

UTAH GROUND WATER DISCHARGE PERMIT NO. UGW370004

STATEMENT OF BASIS
Permit Renewal

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STATEMENT OF BASIS OUTLINE

- I. Purpose
- II. Background
- III. Permit Application and Revised Hydrogeological Report
- IV. General Issues and Public Comments affecting the Permit Renewal
 - a. Chloroform Plume
 - b. Nitrate Plume
 - c. Stipulated Consent Order Docket Number UGW12-03 (Out of Compliance Ground Water Parameter Studies and Pyrite Investigation)
 - d. General Monitoring Wells MW-20 and MW-22
 - e. Deep Water Supply Well: WW-2
- V. Updated Table 1 – Ground Water Classification
- VI. Background Monitoring Report for Monitoring Wells MW-35, MW-36 and MW-37
- VII. Upgradient Monitoring Wells MW-1, MW-18 and MW-19
- VIII. Ground Water Compliance Limit Modifications
- IX. Permittee Requested Modification for Commencement of Accelerated Monitoring Requirements
- X. Removal of Roberts Pond
- XI. Removal of Monitoring Well MW-3
- XII. Modification of Slimes Drain Compliance Requirements for Tailings Cells 2 and 3
- XIII. Resolved Compliance Schedule Items – Removed from Permit
- XIV. Summary of Major Permit Changes
- XV. Summary of Minor Permit Changes
- XVI. References

Attachments:

Attachment A – Proposed Permit Renewal Changes -- Redline Strike-out Groundwater Discharge Permit UGW370004

I. PURPOSE

This Statement of Basis describes the technical and regulatory basis for permit renewal, and describes proposed changes to Utah Ground Water Discharge Permit, No. UGW370004, (“Permit”) for the Energy Fuels Resources (USA) Inc., White Mesa Uranium Milling Facility near Blanding, San Juan County, Utah (“Facility”). The Facility is located in sections 28, 29, 32, 33, Township 37, Range 22 East, Salt Lake Baseline and Meridian, San Juan County, Utah.

The Permit is issued pursuant to the Utah Water Quality Rules, Utah Administrative Code (UAC) R317-6, which requires that any person who operates any new facility or modifies an existing or new facility, not permitted by rule under UAC R317-6-6.2, must obtain a Utah Ground Water Discharge Permit. UAC R317-6 limits issuance of groundwater permits to a five year duration, and provides that a groundwater permit may be reopened for modification on an as-needed basis.

Energy Fuels Resources (USA) Inc. (“Permittee”¹) has made several requests for Permit modification which are included in this Permit renewal, including: 1) Removal of Ground Water Compliance Limits (“GWCL’s”) at three upgradient wells at the Facility; 2) Modification of GWCL’s for certain parameters [current Out of Compliance (“OOC”) Parameters] at certain ground water monitoring wells listed in the Permit; 3) Clarification of Accelerated Monitoring Reporting Requirements; 4) Incorporation of approved ground water compliance limits for groundwater monitoring wells MW-35, MW-36 and MW-37; 5) A modification of slimes drain compliance requirements for tailings cells 2 and 3; and 6) Clarification of storage requirements for feedstock outside of the Facility feedstock storage area. As explained more fully below, the Director of the Utah Division of Waste Management and Radiation Control (“DWMRC”)² has concluded that the foregoing requests are reasonable and are further supported by the administrative record. As a result, the foregoing revisions have been adopted in this renewal. Additionally, it was noted that several of the compliance schedule items listed in the Permit have been completed and have been removed from the Permit, and that Roberts Pond has been removed from the Facility, which change also requires modification to the Permit.

II. BACKGROUND

The Facility was constructed during the years 1979 and 1980 and was originally licensed by the United States Nuclear Regulatory Commission (“NRC”) under Source Material License No. SUA-1358.

¹ In several quotations of documents the Permittee is referred to as “EFR” or “EFRI.” These terms are interchangeable.

² Pursuant to UTAH CODE ANN. §§ 19-1-105(1)(d) and 19-5-102(6), on July 1, 2015, the authority granted to the Director of the Division of Radiation Control (“DRC”) was transferred to the director of the newly created Division of Waste Management and Radiation Control (“DWMRC”). These terms are interchangeable for the purposes of this Statement of Basis.

On August 16, 2004, the NRC delegated the Utah uranium mill regulatory program to the State of Utah by approving Agreement State status. The DWMRC became the primary regulatory authority for the Facility, and subsequently issued a State Radioactive Materials License No. UT1900479 (“RML”) and a separate Permit. The Permit was initially issued on March 8, 2005 to the operator of the Facility, International Uranium (USA) Corporation (“IUC”). The operator of the Facility became Denison Mines (USA) Corp. on March 29, 2007, when they merged with IUC. The Director of DWMRC (“Director”) approved the transfer of control of the Facility to the Permittee on June 27, 2012, who is the current owner and operator of the Facility.

III. PERMIT APPLICATION AND REVISED HYDROGEOLOGICAL REPORT

The Permittee has submitted three versions of the renewal application: 1) The original application during September 2009, 2) Revision 1 dated July 2012, and 3) Revision 2 dated June 2014. The revisions were submitted by the Permittee in response to review comments made by the Director. Based on the Director's review of the June 2014 second revised application, it appears that all comments were addressed by the Permittee and that the application is complete.

The Director noted that per the Permittee's response to comments related to the July 2012 Permit application review (Response dated June 5, 2014), the Permittee included one additional Permit modification request regarding Part I.D.11 requirements for feedstock material stored outside of the feedstock storage area. This request is discussed in the Minor Permit Changes Section XV. (page 24) below.

IV. GENERAL ISSUES AND PUBLIC COMMENTS AFFECTING THE PERMIT RENEWAL

a. Chloroform Plume

In May, 1999 the Permittee and the Director commenced an annual split sampling program for groundwater monitoring wells at the Facility. This program was comprehensive in that it included all monitoring wells at the facility completed in the shallow aquifer, and a large number of groundwater contaminants, including: heavy metals, nutrients, general chemistry, radiologic, and volatile organic compounds (VOCs).

During the May, 1999 split sampling event, excess chloroform concentrations were discovered in Monitoring Well MW-4, which is located along the eastern margin of the site. Because these concentrations were above the Utah Ground Water Quality Standard (GWQS) (70 µg/L), the Director initiated enforcement action against the Permittee on August 23, 1999 via issuance of a Ground Water Corrective Action Order, which required completion of: 1) a contaminant investigation report to define and bound the contaminant plume, and 2) a groundwater corrective action plan to address remediation of the plume to re-establish the GWQS's.

Repeated ground water sampling events by both the Permittee and Director have confirmed the presence of chloroform in concentrations that exceed the GWQS along the eastern margin of the site in wells that are upgradient or cross-gradient from the tailings cells. Other VOC contaminants associated with chloroform have also been detected in these samples. After installation of 20 new monitoring wells at the site, groundwater studies appeared to define the eastern and southern boundaries of the chloroform plume. The Permittee believes the source of this contamination was caused by laboratory wastewater disposal activities that pre-dated Facility operation.

The Director ultimately agreed with the Permittee that the source of the contamination was most likely from legacy Facility laboratory wastewater disposal activities. Prior to Facility construction and in the early years of the Facility, laboratory waste was disposed in unlined sewage leach fields which likely created the chloroform contamination.

The Director's determination that the laboratory wastewater sent to sewage leach fields, and not potential leakage from tailings cells, was the most likely source of the chloroform plume was based on:

- The location of the highest levels of chloroform contamination is at or near the sewage leach fields;
- The contaminant plume is upgradient or cross-gradient from the tailings cells;
- Monitoring wells that are downgradient from the tailings cells do not show chloroform contamination; and,
- As described below, the remediation program has been effective in reducing contaminant concentrations, indicating that there is no continuous source for the contaminants, as would be the case if the cells were leaking.

