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August 11, 2025

Amy Yeldell
DRMS Room 215,
1001 E 62nd Ave,
Denver, CO 80216

Re: Response, Whirlwind Mine, Permit No. M-2007-044, Water Quality Technical Revision

Dear Ms. Yeldell:

Energy Fuels Resources Inc. ("**EFRI"**) is in receipt of the Division of Reclamation, Mining and Safety ("**DRMS**") letter dated December 31, 2024, requesting updates to the hydrologic monitoring program for the Whirlwind Mine ("**Mine**"). EFRI requested and received approval for an extension of time from DRMS to respond by August 15, 2025. Response to DRMS request for additional information are as follows.

Exhibit U - Designated Mining Operation Environmental Protection Plan (Exhibit T)

Facility Evaluation

1. Diversion ditches, Collection ditches (all stormwater control features), Ore Pad Sump, Groundwater Monitoring Well(s) and HDPE waterlines are all considered EPF's under Rule 1.1(21) since they are designed to control or contain (prevent, monitor) designated chemicals, uranium, and uranium by-products. Please provide an evaluation of these facilities as required under Rule 6.4.21(7).

***EFRI Response*:** Exhibit T has been updated to include additional discussion of the Ore Pad Sump, Groundwater Monitoring Well(s) and HDPE waterlines. Additional description was provided for the Sediment Pond also. A redline version has been attached; however, additional edits will be required within this exhibit to revise Table T-2 as described in DRMS comment #3. Therefore, EFRI would request not to finalize this text until Western Water and Land ("WWL") has completed work related to Comments #2a and 2b, at which time edits to Table T-2 can be submitted as well.

Groundwater Information and Quality Data

2. Groundwater at the Whirlwind Mine has not been classified, so the statewide Basic Standards for Groundwater, Regulation No. 41 (Reg 41) apply at the site. Per Senate Bill 181, the Division is an implementing agency for Reg 41 which confers the responsibility to establish points of compliance and to apply groundwater standards at those points; however, it does not give the Division the authority to set groundwater quality standards. (Guidance on groundwater monitoring and protection compliance requirements is given in a 2019 Technical Bulletin. Supplementary guidance on groundwater sampling and analysis was published in 2024).

   Per Reg 41.5(A) and (C), statewide numeric standards for Radionuclides and Organic Pollutants apply, and since TDS at the site does not exceed 10,000 mg/L, the Interim Narrative Standard (Reg 41.5(C)(6), also applies.

   Rule 3.1.7(6) requires that one or more points of compliance shall be established, if there is the potential for a mining operation to impact groundwater. Currently there is only one monitoring well at the Whirlwind Mine, W-1, which monitors groundwater downgradient of the waste pile; it has not been identified as a point of compliance.

Please review the groundwater monitoring program in the light of the guidance documents cited above and the 2022 groundwater characterization study completed by Western Water and Land, and:

a. Propose, with justification, locations where points of compliance will be established. This may or may not include W-1, but the presumption is that each area where there is the potential for groundwater to be impacted will have a point of compliance. As well as an extended narrative, this information should be summarized in a table in the permit file.

EFRI Response: Based on the requested information, EFRI is contracting with WWL to assist in this task, which requires multiple steps and will take additional time and resources to complete. These steps may include field mapping, in addition to the 2022 groundwater characterization study, to identify stratigraphy characteristics to determine suitable drilling locations based on projected mining areas. Once locations are determined, drilling will be done in a phased approach to verify the presence or absence of groundwater. During these phases certain boreholes may be constructed into wells based on the groundwater encountered. Phase I drilling will target a downgradient (from W-1 well) location to investigate the occurrence of groundwater in the Top Rim unit as well as the underlying and overlying units. If groundwater is encountered in the Top Rim unit and the underlying unit, during Phase I drilling, the need for a second phase of drilling will be evaluated. If needed, Phase II drilling would involve an upgradient location to provide additional information pertaining to hydraulic gradients for the hydrostratigraphic zones. Should Phase I and II successfully identify the Top Rim and underlying unit as water bearing, a third phase may be proposed. Phase III drilling would be used in establishing a horizontal hydraulic gradient and groundwater flow direction. WWL will be preparing a report to assist EFRI in a technical revision to the permit which will include tabulated information as applicable.

b. Propose numeric protection limits for groundwater quality parameters. These NPLs must implement the Interim Narrative Standard; in practice this means that the NPL for each parameter is the most restrictive value from Tables 1-4 of Reg 41, unless an exemption is granted. Again, please summarize this information in a table in the permit file.

***EFRI Response*:** Once the monitoring wells are installed, WWL will perform at least five quarters of sampling, in accordance with DRMS regulations. After the laboratory analysis is completed, WWL will compile the data, classify and propose numeric protection limits for the groundwater to be monitored, in accordance with Regulation No. 41. The sampling and protection limits shall be specified under Rules 6.4.21(8), (9) and (12). This will include a determination regarding monitoring well W-1, as well as other points of compliance, as warranted. WWL will be preparing a report to assist EFRI in a technical revision to the permit which will include tabulated information as applicable.

c. The sampling and protection limits shall be specified under Rules 6.4.21(8), (9) and (12). W-1 appears to be the down gradient Point of Compliance. Explicitly include this language. If other point(s) of compliance exist also, please clarify.

***EFRI Response*:** Please see response to 2.b. above.

3. Rule 6.4.21(9)(c) provides the analytical detection limits and groundwater quality parameters.

a. Additional parameters have been added to Table T-2 (Water Monitoring Parameters at Whirlwind Mine) but the method, detection limit and locations are blank.

***EFRI Response*:** Table T-2 will be revised and updated at the conclusion of actions described in Comment #2, as information will likely changes as a result of that work.

4. Surface water and groundwater have different detection limits under WQCC. Table T-2 appears to

include both surface and groundwater monitoring locations. Please clarify if the parameters listed in Table T-2 apply to groundwater, surface or both.

***EFRI Response*:** Table T-2 will be revised and updated at the conclusion of actions described in Comment #2, as information will likely changes as a result of that work.

Rule 7.3 Environmental Protection Facilities

5. Under Rule 7.3.2(2) please commit to providing the Division with a certified verification by a professional engineer or other appropriately qualified professional that will confirm that the facility was constructed in accordance with the approved design plan.

    a. Note that per Rule 7.3.2(1) acceptance of the verification shall be a separate approval from the TR decision. The water treatment system shall not be utilized until final certification from the Division is Received.

***EFRI Response*:** Linkan will be providing a confirmation of construction which EFRI will forward to DRMS for inclusion into the permit file.

Appendix F

6. On page 3 of the Materials Containment Plan the secondary phone number is crossed out. Please provide the applicable phone number to contact in the event of a spill.

***EFRI Response*:** Updated page 3 of the Materials Containment Plan to include a current phone number. The redlined text is included.

If you have any questions please contact me at (307)351-9165 or dkolkman@energyfuels.com, or Scott Bakken at sbakken@energyfuels.com.

Sincerely,

ENERGY FUELS RESOURCES (USA) INC.
Dawn Kolkman
Permitting Manager, Regulatory Affairs

Encl. Exhibit T – redline document only
Appendix F – redline document only

cc: M. Munson (DOGM), J. Whittington (BLM),
S.Bakken, T. Groves, N. Martin, D. Kolkman (EFRI)

DESIGNATED MINING OPERATION ENVIRONMENTAL PROTECTION PLAN EXHIBIT T

1. General Plan

An Environmental Protection Plan and Monitoring Plan is being submitted because the project is classified as a Designated Mining Operation by the Division of Reclamation, Mining and Safety (DRMS). This classification results from the current DRMS definition of Designated Mining Operations that includes a "mining operation at which toxic or acid-forming materials will be exposed or disturbed as a result of mining operations." The Whirlwind Project falls into this category because mine water will be pumped to the surface intermittently where it will be treated and discharged. The mine water contains elevated levels of radionuclides, uranium, and trace metals that could be considered chronically toxic if ingested over an extended period of time. Additionally, some of the water treatment chemicals are strongly acidic and, in their undiluted form, could present a potential threat to human health or the environment.

In preparing this Environmental Protection and Monitoring Plan, the proposed mine plan was evaluated to determine what portions of the project could potentially generate "toxic" materials that would require implementation of additional environmental controls. The following three aspects of the mine plan were identified as having the greatest potential to impact the surrounding environment, especially ground and surface water.

1) Mine Waste Disposal: Surface water runoff from the waste pile and infiltration of precipitation through the waste material could potentially liberate radium, uranium, and other metals resulting in impacts to ground water and/or surface water. Synthetic Precipitation Leaching Procedure (SPLP) tests were conducted on representative waste rock samples to determine the waste's potential for leaching radionuclides and metals. The test results, which are presented in Appendix A, indicate that the waste rock has low leaching potential. The activity and concentration levels of all the constituents in the leachate generated from the tests were below maximum state water quality limits. Based on these results, the waste pile was designed in accordance with standard mine

methods in which surface runoff is diverted around the waste pile while surface runoff within the pile is directed to a sediment pond. Discharges from the sediment pond will be sampled and analyzed periodically to verify that any water being discharged meets state water quality standards. The waste rock embankment is discussed in detail in Section 5 of Exhibit D.

