State of Utah

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Department of
Environmental Quality

Alan Matheson
Executive Director

DIVISION OF WASTE MANAGEMENT
AND RADIATION CONTROL
Scott T. Anderson
Director

November 30, 2017

Vern Rogers, Manager
Compliance and Permitting
Energy*Solutions*, LLC
299 South Main Street, Suite 1700
Salt Lake City, UT 84111

RE: Approval of Request for License Renewal
Radioactive Material License UT2300478, Amendment #0

Dear Mr. Rogers:

The Division of Waste Management and Radiation Control has completed its review of Energy*Solutions'* request for renewal of its Radioactive Material License, UT2300478, dated July 13, 2017, as well the following documents submitted in support of the renewal request:

1. Energy*Solutions* 11e.(2) Byproduct Material License Renewal Application, May 3, 2012.
2. Energy*Solutions'* Response to Completion Review and Environmental Assessment Report, June 4, 2012.
3. Energy*Solutions'* Response to Round 1 Interrogatories, June 30, 2014.
4. Energy*Solutions'* Response to Round 2 Interrogatories, December 11, 2015.
5. Energy*Solutions'* Response to March 8, 2017 Request for Information (RFI), May 2, 2017.
6. July 13, 2017 Final Draft License.
7. Energy*Solutions'* response to July 6, 2017 RFI.

A draft license was subjected to a 45-day public comment period which began August 16, 2017 and ended October 2, 2017. No comments were received. Therefore, Energy*Solutions'* request for renewal of Radioactive Material License UT2300478 is hereby approved. A signed copy of License UT2300478, Amendment #0 is enclosed.

If you have any questions, please call David Esser at (801) 536-0079.

Sincerely,

Scott T. Anderson, Director
Division of Waste Management and Radiation Control

(Over)

DRC-2017-008769

STA/DKE/km

Enclosure: Signed Radioactive Material License #UT2300478 Amendment #0 (DRC-2017-008767)

c: Jeff Coombs, EHS, Health Officer, Tooele County Health Department
Bryan Slade, Environmental Health Director, Tooele County Health Department

UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WASTE MANAGEMENT AND RADIATION CONTROL
RADIOACTIVE MATERIAL LICENSE

Pursuant to the Utah Code Annotated (UCA), Title 19, Chapter 3 and R313 of the Utah Administrative Code and in reliance on statements and representations heretofore made by the Licensee designated below, a license is hereby issued authorizing such Licensee to transfer, receive, possess and use the radioactive material designated below; and to use such radioactive material for the purpose(s) and at the place(s) designated below. This Licensee is subject to all applicable rules, and orders now or hereafter in effect and to any conditions specified below.

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LICENSEE			
1. Name	EnergySolutions, LLC	3. License Number: UT 2300478 Amendment #0	
2. Address	299 S. Main St., Suite 1700 Salt Lake City, UT 84111	4. Expiration Date November 13, 2027	
		5. License Category 2-c	

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6. Radioactive material (element and mass number)	7. Chemical and/or physical form	8. Maximum quantity Licensee may possess at any one time
11e.(2) Byproduct Material	Packaged or Bulk Radioactive Waste	5,048,965 Cubic Yards

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SECTION 9.0. ADMINISTRATIVE CONDITIONS

9.1 All notices to the Division of Waste Management and Radiation Control required under this license shall be addressed to the Director of the Division of Waste Management and Radiation Control (Director), Department of Environmental Quality, 195 North 1950 West, P.O. Box 144880, Salt Lake City, UT 84114-4880.

9.2 Authorized place for use shall be the Licensee's facility located in Section 32 of Township 1 S, Range 11 W, Tooele County, Utah, near Clive.

9.3 Authorized use is for the receipt, storage and disposal of 11e.(2) byproduct material in accordance with statements, descriptions, and representations contained in the Licensee's application, including appendices.

9.4 In order to ensure that no disturbance of cultural resources occurs, the Licensee shall cease any work resulting in the discovery of previously unknown cultural or historical artifacts and report the discovery, in writing, to the Director and the State Historic Preservation Office (SHPO). The artifacts shall be inventoried and evaluated in accordance with UCA 9-8-404, and no disturbance shall occur until the Licensee has received written authorization from the Director and SHPO to proceed.