As with every ground water corrective action, the corrective action plan is developed based on assumptions about the source (assumptions that in this case are based on the evidence cited above), and those assumptions are tested continuously with ground water monitoring as corrective action proceeds. If the results of remediation conflict with the assumptions, the matter will be reopened.

There are currently 38 monitoring wells associated with the Chloroform Plume. The Corrective Action Plan (“GCAP”) for the plume was exposed to public comment from January 12, 2015 through February 13, 2015 and a public hearing was held in Blanding, Utah on February 11, 2015. The GCAP was approved by the Director on September 14, 2015. The approved remediated strategy is using a hydraulic control system (pump and treat) to isolate and capture the chloroform. This hydraulic control system was initiated in April of 2003. Groundwater monitoring results show this initial remediation effort has been effective to remove significant amounts of chloroform as reported in quarterly chloroform monitoring results.

The Director received one set of public comments, from the Ute Mountain Ute Tribe (signed by

Celene Hawkins, Associate General Counsel) and dated February 11, 2015, within the public notice period. There were a total of two comments and “requested revisions” included in the comments. The comments and “requested revisions” are addressed below:

1. The first concern from the Ute Mountain Ute Tribe is regarding the discharge of pumped groundwater from the chloroform corrective action to the Facility Cell 1. The Ute Mountain Ute tribe is concerned that the “*placement of chloroform-laden, extracted groundwater into Tailings Cell 1 (or into the Mill process) because of the risk that the chloroform-laden, extracted ground water posed to the single, 30-mil PVC liner system in Tailings Cell 1.*” The Ute Mountain Ute Tribe was also concerned about the 2014 Statement of Basis and Stipulated Consent Order for the GCAP as follows “*The Statement of Basis does not address whether the low pH extracted groundwater containing chloroform and other associated chlorinated compounds, carbon tetrachloride, dichloromethane (methylene chloride), and chloromethane (all of which are on the RCRA U-List) is compatible with the liner systems of the Cells, and in particular the PVC liner of Cell 1.*”

DWMRC Response:

The DWMRC agrees that the Cell 1 liner construction using a single 30-mil flexible PVC is not an optimal design by today’s standards when considering any potential contact of the PVC membrane with organic solvents. However, in the case of discharging the Chloroform CAP extracted groundwater to Cell 1, there is no anticipated potential for solvent degradation of the PVC due to contact with chloroform. This conclusion is based on the following considerations: (a) the relatively low concentrations of chloroform in the extracted groundwater; the fact that chloroform is essentially immiscible in water; and (c) the fact that chloroform is further diluted and evaporated after being discharged into Cell 1. Moreover, the evidence in the administrative record supports the following additional conclusions relating to this comment:

- Any chloroform not previously removed by contact with the atmosphere and agitation while transferring the extracted groundwater to Cell 1 will float and evaporate quickly from the Cell 1 liquid surface.
- Cell 1 construction includes a foot thick soil cover layer overlying the PVC liner (12 inches on the cell floor and 18-inches on the interior side slope), preventing contact of the pond liquids with the PVC liner.
- The annual water sampling results for chloroform in Cell 1 and other tailings cells have been historically very low or non-detectable. The highest annual sample result for chloroform in Cell 1 was the 2012 result of 19 µg/L, collected from the pond surface. This is well below the drinking water standard of 70µg/L. Also, 19 µg/L corresponds to 19 parts per billion or 0.019 parts per million, it should be evident that this is an extremely low concentration. Even the highest measured concentration of chloroform in the extracted groundwater is for practical purposes extremely low. For

example, the highest detected concentrations of chloroform are around 30,000 µg/L which corresponds to 30 parts per million or roughly 30 drops in 16 gallons of water.

Based on these findings, derived from substantial evidence in the administrative record, the Director will not include language in the Permit which prohibits the Permittee from discharging the contaminated groundwater to Cell 1.

2. The second concern from the Ute Mountain Ute Tribe is regarding the potential for the chloroform pumping project to divert potential tailings cell leakage to the east and cause the leakage to not be detected by the current monitoring wells. Per the Ute Mountain Ute comment, *“During the 2014 Conference Call, the Tribe expressed concern to the DRC that the expanded (eastward) pumping network and limited Groundwater Monitoring Quality Assurance Plan (which only requires groundwater analysis for the 6 GCALs in Table 2...could result in the hydraulic capture of Tailings Cell leachate, the masking of tailings cell leakage, and interference with other ongoing investigations or corrective action plans. The Tribe explained that, because the 13 pumping wells for this SCO will be operated in the eastern portion of the WMM facility, it is possible that the chloroform pumping wells could pull or hydraulically” capture” leakage from the tailings management system between the legacy tailings impoundments and the proposed chloroform pumping well network...”* The Ute Mountain Ute Tribe requests that the Director modify the Stipulated Consent Order for the GCAP as per three bullet statements in the comments as follows:

- *“Monitoring wells located east of the legacy tailings impoundments and completed in areas subject to multiple corrective action plans (such as TW4-22, TW4-24, and TW4-25) will be sampled and analyzed for the full parameter list in Table 2 of the Groundwater Permit at a frequency of no less than once per year.*
- *Compliance monitoring wells subject to Part H of Attachment 1 the SCO, ‘Compliance Monitoring Well Chloroform Excursion Requirements’ which have exhibited two consecutive exceedances of their GCAL concentration limits will be sampled and analyzed for the full parameter list in Table 2 of the Groundwater Permit at a frequency of no less than once per year in addition to the other requirements in Part H.*
- *Monitoring wells located within 500 feet of the White Mesa Mill’s property boundary will be sampled and analyzed for the full parameter list in Table 2 of the Groundwater Permit at a frequency of no less than once per year.”*

DWMRC Response:

As part of the approved chloroform corrective action plan, EFR is required to analyze the groundwater flow directions and chloroform capture zones on a quarterly basis. This analysis is intended, in a large part, to ensure full hydraulic capture of the chloroform plume, but also serves to analyze impacts to the local groundwater flow directions.

DWMRC notes that in the event that a tailings cell were to breach and discharge solution into the groundwater and if the discharged solution were then transported eastward toward the chloroform extraction project (due to the extraction wells), then any contamination potentially diverted in that direction would be captured by the chloroform extraction wells then be discharged either into the milling process or tailings cells.

Per DWMRC review of the current Facility groundwater contour map, quarterly chloroform reports, and the Ute Mountain Ute request it was noted that:

- It is understood that the Ute Mountain Ute Tribe requests that all monitoring wells installed for the GCAP within 500 feet of the Facility boundary be sampled and analyzed for all compliance parameters; however, monitoring wells should be selected for compliance monitoring which will provide early detection of potential contamination from the tailings cells. Requiring that all monitoring wells be required for sampling within a certain distance of the property boundary is not reasonable in the case of potential tailings cell discharge. The purpose of those monitoring wells and current required parameters is appropriate, since the objective is to determine migration of the chloroform plume.
- Likewise, it is not reasonable to require that any GCAP monitoring wells which have had two consecutive exceedances of GCAP concentrations be sampled for the entire list of compliance parameters. The GCAP monitoring wells have been installed to monitor the chloroform plume and therefore it is likely that several of the wells will have multiple consecutive exceedances of the parameters for that objective. This does not necessitate a full suite of monitoring to detect potential discharges from the tailings cells. As per the bullet above, any wells selected should be those that will provide early detection of potential contamination.
- Per Director review of the groundwater elevation contours, capture zones (chloroform and nitrate) and monitoring well locations, it does seem reasonable to require that monitoring well TW4-24 be included in the permit as a general monitoring well and sampled on a semi-annual frequency for all parameters listed under Table 2 of the Permit. It is noted that monitoring well TW4-24 is currently being used as a pumping well for the nitrate corrective action plan, is located within the chloroform plume, and will exceed GWQS's for parameters associated with those projects. Therefore, although the Director agrees that including monitoring well TW4-24 as a general monitoring well is reasonable based on groundwater contours during pumping, it is also expected that the monitoring results will be highly variable and should not be used for direct compliance purposes. Rising or decreasing trends in constituents caused solely by the pumping should not be unexpected. Further, as background cannot be established for this pumping well, and given the variability of background concentrations across the site, constituent concentrations in TW4-24 that are within or close to the range of background values for constituents across the site should not be unexpected.