2) Ore Storage: SPLP testing of representative ore samples generated a leachate containing elevated levels of radium, uranium, arsenic, and selenium (see Appendix A). To ensure that the temporary stockpiles of uranium ore will not impact ground or surface water, the ore pad will be limited to 0.5 acre and a berm will be maintained around the pad that directs all runoff to a small concrete sump. The overflow from the sump will connect to a waterline that will deliver the water to the Untreated Water Tank (see Exhibit D Section 6). From there, the water will be pumped to the treatment plant for removal of radionuclides and trace metals prior to discharge. The ore pad will be underlain by a geosynthetic clay liner (GCL) on a prepared subgrade. The liner will be protected by 2.5 feet of compacted cushion material and 1 foot of run of mine (ROM) waste rock. Details regarding the construction of the ore pad are presented in the Golder Associates design report, which has been included as Appendix J. The liner is designed to prevent downward migration of leachate that could potentially impact ground water. At the end of mining, the liner and cover material will be excavated and placed in the Whirlwind Mine in an appropriate (i.e., dry) area prior to sealing. This is discussed in more detail in Exhibit E – Reclamation Plan.

3) Mine Water Treatment and Discharge: Excess water will need to be removed from the mine on an intermittent basis. As discussed in Exhibit G, ground water inflow into the mine is attributed primarily to seepage from water-bearing zones above the mine workings. This ground water is of poor quality and degrades further when in contact with the ore zone resulting in mine drainage that requires treatment prior to discharge into the local ephemeral drainage.

Mine water management and treatment are the focus of this Environmental Protection and Monitoring Plan because it is these activities that place the mine project into the Designated Mining Operation permit category and, the environmental controls for waste rock disposal and ore storage are already described in detail in Exhibits D and E.

The mine water will be pumped on an intermittent, or as necessary, basis from a sump inside the Whirlwind Mine to the surface for treatment. A 3-inch diameter high density polyethylene (HDPE) pipe will be buried from the portal through the bench area, down the bench slope, under County Road 5/10 and to the Lined Untreated Water Tank shown on Map C-2. The pipe will be buried below the frost line to prevent freezing. A 2-inch diameter HDPE pipe will be buried along side the 3-inch pipe to allow pumping of water from the tank back to the mine's head tank, which is located in the decline.

Direct precipitation runoff from the ore stockpile pad will be directed to a sump that will overflow into a 6-inch diameter HDPE pipe, or equivalent, that will also drain to the Lined Untreated Water Tank. This pipe will be buried alongside the water pipe from the mine. As can be seen from Map C-2, the ore pad area and surrounding loading area is approximately 0.5 acre.

HDPE pipe of various lengths and diameters are used primarily for conveyance of various types of water to different points within the mine. As described above HDPE pipe conveys mine water, storm water, etc. to the Lined Untreated Water Tank where it is collected for treatment as described below. Some of the pipe is buried to protect from freezing. The pipe has been sized to meet the capacity needs for the intended use. Periodic inspections, via required stormwater inspections, will be performed to ensure proper conveyance and note any breaches for immediate repair.

The Untreated Water Tank has a capacity of 164,000 gallons. It is designed to contain up to 50,000 gallons of water during normal treatment operations. The tank has 65,000 gallons of additional capacity for scheduled and unscheduled periods of treatment plant downtime and 49,000 gallons of additional reserve storage capacity for the surface water runoff from the ore pad and direct precipitation on the tank surface from a 100-year storm event. The Untreated Water Tank is lined with two 30-mil, reinforced synthetic liners. Leak detection is provided by an 8-oz. geotextile fabric that is located between the two liners and that is connected to a dip tube leak detector. The entire tank area is also underlain by a GCL on a prepared subbase. This liner provides a third level of containment in the event of a leak.

Water from the Untreated Water Tank will be pumped to the Lyntek system water treatment trailer, where barium chloride and ferric sulfate will be added to remove radium, uranium, and trace metals.

The treated water will flow by gravity into the Settling Tank which allows for particle growth and settling of contaminants before it flows by gravity to the Polishing Tank for additional solids removal. Settled, clarified water from the Polishing Tank will be pumped to the Linkan treatment trailers. The Linkan system will treat the incoming water with hydrochloric acid for pH adjustment prior to it entering a series of sand filters, ion exchange and activated carbon columns (in that order) to remove residual contaminants. A contingent sodium hydroxide dose may be used before the finish water tanks if the pH should fall below the anticipated discharge limits. The treated water will then be pumped to two finish water tanks prior to discharge. Both the Settling and Polishing tanks have a nominal capacity of 7,500 gallons and were constructed with multiple liners in the same manner as the Untreated Water Tank. The treated water will discharge from the finish water tanks by gravity flow to the ephemeral tributary of Lumsden Creek located immediately west of the treatment area, as shown on Map C-2.

Lyntek Incorporated, which specializes in designing treatment plants of this type, has prepared a detailed design of the treatment plant and water tank system. The plant design is included as Appendix H. Linkan's newly designed system is an added treatment to ensure compliance with lower discharge limits per the discharge permit with CDHPE.

2. Maps

In Appendix H, the following maps are enclosed:

Flow Sheet, Water Treatment Plants
General Trailer Layouts

In addition, Map C-2 - Mine Plan, which is included in Appendix I, shows the layout of all surface facilities for the Whirlwind and Packrat sites.

3. Other Agency Environmental Protection Measures

<u>Local Agencies</u>

A Conditional Use Permit for the mine was approved by Mesa County. The Conditional Use Permit included many of the same environmental protection measures described in this permit application. The County permit also included more detailed analyses of road maintenance on County Road 5/10, traffic volume, and noise generation. Road maintenance included installing road warning signs, additional culverts for storm water control, and graveling sections of the road to allow safe access to the mine during inclement weather. The anticipated traffic volume at the intersection of John Brown Canyon Road and Highway 141 is less than 4 trips per day during peak traffic hours; therefore, auxiliary turn lanes will not be required at this intersection. Noise reduction measures will include mufflers or silencers on the generators and fans used at the site.

Energy Fuels has obtained an individual sewage disposal system permit from Mesa County for construction and operation of a septic system at the site. The proposed location of the leach field is north of 5/10 Road next to the treatment plant as shown on Map C-2. Energy Fuels will also apply for building permits from the County prior to building more permanent structures on site. Currently, temporary structures and self-contained porta-bathrooms are present on site during exploration activities. The required permits will be obtained prior to replacing the temporary structures with more permanent facilities. The septic system will be installed in accordance with applicable state and county regulations. Bottled water will be supplied for drinking purposes and water needed for other uses such as showering will be transported to the site from a potable source. A permit is not required for this type of system because the number of employees will be less than 25, which is the current permitting threshold for these types of water systems.

At the present time, no Grand County, Utah permits have been identified as being necessary for proposed mining activities.

Federal Agencies

The project is located entirely on public land managed by the U.S. Bureau of Land Management (BLM). A Plan of Operations has been submitted to the BLM. The Plan of Operations is identical to the 112d Permit Application except for formatting and additional analysis of environmental impacts associated with cultural resources, socioeconomics, radioactivity, site occupancy, site management during temporary mine closure, cave resources, threatened and endangered species, and air quality. The

identification of appropriate environmental protection (i.e., mitigation) measures will be determined by the BLM as part of the National Environmental Policy Act (NEPA) analysis that will be conducted for this project. A summary of anticipated environmental protection measures follow.

1) Cultural resources identified as being eligible for the National Register of Historic Places will be avoided.
2) Socioeconomic impacts to local communities will be positive but relatively minor in extent due to the limited number of employees at the mine.
3) Regrading and placement of the clay-rich topsoil cover will result in the reclaimed site having higher background radiation levels than the immediate surroundings but well within risk-based standards for remote sites.
4) For security reasons, one to two people may reside on site in a small trailer. The trailer will be either equipped with self-contained water and wastewater systems or plumbed into the mine utilities.
5) Additional environmental protection measures will be stipulated during periods when the mine is temporarily closed. These measures will focus on general site cleanup, maintenance, and security.
6) Bats currently may be found in some of the mines in Lumsden Canyon including the Packrat Mine. No bats have been identified in the Whirlwind Tunnel. Bat mitigation measures, such as maintaining one or more of the surrounding historic mines open as alternate roosting sites, may be required by the BLM.
7) A biological survey of the mine areas did not identify any threatened or endangered species of wildlife and vegetation. The Townsend's big-eared Bat, which is a sensitive species, may be present in some portions of the Packrat Mine.
8) Fugitive dust will be controlled in accordance with the requirements of Energy Fuels' Fugitive Particulate Emission Permit (see Other State Agencies below). This will include treatment of haulage roads with magnesium chloride and/or water sprays. The ore stockpile will also be sprayed with water if the ore dries out. Treatment of County Road 5/10 will be done in accordance with Mesa County's requirements, which include application of magnesium chloride to the county roads two to three times per year. Use of mine water for dust suppression will be limited to the mine roads and pads.

