

STATEMENT OF BASIS

for

AMENDMENT 25

Low Level Radioactive Waste Disposal Facility

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November 26, 2019

Purpose

This statement of basis establishes the foundation on which Radioactive Material License No. UT 2300249 (RML) has been recommended for amendment. Once the proposed revisions are approved the revised License will be designated as Amendment 25. These proposed revisions are the result of several requests for amendments made by EnergySolutions, LLC (ES) and an administrative update required by the License. The proposed revisions reviewed by the Division of Waste Management and Radiation Control (the Division) for Amendment 25 are listed below with several brief details.

On March 11, 2019 (CD19-0054), ES submitted a request to the Director of the Division of Waste Management and Radiation Control (Director) to amend **License Condition 15.A.** of the License for the purpose of modifying the condition to allow waste classification prior to management rather than prior to receipt of the waste. Additional information addressing this request for amendment to Condition 15.A is contained in Appendix A of this Statement of Basis.

On March 12, 2018 (CD18-0046), ES submitted a request to the Director to revise the Construction Quality Assurance / Quality Control Manual (CQA/QC Manual). The CQA/QC Manual is required by and directly linked to **License Condition 44** of the License. A minor revision to **License Condition 37.D** was also required due to a revision of Specification 83–Resin Lifts of the CQA/QC Manual. ES and the Division have proposed multiple revisions to update a document that is integral to construction operations at the Clive facility. A detailed discussion of the proposed revisions to the CQA/QC Manual is contained in Appendix B of this Statement of Basis.

On February 4, 2019 (CD19-0029), ES submitted a request to the Director to amend **License**

Conditions 10.A and 57. The request included proposed conditions and requirements necessary for the repair of railcars within Section 29 of the Clive facility, together with certain language clarifications relating to the receipt, storage, and transloading of radioactive material-related railcars in Section 29. A detailed discussion of the proposed revisions to Conditions 10.A and 57 is contained in Appendix C of this Statement of Basis.

On March 29, 2019, (CD19-0075) ES submitted a request to the Director to amend **License Condition 73.C** of the License addressing several aspects of surety. Additional information addressing this amendment to Condition 73.C is contained in Appendix D of this Statement of Basis

The aforementioned requests were reviewed by the Division and all were deemed appropriate and necessary. Several of the changes requested are considered major in nature. Therefore, the Director has determined that in accordance with Utah Administrative Code R313-17-2 a public comment period is required for these proposed license amendments.

All conclusions in this Statement of Basis, including determinations that issues have been resolved or not resolved, are tentative in that they are subject to notice and comment and reconsideration by the agency in light of comments made during the public comment period and the record as a whole. A final determination of the proposed revisions to the License and CQA/QC Manual is dependent on incorporating the outcome of the public comment period.

License Change Summary

License Condition	Minor/Major Change	Description of Changes and Bases for Changes
15.A	Minor	<p>ES is currently required to perform waste classification calculations “prior to receipt” of waste to be treated. Now the requirement allows the calculations to occur “prior to management” of the waste.</p> <p>Condition 15.A was also amended to prohibit the generation of any waste that exceeds Class A waste concentration limit, including not only Class B and Class C wastes but also Greater than Class C waste.</p>
37.D & 44	Major	<p>No text changes were made to Condition 44; however, the CQA/QC Manual referenced therein was revised. Many CQA/QC Specifications were rewritten, expanded, and/or removed to capture change and to remain relevant. License Condition 37.D was also revised due to a revision of Specification 83–Resin Lifts of the CQA/QC Manual.</p>

License Change Summary

License Condition	Minor/Major Change	Description of Changes and Bases for Changes
10.A & 57	Major	Conditions and requirements necessary for the repair of railcars within Section 29, together with certain language clarifications relating to the receipt, storage, and transloading of radioactive material-related railcars in Section 29 have been updated and clarified. The conditions, under which repairs may be undertaken within Section 29, and the required operational controls, are detailed in Condition 57. The designated Radioactive Material Area within Section 29 has been redefined and reduced in scope. A Railcar Transfer Area has been designated.
73.C	Minor	Commensurate with passage of Utah Senate bills 2015-173 and 2017-79, ES is allowed to submit surety calculations for the combined licensed facilities. Condition 73.C has to be revised each time the annual surety is approved by the Director.

Requested Changes not Incorporated

License Condition	Minor/Major Change	Description of Proposed Changes
None	NA	None

Additional Information

Additional details regarding the changes to the License are contained in the following Appendices:

Appendix A: License Condition 15.A – Waste Treatment

Appendix B: License Condition 37.D and 44 – CQA/QC Manual Revision: 28b

Appendix C: License Condition 10.A and 57 – Railcar Repairs

Appendix D: License Condition 73.C – Surety Update

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Appendix A

License Condition 15.A – Waste Treatment

Statement of Basis to Amend License Condition 15.A

On March 11, 2019 (CD19-0054), EnergySolutions, LLC (ES) submitted a request to the Director of the Division of Waste Management and Radiation Control (Director) to amend License Condition 15.A of the License.

The License Section and current License Condition are as follows:

WASTE TREATMENT AND PROCESSING

15. A. Prior to receipt of any low level radioactive or mixed wastes requiring treatment before disposal, the Licensee shall, based on knowledge of the technology to be used for treatment/processing of each particular radioactive or mixed waste, calculate and document that the resultant processed waste is neither Class B nor Class C waste.

The amended License Condition is as follows:

15. A. Prior to ~~receipt~~ management of any low level radioactive or mixed wastes requiring treatment before disposal, the Licensee shall, based on knowledge of the technology to be used for treatment/processing of each particular radioactive or mixed waste, calculate and document that the radionuclide concentrations of the resultant processed waste ~~is neither Class B nor Class C waste. do not exceed Class A waste limits.~~

Basis for License Changes

The language change is necessary since compliance with the condition is not feasible. The “prior to receipt” requirement was placed in the license in 2003 when it was anticipated that the vacuum assisted thermal desorption process that was being introduced as a treatment methodology could concentrate the radioactivity in the remaining solids with the removal of organic liquids. The assumption, at the time, was that a treatment would consist of a known volume of waste where all necessary waste characteristics would be known prior to receipt and the information could be input into a calculation to determine the resultant waste classification following treatment. With the reality that more than one waste shipment could be treated at a time makes the requirement to perform the calculation before the receipt of the various shipments unreasonable and impractical especially if meaningful information is expected to be derived. A logical approach would be to perform the calculation prior to treatment, as has been done to this point, when all the pertinent information regarding the various waste inputs are known.

The calculation cannot be performed before receipt since the input information to perform the calculation is not known until the waste has already been received and the mix of wastes to be treated in a batch is determined. A treatment batch may consist of wastes from a number of

different shipments and different waste streams received at the facility at different time periods.

The ES is still required to perform waste calculations on wastes to be treated where the radionuclide concentrations have the potential of increasing due to the treatment process; however, these determinations are not required to be made “prior to receipt” of the waste.

In the subsequent years following 2003, inspections conducted by the Division of Radiation Control and the Division of Waste Management and Radiation Control focused on the calculations being performed before treatment took place without considering whether they were done prior to or after receipt of the waste at the ES’s site. Having done the calculations after receipt of the input wastes had no bearing on whether or not the waste could be treated and disposed.

The calculations are not time critical provided they are done prior to treatment.

The condition was also amended to safeguard against creating any waste that would exceed Class A waste concentration limits. The condition was amended since it could be inferred that Greater than Class C waste was not a concern since only Class B and Class C wastes were specified.

References

EnergySolutions, LLC. 2019. Radioactive Material License UT2300249, License Amendment Request, Classification Calculations in License Condition 15.A. CD19-0054. March 11, 2019. (DRC-2019-002361).

Appendix B

License Condition 37.D and 44 – CQA/QC Manual

Statement of Basis to Revise CQA/QC Manual Revision: 28b

On March 12, 2018 (CD18-0046), ES submitted a request to the Director to revise the 11e.(2) and LLRW Construction Quality Assurance / Quality Control Manual (CQA/QC Manual). The CQA/QC Manual is required by and directly linked to **License Condition 44** of the License. There are no text changes to License Condition 44. However, a Division change of License Condition 37.D was included based on the retention of Specification 83 of the CQA/QC Manual.

The License Section and current License Condition 37.D are as follows:

CONSTRUCION ACTIVITIES

37.D. Disposed of in accordance with the requirements of the Construction Quality Assurance/Quality Control Manual.

The proposed amended License Condition 37.D:

37.D. Only after receipt of written Director approval for each shipment and then ~~Disposed~~ **disposed** of in accordance with the requirements of the Construction Quality Assurance/Quality Control Manual.

Basis for Changes to License Condition 37.D

In initial discussions with the ES, Specification 83 of the CQA/QC manual was agreed to be removed as it had not been used in a number of years and the Division was concerned how it could be implemented safely. However, before the change was finalized, ES requested that Specification 83 be reinstated in the CQA/QC manual. The Division then proposed changing License Condition 37.D to allow Director approval for each shipment using this specification. The ES agreed.

Ion exchange resins are small particles with an electric charge and can easily stick to tyvek suites, increasing the possibility of contamination to workers. The resins are very small and can easily become airborne in the wind. The concentration of resin now received at the Clive facility can be at or near the class A limit. Therefore, it is appropriate that the Director have the ability to approve each shipment to evaluate whether the shipment destined to use the CQA/QC manual can safely be managed, that the risk to workers will be kept as low as reasonably achievable and that based on where in the embankment the resins will be placed the dose to the public before and after closure as well as dose to an inadvertent intruder will not exceed the regulatory limits.

A detailed discussion of the proposed CQA/QC Manual revisions follows after the following table of contents for Appendix B.

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1 INTRODUCTION

As a part of the on-going Low Level Radioactive Waste (LLRW) license renewal submittal Energy *Solutions* (ES) and the Division of Waste Management and Radiation Control (the Division) have identified reasons to revise the 11e.(2) and LLRW Construction Quality Assurance / Quality Control Manual, Revision: 28b (the CQA/QC Manual). ES submitted their requests for revision in writing. The Division has reviewed the submittals pertaining to this request and resolved questions through issuance of a marked-up CQA/QC Manual and follow-up meetings to which ES has responded. At the conclusion of the interim meetings the Division has concluded that it can issue approval of the proposed revisions with reasonable confidence that the proposed CQA/QC Manual will serve to protect facility workers, members of the general public, and the environment. The Division concludes that the document will satisfy applicable regulatory requirements and meet expected standards of quality.

ES and the Division have proposed multiple revisions to update a document that is integral to construction operations at the Clive low-level and 11e.(2) radioactive waste disposal facility near Clive, Tooele County, Utah, located in Section 32, Township 1 South, Range 11 West, SLBM. The purpose of this Statement of Basis (SOB) is to describe the proposed changes to the CQA/QC Manual and to provide a basis for the Division's approval of the revisions. A redline strikeout version of the proposed CQA/QC Manual is presented in the following Section 6 to this SOB.

