

GROUND WATER QUALITY DISCHARGE PERMIT UGW450005
Permit Renewal

STATEMENT OF BASIS

Low-Level, 11e.(2), and Mixed Radioactive Waste Disposal Facility

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PURPOSE

This Statement of Basis (hereafter SOB) describes the technical and regulatory basis to renew and revise requirements found in the EnergySolutions' (hereafter Permittee) Ground Water Quality Discharge Permit, No. UGW450005, (hereafter Permit) for the commercial Low-Level, 11e.(2), and mixed radioactive waste disposal facility located near Clive, Tooele County, Utah; Township 1 South, Range 11 West, Section 32, Salt Lake Baseline and Meridian. These changes are associated with the five-year renewal of the current Permit, which expired at midnight on June 8, 2013, and a Permit modification request (see Attachment A). The Permit is issued pursuant to Utah Water Quality Rule, Utah Administrations Code (UAC) R317-6, which requires any persons who operates a facility or modifies an existing or new facility that discharges water or would probably result in a discharge of water, to obtain a Ground Water Quality Discharge Permit. The Utah Division of Radiation Control (DRC) oversees the Permittee's Permit, and the Director of the DRC (hereafter Director) ensures that all applicable regulatory requirements are met. As described in UAC R317-6-6.7, the Permit continues in effect until the Director renews, extends, or denies the renewal application. Proposed Permit changes here do not include changes associated with the SampraSafe, and DU Performance Assessments, or the ET cover system review that are currently under review by the DRC. The DRC will deal with these in future Permit modification, once technical issues have been resolved. The DRC has reviewed the renewal request and their findings are found in a memorandum dated February 19, 2014 (see Attachment B). The proposed Permit modifications associated with the Permittee's renewal application to the Director, and ongoing facility evaluations are the basis for this SOB, which describes changes proposed by the Director. The acceptance and implementation of these proposed changes will replace the previous Permit modification, dated June 8, 2013.

Major changes associated with this Permit Renewal include but are not limited to:

- Removal of Ground Water Protection Parameters, Part I.C

- Reduced Frequency of Video Inspection for LARW and Class A West Cell Collection Lysimeter, Part I.E.11
- Revision of Ground Water Protection Levels, Part I.C

The Director considers major Permit changes to be those with a potential to adversely affect public health and/or the protection of the environment, or to represent a reduction in monitoring requirements. Such major Permit changes require a public comment period. Other changes that are considered minor in nature by the Director include, but are not limited to, those that: (1) have no adverse impact on the protection of public health or the environment, or (2) are more stringent or protective than those already existing in the Permit. Both major and minor changes, described below, are proposed in this Permit modification. Proposed changes to the Permit are shown in Appendix C, in underline/strikeout text.

Proposed Major Permit Changes

Removal of Ground Water Protection Parameters, Part I.C - as part of the renewal application, the Permittee requested the elimination of groundwater protection parameters from the Permit that they consider unnecessary to document and maintain compliance (EnergySolutions, December 7, 2012).

The Permit requires that the environmental impacts to groundwater are kept within tolerable risk levels and treats the shallow aquifer below the Clive site as if it is vulnerable to contamination originating from the disposal embankments. Groundwater protection parameters and Ground Water Protection Levels (GWPLs) are used in the monitoring of site performance to demonstrate regulatory compliance with requirements listed in Part I.C of the Permit. Furthermore, since shallow groundwater below the site is defined as Class IV, alternate GWPLs are allowed, as long as they present no significant hazard, and are protective of public health and the environment, UAC R317-6-4.7. Alternate GWPLs levels, on a well and parameter basis, are listed in Tables 1B, 1D, and 1F, Part I.C of the Permit. Groundwater protection parameters are monitored during and after facility operations, and appropriate records and data are submitted for each compliance monitoring well, and parameter to the Director, to demonstrate compliance with regulatory requirements. The DRC reviewed the renewal application request for the elimination of groundwater protection parameters in a memorandum dated June 2, 2014 (see Attachment B).

Potential contamination from an embankment at the Clive site is minimized by proper design, construction, operation, and maintenance of the embankments that receive low level, 11e.(2), and mixed radioactive wastes. Despite design criteria and the operational practices used at the Clive site, which are intended to reduce the change of leakage to shallow groundwater from an embankment, the risk of contamination cannot be completely eliminated. Therefore, groundwater monitoring wells are placed strategically around disposal embankments to provide for environmental protection. The design of an efficient detection monitoring system at the Clive site is difficult and complicated due to uncertainties in the specific characteristics of elevated constituent sources and in the spatial variability of hydrogeological at the site. The sampling of individual parameters at compliance monitoring wells and statistical methods are used to track changes in water quality during an embankments active life and a post closure

period to determine if a release from an embankment has occurred. The concentrations of specific indicator parameters from compliance monitoring wells are compared to GWPLs listed in the permit. The Director originally determined to protect the groundwater and choose some parameters and concentration limits based on Ground Water Quality Standards found in UAC R317-6-2. Therefore, at this time most of the compliance monitoring is based on a comparison to Utah Water Quality Standards for drinking water, or alternate (background) concentrations for water quality compliance parameters. Exceedances of the compliance monitoring GWPLs leads to verification sampling and/or additional evaluation to characterize the nature and extent of the effects on groundwater.

The Permittee is specifically asking for the removal of dissolved metals, including total uranium; cyanide; fluoride; total nitrate/nitrite; and organics as compliance parameters from the Permit. The justification for the request is that monitoring for these parameters is not required by Utah Rules and not technically necessary to ensure compliance with water quality regulations, and relies on a Permit condition, requirements contained in UAC R317-6 (Administrative Rules for Ground Water Quality Protection), and the Permittee's evaluation of groundwater quality data. The Permittee's argument consisted of the following:

1. Part I.A of the Permit defines groundwater in the vicinity of the site as Class IV, saline groundwater. UAC R317-6-3.7 defines Class IV groundwater as having Total Dissolved Solids (TDS) greater than 10,000 milligrams per liter (mg/L). TDS gives an indication of the quality of water, or a measure of the usefulness of water. Class IV groundwater has TDS greater than 10,000 mg/L and is generally considered not potable.
2. There are no requirements linked to specific parameters or the Ground Water Quality Standards in UAC R317-6-2, Table 1, for Class IV groundwater.
3. UAC R317-6-4.7, Class IV Protection Levels states that protection levels for Class IV groundwater will be established to protect human health and the environment.
4. UAC R317-6-6.3, Application Requirements for a Ground Water Discharge Permit, and UAC R317-6-6.3.I .7 states that application will provide a description and justification of parameters to be monitored. There are no requirements linked to specific parameters or the Ground Water Quality Standards in UAC R317-6-2, Table 1.
5. Groundwater characteristics at the Clive site are well understood, and the comprehensive evaluations of groundwater done to date are sufficient to provide an understanding of background groundwater quality.

Shallow groundwater at Clive is Class IV (Part I.A of the Permit), saline groundwater according to UAC R317-6-3.7, with TDS concentrations in the shallow aquifer at the Clive site typically exceeding 30,000 mg/L, this has been documented for over 20 years (EnergySolutions, March 19, 2014). Ground Water Protection Rules for Class IV groundwater, UAC R317-6-4.7, does not require monitoring of groundwater at drinking water standards, only for protection of human health and the environment. The Permittee points out that analysis conducted by the World

Health Organization in 2003 suggested there are adverse effects association with the consumption of high TDS concentrations in water, and the incidence of cancer, coronary heart disease, arteriosclerotic heart disease, cardiovascular disease, and total mortality rates in studies conducted in Australia and the former Soviet Union were elevated from drinking high TDS water (World Health Organization, 2003). Because of the naturally poor quality, due to the high TDS or salinity, the shallow groundwater in the vicinity of the Clive site was considered not suitable for most human uses at the time the Permit was originally issued. The continued compliance monitoring of inorganics (dissolved metals, cyanide; fluoride, and total nitrate/nitrite), and organic chemicals is not necessary to maintain compliance with groundwater quality protection regulations. The Permittee proposes to continue to monitor radionuclides in Clive facility shallow groundwater and to compare the analytical results to the -water based standards currently contained in the Permit, and then sample and analyze the inorganics and organic chemicals once-per-renewal cycle (Part I.F.5.c.3 of the Permit). These parameters would be reported in the Comprehensive Groundwater Quality Evaluation Report (a report required for Permit renewal) and would be compared to the descriptive statistics; minimum, maximum, mean, and standard deviation documented in the 2014 Comprehensive Groundwater Quality Evaluation Report for a comparison (EnergySolutions, March 19, 2014). The other inorganics and organic chemical parameters would be required by Part I.F.5.c.3 of the Permit.

The Permittee reviewed their sampling plan, motivated by a preponderance of inorganic, organic, and radiological sample results that showed little or no change in concentration over time, fell below detection limits, or had elevated levels for compliance parameters that are naturally occurring at the Clive site (EnergySolutions, March 19, 2014). The analytical inorganic results in the groundwater quality dataset consist of at least 50 percent detections, but radionuclides are not detected in Clive groundwater, although the presence of some tritium contribution from atmospheric nuclear testing cannot be ruled out. Organic compounds are infrequently detected at very low concentrations (typically one-time detections and not repeated in subsequent sampling). These one-time detections have been attributed to laboratory contamination and organic compounds are considered not detected in Clive groundwater. Non-naturally occurring radionuclides, and hazardous organics groundwater quality datasets consist chiefly of non-detections at the Clive site. Chemical constituents in groundwater at the Clive site are a consequence of natural physical and chemical process that are strongly influenced by solution chemistry and surface properties of the prevailing mineral phases, and any potential alterations that may have occurred as a consequence of human activity. Metals are present naturally in Clive groundwater, generally in small concentrations, but some naturally occurring dissolved metals compliance parameters have resulted in out-of-compliance monitoring of background conditions in a number of cases at the Clive site. The shallow groundwater's high concentration of dissolved solids has caused problems in the analysis and quantification of many of the groundwater constituents.

In assessing the impact of waste operations on groundwater quality, individual elements or compounds in an analytical list can change or have their sampling schedule reduced based on the results of previous sampling events and/or their low probability of detection in groundwater. Some factors considered in the selection of compliance monitoring parameters are availability, mobility, persistence, analytical methods, contrast of concentrations in potential discharge fluids

and groundwater, and their relevance to important water quality issues such as human health protection. Previously, the Director set most GWPLs as the State Ground Water Quality Standards or a background concentration, whichever was greatest. The Director originally protected the shallow aquifer at the Clive site as if it were a drinking water resource, although groundwater at Clive is Class IV groundwater, this allowed for the protection of groundwater without an adequate evaluation of background conditions, encourage waste containment engineering, and protect public health and the environment. Because the shallow groundwater at the Clive site is saline and defined as Class IV groundwater, flexibility in setting GWPLs was allowed, so long as the GWPLs are protective of public health and the environment. The protection levels are listed in the exception tables of the Permit.

The Permittee is proposing a strategy where indicator constituents (representative of the waste stream) are chosen for frequent sample analysis (annual) and a more comprehensive list of constituents are used for less frequent (once per renewal cycle, 5 years) and less rigorous analysis. This would minimize the occurrence of false detections by removing inorganics, and organics, while continuing to monitor radionuclides and compare these analytical results to the present GWPLs in the Permit. Although they would be removed as compliance parameter, the Permittee will sample and analyze the inorganics (mostly dissolved metals) and organic chemicals as Permit renewal parameters once per renewal cycle. The results from the once per-renewal cycle would be compared to the descriptive statistic documented in the Comprehensive Groundwater Quality Evaluation Report and not to Ground Water Quality Standards. The comparison will evaluate potential changes in groundwater inorganic and organic constituent concentrations.

The Permittee proposes to only use radionuclides for annual monitoring at the Clive site, because the detection of non-radiological constituents associated with a release to groundwater without detection of radiological constituents is unlikely. The radiological content of the waste is documented in the Manifest Radionuclide Inventory Report, and by the analysis of water samples from the evaporation ponds. The evaporation ponds are filled with water that has contacted waste for the most part, and the analysis of this water generally indicates radiological constituents but not inorganic or organic constituents. Radioisotope analytical sensitivities are equal to that of inorganics (dissolved metals, cyanide, fluoride, and nitrate/nitrite elements) that are compliance parameters at the site; and unlike some metals, background levels of most radionuclides included as compliance parameters are essentially zero. Analytical methods for detection and quantification of radiological constituents in water are standardized and the quality control used for the radiological constituent is identical to non-radiological analytical quality control. Some of the radiological constituents are conservative monitoring options, because of the high mobility. Radionuclides are commonly used as surrogate parameters in embankment infiltration and transport modeling, because of their high mobility relative to metals and organics, and the frequency of their presence in the waste (Whetstone Associates, Inc., July 19, 2000, November 22, 2000, August 1, 2000, November 18, 2011, and May 29, 2012). Based on distribution coefficient used in infiltration and transport modeling, four radiological parameters (Sr-90, I-129, Tc-99, and tritium) were considered more mobile than the inorganic compliance parameters in these studies. The Manifest Radioisotope Inventory Report, also prepared and

submitted in support of Permit Renewal, provides documentation of the radiological content of material disposed in each embankment at the Clive facility (EnergySolutions, August 23, 2012).

Requiring some inorganics to meet drinking water standards at the Clive site has been problematic. The Mixed Waste embankment's Part B Permit also requires monitoring of inorganic parameters (cyanide, fluoride, and dissolved metals), but to RCRA protection levels.

The 2012 Comprehensive Groundwater Quality Evaluation Report documents the occurrence of background levels of some inorganics in facility groundwater at some wells that commonly exceed GWPLs in some individual wells (EnergySolutions, March 19, 2014). The exceedances are attributed to naturally occurring inorganic compliance parameters found in Clive facility sediments and groundwater. These conditions have resulted in out-of-compliance monitoring of individual wells at various locations; these wells were eventually added to Tables 1B, 1D, or 1F of the Permit, groundwater protection level exceptions of the Permit. The Permittee believes it is reasonable that the monitoring program should be focused on known potential contaminants present in the disposal embankments, and provided justification for the elimination of groundwater protection parameters for inorganic (metals), and organics, as compliance parameters. Background conditions at the Clive site are now well established, with over 20 years of data for inorganic, organic, and radiological parameters.