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9.5 The Licensee shall:

a) Establish, implement and comply with standard operating procedures (SOPs) for all operational activities involving the handling, storing or disposal of radioactive materials. SOPs for operational activities shall enumerate pertinent radiation safety practices to be followed. In addition, SOPs shall be established and implemented for non-operational activities to include environmental monitoring, bioassay analysis and instrument calibration. An up-to-date copy of each written SOP, as controlled under the quality assurance (QA) procedures, shall be kept in each area where it is used.

b) Design, implement and comply with an effective air sampling program in the workplace based on Revision 1 to Nuclear Regulatory Commission (NRC) Regulatory Guide 8.25 (June 1992), "Air Sampling in the Workplace" or an equivalent program.

9.6 The Licensee shall have all written SOPs reviewed and approved by the Radiation Safety Officer (RSO), or designee, qualified by way of specialized radiation protection training equivalent to that required for the RSO as defined in License Condition 9.8, before being implemented and whenever a change in a procedure is proposed. All existing facility SOPs related to operational and non-operational activities shall be reviewed and documented by the RSO on an annual basis in the 11e.(2) Annual Report, to be submitted to the Director by April 30.

9.7 Any change to the Licensee's corporate organizational structure, as presented in the license application, affecting the assignment or reporting responsibility of the radiation staff shall conform to the NRC's Regulatory Guide 8.31, "Information Relevant to Ensuring That Occupational Radiation Exposures at Uranium Mills Will Be As Low As Is Reasonably Achievable" as amended.

9.8 The Licensee's staff shall meet the qualifications as described in the currently approved *Organization Layout* of Condition 32.A of Radioactive Material License UT 2300249. In addition to the responsibilities and qualifications specified in the Licensee's application, the RSO or designee shall be qualified as specified in Sections 1.2 and 2.4 of the NRC Regulatory Guide 8.31, "Information Relevant to Ensuring that Occupational Radiation Exposures at Uranium Mills will be As Low As Reasonably Achievable," as amended. In addition, the RSO shall also receive 40 hours of related health and safety refresher training every two years.

9.9 For the purposes of this License Condition, reference to "uranium mill" or "milling" in the NRC Regulatory Guide 8.31, as amended, shall mean the Licensee's facility and authorized activities.

9.10 The Licensee shall conduct:

a) Annual training for its facility inspectors that covers all areas included in the daily inspections of the 11e.(2) byproduct material and the disposal area.

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b) Annual operational training that covers all aspects of operational safety and emergency procedures for all employees. The SOPs shall be used to conduct operations training to assure consistency and thoroughness.

9.11 The Licensee shall, at all times, maintain a Surety that satisfies the requirements of R313-24-4 (10 CFR 40, Appendix A, Criterion 9 and 10 incorporated by reference), as defined by License Condition 9.13 (a) or 9.13 (b) (or more frequent, at the Licensee's sole discretion) and shall include closure and post-closure costs in all areas subject to the portions of the facility herein licensed.

9.12 Annually, by March 1, the Licensee shall submit proposed closure and post-closure costs in a Surety Report, upon which financial assurance amounts are based, including costs of potential remediation at the licensed facility, as if accomplished by a third party contractor, for completion of a Director-approved reclamation/decommissioning plan of the Licensee's licensed grounds, equipment and facilities including above-ground decommissioning and decontamination, soil and water sample analyses and groundwater restoration associated with the site, as warranted.

9.13 At its election, the Licensee's annual proposed closure and post-closure costs shall be based on either:

a) a proposed annual cost estimate using unit rates from the current edition of RS Means Facilities Construction Cost Data and other site-specific processes, indirect costs based on the sum of applicable direct costs in accordance with the indirect cost multipliers in Table 9.13A or others mutually agreed to by the Licensee and the Director; or

Table 9.13A

Description	Percentage
Working Conditions	5.5%
Mobilization / Demobilization	4.0%
Contingency	11.0%
Engineering and Redesign	2.25%
Overhead and Profit	19.0%
Management Fee and Legal Expenses	4.0%
DEQ Oversight	4.0%

b) an initial financial assurance determination and for each financial assurance determination every five years thereafter, a proposed competitive site-specific estimate for closure and post-closure care of the licensed facility shall be used; and for each year between this financial assurance determination, a proposed financial assurance estimate that accounts for current site conditions and that includes an annual inflation adjustment to the financial assurance

determination using the Gross Domestic Product Implicit Price Deflator of the Bureau of Economic Analysis, United States Department of Commerce, calculated by dividing the latest annual deflator by the deflator for the previous year shall be used.

9.14 The annual Surety Report shall be prepared under the direct supervision of and be certified by a professional with at least five years of construction cost estimation experience, who bears the seal of either a Professional Engineer or Professional Geologist currently licensed by the State of Utah. The Licensee shall provide the Surety Report in both paper and electronic formats. Within 60 days of the Director's approval of the Surety Report, the Licensee shall submit written evidence that the surety instruments have been adequately funded. The currently-approved Surety Report and instrument(s) shall be maintained as a Surety Appendix to the License.