The pertinent Radioactive Material Licenses (RML) are No. UT 2300249 and No. UT2300478 for the LLRW and 11e.(2) facilities, respectively. No new radionuclides or changes to existing radionuclide concentrations will result from the changes proposed. Therefore, no changes to the radioactive materials licenses in this respect will be required.

A detailed discussion of the proposed revisions is contained in Section 4 of this SOB. In general terms the changes proposed for this CQA/QC Manual are identified below:

- **Specifications Rewritten to Capture Change** – Revision within the CQA/QC Manual is often to capture changes mandated by outdated procedures or technology. In this CQA/QC Manual a technology change was recognized with adoption of the Trimble CCS 900 system that replaced the manufacturer abandoned CAES system.
- **Specifications Expanded** – Several specifications were expanded to capture advanced field operations that are being used by the field crews and Quality Control/Quality Assurance to resolve out-of-specification field conditions.

- **Specifications Removed** – In a few instances a specification was removed because the associated activity is no longer relevant. For example *Specification 122–Surveys*, this specification addressed criteria for quarterly surveys of the interim rad cover that was within two feet of top of waste elevation. The intent of this specification was to minimize overbuilding the waste pile and then having to remove the overbuilt material. The annual aerial surveys and the annual report now take care of this circumstance and overbuild instances are accounted for in annual surety calculations.
- **Editorial Revisions** – There were many clerical updates and typographical fixes, including the replacement of the Division acronym DWMRC with the term Director.
- **Establish Consistency within the CQA/QC Manual** –The requirement for Director approval for various work tasks was standardized throughout the CQA/QC Manual so as to be internally consistent. The details for making a formal Request for Approval were spelled-out including the means for appropriate transmittal and the importance for a timely response by Division.
- **Future Revision of the CQA/QC Manual** – Looking ahead several topics were considered for this CQA/QC Manual, however, the inclusion of the topics was pushed forward to a subsequent revision because the specification text could not be concluded. These topics included specifications for change control and revisions for quality control within tasks associated with the Containerized Waste Facility.

2 CQA/QC REVISION SUBMITTAL CHRONOLOGY

The current accepted CQA/QC Manual is Revision: 28b, dated August 18, 2017. The initial proposed revisions to the CQA/QC Manual were submitted within letters dated March 12, 2018 (CD18-0046, DRC-2018-002421) and April 8, 2018 (CD18-0078, DRC-2018-003683). The Division responded on June 14, 2018 by issuing interim review comments within a marked-up CQA/QC Manual.

With these considerations, following the April 8, 2018 submittal, *EnergySolutions* and the Division agreed to hold comment review and resolution meetings as a means to better facilitate timely exchange of review comments and thoughts between both parties. Meetings were held at the Division’s offices on the following dates: June 14, 2018; June 26, 2018; July 5, 2018; July 14, 2018; August 2, 2018; December 14, 2018; January 16, 2019; January 24, 2019; March 13, 2019, and June 5, 2019. The Division issued an interim draft CQA/QC Manual with change tracking prior to each meeting.

3 REGULATORY REQUIREMENTS

The provisions and requirements for land disposal of low-level radioactive waste are found in the Utah Administrative Code (UAC) R313-25. There are also applicable rules and provisions relevant to 11e.(2) and LLRW facility construction quality assurance and

quality control within UAC R313. Environmental Quality, Radiation Control, including: UAC R313-12 General Provisions; and UAC R313-24 Uranium Mills and Source Material Mill Tailings Disposal Facility Requirements. These regulatory requirements provide the basis for the 11e.(2) and LLRW CQA/QC Manual. The following sections of UAC R313-25 have been referred often during preparation of this Statement of Basis.

UAC R313-25-7(2).a and UAC R313-25-7(2).b provide general information on requirements for personnel qualifications and training.

UAC R313-25-8(5) and UAC R313-8(6) call for the codes, standards, and methods of construction that shall be applied to construct the land disposal facilities.

UAC R313-25-8(10) calls for a description of quality assurance programs to be a part of the construction of land disposal facilities.

UAC R313-25-8(13) calls for a description of the administrative procedures the licensee intends to apply to control activities at the land disposal facility.

UAC R313-25-12(3) describes a requirement for issuance of license to be in accordance with the performance objectives of UAC R313-25-20.

UAC R313-25-22 calls for the protection of individuals during operations.

UAC R313 -25-25 calls for the design of the near-surface land disposal site to be designed to assure the performance objectives will be met. This section calls for the design of features to direct surface water away from the disposal units as well as minimizing to the extent possible the contact of water with the waste.

UAC R313-25-26(4) through UAC R313-25-26(11) describes regulations to be followed the waste placement operations.

UAC R313-25-33 describes the requirements of the licensee to maintain records and reports in connection with licensed activities.

UAC R313-25-34 and UAC R313-25-35 describe the authority of the Division to perform tests and inspections, respectively for the administration of the rules in UAC R313-25.

4 REVISIONS TO CQA/QC MANUAL REVISION: 28b

In general terms the changes proposed for this CQA/QC Manual are identified and discussed below.

- There have been revisions within the CQA/QC Manual to capture changes mandated by outdated procedures or technology.

- Several specifications were expanded to capture advanced field operations
- Specifications were removed because the associated activity is no longer relevant.
- There have many clerical updates and typographical fixes.
- The revised CQA/QC Manual will be identified as Revision 28c.

The following sections of this SOB endeavor to illuminate the proposed changes.

4.1 Work Elements

The CQA/QC Manual is divided into 24 Work Elements along with several tables, figures, and appendices. The number of Work Elements has not changed with these proposed revisions. The work elements are organized with the sequence of waste embankment construction activities. A description of the proposed revisions within each work element and reasoning for the change is presented in the following sections. It is also clearly stated when there were no changes proposed to a specification for this revision of the CQA/QC Manual.

4.1.1 Document Control (Spec. 1 – 4)

There were no changes to the four specifications within *Work Element–Document Control*.

Late in this CQA/QC Manual revision effort an earnest attempt was made by both EnergySolutions and the Division to articulate a new specification for change control; however, as the majority of edits for this revision were concluding there were too many issues with the change control specification yet to be resolved and continuing to ironing out the text of the specification would have held the progress of many other updates to the CQA/QC manual needed for the upcoming construction season. The Division concluded with EnergySolutions that the criteria for change control should be addressed in a subsequent update to the CQA/QC Manual.

4.1.2 General Requirements (Spec. 5 – 23)

There were no changes to *Specification 5–Scope*.

The compaction criteria of *Specification 6–Runon Control During Project* and *Specification 7–Runoff Control During Project* was clarified by inserting the phrase “*a minimum of*” before the text of “90 percent”. Otherwise the acceptance criteria were unnecessarily too restrictive. Several redundant words were removed from the QA column of *Specification 7–Runoff Control During Project*.

There were no changes to *Specification 8–Monthly Berm Inspection*.

The revisions to *Specification 9–Berm Maintenance* were the end result of a corrective action plan (ES, 2019) addressing the breach of a runoff berm during a 2019 spring storm

event. EnergySolutions determined that the probable root cause of the breach was that the runoff ditch had diminished capacity due to the accumulation of sediments within the ditch over time. This specification was revised to include additional requirements to maintain the berm height requirement within the ditch as described in *Specification 7–Runoff Control During Project*.

There were no changes to *Specification 10–Moving or Breaching a Runoff Control Berm*; *Specification 11–Nuclear Density/Moisture Gauge Calibration*; *Specification 12–Sampling Locations for Lots*; and *Specification 13–Test Methods*.

Specification 14–QA Auditing has been revised by adding affirmative wording to the QA column to verify that the auditor’s annual QA audit report is submitted to the Division. Also, within this initial specification and then throughout the CQA/QC Manual, usage of the acronym “DWMRC” has been replaced with the term “Director”. This revision has been made at more than 160 subsequent locations in the CQA/QC Manual. This change was necessary as the authority to regulate a low level radioactive waste facility lies with the Director.

Guidance for obtaining Director approval as specified in Specification 23 has been added to subsection 15.F of *Specification 15–Test Failure Protocol*.

A typographical error was fixed in the QC section of *Specification 16–Quality of Rock* and the timing for prequalification testing of the rock borrow sources has been included. Otherwise the specification relied on a secondary Nuclear Regulatory Commission (NRC) guidance document for timing requirements.

There were no changes to *Specification 17–QC Procedures*

A requirement for Director review and **approval** of construction phase-specific drawings has been added to *Specification 18–Preconstruction Documentation & Communication*. This revision addresses the subsequent references in the CQA/QC Manual that refer to “**approved phase specific plans**”. Requirements have been included in the QC and QA columns to obtain documentation of the Director’s review and approval. Criteria have been added to the specification that the Director approval will be obtained in accordance with Specification 23. Also, a requirement that the Director is to be invited to preconstruction meetings has been added to the specification.

There were no changes to *Specification 19–Project Manager*; *Specification 20–Native Material*; and to *Specification 21–Off-site Fill/Backfill Material*.

Consistent with the global replacement of the acronym DWMRC as described previously in Specification 14, the heading of *Specification 22–DWMRC Exemption* has been revised to ‘*Director Exemption*’.

Usage of the acronym DWMRC had to be updated in *Specification 23–DWMRC Notification*. The specification heading was changed to ‘*Director Notification and Approval*’ and in this one instance the acronym “DWMRC” for the Low-Level Radioactive Waste Section Manager has been replaced with the acronym “LLRW” in order to properly reach the intend recipient. A major change was introduced to this specification which addressed the procedure of obtaining Director approval. Text was added within this specification that describes the methodology and criteria to make a written Request for Approval (or RFA) to the Director for various work tasks included in the CQA/QC Manual. This revision was part of a broader effort within the CQA/QC Manual to update and replace text that indicated tacit or implied approval by the Director if the Director had not replied within a stated timeframe. The actuality for tacit approval made it possible that standards would not be met and therefore any instance had to be removed. There are 15 instances within the CQA/QC Manual that refer to this *Specification 23*. A definition for a Designee for Director rounded off the revisions to *Specification 23*.

4.1.3 Foundation Preparation (Spec. 24 – 30)

There were no changes to *Specification 24–Scope*; and to *Specification 25–Clearing and Grubbing*.

A minor revision to the QC column of *Specification 26–Excavation* clarified that the in-place density testing would be on the backfill.

There were no changes to *Specification 27–Scarification and Compaction*; *Specification 28–Final Grading*; and to *Specification 29–Unsuitable Material*.

A revision to the specification column of *Specification 30–Foundation Approval* clarified the dimensional or physical scope of the foundation approval by adding the term “area” in two places. The terminology “*or Designee*” has been added to the specification column to be internally consistent with the QC column of the specification. Several sentences defining a Designee have been added to the specification as this distinction had been previously undefined in the CQA/QC Manual.

