RADIOACTIVE MATERIAL LICENSE NO. UT 2300478

STATEMENT OF BASIS

11e.(2) Byproduct Material Radioactive Waste Disposal Facility

EnergySolutions, LLC
423 West 300 South, Suite 200
Salt Lake City, UT 84101

January 2012

Purpose

This Statement of Basis describes proposed changes to Radioactive Material License (RML) No. UT 2300478 (hereafter License) for the EnergySolutions, LLC (hereafter Licensee) 11e.(2) byproduct material radioactive waste disposal facility near Clive, Tooele County, Utah; Section 32, Township 1 South, Range 11 West, Salt Lake Base and Meridian. This License authorizes the receipt, storage, and disposal of 11e.(2) byproduct material in accordance with statements, descriptions, and representations contained in the licensee's application, as submitted and approved by the Utah Division of Radiation Control (DRC).

The Division of Radiation Control has reviewed each amendment request and has concluded that a public comment period is not necessary, because the changes are considered minor. Changes are considered minor in nature by the Executive Secretary if these result in either a more restrictive license condition, the license condition remains just as protective, or there are administrative changes to clarify the license condition. The changes considered below succeed the previous license and will be incorporated into Amendment 7 of the License.

License Change Summary

License Condition	Minor/Major Change	Description of Changes
10.8	Minor	Changed the reporting requirement from an Annual Report to be included into the Annual As-built Report. Information was being reported in both documents so this change eliminates a duplicate reporting requirement.
11.1	Minor	Replaced specific ground-water protection requirements from License Condition Section 11.1 with requirements and schedules listed in the Clive facility's Ground Water Quality Discharge Permit, No UGW450005.
12.3	Minor	Changed the report due date from 60 days after conducting the audit to March 31st of the following year.
Signature Block	Minor	Signature page, removed Dane L. Finerfrock and added Rusty Lundberg

License Changes

License Condition Section 10.8

In a letter dated August 12, 2010,(CD10-0231) the Licensee requested to amend the License by deleting License Condition 10.8. After reviewing and discussing the request with the Licensee, the DRC denied the request to delete License Condition 10.8 but proposed alternative language to eliminate a duplicate reporting requirement. On August 9, 2011, the Licensee sent a letter (CD11-0218) to the DRC agreeing to the alternative language and requesting the change to be included in the next license amendment.

License Condition Section 11.1

1. *Inspection, Monitoring, and Recording Requirements*

   The Licensee requested, in a letter dated June 3, 2010, to amend its License by modifying and replacing specific ground-water protection requirements from License Condition Section 11.1 by making the License compliant with, and requiring the License to maintain schedules listed in the Permit with references the Clive facility's Ground Water Quality Discharge Permit, No UGW450005 (hereafter Permit) in their place (EnergySolutions, June 3, 2011). License Condition Section 11.1 required the Licensee to sample, and analyze representative samples from Point-of-Compliance (POC) wells, with locations defined in the License. The Justification for the Licensee proposal is:

   - There are duplicate ground-water protection requirements in both the License and Permit for the Clive facility.
   - There exist conflicting requirements for ground-water protection between the License and Permit.
   - Utilizing the Permit for ground-water protection will streamline ground-water monitoring.

   The License has been modified in the past to incorporate reference to the Permit for clarification, and this proposal was just a continuation of that process. The origin of ground-water protection as a License requirement was with the original U.S. Nuclear Regulatory Commission's (NRC) license for the 11e.(2) embankment, which required specified ground-water protection to comply with NRC and U.S. Environmental Protection Agency (EPA) regulations. These NRC License requirements were a mechanism to minimize the risks to ground water associated with nuclear waste. The NRC delegated their License responsibility to the Utah DRC in 2004, and the ground water protection requirements were maintained within the new DRC License. However, the need for ground-water protection regulations, for activities that pose a threat to the quality, and the overall protection of ground water, has been recognized at the Clive facility since waste storage began. The DRC's technical basis for ground-water protection and the selection of sampling and analytical procedures was established in a March 21, 1991 issuance of the Permit, which provided for a reliable ground-water monitoring program, by the State of Utah.

