

Questions and comments HEAL Utah is submitting for a response at the public hearing scheduled for Wednesday September 8, 2021 regarding EnergySolutions: Amendment 3 of 11e.(2) License UT2300478. Submitted to the Utah Division of Waste Management and Radiation Control August 27, 2021.

Federal Cell Facility Amendment Request

Page 40

EnergySolutions' Radioactive Material License UT2300478 authorizes management and disposal of 11e.(2) byproduct on the same footprint herein being considered for the Federal Cell Facility. In preparation for this Federal Cell Facility Radioactive Material License Application, EnergySolutions previously requested Radioactive Material License UT2300478 be amended license a smaller footprint.⁵

Page 41

EnergySolutions also requests authority to abandon groundwater wells GW-36, GW-37 and GW38R. As groundwater beneath the proposed Federal Cell Facility generally flows toward the north-north east, existing groundwater wells surrounding the combined future Federal stewardship footprint (11e.(2) and Federal Cell Facility) will be adequate for early detection of any unlikely leakage beneath the two adjacent cells (11e.(2) and Federal Cell Facility). Supporting this claim is the recognition that regulatory oversight for both the 11e.(2) byproduct cell and the proposed Federal Cell Facility will be transferred to a single regulatory agency (the U.S. Department of Energy-Legacy Management) following their closure.

Question 1. Why is EnergySolutions Federal Cell Amendment Request being considered as a justification for this 11e.(2) permit amendment request when the former has not yet been approved?

Question 2. How does DWMRC's approval of this 11e.(2) permit amendment affect EnergySolutions ability to proceed in preparing the unused portion of this cell for the receipt of depleted uranium prior to a decision on their DU permit application?

This question was not fully answered in the public hearing. Why is the Federal Cell Facility Amendment Request included in the Division's list of materials related to Amendment 3 of 11e.(2) License UT2300478 at all? Specifically, in this document there are 13 references to EnergySolutions' plans to dispose of depleted uranium. HEAL requests that the Division's approval of EnergySolutions 11 e. (2) amendment request be modified to include explicit language that this approval does not include approval for EnergySolutions to initiate any activity related to the preparation of the unused portion of the 11 e. (2) cell for the disposal of depleted uranium.

Question 3. Please explain why the three groundwater wells proposed for abandonment were considered necessary and now are not.

The verbal response to this question given by Division staff in the public hearing suggests that the G-36 well will continue to operate as part of the monitoring of the 2000 evaporation pond but that approval will be granted for the G-37 and G-38 wells to be abandoned. The abandonment appears to be based on a determination that these two wells do not add useful information to that gathered from the other monitoring wells. Given the facts a) that underground conditions can change due to seismic and hydrologic forces, b) the Great Salt Lake is at its lowest level in

recorded history, c) that the 11 e. (2) material in the Federal Cell will now transition to long-term custody and monitoring, and d) that the future use of the unused portion of the Federal Cell is still undetermined, HEAL Utah opposes the abandonment of any monitoring wells that are already in place.

[Treatment Amendment document](#)

Page 3-2

The material for disposal is placed on the liner and compacted in place to a waste column height of approximately 34 feet at the embankment shoulder. At the embankment's highest point, the waste column will be approximately 50 feet thick.

Question 4. How often is the temporary cover of this cell inspected by state regulators? Has the state issued findings related to compliance with the temporary cover requirements? Are there air quality monitors that measure the levels of radioactive material that is becoming airborne during disposal operations?

Page 3-3

3.1.1. Storm Water Design

The normal design condition evaluates performance under the 100-year, 24-hour storm event of 2.4 inches of precipitation. The abnormal condition evaluates impacts of the Probable Maximum Precipitation (one-hour storm of 6.1 inches) as the worst-case extreme erosion event. The one-hour event was selected to maximize velocity of precipitation and, accordingly, flow through the cover drainage system.

Page L-7

3.0 Storm Events

The performance of the drainage ditches to contain runoff is only important for the active life of the facility (estimated as 25 years). Upon closure, the drainage ditches will be removed or eventually become silted in to allow sheet flow across the site over the natural grade of the area. Therefore, a reasonable maximum storm event over the active life of the facility is the 25-year, 24-hour storm event (1.9 inches). A reasonable potential worst-case event during the active life of the facility is the 100-year, 24-hour storm event (2.4 inches). Both of these storm events are depicted in the isopluvial maps of the National Oceanic and Atmospheric Administration (NOAA) Atlas 2, Volume VI (1973).

