Public Comment Submittal on the Department of Defense "Prototype Microreactor EIS Comments" on the scope of an Environmental Impact Statement for Construction and Demonstration of a Prototype Advanced Mobile Nuclear Microreactor, Docket Number DOD-2020-OS-0002

Comment submittal by Tami Thatcher, March 30, 2020

Comments submitted via email to *Email: PELE_NEPA@sco.mil*. Include "Prototype Microreactor EIS Comments" in the subject line, as stated at https://www.federalregister.gov/documents/2020/03/02/2020-03809/notice-of-intent-to-prepare-an-environmental-impact-statement-for-construction-and-demonstration-of

Highlights of the Department of Defense (DoD) request for public comments are provided in italics, regarding the scope of the Environmental Impact Statement for development of the prototype microreactor envisioned to occur at a Department of Energy site such as the Idaho National Laboratory, [**with emphasis added**]: *"The Department of Defense (DoD), Office of the Secretary of Defense, acting through the Strategic Capabilities Office (SCO), and in partnership with the U.S. Department of Energy, Office of Nuclear Energy (DOE), proposes to construct and demonstrate a prototype advanced mobile nuclear microreactor (prototype microreactor) to support DoD domestic energy demands and DoD operational energy demands (Proposed Action).*

SCO, as lead agency, in partnership with DOE, as a cooperating agency, intends to prepare an Environmental Impact Statement (EIS) in accordance with the requirements of the National Environmental Policy Act (NEPA) and applicable implementing regulations for the Proposed Action. The EIS also will cover the planned disposition of the prototype microreactor following operation and demonstration. Through this EIS process, SCO will identify measures to avoid, minimize, or mitigate any negative impacts to human health or the environment associated with the Proposed Action."

The purpose of the Proposed Action is to construct and demonstrate a prototype microreactor that would be ***capable of producing 1-10 megawatts of electrical power****.*

The microreactor must keep radiation exposure during power operation, abnormal operations, or upset conditions, ***as low as reasonably achievable****. SCO seeks to produce a prototype that will minimize consequences to the nearby environment and population in case of kinetic or non-kinetic action affecting structural integrity or release of contamination. Further, SCO seeks to utilize nuclear materials in the construction of a prototype microreactor that, if damaged, do not generate and impose excessive training and equipping burdens on forward area first responders, site medical facilities, or supported military personnel and the civilian population.*

The prototype microreactor is expected to be a small advanced gas reactor (AGR) using high-assay low enriched uranium (HALEU) tristructural isotropic (TRISO) fuel and air cooling. TRISO fuel is encapsulated and has been demonstrated in the laboratory to be able to withstand

temperatures up to 1,800 degrees Celsius, allowing for an inherently safe prototype microreactor. The Proposed Action includes construction of the prototype microreactor and demonstration activities. The demonstration activities may include testing of project materials, startup and transient testing and evaluation of the constructed prototype microreactor, transportation and operational testing of the prototype microreactor or its components within the boundaries of the selected site to test and evaluate prototype microreactor mobility, and post-irradiation testing of project materials. The EIS also will cover the planned disposition of the prototype microreactor following operation and demonstration.

*The EIS will include an analysis of potential impacts to the quality of the human environment from the range of reasonable Action Alternatives, and the No Action Alternative. Because the specific design of the prototype will be unknown during the preparation of the EIS, SCO will consider potential environmental impacts from all reasonable designs that are under consideration. The EIS will analyze impacts of the Proposed Action to natural and cultural resources, to include Native American resources and concerns; to public health from potential exposure to radionuclides under routine and credible accident or emergency scenarios including natural disasters such as floods, hurricanes, tornadoes, or seismic events; any disproportionately high and adverse effects on minority and low-income populations (*i.e., *environmental justice impacts); and potential impacts of intentional destructive acts, including sabotage and terrorism, as well as other issues that may emerge during the scoping process.*

DOE will provide SCO regulatory oversight and expertise on technical, safety, environmental, and health requirements applicable to the construction and demonstration of the prototype microreactor.

Also see *https://www.cto.mil/pele_eis/ for the recorded scoping meeting.*

The scoping meeting states:

"What is Addressed in an EIS"

- *Existing environment at candidate sites*
- *Analysis of potential environmental effects of the alternatives*
- *Identifies mitigation measures, if needed*
- *Evaluates cumulative impacts*

SCO proposes the following:

- *Construction of the prototype microreactor*
- *Demonstration activities*
- *Disposition of the prototype*
- *Other activities*
    - *Fabrication of nuclear fuel*
    - *Assembly of test/experimental modules*
    - *Assembly of test/experimental modules*

- *Management of waste and spent nuclear fuel*

Potential impacts or effects on the following resources will be evaluated:

- *Land-use plans, policies and controls, and visual resources*
- *Public health from exposure to radionuclides under routine and credible accident scenarios including natural disasters: floods, hurricanes, tornadoes and seismic events*
- *Potentially affected communities (socioeconomic impact)*
- *Minority and low-income populations*
- *Waste management practices and activities*

Effective Scoping Comments

- *Identify specific elements of the environment that might be affected if the proposal is carried out*
- *Pinpoint cause-and-effect relationships that could result from the proposed action*
- *Bring to mind aspects of the proposal that SCO may not have considered*

Comment submittal regarding the scope of the Environmental Impact Statement for the development of the "Prototype Microreactor" also called the "Prototype Advanced Mobile Nuclear Microreactor":

1. **The Environmental Impact Statement (EIS) alternatives must include non-nuclear options for providing electricity**

   First of all, the project alternatives must include developing a system of batteries, solar, wind and/or diesel fuel combinations. These would not provide a very attractive terrorism target, would not shorten the lives of everyone working near the microreactor and would not pose the accident risks that would contaminate from 100 to 1000 square miles. Not to develop more affordable, effective, and safe options simply amplifies the fact that this is really a PORK project for the Idaho National Laboratory to provide it a reason for existing.

2. **The EIS must not rely on fiction; it must not rely on past EIS's that pretend the U.S. has a way to dispose of spent nuclear fuel**

   The EIS must not rely on previous environmental impact statements that presume the existence of a non-existent spent nuclear fuel (SNF) and high-level waste (HLW) repository. The Department of Energy is pretending that an SNF/HLW repository will be available soon and therefore should want to make more nuclear fuel to operate in nuclear reactors in order to make even more spent fuel. And the DOE is using the lack of a

repository as an excuse for failing to prepare the SNF and HLW at the Idaho National Laboratory for shipment to a repository such as the proposed Yucca Mountain repository.

Relying on out-of-date EISs that don't represent the lack of progress toward a repository for spent nuclear fuel and high-level waste and DOE's failure to update radiological health models and standards cannot possibly achieve the stated goals of conducting NEPA analysis.

Should this EIS mention fuel reprocessing as an option, then it must include the truth about the extensive radiological contamination at West Valley, New York as well as at and around the Idaho National Laboratory. The biased and incomplete monitoring by the U.S. Geological Survey cannot be relied on as the complete basis for characterizing the aquifer contamination from the fuel reprocessing conducted at the INL because the U.S.G.S. was actively engaged in covering up the extent of groundwater contamination in southeast Idaho.

The DOE continues on a path to miss all future Idaho Settlement Agreement milestones for treating, packaging and shipping spent nuclear fuel and high-level waste out of Idaho and the prototype microreactor EIS must not hide the numerous serious failures of the Department of Energy to meet these important milestones. [1] This project will only add to the burdens Idaho citizens already have from the radiological contamination from the Idaho National Laboratory.