9.15 The combined annual surety is $76,614,757.43 with the 11e.(2) subtotal of $6,526,140.85 as approved in the Director's letter dated October 12, 2017.

9.16 The Licensee shall require a radiation work permit (RWP) for work where the potential for significant exposure to radioactive materials exists and for which no SOP exists. Each RWP shall contain the information specified in Regulatory Guide 8.31, as amended.

9.17 The RSO, or designee, qualified by way of special radiation protection training equivalent to that required for the RSO as defined in License Condition 9.8, shall indicate by signature, the review and approval of each RWP, prior to the initiation of the work.

9.18 The Licensee shall provide SOPs for controlling internal contamination of workers from dust inhalation, which shall include the use of dust suppressants (e.g., magnesium chloride or water) on all operational roads, as necessary.

9.19 The Licensee shall have qualified individuals, designated by the RSO and Manager, Health and Safety, perform quantitative respirator fit tests on all employees required to wear respirators prior to the initial use of a respirator and annually thereafter. During the annual fit test, the qualified individual performing the test shall ensure that the employee is correctly performing negative pressure fit checks and shall instruct the employee that the fit test is to be performed each time a respirator is donned and prior to entering an area where respirators are required. The Licensee shall follow the guidance provided in the NRC Regulatory Guide 8.15 "Acceptable Programs for Respiratory Protection" as amended.

9.20 The Licensee shall complete "as built drawings" of the facility on an annual basis. The as built drawings shall be certified by a professional engineer.

9.21 The Licensee shall provide for an independent internal audit of facility operations to ensure compliance with applicable regulations and license conditions. The independent internal audit shall be conducted annually by a qualified health physicist knowledgeable of operations

concerning radiation protection programs at milling/waste disposal facilities. The contractor report shall be submitted to the Director as part of the 11e.(2) Annual Report.

9.22 The operational environmental monitoring program shall be conducted in accordance with the current Environmental Monitoring Plan approved by the Director.

SECTION 10.0. OPERATIONAL CONTROLS, LIMITS AND RESTRICTIONS

10.1 The Licensee shall restrict eating and drinking to the administrative offices and enclosed lunch areas that are separated from the disposal areas. With the exception of drinking from closeable containers, there shall be no eating, drinking, smoking, defecating or urinating in the restricted areas at any time.

10.2 The Licensee shall analyze and adequately characterize all incoming waste to identify any new hazardous constituents not listed in the Waste Characterization Plan referenced in Condition 58 of Radioactive Material License UT 2300249. The Licensee shall develop, implement and comply with methodologies and procedures for systematic characterization and analysis of the incoming waste so that any new hazardous constituents are identified. The Licensee shall assume that the baseline background concentrations for any new constituents are at their detection levels, unless the Licensee demonstrates to the Director's satisfaction that the constituents will not reach the water table in one year and proceeds to establish background based on direct monitoring of these constituents in the Point of Compliance (POC) wells for one full year.

10.3 The following key radon attenuation model parameter values shall be used during placement to verify that the values used in the Licensee's model (see Licensee's correspondence to the NRC dated August 30, 2000 and to the DRC dated October 31, 2007) have been achieved: (1) dry density and (2) moisture content (percent by dry weight) of the placed compacted radon barrier material and the upper ten feet of 11e.(2) byproduct material. Average values for each parameter by lift, for the upper ten feet of the 11e.(2) embankment only, per year shall be calculated and submitted to the Director in the 11e.(2) Annual Report.

10.4 The distribution of the Ra-226 and Th-230 concentrations in the 11e.(2) byproduct material in the upper 3.3 meters (10 feet) of the contaminated material shall be used to verify that the concentration in any lift does not exceed the values used in the radon attenuation model. The Licensee shall measure the Ra-226 and Th-230 concentrations using standard analytical procedures for every 2500 cubic yards of material placed for compaction and at least once per lift for lifts smaller than 2500 cubic yards. This sampling may be performed from the waste container/conveyance at receipt or on the lift during waste placement. In the case where sampling will be performed from the waste container/conveyance, proper tracking shall be performed to accurately identify disposal location (or lift number). In the case where sampling will be performed at the disposal lift, each sample shall be a composite sample consisting of ten aliquots from random locations on the lift. The data shall include the elevation (or lift number)

of the sample location. The results shall be presented as average values for each lift and submitted to the Director in the 11e.(2) Annual Report.