4.1.4 Clay Liner Borrow Material (Spec. 31 – 35)

There were no changes to *Specification 31–Scope*; *Specification 32–Clearing and Grubbing*; and to *Specification 33–Material*.

A simple revision to the QC column of *Specification 34–Protection* clarified the scope of potentially misleading wording that could be interpreted to referring to the constructed “in place” clay liner material. This specification is addressing borrow material prior to placement as clay liner material. Previously the text of this specification referred to a disposition of the clay material that is not applicable to this specification. The

specifications for protection of constructed clay liner are a part of *Work Element - Clay Liner Placement*.

There were no changes to *Specification 35–Processing*.

4.1.5 Clay Liner Test Pad (Spec. 36 – 38)

There were no changes to *Specification 36–Scope*.

The revision of *Specification 37–Notice of Test Pad Construction* is generally the first instance addressing the topic of tacit approval within the CQA/QC Manual. The circumstances for the revision involve a specification within the CQA/QC Manual that had criteria requiring an approval response from the Director prior to proceeding past a prescribed activity hold point identified in the specification. Prior to this revision, the specification was written such that the subject activity could resume and proceed past the hold point if the Director had not responded one way or another within a specified timeframe. While the previous criteria were potentially advantageous to *EnergySolutions*, the Director found the timeframe criteria to be unreasonable and that the specifications could allow circumstances that are not adequate to protect public health and safety. The previous provisions for tacit approval have been removed at this and each of the seven other instances.

The revisions to *Specification 38–Test Pad(s)* clarified that the clay liner test pad construction procedures would be outlined in an approved test pad plan. This revision emphasizes the importance for an *approved* test plan.

Specification 38–Test Pad(s) is made up of multiple subsections. There were no changes to the subsections identified as *Specification 38.A* through *Specification 38.H*.

As described above in the revisions of *Specification 37* which addressed changes to specifications requiring Director approval, *Specification 38.I* has been revised to remove the provision allowing the subject activity to proceed past a hold point without obtaining approval from the Director.

4.1.6 Clay Liner Placement (Spec. 39 – 55)

There were no changes to *Specification 39–Scope*; and to *Specification 40–Lift Identification*.

Several moderate revisions were made to *Specification 41–Placement*. The terminology “*the same*” was replaced with the term “*equivalent*” and criteria for equipment equivalency was added to the specification to allow for alternate equipment as determined to be equivalent by a registered Utah Licensed Professional Engineer. The revision included a minimum 48 hour advance notification to obtain approval from Director prior to implementation of alternate equipment. The requirements in the QC and

QA columns to observe, document, and verify the procedures used during clay placement were clarified. And the criterion for maximum clod or rock size was moved up from *Specification 43–Lift Thickness* to this specification because these criteria are important observations to be made during clay placement.

There were no changes to *Specification 42–Lift Bonding*.

Within *Specification 43–Lift Thickness* several typographical errors were fixed in the first paragraph of the QA column. The criterion for maximum clod or rock size was moved from this specification up to *Specification 41–Placement* where the criteria are more timely and relevant. EnergySolutions requested that the requirement limiting the maximum grade pole penetration into the underlying clay liner be increased from one to six inches. The Division didn't concur with the proposed increase from one inch to six inches but a compromise was reached at three inches consistent with other clay liner defect criteria.

Some minor grammatical clarification was added to the sloping criteria in *Specification 44–Keying*.

The requirement for QA to observe at least one lift being compacted was moved up from *Specification 46–Permeability* to be correctly included within *Specification 45–Compaction*. Also, the frequency for QA observation was added to the QA section. This frequency criteria for QA observation is consistent with *Specification 46–Permeability*.

The QA section of *Specification 46–Permeability* was revised with several additions of clarifying text. The frequency of QA observation was clarified and the requirement to observe at least one lift being compacted was appropriately moved from this specification up to *Specification 45–Compaction*.

Specification 47–Liner Drying Prevention has been rewritten entirely by EnergySolutions. The previous specification simply addressed clay liner material found to be out of specification by reporting the deficient condition as a non-conformance. EnergySolutions replaced this indeterminate resolution with comprehensive requirements to repair the defective clay liner. This revision better reflects EnergySolutions actual procedures for the maintenance of clay liner material placed and the repair of clay liner that has been found to be out of specification due to drying.

There were no changes to *Specification 48–Snow Removal*.

A minor revision was introduced to a subsection of *Specification 49–Cold Weather Placement of Clay Liner*. Subsection 49.B.2 of the specification includes a required procedure to “re-roll the surface with one pass of the same type of construction equipment”. The requirement for QC personnel to observe and document this activity

was added to the QC column so that a complete quality record is maintained. Also the applicability of the specification for a soil temperature ranging between 32°F and 27°F was clarified with additional text.

A few minor revisions were introduced for *Specification 50–Spring Start-up*. Within the QC column a capitalization error was fixed and the reference to specifications found ‘above’ was replaced with the specific applicable specification numbering.

There were no changes to *Specification 51–Contamination of Clay Liner*; *Specification 52–Final Grading*; and *Specification 53–Heavy Equipment on Clay Liner*.

Usage of the acronym DWMRC had to be updated in *Specification 54–DWMRC Approval*. The specification heading was changed to ‘Director Approval’ and in eight instances ‘DWMRC’ was replaced with ‘Director’. The sequence of criteria within the QA column was revised to reflect a more logical sequence of events. Additionally, the specification was clarified such that the Director approval should be obtained “prior” to proceeding with the subsequent lifts.

Specification 55–Liner Protective Cover has been completely rewritten by EnergySolutions. The previous specification for protective cover had been interpreted to require any overbuilt underlying clay liner material had to be cut away prior to placement of liner protective cover material. This revision is now specific with acceptance criteria of the protective cover material and allows over-built clay liner material to be utilized as part of the subsequent liner protective cover. The liner protective cover is essentially considered to be contaminated material even though there is no waste in the material and moving the material was unnecessary.

4.1.7 Waste Placement with Compactor (Spec. 56 – 70)

There were no changes to *Specification 56–Scope*, and to *Specification 57–Applicability*.

A grammatical revision was introduced to this entire Work Element starting with *Specification 58–Definitions*. The acronym CAES is being replaced with the acronym CCS. As explained below the CAES software and hardware package is no longer supported by Caterpillar and Trimble’s CCS900 system has been adopted to replace CAES. This revision of the acronym occurs elsewhere in this Work Element within Specifications 58 through 70.

In March of 2016, Caterpillar informed EnergySolutions of their future intent to discontinue support of their Computer-Aided Engineering System or CAES. As approved in the specifications of *Work Element–Waste Placement with Compactor*, CAES was relied upon to track and document both compactive effort delivered by passes of a CAT 826 landfill compactor and the resultant thickness of the underlying waste lift. In near real time the CAES package would indicate to the CAT 826 equipment operator

and to Q/C personnel when a lift area had successfully satisfied preprogramed acceptance criteria. Fortunately, *EnergySolutions* was able to obtain and perform a blind demonstration of Trimble’s CCS900 Compaction Control System (CCS) simultaneously alongside the CAES prior to Caterpillar’s discontinuance of CAES. The Trimble CCS system was able to incorporate the same computer algorithm utilized by CAES with a finer resolution of the data collection. The CCS system was demonstrated alongside the CAES to the Division and the Division found the output to be adequately comparable. As described in Specification 66 some acceptance criteria had to be adjusted to account for the higher resolution and higher quality of data from the CCS device.

The revision to *Specification 59–Liner Protection* was simple terminology usage. In the last sentence the term “*will*” was replaced with the term “*shall*”.

There were no changes to *Specification 60–Lift Identification; and Specification 61–Lift Acceptance*.

There were several procedural clarifications to the QC and QA columns of *Specification 62–Lift Thickness*. Also, *EnergySolutions* had proposed revising a portion of *Specification 62–Lift Thickness* with the deletion of the side slope thickness pixel criteria as described in the second paragraph of the QC column. Subsequent discussion during interim review meetings the request for the subject deletion was rescinded by *EnergySolutions*.

There were no changes to *Specification 63–Lift Area* and *Specification 64–Classifications*.

The revision within the Q/C column of *Specification 65–Terracing of Lifts* was simple terminology usage. In the first and second sentences the terms “*of*” and “*are*” were replaced with the terms “*between*” and “*is*”, respectively.

The CCS pixel acceptance criteria of *Specification 66–Compaction* for the CCS system has been revised from the previous 3.3 foot x 3.3 foot grid to the one-foot x one-foot grid to account for the higher resolution of data being collected by CCS. The outdated CAES methodology was no longer applicable. Clarifying text and acceptance criteria was also included to address the in-field interface between previously placed obstructions and the higher resolution of data collected by the CSS system.

The revision to subsection 67.A of the specification column of *Specification 67–Compaction without CCS* was simple terminology usage. In the first sentence the terminology “*Verbal notice*” was replaced with the affirmative term “*Notice*”. In addition this specification had multiple replacements of the acronym CAES with the acronym CCS.

There were no changes to *Specification 68-Debris Placement*; *Specification 69-Debris Size*; and to *Specification 70-Snow Removal*.

4.1.8 Waste Placement without Compactor (Spec. 71 – 100)

There were no changes to *Specification 71-Scope*; *Specification 72-Lift Identification*; *Specification 73-Lift Acceptance*; *Specification 74-Lift Thickness*; *Specification 75-Compaction*; and to *Specification 76-Classification*.

A minor revision to *Specification 77-Terracing of Lifts* was made to fix a typographical error.

Debris Placement (Specifications 78 through 83)

Specification 78-Debris Definition was completely rewritten using the same definitions and the specification heading was changed to ‘*Definitions*’. Contrary to the subject heading, the previous text essentially defined material other than debris. The rewritten specification now highlights definitions for six different items.

A revision to *Specification 79-Debris Placement Methods* was made to address possible timing requirements for CLSM placement as foundation material below large objects and large components. The window of time allowed for CLSM placement was reduced from 30 days to 14 days. The reduction in allowed time was made in consideration of the potential for instability once the large object has been placed on the ground.

There were no changes to *Specification 80-Debris Quantity in Soil Waste Lifts*; *Specification 81-Wind Dispersible Debris*; and *Specification 82-Debris Size*.

There were several revisions to *Specification 83-Resin Lifts*. This disposal technique for resin wastes presents potential technical issues that may require further analysis. ES does not currently employ this specification in connection with the disposal of resin wastes. Rather than remove this specification, the revisions require *EnergySolutions* to obtain prior Director approval of plans to dispose of resin wastes in accordance with this specification. Criteria have been added to the specification that Director approval will be obtained in accordance with *Specification 23*. Requirements have been added to the QA section to provide QC with Director approval documentation.

CLSM Pours (Specifications 84 through 93)

There were no changes to *Specification 84-CLSM Pyramids* and to *Specification 85-Director Notification of CLSM Pours*.

The first sentence of the QC column for *Specification 86-CLSM Design Specifications* has been rewritten. The new wording clarifies that testing will be done for each day’s production and the sequence of testing described. There was a possibility of

misunderstanding the frequency of testing as originally worded. Also, a typographical error was fixed in the QC column.