   The DRC agrees with the Licensee proposal, and technical details are found in a memorandum dated June 6, 2011 (see Attachment D). Based on the DRC review of the Licensee's June 3, 2010 request, it was confirmed that both License Condition Section 11.1, and the Permit

requires the implementation of a ground-water monitoring program; provided a constituent list for sampling; and requires assessment of the concentration of constituents with ground-water specific concentration limits applied to specific POC wells. Specifically, Section 11.1(a) of the License required monitoring at Point-of- Compliance (POC) wells (same as the POC wells in the Permit), and the implementation of a ground-water monitoring program, which is required in Part I.F, Compliance Monitoring, and Part I.H, Reporting Requirements of the Permit. Section 11.1(b) of the License required parameters, and detection monitoring for constituents listed in the License Condition or any added through amendment. Detection monitoring for required parameters is required in Part I.F.5 of the Permit, with required analyses to be performed for the constituents listed in Table 1C. Additionally, parameters identified by DRC as significant to the 11e.(2) waste and listed in the License, but not included in the Permit's parameter list for 11e.(2) waste were:

- Benzo(a)anthrancene,
- Benzo(a)pyrene,
- Benzo(K)floranthene,
- Cldordane,
- Chrysene,

The DRC believes that incorporating the above five parameters into Table 1C (Ground Water Protection Levels - Universal for all 11e.(2) Wells) of the Permit will provide a performance based list, which is more protective of ground water. The Licensee proposed (EnergySolutions, October 11, 2001) in a response to a DRC request for information (DRC, September 8, 2011), and the DRC found acceptable ground water protections levels for these five parameters of:

- Benzo(a)anthrancene - 0.010 milligrams per liter
- Benzo(a)pyrene - 0.010 milligrams per liter
- Benzo(K)floranthene - 0.010 milligrams per liter
- Cldordane - 0.002 milligrams per liter
- Chrysene - 0.010 milligrams per liter

The ground-water protection levels for Benzo(a)anthrancene, Benzo(a)pyrene, Benzo(K)floranthene, and Chrysene are the practical quantitation limits, and are the concentration limits used for these compounds in the Mixed Waste ground-water monitoring program. The ground water protection level proposed for chlordane is the Utah Ground Water Quality Standard listed in Utah Administrative Codes (UAC) for Water Quality, UAC R317-6-2.

DRC's ground-water monitoring objective at the 11e.(2) embankment has always been to use standardized evaluation and protection practices to achieve meaningful results, and obtain data that are of the right type, quality, and quantity to identify any contamination. The DRC feels it accomplish this with the Permit, which is enforced independently of the License, and provides for effective ground-water sampling for all 11e.(2) applications. Proposed changes to Section 11.1 would make ground-water monitoring and protection more straightforward by consolidating requirements in one location, and removing conflicting requirements; where conflicts exist the DRC has had a long standing policy of utilizing Permit requirements. Condition 11.1was modified with references to the Permit, which clearly indicates that the Permit is adequate for ground-water protection because these removed requirements are

stipulated in the Permit, and conditions 11.1(a), and 11.1(b) were eliminated because of redundancy with the Permit (see attachment A). By requiring the License to fulfill and maintain compliance with all conditions and schedules stipulated in the Permit maintains ground-water monitoring in the License and does not diminish any ground-water protection requirements.

