, including its new Radiation Around Us exhibit. I have tested my own basement for Radon, using the State's very effective resources and materials via the Utah Division of Radiation Control, part of your DEQ (by the way, January is National Radon Action month). My basement is on the borderline of requiring some mitigation! I am well aware of safety and risk issues and the problems of relative risks – this is covered on my Channel 9 TV UU tele-course: Science without Walls, available at:  
[www.tinyurl.com/uutelecourses](http://www.tinyurl.com/uutelecourses) -  
see program on Luck and Risk after clicking on Bioengineering 1510.

Utah has a unique national and international resource: Energy Solutions and its Clive, UT disposal facility. I trust you are familiar with the history of this unique site and facility.

We are all responsible for waste – radioactive, CO2, and otherwise. We want our garbage picked up, we don't want to breathe asbestos, we want efficient industrial processes (some of which use radioactive isotopes), we want safety and risk detection equipment (like smoke detectors, many of which use radioactive isotopes), some of us want nuclear energy (which generates waste, most of that from the mining and enrichment operations needed for reactor fuel), we want the most modern and effective medical diagnosis and treatment (many of which utilize radiation and radioisotopes), etc. – and we don't want any of this stuff in our own backyard. We want to mine Utah's Uranium ores, coal, silver, and gold to generate employment and taxes, but we don't want to fully face the health and environmental hazards involved.

It's all a question of balance: minimizing reasonable risks and maximizing reasonable benefits.

I am delighted that we have reasonable, appropriate, and safe waste disposal facilities, such as the land fills and the Clive facility. I am delighted that we have a State DEQ and Division of Radiation Control to help monitor and regulate such facilities. And I am

delighted that my/our wastes are located in such facilities and thus not spread throughout our communities and environments – and thus not in my own local back yard. Some such facilities even eventually become resources, such as the energy generated via the methane at the County landfill.

As I understand it, the depleted Uranium coming to and already at Clive is low level waste in the oxide form, thus not particularly chemically hazardous. The radioactivity is significantly less than the Uranium ores common in many parts of Utah. Of course it decays, and some of its decay products are of concern – Radon in particular. The Uranium in the soils and concrete in my basement also decay, and the Radon they emit is also of concern, but not of great concern. Half of the average background radiation dose we all get is due to Radon. It's emitted in your basement, in mine, in the soils, in the concrete, etc. Radon is a decay product of Uranium, and Uranium is actually a fairly common element in the Earth's crust. You and I each have about 100 micrograms of Uranium in our bodies, according to the World Health Organization; we each carry in our own bodies the elemental makeup of Planet Earth – our own, personal Periodic Tables!

See the recent op ed piece on depleted Uranium by Prof. deNevers for more information:

[www.sltrib.com/opinion/ci\\_13577796](http://www.sltrib.com/opinion/ci_13577796)

I am far more concerned with our highly polluted air, impacting my wife's asthma; with the rapidly increasing CO2 in our environment – leading to climate disruption and major planetary issues; with the increasing Mercury levels in the GSL and in our waters and fish; and with many other environmental, social, and community hazards – including auto accidents, gun accidents, domestic violence, substance abuse, and child abuse.

Community leaders and elected officials have to weigh all the hazards and all the issues and come up with Solomon-like decisions. They deal with a myriad of special interest groups, some of which give them money to help get their attention.

Some of your constituents are afraid of and thus concerned with and focused on specific topics, such as autism, asbestos, radioactive waste, air pollution, CO2, etc. Because of that focus they are largely unaware of, or less interested in, other equally important topics. Many of these special interest groups are often largely unaware of the science and technical (and medical) basis of their concerns. Lack of knowledge breeds fear and even paranoia. We willingly take risks about actions and things we 'know', like driving, which are 1000 times greater than the risks we tolerate about things we do not know (like radiation, asbestos, etc.). As a people we are generally emotional and irrational. But you do not have that luxury. You have to weigh it all, and make wise decisions – not based on fear, ignorance, or special access.

I recall a discussion chaired by former Oregon Governor John Kitzhaber some two decades ago, in which former Minnesota Senator David Durenberger said, in response to a constituent's irate comment:

'Sometimes your leaders have to lead.'

I'd encourage you to arrange to test your office and basement for Radon - contact your own: [ckeyser@utah.gov](mailto:ckeyser@utah.gov) - I'm sure she's be pleased to assist.

I also recommend you

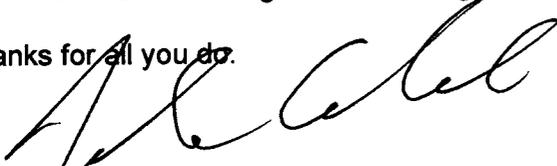
encourage the Energy Solutions folks to fully use that Clive facility to store radioactive waste, including depleted U;

encourage the landfills to keep taking and storing our other wastes; and

encourage DEQ to do the very best they can on all fronts.