3. The EIS must explain where and how the spent fuel from the microreactors will be stored

The EIS must be clear about where the spent nuclear fuel from these reactors can be stored and will be stored. Will the spent nuclear fuel from deploying these reactors sit as orphaned waste, around the world? No one wants the spent fuel in their community or state or country, where the microreactor, whether operating or idle, will be a dirty-bomb target and will be degrading, ultimately allowing its radioactive spent nuclear fuel to disperse into the environment.

The EIS must describe where the spent nuclear fuel from developing and testing (and then deploying) the microreactors be stored. The EIS must explain who will pay for managing and storing the spent fuel and how much it will cost through the entire time that the fuel remains radiotoxic, as well as where it will be stored and how it will be repackaged as its containers degrade.

The commercial nuclear industry made spent nuclear fuel containers that are susceptible to intergranular stress corrosion cracking, cannot be inspected for cracks and cannot be repaired. The faulty design was accepted based on the expectation of storing the spent fuel for only a few decades before disposal. We are no closer to have a spent nuclear disposal option. The issue of degrading spent fuel canisters that allow leakage of

[1] See more about Idaho's Settlement Agreement at https://www.deq.idaho.gov/inl-oversight/oversight-agreements/1995-settlement-agreement.aspx

radionuclides out of the container. The possibility of water leakage into the container that allows a criticality and explosion of the container must be addressed.

4. **The EIS must not assume that the Department of Energy has currently or will provide adequate design standards to apply to the proposed prototype microreactor design and production**

   Overall, the approach by the military is to erroneously assume that the Department of Energy has some adequate design standards or has the expertise to develop adequate standards to apply to this prototype microreactor design endeavor. This assumption by Department of Defense (DoD) is false. Safety shortcomings and shortcuts are to be expected in this endeavor, as planned. The EIS must address the poor record at the Department of Energy regarding design and testing of safety systems.

   When the DOE has cobbled together safety systems such as those for its Advanced Test Reactor, it didn't actually test the systems with any rigor. Those tests that were performed and failed, were simply hidden from view, as the reactor continued operating. The truth about the Department of Energy's extremely poor safety design track record must be included. This would include how the Department of Energy pressured Fluor Idaho to make shortcuts like ignoring State-approved hazardous waste permit restrictions concerning pyrophoric radionuclides that resulted in four transuranic waste drums exploding at the Idaho National Laboratory in 2018, narrowly avoiding worker fatalities and an extensive radiological release.

   The Department of Energy's role in design and safety oversight shortcomings caused the death of three crewmen and release of over a million curies at the 1961 Stationary Low-power Reactor (SL-1) accident. The Department of Energy continues to imply that a crewman deliberately caused the accident. The SL-1 is one of the DOE's more recent reactor design projects. The Department of Energy did not design the U.S. Navy's reactors and it must not be presumed that the organization has any credible capability to oversee the design of a nuclear reactor today.

   The continued failure to acknowledge the true causes of the SL-1 accident means that the Department of Energy hasn't learned from the experience. But perhaps even more importantly, the continued disinformation and denials of the actual airborne releases from the accident, including all actinides (the uranium, plutonium and other transuranics) and the cladding and other core materials has meant that the Department of Energy has been lying about the SL-1 accident for almost 60 years.

5. **The EIS must not only identify appropriate regulations and standards for conducting this work, it must address the high likelihood that the Department of Energy will not adhere to stated regulations and standards**

Typically, an Environmental Impact Statement (EIS) will identify appropriate regulations and standards for conducting work. This EIS must not simply provide lists of Department of Energy regulations and standards, falsely implying that the DOE actually will follow them. The EIS when listing the Department of Energy policies must address the high likelihood that DOE policies may not be adequate and may not be followed, leading to worker and public harm. In fact, the Department of Energy and its contractors have an extensive history of ignoring any regulation, standard or even common sense when deemed inconvenient. The EIS needs to investigate and describe the multitude of examples of the Department of Energy or its contractors falsifying radiation dose records, destroying environmental monitoring samples, operating its nuclear facilities unsafely and so forth. It is not acceptable to list Department of Energy or other regulations in the EIS and wrongly imply that they will be followed.

6. **The DoD states already in its presentations that the fuel is "safe" and does this without providing any scientific evidence – the EIS must provide complete information about the core inventory at end of life and analysis of 100 percent release accident consequences without evacuation**

   The DoD has already delivered propaganda, saying that the fuel is "safe." It is stated in the Federal Register that the fuel **will allow for a reactor design that is "inherently safe."** This is not backed up by detailed risk and accident assessment, independent analysis, or technical documentation. Safe compared to what? Chernobyl? Fukushima?

   Here in southeast Idaho, the Department of Energy claimed that all boiling water reactors were "inherently safe." The Stationary Low-Power (SL-1) reactor with prompt critical power excursion in 1961 was one of those so-called "inherently safe" boiling water reactors.

   How is a microreactor going to survive a plane crashing into it? Or an intentional explosives charge? If this fuel is so safe, why must it only be developed at a site under Department of Energy control with extremely permissive radiological release guidance?

   DoD needs to provide scientific evidence and not public relations propaganda. Full assessment of transportation accidents and deliberate acts of sabotage, as well as other accidents, must be provided in the EIS.

7. **The EIS must bound the complete inventory of prototype microreactor radionuclides and include the uranium fuel, fission products, transuranics and activation products**

   Because the Department of Defense statements describing the size of these reactors are vague and inconsistent, it is difficult for me to bound the actual release. But in the main

Federal Register, DoD stated that the reactor may be from 1 to 10 megawatts of electrical power. In the presentation for the EIS scoping comment, it was stated as from 1 to 5 megawatts of electrical power for 3 years, indicating high burnup of the High-Assay Low Enriched Uranium. Even if assuming low burnup, 10 megawatts of electricity generating would mean roughly 30 megawatts-thermal, and this would correspond to at least 30 million curies to release in the event of an accident. With the expected higher burnup, the radionuclide inventory that could be released to the environment would increase.

These proposed reactors will build up millions of curies of fission products like cesium-137, transuranic radionuclides like plutonium-239 and activation products like manganese-54. The hazard posed by these "microreactors" are anything but "micro." Relatively close to ground level, this will likely concentrate the radioactive fallout within 30 to 50 miles of the microreactor, near the hospitals and other places it is intended to serve.

Because these military reactors will be attractive targets for intentional acts of sabotage or terrorism, the release of 100 percent of the irradiated fuel, by radionuclide and curie amount, must be provided in the EIS.

8. The EIS must include transportation accidents as well as routine exposure from transporting or standing near a microreactor

The EIS must also reflect the reality of external radiation in routine transportation and stationary positioning of the microreactor. Gamma dose as well as neutron dose is needed. Conditions that may compromise the container, allowing gamma beaming or in which the neutron shields (plastic) fail need to be included. The fact that the public and emergency responders may not be equipped to monitor gamma or neutron dose must be addressed.

Emergency responders at the Department of Energy Idaho National Laboratory continue to respond to incidents without proper radiological monitoring support. Firefighters responded to the 1961 SL-1 accident initially without proper radiological support, and firefighters responded to the 2018 explosion of four transuranic waste drums initially without proper radiological support. The radiological and chemical release support throughout the 2018 accident was inadequate due to the Department of Energy's inadequate safety analysis, inadequate safety mitigations and inadequate emergency responder planning.