The Permittee requested the elimination of total uranium as a Permit compliance parameter, and addition of isotopic uranium(s) to the list of radiological compliance parameters for the 11e.(2) wells (isotopic uranium parameters are already included in the list of compliance parameters for the LARW, Class A West, and evaporation ponds GWPLs). Total uranium analyses are redundant to isotopic uranium, because total uranium concentrations can be calculated from isotopic data, and that total uranium analysis provides less information than isotopic uranium analysis. A comparison of laboratory total uranium analytical results to total uranium values calculated from isotopic uranium data indicates that for almost all samples, the laboratory total uranium result is within the calculated total uranium range when the isotopic counting error is included. The Permittee revised this proposed modification to eliminate total uranium analyses, while retaining total uranium GWPL in an August 4, 2014 letter (EnergySolutions, August 4, 2014). Total uranium mass concentration of any compliance sample will continue to be reported, but will be calculated from the isotopic uranium data and reported in accordance to Permit reporting requirements.

Wells monitoring the 11e.(2) embankment are also sampled and analyzed for volatile organic compound (VOCs), semivolatile organic compounds (SVOCs) and the pesticide chlordane. Wells monitoring the LARW, Class A West, and evaporation ponds are monitored for VOCs. VOCs are infrequently detected at very low concentrations in Clive groundwater samples, but do not appear to be related to waste disposal activities (typically one-time detections and not repeated in subsequent sampling). SVOCs do not appear to have been detected in the shallow groundwater related to waste disposal activities. When properly evaluated, non-natural occurring organic compounds are suitable indicators of contamination at a site, and their detections in a monitoring well indicates contamination. Although VOCs are fairly soluble, the primary fate of most VOCs is difficult to understand, with biogeochemical processes occurring during subsurface transport making them particularly immobile in groundwater. VOCs have a

high tendency to volatilize and distribute preferentially into the air. VOCs are found in many industrial products including fuels, solvents, paints, and adhesives. SVOCs are fairly soluble, and have only a moderate tendency to volatilize, and can be fairly persistent in groundwater. SVOCs are also present in many industrial products including plastics, dyes, disinfectants, and petroleum products. Data collected for the last 20 years indicate that organic parameters are not present, or at least have not reached any compliance monitoring wells; VOC and SVOC compounds have not been detected in Clive groundwater. The VOCs required in the Permit may be somewhat feeble indicators of groundwater contamination. A much broader list of organic will continue to be sampled at the mixed waste embankment.

The Director has determined that:

Natural levels of metals have caused additional and unnecessary monitoring at the Clive site. The Permittee has demonstrated that metal exceedances are due to background concentrations being greater than GWPLs. Over 20 years of inorganic data collection from Clive site monitoring wells has demonstrated that inorganics are not significant constituents and would be inadequate indicators of embankment leakage. Inorganics required in the Permit, at the LARW, Class A West and Evaporation; and 11e.(2) monitoring wells, with the exception of total uranium, can be removed from the parameter list. Given the waste inventory, observed evaporation pond concentrations of constituents, potential mobility, and detectability of radiological constituents, radiological constituents are more reliable indicators of waste embankment leakage. Monitoring of inorganics on a renewal bases (every 5 years) is acceptable.

VOCs required in the Permit, at the LARW, Class A West and Evaporation; and 11e.(2) monitoring wells, can be removed from the parameter list, because of the non-detection of organics in 20 years, VOCs characteristics, and slow movement of the groundwater at the Clive site, monitoring of VOCs on a renewal bases (every 5 years) is acceptable. SVOCs and the pesticide chlordane will remain for the 11e.(2) monitoring wells.

Although the inorganics and organics are eliminated as compliance parameters, they will be retained as permit renewal parameters. At the time of Permit renewal, samples will be collected and analyzed for constituent concentrations and reported in the Comprehensive Groundwater Quality Evaluation Report, required for Permit renewal. The analytical results will be compared to statistical results for each parameter that is contained the Comprehensive Groundwater Quality Evaluation Report. The comparison will evaluate potential changes in the groundwater inorganics and organic concentrations. If any Permit renewal parameters are found to be greater than the mean concentration plus two times the standard deviation concentration (background concentration) the Permittee will need to go into an accelerated monitoring program for that well and parameter. Additionally, if any compliance monitoring well for the Mixed Waste embankment has a parameter that exceeds the GWPLs for the Mixed Waste Embankment, than wells along the east side of the LLRW embankment will immediately be sampled for that parameter. All embankments will continue to be monitored for radiological constituents. The proposed modification will not reduce protection of human health and the environment because potential impacts to groundwater from the Clive facility will be detected by continued

monitoring of radiological compliance parameters in groundwater, which are better indicators of embankment leakage.

The inorganic and organic parameters are removed from Tables 1A and 1B of the Permit. The proposed groundwater parameters and protection levels universal to all LARW, Class A West and Evaporation Pond wells are:

The proposed Table 1A of the Permit, Ground Water Protection Levels (GWPL) - Universal to all LARW, Class A West, and Evaporation Pond Wells.

Parameter	GWPL	Parameter	GWPL
		<i>Radiologic Parameters – Alpha Emitters (pCi/l)</i>	
		Neptunium-237	7
		Strontium-90	42
		Thorium-230	83
		Thorium-232	92
		Uranium-233	26
		Uranium-234	26
		Uranium-235	27
		Uranium-236	27
		Uranium-238	26
		<i>Radiologic Parameters – Beta/Gamma Emitters (pCi/l)</i>	
		Carbon-14	3,200
		Iodine-129	21
		Technetium-99	3,790
		Tritium	60,900
		<i>Combined Radiologic Parameters (pCi/l)</i>	
		Radium-226 + Radium-228	5
<i>Field Parameters</i>			
pH (units)	6.5 – 8.5		
<i>Dissolved Metal (mg/l)</i>			
Uranium - total	0.03		

The inorganic and organic parameters are removed from Tables 1C and 1D of the Permit. The proposed groundwater parameters and protection levels universal for all 11e.(2) wells are:

The Proposed Table 1C of the Permit, Ground Water Protection Levels - Universal for all 11e.(2) Wells.

Parameter	GWPL	Parameter	GWPL
		<i>Organic Parameters – Specific to 11e.(s) (mg/l)</i>	
		Naphthalene ⁽⁸⁾	0.02
		Diethyl Phthalate ⁽⁹⁾	5.0
		2-Methylnaphthalene	0.004
		Benzo(a)anthracene	0.01
		Benzo(a)pyrene	0.01
		Benzo(k)fluoranthene	0.01
		Chlordane	0.002
		Chrysene	0.01
		<i>Radiologic Parameters – Beta/Gamma Emitters (pCi/l)</i>	
		Carbon-14	3,200
		Iodine-129	21
		Technetium-99	3,790
		Tritium	60,900
		<i>Combined Radiologic Parameters (pCi/l)</i>	
		Radium-226 + Radium-228	5
		<i>Radiologic Parameters (pCi/l)</i>	
		Thorium-230	83
		Thorium-232	92
<i>Field Parameters</i>			
pH (units)	6.5 – 8.5		
<i>Dissolved Metal (mg/l)</i>			
Uranium - total	0.03		
<i>Radiologic Parameters – Alpha Emitters (pCi/l)</i>			
Neptunium-237	7		
Strontium-90	42		
Thorium-230	83		
Thorium-232	92		
Uranium-233	26		
Uranium-234	26		
Uranium-235	27		
Uranium-236	27		

Parameter	GWPL	Parameter	GWPL
Uranium-238	26		

The Ground Water Protection levels for Mixed Waste Monitoring wells will remain the same, monitoring parameters and protection levels for all Mixed Waste monitoring wells are:

The Proposed Table 1E of the Permit, Ground Water Protection Levels Universal to All Mixed Waste Wells.

Parameter	GWPL	Parameter	GWPL
<i>Dissolved Metals (mg/l)</i>			
Uranium – total ⁽¹⁾	0.03		
<i>Radiologic Parameters (pCi/l)</i>			
<i>Alpha Emitters</i>			
Neptunium-237	7	<i>Dissolved Metal (mg/l)</i>	
Strontium-90	42	Uranium – total	0.03
Thorium-230	83	<i>Beta/Gamma Emitters</i>	
Thorium-232	92	Carbon-14	3,200
Uranium-233	26	Iodine-129	21
Uranium-234	26	Technetium-99	3,790
Uranium-235	27	Tritium	60,900
Uranium-236	27	<i>Combined Radiologic Parameters (pCi/l)</i>	
Uranium-238	26	Radium-226 + Radium-228	5

LARW and Class A West Cell Collection Lysimeter: Operation, Maintenance, and Annual Inspection, Part I.E.11 - the Permittee requested a reduction in the frequency of collection lysimeters video inspections for the collection lysimeters found under the Class A, Class A North (no collection lysimeters as of now have been constructed for the Class A West embankment), and LARW embankments, from annual to once per Permit renewal cycle. The collection lysimeters are installed before the liner is emplaced and are required components of the embankments, Part I.D.10 of the Permit.

Because groundwater protection regulations require that the embankments pose only a minimal risk to the environment and groundwater, low permeability engineered bottom liner systems at the base of the embankments are used, in an effort to minimize any outward movement of contaminants, and provide for the containment of waste. The embankments have a significant reliance on their bottom liner to provide for the containment of waste, and to prevent fluids from gaining access to the surrounding environment during embankment construction and thereafter. The liner system performance is assessed by monitoring the environment surrounding the liner system, by the groundwater monitoring well network, and collection lysimeters. Collection lysimeters at the Clive site are devices designed to monitor the performance of embankment bottom liners. Collection lysimeters provide monitoring of quantity as well as the quality of any leakage through the embankment liner that are used to collect water samples by gravity drainage below the embankments bottom liner, providing an early warning for assessing performance.

The collection lysimeters collect any fluid, by gravity drainage migrating through the liner, and are located so that they acquire data immediately beneath the embankment liner to monitor the performance of isolated areas, and are roughly even distributed around the embankments' bottom liners. Each lysimeter is located near the breakover point, between the top and side slopes. Because the liner is exposed to the environment, and is under relatively small confining stresses during early embankment construction, the liner is more susceptible to the impacts of surface and weather processes at that time. The Permittee believes once the liner system is established and covered, fluid migration patterns through the liner will not change rapidly and can be looked at over a longer time scales. Thus, the frequency of monitoring required to assess liner performance can change with time and construction schedule. If fluid from an embankment is detected in a collection lysimeter, it will provide an early warning of fluid movement through the liner.

The collection lysimeters are roughly 14 feet wide by 28 feet long, and comprised of an arrangement of clay below a HDPE geomembrane below perforated PVC collection pipes embedded in a drainage layer of uniformly graded gravel material overlain by a blanket of sand. The collection lysimeter system incorporates a 20 to 25 foot deep manhole with a stand pipe or riser just beyond the edge of the waste; a transfer pipe connects the collection pipe in the pan to the stand pipe in the manhole. The construction quality assurance collection lysimeter plan establishes materials and construction specifications and quality control and assurance requirements that apply to collection lysimeter construction. The plan addresses responsibility, design, construction criteria, inspections, and testing requirements and frequencies associated with construction of a collection lysimeter. Leachate from the liner would gravity drain to the perforated collection/drainage pipe, then move into the transfer pipe, which transmits the leachate to the collection manhole, where it can be monitored and removed from a standpipe in the manhole. It is the transfer pipe where that the video inspection is conducted. Transfer pipes, connecting the collection lysimeters to the manholes have had some settling since construction leading to isolated low sections where standing water has been observed and sampled. Water that collects in these low sections has been analyzed and determined to be non-contact water, probably condensate, or residual water from placement of liner and embankment construction. The Director is aware of standing water in some transfer pipes.

The inspection of collection lysimeters consist of a visual inspection performed annually that includes visually checking the leachate collection manhole and exposed piping for cracks, leaks, or damage. The standpipe is monitored weekly for the first year after waste is placed over the lysimeter pan, twice per month for the second year, and then monthly thereafter for fluids until the final cover is completed. The annual collection lysimeter inspection now includes the video inspection of the transfer pipe that is accessed from the cleanout port. The video inspection of collection lysimeters is performed to check the transfer pipe for leaking joints, penetrations, cracks, and any damaged section.

The Director verifies information presented in the Permittee collection lysimeter video inspections reports. The 15 videos are reviewed by DRC staff annually to observe the complete condition of each lysimeter drainage pipe. Particular attention is paid to the condition of pipe

joints, the presence of cracks or penetrations in the pipe, shifted or damage sections of pipe, verification of open collection holes at the end of the drain pipe and the condition of each end cap, and the overall condition of each lysimeter.

The Permittee has performed the annual video inspections of embankment lysimeters since 1994, with the initial collection lysimeters installed under the LARW embankment; this has expanded as more collection lysimeters were installed under the Class A and Class A North embankments. These video inspections have demonstrated that the design and construction of the collection lysimeters systems are sturdy and they perform as designed and constructed. Detrimental changes due to embankment construction or waste disposal have been minor or not observed in the collection lysimeter. Based on these observations, the Permittee considers the annual video inspections not necessary, and a frequency of once per renewal cycle sufficient to document the integrity and performance of collection lysimeters.