A Spill Prevention, Control and Countermeasure (SPCC) Plan will be prepared and maintained in conformance with the U.S. Environmental Protection Agency's (EPA's) regulations for aboveground

storage of more than 1,320 gallons of petroleum products. This plan will provide measures for properly storing and handling petroleum products and responding to, and reporting, spills. A copy of the most recent SPCC Plan for the site is included in Appendix F.

A 404 dredge and fill permit is not required from the U.S. Army Corp of Engineers because no drainages or wetlands will be impacted by surface disturbing activities. If this should change in the future, Energy Fuels would request a jurisdictional determination from the Corp for the drainage that would be impacted. If the affected drainage was determined to be a water of the United States, Energy Fuels would obtain a permit from the Corp and approval from the BLM prior to construction. For example, installation of a culvert to access a remote ventilation shaft could trigger the need for a Nationwide Permit Application to the Corp if the drainage is considered jurisdictional.

Ore transportation will be conducted by independent trucking contractors. These contractors will be required to follow all U.S. Department of Transportation rules for hauling uranium ore.

Other State Agencies

The Colorado Discharge Permit System (CDPS) permit issued by the Water Quality Control Division (WQCD) established the limits for all chemical constituents that must be controlled in the discharge of treated water. The permit was originally issued in July 2007. It was later renewed in 2015. A copy of the 2015 permit is included as Appendix L. The treated mine water will be discharged into an ephemeral tributary to Lumsden Creek, which when flowing, discharges into the Dolores River. The permit requires sampling and analysis for selected radionuclides and metals on a weekly and monthly basis at the discharge point. The permit standards are based on the water quality criteria established by the state for Stream Segment 3a of the Dolores River. A Material Containment Plan will also be developed that provides guidance for the storage, use, cleanup, training, and reporting associated with the use of water treatment chemicals on site. The most current Material Containment Plan for the site is presented in Appendix F.

A Stormwater Management Plan (SWMP) is currently in place and implemented for exploration activities on site. The plan was recently expanded to include the proposed mine and reclamation activities described in this Plan of Operations. This plan, which is required by WQCD, addresses both

permanent and temporary best management practices as well as stormwater monitoring. A copy of the plan has been provided to both the BLM and DRMS.

Energy Fuels submitted and received approval from the Colorado Air Pollution Control Division (APCD) for three Air Pollution Emission Notices (APENs). These APENs quantify potential air pollutants from fugitive dust, generator emissions, and mine ventilation emissions. All three sources are considered to be minor sources by the APCD. Fugitive dust controls include applying magnesium chloride and water to mine haul roads and county access roads, maintaining a high moisture content in the ore stockpile, and prompt revegetation of topsoil stockpiles and reclaimed areas. The generators used on site will be modern units with relatively low emissions and noise levels. Ventilation emissions will be recorded continuously and the results will be modeled annually using an EPA approved method to determine radiation levels at the nearest receptor.

A solvent-cleaning station may be installed in one or both of the maintenance shops. These stations generally consist of a cleaning sink mounted on a small drum of solvent. The solvent is pumped into and used in the sink and then recycled back to the drum via a gravity drain. The drums of solvent are periodically replaced by a vendor that recycles the solvent. If these stations are installed, Energy Fuels will acquire the necessary permit(s) from the Colorado Hazardous Materials and Waste Management Division (HMWMD). The electrical transformers to be used on site will not contain Polychlorinated Biphenyls (PCBs). As addressed in Section 4.5 of Appendix H and Section 6 of this exhibit, sludge produced from the water treatment system will be disposed of in accordance with HMWMD's Radiation Management Program's regulations for Technologically-Enhanced Naturally Occurring Radioactive Materials (TENORM).

Utah State Agencies

A small mine permit has been approved by the Utah Division of Oil, Gas and Mining (DOGM) for the installation and eventual reclamation of the vent shafts proposed in Utah. This application had similar content to Sections 14 and 16 of Exhibit D and Section 5 of Exhibit E. DOGM, with BLM input, will be responsible for determining the reclamation bond amount for proposed surface disturbances in Utah.

4. Other Agency Permits

Other permits and plans required for this operation that will include environmental protection measures are listed below. All of these permits and plans, with the exception of the Mesa County building permit, are in place.

1 – CDPHE Colorado Discharge Permit System Permit with the Water Quality Control Division
2 – BLM Plan of Operations (includes a third party environmental assessment of the plan)
3 – Mesa County Conditional Use Permit
4 – CDPHE Fugitive Particulate Emission Permit with the Air Pollution Control Division
5 – CDPHE Stormwater Management Plan with the Water Quality Control Division
6 – EPA Spill Prevention Control and Countermeasures Plan (SPCC)
7 – Mine Safety Health Administration, Mine Permit
8 – CDNR Water Right and Well Permit with the Division of Water Resources
9 – Mesa County Building Permit
10 – Mesa County Health Department Individual Sewage Disposal System Permit
11 – Utah DOGM Small Mine Permit

CDPHE = Colorado Department of Public Health and Environment
CDNR = Colorado Department of Natural Resources

5. Designated Chemical Evaluation

The water treatment chemicals commonly used on site include barium chloride,ferric sulfate, hydrochloric acid, and sodium hydroxide.. Sulfuric acid, hydrochloric acid, and sodium metabisulfite have also been used in the system to reduce pH and oxygen levels, respectively. The ferric sulfate, sulfuric acid, and sodium metabisulfite are low pH chemicals in their undiluted state and, in that form, meet the definition of a "designated chemical." After mixing, the chemicals will be added to the untreated water in dilute concentrations that present minimal risk to human health or the environment. Sodium hydroxide may be used to increase the pH should it fall below the discharge limits. The chemical mixing will be performed within the treatment plant using appropriate personal protection

equipment (PPE), with adequate ventilation, and under the supervision of a certified wastewater treatment operator.

The water treatment chemicals are designed to help remove potentially harmful constituents from the mine discharge water during the water treatment process. In the Lyntek system barium chloride and ferric sulfate will be added to the untreated water to precipitate radionuclides and metals. These chemicals will be premixed in reagent tanks of about 300 gallons each. A spare reagent tank has also been included in the plant design as a contingency measure should an additional water treatment chemical be added to the treatment process. During the initial shakedown period for the treatment plant, both sulfuric acid and sodium metabisulfite have been added in this spare tank to treat selenium. The sulfuric acid lowers the water pH, which helps precipitate selenium. Metabisulfite reduces the oxygen levels in the water, which changes selenium from its selenate form to selenite, which is more easily adsorbed in the chemical precipitant. It is unknown at this time whether sulfuric acid and metabisulfate will continue to be used; it is unlikely that both would be necessary. Addition of a flocculant could also be beneficial to the treatment process. Flocculants are typically non-toxic chemicals that cause the fine particles in solution to agglomerate into flocs, which settle much more rapidly than would the individual dispersed particles.

The chemical precipitate produced from the treatment will settle out in the Settling Tank as a sludge. This sludge will contain low levels of radionuclides and metals. Based on testing performed at a similar facility, the metal concentrations and radioactivity levels are expected to be well below the regulatory thresholds that would require disposal of the sludge as a hazardous waste (see Section 4.5 of Appendix H).

After an average residence time of about 10 hours in the Settling and Polishing Tanks, the water will be pumped from the Polishing Tank to the Linkan treatment trailers where it will be dosed with hydrochloric acid to obtain a pH which is optimal for ion exchange performance. The water will flow into a 300-gallon agitated feed tank before being pumped to a series of fiberglass reinforced vessels containing sand filtration media, strong base anion exchange resin, arsenic/selenium selective ion exchange resin, and activated carbon, in series and in that order. The media filters polish residual solids that carry over from the Polishing Tank while the two ion exchange systems remove residual

uranium, arsenic and selenium. The activated carbon is included to polish residual organics from the treated water to prevent aquatic toxicity. A contingent sodium hydroxide dose will be available just before the finish water tanks should the pH ever be below the anticipated discharge limits.

Magnesium chloride or a similar non-hazardous chemical will be used to treat haul roads within the mine and waste pile area. The chemical will be added in a dilute solution to the road surface where it will bind with the road material. The hard surface created by this treatment will minimize the amount of fugitive dust generated by mine haulage activities. The road treatment solution will be stored in a tank near the mine portal entrance. The tank will be bermed to contain any spills or other releases to the environment.

Diesel fuel, oils, and antifreeze will be used in the mine equipment. Storage and use of these products is discussed in Exhibit D, the SPCC Plan, and the Material Containment Plan. The current SPCC and Material Containment Plans for the site are provided in Appendix F.

6. Designated Chemicals and Materials Handling

Pallets of dry chemicals, up to 1000 lbs. each, and 55-gallon drums of chemical solution will be stored in the treatment plant trailer. Drums containing chemical solutions will be stored on spill-containment pallets or in secondary containment basins. As discussed below, the trailers are also equipped with a secondary containment tank that is connected to the floor drain. The water treatment chemicals will be stored in quantities that are less than their reportable quantities. Petroleum products and antifreeze will be stored in above-ground storage tanks, drums, and smaller containers. All storage areas will have secondary containment that will capture the products in the event of a spill or leak.