There are no changes to *Specification 87–CLSM Placement of Uncontainerized Debris*; and to *Specification 88–CLSM Pours with Debris-filled Containers*.

The first sentence of *Specification 89–CLSM Pours with Soil-filled Containers* has been clarified by including terminology that has been defined earlier in the CQA/QC Manual.

A few minor revisions were made within *Specification 90–CLSM Pours with Resin-filled Containers*. Text was added to confirm the applicability to resin-filled containers and that certain containers are to be pierced with ‘a minimum of’ one hole prior to CLSM placement. Text was also added to improve the filling of headspace voids of containers with diameters less than three feet with CLSM up to the highest point of a container.

There are no changes to *Specification 91–Final CLSM Pour Surface*.

There has been a minor change to *Specification 92–Proof-Roll Testing* and to the QC column to clarify that proof roll testing pressure is applied by the ‘wheel’ surface load.

The QC column of *Specification 93–Six-Inch Cap* was corrected by removing ‘Contractor’s’ from the CLSM compressive strength reporting requirement. The CLSM compressive strength test reporting can be performed by EnergySolutions or a qualified testing subcontractor

Stored Waste (Specifications 94 through 95)

The subsection heading ‘*Stored Waste (Specifications 94 through 95)*’ was added to *Work Element–Waste Placement without Compacter* for clarification purposes as the specifications transitioned from CLSM placement to the storage of waste.

There were no changes to *Specification 94–LLRW Stored Waste*.

A minor revision was made to *Specification 95–11e.(2) Stored Waste*. The last sentence of the specification limiting the duration of storage of 11e.(2) waste was deleted and the reference to RML 2300478 Condition 10.14.d has been updated to reflect the current 11e.(2) License. The condition states the maximum volume of waste that may be stored as in-cell bulk storage on site prior to disposal shall not exceed 10,000 yd³ or (7,645.55 m³) at any one time.

Cold Weather Placement (Specifications 96 through 98)

There were no changes to *Specification 96–Frozen Material*.

The first sentence of *Specification 97–Placement of Waste during Cold Weather* has been

clarified by replacing the term “*placed*” with the term “*disposed*”. This revision was to differentiate between stored waste and disposed waste.

There were no changes to *Specification 98–Snow Removal*.

Waste Placement without Compactor (continued)

There were no changes to *Specification 99–Final Grading before Temporary Cover Placement*.

As described above in the revisions of *Specification 37* which addressed changes to specifications requiring Director approval, *Specification 100–Regulatory Approval* has been revised to remove the provision allowing the subject activity to proceed past a hold point without obtaining approval from the Director.

4.1.9 Containerized Waste Facility Waste Placement Test Pad (Spec. 101 – 103)

There were no changes to *Specification 101–Scope*

As described above in the revisions of *Specification 37* which addressed changes to specifications requiring Director approval, *Specification 102–Notice of Test Pad Construction* has been revised to remove the provision allowing the subject activity to proceed past a hold point without obtaining approval from the Director.

Specification 103–Containerized Waste Placement Test Pad(s) is made up of multiple subsections. Other than a few instances where ‘*DWMRC*’ was replaced with ‘*Director*’, there were no changes to the subsections *Specification 103.A, through 103.D, and 103.F*.

Specification 103.E was clarified by inserting the term ‘*pad*’ following the word ‘*test*’ in the last sentence of the subsection. Also the terms ‘*Utah Licensed*’ were inserted before the words ‘*Professional Engineer*’.

As described above in the revisions of *Specification 37* which addressed changes to specifications requiring Director approval, *Specification 103.F* has been revised to remove the provision allowing the subject activity to proceed past a hold point without obtaining approval from the Director.

4.1.10 Containerized Waste Facility Waste Placement (Spec. 104 – 115)

There were no changes to *Specification 104–Scope*; and to *Specification 105–Lift Identification*.

The revisions to *Specification 106–Lift Acceptance* consisted of including the requirement to have a preceding Containerized Waste Facility (CWF) waste lift accepted before placing the next CWF waste lift. This requirement is consistent with waste placement with a compactor *Specification 61 -Lift Acceptance* and with waste placement

without a compactor *Specification 73–Lift Acceptance*. Requirements were added to the QC and QA columns to document, and verify that the lift acceptance procedures used during CWF waste lift placement were followed.

Specification 107–Definitions includes seven material definitions that are applicable and pertinent to the Containerized Waste Facility. The definitions of the following terms were revised as explained:

There were no changes proposed to the definition of *Backfill*.

The definition of *Backfill Cover* has been revised to require the material to not be cohesionless or in other words Backfill Cover is to consist of a cohesive soil material. The engineering of Backfill Cover is described in AMEC, 2001. Backfill cover and its cohesive nature is intended to prevent an hour glass effect if an accidental void were to develop in the lower CWF waste lift causing the sandy (cohesionless) backfill material of the upper lift to freely flow into a lower lift void resulting in unacceptable void space within the upper waste lift. This condition would then in turn result in an unacceptable performance of the waste embankment and potentially substandard cover performance. This criterion for cohesive soil material should better capture the intent of the gradation testing that had been required in *Specification 112–Backfill Cover*. There were no particle distribution criteria in *Specification 112–Backfill Cover*.

A new definition was added to define the term *Caisson*. The term caisson is used in a number of places in a context that was not consistent with a typical definition of caisson. The definition provided explains the usage of caissons in the Containerized Waste Facility to properly establish a position for the standard or large liners.

The definition of *Containerized Waste* has been revised to resolve an inconsistency with Section VIII of the Waste Characterization Plan. The last sentence discussing Certified Containerized Waste was rewritten. The terminology “*is defined as*” has been replaced with “*consists of*”. As described above the term caisson and associated defining text has been added to the list of items defined in this subsection.

There were no changes to the remaining definitions within *Specification 107–Definitions* including the definitions of *Containerized Waste Facility (CWF) Pyramid*, *Intermediate Sand*, *Lift*, and *Removable Steel Form*.

Specification 108–Containerized Waste Placement is a nine section specification. In subsection 108.A it has been clarified that CWF containers are to be spaced apart from one another by container type as illustrated in CQA/QC Manual Figures 7 & 8. Also, in the fourth paragraph of the QC column the terminology of “*by the*” was replaced with the terms “*during the*” for clarification.

EnergySolutions requested that Subsection 108.B be clarified to make a distinction that caissons without waste in them can be removed without notifying the Director. This was acceptable to the Division because the distinction between filled and unfilled caissons was previously unclear. The term “*layer*” was removed following the word ‘backfill’ because the sand backfill material surrounds each container from top to bottom as the sand mitigates the annular void space between each container rather than performing as a layer. Also text was added to the end of this subsection emphasizing that steel forms can be in contact with adjacent steel forms.

In subsection 108.C it has been clarified such that unusually shaped containers shall not be taller in height than the requirements of this specification.

There were no changes to subsection 108.D.

As has been changed in subsection 108.B, subsection 108.E has been clarified that caissons without waste in them can be removed without notifying the Director and the word “*layer*” was removed from the text.

There were no changes to subsection 108.F.

In subsection 108.G the undefined term “*Sand*” was replaced with the proper term “*Backfill*”.

There were no changes to subsection 108.H.

A revision to subsection 108.I clarified that the lot size for placing containers other than standard or large liners of ion-exchange resins could be shaped to not exceed 2500 square feet instead of a specific square shape of a 50 foot x 50 foot area. The specific square areal dimensions were not consistent with how operations occur in the landfill.

Specification 109-Pyramid Controls is an eight section specification. A minor revision has been made to subsection 109.F. Subsection 109.F has been clarified by replacing the term ‘*container*’ with the term ‘*CWF*’. Guidance was also added to refer to Specification 110 for specifications relevant to usage of CLSM as fill material.

A minor revision to the first sentence of *Specification 110–CLSM Use as Fill* was made in order to clarify the specification by replacing the term “*container*” with the term “*CWF*”. Also the referenced specifications were corrected from *Specifications 84 and 85* to *Specification 85 and 86*. The correction of this typographical error makes the document consistent with older CQA/QC Manuals when only the specification headings were referred to.

There were no changes to *Specification 111–Intermediate Sand*.

Several revisions were made to *Specification 112–Backfill Cover*. The minimum number of in-place compaction tests was revised from two to one per lift. And the criterion to perform a gradation test was removed because there are no gradation specifications other than the material must be cohesive soil material. In support of no longer requiring gradation testing the criterion of a cohesive backfill soil has been included in the definition for Backfill Cover in *Specification 107–Definitions*.

There were no changes to *Specification 113–Set Back of Waste*.

The specification column of *Specification 114–Snow Removal* has been revised with a better description of the work tasks relevant to this specification. The added work tasks were previously implied, but unnecessarily undefined.

The name of *Specification 115– Cold Weather Placement of Flowable Sand Backfill* has been renamed once again to *Specification 115–Cold Weather Placement of Backfill, Intermediate Sand, and Backfill Cover*. The purpose for the change was to use terms consistent with the Work Element and the possibility of encountering other material applicable to this specification. A few other revisions were minor and were limited to grammatical corrections.

4.1.11 Interim Radon Cover Placement and Monitoring (Spec. 116 – 123)

There were no changes to *Specification 116–Scope*; *Specification 117–Definition*; *Specification 118–Interim Rad Cover Material*; *Specification 119–Interim Rad Cover Placement*; *Specification 120–Operational Controls*; and to *Specification 121–Inspections*.

The *Specification 122–Surveys* has been deleted in its entirety and replaced with the placeholder ‘122) Reserved’. The specification addressed criteria for quarterly surveys of the interim rad cover that was within two feet of top of waste elevation. The intent of this specification was to minimize overbuilding the waste pile and then having to remove the overbuilt material. The annual aerial surveys and the annual report now take care of this circumstance and overbuild instances are accounted for in surety calculations.

The revision to *Specification 123–Removal* includes the addition of acceptance criteria for the circumstance when Interim Rad Cover is to be left in place and considered a waste lift. Prior to the addition of this criterion the situation was unspecified.

4.1.12 Temporary Cover Placement and Monitoring (Spec. 124 – 133)

There were no changes to *Specification 124–Scope*; and to *Specification 125–Temporary Cover Material*.

The revisions to *Specification 126–Temporary Cover Placement* included the addition of text on a simple procedure to key in new temporary cover placement with existing old

temporary cover. The added text is as follows: ‘*The interface between old and new cover lifts shall be compacted with a minimum of one pass*’. The specification was previously silent on the circumstance. Requirements were added to the QC column to document, and verify that the construction procedure was followed at the interface between old and new temporary cover placement.

There were no changes to *Specification 127–Pre-Final Cover Settlement Monuments*; *Specification 128–Interim Cover Settlement Monuments Placement*; and to *Specification 129–Survey Requirements*.