The EIS must describe in detail the testing of the containers and the container testing needs to be realistic and rigorous. It is not acceptable to simply say that a different container was tested years ago to ambiguous standards and we hope that this container will survive as is the case for spent nuclear fuel transportation.

9. The EIS accident and waste management assessments must address the entire time that the nuclear fuel remains radiotoxic, which is over one million years

The accident analysis in the EIS must not simply examine the first few days of the accident using a partial set of radionuclides and base radiological doses on the assumption that people evacuate. While there are fission products that decay away rapidly, there is contamination that remains for decades and longer, far longer. The EIS address the harm from a radiological release, both the human health harm and economic harm.

The EIS must not ignore the reactor-made uranium and thorium radionuclides in the radiological release, as has long been the practice in the nuclear industry. The EIS must address all radionuclides in the core, at end of core life, and must include all of the actinides (the uranium-238 and uranium-235 and the plutonium and other transuranics and all of their decay progeny) as well as fission products and activation products. For some radionuclides, low curie amounts still result in very deadly contamination. Remediation of radiologically contaminated sites is virtually impossible. The Department of Energy has been ignoring its releases of uranium and thorium, and even its environmental monitoring contractors claim to not understand the "broken decay chains" in southeast Idaho.

In addition to fission products and activation products, radiological releases from a nuclear reactor include the unfissioned fuel (often uranium-235 and uranium-238) and the transuranics produced during reactor operation such as plutonium-238, plutonium-239, plutonium-240, plutonium-241 and others. The plutonium-238 feeds into the uranium-238 decay series. The plutonium-239 feeds into the uranium-235 series. The plutonium-240, as well as reactor produced uranium-236 feeds into the thorium-232 decay series. The three naturally-occurring decay series can then be increased by the nuclear reactor's radiological release. A fourth decay series called the neptunium series is completely reactor-made, and is the decay series for plutonium-241, americium-241, neptunium-237 and uranium-233. The neptunium decay series decays to thallium and lead as do other uranium and thorium decay series.

The Department of Energy's longstanding and continued practice of ignoring the reactor-made or weapons-testing-made additions of uranium and thorium in southeast Idaho has got to stop. Initially, a crisis mode mentality may have placed the focus on the higher curie amount fission products released during an accident, but ignoring the uranium, thorium, plutonium, curium and their decay products is no longer defensible. The extent to which these are contaminating our air, soil and water is being ignored by the Department of Energy and local water monitoring is designed to not identify plutonium or other reactor-made radionuclides or distinguish when "naturally-occurring" uranium and thorium are increased by reactor fuel releases to the air. Water tanks breathe in the contaminated air and the radionuclides dissolve into the water.

The propaganda has always been focused on the rapid decay of certain fission products and creating the illusion that the problem just decays away. The EIS must not ignore the long-lived radionuclides such as iodine-129 and technetium-99 and must not ignore the long decay series actinides, the uranium, thorium and neptunium series discussed above. The EIS must include full disclosure of how many of the actinides continue to decay, with some decay products having equal or higher health risks and with the increase of lead in our environment. The EIS must address reactor-produced thorium decay progeny, radium-228, because of its very high health harm when inhaled or ingested.

10. DOE's use of ALARA, which means "As Low as Reasonably Achievable" is nothing but a pretense to con the public, has no legal or specified meaning, and should not be used to imply some sort of commitment or reasonableness in the EIS

For the DOE, ALARA, which means "As Low as Reasonably Achievable" can mean anything DOE wants it to mean.

Everyone who has actually worked at a Department of Energy facility knows how meaningless the statement made by DoD is, that the *microreactor must keep radiation exposure during power operation, abnormal operations, or upset conditions, **as low as reasonably achievable***.

ALARA should mean that diligent efforts are made to reduce radiation exposures to levels below the radiation protection standards. But the cost and schedule are often placed above radiation protection. The current use of the term ALARA means that the Department of Energy will actually allow the radiation doses to be whatever is convenient.

Workers at Department of Energy sites continue to get cancer at elevated rates. The ALARA statement is exceedingly meaningless given the lack of radiation monitoring, environmental contamination monitoring and lack of neutron dose monitoring during routine operations that will be conducted at the INL, let alone when the microreactor is deployed. The DoD is suggesting that the goal is that microreactors will be deployed anywhere, and near hospitals, no less.

The Department of Energy continues to give its workers elevated cancer rates at annual doses averaging 400 millirem, [2] which is far less than the 5000 millimrem annual limit in the U.S. In radworker training, there may be discussion of the fact that international radiation worker protection recommends only 2 rem per year, not 5 rem per year. There is still no mention of recent human epidemiology showing the harm of radiation is higher than previously thought and at low doses, below 400 mrem annually to adult workers, increased cancer risk occurs. Non-cancer health harm from ionizing radiation continues

[2] Richardson, David B., et al., "Risk of cancer from occupational exposure to ionizing radiation: retrospective cohort study of workers in France, the United Kingdom, and the United States (INWORKS), BMJ, v. 351 (October 15, 2015), at http://www.bmj.com/content/351/bmj.h5359 Richardson et al 2015 This cohort study included 308,297 workers in the nuclear industry.

to be ignored by the Department of Energy, despite the research from other parts of the scientific community.

Failure to address the actual inhalation and ingestion dose may be part of the problem. Excessive subtraction of "background" may be causing understating the radiation doses and seems to be prevalent. And the failure to address the actual health risk of radiation must be part of the problem. The reality of the health harm caused by ionizing radiation, based on updated scientific evidence, must be addressed in the EIS and therefore, the EIS cannot rely on Department of Energy standards for radiation exposure for workers or the public.

11. DOE's allowable radiation level of 100 mrem/yr would devastate public health

The EIS must not embrace the DOE's unscientific allowable radiation level of 100 mrem/yr and implies that reaching such high levels would not be a devastation to the health of people in our communities.

Department of Energy "regulatory radiological dose limits for member of the public" is 100 mrem/yr for onsite controlled areas and offsite or onsite outsider of controlled areas, no matter the age and gender of the member of the public.

Even now, with air emissions releases supposedly below 1 mrem/yr, communities near the Idaho National Laboratory have elevated levels of certain cancers, sometimes five times the state average, according to the Idaho Cancer Registry.

The DOE's unique Derived Concentration Guidelines (DCGs) [3] allow about 100 times more radiological contamination than other federal standards. With federal drinking water standards, scientific study has shown that even the federal standards for radionuclides are not protective of human health.

To get some perspective on how permissive the DOE's DCGs are, see the federal limits and public health goals for drinking water in Table 1. Compare the DOE's DCGs to federal Maximum Contaminant Levels (MCLs) and the public health goals. (To convert the DOE's DCGs as they are typically presented in microcurie/milliliter, you would multiply by 1,000,000,000 to obtain picocurie/liter.) The DOE DCGs are much higher than the federal Maximum Contaminant Level and even farther above the level would be protective of health by scientifically evaluated recommended health goals.

For example, the federal limit for tritium in drinking water is 20,000 picocuries/liter, the DOE's derived concentration guide (DCG) is 1,900,000 picocuries/liter, but the level that isn't proven to cause harm is no higher than 400 picocuries/liter.

[3] Department of Energy, DOE-STD-1196-2011, Derived Concentration Technical Standard, April 2011. https://www.standards.doe.gov/standards-documents/1100/1196-astd-2011

Table 1. Radionuclide monitoring typical of state drinking water monitoring programs of community wells, with comparison of the Federal drinking water standard maximum concentration levels to the Department of Energy's Derived Concentration Guide (DCG) levels.