Based on these findings, monitoring well TW4-24 will be included as a General Monitoring Well under Part I.E.2. of the Permit. This is considered a minor permit modification and is included in section XV below.

b. Nitrate Plume

During a review of the Permittee April 30, 2008 New Wells Background Report and other Permittee reports, Nitrate + Nitrite (as N) (“Nitrate”) concentrations were observed above the Utah GWQS (10 mg/L) in five monitoring wells in the Facility site area, including wells: MW-30, MW-31, TW4-22, TW4-24, and TW4-25.

After the Nitrate plume was identified and the information was shared with the Permittee, the Director and the Permittee entered into a January 28, 2009 Stipulated Consent Agreement which required the Permittee to complete a Contaminant Investigation Report (“CIR”) to determine the potential sources of the Nitrate contamination. An immediate action to install 19 additional nitrate monitoring wells was initiated to determine the extent of the contamination.

The Permittee submitted a CIR to the Director on January 4, 2010, in which they identified a number of potential sources. After Director review of the CIR, the Director determined that additional investigation was required. This conclusion was shared with the Permittee in an October 5, 2010 letter. The Permittee responded in a November 15, 2010 letter in which they proposed additional studies to be conducted at the Facility. The additional studies were discussed in detail during a November 30, 2010 meeting with the Permittee and DWMRC Staff.

The Director agreed with the Permittee that conducting these additional studies would be appropriate. Therefore, the Director and the Permittee entered into a Tolling Agreement on December 20, 2010 to allow the Permittee time to conduct these additional studies. The additional studies did not attribute tailings cell leakage as a source of the nitrate contamination. However, the studies did provide sufficient evidence to conclude that the Ammonium Sulfate Crystal tanks at the Facility site are likely a primary or sole source of the plume. The Director's basis for this determination was:

- The location of the highest levels of Nitrate contamination are at or directly downgradient from the tanks;
- The contaminant plume is upgradient or cross-gradient from the tailings cells, demonstrating that the tailings cells are not contributing to the contamination; and
- Some of the monitoring wells that are downgradient from the tailings cells do show nitrate, but not in concentrations above standards or indicating increasing trends. Nitrate occurs naturally in groundwater, so its presence in concentrations below standards is not considered an indication of a problem.

After completion of the studies, the Director and the Permittee subsequently agreed to pursue the

development and implementation of a corrective action plan (CAP) to address the nitrate in the groundwater. The Permittee completed and submitted the nitrate CAP to the Director. The chosen remediation plan requires the Permittee to pump the groundwater and treat it by evaporation and/or use it as process water for milling.

A public comment period began on July 18, 2012 to receive comment on a proposed Stipulated Consent Order, Docket Number UGW12-04 (“SCO”) for the approved CAP for the nitrate contamination found in the local groundwater at the Facility. A hearing to receive public comments was held on August 20, 2012. A public participation summary and response to the comments received was completed and on December 12, 2012 the Director authorized and issued the SCO. This approval is subject to conditions, stipulated penalties and timelines outlined in the SCO. Pumping under the remediation plan began in January, 2013.

c. Stipulated Consent Order Docket Number UGW12-03 (Out of Compliance Ground Water Parameter Studies and Pyrite Investigation)

On May 9, 2011 the Director issued the Permittee a Notice of Violation and Compliance Order, Docket Number UGW11-02 (“NOV”), which required source assessment activities for several monitoring wells/parameters in out-of-compliance (“OOC”) status (based on the Directors review of the 1st, 2nd, 3rd, and 4th quarters 2010 ground water monitoring data); and required the Permittee to submit revised statistics for field pH for several of the facility monitoring wells which were in OOC status.

During several meetings and phone conferences between the Director and the Permittee subsequent to issuance of the NOV, the Permittee indicated that pH decreasing trends appeared to be a site wide occurrence (observable in monitoring wells upgradient, interior and downgradient) in the ground water in the vicinity of the Facility and that there was likely a regional root cause. The Permittee also suggested that several of the other ground water parameters in OOC (e.g. certain metals) may be attributed to the decreases in pH and thus attributable to the root cause. Based on these discussions, the plan and time schedule deadline for the pH statistical evaluation was extended in order for the Permittee to include a plan to evaluate the root cause of the site wide decreasing trends in pH. The Permittee subsequently submitted plan and time schedules for studies to determine root causes of pH and OOC parameter exceedances and also submitted a plan and time schedule to determine if regional dissolution of pyrite in the mineral matrix of the Burro Canyon formation could be causing the site wide decreasing trends in pH.

On July 12, 2012 the Director approved the Permittee’s plans and time schedules for the studies through issuance of a Stipulated Consent Agreement, Docket Number UGW12-03 (“SCA”). The SCA approved study plans and as a result the following Permittee reports were submitted:

- October 10, 2012, *Source Assessment Report White Mesa Uranium Mill*, prepared by Intera Geosciences & Engineering (Intera) – Provides explanation and source

assessment study of OOC exceedances except for pH. Provides statistical analysis of data and includes graphs and tables of analysis.

- November 9, 2012, *pH Report White Mesa Uranium Mill*, prepared by Intera – Provides source assessment study for monitoring wells in OOC for pH. Proposes modified pH Groundwater Compliance Limits for pH for all MW series monitoring wells based on field measurements.
- December 7, 2012, *Investigation of Pyrite in the Perched Zone White Mesa Uranium Mill Site*, prepared by Hydro Geo Chem, Inc. (HGC) – Provides findings of a study to support the regional geochemical process explaining decreasing pH trends at monitoring wells. The study analyzes quantities of iron pyrite (from monitoring well cores and cuttings) and models dissolution in the Burro Canyon Formation.

Based on the Directors review of these reports, a letter was sent to the Permittee, dated April 25, 2013, which agreed that revised GWCL's as provided for OOC parameters, and revised GWCL's for pH for all MW series monitoring wells are appropriate and will be included in a permit modification with some adjustments. The Director also noted that dissolution of pyrite as a root cause for pH decreasing trends appeared to be a possible explanation for apparent site wide decreases in field pH. Resolution of Stipulated Consent Agreement UGW12-03 is pending formal inclusion of the modified GWCL's in the Permit renewal. The GWCL changes are considered a major Permit modification and are discussed in section XIV below.

d. General Monitoring Wells MW-20 and MW-22

Monitoring wells MW-20 and MW-22 were installed in 1994 and are located at a distance of more than $\frac{3}{4}$ mile and one mile south of the tailings cells, respectively. When the State of Utah began oversight of the Facility in August 2004, there was no monitoring data for these wells. Therefore, the Director required, per a March 17, 2008 Permit modification, that the Permittee begin quarterly monitoring in both wells. After eight consecutive quarters of sampling, the Permittee was required to submit a report determining background groundwater quality and a calculation of groundwater velocities in the vicinity of wells MW-20 and MW-22. A determination would then be made by the Director whether or not these wells would be made point-of-compliance (POC) wells for the site.

After reviewing the June 1, 2010 Background Report for wells MW-20 and MW-22, the Director determined the following:

- Monitoring wells MW-20 and MW-22 are far downgradient from the nearest tailings impoundment. MW-20 is about three quarters of a mile away and MW-22 is about a mile away and cross gradient from the downgradient edge of Cell 4A making it unlikely that groundwater quality in samples from these wells today has been influenced by potential tailings cell seepage.

- One other far-downgradient monitoring well (MW-3A) exists between MW-20 and the nearest tailings cell.