The collection lysimeters measure any spatial and temporal leaking of fluids from the embankment bottom liner during construction of the embankment and after, field monitoring of the collection lysimeter demonstrated the integrity of the collection lysimeter. Past video inspections of the collection lysimeters have provided a level of confidence in the ability of the collection lysimeters to function as designed. Based on these observations, EnergySolutions believes that annual video inspections are not necessary, and once per renewal cycle is sufficient to document the integrity and performance of collection lysimeters. However, the Director believes that since the collection lysimeters are most susceptible to damage during liner construction and placement of waste, the Permittee should confirm that each new collection lysimeter is not damaged, by undergoing a video inspection within one calendar year following liner construction over the lysimeter pan. Then the collection lysimeters will undergo a video inspection every other year (two year cycle). This video inspection will act as a check on damage due to waste placement above the collection lysimeter. Other monitoring, such as the monitoring for free liquids in the stand pipe will still occur at the current schedule.

The Permittee has also requested that this condition be revised for clarity, and the elimination of unnecessary wording. Deleted text at end of the condition is considered self-evident by the Permittee and is implied in the construction quality assurance collection lysimeter plan, Appendix C of the Permit. The Director agrees with this, and has determined that the changes have no adverse impact on the protection of public health or the environment. This condition has been rewritten to eliminate unnecessary wording.

Revision of Ground Water Protection Levels, Part I.C - the Permittee requested a modification to the Permit, concerning exceptions to the universal GWPLs found in Tables 1A, and 1C of the Permit for nine parameters in eight wells, and to return ten parameters to the baseline monitoring frequency. The chemical constituents in groundwater at Clive are a consequence of natural physical and chemical process as well as any alterations that may have occurred as a consequence of human activity. In assessing groundwater concentrations of monitored parameters it is necessary to establish a baseline, to which any incremental effect of a potential release can be compared. GWPLs are concentration limits for groundwater constituents that are used in the determination of potential contamination in the subsurface environment. As required

in Part I.F.5.c.1.ii of the Permit, laboratory detection limits of all groundwater chemical analyses may not exceed the groundwater protection limit. The effort of adjusting GWPLs to reflect the natural background conditions of the groundwater is on the exception tables in the Permit (tables 1B, 1D, and 1F). To evaluate potential exception to the universal GWPLs for an embankment at the Clive facility, the Permittee gather groundwater samples from the monitoring well network placed strategically around an embankment, and then compares sample analytical results to the GWPL for each monitoring parameter; if a revision of the GWPL is required than the Permittee will perform statistical analysis on the analytical results to support a modify GWPL for the parameter at a well. The Permittee submitted a December 26, 2013 request to the Director to modify GWPLs for nine parameters in eight wells, and to return ten parameters to baseline monitoring frequency bases on modified GWPLs (EnergySolutions, December 26, 2013). Previously, the Director has set the GWPLs as either: the State Ground Water Quality Standards found in UAC R317-6-2, or an alternate concentration limit based on background concentrations that present no significant hazard, whichever is greater (Part I.C.1 and 2 of the Permit). The alternate concentration limit is defined as a background concentration resulting from the sum of the mean concentration plus two times the standard deviation of the concentration. Universal GWPLs are listed in Tables 1A of the Permit for the LARW, and Class A West embankments and evaporation ponds; Table 1B is for 11e.(2), and Table 1E is for mixed waste embankment. However, for those cases where well specific background concentration exceed the groundwater quality standards, exception Tables 1B, 1D, and 1F were created. The Permit requires that groundwater quality in any compliance monitoring well comply with the GWPLs found in Tables 1A, 1C, or 1E of the Permit unless other GWPLs have been designated on a well- and parameter-specific basis in Tables 1B, 1D, or 1F.

The December 26, 2013 request summarized historical water quality data and documented statistical evaluations performed on the water quality data for the wells and parameters in question, using Microsoft Excel and an Excel add-in program, Analyse-it[®] for identifying outliers, normality testing, and to calculate the mean and standard deviation. The Permittee can request that specific parameters in compliance monitoring wells become exception in the Permit, with the submittal of supporting ground water quality data, review by the DRC, and inclusion into Table 1B, 1D, or 1F of the Permit (GWPL exceptions). The Permittee submitted the supporting data in Source and Contamination Assessment Study Plans for monitoring wells listed in Table 1. The DRC reviewed and evaluated the Source and Contamination Assessment Study Plans in a memorandum dated February 10, 2014, see Attachment C (DRC, February 10, 2014). Table 1. Wells, parameters in review, present GWPL, proposed GWPL, and current accelerated monitoring frequency (Probable-Out-of-Compliance or Out-of-Compliance status).

Well Number	Parameter	Current GWPL/ Baseline Monitoring Frequency	Proposed GWPL	Current Accelerated Monitoring Frequency
GW-24	Selenium	0.05 mg/L Annual	0.0534 mg/L	Quarterly-POOC
GW-26	Thallium	0.002 mg/L Annual	0.00255 mg/L	Monthly-OOC
GW-100	Thallium	0.002 mg/L Annual	0.00422 mg/L	Monthly-OOC

GW-103	Selenium	0.05 mg/L Annual	0.0580 mg/L	Monthly-OOC
GW-137	Sum of Radiums	5 pCi/L Annual	5.54 pCi/L	Monthly-OOC
GW-137	Total Uranium	0.03 mg/L Annual	0.0371 mg/L	Monthly-OOC
GW-138	Sum of Radiums	5 pCi/L Annual	5.51 pCi/L	Quarterly-POOC
GW-138	Selenium	0.05 mg/L Annual	0.0695 mg/L	Monthly-OOC
GW-141	Selenium	0.05 mg/L Annual	0.0705 mg/L	Monthly-OOC
P3-95 NECR	Thallium	0.002 mg/L Annual	NA	Quarterly-POOC

A groundwater protection level of 0.058 mg/L was previously established as the GWPL for selenium concentrations in well GW-24 and listed in Table 1B of the Permit. However, selenium concentrations in excess of this GWPL have been observed, with an evident slightly increasing trend that allows the Permittee to propose a modified GWPL. Selenium is naturally distributed throughout the world; however, it is generally present in trace quantities. In the semi-arid western U.S., high selenium concentrations have been associated with high dissolved-solids concentration waters. Selenium contamination can be derived from weathering of natural deposits as well as discharge from various wastes. Additionally, there have been problems observed with sampling results using analytical methods employed in the analysis of selenium due to matrix effects. Embankment leakage does not appear to have caused the elevated concentrations of selenium based on facility groundwater travel times, and no other embankment related contaminants are seen in the well. The relationship between high groundwater levels, dissolved mineral content, and detection limits at the Clive facility are potential sources of the elevated levels; and selenium concentrations have been noted in the shallow lacustrine deposits in the past. Variability in selenium concentration is likely associated with changing concentration due to slow dissolution (due to oxidation of elemental selenium), desorption from the shallow aquifer materials, slow advective transport, well and aquifer characteristics, and/or sample collection. The Source and Contamination Assessment Study Plan indicated that unconsolidated lacustrine sediments at the Clive facility have a higher content of naturally occurring dissolved minerals, and selenium is one of them. Selenium appears to be present in the aquifer matrix and readily soluble, and the Permittee attributed elevated concentration at the site to natural selenium. The Permittee has requested the GWPL be changed to 0.0534 mg/L for selenium concentration values in well GW-24.

A groundwater protection level of 0.002 mg/L, the GWQS, for thallium in well GW-26 was previously established as the GWPL. Thallium concentrations in excess of the GWPL have been observed in well GW-26; however, no trend is evident. Thallium occurs mostly associated with potassium minerals in clays and soils. Thallium is water soluble and consequentially can dissolve/desorbed in groundwater when soils containing thallium become inundated. Additionally, the analytical method used has suffered from matrix effects, and the method has a low detection limit, near the GWPL, affecting the accuracy of the thallium results. Matrix

effects may increasingly lead to erroneous environmental decisions as regulatory limits, or risk-based concentrations of concern for metals move lower toward the limits of analytical detection. In December 2009, the DRC added thallium as a monitoring parameter to the Permit, because the Utah Water Quality Board had recently established a protection level for it. The drinking-water-based universal GWPL for thallium, 0.0002 milligrams per liter (mg/L), is equal to the analytical minimum detection limit (MDL). The combination of background levels of thallium and a universal GWPL established at the limit of detection contribute to the observed thallium exceedances. GW-26 has been impacted by groundwater mounding, and the Permittee attributes elevated concentrations of thallium in well GW-26 to natural thallium that has been mobilized by raising water levels. The Permittee is in the process of restoring hydraulic gradients and groundwater levels to natural levels with a groundwater mound removal and recharge control program (DRC, November 6, 2013; EnergySolutions, July 21, 2014). The Permittee has requested the GWPL be revised to 0.00255 mg/L for thallium concentration values in well GW-26.

A groundwater protection level of 0.002 mg/L, the GWQS, for thallium in well GW-100 was previously established. Thallium concentrations in excess of the GWPL, with a slight increasing trend are evident. In December 2009, the DRC added thallium as a monitoring parameter to the Permit, because the Utah Water Quality Board had recently established a protection level for it. The drinking-water-based universal GWPL for thallium, 0.0002 mg/L, is equal to the analytical MDL. The combination of background levels of thallium and a universal GWPL established at the limit of detection contribute to the observed thallium exceedances. Additionally, the analytical method appears to suffer from matrix effects, because of the low detection limit, near the GWPL. Matrix effects may increasingly lead to erroneous environmental decisions as regulatory limits, or risk-based concentrations of concern for metals move lower toward the limits of analytical detection. Embankment leakage does not appear to have caused the elevated concentrations of thallium based on facility groundwater travel times. The Permittee has requested the GWPL be changed to 0.0042 mg/L for thallium concentration values in well GW-100. Thallium occurs mostly associated with Potassium minerals in clays and soils. Thallium is water soluble and consequentially it can spread with groundwater when soils containing thallium are inundated.

A groundwater protection level of 0.05 mg/L of selenium, the GWQS, in well GW-103 was previously established as the GWPL. Selenium concentration is excess of the GWPL, with a slight increasing trend is evident in well GW-103. Both natural processes and anthropogenic sources cause high selenium concentrations in sediments and groundwater. Approximately, 4 percent of the wells at the Clive facility have elevated natural selenium concentrations, and are listed as GWPL exceptions. This area has had groundwater level variation due to recharge from conveyance ditches, which has been addressed. Embankment leakage does not appear to have caused the elevated concentrations of selenium, as no waste has been placed hydraulically up gradient of the monitoring well. The Permittee believes the increasing selenium concentration is likely due to dissolution/desorption of new aquifer material due to changing groundwater elevations. The Permittee has requested the GWPL be changed to 0.058 mg/L for selenium concentration values in well GW-103.

A groundwater protection level of 5 pCi/L, the GWQS, in well GW-137 was previously established for Sum of Radiums as the GWPL. Sum of Radiums activity is in excess of the GWPL, with an essentially flat trend in well GW-137. Radium is a trace element in most rocks and sediments, its presence being due principally to the radioactive decay of uranium-238 and thorium-232. Radium-226 (daughter radionuclide) is a disintegration product of uranium-238 (parent radionuclide); and radium-228 (daughter radionuclide) is a disintegration product of thorium-232 (parent radionuclide). Radium is naturally occurring in sediments at the Clive site and the mobility of radium in the shallow aquifer, natural or introduced from an embankment, is a function of the local subsurface geology and geochemistry. The natural accumulation of radium in the sediments at the Clive site could represent previous precipitation or sorption of uranium and thorium species from groundwater or lake water. Some of the most permeable shallow sediments at the Clive site are found in the area of GW-137 (northern CAN embankment area). Embankment leakage does not appear to have caused the elevated activity of Sum of Radiums based on facility groundwater travel times. The Permittee believes the increasing Sum of Radiums activity is likely due to dissolution/desorption of new aquifer material due to natural changing groundwater elevations. The Permittee has requested the GWPL be changed to 5.54 pCi/L for Sum of Radiums activity values in well GW-137.

A groundwater protection level of 0.0371 mg/L in well GW-137 was previously established for Total Uranium as the GWPL and listed in Table 1B of the Permit. The groundwater flow direction and velocities indicate the embankments are not the source of uranium. A review of uranium data for monitoring well GW-137 (data from 11/5/2009 through 9/10/2013) indicates a slight increasing trend. Based on its review, the Permittee believes the changing uranium concentrations in GW-137 are due to natural groundwater level fluctuations. Other wells around GW-137 have been proposed for exception status for various radioactive elements. It appears appropriate to adjust the GWPL for uranium in monitoring well GW-137. The Permittee has requested the GWPL be changed to 0.0371 mg/L for Total Uranium as the concentration values in well GW-137.

A groundwater protection level of 5 pCi/L, the GWQS, in well GW-138 was previously established for Sum of Radiums as the GWPL. Sum of Radiums activity is in excess of the GWPL in well GW-138. Data from 11/5/2009 through 3/18/2013 show an essentially flat trend for Sum of Radiums activity values. Embankment leakage does not appear to have caused the elevated activity of Sum of Radiums based on facility groundwater travel times. The Permittee believes the increasing Sum of Radiums activity is likely due to dissolution/desorption of new aquifer material due to changing groundwater elevations. The Permittee has requested the GWPL be changed to 5.51 pCi/L for the Sum of Radiums activity values in well GW-138.

A groundwater protection level of 0.05 mg/L of selenium, the GWQS, in well GW-138 was previously established as the GWPL. Selenium concentration is in excess of the GWPL, with an essentially flat trend evident in well GW-138. Both natural processes and anthropogenic sources cause high selenium concentrations in sediments and ground water. Approximately, 4 percent of the wells at the Clive facility have elevated natural selenium concentrations, and are listed as a GWPL exception. Embankment leakage does not appear to have caused the elevated concentrations of selenium, as no waste has been placed hydraulically up gradient of the

monitoring well. The Permittee believes the increasing selenium concentration is likely due to dissolution/desorption of new aquifer material due to changing groundwater elevations. The Permittee has requested the GWPL be changed to 0.0695 mg/L for selenium concentration values in well GW-138.

A groundwater protection level of 0.05 mg/L, the GWQS, in well GW-141 was previously established for selenium as the GWPL. Selenium concentrations are in excess of the GWPL, with an essentially flat trend; however, a large number of the samples were above the GWQS. Embankment leakage does not appear to have caused the elevated concentration of selenium, as calculated groundwater travel time to well GW-141 is too great. The elevated selenium concentrations are likely due to natural concentrations. The Permittee has requested the GWPL be changed to 0.0705 mg/L for selenium concentration values in well GW-141.