10.5 The Licensee shall assume full responsibility for remediation of any groundwater contamination caused by hazardous constituents originating from the 11e.(2) disposal facility that have been detected at the Point of Compliance (POC) wells in concentrations exceeding the limits specified in Tables 1-C and 1-D of the Groundwater Discharge Quality Permit UGW450005. It shall be assumed that the 11e.(2) disposal facility is the source of all of the hazardous constituents detected in the POC wells, unless it can be demonstrated to the Director's satisfaction that the 11e.(2) facility is not the source of those constituents.

10.6 The Licensee shall undertake corrective action to clean up groundwater contamination if and when required, but no later than 18 months from the date when exceedance of a standard has first been discovered and without taking credit for any delays caused by disagreements as to the source of contamination. The Licensee shall consider and evaluate existing and new groundwater clean-up technologies before selecting and implementing an appropriate clean-up program.

10.7 The Licensee shall continue groundwater and land surface monitoring at all POC locations throughout the post closure period until the disposal facility is transferred to long-term government custody.

10.8 The Licensee shall implement the quality assurance plan as provided in the license application.

10.9 The Licensee shall, prior to managing waste for disposal, determine the presence of free liquids as described in Section IV of the Waste Characterization Plan referenced in Condition 58 of Radioactive Material License UT2300249. Solid waste received for disposal shall contain as little free standing and non-corrosive liquid as reasonably achievable, but shall contain no more free liquids than one percent of the volume of the waste.

10.10 The Licensee shall not accept any waste containing free liquid for disposal. Solid waste received and containing unexpected aqueous free liquids in excess of 1% by volume shall have the liquid removed and placed in the evaporation ponds or the liquids shall be solidified prior to its management.

10.11 Unexpected non-aqueous free liquids less than 1% of the volume of the waste within the container shall be solidified prior to disposal.

10.12 Should shipments arrive with greater than 1% unexpected free liquids (total of aqueous and non-aqueous), the Licensee shall notify the Director within 24 hours that the shipments failed the requirements for acceptance and shall be managed in accordance with the Waste Characterization Plan as referenced in Condition 58 of Radioactive Materials License UT2300249.

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10.13 The Licensee shall, upon arrival of waste, perform external exposure rate measurements of the waste conveyances. Any shipment with exposure rates greater than five mrem per hour at a distance of 30 cm from any surface and which cannot be disposed of within 24 hours, shall be posted as a Radiation Area in compliance with R313-15-901, R313-15-902 and R313-15-903 [10 CFR 20.1902(a) incorporated by reference] until disposed.

10.14 The Licensee shall operate the facility in compliance with the following specifications:

a) The maximum bulk mass of waste disposed of annually shall not exceed 4.536×10^5 tonnes (5×10^5 tons) or (3.82×10^5 m^3) or (4.00×10^5 yd^3).

b) The open cell area shall not exceed 78,038.55 m^2, 93,333.33 yd^2, 840,000 ft^2 or 19.28 acres.

c) The total embankment capacity shall not exceed 3,860,211 m^3 (5,048,965 yd^3).

d) The maximum volume of waste that may be stored as in-cell bulk storage on site prior to disposal shall not exceed 10,000 yd^3 or (7,645.55 m^3) at any one time.

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.

10.15 The Licensee shall maintain the detailed documents demonstrating compliance with the specifications in License Condition 10.16 on-site and shall summarize the data in Condition 10.17 and Condition 10.18. This information shall be submitted to the Director in the 11e.(2) Annual Report.

10.16 The minimum compacted radon barrier thickness placed in accordance with the specifications authorized in the LLRW and 11e.(2) Construction Quality Assurance / Quality Control Manual, as revised (CQA/QC Manual) shall be 4.0 ft. on the top and 3.5 ft. on the side of the disposal cell. CLSM shall not be used in the upper ten feet of the 11e.(2) embankment.

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

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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/cm^3 for either.

SECTION 11. INSPECTION, MONITORING AND RECORDING REQUIREMENTS

11.1 The Licensee shall fulfill and comply with all conditions and all compliance schedules stipulated in the Ground Water Discharge Permit, number UGW 450005, issued by the Director, as amended.

11.2 The Licensee shall require that the RSO and the Engineering Director or designee perform and document joint inspections of all work areas at least quarterly. The Licensee shall correct any deficiency noted during the inspection within seven working days. The results of the inspections and any necessary corrective actions shall be submitted to the Director in the 11e.(2) Annual Report.