Calculated average linear groundwater velocities for MW-20 and MW-22 are 0.33 feet per year (ft/yr) and 0.43 ft/yr, respectively. Therefore, any potential contaminant transport from the tailing cell liner, to the groundwater table, and then to the monitoring wells would take an extremely long time (thousands of years). Also contaminants would be subject to dispersion. Additionally, per a Permittee study of groundwater elevations and pathlines in the southwest area of the Facility⁴ it is unlikely that contamination from the tailings cells would be transported to either monitoring well.

Therefore, the Director determined that monitoring wells MW-20 and MW-22 would not be added as POC wells; however, the wells would be General Monitoring Wells where aquifer head and groundwater quality information would be collected for informational purposes. The wells would be sampled on a semi-annual frequency for the constituents listed in the Permit.

The Ute Mountain Ute Tribe has requested that monitoring well MW-22 be added as a POC well since it is the closest well to a resident of the Tribe. The Tribe also makes the assertion that the sampling results found in the well are due to tailings cell leakage.

When the State of Utah began oversight of the Facility in August 2004, the Director was concerned that the observations (primarily uranium) found in the wells on site could have come from potential tailings cell leakage. To address the concern, and in addition to other studies completed by the Permittee, the Director commissioned the University of Utah to investigate. This study was conducted at the Facility from July 17 - 26 of 2007. The purpose of the Study was to verify if the increasing and elevated trace metal concentrations (such as uranium) found in the monitoring wells at the Facility were due to potential leakage from the on-site tailings cells.

After review of the May, 2008 University Report¹¹, the Director determined that downgradient wells with excess total uranium concentrations (including well MW-22) are likely the product of surface recharge mobilizing natural uranium in the vadose zone, and not from potential tailings cell leakage. This conclusion was based on at least four lines of isotopic evidence.

1. Tritium Signature - wells MW-3, MW-3A, MW-14, MW-15, and MW-22 had tritium signatures in groundwater at or below the limit of detection (0.3 Tritium Units), see 2008 University Report p. 26. These values are more than an order of magnitude below the corresponding surface water results found in either the tailings cells or the wildlife ponds. Consequently, the groundwater in these five downgradient wells is older than water in the tailings cells, and is of a different origin than the tailings wastewater.
2. Stable Isotopes of Deuterium and Oxygen-18 in Water - the Deuterium and Oxygen-18 content of the groundwater matrix and tailings wastewater matrix was tested in all

of the water sources studied. University results showed that wells MW-3, MW-3A, MW-14, MW-15, and MW-22 (all downgradient with the elevated uranium concentrations) had Deuterium / Oxygen-18 signatures that were almost twice as negative as any of the surface water results (see 2008 University Report p. 42). Consequently, groundwater in these downgradient wells had a different geochemical origin than the tailings cell wastewater.

3. Stable Isotopes on Dissolved Sulfate - the University Study evaluated 2 stable isotopes found on sulfate minerals dissolved in the water samples (Oxygen-18, and Sulfur-34). These samples showed that the sulfate solutes in groundwater from downgradient wells MW-3, MW-3A, MW-14, MW-15, and MW-22 had a different isotopic signature than the sulfate minerals dissolved in the tailings wastewater. In the case of Oxygen-18 on sulfate, the downgradient wells showed more negative values than the tailings cells wastewater. For Sulfur-34, the results were inversed, with groundwater showing more positive values than the negative values seen in the tailings wastewater (see 2008 University Report p. 46). As a result, the sulfate dissolved in the downgradient wells, with elevated uranium concentrations, has a different origin than the tailings wastewater.
4. Wells with elevated metal concentrations. The University Study concluded that wells with high concentrations of metals (MW-3, MW-14, MW-15, MW-18, and MW-22) bear very different isotopic fingerprints than those of the surface water sites (e.g. wildlife ponds, and tailings cells) (2008 University Report p. 58). Regarding uranium concentrations in well MW-22, the University Study stated that "...it does not appear that the elevated uranium values are the result of leakage from tailings cells..." (2008 University Report p. 45).

In addition to these findings, the Director notes that if the tailings cells were leaking the monitoring wells located near the tailings cells would show evidence of the leakage well before MW-22.

e. Deep Water Supply Well: WW-2

Deep water supply well WW-2 is installed in the Navajo Sandstone aquifer. In the process of writing the original groundwater permit for the site, the Director reviewed well construction as-built drawing for the wells on site. The Director found that the construction of deep water supply well WW-2 appeared to be inadequate, in that it failed to provide an annular seal that would isolate the deep confined aquifer from the shallow unconfined aquifer. In response, the Permittee agreed to consider several alternatives for well WW-2 at the time of Facility decommissioning and this commitment was written into the Permit.

On October 8, 2009 the Ute Mountain Ute Tribe submitted comments for a proposed modification to the Permit. In the comments, the Tribe voiced a concern that the well creates a

direct conduit to the Tribe's drinking water source in the White Mesa Ute Community as they use the Navajo Sandstone aquifer for drinking water.

On January 14, 2010, the Permittee committed to verify the well casing and annular seal integrity of well WW-2 and agreed to remediate, if needed. The Permittee committed that it would perform the investigation and repair of well WW-2 (if needed) and submit a repair report. A compliance schedule item was added in the Permit to document this commitment. The schedule item also included different methods the Permittee could take to determine the seal integrity.

On January 24, 2012 the Permittee submitted an investigation report for well WW-2. The Director's review determined that the findings of the report were inconclusive to prove that well WW-2's casing and annular seal had physical and hydraulic integrity. Because well WW-2 is a deep water supply well and the water in the well could be used for drinking water, the Director met with Utah Division of Drinking Water ("DDW") to discuss well WW-2. DDW was familiar with well WW-2 at the Facility and told the Director that the Permittee is required to sample the well and submit the results to DDW. DDW indicated that if any of these constituents sampled exceed a maximum contaminant level (MCL), or if there is any detectable concentrations of volatile organic compounds (VOCs) observed, DDW will enforce remedial action.

The Permittee was issued a Notice of Enforcement Discretion for failing to perform any of the techniques listed in Part I.H.3(a) of the Permit for the well WW-2 investigation. However, the Director determined that even though the Permittee failed to perform any of the investigation techniques required in Part I.H.3(a) of the Permit, the deep aquifer found in well WW-2 was protected for the following reasons:

- Well WW-2 is located upgradient of the tailings cells and the Chloroform and Nitrate plumes; therefore, it is unlikely groundwater in this well has been affected or will be affected by these potential sources.
- Well WW-2 currently provides the Facility with water for eye wash stations and showers, is pumped several times a day, and yields about 160 gallons per minute. The deeper confined aquifer is protected due to the artesian conditions in the confined aquifer and the repeated removal of water from well WW-2. This active pumping will deliver any potential contaminants back to the ground surface for use in the Facility operations.
- Well WW-2 is regulated by the DDW. The Permittee is required to sample the well and submit the results to DDW. The DDW has assured the Director that if any samples exceed an MCL for any constituent or if there is any detectable concentrations of VOCs observed, the DDW will enforce remedial action.

V. UPDATED TABLE 1 – GROUND WATER CLASSIFICATION

It was noted that Table 1 included in Part I of the Permit (Specific Permit Conditions) regarding evaluation of total dissolved solids (TDS) in several monitoring wells needed to be revised based on a significant increase in the data population since initially calculated. The table includes updated calculations of TDS average concentration and standard deviation for wells which were initially calculated with twelve or fewer data points. Overall it appears that the results for average TDS concentrations in the recalculated wells remained consistent and that standard deviation results were larger for most of the recalculated wells. This is consistent with expected findings. It is noted that none of the wells require reclassification as a result of the recalculations.