The complete description of how the water treatment chemicals will be used and stored is explained in Appendix H in the Lyntek and Linkan systems reports. The Environmental and Operator Safety Plan is presented in Section 4.0 of the same appendix and the SDS sheets for the primary chemicals are also attached to the same. The expected use rate of barium chloride is 1.3 tons per year and the expected rate of ferric sulfate use is 0.2 tons per year. Hydrochloric acid will be dosed from a 275-gallon IBC tote in the new containerized system and the sodium hydroxide will be dosed from a 55-gallon barrel.

The acid and base will be separated completely and contained on their own individual secondary containment vessels. SDS sheets for all chemicals are maintained in a binder at the mine site.

With the addition of barium chloride and ferric sulfate to the mine water, a sludge precipitate will form that contains radium, uranium, arsenic and other metals. The Settling Tank has been designed to contain the full amount of sludge produced for the currently projected mine life of 10 years. As described in the reclamation plan, the sludge will be shipped to a mill for uranium recovery, disposed of in an appropriate off-site landfill, or mixed with concrete and disposed of in a dry location within the upper portion of the Whirlwind decline.

If the rate of sludge production is more than anticipated due to an increased solids load from the mining operation or the mine life exceeds 10 years, than a one time sludge removal would be needed in the latter part of the mine life. This material would be removed from the Settling Tank and either 1) dried and disposed of at a off-site facility approved to handle such material, according to the TENORM regulations of the CDPHE or 2) mixed with ore and transported to a uranium mill for recovery.

Spills and leaks from the treatment system will be contained as described in Section 4.5 and 5.0 of Appendix H, and will not result in a release to the environment. Liquid spills will be contained in the treatment trailers or be directed to the floor drains that discharge into a 275-gallon secondary-containment tank located immediately outside the trailers. This solution will be evaluated for content and then either recycled for plant use, pumped to the Untreated Water Tank, or disposed of off-site at an approved facility. If a significant spill should occur from one of the 300-gallon reagent tanks, the plant will be shut down to prevent a situation where water could flow through the system without proper chemical dosing.

Sections 4.0, 5.0 and 6.0 of Appendix H provide chemical information, a material handling plan, and a monitoring plan respectively. Appendix F presents the current SPCC and Material Containment plans for the mine. These plans will be updated whenever the storage or use of chemicals and petroleum products changes. The procedures and controls discussed in appendices F and H are designed to

minimize the potential that an upset condition within the plant could adversely impact the surrounding environment.

If it is necessary to temporarily shut down the mine, dewatering operations will continue on an intermittent basis. If the plant is not needed because mine operations are consuming all of the ground water inflow, the plant will be shut down until needed. Temporary shutdown will include minimizing the volume of water contained in the water tanks, draining liquid reagents from the tanks, and locking the trailer and gates to prevent unauthorized access.

7. Facilities Evaluation

Maps and drawings describing the facility layout are included in Appendix H. Map C-2 in Appendix I shows the relative location of the treatment facility, tanks, and point of discharge. The proposed portable treatment plant with its secondary containment features is a proven design that has been used successfully at other locations. The plan takes into account site conditions by locating the treatment plant and water tanks in a relatively flat area that provides sufficient space to allow for the extra tank storage capacity that may be needed in the event of a plant outage or large storm event. The plant area is located downslope and separate from the main mine area with its own separate access off County Road 5/10. It is surrounded by a chain link fence so that access is controlled and limited to authorized personnel. The use of fabricated tanks and a portable trailer to house the treatment plant will facilitate future closure and reclamation of the site.

7.1 Water Balance

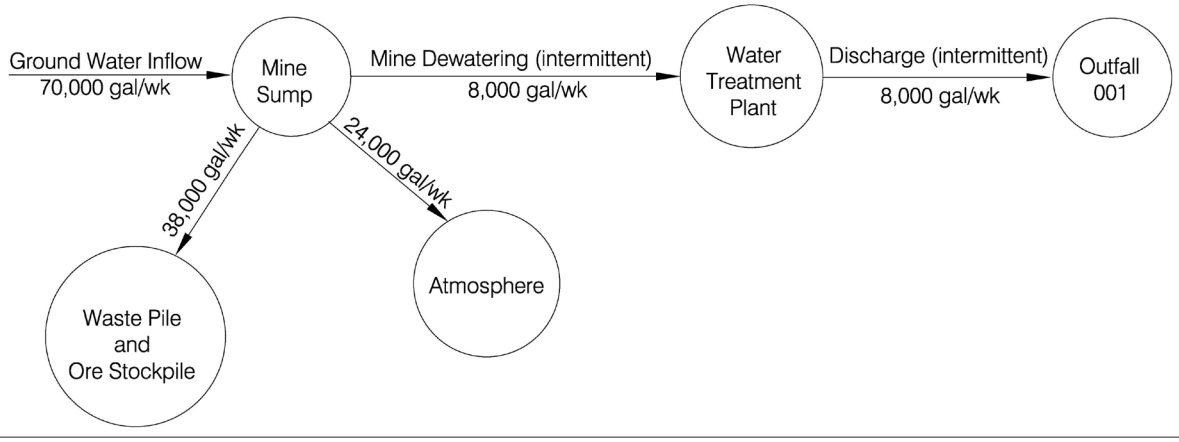
As discussed in Exhibit G, the upper Salt Wash ore zone is relatively dry. The majority of the ground water found in this unit originates from the Burro Canyon and Brushy Basin aquifers above. This water enters the mine workings through the Whirlwind decline, the existing Ten-Straight Shaft, historic exploration drill holes, and natural fractures and faulting. Based on records kept by Pioneer Uravan and Umetco, Energy Fuels believes that the water inflow into the Whirlwind and Packrat mine workings averages about 7 gpm. Historically, the ground water entering the mine workings collected in sumps and was used in mining operations for drilling and dust suppression purposes. Because the

ground water inflow rate was relatively low, mine operations consumed most of this water when the mines were active.

After the mines shut down, ground water accumulated in the low areas of the mine workings until equilibrium was established between the water source and the ore formation. This accumulated ground water will need to be pumped out, treated, and discharged prior to starting full-scale mining operations. The water treatment system is designed to treat 20 gpm. During initial dewatering, the system will operate 24 hours per day to remove the water collected in the lower portions of the mine plus the additional ground water inflow during this period. Once the mine is dewatered, the plant operation can be reduced to one shift per day.

Most, if not all, of the ground water inflow into the Whirlwind Mine will be consumed by mining activities when the mine is put into production. A water right to consume this water has been approved by the district water court. During mining operations, the ground water inflow will be directed to mine sumps where it will be used for drilling and dust suppression. Most of the water used during drilling flows back out of the drill holes and into the nearest mine sump, where it is then circulated back to the drilling equipment. However, some of the water remains in the rock, which is blasted and mucked out with small loaders. Some water is also lost to evaporation as dry air from the surface is circulated through the mine for ventilation purposes. The anticipated water balance during production is shown on Figure T-1 and described in the narrative below.

FIGURE T-1 MINE WATER BALANCE



The mining plan calls for an initial mining rate of 100 tons of ore with an average of 275 tons of waste rock generated per workday. Assuming that the broken material averages eight to nine percent moisture content, an average of about 7,700 gallons of water will be removed in the mined material per workday. As the mine develops, production is expected to increase along with water use and consumption. As shown in the calculation below, this means that most of the projected ground water inflow will be consumed by mining.

Ground Water Inflow = 7 gpm x 60 minutes x 24 hours x 7 days/week = 70,560 gals/week
Water Consumed = (7,680 gal/day x 5 days/wk) = 38,400 gals/week

The added moisture in the ore and waste is beneficial in reducing fugitive dust emissions from the ore stockpile and waste rock pile. The moisture also promotes higher densities in the waste rock material, which is compacted by the loaded buggies and other mobile equipment used on top of the waste rock pile.

Water will also be evaporated by the mine's ventilation circuit. Approximately 100,000 cubic feet per minute of air will be circulated through the mine during the initial stages of development and production. The water saturation level in the air will likely increase by an average of 30% or more while the air is circulated through 1 to 2 miles of drift. At an approximate elevation of 7,000 feet, a 30 percent increase in saturation is equivalent to 0.0002 pounds per cubic foot (pcf) of air. As shown below, a significant volume of water is expected to be lost in the mine ventilation circuit.

Water Evaporated = 100,000 cfm x 0.0002 pcf x 1gal/8.3 lb = 2.4 gpm or about 24,000 gals/wk

As the mine expands, Energy Fuels expects that pumping, treatment, and discharge of water will be needed only intermittently. This may include pumping in the spring when ground water inflows may increase due to snowmelt, after weekends and holidays, and in the event that open exploration holes are mined into (which is not uncommon in historic mine areas). As discussed in Section 10, Energy Fuels will plug point sources of ground water inflow as they are encountered during the normal course of mining. This is expected to further reduce the need for future water treatment at the site.

7.2 Treatment System Safety Features

The safety features of the treatment system components consisting of the Untreated Water Tank, Settling and Polish Tanks, and the Treatment Plant are described in more detail below.