The DRC review of the Permittee's Source and Assessment Plans for the OOC parameters/wells is provided in Appendix C of this SOB and appears to confirm the Permittee's evaluation, which supports the conclusion that groundwater exceedances are Background and/or laboratory related. The Director notes that the Permittee had submitted the required Source and Contamination assessment on all parameters in out-of-compliance status, as required by Part I.G.3.b of the Permit, and that monitoring wells GW-137, GW-138, and GW-141 were completed in the summer of 2009 and background-based GWPL exceptions have not yet been established for them; however, these new wells replaced existing wells, with one of the existing well listed in the exceptions tables (e.g. GW-113, total uranium and Ra-226 + Ra-228). The Director concurs that the sources of the exceedances are most likely related to background geochemistry and/or are due to analytical uncertainty in the data results. The Director's findings are found in Appendix C, a memorandum dated February 10, 2014. Listed below are the proposed GWPL exceptions recommended for inclusion in this permit modification.

Well ID	Parameter	Current GWPL (mg/L)	Proposed GWPL Exception (mg/L)	Embankment monitoring
GW-24	Selenium	0.058	0.0634	LLRW,
GW-26	Thallium	0.002	0.00255	11e.(2)
GW-100	Thallium	0.002	0.00422	Class A
GW-103	Selenium	0.05	0.0580	LARW
GW-137	Ra-226+Ra-228	5 pCi/L	5.54 pC/L	Class A North
	Total Uranium	0.03	0.0371	Class A North
GW-138	Ra-226 +Ra-228	5 pCi/L	5.51 pC/L	Class A North
	Selenium	0.05	0.0695	Class A North
GW-141	Selenium	0.05	0.0705	Class A North

Because GW-24, GW-103, GW-138, and GW-141 and GW-26, and GW-100 are currently in an accelerated monitoring status for selenium and thallium, respectively, and these metals are proposed parameters to be removed from compliance monitoring an exception will be made for these wells and parameters so that monitoring will continue on an annual basis. The purpose of these exceptions is so monitoring can continue, on a parameter and well basis, at a schedule that

is more reasonable than a renewal cycle. This will allow the Director the opportunity to observe any additional changes in a reasonable time. If these parameters remain below the proposed GWPLs then the Director will consider removing them from the exceptions tables at the next Permit renewal. Table 1B, and Table 1D Ground Water Protection Level Exception for the LARW, Class A West, and Evaporation Pond Wells, and 11e.(2) Wells, respectively, are updated to include these wells

Monitoring Requirements and Frequency, Water Level Measurements, Part I.F.5.a - the Permittee has requested to change the frequency of groundwater level measurements from monthly to quarterly. The Permittee's justification for the request is that groundwater elevations have been extensively documented at the Clive facility for more than 20 years; the magnitude and variability of hydraulic gradients are well characterized, as is the direction and variability of groundwater flow; groundwater flow is relatively slow, and groundwater elevation at each compliance monitoring well does not typically change significantly from month-to-month. Therefore, the Permittee feels that quarterly frequency for groundwater elevation measurements is adequate to maintain and document compliance with the gradient performance standards of the Permit. Obtaining and understanding water-level data are an essential part of the Clive facility groundwater monitoring program. Groundwater levels are used to determine hydraulic head distribution, which in turn are used to assess groundwater hydraulic gradients, which are used in flow direction and velocity determinations. Groundwater levels are not static at Clive, and can change in response to a variety of factors such as recharge for precipitation, infiltration of standing water, and evapotranspiration. When referenced to time, water-level measurements reveal changes in the groundwater flow regimes brought about by Clive operations. Groundwater mounding at the Clive facility has modified horizontal and vertical gradients and thus alter groundwater flow directions, and is indicated in the measured groundwater levels. The Permittee provided additional information regarding this request in a letter dated August 4, 2014 (EnergySolutions, August 4, 2014). Groundwater flow is relatively slow, and groundwater elevations at each compliance monitoring well does not typically change significantly from month-to-month. For these reasons, a quarterly frequency for groundwater elevation measurements at most wells is adequate to maintain and document compliance with the gradient performance standard. The Director has determined that quarterly groundwater elevation measurements are excitable with the follow conditions:

- For each compliance monitoring well listed in Parts I.F.1.a, I.F.1.b, and I.F.d of this Permit, quarterly water level measurement will be compared to the measurement from the previous quarter. If the difference between measurements is greater than 0.4 feet, the Permittee shall notify the Director within 15 days of discovery and shall immediately increase the water level measurement frequency to monthly for each well meeting this condition.
 - For well pairs listed I Part IH.2.c, if an upward vertical gradient (as defined in Part I.E.26) is observed in any water level data, the Permittee shall notify the Director within 30 days of the discovery and shall immediately increase the water level measurement to monthly at well pairs meeting the upward gradient condition.
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- Return to quarterly water level measurement frequency will be approved by the Director.
- The frequency of water level measurements at compliance monitoring wells GW-19A, GW-19B, GW-60, GW-63, and PZ-1 will remain monthly.

The Director has determined that this modification to the Permit has no detrimental consequences to the public or environment.

Monitoring Requirements and Frequency, Ground Water and Pore Water Quality Sampling and Analysis, Analysis Parameters, Part I.F.5.c.2.ii - the Permittee has requested that general inorganic, and general radiological parameters listed under laboratory parameters be deleted. The Permittee's justification is that shallow groundwater at the Clive facility has been characterized extensively for more than 20 years, continued sampling and analysis for general inorganic parameters on an annual basis is not required to demonstrate compliance with Utah groundwater quality protection regulations. Additional data will not add appreciably to the characterization of the hydrogeology of the facility. This justification also is applicable to potassium-40 and gross beta analyses. In addition, gross beta is not necessary, because the groundwater monitoring program includes the individual beta-emitters carbon-14, iodine-129, strontium-90, technetium-99, and tritium. Water quality is a result of the natural physical and chemical state of the water as well as any alterations that may have occurred. The general inorganic and radiologic parameters provided information about the entire site, not specific to an embankment. These parameters represent the quality of the groundwater site wide and are evaluated to look for any changes that would alert the DRC to a potential problem. The Director has determined that this modification to the Permit would have detrimental consequences to the public or environment; therefore it stays as is.

Monitoring Requirements and Frequency, Ground Water and Pore Water Quality Sampling and Analysis, Arsenic and Molybdenum, Part I.F.5.c.3 - the Permittee has requested that the list of parameters (currently arsenic and molybdenum) that are sampled and analyzed once per permit-renewal cycle be expanded and that Permit Renewal Parameters be the title of this condition. The Permittee has requested these parameters added to the list be removed as compliance parameters based on shallow groundwater at the Clive facility being characterized extensively for more than 20 years, continued sampling and analysis for general inorganic and organic parameters on an annual basis is not required to demonstrate compliance with Utah groundwater quality protection regulations, and additional data do not add appreciably to the characterization of the hydrogeology of the facility. Dissolved metals generally have natural elevated concentration levels in the groundwater at the Clive site, and have caused problems with analytical methods making them poor indicators of embankment leakage. As a best management practice, the Permittee will sample for the listed parameters for Permit renewal, and the results will be compared to the applicable site statistics summarized in the Comprehensive Groundwater Quality Evaluation Report to evaluate potential changes in water chemistry. The comparison will be documented in the Comprehensive Groundwater Quality Evaluation Report submitted as part of the Permit renewal process. Sampling will be performed prior to Permit renewal, and results

will be reported in the Comprehensive Groundwater Quality Evaluation Report. The Director has determined that the condition can be retitled "Permit Renewal Parameters." Parameters that were removed as compliance parameters were added to this conditions. The Director has determined that this modification to the Permit has no detrimental consequences to the public or environment.

Proposed Minor Permit Changes

Background Quality from Existing Monitoring Wells, Part I.B.1 - the Permittee has requested that the date of the groundwater quality samples that have been collected be updated. The Director has determined the Permit can be updated to reflect the current sampling without any detrimental consequences to the public or environment. The Permit is updated to indicate samples have been collected through December 2011.

Ground Water Protection Levels, LARW cell, and Class A West cell, Part I.C.1 - the Permittee has requested that this condition be revised for clarity, consistency, and the elimination of unnecessary wording. The Director agrees with this, and has determined that the changes have no adverse impact on the protection of public health or the environment. This condition is rewritten for clarity, and the elimination of unnecessary wording.

Ground Water Protection Levels, 11e(2) cell, Part I.C.2 - the Permittee has requested that this condition be revised for clarity, consistency, and elimination of unnecessary wording. The Director agrees with this, and has determined that the changes have no adverse impact on the protection of public health or the environment. This condition is rewritten for clarity, and the elimination of unnecessary wording.

Ground Water Protection Levels for Radiologic Parameters, Mixed Waste cell, Part I.C.3 - the Permittee has requested that this condition be revised for clarity, consistency, and elimination of unnecessary wording. The Director agrees with this, and has determined that the change has no adverse impact on the protection of public health or the environment. This condition is rewritten for clarity, and the elimination of unnecessary wording.

LARW Cell Engineering Design and Specifications, Part I.D.2 - the Permittee requested the removal of LARW engineering design and specifications from the Permit, but to leave, for reference, Table 2, the list of approved LARW cell engineering design documents. Final cover construction over the LARW cell was completed in October 2005. Thus, the need for BAT design and construction standards is unnecessary, and/or no longer needed. The DRC considers it appropriate to list the cover system as a reference for cover system repairs if needed in the future. However, cover system details are also included in the engineering design documents. Thus, the Director has determined the text can be removed from this condition, including the cover system description, without an adverse impact on the protection of public health or the environment. Text, including the cover system description, is removed from this condition.

LARW Cell Engineering Design and Specifications, Part I.D.2, Table 2A - the Permittee has requested the removal of an erogenous design drawing that has been updated and listed

elsewhere in the table. The Director has determined that this is appropriate and Drawing 03046 VO1, Rev. 0 has been removed.

LARW Cell Engineering Design and Specifications, Part I.D.3, Table 2B - the Permittee has requested that design drawings for the 11e.(2) cell be updated with the most recent versions. The Director does not have the drawings referenced in the request and has determined not to allow the proposed changes. The Permittee can submit the drawing for approval, or if the drawings have been approved submit the approval letters and the drawings.

LARW Cell Engineering Design and Specifications, Part I.D.3.c - the Permittee requested information dealing with disposal embankment construction, but not related to liner construction, be removed from this condition. This information is included in the LLRW and 11e.(2) Construction Quality Assurance/Quality Control (CQA/QC) manual. The CQA/QC manual is a document that describes CQA requirements for embankment construction and is referenced in this condition. The text in question is removed from this condition with no adverse impact on the protection of public health or the environment.

Final Authorized Class A West Cell Engineering Design and Specification, Part I.D.4 - the Permittee has requested a minor change to the text of this condition, using the abbreviation/acronym for Construction Quality Assurance/Quality Control (CQA/QC) in the text, which is spelled out earlier in the Permit and removal of reference to the Radioactive Material License. The CQA/QC manual has been in use for an extensive period of time at the Clive facility, a reference to the license condition requiring the CQA/QC manual is not necessary to identify it. The Director has determined that the requested changes are grammatically correct and adds to clarity, and does not affect the protection of public health or the environment.

Final Authorized Class A West Cell Engineering Design and Specification, Cover System, Part I.D.4.a - the Permittee has requested that the Class A West embankments cover system be changed to a proposed evapotranspirative (ET) cover system. The change in cover design is currently being evaluated and until the Director approves the ET cover system, no changes can be made. No changes to the cover system are proposed by the Director at this time, the currently approved cover system will remain in the Permit. Only a minor change is made in the text for clarity that does not affect the protection of public health or the environment.

Final Authorized Class A West Cell Engineering Design and Specification, Part I.D.4.b - the Permittee has requested that the waste layer final thickness be corrected to the final thickness used in the engineering drawings. The waste layer is not to exceed a final thickness of 74.3 feet. The Director has determined that this change has no adverse impact on the protection of public health or the environment.

Final Authorized Class A West Cell Engineering Design and Specification, Part I.D.4.c - the Permittee has requested that text be removed from this condition, where the wording is redundant with the LLRW and 11e.(2) CQA/QC manual. The Director has determined that the

text is found in the LLRW and 11e.(2) CQA/QC manual, and can be removed from this condition, without an adverse impact on the protection of public health or the environment.

Final Authorized Class A West Cell Engineering Design and Specification, Table 2C: Approved Class A West Cell Engineering Design Drawings, Part I.D.4, Table 2C - the Permittee has requested the correction of dates, and the updating of drawings. The Permittee is also requesting the removal of some drawings from this Table. The requested updated drawings are for the incorporation of the proposed evapotranspiration cover design. Since the new cover is not approved, the current design drawing will remain in the Permit. However, the drawings the Permittee is requesting to remove are also found in Table 5 of the Permit; therefore, they have been removed from Table 2C.

Approved Class A and Class A North Cell Engineering Design Drawings, Table 2C1 - the approved engineering design drawings for the Class A and Class A North embankments have been added back in the Permit, as Table 2C1, because the Permittee is continuing to operate the Class A West embankment as two separate embankments. If the Class A West embankment were to close today, it would be closed as two separate embankments. These drawings were removed from the Permit, with the approval of the Class A West embankment, with the expectation of the start of the Class A West embankment construction.

Disposal Cell Location Restrictions, Part I.D. 5, Table 3 - the Permittee has requested that a minor typographic error be corrected in the Title of the table (no space between the words west and disposal). The Director has determined that the minor typographic error can be corrected in this condition, without an adverse impact on the protection of public health or the environment. The minor typographic error has been removed.