VI. BACKGROUND MONITORING REPORT FOR MONITORING WELLS MW-35, MW-36, and MW-37

On May 1, 2014, the Permittee submitted a Background Ground Water Quality Report for monitoring wells MW-35, MW-36, and MW-37 (Background Report). The Background Report included new proposed GWCLs for the 38 constituents in each of three wells, for a total of 114 individual GWCLs. The GWCLs were established using the same Decision Tree/Flowchart that was used to calculate the GWCLs in the Permittees background groundwater quality reports dated October 2007 (existing wells) and April 30, 2008 (new wells). The flowchart is based on the following EPA Guidance:

1. February, 1989, "Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities Interim Final Guidance," U.S. Environmental Protection Agency, Office of Solid Waste, 530-SW-89-026, and
2. July, 1992, "Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities Addendum to Interim Final Guidance," U.S. Environmental Protection Agency, Office of Solid Waste.

The Flowchart also allows the permittee to consider a modified approach to setting GWCLs for upward trending constituents. The August 24, 2007 Conditional Approval for the Flowchart states that *“Please be advised that before the DRC (Director) considers such a proposal, DUSA (the Permittee) will be required to provide sufficient technical explanation and justification for why the most recent data is both representative and protective of local groundwater resources.”*

In the preparation of the Background Report, the Permittee asked the Director if they could consider newer EPA Guidance for upward trending constituents. The Director agreed and the Permittee also considered the additional EPA guidance document listed below for preparation of the Background Report:

- March, 2009, *“Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance. EPA 530/R-09-007”*, U.S. Environmental Protection Agency, Office of

Resource Conservation and Recovery, Program Implementation and Information
Division.

After review of the Background Report and consideration of the University of Utah Study Final Report; the Director determined the following: 1) The Director accepts 108 of the 114 GWCL values proposed by the Permittee in the May 1, 2014 Background Report; and 2) For the remaining six GWCLs, the Director will adopt the values calculated in tables 7, 8, and 9 of the July 14, 2014 Director Memorandum.

During the writing of the revised Permit and this Statement of Basis, a typographical error for the calculated GWCL for Nickel in MW-35 was identified. In the May 1, 2014 Permittee Background Report, the Permittee proposed a value of 5 µg/L for Nickel based on the fractional approach of the State GWQS for nickel. The GWQS for nickel is 100 µg/L. Therefore, using the fractional approach (50% for Class III) the GWCL should be 50 µg/L, not 5 µg/L. This error was also shown in the Director July 14, 2014 Review Memo and July 15, 2014 Approval Letter. However, the correct value of 50 µg/L for Nickel in MW-35 appears in Table 2 of the Permit.

Routine groundwater quality monitoring is conducted on a quarterly basis (4-times/year). However, the Director may allow a reduced frequency of routine groundwater sampling if site specific groundwater conditions warrant [see UAC R317-6-6.16(A)(2)]. For certain sites where groundwater velocities have been found to be low (e.g., less than 10 feet per year), the Director has approved a semi-annual sampling frequency (2-times/year) in order to avoid statistical problems such as auto-correlation, and allow a better measure of natural groundwater quality variations.

As described in the Permittee Ground Water Quality Discharge Permit - December 1, 2004 Statement of Basis, there are two different frequencies of routine groundwater monitoring at the Facility, as follows:

- Semi-annual (2-times/year) where groundwater velocity is less than 10 feet/year, and
- Quarterly (4-times/year) where groundwater velocity is equal to or greater than 10 feet/year.

Part I.H.4 of the Permit required the Permittee to install groundwater monitoring wells MW-36 and MW-37. Part I.H.5 of the Permit required the Permittee to calculate the average linear groundwater velocity calculated for the wells. The Permittee provided this information in the May 1, 2014 Background Report. After review of the Background Report, the Director found that the Permittee provided aquifer permeability data and average linear velocity calculations for the three new wells: MW-35 (8 feet/year), MW-36 (13 feet/year), and MW-37 (0.6 feet /year). As a result, the Director has decided that wells MW-35 and MW-37 should be sampled on a semi-annual basis and MW-36 should be sampled on a quarterly basis (see July 14, 2014 Director Memorandum, Table 3), as set forth in the Permit Parts I.E.1(b) and (c).

VII. UPGRADIENT MONITORING WELLS MW-1, MW-18 AND MW-19

Per Director review of the October 10, 2012 Source Assessment Report and April 13, 2012 pH Report, the Permittee requested the removal of Ground Water Protection Limits from three upgradient monitoring wells (well numbers MW-1, MW-18, and MW-19).

Per the Directors April 23, 2013 Review Memo (April 23, 2013; Attachment E): *“DRC agrees with the justifications provided by EFR, that far-upgradient wells are not likely to be impacted by current Mill activities based on review of kriged water level maps included with the Mill Quarterly Ground Water Reports. Specifically, per DRC review of the water level elevations, the elevations at monitoring wells MW-1, MW-18 and MW-19 are higher than water elevations in the Burro Canyon Aquifer beneath all of the Mill tailings cells. Additionally, those monitoring wells are located north and northeast of the tailings cells, local groundwater flow is to the south-southwest. If future groundwater gradients change such that there is reasonable evidence to suggest that any of the upgradient wells MW-1, MW-18 or MW-19 may be impacted by tailings cell discharge or other Mill related activities, then the Director will re-institute GWCLs in the Permit at any or all of the monitoring wells. Continued semi-annual (baseline) monitoring for all contaminants listed in Table 2 of the current Permit (Current - DRC 8/24/2012) will be required to continue for continued assessment of background groundwater quality at monitoring wells MW-1, MW-18 and MW-19.”*

Specifically, DRC justifications to allow removal of GWCLs at wells MW-1, MW-18 and MW-19 are as follows:

- 1. Per DRC review of water elevation maps and expected groundwater flow directions, wells MW-1, MW-18, and MW-19 are hydraulically upgradient from the Mill,*
- 2. Groundwater monitoring for all currently monitored parameters listed on Table 2 of the permit will continue at baseline monitoring frequencies and will be submitted with the Mill Quarterly Ground Water Monitoring Reports,*
- 3. Continuation of GWCLs at upgradient monitoring wells may result in unnecessary enforcement action and source assessment.”*

The Director also provided notification that the removal of Ground Water Compliance Limits at the upgradient monitoring wells appeared appropriate per an April 25, 2013 letter to the Permittee (Utah Division of Radiation Control, April 25, 2013). Removal of GWCL's at the upgradient wells (change is designation to general monitoring wells in the Permit) is considered a major Permit modification and is discussed in Section XIV below.

VIII. GROUND WATER COMPLIANCE LIMIT MODIFICATIONS

The Permittee has made several requests for ground water compliance limit modifications via Source Assessment Reports (SAR's) (in addition to the October 10, 2012 SAR discussed in Part IV.c above). Per the SAR's the Permittee proposed modifications to the Permit Part I-Table 2,

Permit Part I.E.1.c., and Permit Part I.E.3.d. The Permittee submitted requests for GWCL modifications (SAR's) as follows:

1. October 10, 2012 – Permittee Source Assessment Report⁶
2. November 9, 2012 – pH Report⁷
3. May 7, 2013 – Permittee Source Assessment Report for TDS Exceedances in Monitoring Well MW-29⁹
4. August 30, 2013 – Permittee Source Assessment Report for Selenium Exceedances in Monitoring Well MW-31¹⁰
5. January 13, 2014 – Permittee Source Assessment Report for Gross Alpha in Groundwater Monitoring Well MW-32¹¹
6. March 18, 2014 -- Permittee Source Assessment Report for Sulfate Exceedances in Monitoring Well MW-1 and Total Dissolved Solids Exceedances in Monitoring Well MW-3A¹²
7. December 9, 2015 – Permittee Source Assessment Report for Selenium, Sulfate, TDS and pH in Monitoring Well MW-31¹³
8. June 24, 2016 – Permittee Source Assessment Report for Sulfate in Monitoring Well MW-18 and Fluoride, pH, Cadmium and Thallium in Monitoring Well MW-24¹⁴
9. November 17, 2016 – Permittee Revised Statistical Analysis for Cadmium and Thallium in Monitoring Well MW-24¹⁵
10. January 16, 2017 – Permittee Revised GWCLs for Cadmium and Manganese in Monitoring Well MW-3A¹⁶