Untreated Water Tank Safety Features

The Untreated Water Tank was installed in the fall of 2007 and consists of interlocking fabricated panels that support a multiple liner containment system. Prior to tank construction, topsoil was removed from the treatment area and the area was graded and compacted. Fine-grained squeegee material was then placed and compacted to create a smooth and level surface for tank installation. The interlocking panels were installed first and were anchored with blocks to prevent movement. Next, a geosynthetic clay liner (GCL) was installed on the prepared subbase between the panels as an extra precaution against seepage. The tank installation was completed by installing two 30-mil synthetic liners within the panel support system. A geotextile was also installed between the two liners and then connected to a monitoring dip stick to provide leak detection. This system provides both multiple containment and leak detection in the event that the upper liner is punctured.

The Untreated Water Tank has a total capacity of 164,000 gallons. To provide adequate settling of suspended particles in the mine water, the tank will be maintained at a nominal operating level of 50,000 gallons. The tank is designed with an additional 65,000 gallons of storage capacity for 6.5 days of mine pumping at an inflow rate of 7 gpm. The 7 gpm inflow is the expected rate of mine dewatering that would be required to keep the Whirlwind/Packrat mine workings dry when the mine is idle. When the mine is operating, most of this water will be consumed by drilling and other mining activities and the volume of water requiring treatment will decrease proportionately.

The Untreated Water Tank is also designed to contain the calculated 49,000-gallon direct precipitation and runoff volume generated during a 100-year, 24-hour storm event on the ore pad area and tank surface. Runoff from the ore pad will flow to a sump in the corner of the pad and then overflow through a pipe to the Untreated Water Tank.

Ore Pad Sump

This feature protects downstream hydrology. The Ore Pad Pump captures and contains precipitation and runoff from the Ore Pad, preventing stormwater that has come into contact with the mined ore on the pad from flowing downstream. The Ore Pad Sump is illustrated on Map C-2. There are no chemicals or treatments associated with this feature as the sump. The water is only contained in the sump temporarily, as described above. Excess water in the sump overflows via HDPE pipeline to the Untreated Water Tank where it is then treated prior to discharge. Monitoring and sampling are therefore performed only within the water treatment process. As described above the Ore Pad Sump is designed for a 100-year storm event as follows. Any ore sediment accumulating in the sump will be periodically removed and placed back onto the ore pad which will then be taken to the White Mesa Mill.

The expected volume of runoff from the ore pad area was calculated using the SURVCADD program and shown below:

Runoff Curve Number and Runoff

Project: Whirlwind Mine By: GL
Location: Ore Pad Storm Volume Checked: GL
Developed Watershed

1. Runoff curve number (Cn)

Cover description	*CN*	*Soil Type*	*Area*
Pad compacted	*92*	*disturbed*	*0.810 Acres (This is the total area draining to the sump)*

CN (weighted): 92

2. Runoff
Frequency ..... : 100 yr
Rainfall, P (24-hour) .. : 2.90 in
Runoff, Q ..... : 2.0668 in

Runoff Volume ..... : 0.1395 Acre-Ft = = 40,600
Volume of Direct Precipitation on Tank = (2.9 in./12) x 68 ft x 68 ft/(7.48 gal/ft^3) = 8,400 gal.
Total Extra Volume Required for 100-yr storm event = 40,600 gal. + 8,400 gal. = 49,000 gal.

Treated Water Settling Tank Safety Features

The two Treated Water Tanks (a.k.a., Settling Tank and Polishing Tank) were installed in identical fashion to the Untreated Water Tank. The Settling Tank is designed to handle the full amount of precipitated sludge produced from the water treatment process over the life of the mine (see Section 3.3 of Appendix H). The level of sludge will be monitored on an ongoing basis during operation. The treated water from the Settling Tank could be directly discharged; however, a Polishing Tank has been included in the design to provide additional holding capacity and the opportunity to sample the water prior to discharge.

Treatment Plant Safety Features

Safety procedures for daily plant operation, with redundancies and backups are summarized below:

1) All plant personnel will be fully trained and supervised in the operation of the plant by a state certified industrial wastewater operator. Annual refresher training and additional training for any facility alterations will be provided. Training records will be maintained onsite during operations.

2) Once the ore pad is constructed, the Untreated Water Tank will have a float valve installed at the 115,000-gallon level, which corresponds to a freeboard level of 1.5 feet. If the water reaches this level, the float valve will trigger the mine pump to shut down and/or sound an alarm. The 1.5 feet of freeboard will provide 52,000 gallons of additional storage capacity, which is sufficient to contain the 100-year, 24 hour storm event runoff from the ore pad area plus direct precipitation on the tank.

3) Plant personnel will be required to inspect the plant at the start and periodically during each shift.

4) Any liquid chemical spills in the Lyntek trailer will be collected in a floor drain and diverted to a 400-gallon, secondary-containment tank located immediately outside the trailer. Any liquid chemical spills in the Linkan trailers will be collected in a floor drain and diverted to a 275-gallon sump which is fed to the Untreated Water Tank.

5) Any shutdown of the generator will shut down the entire plant, including the reagent feed equipment and the pump from the Untreated Water Tank to the plant.

6) Level controls in the reagent feed tanks will shut down the entire plant if any tank reaches a volume of less than or equal to 5% of its capacity.

7) The ongoing monitoring and sampling procedures are outlined in Appendix H – Section 6.0.

8) An Emergency Response Plan has been prepared and is included with the Material Containment and SPCC Plans in Appendix F. The Emergency Response Plan provides direction on how to respond to an upset condition at the plant that presents a threat to worker safety and/or the environment.

8. Ground and Surface Water Information

Map G-1 shows the regional hydrology of the Beaver Mesa area and all the nearby springs, streams, ditches, wells and other water features from the mesa to the confluence of Lumsden Creek with the Dolores River. The River is 5.1 miles downstream from the mine discharge point. The strata and aquifers within 2 miles of the site are comprised of the following in the order of their occurrence:

- Sandstones of the Burro Canyon Formation, (known discharge at DP Spring at Lumsden Fault)
- Sandstones of the Brushy Basin member of the Morrison Formation (closest known discharge is Willow Creek located southeast of Beaver Mesa)
- Sandstones of the Salt Wash member of the Morrison Formation (known discharge at PR Spring)
- Sandy shale and mudstone of the Summerville Formation (aquitard with no aquifers)
- Slick Rock member of the Entrada Sandstone (possible aquifer but no known springs)
- Dewey Bridge member of Entrada Sandstone (no known aquifer on Beaver Mesa))
- Sandstones of the Navajo Sandstone (possible aquifer but no known springs)
- Sandstones of the Kayenta Formation (possible aquifer but no known springs)
- Wingate Sandstone ((possible aquifer but no known springs)
- Sandstones of the Chinle Formation (possible spring in Lumsden Canyon)

Figure G2 shows a stratigraphic section of the geologic formations for the area. Map G-2 shows the formation outcrop areas, old mine workings, wells, springs, mine portals, mine shafts, and other features in relationship to the planned Whirlwind Mine. Surface topography is also shown on this map.

Exhibit G provides detailed information on the formations, springs, ground water and surface water found on Beaver Mesa and downstream in Lumsden Canyon.

Overall, there is very little groundwater in the area. Although numerous perforations exist from the Burro Canyon and Brushy Basin aquifers into the old mine workings, the discharges from the portals were minimal in the past and have since ceased. The only exception was the Rajah 30 portal, which was sealed. This is discussed in detail in Exhibit G.

There are no known wells or other uses in Lumsden Creek within 2 miles downstream of the planned discharge location. The treatment plant will discharge in the middle fork of Lumsden Creek, which is an ephemeral stream. It flows only in response to spring thaw and large runoff events. Over the distance of approximately 5.15 miles from the planned discharge point to the Dolores River, Lumsden Creek drops 2,515 feet from an initial elevation of 7,050 feet to an elevation of 4,535 feet. This is an average grade of 9.2%. The approximate distances from the mine discharge point to key locations are presented in Table T-1 below.

Table T-1 Lumsden Canyon Drainage from Whirlwind Mine to Dolores River

Segment #	From	To	Length Ft	Cumulative Length Ft	Comments
1	Mine Discharge	Packrat Mine	2,040	2,040	Steep Canyon
2	Packrat Mine	Junction of North fork from Dutchman Mine and DP Spring	3,791	5,831	Steep Canyon
3	Junction N Fork	Junction with East Fork From Raja 49	1,330	7,161	Steep Canyon
4	Junction from East Fork	Lumsden Spring	8,300	15,461	Steep Canyon
5	Lumsden Spring	Mouth of Canyon	3,327	18,788	Steep Canyon
6	Mouth of Canyon	Dolores River	8,410	27,198	Mild Slopes

The nearest recorded occurrence of any usable water downstream in the Lumsden Creek drainage is PR Spring, located 2,040 feet downstream of the discharge point. This spring flows at approximately 4-10 gallons per minute and feeds a stock tank, which then overflows into a minor drainage. The water flows from the base of the Top Rim sandstone in the Salt Wash and reportedly infiltrates into the soils prior to reaching Lumsden Creek. The spring water is of poor quality, as it contains elevated levels of radium, uranium, arsenic and selenium.