Code	Analyte	Typical of uncontaminated basalt aquifer	**Federal MCL[a]** **Versus** **(DOE's Derived Concentration Guide)**	**Public Health Goal[b]**	Comment
4000	Gross alpha excluding radon and uranium	Zero	15 pCi/L	Zero	The source of alpha can be radium, thorium, plutonium, or americium. The absence of radium-228 suggests the absence of thorium-232.
4002	Gross alpha including radon and uranium	< 3 pCi/L	See Uranium MCL	See Uranium goal	Gross alpha including uranium would not include gaseous radon. It would include radium-226 which is an alpha emitter. It would not include radium-228 because it is a beta emitter. And it may include radium-224 although typically the radium-224 is not determined.
4100	Gross beta (excluding K-40)	Zero	4 mrem 50 pCi/L	-	Units of mrem or pCi/L may be used. The source of the beta/photon emitter is usually not identified but can be manmade strontium-90, cesium-237, cobalt-60 or plutonium. Proper determination of mrem requires knowing which nuclides are present.
	Strontium-90	Zero	8 pCi/L **(DOE's DCG: 1,100 pCi/L)**	0.35 pCi/L	(Sometimes measured and relates to total strontium)
4010	Combined radium-226 and radium-228		5 pCi/L **(DOE's DCG: 112 pCi/L)**	See radium-226 and radium-228 limits.	Radium ingestion or inhalation can cause lymphoma, bone cancer or diseases of blood formation such as leukemia and aplastic anemia). Radium-224 is typically not regulated and to do so would require gross alpha

Code	Analyte	Typical of uncontamin-ated basalt aquifer	**Federal MCL[a]** **Versus** **(DOE's Derived Concentration Guide)**	**Public Health Goal[b]**	**Comment**
					testing with 48 hours of sample collection
4020	Radium-226		See combined radium MCL **(DOE's DCG: 87 pCi/L)**	0.05 pCi/L	Detection levels of 1 pCi/L may be too high to discern low levels.
4030	Radium-228		See combined radium MCL (DCG: 25 pCi/L)	0.019 pCi/L	Detection levels of 1 pCi/L may be too high to discern low levels.
4006	Combined uranium		20 pCi/L	0.43 pCi/L	20 pCi/L would correspond to 30 ug/L if natural uranium. Typical conversion using 0.67 pCi/ug assumes natural uranium composition.
4007	Uranium-234		For MCL, see combined uranium MCL. **(DOE's DCG: 680 pCi/L)**	See combined uranium goal	Uranium-234 is present is natural uranium and non-natural uranium and contributes significantly to activity.
	Radon		Advisory level between 300 and 4000 pCi/L	1.5 pCi/L	No requirement to monitor radon.
4008	Uranium-235		See combined uranium MCL **(DOE's DCG: 720 pCi/L)**	See combined uranium goal	Uranium-235 concentration is lower in depleted uranium and higher in enriched uranium. Enrichment can range from 3 to 93.5 percent.
4009	Uranium-238		See combined uranium MCL **(DOE's DCG: 750 pCi/L)**	See combined uranium goal	Uranium-238 concentration is greater in depleted uranium.

Code	Analyte	Typical of uncontamin-ated basalt aquifer	Federal MCL[a] Versus (DOE's Derived Concentration Guide)	Public Health Goal[b]	Comment
	Tritium		20,000 pCi/L (DOE's DCG: 1,900,000 pCi/L)	400 pCi/L	Don't be fooled by the wildly permission federal or DOE tritium standards.

Table notes: Federal maximum contaminant levels (MCLs) set the state and federal levels requiring enforcement are based on EPA's 2012 edition of Drinking Water Standards at oehha.ca.gov/water/phg/allphgs.html. The public health goals in the table are based on California's State Water Resources Control Board 2016 Groundwater Information Sheet on Radionuclides and are not enforceable.

The Department of Energy cites its "derived concentration guide" in defending the DOE's expansion of test range activities at the Idaho National Laboratory's National Security Test Range and Radiological Response Training Range. This will, for at least the next 15 years, will be releasing to the winds various long-lived and short-lived radionuclides to further the contaminate the INL and to blow to nearby communities at far higher levels than recent in recent decades. [4]

By no means is the DOE's 100 mrem/yr dose limit in its "derived concentration guides" protective of human health. DOE ignores the epidemiology that shows that a few years of an average 400 mrem/yr to adult radiation workers increases cancer risk. Exposure of pregnant women to DOE's allowed 100 mrem/yr dose would greatly harm fetal health. The DOE ignores all modern epidemiology studies for human health effects that show harm greater than DOE chose to believe decades ago, especially to the unborn, and to females and children.

The public as well as radiation workers need to keep in mind that, despite what they may have been taught:

- The cancer risk is not reduced when radiation doses are received in small increments, as the nuclear industry has long assumed. [5]

[4] U.S. Department of Energy Draft Environmental Assessment for Expanding Capabilities at the National Security Test Range and the Radiological Response Training Range at Idaho National Laboratory (DOE/EA-2063) at https://www.energy.gov/sites/prod/files/2019/09/f66/draft-ea-2063-expanding-capabilities-nstr-rrtr-inl-2019-09.pdf Send comments by October 12, 2019 to nsrrea@id.doe.gov

[5] Richardson, David B., et al., "Risk of cancer from occupational exposure to ionizing radiation: retrospective cohort study of workers in France, the United Kingdom, and the United States (INWORKS), BMJ, v. 351 (October 15, 2015), at http://www.bmj.com/content/351/bmj.h5359 Richardson et al 2015 This cohort study included 308,297 workers in the nuclear industry.

- Despite the repeated refrain that the harm from doses below 10 rem cannot be discerned, multiple and diverse studies from human epidemiology continue to find elevated cancer risks below 10 rem and from low-dose-rate exposure. [6]
- The adverse health effects of ionizing radiation are not limited to the increased risk of cancer and leukemia. Ionizing radiation is also a contributor to a wide range of chronic illnesses including heart disease and brain or neurological diseases.

The public and radiation workers take cues from their management that they should not be concerned about the tiny and easily shielded beta and alpha particles. DOE-funded fact sheets often spend more verbiage discussing natural sources of radiation than admitting the vast amounts of radioactive waste created by the DOE. The tone and the meta-message from the DOE, the nuclear industry, is that if you are educated about the risks, then you'll understand that the risks are low. Yet, these agencies continue to deny the continuing accumulation of compelling and diverse human epidemiological evidence that the harm of ingesting radionuclides is greater than they've been claiming.

The EIS must not be based on unscientific claims of low harm to the public from radiation, particularly the inhalation and ingestion risks.

12. The EIS must not ignore the genetic consequences of radionuclide exposures and emissions

The EIS must account for the actual genetic harm to radiation and non-radiation workers at the site and to families living offsite. The EIS, were it to be credible, must address the genetic harm, the illnesses in addition to cancer, the elevated rates of cancer and the shorter life spans of people living in a radioactively contaminated environment.

The biological harm that ionizing radiation may cause to DNA is mentioned sometimes but it is emphasized that usually the DNA simply are repaired by the body. And the training to radiation workers will mention that fruit flies exposed to radiation passed genetic mutations to their offspring but workers are told that this phenomenon has never been seen in humans even though, sadly, the human evidence of genetic effects has continued to accumulate. Birth defects and children more susceptible to cancer are the result.