Specification 130–Survey Interval was revised by adding a reference to *Specification 133–Transition to Final Cover* to emphasize the frequency and criteria of pertinent surveys.

There were no changes to *Specification 131–Inspection*

The name of *Specification 132–Reporting* was renamed to *Specification 132–Annual Reporting*. The purpose for the change was to distinguish this specification from other reporting specifications.

There were no changes to *Specification 133–Transition to Final Cover*.

4.1.13 Radon Barrier Borrow Material (Spec. 134 – 138)

There were no changes to *Specification 134–Scope*; and to *Specification 135–Clearing and Grubbing*.

Within *Specification 136–Material-Natural Clay Mixture* the incorrect terminology of “*be defined*” was replaced with the more appropriate terminology “*meet the specification*”. The requirement for the borrow soil to be classified as **both** CL and ML has been corrected to state that the soil is to be classified as one or the other. Classifying the soils as both an ML and CL is not consistent with Unified Soil Classification System procedures. And the title of the Unified Soil Classification System has been corrected.

There were no changes to *Specification 137–Protection*; and to *Specification 138–Processing*.

4.1.14 Radon Barrier Test Pad (Spec. 139 – 141)

There were no changes to *Specification 139–Scope*.

As described earlier in the revisions of *Specification 37* which addressed changes to specifications requiring Director approval, *Specification 140–Notice of Test Pad Construction* has been revised to remove the provision allowing the subject activity to proceed past a hold point without obtaining approval from the Director.

A revision to the first and second paragraphs of *Specification 141–Test Pad(s)* replaced the term “will” with the term “shall”. In addition the term “proposed” was replaced with the terminology “approved in the test plan” in the first paragraph. A revision to the second paragraph of the QC column of the specification replaced the term “lift” with the correct term “lot”. These revisions were to clarify the context of the Test Pad specifications.

Specification 141–Test Pad(s) is made up of multiple subsections. There were no changes to the subsections of *Specification 141.A* through *Specification 141.F*

The revision to *Specification 141.G* clarified that the criterion for permeability is currently specified in two locations.

There were no changes to the subsection of *Specification 141.H*.

As described earlier in the revisions of *Specification 37* which addressed changes to specifications requiring Director approval, *Specification 141.I* has been revised to remove the provision allowing the subject activity to proceed past a hold point without obtaining approval from the Director.

4.1.15 Radon Barrier Placement (Spec. 142 – 163)

There were no changes to *Specification 142–Scope*; and to *Specification 143–Notice of Cover Construction*.

A few minor revisions have been made to *Specification 144–Project Area* which included a clarification to the design details as depicted on approved phase-specific plans. Emphasis was also added for ‘phase-specific’ plans at the end of the specification. Also criteria have been added to the specification that Director approval will be obtained in accordance with *Specification 23*.

There were no changes to *Specification 145–Lift Identification*.

As has been revised earlier in *Specification 41* for clay liner placement, several moderate revisions were made to *Specification 146–Placement* for radon barrier placement. The terminology “the same” was replaced with the term “equivalent” and criteria for equipment equivalency was added to the specification to allow for alternate equipment as determined by a registered Utah Licensed Professional Engineer. The revision included a minimum 48 hour advance notification to obtain approval from the Director prior to implementation of alternate equipment. Criteria have been added to the specification that Director approval will be obtained in accordance with *Specification 23*. The requirements in the QC and QA columns to observe, document, and verify the procedures used during clay placement were clarified. And the criterion for maximum clod or rock size was moved up from *Specification 148–Lift Thickness* to this specification because

these criteria are important observations to be made during radon barrier placement.

A minor grammatical change to remove a redundant word was made to *Specification 147–Lift Bonding*.

Within *Specification 148–Lift Thickness* a typographical error was fixed in the first paragraph of the specification. The incorrect term “*liner*” was replaced with the correct term of “*radon barrier*”. The criterion for maximum clod or rock size was moved from this specification up to *Specification 146–Placement*. EnergySolutions requested that the requirement for maximum allowed grade pole penetration into the underlying clay radon barrier be increased from one to six inches. The Division didn’t concur with the proposed increase from one inch to six inches but a compromise was reached at three inches. Three inches is consistent with other radon barrier defect criteria (see *Specification 154*).

There were no changes to *Specification 149–Keying-In*; *Specification 150–Compaction*; to *Specification 151–Permeability*.

Within *Specification 152–Layer Thickness* the following minor revisions were made. EnergySolutions had requested the specification be deleted in its entirety on the basis that it was redundant with the approved design plans. The Director concurred with removing the duplication of details that are specified on the approved design plans but insisted on including references to the approved design plans.

Text was added to *Specification 153–Transitions between Radon Barriers with Different Specified Permeabilities* so as to clarify the minimum and maximum acceptable thickness of the higher permeability component of the radon barrier. Late in the CQA/QC Manual revision process EnergySolutions requested an allowance to construct the sequence of higher 1×10^{-6} cm/sec permeability radon barrier material with the lower 5×10^{-8} cm/sec permeability material; however this change was not accepted during the revision review process due to the late consideration. EnergySolutions argued that there is no specified minimum permeability for the upper radon barrier material. This revision would have allowed the lower 5×10^{-8} cm/sec radon barrier material to be overbuilt and then incorporated into the 1×10^{-6} cm/sec material. The possible impacts to cover modeling were beyond the scope. However, this idea could be reconsidered during a subsequent revision to the CQA/QC Manual.

Specification 154–Radon Barrier Drying Prevention has been rewritten entirely by EnergySolutions. Text was added and/or deleted from the specification to include criteria for some unclear circumstances. The requirement to document an unacceptable condition of unfinished radon barrier with a non-conformance report was deleted in consideration that construction of the cover material has not been finish. The text of the specification addressing finished or unfinished radon barrier material found to be out of specification

was replaced entirely with more comprehensive requirements to repair the defective radon barrier material rather than just reporting the condition as a non-conformance. Also, at several locations the incorrect term “*liner*” was replaced with the correct term of “*radon barrier*” in the QC and QA sections. This revision better reflects EnergySolutions actual procedures for the maintenance radon barrier material placed and the repair of radon barrier that has been found to be out of specification due to drying.

There were no changes to *Specification 155–Snow Removal*.

The revisions to *Specification 156–Cold Weather Placement of Radon Barrier* were to simply replace an indirect call-out to a reference with a direct call-out to the intended Specification 157. Also text was added to clarify the testing lot size for radon barrier material exposed to cold weather.

The changes to *Specification 157–Spring Start-up* addressed an indirect reference to testing criteria found elsewhere in the CQA/QC Manual with specific testing criteria for spring start-up of radon barrier placement.

There were no changes to *Specification 158–Contamination of Radon Barrier*; *Specification 159–Final Grading*; *Specification 160–Erosion Control for Exposed Soil*; *Specification 161–Radiological Sampling for Exposed Soil*; and *Specification 162–Heavy Equipment on Radon Barrier*.

Usage of the acronym DWMRC had to be updated in *Specification 163–DWMRC Approval*. The specification heading was changed to ‘*Director Approval*’ and in seven instances ‘*DWMRC*’ was replaced with ‘*Director*’. Additionally, the specification was clarified such that Director approval shall be obtained “*prior*” to proceeding with the subsequent design lifts. As described earlier in the revisions of *Specification 37* which addressed changes to specifications requiring Director approval, *Specification 163* has been revised to remove the provision allowing the subject activity to proceed past a hold point without obtaining approval from the Director.

4.1.16 Filter Zone (Spec. 164 – 168)

There were no changes to *Specification 164–Scope*.

An incorrect term within the Q/C column of *Specification 165–Type B Filter Zone Permeability* has been corrected. The term “*gradation*” has been corrected to the term “*permeability*”.

There were no changes to *Specification 166–Gradation*.

Absent text was inserted into *Specification 167–Placement* to include the placement of filter zone material over both the radon barrier design layer and the sacrificial soil design

layer.

There were no changes to *Specification 168–Snow Removal*.

There have been two revisions of *Specification 169–Final Grading*. First the requirements for observing grade pole installation method have been moved from the QC column to the QA column. Second an incorrect term within the second paragraph of the Q/C column has been corrected. The term “rip-rap” has been corrected to the term “filter zone”.

4.1.17 Sacrificial Soil Placement (Spec. 170 – 174)

There were no changes to *Specification 170–Scope* and *Specification 171–Placement*.

The criteria for sacrificial soil gradation testing frequency in *Specification 172–Gradation* has been revised to be consistent with NRC guidance that is contained in NUREG-1623, Appendix F that allows for a gradation test every 10,000 yd³ instead of testing every 2,500 yd³. However, if material is transferred directly from the sacrificial soil production facility to the cell, a higher frequency of gradation testing was included to account for the need to determine acceptable gradation bands of sacrificial soil, that are a function of the underlying filter zone material, additional wording with regards to timing of gradation testing has been added.

There were no changes to *Specification 173–Snow Removal*.

A revision to *Specification 174–Final Grading* includes the addition of text to confirm not only the grade (or slope) of sacrificial soil but also the in-place thickness of the material placed. This requirement was already adequately included in the QC column.

4.1.18 Rock Erosion Barrier (Spec. 175 – 180)

There were no changes to *Specification 175–Scope*.

The text of *Specification 176–Gradation* has been revised by clarifying several terms. In the first sentence of the specification the terminology “erosion material” was added to better identify the applicable material. In the QC column the relevance of this gradation testing as opposed to rock source prequalification testing was clarified. Text was added to the QC column that the gradation testing of this specification was to occur following the gradation testing for rock quality scoring as required in *Specification 16–Quality of Rock*.

Specification 177–Placement has been revised and corrected to refer to minimum rock layer thickness designs presented in the approved engineering design drawings for the CAW and 11e.(2) embankments that are listed in the Groundwater Quality Discharge Permit UGW45005. And terminology in the QA column has been corrected from “filter

rock” to “*rock erosion*”.

There were no changes to *Specification 178–Snow Removal*.

A minor revision was made to the QC column of *Specification 179–Final Grading*; the incorrect term “*sacrificial soil*” was replaced with the correct term “*rock erosion barrier*”.

There were no changes to *Specification 180–Notice of Cover Construction*.

4.1.19 Drainage Ditch Imported Borrow (Spec. 181 – 184)

There were no changes to *Specification 181–Scope* and *Specification 182–Clearing and Grubbing*.

The QC column of *Specification 183–Material* has been revised. Within the QC column the frequency of acceptance gradation testing for the ditch imported borrow material has been reduced from every 3,000 yd³ to every 5,000 yd³ to be internally consistent with the other similar CQA/QC specifications (including *Specifications 6, 7, 33, 125, and 136*). And the text “*for use in the road*” has been deleted because this specification is applicable to constructing drainage ditches.

Revisions were made to *Specification 184–Lift Thickness* to make the specification more applicable to drainage ditch construction. In subsection 184.A the criteria requiring grade poles not be installed deeper than 1-inch was removed because ditch construction is not underlain by waste. In subsection 184.B text was added to better define the frequency of thickness acceptance testing. The frequency of measurements was previously undefined.