The next closest downstream water occurrence is Lumsden Spring. There is an upper and lower contact for the spring, as recorded by the BLM in 1993. This spring is 2.93 miles downstream of the discharge point of the treated water. When the spring was sampled by Energy Fuels in April 2007, it was flowing at 7 gpm. The water contained elevated concentrations of uranium and selenium, but was of

better quality than PR Spring. The 1993 samples of this water collected by the BLM exhibited elevated levels of radium 226 and uranium. See Appendix E for a summary of the water data collected for the general area.

The only major fracture system in the area is the Lumsden Fault (see Map G-2), which has a vertical displacement of slightly less than 100 feet. It is located north of the Packrat portal and trends SW – NE. DP Spring, which is located upstream in the west tributary of Lumsden Creek, occurs at or near the fault. It appears that Burro Canyon ground water flowing to the northeast along the known dip of 1.75 degrees encounters the fault and is forced to the surface at this point. The water quality of this spring is relatively good but it degrades significantly as it flows through the toe of the old Dutchman mine dump, which is located in the northwest drainage channel of Lumsden Canyon.

The Whirlwind Mine waste pile, treatment tanks and other facilities are located in the Brushy Basin member of the Morrison Formation, as shown on Map G-2. There are no known fractures in the immediate vicinity. Although the Brushy Basin member is known to have some minor aquifers, it primarily contains shales and mudstones which prevent downward migration of water. There are no known springs in the area of the waste rock pile or the other surface facilities of both portals.

9. Ground Water Quality Data

Ground water quality data is available for all the major geologic formations in the Whirlwind Project area. Representative samples have been collected from the Burro Canyon Formation at the BLM Well and DP Spring. Upper Brushy Basin sample data has been collected from the two shallow wells known as the Cherokee Wells and Willow Spring, which are located east of the mine site. Middle and Lower Brushy Basin samples have been collected from drill holes completed as part of past uranium exploration and environmental investigation projects. Two water samples were also recently collected from the Lower Brushy Basin the unit intersects the Whirlwind Decline. The Salt Wash has a discharge at PR Spring that has been sampled extensively. Ground water data is also available from past mine discharges in the area (Packrat Mine, Lumsden #2, and Rajah 49) and from the current water pools in the Whirlwind decline and Packrat drifts. Water quality data for the springs, groundwater, surface water and mine water are presented in Appendix E.

The water quality data and other information collected from the Beaver Mesa aquifers indicate that:

1) the aquifers located immediately above and below the mine workings are limited in extent, thickness, and potential recharge;
2) the water quality deteriorates with depth on the mesa. The Burro Canyon and the Upper and Middle Brushy Basin aquifers are of relatively good quality while the Lower Brushy Basin and Salt Wash aquifers contain high levels of salts, metals, and radionuclides;
3) the mine workings, which are located at the very top of the Top Rim Salt Wash unit is a tight formation containing very little in-situ ground water;
4) most of the water in the mine workings is entering the mine from above through natural fractures and pre-existing exploration holes, vent shafts, and declines; and,
5) the water quality of the ground water flowing into the Salt Wash deteriorates further because of contact with the uranium-bearing sandstone that contains elevated levels of salts, metals, and radionuclides.

The conclusions presented above are based on the water information presented in Exhibit G.

10. Ground Water Control and Monitoring

Reduction of ground water inflows into the mine during mining operations and after mine closure will minimize the potential impacts to ground and surface water in the area. It will also provide cost savings for Energy Fuels by limiting the volume of water that will need to be pumped and treated. Monitoring and ground water characterization will be conducted during and after mine operations, both within the mine and in the two closest aquifers, to create a model of the local ground water system and identify any impacts to ground water that may occur as a result of mining activities.

10.1 Ground Water Control Measures

Reduction of ground water flows will be accomplished by: (1) implementing an inflow source control program at the start of and during mining operations, and (2) constructing hydraulic seals during closure and reclamation to further reduce ground water inflow from point sources and non-point sources. Details of the proposed ground water control program follow.

Point Source Control

During mining operations, Energy Fuels will identify those locations where ground water is entering the mine. This will include both point sources and area where seepage occurs over a broader area. Potential point sources consist primarily of historic mining features such as open exploration holes and un-grouted vent shafts and declines. Non-point sources include seepage from fracture systems and more permeable sandstone lenses. The locations and estimated flow rates where ground water is entering the mine workings will be identified and plotted on a map, where possible.

Each of the ground water inflow locations will be evaluated to determine whether the inflow can be prevented or reduced in volume as part of active operations or at time of mine closure. Point sources can be plugged or partially plugged by installing packers in the opening and then grouting the opening above the packer through the packer mandrel or by drilling from the side and injecting a concrete grout. Packers are inflatable and/or mechanical devices that can be wedged tightly in an opening. Larger openings, such as around the outside of a vent shaft, may require the installation of forms that can then be filled hydraulically with a cement grout. Sprayed structural (e.g., polyurethane) foam can also be used at times to create temporary support for the subsequent installation of permanent seals.

It may also be possible to grout or otherwise plug some point sources from the surface. In most cases, this will be limited to larger features such as vent shafts that can be readily located on the surface. Surface plugging of cased vent shafts would, in most cases, consist of drilling around the opening and sealing the opening off from shallow aquifers by injecting grout. Surface exploration drill holes drilled by Energy Fuels Resources are plugged in accordance with existing regulatory and specific exploration permit requirements. Most historic surface exploration drill holes cannot be located and plugged on the surface because the collar area of the holes has typically caved and been filled in over time.

After identifying those areas where immediate action can be taken, Energy Fuels will conduct sealing operations. This may require the assistance of a grouting contractor with specialized equipment. The sealing operations and observed reductions in ground water inflow rates will be documented. Those

seepage areas that cannot be sealed during mining operations will be evaluated for sealing at the time of mine closure as discussed below under Closure Source Control.

As the mine is developed, point source control will continue to be implemented. New vent shafts will be grouted where they pass through aquifers so that there is no conduit available for ground water inflow. Historic exploration holes and other points of ground water inflow encountered during mine development will be evaluated and, where practicable, sealed using packers and injected grout.

Closure Source Control

Point Source Control is expected to reduce the ground water inflow rate into the mine and the volume of water that will need to be pumped and treated during active operations. However, there will be other areas where ground water inflow cannot be controlled during mining. The Whirlwind decline is a good example of this type of situation. The decline passes through the lower Brushy Basin aquifer over a distance of about 200 feet. The seepage along this contact is barely detectable but the overall inflow is significant (i.e., as high as 2 gpm). There does not appear to be a reliable method for sealing off this inflow during active mining operations and some, if not all, of this water will still be needed to support drilling and dust suppression activities in the mine.

Energy Fuels proposes to seal off the portion of the decline that is making water during final reclamation by installing a hydraulic seal downgradient of the seeping sandstone lenses The aquifer is perched and present only at the base of the channel sandstone unit; therefore, the water level behind the bulkhead seal is expected to stabilize at or near the ground water inflow point within the decline. Energy Fuels will monitor the water elevation above the lower seal until it reaches equilibrium plus an additional 5 quarters (i.e., 1.25 years). This will be done by manual measurement since an upper seal will not be installed.

The pool is not expected to migrate significantly because it will be contained within low-permeable Brushy Basin mudstones and shales. A schedule for taking water level measurements and water quality samples will be proposed to DRMS and the BLM prior to sealing based on the inflow rates measured

at that time. Once the pool reaches and maintains equilibrium for 5 quarters, the portal will be backfilled and reclamation of the site can be completed.

Exhibit E – Reclamation Plan provides additional details for the bulkhead seal in the decline. Other areas of low, generalized seepage will also be evaluated as part of closure activities for possible implementation of inflow reduction measures. Energy Fuels has also agreed to include a contingency bulkhead seal in the reclamation bond for the site (see Exhibit E).

10.2 Ground Water Monitoring and Characterization

Ground water will be monitored (1) within the mine, (2) in a monitoring well completed in the lower Brushy Basin, and (3) at PR Springs. This information will be used to establish baseline conditions, verify compliance with regulations, and construct a model of ground water flow and quality for the site. Proposed water quality parameters and test methods are presented in Table T-2 below.