Gulf War veterans who inhaled depleted uranium have children with birth defects at much higher than normal rate. The same kinds of birth defects also became prevalent in the countries were citizens were exposed to DU. There are accounts to suggest that the actual number of birth defects resulting from the World War II atomic bombs dropped on

[6] US EPA 2015 http://www.regulations.gov/#!documentDetail;D=NRC-2015-0057-0436 . For important low-dose radiation epidemiology see also John W. Gofman M.D., Ph.D. book and online summary of low dose human epidemiology in "Radiation-Induced Cancer from Low-Dose Exposure: An Independent Analysis," Committee for Nuclear Responsibility, Inc., 1990, http://www.ratical.org/radiation/CNR/RIC/chp21.txt And see EDI's April 2016 newsletter for Ian Goddard's summary and listing of important human epidemiology concerning low dose radiation exposure.

Japan and by weapons testing over the Marshall Islands have been underreported. The Department of Energy early on made the decision not to track birth defects resulting from its workers or exposed populations. But people living near Hanford and near Oak Ridge know of increased birth defects in those communities.

The book *Plutopia* documents the elevated percentage of deaths among infants in the Richland population in the 1950s. Elevated fetal deaths and birth defects in Richland were documented by the state health reports, yet Hanford's General Electric doctors and the Atomic Energy Commission that later became the Department of Energy failed to point these statistics out. The local newspapers failed to write of it. The Department of Energy has continued to fail to tell radiation workers and the public of the known risk of increased infant mortality and increased risk of birth defects that result from radiation exposure.

The finding of excess infant deaths near the Department of Energy Savannah River site around the 1970s and near the 1979 Three Mile Island nuclear accident are described in Jay Gould's book *Deadly Deceit*. [7] But I was unaware of the clarity of the records of infant mortality in the case of Richland near Hanford. The disregard to human life and human suffering seems to go hand-in-hand with the nuclear industry. But you don't have to take my word for it — read and know the history for yourself.

The Department of Energy support for and subsequent squelching of Hanford radiation worker epidemiology studies are described in Gayle Greene's *The Woman Who Knew Too Much – Alice Stewart and the Secrets of Radiation*. [8] Alice Stewart is famous for the unexpected finding that very small external x-ray medical radiation doses to pregnant woman in the 1950s increased the risk of childhood cancer and leukemia.

Time magazine recently mentioned Julian Aguon's book *What We Bury At Night,* a chronicle of how irradiated Marshallese mothers had borne "jellyfish babies" with translucent skin and no bones. From 1946 to 1958, the U.S. tested 67 nuclear weapons in the Marshall Islands near Guam. Official reports omitted the truth of the birth defects.

For more information about the health effects and after math from the U.S. bomb tests over the Pacific islands and the repeated deceptions about the consequences, read Giff Johnson, *Don't Ever Whisper —Darlene Keju, Pacific Health Pioneer, Champion for Nuclear Survivors*. [9]

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[7] Jay M. Gould and Benjamin A. Goldman, *Deadly Deceit – Low Level Radiation High Level Cover-Up,* Four Walls Eight Windows New York, 1990. ISBN 0-941423-35-2.

[8] Gayle Greene, *The Woman Who Knew Too Much – Alice Stewart and the Secrets of Radiation,* University of Michigan, 1999. ISBN 0-472-08783-5.

[9] Giff Johnson, *Don't Ever Whisper – Pacific Health Pioneer, Darlene Keju, Champion for Nuclear Survivors*, 2013. ISBN-10: 1489509062.

13. The EIS must disclose that INL's radiological workers continue to have elevated levels of illness yet are usually denied Energy Employee compensation

The EIS must discuss the evidence that radiological workers for the Department of Energy contractors are not adequately protected, get illnesses, cancers, infertility at elevated rates and yet the vast majority are denied Energy employee illness compensation under the Energy Employee Occupational Illness Compensation Program enacted in 2000. The EIS must discuss that worker radiation dose records are often deliberately destroyed and dose falsification at the INL is prevalent. Dose records are frequently withheld from workers but the few I have seen have revealed incompetence and deliberate falsification. The EIS must discuss that the U.S. does not use science to create safe radiation protection standards. A science-based standard must allow new information to inform the creators of the standard of its effectiveness. The radiation protection standards for workers and the public in the U.S. are not protective, not even of adult men exposed for a few years of their lives, let alone for the unborn, for children and for females.

The workers involved with reactor fuel fabrication, reactor operation, fuel transportation and radioactive waste disposal are known to suffer from more cancers and illnesses. But at the INL, even those workers who are secretaries and not radiological workers also bear more illnesses. The Energy Employee Occupational Illness Compensation Program (EEIOCP) typically denies INL worker compensation, saying the radiation exposure records just wasn't high enough. State worker's compensation is based on the INL's biased, falsified radiation records. There is no independent assessment of a worker's radiation exposure and no advocate for radiation workers at the INL.

These compensation denials remain in place even while investigations have found that INL monitoring, particularly for alpha inhalation, was completely out-to-lunch inadequate even in obviously contaminated circumstances. Bioassays were not performed even when lids popped off of transuranic waste drums. The Department of Energy's record of failing to protect radiation workers and non-radiation workers, alone, should be enough to disqualify it from even being considered for this project.

14. The EIS must address all INL's current and proposed airborne releases, which are already set to increase by more than a factor of 170

The INL's deliberate and health-harming radiological releases to the environment are already increasing by a factor of more than 170, for its High-Assay Low Enriched Uranium (HALEU) processing at the Materials and Fuels Complex. See my uppercase and bold additions to Table 2 comments regarding the unreliability of the estimated air emissions data.

Table 2. Estimated annual air pathway dose (mrem) from normal operations to the maximally exposed offsite individual from proposed projects, including the estimated dose from expanding capabilities at the Ranges based on DOE/EA-2063.

Current and Reasonably Foreseeable Future Action	**Estimated Annual Air Pathway Dose (mrem)**
National Security Test Range	0.04[e]
Radiological Response Training Range (North Test Range)	0.048[d]
Radiological Response Training Range (South Test Range)	0.00034[a]
HALEU Fuel Production (DOE-ID, 2019)	1.6[a]
Integrated Waste Treatment Unit (ICP/EXT-05-01116)	0.0746[h]
New DOE Remote-Handled LLW Disposal Facility (DOE/ID 2018)	0.0074[a]
Recapitalization of Infrastructure Supporting Naval Spent Nuclear Fuel Handling (DOE/EIS 2016)	0.0006[c]
TREAT (DOE/EA 2014)	0.0011[a]
DOE Idaho Spent Fuel Facility (NRC, 2004)	0.000063[a]
Plutonium-238 Production for Radioisotope Power Systems (DOE/EIS 2013)	0.00000026[b]
Total of Reasonably Foreseeable Future Actions on the INL Site	1.77[g]
Current (2018) Annual Estimated INL Emissions (DOE2019a)	0.0102[f]
Total of Current and Reasonably Foreseeable Future Actions on the INL Site [**DOE WOULD INCREASE INL'S AIRBORNE RELEASES BY OVER 170 TIMES**]	1.78[g]

Table notes:

a. Dose calculated at Frenchman's Cabin, typically INL's MEI for annual NESHAP evaluation.

b. Receptor location is not clear. Conservatively assumed at Frenchman's Cabin.

c. Dose calculated at INL boundary northwest of Naval Reactor Facility. Dose at Frenchman' Cabin likely much lower.

d. Dose calculated at INL boundary northeast of Specific Manufacturing Capability. Dose at Frenchman's Cabin likely much lower.

e. Sum of doses from New Explosive Test Area and Radiological Training Pad calculated at separate locations northeast of MFC near Mud Lake. **Dose at Frenchman's Cabin likely much lower.**

PLEASE NOTE THAT THE PUBLIC AT MUD LAKE IS CLOSER TO THE RELEASE THAN TO FRENCHMAN'S CABIN.

f. Dose at MEI location (Frenchman's Cabin) from 2018 INL emissions (DOE 2019a). The 10-year (2008 through 2017) average dose is 0.05 mrem/year.