4.1.20 Drainage Ditches (Spec. 185 – 190)

There were no changes to *Specification 185–Scope*.

There were several revisions to *Specification 186–Excavation*. The criteria to notify the Division of a ditch diversion were revised to be less subjective. The new criteria require *EnergySolutions* to obtain the Director approval of plans to divert a drainage ditch. Criteria have been added to the specification that Director approval will be obtained in accordance with *Specification 23*. Requirements have been added to the QA section to provide QC with Director approval documentation. In the third paragraph of the specification the term “*select*” was unclear and has been replaced with a defined material type of “*drainage ditch borrow*”. To address testing requirements for small lot sizes of drainage ditch construction criteria was added requiring a minimum of one test per construction phase.

A minor revision was made to *Specification 187–Final Grading*, the term “*riprap*” was removed since it is not applicable to the next design layer of drainage ditch construction.

Riprap is underlain by filter zone material throughout the drainage ditch network.

There were no changes to *Specification 188–Filter Zone and Rock Erosion Barrier*.

As in revision to Specification 187 above, a minor revision was made to *Specification 189–Erosion Control for Exposed Soil*, the term “*riprap*” was removed since it is not applicable to drainage ditch construction.

A minor grammatical error was corrected in *Specification 190–Radiological Sampling for Exposed Soil*. The word “*this*” was added to the last sentence of subsection 190.B.

4.1.21 Inspection Road (Spec. 191 – 195)

Other than the changes to *Specification 192–Material* there were no changes to the specifications within the *Work Element–Inspection Road*.

The revisions to *Specification 192–Material* replaced the generic road base gradation table for a road base that would be readily available and manufactured according to Utah Department of Transportation (UDOT) road base specifications. The selected road base mix design would be approved by a Utah Licensed Professional Engineer.

4.1.22 Permanent Chain Link Fences (Spec. 196 – 198)

There were no changes to the specifications within the *Work Element–Permanent Chain Link Fences*.

4.1.23 Settlement Monitoring (Spec. 199 – 204)

There were no changes to *Specification 199–Scope*.

A minor revision was made to *Specification 200–Settlement Monuments*. In the second paragraph a call-out to the 11e.(2) embankment was added to the text. A call-out to the 11e.(2) embankment was absent in previous CQA/QC Manuals.

There were no changes to *Specification 201–Settlement Monument*; *Specification 202–Survey Requirements*; *Specification 203–Survey Interval*; and *Specification 204–Reporting*.

4.1.24 Annual As-Built Report (Spec. 205 – 207)

There were no changes to *Specification 205–Scope*.

The scheduling criteria were revised in *Specification 206–Aerial Survey Requirements*. The survey performance window was moved closer to the submittal date of the Annual As-Built report. The revision results in survey data that is more current to the submittal requirement of the Annual As-Built report.

A minor grammatical error was corrected in *Specification 207–Annual As-Built Volumes*. The term embankment was made plural because this specification applies more than one embankment.

4.2 Tables

4.2.1 Table 1 – Reserved

4.2.2 Table 2 – Material Specifications for Portland Cement CLSM

No change to Table 2 of CQA/QC Manual, Revision: 28b.

4.3 Figures

There are no changes proposed to the following Figure 1 through Figure 8 of CQA/QC Manual, Revision: 28b.

4.3.1 Figure 1 – LARW Settlement Monuments, May 1, 2006

4.3.2 Figure 2 – Class A West Settlement Monuments, rev. 4, September 18, 2015

4.3.3 Figure 3 – Mixed Waste Settlement Monuments

4.3.4 Figure 4 – 11e.(2) Settlement Monuments rev.2, October 10, 2008

4.3.5 Figure 5 – Cross Section of 11e.(2) and Class A West Settlement Plate Monument Installation, rev. 1, August 19, 2015

4.3.6 Figure 6 – Reserved (rev. 26a, September 15, 2011)

4.3.7 Figure 7 – CWF Cell Construction Requirements, Sheet 1 of 2, Rev. 1, 10/10/07

4.3.8 Figure 8 – CWF Cell Construction Requirements, Sheet 2 of 2, Rev. 0, 10/10/07

4.4 Appendices

4.4.1 Appendix A – List of CQA/QC Documentation Forms

No change to Appendix A of CQA/QC Manual, Revision: 28b.

4.4.2 Appendix B – Testing Methods, rev. 6, October 11, 2010

No change to Appendix B of CQA/QC Manual, Revision: 28b.

4.4.3 Appendix C – Rock Quality Scoring

No change to Appendix C of CQA/QC Manual, Revision: 28b.

4.5 Closure

This concludes the SOB for the proposed revisions to the CQA/QC Manual Revision 28b. It is the Division’s understanding that the final approved CQA/QC Manual will be designated by EnergySolutions as the *11e.(2) and LLRW Construction Quality Assurance / Quality Control Manual, Revision: 28c*.

5 REFERENCES

AMEC Earth & Environmental, Inc., Response to Interrogatory Number 2: Placement of HIC's in Caissons, Envirocare Class A Disposal Facility, Near Clive, Utah, October 1, 2001. AMEC Job No. 0-817-003313, **Task 10**.

EnergySolutions, LLC. 2019. Radioactive Material License UT2300249, Corrective Action Plan for Berm Breach NOED dated June 20, 2019. CD19-0163. July 25, 2019. (DRC-2019-007290).

EnergySolutions, LLC. 2018a. Groundwater Quality Discharge Permit No. UGW450005, Revision to Drawing 10014 C04. CD18-0078. April 8, 2018. (DRC-2018-003683).

EnergySolutions, LLC. 2018b. Radioactive Material License UT2300249, CQA/QC Manual Revision Request. CD18-0046. March 12, 2018. (DRC-2018-002421).

Johnson, T.L., "Design of Erosion Protection for Long-Term Stabilization," NUREG-1623, U.S. Nuclear Regulatory Commission, September 2002.

**6 REDLINE/STRIKE-OUT VERSION of PROPOSED REVISIONS TO
CONSTRUCTION QUALITY ASSURANCE / QUALITY CONTROL MANUAL,
Rev.: 28b**

Appendix C

License Condition 10.A & 57 – Railcar Repairs

Statement of Basis to Amend License Condition 10.A & 57

On February 4, 2019 (CD19-0029), ES submitted a request to the Director to amend **License Conditions 10.A and 57**. The request included proposed conditions and requirements necessary for the repair of railcars within Section 29 of the Clive facility, together with certain language clarifications relating to the receipt, storage, and transloading of radioactive material-related railcars in Section 29.

The License Section and current License Condition 10.A are as follows:

SITE LOCATION

10.A. The Licensee may receive, store, transload, and dispose of licensed material at the Licensee’s facility located in Section 32 of Township 1 South and Range 11 West, SLBM, Tooele County, Utah. The Licensee may receive, transload closed packages as defined in 57.B.iii, and store licensed materials within certain portions of the Licensee’s facility located in Section 29 of Township 1 South, Range 11 West, SLBM, Tooele County, Utah, in accordance with Condition 57.

The proposed amended License Condition 10.A:

10.A. The Licensee may receive, store, transload, and dispose of licensed material at the Licensee’s facility located in Section 32 of Township 1 South and Range 11 West, SLBM, Tooele County, Utah. The Licensee may receive, survey, inspect, transload closed packages as defined in Condition 57.B.iii, perform maintenance or repairs on released railcars, and store licensed materials within certain portions of the Licensee’s facility located in Section 29 of Township 1 South, Range 11 West, SLBM, Tooele County, Utah, in accordance with Condition 57.

The License Section and current License Condition 57 are as follows:

SITE OPERATING PROCEDURES

57.A The Licensee has established, within Section 29 of Township 1 South, Range 11 West, SLBM, Tooele County, a “Section 29 Licensee Controlled Area”, as depicted on (DWG No. 0801-G06, Stamp Dated 8/9/18). The Section 29 License Control Area consists of an access-controlled area secured with a six-foot chain link fence and access gates that are controlled by the Licensee. All rail lines within the Section 29 Licensee Controlled Area are designated as a Radioactive Material Storage Area (“RMSA”) while licensed material is being stored. The RMSA is measured from the centerline of the track to a distance of no less than 10 feet in each direction. The Licensee may receive and store railcars, and may transload Closed Packages containing licensed materials within the RMSA. All

operations within the RMSA shall be subject to the applicable provisions of this Condition 57 and other relevant provisions of the License. Conveyances and packages released from Licensee’s control in accordance with Condition 27 are deemed not to contain any licensed materials and are considered “unrestricted release.” Unrestricted release conveyances and packages are not subject to the requirements of Condition 57.

- B. The following requirements shall apply to the rail shipment receipt and storage of all types of rail-delivered conveyances and closed packages within the Section 29 Licensee Controlled Area:
- i. Receipt and storage of licensed materials is limited to the RMSA portions of the Section 29 Licensee Controlled Area.
 - ii. Waste management operations are prohibited within the Section 29 Licensee Controlled Area. Conducting radiological surveys, railcar staging, storage, transloading Closed Packages, and moving and switching operations are not considered to be waste management operations.
 - iii. The Licensee may designate specific areas within the RMSA as a transloading area. Transloading areas shall be designed in accordance with best available technology and all transloading operations within the RMSA shall be conducted in a manner so as to minimize the risk of Closed Packages becoming damaged or for licensed material otherwise being released. All transloading area designations and transloading procedures shall be approved in advance by Licensee’s RSO, with such approval being documented in writing. Within any designated RMSA transloading area, the Licensee may offload and transfer (transload) undamaged, closed, rail-delivered packages containing solid licensed materials (Closed Packages) from railcars stored within any RMSA. Closed Packages may not be placed on the ground within any area in Section 29. Transloaded Closed Packages shall be moved into Section 32 by the end of the shift when the Closed Package was removed from the delivering railcar. Only equipment and procedures that are compatible with the Closed Package design shall be used for transloading.
 - iv. Ingress into and egress from the each RMSA shall be controlled to ensure only authorized personnel are granted access and to prohibit unauthorized removal of licensed material or release of radioactive contamination. The Licensee shall maintain constant surveillance and monitoring of each RMSA whenever storage or transloading of licensed materials is taking place.
 - v. At all times when storage or transloading of licensed materials is taking place within an RMSA, the boundaries of the RMSA shall be marked with conspicuous signage, as follows: “Caution, Radioactive Material Area—Radiation Work Permit Required for Entry,” with signs placed in accordance with the Licensee’s Radiation Protection Program and UAC R313-15-902.