I'd be happy to discuss any of this with you and/or your advisors/staff. I plan to share these perspectives with your people at DEQ, Radiation Control, and Radon Program, as well as with Utah's Congressional delegation.

Thanks for all you do.



Joe Andrade, Distinguished Professor  
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January 26, 1010

Utah Department of Environmental Quality  
Division of Radiation Control  
168 1950 West  
Salt Lake City, UT 84114

Dear Members:

*As a voting resident of Salt Lake City, I firmly believe that our state should work to protect future generations from radiological exposure and contamination. I therefore strongly request, stand behind and support the Board's course of action to devise a new rule to ensure that no depleted uranium comes to our state in advance of the completion of thorough public health studies and performance assessments. A new rule should also take into account when levels of peak dosage occur as well as likely geological processes such as flooding and erosion.*

*Furthermore, since I understand that Utah is one of very few states that will take nuclear waste, I do not understand WHY this decision was made! Why must Utah be a dumping ground for the rest of the world? Do we want our children to glow in the dark?!*

Thank you.

Sincerely,

A handwritten signature in cursive script, appearing to read "Richard Lane". The signature is written in black ink and is positioned above the printed name and address.

Richard Lane  
137 E. Commonwealth Avenue  
Salt Lake City, UT 84115

26 January 2010

Utah Radiation Control Board  
Utah Department of Environmental Quality  
PO Box 144850  
Salt Lake City, UT 84114-4850

RE: Disposal of depleted uranium in Utah

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First, let me take a second to thank you for the opportunity to make these remarks a part of the record regarding this issue.

"The Utah Division of Radiation Control (DRC) protects Utah citizens and the environment from sources of radiation that constitute a significant health hazard." These words were taken from the Utah Division of Radiation Control website, in Director Finerfrock's welcome message. I think it unfortunate that I need to come before this Board to remind you of your obligation to Utah's people and her environment, but your recent refusal to act in any interests but those of corporate greed does, in fact, necessitate such a reminder.

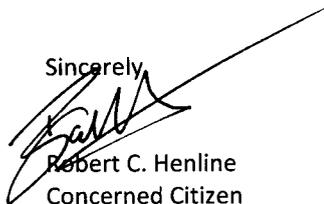
There is no doubt that depleted uranium poses a significant health and safety risk. There is not a credible scientific expert that will contest this simple fact. It is a substance that is not only toxic for billions of years, it also becomes increasingly toxic over time. This we know. What we don't know is if the EnergySolutions Clive facility is capable of storing this waste safely. Let me repeat that: we don't know if that facility is capable of safely storing depleted uranium.

In a letter dated 21 September 2009, EnergySolutions President Val Christensen stated: "EnergySolutions has contracted with Neptune and Company, the industry recognized experts in the field of performance assessments, to provide an updated performance assessment for depleted uranium disposal....We anticipate that the performance assessment will be provided to your staff by December 2010."

What this tells us is that the facility at Clive has not been properly evaluated for the safe long-term disposal of depleted uranium, by EnergySolutions own admission. Yet they still demand the right to import this deadly substance and to dispose of it on our lands, in our back yards.

It is now time for the people of Utah to make a demand of their own, a demand that this body live up to its obligations and act in the best interest of the people and environment of Utah, not a corporation that has repeatedly demonstrated its disdain for the rules and regulations meant to protect us. What that means, ladies and gentlemen, is that as you evaluate the regulations regarding the disposal of depleted uranium you err on the side of caution, on the side of protection, on the side of doing the job that you've accepted. Unless and until it can be proven that this toxic waste can be safely and permanently stored at this facility, your jobs and your integrity demand that you refuse to allow it to come to Utah.

Sincerely,



Robert C. Henline  
Concerned Citizen

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Robert Henline  
Email: bob@nonpart.org

11754 South Oakmond Road  
South Jordan, UT 84095

AMY O'CONNOR  
1115 HEARD AVE, SLC  
AMOCONNOR@FARTRACUM.  
NET

I would like to read from a 2003 National Research Council paper titled *Improving the Scientific Basis for Managing DOE's Excess Nuclear Materials and Spent Nuclear Fuel* (2003),

Options for future disposition of the DU, once converted to oxide, are continued storage, reuse, or disposal as waste. There are significant gaps in understanding health effects of uranium and its compounds that need to be resolved before DOE can fully evaluate these options. Beneficial ways to reuse large amounts of uranium have not been identified. Because of uranium's unique chemical and physical properties, the committee believes that this lack of reuse options reflects gaps in current knowledge rather than being an a priori reason for disposing of the material as a waste. There are significant challenges for deciding how the uranium might be disposed if it were declared to be waste.