Definition of Class A LARW waste, Part I.D.6 - the Permittee has requested a change to the wording of this condition, to reduce wordiness and provide clarity. Also, the referenced UAC R313-15-1008 used in this condition is for the definition of Byproduct Materials and should be UAC R313-15-1009, the Classification and Characteristic of Low Level Radioactive Waste. The Director has determined that change to the text of this condition will provide clarity and has no adverse impact on the protection of public health or the environment. Changes are made to the text of this condition.

Definitions of Mobile Waste, Part I.D.7 - the Permittee requested the removal of the definition of mobile waste from the Permit. In the past there were restriction for the mobile wastes at the Clive Facility, but these restrictions were showed to not be necessary. There are no disposal restrictions, special provisions, or requirements for these particular radionuclides in the Class A West embankment. The Director has determined that removal of this condition will have no adverse impact on the protection of public health or the environment. This condition is removed.

Collection Lysimeters for Future Construction at the Class A West Cell, Part I.D.10 - the Permittee has proposed a change in this condition to remove language that is redundant with Appendix C - Construction Quality Assurance Plan for Collection Lysimeter Construction and

Collection Lysimeter Operation, Maintenance and Closure Plan. The redundancy has been removed and the condition has been reworded and edited for clarity. The Director has determined that change to the text of this condition has no adverse impact on the protection of public health or the environment.

Future Modification of Disposal Cell Engineering Design or Specifications, Part I.D11 - the Permittee has requested that text be simplified and reorganized for clarity. The Director has determined that change to the text of this condition will provide clarity and has no adverse impact on the protection of public health or the environment.

Final Authorized Engineer Design and Specifications for Waste and Wastewater Related Facilities, Part I.D.12, Table 5 - the Permittee has requested that the design drawings in the table be updated with the correct revision number and date. The following engineering design drawings have been modified to depict the current design and construction of Waste/Wastewater Related Facilities:

Related Facility	Drawing No	Revision Date	Subject / Title of Drawing
1995 Evaporation Pond	08007-C01, Rev. 2	Oct. 19, 2011	1995 Evaporation Pond HDPE Repairs, New 60 mil HDPE Liner
Intermodal Unloading Facility	9705-2, Rev. B	Nov. 20, 1998	Cross Section Drawings
Shredder Facility	05056-L2, Rev. 2	Oct. 25, 2006	Shredder Facility; Containment Pad Water Management Layout Plan
	05056-C1, Rev. 10	Oct. 25, 2006	Shredding Facility; Operating Pad Layout (As-Built)
	05056-C6, Rev. 4	Oct. 25, 2006	Shredding Facility; Operating Pad – Sections and Details (As-Built)
East Side Drainage and Gray Water	06007-C1, Rev. 6	July 23, 2012	East Side Drainage, General Site Plan
	06007-C2, Rev. 6	7/23/12	East Side Drainage, Storm Water Drainage Plan
	06007-V1, Rev. 4	7/23/12	East Side Drainage, Storm Water and Waste Flow Diagram
11e.(2) Disposal Cell Temporary Diversion Ditch	9420-7D, Rev. 1	10/15/09	Lift Section Details
DU Storage Building	10008 C01, rev. 1	11/1/10	Site Ground Plan
LLRW Operations Building	07015-P101 (redlined)	Feb. 7, 2008	Plumbing Plan
	07015-V1, Rev. 2	March 1, 2010	Holding Tank Sections and Details

The Permittee has also requested to remove engineering design and specification drawings from the Permit. The Permittee's justification is that the drawings proposed to be removed do not contain information or features applicable to BAT requirements. However, Table 5 is the only place engineering drawings are listed. The DRC references the various drawings in its regulation of the Clive facility. The Director has determined that the table will be updated, and all drawings will remain in the Permit.

Waste Restrictions, Part I.E.1.a - the Permittee has requested the removal of this waste restriction condition, dealing with the volume of Class A Waste allowed in the Class A West and Mixed Waste embankments. This condition is also found in Radioactive Material License Condition 9.E and was incorporated into the Permit by reference to emphasize the amount of waste volume that can be disposed of at the Clive facility. No change will be made to the Permit.

Waste Restrictions, Part I.E.1.b - the Permittee has requested that a minor grammatical error be fixed. The Director has determined that the verb form is correct and this change has been made. This does not change the meaning of the conditions and does not affect the protection of the public or the environment.

Waste Restrictions, Part I.E.1.d - the Permittee has requested that minor typographical error be corrected, and the referenced UAC R313-15-1008, definition of Byproduct Materials, be replaced with UAC R313-15-1009, Classification and Characteristic of Low Level Radioactive Waste, the correct reference. The Director determined that this is the correct reference and the Permit has been changed accordingly.

Prohibited Wastes, Part I.E.2 - the Permittee has requested the removal of text in this section and correction of minor typographical errors, to make the meaning of the text clearer. This minor typographical correction has been made to the text for clarification. The Permittee has requested that the reference to the Procedure for Certification of 11e.(2) Waste be removed and Appendix E of this Permit be removed. The changes have been made accordingly.

Prohibited Wastes, Part I.E.2, Table 6 - the Permittee has requested that a synonym for 2-Butanone be added to the Table 6. The Director has determined this does not change the meaning of the condition.

Failure to construct as per Approval, Part I.E.3 - the Permittee has request the removal of this condition from the Permit, indicating the requirement is self-evident. The Director chooses to leave this condition at this time as a reminder of the importance of construction to approved design.

Unsaturated Soil Moisture Content Monitoring, Part I.E.4 - the Permittee has requested the removal of text in this condition. The requirement to develop the Cover Test Cell and collect data has been in place for many years, with the objective of demonstrating the effectiveness of the approved cover system. Deficiencies have been found that the DRC and the Permittee are working to resolve. However, the Director has chosen to leave this condition as is until a resolution is reached.

Allowable Heavy Metal Waste Concentration Limits, Part I.E.5 - the Permittee has requested the removal of this condition from the Permit stating that it conflicts with the requirements of Part I.E.2.a and the requirement is not needed. For the heavy metals listed, infiltration and contaminant transport models provided by Permittee has shown that none of these metals cause nearby groundwater monitoring wells to exceed their respective GWQS in less than 200 years. The Director agrees and the condition has been removed it from the Permit. Part I.E.5 of the Permit has been set to reserved.

Open Cell Time Limitation, Part I.E.6 - the Permittee has ask to suspend the open-cell time limitation for non-contaminated disposal areas, i.e., the large component area and containerized waste facilities (CWF); the time limitation would only apply when bulk LLRW (waste) is placed on the lift area. The bulk waste has greater moisture retention properties then containerized waste and thus contamination is considerably more mobile in the bulk waste. The CFW and large component areas are not approved for bulk waste management; radiological contamination associated with CFW and large component wastes is contained within the liner, containers, or the large components themselves. These areas are operated as non-contaminated restricted areas, and are surveyed to confirm this. The open-cell time limitation is based on a water balance model using a bulk waste profile and is not applicable to the CFW and large component areas. The Permittee is proposing that in the CFW and large component areas the time limitation would apply when bulk waste is first placed on the lift area. The Permittee provides no demonstration that advice impacts at the site will not occur during the additional time the Class A West embankment is open. The Director is concerned that this request would provide for an unlimited open cell time.

The Permittee request to clarify that the time limitation apply only to the Class A West disposal cell. The open cell time limit specifically references the LARW and Class A West cell designs, and the final cover referenced in this condition is for the LARW and Class A West cells, not the 11e.(2) cell.

Additionally, the Permittee is requesting that the time limitation be extended for bulk waste, with prior Director approval, by use of low permeability clay, HDPE, or other engineering methods to discourage moisture infiltration to emplaced waste. However the Permittee has not provided any detailed justification or detailed engineering control specifications for the Director to reviews to extend the lime limitation.

The Permittee has also requested that a description of the final cover be removed from this condition.

The Director has determined that the CFW and large component areas are not excluded for the open cell time limit, which was intended for bulk waste; the Director sees no justification to change this condition to allow the time limitation to be extended. A more detailed description of the final cover is provided in Part I.D.2 of this Permit and does not need to be repeated here.

Additionally, in an October 8, 2013 letter the Permittee requested an extension to the open cell time limitation for lift areas in the northern Class A embankment (approximately 644,002 square

feet) to extent the open cell time limitation to 25 years after the initial placement of waste in these lift areas (EnergySolutions, October 8, 2013). The lift areas had initial waste placement dates ranging from July 26, 2004 to November 18, 2008 and the majority of the area had interim rad cover by late 2010. Open cell modeling had established that for some instances, based on precipitation amounts, the embankment could remain open for 25 years (Whetstone Associated, Inc., 2011). However, the DRC chose to use a more conservative approach and set an 18 year open-cell-time limit. The DRC objective was to not invalidating previous closed cell infiltration and transport modeling. The Permittee provided data for the Clive site, which showed actual averaged precipitation below the open cell modeling precipitation amounts used in setting the 18 year open-cell-time limit. This indicates that the volume of water entering the open embankment is small, which is reasonable given the arid environment. The DRC evaluated the data provided in the October 8, 2013 letter in a memorandum dated December 3, 2013 (DRC, December 3, 2013). The DRC was concerned about future above normal precipitation that could invalidate this analysis and will consider engineering controls as a way to stop infiltration of water into the waste if precipitation trends increased. After consideration of the information provided in the October 8, 2013 request and in concert with existing operation procedures in use at the Clive site, the Director concluded the lift areas could remain open for 25 years if this precipitation trend was to continue (DRC, June 5, 2014). This condition was modifier to indicate this extension exists.

General Stormwater Management Requirements, Part I.E.7 - the Permittee has requested the deletion and modification of some text in this condition, indicating the removed texts is self-evident and/or repetitive, and to add the Rotary Dump as a facility where contact stormwater can be used for dust suppression. Part I.E.7 of the Permit specifies the requirements and priorities for managing and disposing of stormwater, and requires the removal of stormwater in a specified sequence. The stormwater management requirements have been reviewed and clarified in cooperation with the Permittee in Appendix J, BAT Performance Monitoring Plan. The text can be removed without reducing the protection of public health or the environment.

The Rotary Dump Facility is designed to provide for drainage of any water on its concrete pads (bulk waste is placed on the dump floor concrete pad) to its catchbasin, where a pump connected to a pipeline conveys water to Northwest Corner Pond or Alternate Wastewater Management Area. Bulk waste at the Rotary Dump Facility requires water for dust suppression, using contact stormwater will reduce the volume of non-contact water needed for this purpose. Once water contacts waste on the concrete pad of the Rotary Dump Facility, even non-contact water, it becomes contact water, and the system is designed to handle contact water. The facility is inspected daily to ensure free drainage to the catchbasin. The use of contact storm water for dust suppression is not expected to cause contamination of rail equipment; and each constituent of the rail haulage equipment is surveyed to confirm this prior to release. The Rotary Dump Facility is designed, operated, and inspected to minimize the potential for contact water discharge to groundwater.

The Director has reasoned that the proposed changes do not harm the protection of groundwater. The Director has also concluded that the request to use contact stormwater for dust control at the

Rotary Dump Facility seems reasonable and poses no additional concerns to facility workers, or the environment. Groundwater protection is not compromised by allowing the use of contact stormwater for dust control, given the facility is designed and built for contact water and there are inspection requirements to verify free drainage conditions.

11e.(2) Waste Management Requirements, Part I.E.8 - the Permittee requested that this condition be combine with Part I.E.10. The Director has determined that the proposed changes do not harm the protection of groundwater or public health. Part I.E.8 of the Permit has been set to reserved.

LLRW Waste Management Performance Requirements, Part I.E.10 - the Permittee has requested that 11e.(2) be added to the title of this condition as the 11e.(2) waste management performance requirements are similar to LLRW. The Director has determined that this condition is applicable to 11e.(2) waste and the title of this condition has been changed to LLRW and 11e.(2) Waste Management Performance Requirements. The proposed change does not harm the protection of groundwater or public health.

LLRW Waste Management Performance Requirements, Contaminant Containment and Spill Prevention, Part I.E.10.a - the Permittee requested the removal of text from this condition because it is self-evident and/or repetitious. Similar text in this condition is found in Appendix J of the Permit, BAT Monitoring Plan, but not all of it is specifically applied to 11e.(2) waste. The Director has determined that the condition should remain unchanged so as to do no harm the protection of groundwater or public health.

LLRW Waste Management Performance Requirements, Containerized Waste Storage Pad and Other Waste Storage Area, Part I.E.10.b - the Permittee requested the removal of text and some minor typographic errors from this condition, because this text is self-evident and/or repetitious. Some text in this condition is the result of past situation or misunderstanding concerning waste management at the facility and is thus repetitious. The removed text from this condition is repeated in Appendix J of the Permit, BAT Performance Monitoring Plan and does not need to be repeated here.

LLRW Waste Management Performance Requirements, Prohibition and Restrictions for Dry Active Waste (DAW) Storage, Part I.E.10.c - the Permittee requested the removal of this condition because it is repetitive with the Radioactive Material License. The Director disagrees and points out that the text found in the condition has the requirement that DAW must be covered by the end of the working day, the license has no such requirement. Therefore, the Permit condition will remain as is.

LLRW Waste Management Performance Requirements, Intermodal Unloading Facility, Part I.E.10.d - the Permittee has requested a minor change to this condition that reflect the current Appendix J of the Permit, BAT Performance Monitoring Plan. This minor typographical correction is made to the text for clarification. The Director has determined that the proposed changes do not harm the protection of groundwater or public health.

LLRW Waste Management Performance Requirements, Containerized Waste Management, Part I.E.10.e - the Permittee has requested a change to this condition, where the title more clearly reflects the purpose of the condition. Additionally, the Railcar Rollover Facility has been removed from the site and was removed from the Permit in 2013 (SOB, 2013). So the Railcar Rollover Facility has been removed from this condition. The Director has determined that the proposed changes do not harm the protection of groundwater or public health.

LLRW Waste Management Performance Requirements, Bulk Waste Management, Part I.E.10.f - the Permittee requested minor corrections to this condition, to make the meaning of the text clearer and to remove an incorrect facility (East Truck Unloading facility).