- vi. Unescorted non-radiation workers shall not enter the RMSA. The Licensee shall provide appropriate training for all unescorted non-radiation workers entering the Clive facility Section 29 Licensee Controlled Area regarding the RMSA.
 - vii. Licensed materials stored within an RMSA shall not exceed a dose rate greater than 2 mrem per hour at 30 centimeters.
 - viii. The Licensee shall continuously monitor the fenced boundary of the Section 29 Licensee Controlled Area and the non-fenced, interior boundaries of the RMSAs and Transloading Areas, pursuant to Condition 26 and the Environmental Monitoring Plan. Results of all monitoring shall be included in the reports required by Condition 29.A.
 - ix. A radiological survey shall be conducted for workers exiting any RMSA where storage or transloading of licensed materials is taking place. The survey shall be conducted in accordance with the Licensee's Radiation Protection Program.
 - x. The Licensee shall conduct and document regular inspections of each RMSA and all licensed materials stored therein for compliance with the Utah Administrative Code and conditions of this License.
 - xi. The Licensee shall at all times maintain sufficient surety in accordance with Condition 73 to adequately cover all licensed materials, equipment, and railcars stored within the RMSA.
 - xii. By January 31st of each year, the Licensee shall submit an annual inventory report to the Director indicating the number of conveyances in storage within the RMSA during the previous calendar year, including the dates conveyances entered and were removed from the RMSA.
- C. All incoming rail shipments shall be considered in storage once the rail shipments are delivered to the Licensee's rail line and the delivering engine is decoupled. The following conditions shall apply to incoming shipments.
- i. The Licensee shall conduct a radiological survey within 96 hours of arrival of any railcars containing licensed materials. Any individual railcar or package (a) with a dose rate greater than 2 mrem per hour at 30 centimeters, or (b) showing evidence of any actual or potential release shall be moved as soon as reasonably possible to the Restricted Area (Section 32). In the event of an actual or a potential release, any impacts to the RMSA or any Transloading Area shall be surveyed, remediated, and reported to the Director within 48 hours of observation of the release.
 - ii. No incoming railcar shall be stored in the RMSA longer than 60 days from the date of its initial radiological survey (conducted in accordance with Conditions 57.C.i.).

Within seven days of making a determination that any licensed material stored within an RMSA does not meet applicable conditions or requirements for disposal, such licensed

material shall be offered for return to the generator.

D. Empty railcars may be stored in the RMSA, subject to the following conditions:

- i. Empty railcars shall be maintained in working condition.
- ii. No empty railcar shall be continuously stored in the RMSA for longer than two years.
- iii. Empty railcars shall be surveyed and the Licensee shall document that they meet DOT and License requirements. Once surveyed, empty railcars shall be offered for pick up by the local rail service within seven days of removal from the RMSA.

The proposed amended License Condition 57.

57.A. The Licensee has established, within Section 29 of Township 1 South, Range 11 West, SLBM, Tooele County, a “Section 29 Licensee Controlled Area” as depicted on (DWG No. 0801-G06, Stamp Dated ~~8/9/18~~ 10/22/2019) (Drawing). The Section 29 Licensee Controlled Area consists of an access-controlled area secured with a six-foot chain link fence and access gates that are controlled by the Licensee. ~~All rail lines within~~ Within the Section 29 Licensee Controlled Area, ~~the Licensee has designated a Railcar Transfer Area and are designated as a~~ the Licensee has designated a Railcar Transfer Area and ~~are designated as a~~ are designated as a Radioactive Material ~~Storage~~ Storage Area (RMSA), ~~as depicted in the Drawing. while licensed material is being stored. The RMSA is measured from the centerline of the track to a distance of no less than 10 feet in each direction. The Licensee may receive and store railcars, and may transload Closed Packages containing licensed materials within the RMSA. All operations within the RMSA shall be subject to the applicable provisions of this Condition 57 and other relevant provisions of the License.~~ as depicted in the Drawing. while licensed material is being stored. The RMSA is measured from the centerline of the track to a distance of no less than 10 feet in each direction. The Licensee may receive and store railcars, and may transload Closed Packages containing licensed materials within the RMSA. All operations within the RMSA shall be subject to the applicable provisions of this Condition 57 and other relevant provisions of the License. Conveyances and packages released from Licensee’s control in accordance with Condition 27 are deemed not to contain ~~any~~ any licensed materials and are considered “unrestricted release.” ~~Unrestricted release conveyances and packages and~~ Unrestricted release conveyances and packages and are not subject to the requirements of Condition 57.

B. The following requirements shall apply to the rail shipment, receipt, ~~and~~ and storage of all types of rail-delivered conveyances and closed packages, ~~the maintenance or repair of released railcars, and outgoing railcars that do not meet unrestricted release criteria found in~~ the maintenance or repair of released railcars, and outgoing railcars that do not meet unrestricted release criteria found in Condition 27 within the Section 29 Licensee Controlled Area:

- i. Receipt of licensed material is limited to the Railcar Transfer Area. As depicted on the Drawing, the north-south railroad tracks on the east side of the Section 29 Licensee Controlled Area, is designated as the Railcar Transfer Area. All incoming rail shipments of licensed material shall be placed in the Railcar Transfer Area. Within the Railcar Transfer Area, the Licensee may perform inspections, surveys, and incidental railcar switching operations. The Licensee shall not perform maintenance and repair operations within the Railcar Transfer Area. Incoming railcars may be temporarily located in the Railcar Transfer Area for up to 10 days, unless otherwise approved by the Director. The temporary presence of licensed material within the

- Railcar Transfer Area is considered to be incidental to shipment and is not deemed to constitute “storage” within the meaning of the License.
- ii. ~~and s~~Storage of licensed materials is limited to the ~~RMSA~~ portions of the Section 29 Licensee Controlled Area. The RMA is measured from the centerline of the track to a distance of no less than 10 feet in each direction. The Licensee may receive and store railcars, perform maintenance or repairs on released railcars, and transload closed packages containing licensed material within the RMA. All operations within the RMA shall be subject to the applicable provisions of this Condition 57 and other relevant provisions of the License.
 - iii. Direct Waste management operations are prohibited within the Section 29 Licensee Controlled Area. Conducting radiological surveys, railcar staging, storage, transloading ~~c~~Closed ~~p~~Packages, maintenance or repairs on released railcars, and moving and switching operations are not considered to be direct waste management operations and may be conducted within certain portions of the Section 29 Licensee Controlled Area, in accordance with applicable conditions of the License.
 - iv. The Licensee may designate specific areas within the ~~RMSA~~ as a transloading area. Transloading areas shall be designed in accordance with best available technology and all transloading operations within the ~~RMSA~~ shall be conducted in a manner so as to minimize the risk of closed packages becoming damaged or for licensed material otherwise being released. All transloading area designations and transloading procedures and operations shall be approved in advance by Licensee’s RSO, with such approval being documented in writing as part of the permanent operating record. Within any designated ~~RMSA~~ transloading area, the Licensee may offload and transfer (transload) undamaged, closed, rail-delivered packages containing solid licensed materials (closed packages) from railcars stored within any ~~RMSA~~. Closed packages may not be placed on the ground within any area in Section 29. Transloaded closed packages shall be moved into Section 32 by the end of the shift when the closed package was removed from the delivering railcar. Only equipment and procedures that are compatible with the closed package design shall be used for transloading.
 - v. Ingress into and egress from the ~~each~~ ~~RMSA~~ shall be controlled to ensure only authorized personnel are granted access and to prohibit unauthorized removal of licensed material or release of radioactive contamination. The Licensee shall maintain constant surveillance and monitoring of all access points in the Section 29 Licensee Controlled Area each RMSA whenever receipt, storage, or transloading of licensed materials, or maintenance or repairs on released railcars is taking place.
 - vi. At all times when storage or transloading of licensed materials, or maintenance or repairs of released railcars, is taking place within an ~~RMSA~~, the boundaries of the ~~RMSA~~ shall be marked with conspicuous signage, as follows: “Caution, Radioactive Material Area—Radiation Work Permit Required for Entry,” with signs placed in accordance with the Licensee’s Radiation Protection Program and UAC R313-15-902. A radiological survey shall be conducted prior to deposing any RMA to

- demonstrate that the area no longer meets the requirements for RMA posting.
- vii. Unescorted non-radiation workers shall not enter the RMSA. The Licensee shall provide appropriate training for all unescorted non-radiation workers entering the Clive facility Section 29 Licensee Controlled Area regarding authorized visitor access roads-the RMSA.
 - viii. As provided more fully in Section C.i., below, Licensed materials located within the Railcar Transfer Area or stored within an RMSA shall not exceed a dose rate greater than 2 mrem per hour at 30 centimeters.
 - ix. The Licensee shall continuously monitor the fenced boundary of the Section 29 Licensee Controlled Area and the non-fenced, interior boundaries of the RMSAs, and Transloading Areas, and maintenance or repair areas pursuant to Condition 26 and the Environmental Monitoring Plan. Results of all monitoring shall be included in the reports required by Condition 29.A.
 - x. A radiological survey shall be conducted for of workers exiting any RMSA where storage or transloading of licensed materials, is taking place. The survey shall be conducted in accordance with the Licensee’s Radiation Protection Program.
 - xi. The Licensee shall conduct and document regular inspections of each RMSA and all licensed materials stored therein for compliance with the Utah Administrative Code and conditions of this License.
 - xii. The Licensee shall at all times maintain sufficient surety in accordance with Condition 73 to adequately cover all licensed materials, equipment, and railcars stored within the RMSA.
 - xiii. By January 31st of each year, the Licensee shall submit an annual inventory report to the Director indicating the number of conveyances in storage within the RMSA during the previous calendar year, including the dates conveyances entered and were removed from the RMSA.
- C. All incoming rail shipments shall be considered Licensee controlled in storage once the rail shipments are delivered to the Licensee’s rail line and the delivering engine is decoupled. The following conditions shall apply to incoming railcars containing licensed material shipments.
- i. The Licensee shall conduct a radiological survey within 96 hours of arrival of any railcars containing licensed materials. Any individual railcar or package (a) with a dose rate greater than 2 mrem per hour at 30 centimeters, or (b) showing evidence of any actual or potential release shall be moved as soon as reasonably possible to the Restricted Area (Section 32). In the event of an actual or a potential release, any impacts to the Section 29 Licensee Controlled Area RMSA or any Transloading Area shall be surveyed, remediated, and reported to the Director within 48 hours of observation of the release.
 - ii. No incoming railcar shall be stored in the RMSA longer than 60 days from the date of its initial radiological survey (conducted in accordance with Conditions 57.C.i.).