The Director reviewed the GWCL changes pending inclusion in the Permit as follows:

1. April 23, 2013 – Directors review regarding the Permittee October 10, 2012 Source Assessment Report, November 9, 2012 pH Report and December 7, 2012 Pyrite Investigation Report²⁵
2. July 15, 2013 – Directors Review regarding the Permittee May 7, 2013 Request (1st Quarter 2013 Ground Water Monitoring Report Review Memo)²⁷
3. September 17, 2013 – Directors Review regarding the Permittee August 30, 2013 Request²⁸
4. March 4, 2014 – Directors Review regarding the Permittee January 13, 2014 Request²⁹
5. June 5, 2014 – Directors Review regarding the Permittee March 18, 2014 Request³¹
6. February 16, 2016 – Directors Review regarding the Permittee December 9, 2015 Request³⁴
7. September 14, 2016 – Directors Review regarding the Permittee June 24, 2016 Request³⁵
8. December 20, 2016 – Directors Review regarding the Permittee November 17, 2016 Request³⁶
9. January 25, 2017 – Directors Review regarding the Permittee January 16, 2017 Request³⁷

A table of all proposed GWCL modifications is included in section XIV below and in the redline strikeout version of the proposed Permit (Attachment A).

IX. PERMITTEE REQUESTED MODIFICATION FOR COMMENCEMENT OF ACCELERATED MONITORING REQUIREMENTS

The Permittee submitted a letter and attachment request for Permit modification regarding accelerated monitoring schedules, request dated May 25, 2012. The request was made in response to a Director February 7, 2012 Director Notice of Enforcement Discretion regarding review of the Permittee's 1st, 2nd and 3rd Quarter 2011 Ground Water Monitoring Reports. The Permittee's Modification Request formalizes agreements made between the Director and the Permittee during a phone conference on April 5, 2010. The Permit modification affects Part I.G.1.b, which requires initiation of accelerated sampling. The modification changes the time period for commencement of accelerated monitoring from "immediately" for both monthly and quarterly monitoring to the accelerated monitoring period (monthly or quarterly) following Director receipt of the Permittee Exceedance Notice.

Per the April 5, 2010 telephone conference between the Director and the Permittee this schedule for commencement of accelerated monitoring was deemed appropriate due to increased sampling requirements in the facility Quality Assurance Plan (requirement for a 2 well volume purge) at the Facility and the need for more flexibility in preparing and submitting the Exceedance Notice to the Director, due to the extended time required for sample collection and longer timelines to receive all of the period laboratory reports. The Permittee proposed at the time to commence accelerated monitoring during the monitoring period following the submission of the 30-day Exceedance Notice to the Director.

X. REMOVAL OF ROBERTS POND

The Director notes that part 2.7.6 of the Permit Application summarizes the uses of Roberts Pond as follows: "*Roberts Pond receives periodic floor drainage and other wastewaters from Mill process upsets, is frequently empty, and was re-lined with new FML in May, 2002. In order to minimize any potential seepage release from Roberts Pond, the Director required the following in Part I.D.3(e) of the Permit: (i) EFRI shall operate this wastewater pond [Roberts pond] so as to provide a minimum 2-foot freeboard at all times. Under no circumstances shall the water level in the pond exceed an elevation of 5,624 feet amsl. In the event that the wastewater elevation exceeds this maximum level, the Permittee shall remove the excess wastewater and place it into containment in Tailings Cell 1 within 72-hours of discovery; (ii) At the time of Mill site closure, EFRI will excavate and remove the liner, berms, and all contaminated subsoils in compliance with an approved final reclamation plan under the Mill License.*"

The Director notes that during early 2014 the Permittee reported that the Roberts Pond Liner had torn. The Permittee proceeded to provide the Director additional reports concerning the pond including soil sampling results beneath the pond and evidence that the soils were contaminated. The Permittee then excavated soils to remove contamination to screening concentrations. The Permittee opted to completely remove the pond after the excavation activities, and submitted a

re-grading plan for Director Review and Approval. The Director subsequently approved the plan on August 5, 2015. Additionally, the Permittees Discharge Minimization Technology Monitoring Plan has been revised to remove inspection requirements associated with Roberts Pond. The Permittee has completed a drainage line directly to Cell 1, and other onsite diversions to handle discharges previously routed to Roberts Pond.

Based on these actions it is appropriate to remove Permit sections related to Roberts Pond. This is summarized in the Minor Permit Changes Section XV below.

XI. REMOVAL OF MONITORING WELL MW-3

A 2005 Permit Statement of Basis listed several construction issues associated with Monitoring Well MW-3. At that time it was decided that a replacement well should be installed and the Permit included a requirement to install the replacement monitoring well. The Permittee installed monitoring well MW-3A as a replacement during August 2005.

Specific issues concerning the Monitoring Well MW-3 construction were:

1. No geologic log is available for Monitoring Well MW-3 and it is not possible to verify whether screened interval is located at the base of the Brushy Basin Shallow Aquifer.
2. MW-3 was constructed without a filter media or sand pack across the screened interval.
3. A 10-foot long section of blank (non-perforated) casing was left at the bottom of the well below the screened interval which acts as a sump and contains stagnant water and sediment.
4. MW-3 is a low yield well. Water levels are typically only 5 feet above the base of the well screen.

These construction issues, combined with low water levels and low recharge rates in the well, have resulted in inconsistent results for several of the monitoring constituents in the well. It is noted that both monitoring wells, MW-3 and MW-3A, have been monitored by the Permittee since the installation of Monitoring Well MW-3A (11 years of data for both wells). The two wells are located in close proximity to each other and MW-3A does not show the same inconsistent results. This observation supports the finding that the MW-3 well construction has been the historical cause of fluctuating results and has likely resulted in GWCL exceedances of several monitoring parameters.

Based on these findings it was determined by the Director that continued monitoring of MW-3 was not necessary and that the well should be plugged and abandoned in conformance with State rules and regulations, as was intended during the 2005 review for the Statement of Basis. Well abandonment activities were completed on November 30, 2016 by Bayles Exploration Inc., a

licensed water well driller, under the direction of a licensed professional geologist (Stewart J. Smith) with Hydro Geo Chem, Inc. Based on this, sections of the Permit pertaining to monitoring of MW-3 have been removed.

XII. MODIFICATION OF SLIMES DRAIN COMPLIANCE REQUIREMENTS FOR TAILINGS CELLS 2 AND 3

The Permit Part I.D.3.b.3 has required the calculation of slimes drain tailings fluid elevation and comparisons with prior years to ensure that the tailings fluid elevations were lower, as measured in the slime drain pipe, for the current year as compared with the two previous years. This requirement became insufficient as the result of tailings fluid rise due to the emplacement of Phase I of the final cover on Cell 2 (per Reclamation Plan v. 5.1). Emplacement of Phase 1 of the cover has essentially surcharged the tailings.

In addition to placement of the Phase I final cover on Cell 2, a series of piezometers were installed to allow measurement of tailings fluid head across the cell. This allows for fluid elevation measurements across Cell 2, fluid elevation contouring across the cell, and provides a means to evaluate the overall effectiveness of the slimes drain pumping.

Since the physical state of Cell 2 has changed and is progressing towards construction of final cover, and since new tools, including piezometer measurements and enhanced settlement monitoring now exist to evaluate the effectiveness of the slimes drain dewatering, and to better project timelines for cell dewatering, it was determined that a specific plan for compliance at Cell 2 (and Cell 3 when dewatering activities commence) would be more appropriate than the previous compliance measure. A requirement for submittal of a Slimes Drain Compliance Plan has been added as Part I.H.1 of the Permit. This change will result in a more comprehensive compliance measure.