Stormwater Drainage Works Performance Criteria, Seepage Control to Prevent Ground Water Mounding, Part I.E.12 – the Permittee has requested to modify text to state a standard hydraulic gradient performance standards listed in Parts I.E.25 and I.E.26. The changes would replace text that they believe contradicts other parts of the Permit. This condition is not related to the performance standard, but the Director not wanting the alteration of natural groundwater hydraulic gradients at the site. Therefore, the Permit condition will remain as is.

Stormwater Drainage Works Performance Criteria, Temporary Stormwater Drainage Works, Part I.E.12.c - the Permittee has requested to modify text to remove unnecessary wording. Some text has been removed, because it is was deemed unnecessary. The Director has determined that the proposed changes do not harm the protection of groundwater or public health.

Wastewater Management Requirements, 1995, 1997, 2000, Mixed Waste and Northwest Corner Evaporation Ponds, Part I.E.14.a - the Permittee has requested to modify text in this section that is self-evident. Unnecessary text is removed. The Director has determined that the proposed changes do not harm the protection of groundwater or public health.

Wastewater Management Requirements, Leak Detection System Pumping and Monitoring Equipment Continuous Operation, Part I.E.14.a.1 - the Permittee has requested to modify text in this section that is self-evident and/or repeats BAT requirements listed in Appendix J. The Director has determined that the proposed changes do not harm the protection of groundwater or public health.

Wastewater Management Requirements, Maximum Allowable Daily Leakage Volume, Part I.E.14.a.2 - the Permittee has requested to modify text in this section stating that removed text is self-evident and/or repeats BAT requirements listed in Appendix J. The Director has determined that the proposed changes do not harm the protection of groundwater or public health.

Filter Construction Settlement Performance Standards, Part I.E.15 - the Permittee has requested that this condition be deleted. The Permittee points out that the LLRW and 11e.(2) CQA/QC manual is referenced in cell design conditions and requires settlement monitoring for waste before the radon barrier is built, and that the radon barrier meets 95% compaction. The LLRW and 11e.(2) CQA/QC Manual is a document that describes engineering requirements that apply to the Class A West and 11e.(2) embankments to provide assurance that the construction of an

embankment is performed in compliance with approved design criteria, engineering drawings, specifications, and that certain controls will be implemented during construction of an embankment. These controls are in the form of inspections, sampling, testing, survey controls, records, etc. All of these activities require a plan of sequences, frequencies, and record keeping. This condition has been changed to indicate the cover system filter shall meet the requirements in the CQA/QC Manual.

Mixed Waste Cell BAT Performance and Best Management Practice Standards, Part I.E.16 - the Permittee has requested that this condition include all operations that occur at the Mixed Waste Facility under the stated-issued Part B Permit, UTD98258898, as amended, for Mixed Waste operations. Mixed Waste Cell has been changed to Mixed Waste Facility to be more inclusive. The Director has determined that the proposed changes do not harm the protection of groundwater or public health.

Management of 2000 Evaporation Pond Waste Material, Part I.E.19 - the Permittee has requested that the text Mixed Waste Cell be added to this condition, and some minor text revision for clarity. The Permittee is required to dispose of any materials produced from or associated with the evaporation ponds be treated as contaminated. The condition has been made more generic, to include all ponds that produce waste that needs to be disposed. The Director has determined that the proposed changes do not harm the protection of groundwater or public health.

Shredder Facility, Part I.E.20 - the Permittee has requested a modification of text in this condition that repeats requirements found in Appendix J, BAT Performance Monitoring Plan. To achieve the maximum reduction of pollutants achievable the Permit specifies that Best Available Technology be used and that all facilities be operated according to Best Management Practices. The requirements of this condition are duplicated in Appendix J of the Permit. The condition is changed to indicate that the shredder facility is operated and maintained in accordance with the currently approved Appendix J of the Permit.

Rotary Dump Facility, Part I.E.21 - the Permittee has requested a modification of text in this condition that repeats requirements found in Appendix J, BAT Performance Monitoring Plan. To achieve the maximum reduction of pollutants achievable the Permit specifies that Best Available Technology be used and that all facilities be operated according to Best Management Practices. The requirements of this condition are duplicated in Appendix J of the Permit. The condition is changed to indicate that the rotary dump facility is operated and maintained in accordance with the currently approved Appendix J of the Permit.

Intermodal Container Wash Building, Part I.E.22 - the Permittee has requested a modification of text in this condition that repeats requirements found in Appendix J, BAT Performance Monitoring Plan. To achieve the maximum reduction of pollutants achievable the Permit specifies that Best Available Technology be used and that all facilities be operated according to Best Management Practices. The requirements of this condition are duplicated in Appendix J of the Permit. The condition is changed to indicate that the intermodal container wash building is operated and maintained in accordance with the currently approved Appendix J of the Permit.

Decontamination Access Control Building, Part I.E.23 - the Permittee has requested a modification of text in this condition that repeats requirements found in Appendix J, BAT Performance Monitoring Plan. To achieve the maximum reduction of pollutants achievable the Permit specifies that Best Available Technology be used and that all facilities be operated according to Best Management Practices. Appendix J is a document that describes operations and maintains inspection requirements for facilities that have a potential of discharging pollutants that may move into groundwater. The requirements of this condition are duplicated in Appendix J of the Permit. The condition is changed to indicate that the decontamination access control building is operated and maintained in accordance with the currently approved Appendix J of the Permit.

East Side Drainage Project, Part I.E.24 - the Permittee has requested a modification of text in this condition that repeats requirements found in Appendix J, BAT Performance Monitoring Plan. To achieve the maximum reduction of pollutants achievable the Permit specifies that Best Available Technology be used and that all facilities be operated according to Best Management Practices. The requirements of this condition are duplicated in Appendix J of the Permit. The condition is changed to indicate that the east side drainage project is operated and maintained in accordance with the currently approved Appendix J of the Permit.

Horizontal Hydraulic Gradient Performance Standard, Part I.E.25 - the Permittee has requested the deletion of some text that it considers obsolete. The Permittee submitted an updated infiltration and transport model report for the LARW Cell (CD12-0123, May 29, 2012). The updated model report provides a revised horizontal hydraulic gradient performance standard, which is included in Part 1.H.2.d. The DRC is in the process of reviewing that document. Wording when the standard would take effect has been removed, as the effective date is in the past. The Director has determined that the proposed changes do not harm the protection of groundwater or public health.

DU Storage Building Performance Standard, Part I.E.27 - the Permittee has requested a modification of text in this condition that repeats requirements found in Appendix J, BAT Performance Monitoring Plan. To achieve the maximum reduction of pollutants achievable the Permit specifies that Best Available Technology be used and that all facilities be operated according to Best Management Practices. The requirements of Part I.E.27 are duplicated in Appendix J of the Permit (particular in the DU Storage Building Inspection Form and other conditions of the appendix). The condition is changed to indicate that the DU storage building is operated and maintained in accordance with the currently approved Appendix J of the Permit.

Compliance Monitoring, Compliance Monitoring Wells, Part I.F.1.a.2 - the Permittee requested a minor revision for clarity to this condition. Minor typographic errors are corrected. The Director concurs with this minor revision; it poses no reduction in protection to the public or environment.

Compliance Monitoring, Compliance Monitoring Wells, Part I.F.1.b - the Permittee requested that well I-3-30 be removed from the list of Mixed Waste Cell monitoring wells. The Permittee considers this an error, because well I-3-30 is associated with the old Mixed Waste Cell footprint, and changes associated with the Mixed Waste Cell expansion has been approved. New

monitoring wells will be installed for the Mixed Waste Cell expansion (replacement monitoring wells). The new monitoring well network for the Mixed Waste Cell was approved with a 2012 Permit modification. Although, the new Mixed Waste monitoring network was approved in 2012, the replacement wells have yet to be installed. Therefore, monitoring well I-3-30 will stay in the Permit until the new nested well pair is installed. After the new Mixed Waste monitoring wells are installed, well I-3-30 can be removed in a future permit modification.

Compliance Monitoring, Evaporation Pond Monitoring Wells, Part I.F.1.c - the Permittee has requested the removal of monitoring well GW-19A from the list of evaporation pond monitoring wells. GW-19A is also a monitoring well for the 11e.(2) embankment, it is about 500 feet up gradient of the 2000 evaporation pond. The Director has determined GW-19A should remain in the Permit as a monitoring well for the 2000 Evaporation Pond.

Compliance Monitoring, Notification of Ground-water Monitoring Event, Part I.F.1.i - the Permittee has requested the removal of some text from this condition, stating the removed text is extraneous and self-evident. The DRC is required to do split sampling with the Permittee annually. This condition was added when the sampling frequency was changed to annually, to assure that the DRC had an opportunity to do its required sampling. The removal of the unnecessary text does not affect the meaning of the condition.

BAT Compliance Monitoring Points, Part I.F.2 - the Permittee has requested the removal of most of the text from this condition, stating the removed text repeats BAT requirements listed in Appendix J of the Permit. This condition was added to the Permit to formally define the facilities and type of monitoring that are required to determine compliance with the BAT performance standards. BAT compliance monitoring is a philosophy of handling waste safely through design, equipment, and operations for the maximum reduction of pollutants. Appendix J has been updated and expanded since this condition was added to the Permit. The requirements listed in this condition are collected with varying degrees of formality in the Best Available Technology Performance Monitoring Plan, Appendix J of the Permit, which will be referenced in this condition. The Director concurs with this minor revision; it poses no reduction in protection to the public or environment.

Future Modification of Compliance Monitoring Systems or Equipment, Part I.F.3 - the Permittee has requested the removal of this condition. The Permittees' justification for the removal of this condition is that the requirement is self-evident, and there is not a similar condition in the Permit for the White Mesa Mill Facility, operated by Energy Fuels Resources, Inc. The White Mesa Mill Facility is a different facility than Clive; however, its Permit does require the facility to minimize the potential for a release to groundwater or the environment, and provides for the re-opening and modification of the Permit to include additional Director requirements. The Director has determined this condition will stay in the Permit.

Compliance Monitoring Period, , Part I.F.4 - the Permittee has requested the removal of this condition. The Permittees' justification for the removal of this condition is that the requirement is self-evident, and there is no similar condition in the Permit for the White Mesa Mill Facility, Energy Fuels Resources, Inc. The Water Quality rules require the DRC to review all plans and

specification as to their adequacy of design and require any changes to assure compliance with pertinent regulation. The White Mesa Mill Facility is a different facility than Clive, where none of the conditions of this requirement apply. However, the requirement for monitoring the collection lysimeters is covered in the Construction Quality Assurance Plan for Collection Lysimeter Construction and Operation, Maintenance, and Closure Plan, Appendix C of the Permit and does not need to be repeated here. Also Part I.E.4, Unsaturated Soil Moisture Monitoring refer to the instrumentation installed in the Cover Test Cell, which are being monitored, so this condition is also repetitive and not needed. The Director has determined that the removal of this condition will not affect or reduce the protection of the public or environment. Part I.F.4 of the Permit has been set to reserved.

Monitoring Requirements and Frequency, Water Level Measurements, Part I.F.5.c. - the Permittee has requested the removal of some text from this condition, making the condition more generic. The specific parameters removed from the condition are listed in the referenced condition, Part I.F.5.c.3, and the removal of the word chemical analysis does not make the understanding any less clear. The Director concurs with this minor revision as it poses no reduction in protection to the public or environment.

Monitoring Requirements and Frequency, Ground Water and Pore Water Quality Sampling and Analysis, Ground/Pore Water Analytical Methods, Part I.F.5.c.1.vi - the Permittee has requested the removal of some text from this condition that is not needed, or is self-evident. The currently approved Water Monitoring Quality Assurance Plan lists all currently approved methods for groundwater sample analysis, and thus the removed text is repetitive. The Director concurs with this minor revision; it poses no reduction in protection to the public or environment.

Collection Lysimeter Sampling, Part I.F.6 - the Permittee has requested the removal of unnecessary wording in this condition. The Director has determined that text in question can be removed from this condition with no adverse impact on the protection of public health or the environment.

Modification of Monitoring or Analysis Parameters, Part I.F.7 - the Permittee has requested the removal of this condition. The Permittee's justification is that requirements of this condition are self-evident, and there is no similar condition in White Mesa Mill Facility Ground Water Quality Discharge Permit (No. UGW 370004) for the Energy Fuels Resources, Inc. Water Quality rules require the DRC to review all plans and specifications (this includes water monitoring) to their adequacy of design, and that the Director may require any changes to assure compliance with pertinent regulation. The White Mesa Mill Facility is a different facility than Clive; however, its Permit does require approval of monitoring plans, and provides for the re-opening and modification of the Permit to include additional Director requirements. The Director has determined this condition will stay in the Permit.

Waste Characterization Monitoring, Part I.F.8 - the Permittee has requested the removal of this condition. The Permittee's justification is that the condition duplicates the Radioactive Material License (RML) waste characterization monitoring requirements. RML is incorporated by

reference therefore its conditions do not need to be duplicated here. Waste characterization is included in the RML, but this condition also references other Permit conditions dealing with waste restriction therefore, the Director is maintaining this condition.

Waste Liquid Content Monitoring, Part I.F.9 - the Permittee has requested the removal of this condition. The Permittee's justification is that the condition duplicates Radioactive Material License (RML) requirements for the liquid content of waste. RML is incorporated by reference therefore its conditions do not need to be duplicated here. Requirements for liquid content of waste are contained in the RML. However Part I.F.9 is not only a compliance condition it also has a reporting requirement; therefore, the Director is maintaining this condition.

Containerized Waste Storage Areas: Leakage/Spill Monitoring and BAT Status, Part I.F.12 - the Permittee has requested the removal of this condition, because it repeats BAT requirements found in Appendix J of the Permit. The condition requirements are found in the BAT Plan, Appendix J of the Permit and do not need to be repeated here. However, in order to provide continuity and leave reference to the facility in the Permit the text in this condition is to read the Permittee shall perform monitoring in accordance with the BAT Performance Monitoring Plan, Appendix J of this Permit.