PLEASE NOTE THAT MANY RADIOLOGICAL RELEASES ARE IGNORED AND NOT INCLUDED IN THE RELEASE ESTIMATES IN NESHAPS REPORTING.

g. This total represents air impact from current and reasonably foreseeable future actions at INL. It conservatively assumes the dose from each facility was calculated at the same location (Frenchman's Cabin), which they were not.

h. Receptor location unknown.

15. The EIS must include the full and truthful consequences of the 3 megawatt-thermal Stationary Low-power reactor, the SL-1, that was also to be deployed as a mobile power supply for the military

The SL-1 is in many ways is quite similar in hubris concerning the "prototype microreactor." The SL-1 was 3 megawatts-thermal and high enriched uranium-235 with high burnup. The millions of curies released from that accident smoked much of southeast Idaho from Monteview to Albion, despite Department of Energy's continued lie that only 1100 curies were released. Read more about the SL-1 accident at the Environmental Defense Institute website. [10] [11] [12]

Roughly 30 percent of the 2.5 megawatt-thermal SL-1 core was vaporized in building exhausting through a ceiling vent. The initial curie inventory of the core would have been roughly at least 2 million curies and there are more fission products in the parts of the core that melted. The Department of Energy is still claiming that the SL-1 accident released mainly iodine-131 and that the total release was only 1100 curies. In addition, the Department of Energy in the *INEL Historical Dose Evaluation* claims that no uranium, plutonium, or americium was released.

The estimated releases from the SL-1 accident are provided in Table 3. The AEC grossly understated the SL-1 radiological release and the Department of Energy continues the deception which would have otherwise dominated all historical INL radiological releases.

Even now the Idaho Operations Office and their "story" about the SL-1 accident in the DOE-funded book *Proving the Principle* [13] lays the blame for the SL-1 accident on a crewman and presents incorrect information about the accident.

Estimates of the fuel release fractions for the SL-1 accident performed for the Center for Disease Control implied by the Department of Energy's stated released yielded impossibly low fuel release fractions for that fuel design. [14]

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[10] Environmental Defense Institute newsletter articles by Tami Thatcher, for December 2019: "Interesting Similarities Between the SL-1 and the Chernobyl Nuclear Accidents," Understanding Reactivity Insertions – And Why You Should Never Insert a Dollar…," and "Just Some of the Lies Told About SL-1 Accident to Coverup the Accident Cause and Consequence," at http://www.environmental-defense-institute.org/publications/News.19.Dec.pdf

[11] Environmental Defense Institute September 2019 newsletter article by Tami Thatcher: "A Comparison of the Three Mile Island Unit 2 Fuel Release Fractions to the SL-1 Derived Release Fractions," at http://www.environmental-defense-institute.org/publications/News.19.Sept.pdf

[12] Tami Thatcher, *Environmental Defense Institute*, updated 2019, "The SL-1 Accident Consequences," at http://environmental-defense-institute.org/publications/SL-1Consequences.pdf and "The Truth about the SL-1 Accident – Understanding the Reactor Excursion and Safety Problems at SL-1" at http://environmental-defense-institute.org/publications/SL-1Accident.pdf

[13] Susan Stacy, "Proving the Principle – A History of the Idaho National Engineering and Environmental laboratory, 1949-1999," Washington, D.D.: US Department of Energy. p. 148. http://www.inl.gov/publications/ and http://www.inl.gov/proving-the-principle/introduction.pdf

[14] Report by Risk Assessment Corporation for Centers for Disease Control and Prevention, Department of Health and Human Services, *Final Report Identification and Prioritization of Radionuclide Releases from the Idaho*

Table 3. SL-1 radiological release estimates.

Element	Inventory (Ci)	AEC Release Fraction, percent (Note 1)	INEL HDE Release Estimate (Ci) (Note 2)	More Probable Release Fraction	More Probable Release (Ci)
Iodine-131	18,182 Ci	0.44 percent	80 Ci	30 to 100 percent	5455 to 18,182 Ci
Cesium-137	2,941 Ci	0.017 percent	0.5 Ci	30 percent	882 Ci
Strontium-90	2,778 Ci	0.0036 percent	0.1 Ci	30 percent	833 Ci
	Total inventory decayed to 6 months after the SL-1 accident is 221,500 curies, (Note 3) which would correspond to a 10-fold higher inventory of about 2 million curie inventory at the time of the January 3, 1961 accident.				

Table Notes: 1. Risk Assessment Corporation estimated the SL-1 release fractions, based on the release estimates by the Atomic Energy Commission (AEC), now the Department of Energy. Report by Risk Assessment Corporation for Centers for Disease Control and Prevention, Department of Health and Human Services, *Final Report Identification and Prioritization of Radionuclide Releases from the Idaho National Engineering and Environmental Laboratory*, RAC Report No. 3, CDC Task Order S-2000-Final, October 2002, pages 117, 118. https://www.cdc.gov/nceh/radiation/ineel/TO5FinalReport.pdf Note 2: See *Idaho National Engineering Laboratory Historical Dose Evaluation*, DOE-ID-12119, August 1991. US Department of Energy Idaho Operations Office, Volumes 1 and 2 (and Table A-41 with SL-1 release estimates) at https://www.iaea.org/inis/inis-collection/index.html or see https://inldigitallibrary.inl.gov and Note 3: K. J. Holdren et al., Lockheed Idaho Technologies Company, *Remedial Investigation/Feasibility Study Report for Operable Units 5-05 and 6-01 (SL-1 and BORAX-1 Burial Grounds)*, INEL-95/0027, March 1995. This report has slightly different curie estimates than the RAC report, with 2954 curies of Cs-137 and 2845 curies of Sr-90.

A complete and reasonable accounting of the SL-1 accident radiological release must be provided by the Department of Energy and made available in the EIS. Or are we to presume that the EIS will be satisfied with radiological releases from the prototype microreactor being similarly covered up with lies?

16. The EIS must provide a full and accurate accounting of the Department of Energy's past environmental releases

To assess the harm to local communities the EIS requires a credible accounting of the historical releases from the Idaho National Laboratory. The Department of Energy has not provided factually accurate accounting of its past releases. The document issued by

National Engineering and Environmental Laboratory, RAC Report No. 3, CDC Task Order S-2000-Final, October 2002, pages 117, 118. https://www.cdc.gov/nceh/radiation/ineel/TO5FinalReport.pdf

the Department of Energy in 1991, the *INEL Historical Dose Evaluation* [15] [16] has been found to contain numerous underestimates so blatant that even the Center for Disease Control found some releases underestimated by 10-fold. The truth is that the underestimates are larger than the CDC found. The Department of Energy's *INEL Historical Dose Evaluation* has greatly underestimated the total curies released and has also omitted in many cases the uranium, plutonium and thorium-232/progeny from its assessed releases.