Table T-2 Water Monitoring Parameters at Whirlwind Mine

Parameter	Method	Det. Limit	Unit	Moni-toring Well W-1	Mine Water	PR Springs	Storm Water	Treated Water
Major Ions (See Note 1)								
Alkalinity, Total as CaCO3	E310.1/A2320 B	1	mg/L	X	X	X	X	
Bicarbonate as HCO3	E310.1/A2320 B	1	mg/L	X	X	X	X	
Calcium	E200.7/E200.8/ E215.1	1	mg/L	X	X	X	X	
Chloride	E300.0/A4500-Cl B	1	mg/L	X	X	X	X	
Fluoride	A4500-F C/Technicon 380-7WE	0.1	mg/L	X	X	X	X	
Magnesium	E200.7/E200.8/ E242.1	1	mg/L	X	X	X	X	
Phosphorus	E200.7/E365.1	0.1	mg/L	X	X	X	X	
Potassium	E200.7/E200.8/ E258.1	1	mg/L	X	X	X	X	
Sodium	E200.7/E200.8/ E273.1	1	mg/L	X	X	X	X	
Sulfate	A4500-SO4 E/E300.0	1	mg/L	X	X	X	X	
Nitrate as N	E353.2	0.05	mg/L	X	X	X	X	
Physical Properties (See Note 2)								
Chemical Oxygen Demand (COD)	HACH 8000 /E410.1/ E410.4	1	mg/L					X
pH	A4500-H B/E150.1	0.1	s.u.	X	X	X	X	X

Parameter	Method	Det. Limit	Unit	Moni-toring Well W-1	Mine Water	PR Springs	Storm Water	Treated Water
Total Dissolved Solids (TDS)	A2540 C/E160.1	10	mg/L	X	X	X	X	X
Total Suspended Solids (TSS)	A2540 D/E160.2	10	mg/L	X	X	X	X	X
Metals (See Note 3)								
Arsenic	E200.8/E200.9	0.005	mg/L	X	X	X	X	X
Aluminum			µg/L					X
Barium	E200.7/E200.8	0.1	mg/L	X	X	X	X	
Beryllium	E200.7/E200.8/ E200.9	0.001	mg/L	X	X	X	X	
Boron	E200.7/E200.8	0.1	mg/L	X	X	X	X	
Cadmium	E200.7/E200.8/ E200.9	0.001	mg/L	X	X	X	X	X
Chromium	E200.7/E200.8/ E200.9	0.01	mg/L	X	X	X	X	X
Copper			µg/L					X
Iron	E200.7/E200.8/ E200.9/ E236.1/E200.2	0.03	mg/L					X
Lead	E200.7/E200.8/ E200.9	0.01	mg/L	X	X	X	X	X
Manganese	E200.7/E200.8/ E200.9	0.01	mg/L	X	X	X	X	X
Mercury			µg/L					X
Molybdenum	E200.7/E200.8/ E246.2	0.005	mg/L	X	X	X	X	X
Nickel	E200.7/E200.8/ E200.9	0.01	mg/L	X	X	X	X	X
Selenium	E200.8/E200.9/ A3114B	0.005	mg/L	X	X	X	X	X
Silver			µg/L					X
Uranium	E200.8/E908.0	0.01	mg/L	X	X	X	X	X
Vanadium	E200.7/E200.8/ E286.2	0.1	mg/L	X	X	X	X	X
Zinc	E200.7/E200.8/ E200.9	0.01	mg/L	X	X	X	X	X
Non-Metals								
Cyanide, Weak Acid Dissociable	ASTM D2036	0.005	mg/L					X
Radionuclides – Total								
Radium 226	E903.0	0.2	pCi/L	X	X	X	X	X
Radium 228	E904.0/RA-05	1.0	pCi/L	X	X	X	X	X
Radionuclides – Dissolved								
Radium 226	E903.0/E200.2	1.0	pCi/L					X

Notes:
1 SAR (sodium adsorption ratio) and ionic balance calculations will be provided for all samples except treated water.
2 Physical parameters including dissolved oxygen, specific conductivity, pH, and temperature will be measured at the time of sample collection of all samples.
3 All metals will be analyzed for total metals with two exceptions (or as stated in individual permit):
- treated water samples will be analyzed for dissolved iron; and
- groundwater samples collected from monitoring well W-1 will be analyzed for dissolved metals only.

Mine Water Monitoring and Reporting

Energy Fuels will document existing water conditions within the Whirlwind Mine complex (i.e., Packrat workings and the Whirlwind Decline) as safe access is gained to the various areas. This information will be collected and reported quarterly to DRMS and the BLM. The quarterly hydrological report will include:

1) Mapped inflow locations and flow rates (quarterly measurement)
2) Description of each inflow and possible source reduction measures (initial report)
3) Proposed point source and closure source control measures (initial report)
4) Results of any source control measures implemented during mine rehabilitation (as completed)
5) Water sampling and analytical results for each inflow greater than 1 gpm (minimum of two sampling events per inflow taken over the first two quarters)
6) Documentation of any new inflow locations, flow rates, and water quality
7) Mapped locations and depth of standing water and any associated flow rates within the mine drifts (quarterly measurement).
8) Sampling and analytical results of representative pools of standing water (minimum of two sampling events at up to three locations)
9) Records of mine water volumes pumped, treated, and discharged as well as the volume of water that is used during mining (i.e., hauled out of the mine in the produced ore and waste and exhausted to the atmosphere by the mine ventilation system).

PR Spring Monitoring and Reporting

The monitoring program will also include recording of the flow rate and sampling and analysis of PR Spring on a quarterly basis for the first 5 quarters of the project. After 5 quarters of baseline monitoring, the spring will be checked quarterly for flow rate and sampled and analyzed on an annual basis. PR Spring flows from the base of the Top Rim sandstone and represents the closest downgradient sampling point (from the mining zone) for ground water. The spring seeps from an area that supports tree and shrub growth, as opposed to the relatively sparse vegetation in surrounding areas. The point for sample collection and flow measurements will be an existing PVC pipe from which water flows into a stock tank before overflowing into the drainage below. Quarterly flow rates

and water quality analyses will be reported in the quarterly hydrological report to DRMS and the BLM. Any changes in flow rate and/or water quality will be discussed and evaluated.

In conjunction with monitoring activities at PR Spring, monitoring personnel will also perform a pedestrian survey of the Top Rim sandstone within Lumsden Canyon. This survey will be performed over a distance of about 1,000 feet to the south of PR Spring and 1,500 feet to the northwest of PR Spring. Any seeps or wet spots encountered in this area will be plotted on a map, measured for approximate flow rate, and sampled and analyzed if the flow rate is sufficient to collect a sample. This seep survey will be performed in late spring of each year after the snow has melted. In addition, the flow rate at upgradient DP Spring will be measured and reported quarterly.

Lower Brushy Basin Monitoring and Reporting

Energy Fuels will install a monitoring well (Well W-1) just north of County Road 5/10 as shown on Map C-2. This monitoring well is located downgradient of the Whirlwind surface facilities and the bulkhead seal in the decline. The monitoring well will consist of threaded 2-inch polyvinylchloride (PVC) pipe screened in the lower water-bearing zone of the Brushy Basin (approximately 150 feet below ground surface). If the well produces water, it will be sampled 8 times in the first 15 months after completion (i.e., immediately after completion and every two months thereafter) to establish baseline conditions. If the well does not produce sufficient water for sampling or is dry, water levels will be recorded during the 8 baseline sampling events. After baseline conditions have been established, a monitoring schedule will be developed in consultation with DRMS.

A boring log, well completion details, water levels, and an initial water quality analysis will be submitted to DRMS within 90 days after well completion as part of the quarterly hydrologic report. Subsequent monitoring data will be included in later quarterly reports for the facility. Energy Fuels will notify DRMS and the BLM within 30 days of receiving sample results if the analyses indicate deterioration in water quality compared to the established baseline data. If this were to happen, Energy Fuels would evaluate ground water conditions and propose suitable mitigation measures if the compiled information indicates an impact from mining activities.

Energy Fuels will also monitor water inflows into the Whirlwind Decline from the lower Brushy Basin. Flow rates will be reported quarterly and any changes in flow rates will be described.

Ground Water Characterization

An environmental consulting company experienced in hydrogeologic investigations will review the existing geology and hydrology database plus the information collected from the underground mine, springs, and Monitoring Well W-1 over the first 5 quarters of mine operation. Staff from this company will then inspect the mine workings and prepare a preliminary ground water characterization of the site. The preliminary ground water characterization will identify any data gaps that may exist and propose measures for collecting additional data to complete the characterization. This report will be submitted to DRMS for review and comment prior to implementing additional field work.

Additional field and laboratory information needed to address data gaps may include one or more of the following.

1) Hydraulic conductivity test results for rock samples from representative mine strata.
2) Placement of tracer or dye packs in mine pools coupled with monitoring of springs and seeps.
3) Installation, sampling, and testing of additional temporary or permanent water wells.
4) Geologic and structural mapping of the mine workings.
5) Inventory and sampling of outlying springs or seeps in similar geologic terrain and hydrogeologic conditions.

Once the additional data is collected, the final ground water characterization report will be prepared and submitted to DRMS for review and comment. The report will characterize the upgradient and downgradient aquifers, the ground water flowing into the mine, the water flowing out of the mine, the eventual fate of the water flowing from the mine, and any ground water impacts from mining operations. Potential environmental impacts that are found as a result of the investigation will be evaluated in the report and, if necessary, mitigation measures will be proposed.

Groundwater monitoring wells shall be constructed (sealed, completed, and covered) in such a manner to protect against entrance of undesirable materials (e.g. stormwater, chemicals, etc.) into the well.