### **Disposal**

The current plans for conversion to oxide will put the DU in a form that will be more stable than the DUF6 for further storage. If disposal is necessary, it is not likely to be simple. The alpha activity of DU is 200 to 300 nanocuries per gram. Geological disposal is required for transuranic waste with alpha activity above 100 nanocuries per gram. If uranium were a transuranic element, it would require disposal in the Waste Isolation Pilot Plant (WIPP) based on its radioactivity. The chemical toxicity of this very large amount of material would certainly become a problem as well. One option suggested by the U.S. Nuclear Regulatory Commission (USNRC) is disposal in a mined cavity or former uranium mine (Leeds, 2000). Challenges for this option would include understanding the fundamental differences between uranium ore (see Sidebar 6.1) and the bulk uranium oxide powder.

**Longer-Term Research for Reuse or Disposal** WORLD HEALTH ORGANIZATION  
WHO has compiled a list of the research needed to better assess chemical and radiological health risks from exposure to uranium compounds. § The committee believes that this research will assist DOE in its future decisions for reusing or disposing of its DU:

- Neurotoxicity: Other heavy metals (e.g., lead and mercury) are known neurotoxins, but only a few studies have been conducted on uranium. Studies are needed to determine if DU is neurotoxic. Reproductive and developmental effects have been reported in single animal studies but no studies have been conducted to determine if they can be confirmed or that they occur in humans.
- Hematological effects: Uranium distribution within bone is thought to be such that irradiation of bone marrow and bloodforming cells are limited due to the short range of alpha particles emitted during decay. Research is needed to determine if this view is correct.
- Genotoxicity: Some in vitro studies suggest genotoxic effects occur via the binding of uranium compounds to DNA. Research is needed to determine if uranium is genotoxic by this or other mechanisms. There are also opportunities to extend current knowledge

in the following areas:

- Understanding of the extent, reversibility, and possible existence of thresholds for kidney damage in people exposed to DU. Important information could come from studies of populations exposed to naturally elevated concentrations of uranium in drinking water.
- Better assessments of impacts of exposure of children. This is particularly important given their unique exposure scenarios such as geophagia and hand-to-mouth activities.
- Validation of transfer coefficients for uranium compounds entering the food chain, for example, from soil ingested by livestock during grazing and then to humans.

Investigations are needed on the chemical and physical form, physiological behavior, leaching, and subsequent environmental cycling of specific forms of uranium from various industrial and military sources (e.g., depleted uranium alloys, phosphate by-products). Particular attention should be paid to how the bulk of DU might eventually be disposed. Aside from the possible presence of contaminants in some of the DU from recycled uranium, the isotope enrichment process leaves a material that initially has a lower radioactivity than natural uranium. Not only U-235 but most of the uranium decay chain isotopes (e.g., radium, radon) are removed. Modeling the long-term behavior of DU should include the fact that these daughter isotopes will gradually reappear over time.

~~A~~ All of these considerations should have been dealt with prior to EnergySolutions ~~X~~ accepting any quantity of depleted uranium. Please ensure that each and every one of these issues is fully investigated before Utah accepts any more depleted uranium.

p. 63. Online at: <http://www.nap.edu/catalog/10684.html>

Testimony Given before the Division of Environmental Quality

by Ed Firmage, Jr.

January 26, 2010

For the last year, the DEQ has struggled to deal with the consequences of the NRC's shockingly shortsighted and scientifically indefensible decision to classify depleted uranium (DU) as Class A Low Level Waste. The proper response from Utah to this decision should have been, and still could be, to ban depleted uranium altogether. In view of our state's craven relationship with Energy Solutions, this seems unlikely.

The least, therefore, that our state should do is to insure that appropriate new measures are in place to limit future damage. DU violates every essential definition of true low-level waste. It becomes more, not less radioactive over time, and it is long lasting. Energy Solutions' Clive facility is designed for waste with a short half life and relatively low levels of radioactivity. On this basis alone, storing DU at Clive must necessarily involve extra, site-specific measures.

But concerns about longer-lived and eventually more potent radioactive material are not the only reasons that new, much more stringent requirements should be in place. Energy Solutions touts Clive as a remote and arid facility ideal for storing dangerous material. On the timescale of true low-level waste, this claim is not inaccurate. On the

timescale of DU, however, it is entirely misleading. Clive is located at the bottom of historic Lake Bonneville, which has inundated the area several times in the last hundred thousand years. In geologic time, which is what we're talking about with the active life of DU, it is near certain that Lake Bonneville will return. And with its return, Clive ceases to be a remote, arid anything. The integrity of Clive will be destroyed by wave action, and radioactive material could be dispersed by currents, storms, and the rise and fall of the lake to every part of the basin, and potentially beyond.

It is therefore incumbent on Utah, if it will not do the sensible thing and ban DU altogether, to provide a higher level of safety for DU storage here than currently applies at Clive. It should be the purpose of the RCB's new rule making to ensure that this is the case.