Question 5. The "worst case" storm event scenario described by DWMRC does not include the worst-case extreme erosion event described by EnergySolutions (a one-hour storm of 6.1 inches). It seems inconsistent that 2.4 inches of precipitation could be the maximum projected for a 100 year, 24-hour storm event but the projected maximum precipitation for a one-hour erosion event would be 6.1 inches of precipitation.

Question 6. Please explain this inconsistency. Does DWMRC's permit include requirements for EnergySolutions cell to withstand a one-hour erosion event?

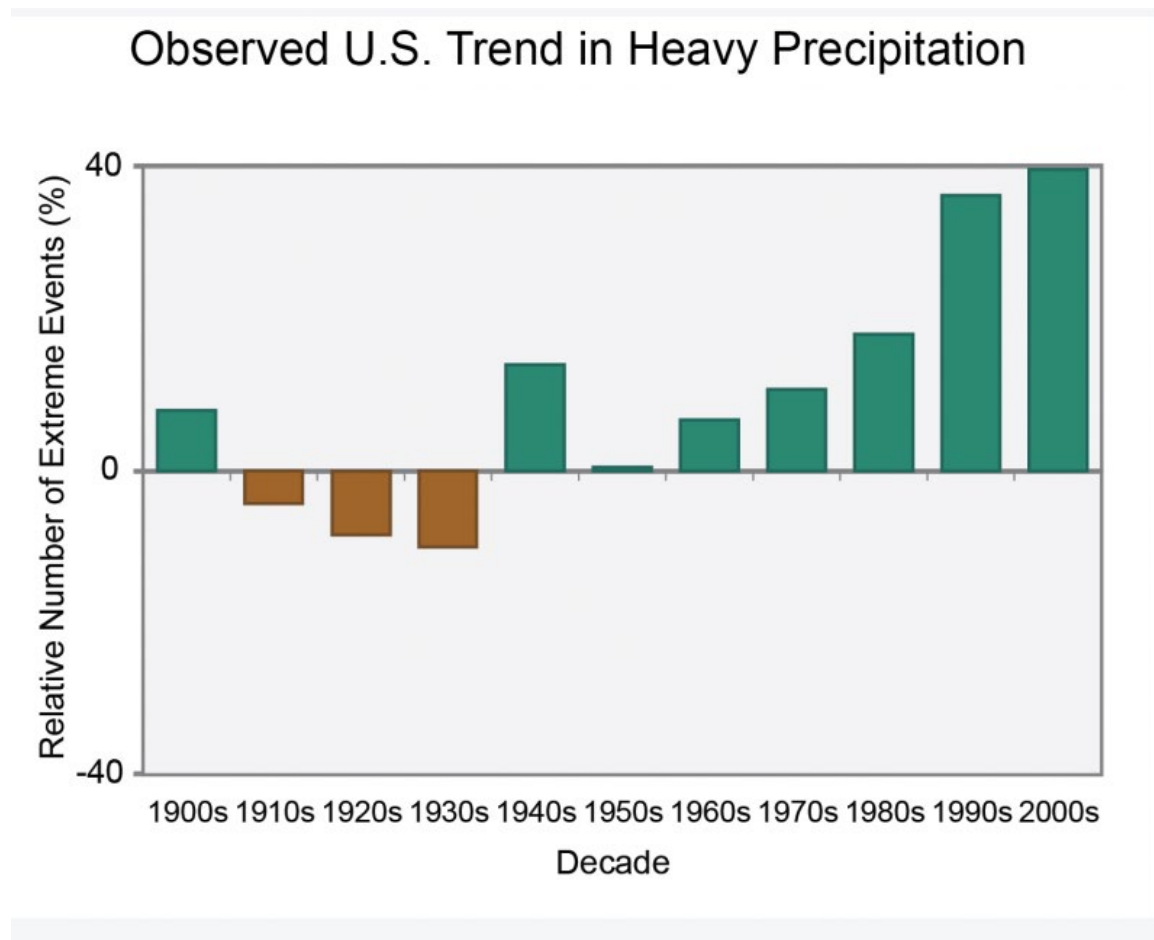
These precipitation projections are based on NOAA modeling from 1973. Effective August 6, 2003, NOAA Atlas 2 has been superseded by NOAA Atlas 14 Volume 1 for Arizona, Nevada, New Mexico, and Utah. <https://www.nws.noaa.gov/ohd/hdsc/noaaatlas2.htm> So the projections being used by EnergySolutions and DWMRC are at least 30 years out of date.

Based on federal regs. Difference between drainage ditches used during active cell operations and long term custody of the cell

Question 7. Why hasn't EnergySolutions been required to update their precipitation projections to Atlas 14?