The Department of Energy must start by issuing a report to correct the underestimates in the *INEL Historical Dose Evaluation* that covers the time from the beginning of the laboratory until 1989 and add to it information to the present that includes acknowledging various radiological releases that it so far has denied.

17. **The EIS must acknowledge the many deliberate acts of failure to monitor contaminants and failure to report Idaho National Laboratory contamination**

Department of Energy has never conducted coherent defensible and complete environmental monitoring of its radiological releases. Instead, the Department of Energy has exerted influence over agencies like the U.S. Geological Survey to not monitor and/or not report radiological information. The Department of Energy has always made it its first priority to avoid the liabilities should a citizen object to be poisoned.

Unfortunately, U.S. Geological Survey reports have been used as a basis to dismiss assertions of aquifer contamination from the deepwell injection of radioactive wastes into the aquifer. Because of deceptive practices and deliberately inadequate monitoring and failure to report known contamination, the effect on nearby communities has been underestimated when it rightfully should have been acknowledged the hexavalent chromium and elevated radionuclides in the drinking water, along with airborne radiological releases have indeed caused elevated illness and death, particularly in the Magic Valley, aquifer down-gradient of the INL.

In addition, the Department of Energy controls whether or not air monitoring filters are turned over to the U.S. Environmental Protection Agency. Years of EPA RadNet data blackouts are prevalent from Seattle, WA, to Richland, WA, to Boise, ID, to Idaho Falls, ID.

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[15] US Department of Energy Idaho Operations Office, "Idaho National Engineering Laboratory Historical Dose Evaluation," DOE-ID-12119, August 1991. Volumes 1 and 2 can be found at https://www.iaea.org/inis/inis-collection/index.html

[16] Environmental Defense Institute's comment submittal on the Consent-based Approach for Siting Storage for the nation's Nuclear Waste, July 31, 2016. http://www.environmental-defense-institute.org/publications/EDIXConsentFinal.pdf

Citizens can basically count on bad news about elevated radiological contamination in their air being unavailable because the U.S. Department of Energy didn't want the data to be seen.

18. The EIS must require the Department of Energy's to review and revise its currently inadequate environmental monitoring programs

The EIS must require that the Department of Energy must seek some knowledgeable advice outside the Department of Energy for how to create a credible radiological monitoring program. The current program continues to imply that any uranium and thorium in the soil is naturally occurring even when obviously elevated due to radiological releases. The current DOE environmental monitoring program is failing to address that the "broken decay chains" prevalent in SE Idaho are due to radiological releases. The current DOE environmental monitoring program avoids monitoring important radionuclides when such monitoring might implicate the INL as the source of the radiological release.

How are citizens supposed to have confidence in the DoD's EIS when the Department of Energy does not design an effective monitoring program (see the Department of Energy contractor for environmental monitoring on the IdahoESER.com website), destroys samples, destroys sample data, biases results, avoids sampling in problem areas and basically conducts a charade to avoid implicating the INL as being the source of the radiological release? The EIS needs to address the credibility problem that the Department of Energy has, including its lack of credibility regarding environmental monitoring. The EIS, to have any credibility for microreactor prototype development at the INL must require DOE to revise its on- and off-site environmental monitoring programs. (And the State of Idaho's program has basically taken its lead from the inadequate DOE program, so forget about relying on the State of Idaho's also inadequate program, which only addresses southeast Idaho and ignores the rest of the state.)

Historical and current INL radiological emissions are inadequately monitored. And reported monitoring rarely attributes INL's releases to the INL even when there is no other reasonable explanation. The environmental monitoring seems to be centered on monitoring in such a way that the results are ambiguous.

I find that current INL radiological airborne monitoring is already inadequate because (1) emissions reporting from various INL facilities are usually based on estimates and not measurements, (2) extensive time-averaging rather than instantaneous monitoring, and (3) increasingly tardy quarterly and annual environmental monitoring reports that are prone to "air monitor malfunctioning" or other excuses to avoid revealing the peak levels of contamination.

The U.S. Environmental Protection Agency has radiological air monitoring in Boise and in Idaho Falls. But strange gaps and lapses in monitoring occur in RadNet. When the explosion in 2018 at the US Ecology Grandview facility occurred, which is a state

permitted hazardous waste burial facility that accepts radioactive waste, including Special Nuclear Material, RadNet went down that day and stayed down for weeks. [17] [18]

The Idaho DEQ addresses radionuclide emissions via Permit to Construct licenses which the Idaho DEQ does not make public and does not enforce, based on DEQ's failure to investigate the unplanned disposal of radionuclides at the Advanced Test Reactor Complex radioactive waste pond.

The Idaho Department of Environmental Quality Oversight Monitoring page has removed two decades of citizen-paid-for monitoring. [19] See https://www.deq.idaho.gov/inl-oversight/monitoring/reports/

The INL is required to provide radionuclide air emissions reporting in accordance with federal National Emission Standards for Hazardous Air Pollutants (NESHAPS) [20] means unmonitored guessimated and not-publicly-available rationale for radionuclide estimates are used to make estimated radiological dose estimates all while ignoring the buildup of long-lived radionuclides in the air, soil and water. The NESHAPS reports are difficult to locate as the locations where the documents might be found frequently change. Most of NESHAPs reporting for the INL is not based on monitored emissions; it is based on estimated releases computed in documents that are not identified and are not available for public review.

In fact, no one at DOE will discuss whether or not the years of "accidental" resin releases from the Advanced Test Reactor to the open air evaporation pond has been included in NESHAPs reporting. These resins are highly radioactive and a not a permitted release to the evaporation pond. The Idaho Department of Environmental Quality refused to investigate the release and the Idaho National Laboratory refuses to answer any questions about it.

The public needs to be aware of the inadequate environmental monitoring as well as deliberately manipulated data to minimize peak contamination levels that appears to me to be prevalent.

According to the air filter analysis conducted by a Department of Energy contractor for environmental monitoring on the IdahoESER.com website, "Alpha-emitting radionuclides ^{238}Pu, $^{239/240}$Pu, and ^{241}Am were detected in the Van Buren Gate filter

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[17] Environmental Protection Agency RadNet (that went down in 2018 the day of the US Ecology Grandview, Idaho explosion and stayed down for two weeks after the accident so there are no radiological monitoring data in the Boise area during that time that are publicly available other than radon measurements) at https://www.epa.gov/radnet/near-real-time-and-laboratory-data-state and choose the state, https://www.epa.gov/radnet/radnet-air-data-boise-id or https://iaspub.epa.gov/enviro2/erams_query_v2.simple_query

[18] Environmental Defense Institute March 2019 newsletter article by Tami Thatcher "Serious Flaws in the Radiological Monitoring in the Boise Area and the US Ecology Idaho Disposal and Transfer Facilities," and "Two Explosions at Idaho DEQ RCRA-Permitted Facilities in Idaho in 2018 Suggest Idaho DEQ Doing a Bang-Up Job of RCRA Permitting at http://environmental-defense-institute.org/publications/News.19.March.pdf

[19] See May 2017 Environmental Defense Institute newsletter which discusses the Idaho Department of Environmental Quality Oversight Monitoring page where the monitoring for two decades prior to 2010 has been removed. See the Idaho Department of Environmental Quality website at https://www.deq.idaho.gov/inl-oversight/monitoring/reports/

[20] https://www.epa.gov/compliance/national-emission-standards-hazardous-air-pollutants-compliance-monitoring

composite at elevated levels compared to historical measurements by the ESER program." [21] "This was also one of the infrequent times americium and plutonium isotopes have been detected together in an ESER Program filter composite. Thorough examination of quality assurance and control data, including analytical results from blanks and performance evaluation samples, does not suggest inadvertent contamination of the filter in the field or laboratory. Although the measurements were elevated, they are well below public health standards (i.e., DCSs) and therefore do not represent a public health concern."