Based on the foregoing, the previous Part I.D.3.b.3 language and equation has been removed and replaced with a requirement for the Permittee to submit an annual report to the Director which includes slimes drain pumping volumes, results of slimes drain recovery tests, a calculation of average wastewater recovery elevation, and verification that the maximum fluid volume which could practicably be extracted from the slimes drain in accordance with the systems in place was removed. This measure is appropriate until Director receipt and review of the Slimes Drain Compliance Plan, at which time, it is expected that Part I.D.3.b.3 will be revised to include a more comprehensive reporting requirement.

XIII. RESOLVED COMPLIANCE SCHEDULE ITEMS – REMOVED FROM PERMIT

Completion of Compliance Item 1, On-site Chemicals Inventory Report, Part I.H.1

Part I.H.1 of the Permit required the Permittee to submit an On-Site Chemical Inventory Report at the time of Permit renewal. The Permittee compliance is summarized below:

- On January 16, 2012, the Director received the Revised Renewal Application for the Energy Fuels Resources Ground Water Quality Discharge Permit No. UGW370004. Appendix L of the revised Permit Renewal Application included the On-Site Chemical Inventory Report.
- In a March 19, 2014 Request for Information for the revised Permit Renewal Application, the Director asked that the Permittee update the Chemical Inventory Report and include historic chemicals used and their estimated volumes.
- On June 5, 2014, the Permittee provided an updated On-Site Chemical Inventory Report that included the requested information.

As described above, the Permittee has satisfied the requirements of Part I.H.1 of the Permit. Therefore, this compliance schedule item has been removed from the Permit.

Removal of Compliance Item 2. Infiltration and Contaminant Transport Modeling Work Plan and Report, Requirements Moved to Stipulation and Consent Order

Infiltration modeling was conducted for the monolithic ET cover and a complete description of the analyses was provided in EFR's March 2010 Revised Infiltration and Contaminant Transport Modeling (ICTM) Report. The modeling was updated to address the Director's March 2012 and February 2013 comments on the ICTM Report and to incorporate supplemental field investigations conducted in 2010 and 2012 for cover borrow material and in 2013 for in situ tailings. The updated infiltration modeling results were presented in EFR's submitted responses to the Director's March 2012 and February 2013 review comments in August 2012 and August 2015.

On November 11, 2015, the Director held a conference call with EFR outlining a plan to complete reclamation of tailings Cell 2. This plan includes field testing the ET cover using a constructed test cell on Cell 2 and a supplemental test cell located outside of the restricted area. The cover test cells will evaluate findings of the Infiltration and Contaminant Transport Model Predictions in the field. Completion of placement of the Proposed Cover Design on Cell 2 will be accomplished according to timelines and specifications outlined in the current Reclamation Plan (version 5.1), and will be conducted in two phases. The first phase will include the construction of the cover radon barrier across all of Cell 2 and completion of a demonstration that the ET cover will perform adequately according to performance monitoring at the cover test cell and supplemental test cell. Requirements related to the cover test cell construction and monitoring are included in a Stipulation and Consent Agreement (SCA), which includes timelines, performance criteria and stipulated penalties for violations. In the event the ET cover does not meet performance criteria outlined in the SCA, and these issues cannot be resolved by additional evaluation and groundwater modeling as specified in the SCA, the Director may reject the ET cover and revert to the currently-approved rock armor cover design.

The current actions required for the cover test cell, including potential requirements for additional groundwater modeling are included in the SCA, and therefore the ICTM Report

compliance item has been removed from the Permit.

Completion of Compliance Item 3, Plan for Evaluation of Deep Supply Well WW-2 , Part I.H.3

Part I.H.3 of the Permit required the Permittee to submit a report that documented an investigation of water supply well WW-2 to verify that the casing and annular seal is intact and creates both a physical barrier and maintains hydraulic isolation between the shallow unconfined and the deep confined aquifers. The Permittee actions are summarized below:

- On January 24, 2012, the Permittee submitted the Facility Evaluation of Deep Supply Well WW-2 Report. After review of the report, the Director sent the Permittee a Notice of Enforcement Discretion (NOED) for failing to perform any of the investigation techniques required in Part I.H.3(a) of the Permit. However, the Director did still find the deep aquifer was protected and closed out the project.

As described above, the Permittee has satisfied the requirements of Permit compliance schedule item I.H.3 of the Permit. Therefore, the Director has removed this compliance schedule item from the Permit.

Completion of Compliance Item 4, Installation of New Groundwater Monitoring Wells, Part I.H.4

Part I.H.4 of the Permit required the Permittee to install groundwater monitoring wells MW-36 and MW-37 to replace wells MW-33 and MW-34 and submit an As-Built report for the wells on or before June 30, 2011. The Permittee undertook the following action:

- The Permittee submitted the As-Built for well MW-36 and MW-37 on June 29, 2011 and the Hydraulic Testing report on June 28, 2011. The Director reviewed the reports and closed out the project on November 14, 2011.

As described above, the Permittee has satisfied the requirements of compliance schedule item I.H.4 of the Permit. Therefore, the Director has removed this compliance schedule item from the Permit.

Completion of Compliance Item 5, Background Groundwater Quality Report for Well MW-35 and New Monitoring Wells , Part I.H.5

Part I.H.5 of the Permit required that after completion of eight consecutive quarters of groundwater sampling and analysis of wells MW-35, MW-36, and MW-37, the Permittee would submit a Background Groundwater Report for Director Approval. The Permittee compliance is summarized below:

- The Permittee submitted the Background Groundwater Report for wells MW-35, MW-36, MW-37 on May 1, 2014. The Background Report was approved by the Director on July 15, 2015.

As described above, the Permittee has satisfied the requirements of Permit compliance schedule item I.H.5 of the Permit. Therefore, the Director has removed this compliance schedule item from the Permit.

Completion of Compliance Item 6, Detailed Southwest Hydrogeologic Investigation and Report, Part I.H.6

Part I.H.6 of the Permit required the Permittee to conduct an investigation to define, demonstrate, and characterize: 1) hydraulic connection and local groundwater flow directions between the area near Tailings Cell 4B, and the western margin of White Mesa and submit an investigation report on or before January 13, 2012. The Permittee compliance is summarized below:

- The Permittee submitted the Southwest Hydrogeologic Investigation Report on January 12, 2012. The Director reviewed the report and sent the Permittee an RFI on May 30, 2012.
- The Permittee submitted a revised Southwest Hydrogeologic Investigation Report on August 3, 2012. The Director reviewed the report and sent the Permittee an RFI on September 20, 2012.
- The Permittee submitted a 2nd revised Southwest Hydrogeologic Investigation Report on August 7, 2012. The Southwest Hydrogeologic Investigation Report was approved by the Director on February 21, 2013.

As described above, the Permittee has satisfied the requirements of Permit compliance schedule item I.H.6 of the Permit. Therefore, the Director has removed this compliance schedule item from the Permit.

Completion of Compliance Item 7, Modification to the DMT Monitoring and Cell 4A and Cell 4B BAT O&M Plans, Part I.H.7

Part I.H.7 of the Permit required the Permittee to submit proposed modifications to the currently approved DMT Monitoring and Cell 4A and Cell 4B BAT O&M Plans for Director approval on or before August 1, 2011.

- The Permittee submitted a modification for the Facility DMT and BAT plans on July 11, 2011. The Director reviewed the modification and sent the Permittee an RFI and Confirmatory Action Letter on September 13, 2011
- The Permittee submitted revised Facility DMT and BAT plans on February 29, 2012. The Facility DMT and BAT plans were approved by the Director on March 12, 2012.

As described above, the Permittee has satisfied the requirements of Permit compliance schedule item I.H.7 of the Permit. Therefore, the Director has removed this compliance schedule item from the Permit.