- iii. Whenever the Licensee has reason to believe ~~Within seven days of making a determination~~ that any Licensee-controlled licensed material ~~stored within an RMSA~~ does not meet applicable conditions or requirements for disposal, the Licensee shall provide notice to the Director, not later than 24 hours. Within 7 days after either the Licensee or the Director determines that such licensed material does not meet applicable acceptance criteria (whichever is sooner), the Licensee shall offer such licensed material ~~shall be offered~~ for return to the generator. The Licensee shall undertake all necessary measures with respect to such non-compliant licensed material until it is picked up for return to the generator.
- D. The Licensee may store released~~empty~~ railcars ~~may be stored~~ in an the RMSA, subject to the following conditions:
- i. The Licensee shall maintain released~~empty~~ railcars ~~shall be maintained~~ in working condition.
 - ii. The Licensee shall not store any ~~No~~ released~~empty~~ railcar ~~shall be continuously stored~~ in the RMSA for longer than two continuous years.
 - iii. Prior to storing released railcars in the RMA, the Licensee shall survey released~~Empty~~ railcars ~~shall be surveyed~~ and the Licensee shall document that they meet DOT and License requirements. This documentation shall form part of the permanent operating record.
 - iv. Storage shall not include ~~Once surveyed, releasedempty~~ railcars that the Licensee has placed on a designated outbound track and has ~~shall be~~ offered for pick up by the local rail service, provided that such cars are picked up by the local rail service within seven days ~~of removal from the RMSA~~ or such additional time as the Director approves.
- E. The following requirements shall apply to any railcar maintenance or repair operations within the RMA. The Licensee may conduct maintenance or repair operations on the exterior surfaces and exterior appliances of released~~empty~~ railcars, subject to the following conditions:
- i. All maintenance and repair procedures and operations shall be approved in advance by the Licensee's RSO, with such approval being documented in writing as part of the permanent operating record.
 - ii. All railcar maintenance and repair operations shall be conducted in a manner that minimizes the risk of environmental release of licensed material and exposure to the Licensee's employees, third-party contractors, or other persons.
 - iii. All railcar maintenance and repair operations within the Section 29 Licensee Controlled Area shall be conducted solely within an areas approved by the Licensee's RSO, which areas shall be under the exclusive use and control by a device that can be locked and unlocked only by the workers who are responsible for the maintenance or

- repair work.
- iv. The Licensee shall be solely responsible for compliance with all applicable laws, rules, and regulations relating to the maintenance and repair of railcars, including, without limitation, those rules, regulations, and standards relating to the Federal Railroad Administration, the U.S. Department of Transportation, and the Association of American Railroads.
 - v. Prior to the time that the Licensee undertakes any railcar maintenance or repair operations, the Licensee shall conduct appropriate radiological surveys to document that the railcar surface to be repaired is compliant with the applicable contamination limits set forth in Condition 27, as determined by the Licensee’s RSO.
 - vi. At all times that railcar maintenance or repair operations are being undertaken, the Licensee shall perform appropriate radiological surveys as to the Railcar Maintenance Facility, not less frequently than once per day, as determined by the Licensee’s RSO.
 - vii. The Licensee shall retain records regarding railcar maintenance or repair operations and associated radiological surveys for at least three years. Railcar maintenance records shall include, at a minimum, the railcar reporting mark and number, the railcar ownership status, a description of the maintenance or repairs undertaken (including the location of the repair and type of repair), the results achieved, and the dates of railcar acceptance and release.
 - viii. Railcar repair operations involving welding within Section 29 shall be undertaken only in the RSO-approved maintenance area under the supervision of an RST with RSO approval and appropriate monitoring.
 - ix. The following activities are prohibited within Section 29: (a) removal of gondola railcar lids; and (b) accessing the interior of gondola railcars for any purpose, including inspection, repairs, or maintenance.

Railcar Receipt, Storage, and Repairs

The ES submitted the request to the Director to amend **License Condition 57** of the License for the purposes of repairing railcars in Section 29 at the Clive facility. In this respect, this License Amendment 25 is related to License Amendment 24, where the Director approved amendments to License Conditions 10, 57, and 62 relating to the receipt, storage, and transloading of railcars containing radioactive material or having residual surface radioactivity above unrestricted release levels at the ES’s facility are acceptable practices outside of Section 32 at the ES’s facility and has designated areas where these activities can take place as formal Radioactive Material Storage Areas. In processing the License amendment request relating to the issue of railcar repairs, the Director decided to make certain changes to the wording of Condition 57 relating to the receipt, storage, and transloading matters that were addressed in License Amendment 24, in order to provide more clarity. For example, the term “Radioactive Material Storage Areas” has been changed to Radioactive Material Area to be more consistent with the Radiation Control and NRC rules and publications. These revisions are discussed in more detail below.

Basis for License Changes

License Amendment 24 represented a major amendment of Condition 57. Subsequent to the finalization of License Amendment 24, ES requested that this Condition be amended to allow ES to undertake certain repair and maintenance operations on railcars that are stored in Section 29 under the amended Condition 57. ES presented a detailed operational plan to ensure that railcar repair, maintenance, and management activities in RMAs in Section 29 are conducted in a manner that is protective of the environment and is radiologically safe for workers and the public.

The requirements governing the types of repairs and maintenance activities that are allowed, and the manner in which such operations are conducted, are designed to be flexible enough to accommodate operations and the constantly changing number of railcars yet specific and tight enough to ensure controls are effective and inspectable and enforceable.

The RMA definition has been clarified to be limited to a specific area within Section 29, whereas before all rail lines in Section 29 were designated as RMAs. Instead, a specific Railcar Transfer Area has been defined. The Railcar Transfer Area is not designated as a formal RMA. However, the substantive requirements that would apply to RMAs apply to the Railcar Transfer Area as provided in the amended language. This was done to accommodate the transfer process whereby a common carrier drops off incoming shipments and picks outgoing (released) railcars. These transfer operations are incidental to the normal shipping and receiving process. Similarly the railroad personnel are authorized to perform railcar transfer operations in the Railcar Transfer Area without an escort. For incoming shipments, the bill of lading is not fulfilled until the waste reaches the disposal facility in Section 32. For outgoing (released) railcars, these railcars have been cleaned and surveyed and demonstrated to meet applicable DOT regulations for service (e.g., restricted release). The Railcar Transfer Area, including the 10-day transfer period, are based on federal regulations relating to similar activities. *See* 40 CFR § 263.12 (relating to transfer facility requirements, providing a 10-day transfer period); 40 CFR § 262.30 (relating to packaging waste or offering hazardous waste for transportation off-site); 49 CFR §171.1(c)(4) (governing storage of a transport vehicle, freight container, or package containing hazardous material incidental to movement of a hazardous material); 49 CFR §171.8 (defining “storage incidental to movement” to include storage incidental to delivery to the final destination, including railcars stored on “private track or siding”).

Public access to the Railcar Transfer Area will be controlled and monitored. The substantive requirements established in Amendment 25 (e.g., radiation monitoring, surveying, environmental monitoring, and so forth) will still apply to the Railcar Transfer Area. As before, in all events, limits are placed on radiation dose rates emanating from railcars placed in the Railcar Transfer Area and in the RMA. Incoming railcars must be surveyed within 96 hours of arrival. Railcars must be removed from the Railcar Transfer Area within 10 days.

References

EnergySolutions, LLC. 2019a. Orton, Tim. Message to Bret Randall. October 22, 2019. Email Attachment: Section 29 Licensee Controlled Area, Site Map, Clive Utah. Scale 1"=600', Stamp dated October 22, 2019, Drawing No. 0801-G06

EnergySolutions, LLC. 2019b. Radioactive Material License UT2300249, Request for License Amendment to Allow Railcar Maintenance within Section 29. CD19-0029. February 4, 2019. (DRC-2019-001441).

Appendix D

License Condition 73.C – Surety Update

Statement of Basis to Amend License Condition 73.C

License Condition 73.C. of the LLRW Radioactive Material License (UT 2300249) lists the approved combined annual surety amount for the Clive site and the individual surety amount for the LLRW Facility. Changes to the combined surety and individual facility amounts are updated annually based on physical changes at the facility and inflation calculations. Occasionally intermediate revisions are approved by the Director.

Within earlier License Amendment 23 (dated 8/1/18, DRC-2018-004075) and the current License Amendment 24 (dated 10/18/18, DRC-2018-010114) the surety values listed in License Condition 73.C are based on the Director's approval of an ES letter dated March 26, 2018 (CD18-0060, DSHW-2018-003012). The Director's approval is summarized in a letter dated April 26, 2018 (DSHW-2018-003623).

In a letter dated December 7, 2018 (DSHW-2018-010862) the Director approved an Annual Surety update. This subject approval was an acceptance of the 2017 Annual Surety review submitted by ES on March 1, 2018 (CD18-0040, DRC-2018-002081).

Prior to issuing a license amendment to capture the 2017 Annual Surety values approved on December 7, 2018, a subsequent set of surety values would be approved by the Director. On March 29, 2019 ES submitted to the Director the 2018 Annual Surety update to the combined annual surety amount for the state-issued Part B Permit, the 11e.(2) Radioactive Material License (UT 2300478) and the LLRW Radioactive Material License (UT 2300249). The Director has approved the 2018 Annual Surety update revision with an approval letter dated October 11, 2019 (DSHW-2019-012382). These 2018 Annual Surety values are being incorporated into this License Amendment 25.

Based on a Division review of the annual update submission, Condition 73.C. of the LLRW Radioactive Material License shall be revised as indicated in the following paragraphs:

The License Section and current License Condition are as follows:

FINANCIAL ASSURANCE/CLOSURE

73.C. The combined annual surety is \$76,690,920.92 with the LLRW subtotal of \$50,005,828.16 as approved in the Director's letter dated April 26, 2018.

The amended License Condition 73.C is as follows:

73.C. The combined annual surety is ~~\$76,690,920.92~~ \$80,149,535.08 with the LLRW subtotal of ~~\$50,005,828.16~~ \$52,666,194.70 as approved in the Director’s letter dated ~~April 26, 2018~~ October 11, 2019.

References

EnergySolutions, LLC. 2019. Radioactive Material License UT2300249, Radioactive Material License UT2300478, EPA ID Number UTD982598898, 2018 Combined Surety Annual Review, Class 1 Permit Modification, and LLRW, and 11e.(2) License Amendment Requests. CD19-0075. March 29, 2019. DRC-2019-002923.

EnergySolutions, LLC. 2018a. EPA ID Number UTD982598898, Radioactive Material License UT2300249. Notification of Surety Exceedance, Combined Surety Unloaded Railcar Increase and Class 1 Permit Modification. CD18-0060. March 26, 2018. DSHW-2018-003012.

EnergySolutions, LLC. 2018b. Radioactive Material License UT2300249, Radioactive Material License UT2300478, EPA ID Number UTD982598898, 2017 Combined Surety Annual Review, Class 1 Permit Modification, and LLRW, and 11e.(2) License Amendment Request. CD18-0040. March 1, 2018. DRC-2018-002082.

Utah Department of Environmental Quality, Division of Waste Management and Radiation Control (UDEQ-DWMRC), 2019, 2018 Combined Surety Review, dated October 11, 2019. DSHW-2019-012382.

UDEQ-DWMRC, 2018a, 2017 Surety Approval. Dated December 7, 2018. DSHW-2018-010862.

UDEQ-DWMRC, 2018b, Class 1 Permit Modification Request, LLRW Storage Increase, UTD982598898. Dated April 26, 2018, DSHW-2018-003623.