The 2018 Second Quarter report, further states: "A possible source of the radionuclides measured in the Van Buren Gate sample is the Radioactive Waste Management Complex (RWMC). Plutonium isotopes and ^{241}Am are often detected in low-volume air filters collected around the Subsurface Disposal Area, as well as in soil contaminated from past flooding (in 1962 and 1969) of pits and trenches containing transuranic waste originating from the Rocky Flats Plant. The Van Buren Gate is also situated in the predominant downwind direction from the RWMC. This and other possible sources will be investigated further."

Curiously, the four drums exploded at the RWMC in the second quarter of 2018. Also, the Mound Box Project with plutonium-238 and transuranic radionuclide contamination was moving the waste between facilities.

And more curiously, this year the quarterly reports are not timely issued by idahoeser.com although the Department of Energy has acknowledged that the 2019 range fire at the INL in 2019 was a significant radiological event that can be monitored around the globe.

The environmental reporting by DOE includes trending of airborne contamination that have large lapses in the reporting, of days and weeks.

The representation of harm from air emissions to the region must assess cumulative impacts from historical releases and ongoing releases as well as future releases. See the High-Assay Low Enriched Uranium Environmental Assessment's (HALUE EA) presentation of estimated dose from radiological emissions which demonstrate the inaccuracy and underrepresentation of ongoing radiological air emissions as reported at Frenchman's Cabin in National Emissions Standards for Hazardous Air Pollutants.

The HALUE EA refers to one year of NESHAPs data without even providing a reference to the document. Most of NESHAPs reporting for the INL is not based on monitored emissions; it is based on estimated releases computed in documents that are not identified and are not available for public review. In fact, no one at DOE will discuss whether or

[21] INL Environmental Surveillance, Education and Research Program, Managed by Veolia Nuclear Solutions – Federal Services, www.idahoeser.com, Second Quarter 2018 INL Quarterly Site Environmental Report, VNS-ID-ESER-SURV-058, http://www.idahoeser.com/Quarterlies/2018Q2/air.html

not the years of "accidental" resin releases from the Advanced Test Reactor to the open air evaporation pond has been included in NESHAPs reporting. These resins are highly radioactive and a not a permitted release to the evaporation pond, but when the new contractor inadvertently discovered the release, they covered up contaminated soil with 1 ft of soil without any transparency or accountability to Idaho citizens what-so-ever. [22] CERCLA cleanup standards promised by the DOE are 11 ft depth, while DOE reneged to a 3 ft depth cleanup at the ATR Complex.

In fact, long-lived radionuclides are present not only at INL's INTEC facility where naval and research spent nuclear fuel was reprocessed, long-lived radionuclides including americium-241 are present at the ATR Complex. [23] [24]

Because of the habitual omission of long-lived radionuclides and decay series, even the Department of Energy had not properly determined the number of years that institutional controls limiting access to contaminated areas would be required. The 2095 date was incorrect, then in 2010, 300 years was added to create the later 2310 date, which was also incorrect. Then NSI-26002 stated an additional 24,100 years needed to be used. But the number of years that needed to be added was actually far larger because more than one half-life of americium-241 decay was needed and they forgot that americium-241 must decay through several radioactive decay progeny before reaching a stable non-radioactive isotope. [25]

Add to this now the flushing of highly radioactive resin beads to the open-air evaporation pond at the ATR Complex, and covering up contaminated soil with 1 ft of soil without any transparency or accountability to Idaho citizens what-so-ever. [26] With its refusal to investigate or enforce, the State of Idaho actively participates in covering up the INL's radiological releases.

19. The EIS must investigate and acknowledge the buildup of radionuclides in southeast Idaho from the Department of Energy's past Nevada nuclear weapons testing, from

[22] See EDI newsletters on ATR Evaporation Pond release in August and September 2017 at www.environmental-defense-institute.org

[23] Federal Facility Agreement and Consent Order New Site Identification (NSI), "TRA-04: TRA-712 Warm Waste Retention Basin System (TRA-712 and TRA-612). NSI-26002, signed August 2015. See the CERCLA Administrative Record at ar.icp.doe.gov

[24] Federal Facility Agreement and Consent Order New Site Identification (NSI), "TRA Courtyard Area," NSI-26011, signed April 2014. See the CERCLA Administrative Record at ar.icp.doe.gov. Table 9 includes extensive americium-241 contamination in soil along with europium-152, cesium-137, and cobalt-60.

[25] Federal Facility Agreement and Consent Order New Site Identification (NSI), "TRA-04: TRA-712 Warm Waste Retention Basin System (TRA-712 and TRA-612). NSI-26002, signed August 2015. See the CERCLA Administrative Record at ar.icp.doe.gov See page 7 of Rev. 1. showing americium-241 contamination at 3210 pCi/g yet the unrestricted use concentration is 187 pCi/g.

[26] See EDI newsletters on ATR Evaporation Pond release in August and September 2017 at www.environmental-defense-institute.org

the Idaho National Laboratory, from what blows in from radioactive waste dumps on the Boise side of the state, and other sources

Southeast Idaho's air, water and soil are already radiologically contaminated. The environmental monitoring ignores the uranium and thorium added to the soil from INL operations, despite known elevated levels far above what was naturally in our region before 1950. Ignoring the buildup of long-lived radionuclides in our environmental monitoring programs may be convenient and may reduce the direct evidence of releases by the INL, but it is unacceptable and cannot be used to defend the EIS to build the prototype microreactor.

20. The EIS must address the negative impact the deploying these dirty-bomb terrorism targets called microreactors into communities and the potential for contaminating their homes and hospitals virtually for forever

The EIS will be for microreactor development but it needs to be emphasized that the deployed microreactors will be extremely attractive targets as they are "dirty bombs." In the EIS that addresses on its development at a Department of Energy site, the accident risks must acknowledge Idaho has no medical facilities cannot cope with radiologically contaminated victims. The EIS must acknowledge the history of the INL not having provisions for showing or decontaminating workers, as was the case in the 2011 plutonium inhalation event at the Materials and Fuels Complex.

The degree of bad public relations that putting these microreactors needs to be included in the EIS because there are so many more affordable and safer solutions for providing electrical power. When people actually understand how these microreactors will make their communities terrorist targets and how the contamination from a single microreactor can forever change their communities, placing these reactors in or outside the U.S. will worsen the reputation of the U.S. military and create more enemies of the U.S. Ultimately, the design of a microreactor does not make the world a safer place. Instead, no neighborhood, no ocean or lake, no place on earth will be safe from the deployment of these microreactors.

Beyond the routine emissions and additional disposal of the spent nuclear fuel created, the deployment of the "microreactors" makes as much sense at the nuclear engine aircraft that was researched at the Idaho National Laboratory and later cancelled. Like the aircraft engine project, which made no sense in terms of worker or public safety, the fact is that each microreactor will be able to release millions of curies of fission products, unfissioned fuel, actinides and activation products that can devastate health and 100 to 1000 square miles. While the EIS is for the prototype reactor, NEPA should not be used to enable such a devastating project by pretending that the project would not be extremely harmful in the long run as well as during development.

Sincerely,

Tami Thatcher