11.3 The Licensee is granted an exemption from R313-15-201(4) and R313-15-302(2) and is authorized to use Annual Limit on Intake (ALI) and Derived Air Concentration (DAC) values based on dose coefficients adopted by the International Commission on Radiological Protection (ICRP) and published in ICRP publication No. 68 and adult dose factors published in ICRP publication No. 72, as required to demonstrate compliance with the requirements of Subpart C and Subpart D of 10 CFR 20 (UAC R313-15).

11.4 The Licensee shall conduct an analysis to assess the need to characterize the basal aquifer.

SECTION 12. REPORTING REQUIREMENTS

12.1 The Licensee shall perform an annual ALARA audit of the radiation safety program which shall be led by the RSO or designee, qualified by way of specialized radiation protection training equivalent to that required for the RSO as defined in License Condition 9.8, in accordance with Section 2.3.3 of NRC Regulatory Guide 8.31, as amended. A report of this audit shall be submitted to the Director in the 11e.(2) Annual Report. The report shall include detailed summaries of the analytical results of the radiological surveys. In order to evaluate the ALARA objective, the Licensee shall, at a minimum, review the following records:

a) Bioassay results including any actions taken when the results exceed established action levels as referenced in the NRC Regulatory Guide 8.9, "Acceptable Concepts, Models, Equations, and Assumptions For A Bioassay Program" as amended.

b) Records of external and internal exposure.

c) Safety meeting minutes, attendance records, and training program records.

d) Daily inspection log entries and summary reports of the annual review.

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e) Radiological survey and monitoring data, as well as environmental radiological effluent and monitoring data.

f) Surveys required by radiation work permits.

g) Reports on overexposure submitted to the Director and previously submitted to the NRC.

h) Reviews of operating and monitoring procedures completed during the period.

12.2 The ALARA audit shall also address any statistically significant trends in personnel exposures for identifiable categories of workers and types of activities, any trends in radiological effluent data and the performance of exposure and effluent control equipment as well as its utilization, maintenance and inspection history. Any recommendations to further reduce personnel exposures or environmental releases of uranium or radon and radon progeny shall be included in the report.

12.3 The Licensee shall conduct an annual land use survey for a five km radius around the site. The purpose is to assess population growth or industry growth in the immediate vicinity of the Clive facility and provide an inventory of domestic and agricultural wells within the survey area. The Licensee shall document this survey in the 11e.(2) Annual Report submitted to the Director.

12.4 The Licensee shall orally notify the Director within 24 hours and by submitting a letter within seven days of any waste shipment where a violation of applicable regulations or license conditions occurs. For example:

a) Free liquids and leaking shipment discrepancy notifications made in accordance with applicable provisions of the Waste Characterization Plan as referenced in Condition 58 of Radioactive Materials License UT2300249.

12.5 Shipment discrepancies not addressed by the Waste Characterization Plan shall be noted on the manifest and the manifest retained on site for Division review.

12.6 The Licensee shall, unless otherwise specified, include in 11e.(2) the Annual Report submitted to the Director:

a) The annual reporting requirements as specified in the license conditions;

b) The results of calibration of equipment;

c) Reports on audits and inspections completed during the year;

d) The results of all meetings and training courses required by this license; and

e) Any other significant subsequent information, reviews, investigations and corrective actions. Unless otherwise specified by rule, all such documentation shall be maintained at the site and corporate headquarters for a period of at least five years.

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12.7 The Licensee shall, at least three months prior to license termination, submit to the Director a report which demonstrates the site has met all applicable provisions for license termination and transfer of the facility to the government for long-term custody in accordance with R313-24-4 (10 CFR Part 40, Appendix A, Criterion 11 incorporated by reference). Specifically, the Licensee shall document that:

a) The concentrations of all of the listed hazardous constituents at the POC are within their designated concentration limits (standards);

b) If a corrective action program was implemented, that the hazardous constituents contaminating the groundwater were returned to their designated limits; and

c) The facility has been properly decontaminated and decommissioned in accordance with the decontamination and decommissioning plan proposed by the applicant in the license application and approved by the Director. The license termination shall not occur until the Licensee has demonstrated that these actions have been completed.

12.8 The Licensee shall immediately report to the Director:

a) Any failure of the 11e.(2) byproduct material disposal cell that results in a release of waste into unrestricted areas; or

b) Any unusual conditions that, if not corrected, could indicate the potential or lead to the failure of the system and result in a release of waste into an unrestricted area.

DIVISION OF WASTE MANAGEMENT AND RADIATION CONTROL

Scott T. Anderson, Director

30 November 2017
Date