Furthermore, NOAA is in the process of analyzing the impacts of non-stationary climate on depth-duration-frequency (DDF) precipitation magnitudes. https://www.weather.gov/media/owp/oh/hdsc/docs/202107_HDSC_PR.pdf

Questions 8 and 9. Given the dramatic increase in heavy precipitation events across the U.S. due to climate change (see chart below), even during the 18 years since Atlas 14 was published, what is DWMRC's confidence in the accuracy of the Probable Maximum Precipitation scenarios? Will DWMRC require EnergySolutions to revise its Storm Events assumptions and design as NOAA's modeling is updated? <https://www.c2es.org/content/extreme-precipitation-and-climate-change/>



Also, drought is known to change the dynamics of runoff.

Question 9 a. Does EnergySolutions design for this cell incorporate the effects of prolonged drought on soil conditions and storm water runoff?

Question 10. Have any of the 25-year, 100-year or 1000-year requirements for the site to withstand extreme weather events been updated in light of new projections that have been developed with regards to climate change?

The Division's responses to questions 5-10 did not satisfactorily address our concerns about the requirements for the site to withstand extreme weather events once the drainage ditches have been removed or are silted in and runoff occurs via "sheet flow" across the site. This includes the lack of information about drought effects on soil erosion posed in question 9a as is now labeled above but which was not specifically labeled in HEAL's original submission of questions for the public hearing. The explanation offered verbally by the Division staff is that it uses the previous year's precipitation records to predict extreme weather scenarios into the future. When talking about "extreme" weather, a one-year site-specific data set is obviously an inadequate basis upon which to predict extreme weather events, which may only occur at some time decades into the future. And given the rapid acceleration of climate change and the resulting recent increase in extreme weather events around the world, even 25-year or 100-year data sets are no longer very reliable predictors of extreme weather. HEAL Utah requests that the Division provide a full written explanation and justification of the methodology it uses for extreme weather modeling and how that methodology incorporates the most recent scientific climate projections.

To facilitate the closure of the cell

Page C-8

e) Waste with an average concentration above 4,000 pCi/g for natural uranium or for any radio nuclide in the radium-226 series; or above 60,000 pCi/g for thorium-230; or above 6,000 pCi/g for any radionuclide in the thorium series in any truckload or railcar shall not be accepted.

10.17 At the end of every calendar year, the Licensee shall ensure that the cumulative average activity concentration of waste placed within the upper three feet of disposed waste does not exceed 300 pCi/g of Ra 226 or 900 pCi/g of Th 230, and within the next seven feet does not exceed 500 pCi/g Ra 226 or 1500 pCi/g of Th 230. When both radionuclides are present, the unity rule defined below shall apply to ensure that the Ra-226 limit is not exceeded within 1000 years. Activity of Th 230 (pCi/g)/X + Activity of Ra 226 (pCi)/Y < or = 1 Where: X = 900 pCi/g in the upper three feet and 1500 pCi/g in the next seven feet of waste, and Y = 300 pCi/g in the upper three feet and 500 pCi/gm in the next seven feet of waste 10.18 The cumulative average densities of the waste in the upper ten feet of the 11e(2) embankment and of the compacted radon barrier placed shall not be less than 1.5 g/cm³ for either.

Generally, it isn't the concentration of radioactivity that poses the health and environmental risk but the total amount of radioactivity present. A kilogram of waste with 300 pCi of radium-226 per gram of waste is far less dangerous to the environment or public health than a thousand tons of waste at 3 pCi/g.

Question 11. What are the assumptions regarding human health risks for the use of these metrics as the upper limits of radioactivity in such a large volume of material?

EPA's default Preliminary Remediation Goals for Superfund sites is 0.002 pCi/g for radium-226 and similarly for thorium-230.

Question 12. Assuming that the cells contain the maximum level of radioactivity allowable in the permit, how long will it take before the radioactivity levels fall below these Superfund thresholds?

If closure and partition of the 11 e. (2) cell is approved, HEAL Utah requests that the Division issue a final report that includes

- 1) the final radio nuclide concentration metrics for Ra 226 and Th 230 specified in item 10-17 of the Treatment Amendment document
- 2) similar metrics for any other radio nuclides in the Ra 226 or Th 230 series
- 3) the total volumes of disposed waste containing each of these radio nuclides
- 4) the average concentration of natural uranium, radio nuclides in the radium 226 series, thorium-230 and radio nuclides in the thorium series in each truckload or rail car of waste disposed of in the 11 e. (2) cell.