Evaporation Ponds Monitoring, Part I.F.13.a - the Permittee is requesting a modification of text in this condition, because they duplicate BAT requirements found in Appendix J of the Permit. The removed text is found in the BAT Performance Plan, Appendix J of the Permit and does not need to be repeated here.

Evaporation Ponds Monitoring, Part I.F.13.b and c - the Permittee is requesting a modification of text in this condition, to remove an unnecessary reference to Part I.F.2.d of the Permit and remove the requirement for a complete gamma spectroscopy analysis. The Director has determined that the unnecessary reference can be removed; however, the requirement for gamma spectroscopic analysis will remain.

Confined Aquifer Head Monitoring, Part I.F.14 - the Permittee has requested the removal of this condition, because it duplicated requirements from Parts I.F.1.d and I.F.5. The wells completed in the deep confined aquifer are not compliance wells and this condition is needed to insure their water levels are measured and are compared to shallow wells. This condition will stay the way it is.

Intermodal Unloading Facility Monitoring, Part I.F.16 - the Permittee has requested the removal of this condition, because it repeats BAT requirements found in Appendix J. However, in order to provide continuity and leave reference to the facility in the Permit the text in this condition is changed to read the Permittee shall perform monitoring in accordance with the BAT Performance Monitoring Plan, Appendix J of this Permit.

Box-Washing Facility Monitoring, Part I.F.17 - the Permittee has requested the removal of this condition, because it repeats BAT requirements found in Appendix J. However, in order to provide continuity and leave reference to the facility in the Permit the text in this condition is

changed to read the Permittee shall perform monitoring in accordance with the BAT Performance Monitoring Plan, Appendix J of this Permit.

Rail Car Wash Facility Monitoring, Part I.F.18 - the Permittee has requested the removal of this condition, because it repeats BAT requirements found in Appendix J. However, in order to provide continuity and leave reference to the facility in the Permit the text in this condition is changed to read the Permittee shall perform monitoring in accordance with the BAT Performance Monitoring Plan, Appendix J of this Permit.

Open Cell Time Limit Monitoring, Part I.F.20 - the Permittee has requested that this condition be revised for clarity, and the elimination of unnecessary wording. The Director agrees with this, and has determined that the changes have no adverse impact on the protection of public health or the environment. This condition is rewritten for the elimination of unnecessary wording.

BAT Performance Monitoring Plan, Part I.F.22 - the Permittee requested the removal of this condition; because they claim it is a redundant requirement of Part I.F.2 of the Permit, and BAT requirements of Appendix J of the Permit. This condition requires the Permittee be responsible for using the BAT performance monitoring plan. The Director has determined the condition should stay in the Permit.

BAT Contingency Plan, Part I.F.23 - the Permittee requested the removal of this condition; because non-compliance status is addressed in the compliance monitoring requirements, Part I.F. of the Permit, and duplicates BAT requirements of Appendix J of the Permit. This condition requires the Permittee be responsible for using the BAT contingency plan. The Director has determined this condition should stay in the Permit.

Stormwater Monitoring, Part I.F.24 - the Permittee has requested the removal of this condition, because it is redundant and duplicates requirements found in Part I.F.2 and the BAT requirements of Appendix J of the Permit. This condition is a compliance requirement for records of stormwater management and is not sufficiently covered in Appendix J of this Permit. The Director has determined this condition should stay in the Permit.

Shredder Facility, Part I.F.25 - the Permittee has requested the removal of this condition, because it is redundant, and repeats requirements found in Part I.F.2 and in the BAT requirements found in Appendix J. However, in order to provide continuity and allow reference to the facility, the text in this condition is changed to read the Permittee shall perform monitoring in accordance with the BAT Performance Monitoring Plan, Appendix J of this Permit. The Director has determined the changes have no adverse impact on the protection of public health or the environment.

Rotary Dump Facility, Part I.F.26 -- the Permittee has requested the removal of this condition, because it is redundant, and repeats requirements found in Part I.F.2 and in the BAT requirements found in Appendix J. However, in order to provide continuity and allow reference to the facility, the text in this condition is changed to read the Permittee shall perform monitoring in accordance with the BAT Performance Monitoring Plan, Appendix J of this Permit. The

Director has determined the changes have no adverse impact on the protection of public health or the environment.

Intermodal Container Wash Building, Part I.F.27 - the Permittee has requested the removal of this condition, because it is redundant, and repeats requirements found in Part I.F.2 and in the BAT requirements found in Appendix J. However, in order to provide continuity and leave reference to the facility in the Permit the text in this condition is changed to read the Permittee shall perform monitoring in accordance with the BAT Performance Monitoring Plan, Appendix J of this Permit. The Director has determined the changes have no adverse impact on the protection of public health or the environment.

Decontamination Access Control Building, Part I.F.28 - the Permittee has requested the removal of this condition, because it is redundant, and repeats requirements found in Part I.F.2 and in the BAT requirements found in Appendix J. However, in order to provide continuity and leave reference to the facility in the Permit the text in this condition is changed to read the Permittee shall perform monitoring in accordance with the BAT Performance Monitoring Plan, Appendix J of this Permit. The Director has determined the changes have no adverse impact on the protection of public health or the environment.

East Side Drainage Project, Part I.F.29 - the Permittee has requested the removal of this condition, because it is redundant, and repeats requirements found in Part I.F.2 and in the BAT requirements found in Appendix J. However, in order to provide continuity and allow reference to the facility in the Permit, the text in this condition is changed to read the Permittee shall perform monitoring in accordance with the BAT Performance Monitoring Plan, Appendix J of this Permit. The Director has determined the changes have no adverse impact on the protection of public health or the environment.

DU Storage Building Monitoring, Part I.F.30 - the Permittee has requested the removal of this condition, because it is redundant, and repeats requirements found in Part I.F.2 and in the BAT requirements found in Appendix J. However, in order to provide continuity and leave reference to the facility in the Permit the text in this condition is changed to read the Permittee shall perform monitoring in accordance with the BAT Performance Monitoring Plan, Appendix J of this Permit. The Director has determined the changes have no adverse impact on the protection of public health or the environment.

Other Methods to Determine Ground Water Quality Compliance Status, Part I.G.1.c - the Permittee has requested the removal of this condition, because the compliance status is clearly defined in Parts I.G.1.a and I.G.1.b, and there is no similar caveat for other methods in Ground Water Quality Discharge Permit No. UGW 370004 for the Energy Fuels Resources Inc. White Mesa Mill Facility. Because of the complex nature of the shallow groundwater below the Clive site, the Director found it necessary to provide for other methods in order to determine a well status. The water quality under the White Mesa Mill Facility is a much higher quality than at Clive and this kind of condition was not needed. The Director has determined this condition should stay in the Permit.

Requirements for Ground Water Monitoring for Probable Out-of-Compliance Status, Part I.G.2.a - the Permittee has requested that a word be changed from detection to determination claiming that it is a minor grammatical change, the Director disagrees. Environmental monitoring analytical lab reports should be reviewed when they are received by the Permittee in order assess if corrective action is required. Furthermore, the word detection is the same as the Ground Water Quality Protection Rules. The Director has determined this condition should stay as written in the Permit.

Requirements for Ground Water Out-of-Compliance Status, Part I.G.3.a.1 - the Permittee has requested that a word be changed from detection to determination claiming that it is a minor grammatical change, the Director disagrees. Environmental monitoring analytical lab reports should be reviewed when they are received by the Permittee in order assess if corrective action is required. Furthermore, the word detection is the same as the Ground Water Quality Protection Rules. The Director has determined this condition should stay as written in the Permit.

Requirements for Ground Water Out-of-Compliance Status, Part I.G.3.a.2 - the Permittee has requested the removal of the last sentence of this condition and minor grammatical changes. The Permittee's justification is that the requirement is redundant; the regulatory authority to require sampling and analysis of additional analytes is already given in Utah water quality regulations; and there is no similar such requirement in White Mesa Mill Facility Ground Water Quality Discharge Permit (No. UGW 370004) for Energy Fuels Resources Inc. The Director has determined that the minor changes have no adverse impact on the protection of public health or the environment and to make the changes related to the Permittee request. As far as removing any Director discretionary actions requirements, they will be left in the Permit.

Requirements for Ground Water Out-of-Compliance Status, Part I.G.3.c - the Permittee has requested that this condition be revised for the elimination of unnecessary wording. The Director disagrees with this, and has determined that the changes may have an adverse impact on the protection of public health or the environment. This condition is left the way it is.

Definition of Failure to Maintain BAT Requirements, Part I.G.4.a - the Permittee has requested the removal of this condition, Definition of Failure to Maintain Best Available Technology (BAT) Requirements. The Permittee's justification is that the requirement is self-evident, and there is no similar such requirement in White Mesa Mill Facility Ground Water Quality Discharge Permit (No. UGW 370004) for Energy Fuels Resources Inc. The Director disagrees and finds it is important to have a definition like this in the Permit. Therefore, the Director has determined this request may have an adverse impact on the protection of public health or the environment and condition should stay as written in the Permit.

Definition of Failure to Maintain BAT Requirements, BAT Contingency Plan, Part I.G.4.c - the Permittee requested a revision for clarity to this condition. This condition is reworded to reference Appendix K, the BAT Contingency Plan. The Director concurs with this minor revision, it poses no reduction in protection to the public or environment.

Reporting Requirements, Part I.H - the Permittee requested a revision to this condition that removed reference to the Radioactive Material License. From time to time various environmental monitoring reporting requirements have been included in the Radioactive Material License, such as the cover test cell. The Director considers it wise to leave reference to the Radioactive Material License in this condition. Since this section deals with reporting, not monitoring the text will be changed to read “notwithstanding any reporting required by the Radioactive Material License”; this poses no reduction in protection to the public or environment.

Reporting Requirements, Ground-Water Monitoring, Part I.H.1.b - the Permittee requested a revision to this condition that removed reference to the Director, and removal of a phrase about constructive information, as being self-evident or redundant. Reference to the Director will remain, but the phrase “any other constructive information concerning all wells in accelerated monitoring” will be removed because of its subjective nature. The Director has determined this change has no adverse impact on the protection of public health or the environment.

Water Level Measurements, General Requirements, Part I.H.2.a - the Permittee requested a revision for clarity to these conditions in the word “compliance” be added before monitoring wells. The Director disagrees in that water level measurements are required at all wells, not just the compliance wells. Therefore, the Director has determined this condition should stay as written in the Permit.

Water Level Measurements, Vertical Hydraulic Gradient Reporting, Part I.H.2.c - the Permittee requested a revision for clarity to this condition. The revisions for clarity are made to the text of this condition and they do not reduce the protection of the public or environment.

Water Level Measurements, Horizontal Hydraulic Gradient Reporting, Part I.H.2.d - the Permittee requested a revision for clarity to this condition, and changes to horizontal hydraulic gradients for the LARW and Mixed Waste embankments. The LARW hydraulic gradient is currently under review by the DRC at this time and has not been approved. Therefore, it will remain as currently written. The hydraulic gradient value used in the Mixed Waste modeling was 1.00E-3 ft/ft, and is higher and therefore more conservative than the actual average monthly hydraulic gradient listed. The Mixed Waste Cell infiltration and Transport Modeling was approved by the Director in 2000. The revisions for clarity are made to the text of this condition and they do not reduce the protection of the public or environment.

Ground Water and Pore Water Quality Sampling, Part I.H.3 - the Permittee requested a revision to clarify that surface water sampling, and total anions and cations will not be a reporting requirement; also that an electronic file format equivalent to a comma separated value (CSV) file may be submitted. The Permittee justification for this is the Permit does not require surface water samples; with the changes proposed to the analytical program, total anions and cations will not be reported annually; however, they will be reported at Permit renewal per Part 1.F.5.c.3. The Director has determined that this condition is for groundwater and pore water quality sampling and not surface water, total anions and cations analysis is still a requirement of the Permit, and allowing a CSV equivalent file format adds some flexibility to the Permit. CSV equivalent provides more flexibility for the Permittee to submit data files in a format that is

easier for DRC to view and manipulate, e.g., Microsoft Excel files. The Director has determined that change to this condition for clarity do not reduce the protection of public health or the environment.

Post-Closure Monitoring, Part I.H.5 - the Permittee has requested the text “currently approved” be removed for this condition. The Post-Closure Monitoring Plan, Appendix F of the Permit, is a plan that can be revised or updated as needed, but this has not happened January of 2000. The Director has determined that the text “currently approved” should remain.

Annual "As-Built" Report, Part I.H.6 - the Permittee has requested to modify text in this condition, because the text is self-evident. The text the Permittee wants to remove is in compliance with the currently approved design and specifications, and the LLRW and 11e.(2) construction Quality Assurance/Quality Control Manual (Radioactive Materials License, Condition 44). Reference to “design and specification, and the LLRW and 11e.(2) Construction Quality Assurance/Quality Control Manual” will remain as a necessary part of the conditions, but reference to the Radioactive Materials License can be removed. The Director has determined that change to this condition do not reduce the protection of public health or the environment.

Waste Characterization Reporting, Part I.H.7 - the Permittee has requested the deletion of this condition, because it duplicated requirements found in the Waste Characterization Plan. This condition is intended to ensure that the Permittee identifies any waste that various from what it is allowed to accept. This information forms the basis for determining additional groundwater monitoring parameters needed. This condition will remain in the Permit.

Collection Lysimeter Reporting, Part I.H.8 - the Permittee has requested that the frequency of the video inspection of collection lysimeters be changed from annual to once per Permit renewal cycle. This permit change would have been required for consistency if the collection lysimeters were changed to once per renewal cycle; however, the video inspection of the collection lysimeters is still required after liner construction over the lysimeters for the first year. The Director has determined that after the initial video inspection, every other year is an appropriate cycle for the inspection.