XIV. SUMMARY OF MAJOR PERMIT CHANGES

Removal of GWCL’s for Upgradient Wells MW-1, MW-18 and MW-19 Part I.C. Table 2

The removal of GWCLs in upgradient wells MW-1, MW-18 and MW-19 is appropriate for the reasons described above. These wells will be included as general monitoring wells and the Permittee will be required to monitor the wells for all compliance parameters, this language has been included in the Permit Part I.E.2.

GWCL Changes Part I.C. Table 2

The Permittee has submitted several Source Assessment Reports (SAR’s) in addition to the one discussed in section IV.c above (Requests for GWCL modifications were received from the Permittee and reviewed by the Director as discussed above. The table below lists the GWCL modifications that are included in the Permit.

Wells/parameters subject to GWCL modifications

Monitoring Well No.	Parameter	Current GWCL	Modified GWCL
MW-3A	Selenium	89 µg/L	109.58 µg/L
MW-3A	Sulfate	3640 mg/L	3949.27 mg/L
MW-3A	TDS	5,805 mg/L	6,028 mg/L ^(a)
MW-3A	Cadmium	8.3 µg/L	3.55 µg/L
MW-3A	Manganese	6,287 µg/L	383 µg/L
MW-11	Manganese	131.29 µg/L	164.67 µg/L
MW-12	Selenium	25 µg/L	39 µg/L
MW-24	Cadmium	2.5 µg/L	6.43 µg/L
MW-24	Fluoride	0.36 mg/L	0.47 mg/L
MW-24	Thallium	1 µg/L	2.01 µg/L
MW-25	Uranium	6.5 µg/L	7.25 µg/L
MW-26	Uranium	41.8 µg/L	119 µg/L
MW-27	TDS	1075 mg/L	1185.72 mg/L
MW-29	TDS	4,400 mg/L	4,570 mg/L
MW-30	Selenium	34 µg/L	47.2 µg/L
MW-31	TDS	1320 mg/L	1700 mg/L ^(c)
MW-31	Sulfate	532 mg/L	697.60 mg/L ^(c)
MW-31	Selenium	71 µg/L	86.81 µg/L ^(c)
MW-32	Gross Alpha	3.33 pCi/L	7 pCi/L ^(b)

^(a) Director Approval Letter Dated June 5, 2014

^(b) Director Approval Letter Dated March 10, 2014

^(c) Director Approval Letter Dated February 16, 2016

Wells subject to GWCL modifications for pH

Monitoring Well No.	Parameter	Current GWCL (S.U.)	Modified GWCL (S.U.)
MW-2	pH	6.5-8.5	6.72-8.5
MW-3A	pH	6.5-8.5	5.84-8.5
MW-5	pH	6.5-8.5	7.04-8.5
MW-11	pH	6.5-8.5	6.25-8.5
MW-12	pH	6.5 – 8.5	5.86-8.5
MW-14	pH	6.5 – 8.5	5.42-8.5
MW-15	pH	6.62 – 8.5	5.88-8.5
MW-17	pH	6.4-8.5	6.27-8.5
MW-23	pH	6.5-8.5	5.97-8.5
MW-24	pH	6.5-8.5	5.03-8.5
MW-25	pH	6.5-8.5	5.77-8.5
MW-26	pH	6.74 - 8.5	5.61-8.5
MW-27	pH	6.5-8.5	6.47-8.5
MW-28	pH	6.1-8.5	5.58-8.5
MW-29	pH	6.46-8.5	5.94-8.5
MW-30	pH	6.5-8.5	6.47-8.5
MW-31	pH	6.5-8.5	6.23-8.5 ^(a)
MW-32	pH	6.4-8.5	5.31-8.5

^(a) Director Approval Letter Dated February 16, 2016

Removal of Monitoring Well MW-3

The plugging and abandonment of Monitoring Well MW-3, pursuant to findings stated in a 2005 Statement of Basis and construction of replacement well MW-3A at that time, has been completed in accordance with State rules and regulations. Monitoring well MW-3 has been removed from the Permit Table 2. And Section E. (Ground Water Compliance and Technology Performance Monitoring).

Out of Compliance Status Changes Part I.G.1.

The Permit modification request to extend the timeline to report GWCL exceedances and commence accelerated monitoring is deemed appropriate and necessary due to increased onsite groundwater monitoring requirements and laboratory analysis timelines. These changes were verbally agreed to during an April 5, 2010 teleconference between the Director and the Permittee at which time it was communicated that the current Permit timelines were unfeasible.

XV. SUMMARY OF MINOR PERMIT CHANGES

Recalculation of TDS Average and Standard Deviation for Several Monitoring Wells Part

I.A. Table 1

Monitoring Wells which had initial calculations of TDS average concentrations and standard deviation with a data population of twelve or less were re-calculated to ensure consistent results using all historical TDS results. Based on the recalculations, none of the original groundwater classifications will be altered.

Addition of Monitoring Well TW4-24 as a General Monitoring Well Part I.E.2

In consideration of altered hydraulic gradients due to groundwater pumping for the chloroform remediation project, monitoring well TW4-24 (Currently used as a pumping well) will be included in the Permit as a general monitoring well and the Permittee will be required to sample the well for all compliance parameters semi-annually. This issue is additionally discussed in section IV.a. above

Chemicals Inventory Report, Part I.F.8, Table 2

Part I.F.8 of the Permit requires that the Permittee submit a Chemicals Inventory Report at the time of submitting an application for Permit renewal. Requirements have been added at this Part on what should be included in the report.

Clarification of BAT Requirements for Feedstock Material Stored Outside the Feedstock Storage Area Part I.D.11

Per the Permittee's June 5, 2014 response to a Director March 19, 2014 interrogatory regarding clarification of the Permit Part I.D.11, the Permittee requested a wording change. Per the Director's review of the response and the Permit, it is agreed that the language in Part I.D.11 needs additional clarification. The permit language has been revised to clearly state the requirements for feedstock material outside the feedstock storage area. Specifically, the Permittee is required to provide aisle ways between drummed material to allow inspection of all drummed material and ensure integrity and water tightness of the drums or overpacks, or to provide an approved hardened surface for drum storage.

Removal of DMT Requirements for Roberts Pond Part I.D.3.e and I.E.7.c

The Permittee found that the Roberts Pond liner had a tear during 2012 and removed the pond from service. Soil sampling beneath the pond was subsequently performed during 2014 and the contaminated soils were excavated. The Director issued an August 5, 2015 Approval Letter to backfill and re-grade Roberts Pond. The DMT Monitoring Plan was revised by the Permittee to remove inspections at Roberts Pond, which was subsequently approved by the Director on April 7, 2015. Since Roberts Pond is no longer in use and has been backfilled and re-graded according to approved plans it is appropriate to remove DMT requirements for Roberts Pond from the Permit. The Permit parts I.D.3.e and I.E.7.c have been removed.

Slimes Drain Compliance Item Cells 2 and 3 Part I.D.3.b.3 and Part I.H.1

Since the physical state of Cell 2 has changed and is progressing towards construction of final cover, and since new tools, including piezometer measurements and enhanced settlement monitoring now exist to evaluate the effectiveness of the slimes drain dewatering, and to better project timelines for cell dewatering, it was determined that a specific plan for compliance at Cell 2 (and Cell 3 when dewatering activities commence) would be more appropriate than the previous compliance measure. As such, the previous language has been updated to require relevant reporting data, and a requirement for the Permittee to submit a Slimes Drain Compliance Plan within two years of the effective date of the Permit has been added as a compliance schedule item. Upon Director receipt and review of the Slimes Drain Compliance Plan, it is expected that Part I.D.3.b.3 will be revised to include a more comprehensive reporting requirement.

XVI. REFERENCES

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Attachment A
Proposed Permit Changes -- Redline Strike-out Groundwater Discharge Permit UGW370004