2. Revision to Section 5 of the 11e.(2) License Application

Groundwater Protection

The Licensee requested, in its letter dated June 3, 2010, to amend Section 5 of the License Application, by removing specific controls to prevent the introduction of waste to, and that provides for the protection of ground water. Section 5 of the License Application imposes standards required by the EPA and NRC with references to Criterion 5 and 13 of Appendix A of 10 Code of Federal Regulations (CFR) 40, NRC's Domestic Licensing of Source Materials; and 40 CFR 192, Subparts D and E, EPA's Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings. 10 CFR 40 was assimilated into UAC R313-24, uranium mills and source material mill tailings disposal facility requirements, and Criteria 5A through 5D and 13 of Section 40 CFR Part 192, Subparts D and E were promulgated into UAC R317-6, Administrative Rules for Ground Water Quality Protection. UAC R317-6 is incorporated into, and enforced through the Permit. Section 5 of the License Application provides for ground-water protection by addressing the geology and hydrogeological characteristics of the areas, containment of waste, monitoring and concentration limits; and provides for consideration of ground water use, protection level exceptions, waste disposed at the facility, and the contact of waste with the ground at the 11e.(2) embankment. A technical basis for ground-water protection, using design to prevent access of radioactive waste to ground water and the selection of sampling and analytical procedures, was established in the Permit. The Permit requires aquifer, and water classification; establishes parameters/constituents; sets protection levels for monitoring, and provides for ground-water protection levels exceptions in Part I.C, and Table 1D; and requires the use of Best Available Technology (BAT), which requires the Licensee to consider design, equipment, work practices, and operations or a combination of these to protect ground-water, used in construction and operation of the facility as part of the Permit's ground water protection program (Part I.D).

The Licensee proposes as a mechanism for ground-water protection to modify Section 5 of the License Application by requiring the License to be compliance with State of Utah requirements, as stated in Utah Administrative Rules, UAC R317-6, and the Clive facility's Permit. The Justification for the Licensee proposal is:

- Promulgation of Federal Regulations by Utah Administrative Codes, and duplicate License and Permit ground-water protection requirements for the Clive facility.
- Conflicting License and Permit requirements for ground-water protection.
- Streamline ground-water monitoring.

The DRC aggress with the Licensee's proposal, and technical details are found in a memorandum dated June 6, 2011 (see Attachment D). Based on the DRC review of the Licensee's request of June 3, 2010, it was confirmed that Section 5 of the License Application and the Permit have similar and duplicate requirements, and some of these requirements conflicted. The Permit addresses ground-water protection and monitoring requirements for all

waste disposal operation at the Clive facility. Permit requirements dealing with ground-water protection that duplicate Section 5 of the License Application requirements are found in Part I.A of the Permit, which describes the classification of ground water at the site; Part I.H.24 requires a hydrogeologic report at the time of renewal (every 5 year); Part I.D.3 (3) of the Permit includes liner design parameters; the Permit required, and DRC approved CQA/QC Manual embraces materials, testing, and placement of the liner (Appendix C of the Permit); monitoring is required within Part.I.H of the Permit; parameters are listed in Part I.C, Tables 1C and 1D of the Permit, with DRC approved background concentrations; and Part I.G of the Permit requires the Licensee to confirm any exceedence of listed parameters found in the Permit,. The DRC accepted the revision to the License Application, and language is being added to this condition to indicate Utah Administrative Rules for uranium mills and source material mill tailings disposal facility, and ground-water protection. The referencing of state rules and the Permit for ground-water protection within the License maintains ground-water protection requirements within the License, and does not reduce any protection.

3. Revision to Appendix Z of the 11e.(2) License Application

Groundwater Protection Plan and Groundwater Monitoring Quality Assurance Plan
The Licensee requested, in its letter dated June 3, 2010, to amend Appendix Z of the License Application by removing the Groundwater Monitoring Quality Assurance Plan. The Groundwater Monitoring Quality Assurance Plan focuses on acquiring representative ground-water samples by describing requirements for field and laboratory activities relating to ground-water sample collection, preservation, shipment, analytical methods, analytical detection levels, and chain-of-custody controls for the License. The Groundwater Monitoring Quality Assurance Plan can also serves as a reference for sampling team members in the field, during sampling events. Oversight of this type is necessary to ensure approved procedures are used in the sampling and analysis of ground water. The Licensee justification for removing the Groundwater Monitoring Quality Assurance Plan is that it duplicates requirement and has conflicts between the Permit's Water Monitoring Quality Assurance Plan, and having one document to base water sampling on at the Clive facility will streamline ground-water monitoring. Where conflicts exist between the Groundwater Monitoring Quality Assurance Plan and Water Monitoring Quality Assurance Plan, the DRC has had a long standing policy of utilizing Permit requirements in the Water Monitoring Quality Assurance Plan of the Permit.