Reporting of Mechanical Problems or Discharge System Failures, Part I.H.9 - the Permittee requested the removal of this condition, because it duplicated requirements in Appendix K of the Permit, BAT Contingency Plan. Time lines for notification of failure of mechanical or discharge system at the Clive facility are given in Appendix K of the Permit. This section will be changed to read “The Permittee shall meet all requirements of reporting any mechanical or discharge system failure as outline in Appendix K, the BAT Contingency Plan of the Permit.” The Director has determined that the changes have no adverse impact on the protection of public health or the environment.

Meteorological Reporting, Part I.H.8 - the Permittee has requested a modification of this condition, because a submittal of a meteorological report at Permit renewal is redundant. The annual meteorological report provides all meteorological data for the life of the facility. The annual meteorological report prepared for the Permittee summarizes the meteorological data

collected at the weather monitoring station for a 12-month period, and also all meteorological data for the life of the facility. Thus, it is redundant to require a summary report of all meteorological data at the time of Permit renewal. The Director has determined that the changes will have no adverse impact on the protection of public health or the environment.

Containerized Waste Storage Area Reporting, Part I.H.11 - the Permittee requested the removal of this condition, because it duplicates requirements in Appendices J and K of the Permit, BAT Performance Monitoring Plan, and BAT Contingency Plan. Reporting requirements are specified in Appendices J and K of the Permit. The Director has determined to leave this condition, but changes it to read "Reporting requirements shall conform to BAT requirements found in Appendices J and K of this Permit."

Evaporation Ponds Reporting, Annual Water Quality Sampling, Part I.H.12.a - the Permittee has requested a minor change for clarity. The Director has determined the changes have no adverse impact on the protection of public health or the environment.

Evaporation Ponds Reporting, 1995, 1997, 2000, Mixed Waste, and Northwest Corner Evaporation Pond Daily Monitoring, Part I.H.12.b - the Permittee has requested the removal of this condition, because it duplicates requirements from Appendix K of the Permit, BAT Contingency Plan. Reporting requirements are specified in Appendices J and K of the Permit. The Director has determined to leave in this condition, but change it to read "Reporting requirements shall conform to BAT requirements found in Appendices J and K of this Permit."

Evaporation Ponds Reporting, Annual Pump Inspection, Part I.H.12.c - the Permittee has requested the removal of this condition, because they are requesting to eliminate the semi-annual BAT monitoring report. However, the Director has determined not to eliminate the semi-annual BAT monitoring report so there will be no changes made to this condition.

Annual Ground Water Usage Report, Part I.H.13 - the Permittee has requested to reduce the frequency the groundwater usage report is submitted, from annual to once per Permit renewal cycle. The Permittee justification for this is that the annual groundwater usage report has been submitted since approximately 1998, these reports have indicated that groundwater usage is extremely limited and does not vary significantly over time. Given that the groundwater is Class IV, usage is extremely limited, usage does not change significantly with time, and groundwater travel times are very slow; annual reporting of groundwater usage is not necessary for protection of human health and the environment. The Permittee feels one report per Permit renewal cycle is sufficient. The Permittee's Radioactive Material License requires the identification of known natural resources at the site whose exploitation could result in inadvertent intrusion into the wastes. A water well drilled in 1998 near the site demonstrated that groundwater in the vicinity of the Clive facility constitutes a natural resource whose exploitation could lead to inadvertent intrusion, also, the exploitations of the mineral brines found in the shallow aquifer could lead to an inadvertent intrusion. The Director has determined that this condition should remain as written.

BAT Non-Compliance Reporting Requirements, Part I.H.16 - the Permittee has requested that this condition be removed, because it duplicated requirements from Appendix K of the Permit, BAT Contingency Plan. The Contingency Plan provides direction to the Permittee as to contingency actions required for maintaining or regaining compliance with the Permit BAT requirements and requires notification to the Director of any BAT failures that are not corrected within 24 hours. Appendix K of the Permit requires the Quality Assurance Manager or designee to provide verbal notifications required under the Permit. The Director has determined that this condition comprises the reporting requirement and will remain in the Permit.

Annual Cover Test Cell Report, Part I.H.17 - the Permittee requested the modification of this condition to match proposed changes to the Radioactive Material License submitted with the October 25, 2012 License renewal application. Radioactive Material License Condition 28 required the submittal of a data report and corrective action plan. The Permittee met this requirement and the submittal is under review. In the submittal the Permittee proposed a change to the Radioactive Material License Condition 28 that the Director has incorporated in the Permit.

BAT Semi-annual Monitoring Report, Part I.H.20 - the Permittee has requested to eliminate the semi-annual BAT monitoring report. The Permittee justification for the request is that the data and information included in the semi-annual BAT monitoring report can be obtained, or is available elsewhere. These sources are:

- Significant BAT failures are reported within 24 hours and written notification is required.
- Items such as container labeling issues, restoring free drainage, removal of water in accordance with priority requirements, and the scheduling of surface repairs are performed and documented on the inspection form. If the required schedule is not met, notification is provided.
- Fluid head levels and allowable leakage rate above the permit limits are reported within 24 hours of identification.
- Precipitation data are reported in the annual Meteorological Report.
- DRC representatives in most cases obtain storm water management information prior to semi-annual reporting, and DRC representatives perform inspections during or immediately after significant storm events.
- Inspection forms have been periodically requested by DRC representatives prior to submittal of semi-annual reports. These requests are always quickly satisfied.

The Permittee has developed a BAT program that utilizes operational strategies and inspection procedures to ensure the effectiveness of waste handling and decontamination facilities that analyzes the potential impacts of each facility as a way to ensure groundwater protection; and provides a mechanism to manage contamination with a potential of being discharged directly or indirectly into groundwater. Requiring BAT at each facility for the Clive site shows environmental compliance in a way that protects public health and safety and the environment. This provides a definable strategy that identifies system failures during inspections and ensures the Permittee's efforts are properly focused at each facility for environmental compliance during facility operations. The DRC uses the semi-annual BAT monitoring report as a check on BAT compliance and evaluates any condition that may be of concern. The Director has determined that this condition will stay the same with some minor changes for clarity. The Director has

determined the changes have no adverse impact on the protection of public health or the environment.

Manifest Radionuclide Inventory Report, Part I.H.21 - the Permittee has requested to modify this condition. The Permittee's justification is that the RML UT#2300249 is incorporated by reference; therefore, its conditions do not need to be duplicated here. The inventory report includes all manifested radionuclides, including half-lives and distribution coefficients is not necessary in the context of the inventory report. These parameters are included in technical submittals when they are used in the content (e.g., infiltration and transport modeling reports). The manifest radioisotope inventory report was required in response to the DRC's review of the Permittee request to remove Adjusted Gross Alpha as a compliance monitoring parameter in the Permit. Performance assessment modeling (groundwater fate and transport), submitted by the Permittee (Whetstone Associates Inc., July 19, 2000), showed some radioisotopes exceeded their respective GWPLs within 500 years at the 90-foot compliance wells. The DRC required the Permittee to report these isotopes when they arrive at the Clive facility in Radioactive Materials License (No. 2300249, Amendment 9) Condition 29.E. The report required in Part I.H.21 ties the Permit to the License, and allows the DRC to evaluate waste inventories of these listed radioisotopes at the Clive facility, and compare those to the maximum waste source term concentration simulated in currently approved performance assessment modeling reports. Assessments of radioisotopes using the manifest radioisotope inventory report will allow the DRC to confirm if the average inventory disposed at the site does or does not exceed the maximum source term concentration in modeled or analyzed condition, or that respective GWQS at the 90-foot point of compliance wells will not be exceeded for more than 500 years. The Director has determined that this condition will stay the same with some minor changes for clarity. The Director has determined the changes have no adverse impact on the protection of public health or the environment.

Comprehensive Ground Water Quality Evaluation Report, Part I.H.22 - the Permittee has requested that the text in this condition be modified to clarify the scope of the water quality evaluation. The Permittee's justification is that the evaluation is limited to compliance parameters in groundwater data from the current compliance monitoring wells. The Permittee also argues that it is not viable to evaluate the normality of reporting limits; normality testing should not be required for datasets with greater than 50% non-detections. The 2012 *Comprehensive Groundwater Quality Evaluation Report* determined that most parameters with detected, quantified results were normality distributed. This agrees with the premise of slow-moving groundwater in chemical equilibrium with aquifer solids, without the influence of recharge. However, for parameters with concentrations at or near the detection limit, the datasets are censored (below detection limits for non-radiologic parameters) or analytical error is relatively high (for radiological parameters). For these parameters, although they are probably normally distributed, due to analytical limitations, normality testing is not warranted. The U.S. EPA Statistical Analysis for Groundwater Monitoring Data at RCRA Facilities (Unified Guidance, EPA 530/R-09-007; March 2009) recommends that parametric statistical methods not be used for datasets consisting of greater than 50% non-detections. The condition is modified for clarity and updated where needed. The Director has determined the changes have no adverse impact on the protection of public health or the environment.

Revised Hydrogeologic Report, Part I.H.24 - the Permittee has requested that this condition be revised for clarity. The Director agrees with this and has determined that the changes have no adverse impact on the protection of public health or the environment. This condition is rewritten for clarity and the elimination of unnecessary wording.

Ground Water Institutional Control Plan, Part I.I.1 - the Permittee has requested that this condition be revised for clarity. The Director agrees with this and has determined that the changes have no adverse impact on the protection of public health or the environment.

Groundwater Mound Dewatering Near Wells GW-19A/GW-19B, Part I.I.2 - the Permittee has requested the removal of this condition. The Permittee's justification is that the requirements of this condition have been met. On January 14, 2010, the Permittee submitted the plan and schedule for groundwater mound dewatering activities near wells GW-19A/GW-19B (CD10-0015). Groundwater extraction began in November 2009 and has continued to the present. As of November 8, 2012, approximately 350,000 gallons of groundwater had been extracted from the mound near GW-19A/GW-19B. The Director has determined this compliance schedule can be completed by the submitted report and can be removed.

Background Ground Water Quality Report for the new Mixed Waste Compliance Wells, Part I.I.3 - the Permittee has requested that this condition be revised for clarity and to remove minor typographic errors. The Director agrees with this and has determined that the changes have no adverse impact on the protection of public health or the environment. This condition is rewritten for clarity and the elimination of unnecessary wording.

Background Ground Water Quality Report for the new Class A West Compliance Wells, Part I.I.4 - the Permittee has requested that this condition be revised for clarity and to remove minor typographic errors. The Director agrees with this and has determined that the changes have no adverse impact on the protection of public health or the environment. This condition is rewritten for clarity and the elimination of unnecessary wording.

Representative Sampling, Part II.A - the Permittee has requested a modify to this condition by deleting the last sentence. The Permittee's justification is that the deleted text is self-evident, and there is no similar such requirement in the Energy Fuels Resources Inc. Ground Water Quality Discharge Permit No. UGW 370004 for the White Mesa Mill Facility. The language in this section of the Permit (Part II) has been reviewed by the DRC in consultation with others over the years to clarify its intent. The Permittee incorporated these requirements into their procedures and daily operations years ago. Therefore, the Director has determined this condition should stay as written in the Permit.

Analytical Procedures, Part II.B - the Permittee has requested to modify this condition by deletion of the last sentence. The Permittee's justification is that the deleted text is self-evident as it is included in UAC R317-6-6.12.A. The language in this section of the Permit has been reviewed by the DRC in consultation with others over the years to clarify its intent. The

Permittee incorporated these requirements into their procedures and daily operations years ago. Therefore, the Director has determined this condition should stay as written in the Permit.

Records Contents, Part II.G - the Permittee has requested the removal of this condition. The Permittee's justification is that the requirements of this condition are redundant with requirements listed in Part I.H.3 and the Water Monitoring Quality Assurance Plan (Appendix B). The language in this section of the Permit has been reviewed by the DRC in consultation with others over the years to clarify its intent. The Permittee incorporated these requirements into their procedures and daily operations years ago. Therefore, the Director has determined this condition should stay as written in the Permit.

Plugging and Abandonment Reports, Part II.H - the Permittee has requested the modification of text in this condition. The Permittee's justification is the removed text is self-evident. The language in this section of the Permit has been reviewed by the DRC in consultation with others over the years to clarify its intent. The Permittee incorporated these requirements into their procedures and daily operations years ago. Therefore, the Director has determined this condition should stay as written in the Permit.

Proper Operation and Maintenance, Part III.E - the Permittee has requested a modification of this condition. The Permittee's justification is that deleted text is redundant with the sentence immediately preceding it. The language in this section of the Permit has been reviewed by the DRC in consultation with others over the years to clarify its intent. The Permittee incorporated these requirements into their procedures and daily operations years ago. Therefore, the Director has determined this condition should stay as written in the Permit. The Director does not consider the text redundant, and shall remain as written.

Prior Approval, Part IV.A - the Permittee requested to delete this condition. The Permittee's justification is that the requirements are self-evident as they are included in the referenced UAC rules. The language in this section of the Permit has been reviewed by the DRC in consultation with others over the years to clarify its intent. The Permittee incorporated these requirements into their procedures and daily operations years ago. Therefore, the Director has determined this condition should stay as written in the Permit.

Modification of Approved Engineering Design, Specifications, or Construction, Part IV.C - the Permittee requested to delete this section. The Permittee's justification is that the requirements of this section are self-evident. Also, the requirements for modification of disposal cell engineering design or specifications are provided in Part I.D.10. The language in this section of the Permit has been reviewed by the DRC in consultation with others over the years to clarify its intent. The Permittee incorporated these requirements into their procedures and daily operations years ago. Therefore, the Director has determined this condition should stay as written in the Permit.

Reopener Provision, Part IV.P - the Permittee has requested a minor typographic error be fixed. The Director has determined the changes have no adverse impact on the protection of public health or the environment and to make the changes related to the Permittee request.

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Whetstone Associates, Inc., 2000b. Mixed Waste Cell Infiltration and Transport Modeling Report: Prepared for Envirocare of Utah. November 22, 2000.

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