



State of Utah

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DIVISION OF WASTE MANAGEMENT  
AND RADIATION CONTROL

Douglas J. Hansen  
*Director*

April 17, 2024

Vern C. Rogers, Director of Regulatory Affairs  
EnergySolutions, LLC  
299 South Main Street, Suite 1700  
Salt Lake City, UT 84111

RE: Federal Cell Facility Application Request for Information

Dear Mr. Rogers:

The Division of Waste Management and Radiation Control (Division) hereby provides follow-up Requests for Information (RFI) regarding the Federal Cell Facility Application dated August 4, 2022.

Each RFI in the attached document represents a follow up to an RFI issued earlier in the application review process. The numbering system ties the additional questions to the initial RFI with an added letter designation. When responding to an RFI, please use the assigned number representing the question.

With this round of follow up RFIs, the Division recommends that appropriate staff from the Licensee, the Division and consultants meet to discuss each matter for clarity.

Please contact Otis Willoughby at 385-622-2213 to schedule a meeting.

Sincerely,

Douglas J. Hansen, Director  
Division of Waste Management and Radiation Control

(Over)

DJH/OHW/JMK/wa

Enclosure: Federal Cell Application Review, Requests for Information or Updates to the Application

c: Jeff Coombs, EHS, Health Officer, Tooele County Health Department  
Bryan Slade, Environmental Health Director, Tooele County Health Department  
Energy*Solutions* General Correspondence Email  
LLRW General Correspondence Email

## Federal Cell Application Review

### Request for Information or Updates to the Application (RFI)

#### General

- Each of the RFI's has been assigned an identifier with a numbering convention as follows-
  - Application/Appendix Section
    - Section/Appendix Subsection
      - Section/Appendix Subsubsection (when applicable)
        - Sequential numbering

*Example: A question in Section 1, subsection 1, subsubsection 1 -The first RFI # would be 1.1.1-1, the next question in that section/subsection would be numbered 1.1.1-2*

**Please refer to the assigned RFI number when submitting a response.**

#### ***Appendix O: Federal Cell Facility Waste Characterization Plan***

##### **O-39.a**

The Division has reviewed the literature and reports provided by EnergySolutions/Neptune regarding data scaling, and while the importance is understood, documented justification for the approach has not been located. The Division is not convinced data scaling is being conservatively applied in NAC-0032\_R6 of the DU PA (Deep Time Assessment). The response to the request for justification was "This is a technically correct choice." (NAC-0147\_R0, Section 2.3.1).

To avoid underestimating Deep Time impacts, it is important that the amount of aeolian deposition estimates be conservative and defensible. The response needs to be supported by providing the mathematical derivation as to why it is the *technically correct choice*. Please provide a White Paper or a peer reviewed reference that includes the technical basis taken in NAC-0032\_R6 for aeolian deposition data scaling as the correct approach.

##### **O-39.b**

The approach taken for Intermediate Lake sedimentation in NAC-0032\_R6 was based upon the interpretation of lake cycles and sediment thickness from a Clive pit wall description by C. G. Oviatt, PhD, Professor of Geology, Kansas State University, as documented in NAC-0032\_R6, Table 3 (Lake cycles and sediment thickness from Clive pit wall interpretations (C.G. Oviatt, personal communication)). The Division has reviewed the data documented in NAC-0032\_R6 and compared it to other data, such as the lake sedimentation data provided in NAC-0105\_R0. Based on review of the data provided by Oviatt (Oviatt, et al 1999, Oviatt 2019), Jewell (Jewell 2014), and Neptune (Neptune 2018, Neptune 2021), it is concluded that the Clive DU PA Intermediate Lake sedimentation model does not represent existing lake sedimentation data and is non-conservative.

The Division finds that in the use of an intermediate lake sedimentation rate based on the total lake cycles, Neptune's document NAC-0032\_R6 speculates that there would be multiple short-term transgressions and regressions in lake elevations at Clive and constructed a heuristic model to evaluate short-term variations. To avoid underestimating the Deep Time impacts, it is important that the estimates of the amount of aeolian deposition and lake sedimentation be conservative and defensible. Please provide documentation that the intermediate lake sedimentation model is conservative as presented or revise the intermediate lake sedimentation model to be conservative with existing lake sedimentation data.

#### **References:**

Oviatt, C. G., R. S. Thompson, D. S. Kauffman, J. Bright, & R. M. Forester, 1999. "Reinterpretation of the Burmester core, Bonneville Basin, Utah," *Quaternary Research*, Vol. 52, pp. 180–184.

Oviatt, C. G., 2019. "Geomorphic Controls on Sedimentation in Pleistocene Lake Bonneville, Eastern Great Basin," in Starratt, S. W., and M. R. Rosen, eds., *From Saline to Freshwater: The Diversity of Western Lakes in Space and Time: Geological Society of America Special Paper 536* (in press) [https://doi.org/10.1130/2018.2536\(04\)](https://doi.org/10.1130/2018.2536(04)).

Jewell, P., 2014. "Comments on 'Deep Time Supplemental Analysis for the Clive DU PA,'" University of Utah, email to D. Back, SC&A, Inc, August 10.

Neptune and Company, Inc., 2018. *Deep Time Supplemental Analysis Responses for the Clive DU PA Model*, NAC-0105\_R0, February 23.

Neptune and Company, Inc., 2020. *Deep Time Assessment for the Clive DU PA Model v1.5*, NAC-0032\_R5, March 30.

Neptune and Company, Inc., 2021. *Deep Time Assessment for the Clive DU PA Model v2.0*, NAC-0032\_R6, August 2.

#### **O-40.a**

NAC-0025\_R4 (Geochemical Modeling) states that literature studies were selected which best represent the site conditions. While this is an understandable approach, little evidence is provided (Section 4) to support the statement. In addition, because the sorption coefficients are empirical, it is not generally recommended to use a K<sub>d</sub> value determination from one site to another site. The use of the same empirical coefficients at different sites introduces a large amount of uncertainty into the model due to the variability in the coefficients and geochemical conditions.

Please provide supplementary evidence that the selected range of partitioning coefficients from the literature were collected under geochemical conditions and with comparable mineralogy to the conditions at the Clive site. Additionally, please provide information of the overall technical approach of selecting partitioning coefficients from the literature as opposed to simulating them using site specific conditions.

**O-40.b**

In NAC-0025\_R4 (Geochemical Modeling), many of the partition coefficients and the solubility of constituents described in Sections 4 and 5 are based on literature reviews. The Division has been unable to verify their applicability to the Clive site and recommend simulating the exact speciation under site-specific conditions using the geochemical parameters provided in Tables 7 and 8 of NAC-0025\_R4 to provide better site applicability. This effort would be useful to ensure that the partitioning coefficients and solubility value ranges selected in this report match the geochemical conditions under which the literature values were collected. (Note: Visual MINTEQ was discussed for modeling some of the uranium speciation in this report.)

Using the values in Tables 7 and 8, please provide site specific speciation simulations for each of the constituents considered in the report.