The DRC agrees with the Licensee's proposal, and technical details are found in a memorandum dated June 6, 20011 (see Attachment D). For ground-water sampling, careful planning as provided in the Water Monitoring Quality Assurance Plan improves the representativeness and overall quality of sampling, the effectiveness and efficiency to which the sampling is implemented, and the usefulness of subsequent data. Based on the DRC review of the Licensee June 3, 2010 request, it was confirmed that the Water Monitoring Quality Assurance Plan of the Permit provides the objectives of the sampling program with more clarity than the Groundwater Monitoring Quality Assurance Plan of the License. The Water Monitoring Quality Assurance Plan addresses data quality; project responsibilities, designation of analytical laboratory; ground-water sampling protocols; sample custody; requirements for quality control samples; analytical methods, holding times, sample containers, sample preservative, data validation,

reporting. and corrective action procedures that are required if field and/or analytical procedures are found to deviate from the requirements In the Water Monitoring Quality Assurance Plan all steps in the investigation are understood and nothing is left for laboratory interpretation. Given the benefit of quality assurance planning, the DRC prefers a single, logical, and systematic planning procedure that provides for data quality assurance, the scientific and statistical evaluation of data, to determine if data obtained from any sampling event are the right type, quality, and quantity to be used. The Water Monitoring Quality Assurance Plan of the Permit has been the defacto plan at the Clive facility, whenever conflicts exists, and provides for the objective of any water investigations with regard to field and laboratory data quality. The DRC accepted the revision to the License Application, and language of the Groundwater Monitoring Quality Assurance Plan is removed from Appendix Z of the License Application (see Attachment A).

License Condition Section 12.3
In a letter (CD10-0231) dated August 12, 2010, the Licensee requested to amend the License by deleting License Condition 12.3. After reviewing and discussing the request with the Licensee, the DRC denied the request to delete License Condition 12.3 but proposed alternative language to change the due date for the Annual ALARA Audit report from 60 days after the completion of the report to March 31st of the following year. On August 9, 2011, the Licensee sent a letter (CD11-0218) to the DRC agreeing to the alternative language and requesting the change to be included in the next license amendment.

References
EnergySolutions, June 3, 2010, Radioactive Materials License UT 2300478 – Amendment Request to Consolidate 11e.(2) Embankment Groundwater Monitoring requirements with the Requirements listed in the Groundwater Quality Discharge Permit (UGW 450005): letter from Sean McCandless of EnergySolutions to Dane Finerfrock of the DRC.

EnergySolutions, August 12, 2010, Radioactive Materials License No. UT 2300478 amendment request: letter from Sean McCandless of EnergySolutions to Rusty Lundberg of the DRC.

DRC, September 2, 2010, Radioactive Material License (RML) Number UT 2300478 amendment request dated August 12, 2010: Letter from Rusty Lundberg of the DRC to Sean McCandless of EnergySolutions.

DRC, June 6, 2011, Request to Consolidate 11e.(2) Embankment's Ground-Water Monitoring Requirements, 11e.(2) License UT2300478, Amendment #6, with the Ground Water Quality Discharge Permit, UGW 450005: DRC Memorandum from Charles Bishop to John Hultquist/Loren Morton.

EnergySolutions, August 09, 2011, Radioactive Material License (RML) Number UT 2300478 amendment request dated August 12, 2010: letter from Sean McCandless of EnergySolutions to Rusty Lundberg of the DRC.

DRC, September 8, 2011, EnergySolutions request to amend Radioactive Material License UT 2300478, consolidating the 11e.(2) embankment's Ground Water Monitoring Requirements into the

Ground Water Quality Discharge Permit, UGW450005: Division of Radiation Control Request for Information: letter from Charles Bishop of the DRC to Sean McCandless of EnergySolutions.

EnergySolutions, October 11, 2011, Response to Division of Radiation Control Request for Information – Radioactive Material License UT 2300478 - Amendment Request to Consolidated 11e.(2) Embankment Ground Water Monitoring Requirements with the requirements listed in Ground Water Quality Discharge Permit UGW450005: letter from Sean McCandless of EnergySolutions to Rusty Lundberg of the DRC.

Attachment A
Redline/Strikout text of EnergySolutions 11e.(2) License