11. Surface Water Quality Data

Surface water quality data is discussed in Exhibit G and enclosed in Appendix E. Surface water in Lumsden Creek occurs only intermittently after precipitation events and during spring snow melt. Several small ponds have been placed in the three tributaries upstream from the mine for use as stock watering ponds. These ponds further reduce downstream flows. The creek water does not have any known domestic or agricultural uses downstream of the mine site. With the exception of wildlife use, it is unlikely that there will be any future downstream uses of the water due to the prevailing dry conditions and intermittent nature of the surface flows. As shown in Table T-1, Lumsden Creek is in a steep canyon for the first 3.55 miles downstream from the treatment plant discharge location. The steep terrain and remote location on public land make it even more unlikely that the water could be used beneficially for domestic or agricultural purposes in the future.

The surface water quality data indicate that natural erosional processes and historic mining activity has resulted in the accumulation of uranium-bearing sands within the Lumsden Creek streambed. Limited downstream sampling of the creek by the BLM in 1996 and 1997 indicate that the environmental effect of this material is low during storm events when flow rates are significant. However, lower surface water flows from springs, snow melt, and small precipitation events can become more concentrated in radionuclides and metals when exposed to these uranium-bearing materials. This is most apparent in the west tributary of Lumsden Creek where DP Spring flows through the toe of the historic Dutchman waste dump. The spring water degrades in quality with increases in radium, uranium, and arsenic levels as it flows through the toe area and gradually infiltrates into the streambed. The middle tributary to Lumsden Creek, where Energy Fuels proposes to discharge treated water, is less impacted by historic mining activities.

12. Surface Water Control and Monitoring

Potential contaminants in surface water will be controlled by diverting surface waters away from material storage areas, containing and treating surface water runoff originating in ore storage areas, and

by both preventing exposure to surface water and providing for secondary containment of the various chemicals used on site.

Containment and use of chemicals on site for water treatment, dust suppression, and equipment fueling and maintenance is addressed earlier in Section 6 of this Exhibit and in more detail in Appendices F and H. There will be no acid mine drainage or acid-forming material on site. The uranium ore, as previously discussed, has the potential to contribute radionuclides and metals to surface water runoff. Accordingly, runoff from the ore pad will be contained and treated prior to discharge. All ore stockpiles will be removed prior to performing reclamation.

Collection and Diversion Ditches

Collection and Diversion Ditches are part of stormwater management on-site and are meant to prevent possible contamination from mine water or activities. Diversion Ditches convey clean stormwater run-on and runoff away from the mine site. The clean stormwater that has been diverted enters directly into a nearby natural drainages. Diversion Ditches are specifically designed for year-round 100-year, 24-hour storm event of 2.9 inches. A Diversion Ditch with a design flow greater than 5.0 feet per second is designated for a rip-rap lining, which is also designed to withstand the peak flow from the 100-year 24-hour event.

Collection Ditches, collect stormwater and diverts it from the Waste Rock Pile and other surface facilities. All collection ditches drain to the sediment pond. The ditches have maximum side slopes of 2H:1V and freeboard levels of 0.3 feet except next to topsoil stockpiles where the freeboard depth is 1.0 feet. The Collection Ditch has been designed for a 10-year, 24-hour storm event.

These drainage designs are discussed in Exhibit D – Mine Plan – Section 18. The actual design calculations are presented in Appendix B and on Maps C-2 and C-6. Collection ditches within the site are shown in light blue and diversion ditches around the site are shown in purple on Map C-6. There are no chemicals, reagents or treatments associated with either type of ditch. Since these features are part of stormwater management they are subject to inspection and maintenance in accordance with the Stormwater Pollution Prevention Plan.

Sediment Pond

As described in Section 18 of Exhibit D, the sediment pond receives and contains surface water runoff from the disturbed area around the Whirlwind portal, via Collection Ditches. Containing runoff in a Sediment Pond reduces how fast water flows which allows sediment to settle out of the water. This can protect water quality downstream.

The Sediment Pond will have excavated slopes of 2H:1V with a surface area of 0.46 acres and a volume of 4,608 cubic yards. It was designed to contain all the runoff from the 10-year, 24-hour storm event and will safely pass the 100-year 24-hour event. Excess water will be discharged through the pond's emergency overflow that leads to the ephemeral drainage. There are no chemicals, reagents or treatments associated with water in the sediment pond; however, water collected in and discharged from the sediment pond will be sampled and analyzed on a quarterly basis for a full suite of DRMS water quality parameters including radium-226 and uranium (see stormwater column in Table T-2).

In the event that a sediment pond sample fails to meet surface water quality discharge parameters, Energy Fuels will investigate the system of collection ditches to determine the likely source or sources of the elevated constituents. If this should occur, the most likely cause would be the placement of low-grade proto-ore in or next to a collection ditch. Identification of the potential source would include visual reconnaissance, sampling of soil materials, and follow-up sampling and analysis of subsequent surface water runoff events. A full report of any exceedances and corrective action taken will be provided in the quarterly report to the DRMS with copies to the BLM. Should surface water discharge from the sediment pond continue to exceed state standards, additional mitigation measures would be adopted in consultation with DRMS and the BLM. This could include diverting the pond water to the water treatment system for treatment prior to discharge.

Energy Fuels has obtained a discharge permit from the Water Quality Control Division of CDPHE for treating and discharging excess mine water. The permit requires that the treated water be sampled and analyzed on a weekly and monthly basis during active discharge operations. The monitoring parameters and frequency are summarized on Table T-2. The permit limits for each constituent are

based on the state water quality standards for the Dolores River at Gateway (i.e., Segment 3a of the river). The permit limits are provided in the CDPS Permit that is included as Appendix L.

Since this feature is still a part of stormwater management it is subject to inspection and maintenance in accordance with the Stormwater Pollution Prevention Plan.

13. Climate Data

The available climate data for the location has been included in Exhibit K. Evaporation data is included. Interpolation between weather stations was required, since no one station was representative of the actual mine site. Site-specific wind data is not available but the prevailing winds are generally from west to east. Site-specific precipitation data from nearby Cave Canyon has also been included in Exhibit K. This data, which was provided by the BLM, corresponds closely with the precipitation data that was generated through interpolation methods.

14. Geochemical Data and Analysis

Recent samples of the ore and waste from newly exposed underground faces were taken by Energy Fuels. These samples were analyzed for chemical content and then tested using the Synthetic Precipitation Leaching Procedure (SPLP), which is the Division's recommended procedure for determining whether mine waste and ore has the potential to environmentally impact ground or surface water.

The sampling procedures, locations and results of these tests are presented in Appendix A. The results show that the ore has the potential to generate leachate or surface water runoff containing elevated levels of uranium, radium, and trace metals. Accordingly, runoff from the ore stockpile area will be contained and treated prior to discharge.

The waste rock, however, did <u>not</u> produce leachate that exceeded state water quality standards. The following Best Management Practices (BMPs) will also help insure that the waste material does not impact surface or ground water resources.

Waste Rock Pile BMPs

1) In the SPLP test, the ore is ground to a minute size (i.e., smaller than 9.5 millimeters) prior to leaching with a pH 5 solution, while the actual waste rock pile will consist primarily of larger sized rocks from one inch to twenty-four inches in diameter, that will not leach as readily. The permeability of the waste rock (and susceptibility to leaching) will also be reduced by the compaction that occurs as loaded haulage buggies and other equipment travel over the top of the waste pile.

2) Blending of low grade ore with high grade ore will be standard practice at the mine, thereby minimizing the amount of sub-ore-grade material that would otherwise be disposed of as waste.

3) Undisturbed runoff from the hillside south of the waste rock pile will be permanently diverted away from the waste rock embankment, utilizing diversion ditches designed for the 100-year, 24-hour storm event.

4) The waste rock embankment will be covered with a minimum of twelve inches of topsoil cover material and planted with a stable mix of grasses and forbs well suited to this location. The vegetation will utilize most of the direct precipitation and surface water runoff that occurs on the reclaimed embankment. This will prevent most of this water from ever entering the waste material.

5) The gradual slopes and revegetated surface of the waste rock embankment will minimize erosion of the topsoil and make any subsequent exposure of waste rock unlikely.

15. Construction Schedule Information

The water treatment plant and tanks were installed as part of prospecting activities. Required construction and estimated completion times for the remaining environmental protection facilities are listed below. The goal is to have all of these facilities in place by early fall 2008.

1) Construct diversion ditches, collection ditches, and sediment pond (3 months)
2) Enlarge top of waste pile and construct lined ore pad, sump, and overflow pipe to the Untreated Water Tank (6 months)
3) Install septic system (1 month)
4) Move and reinstall the fueling station, oil storage enclosure, and generator stations, as needed, with appropriate secondary containment for all petroleum products (6 months).

16. Quality Assurance and Quality Control Program and Measures

Energy Fuels will notify the BLM and DRMS at least 10 working days in advance of any major construction activities on site. This will allow the agencies the opportunity to conduct inspections prior to, during, and after construction. A licensed professional engineer experienced in construction of ponds, embankments, liners, etc. will be on site during the construction of the ore pad and sediment pond to verify that these facilities are properly constructed. The engineer will prepare a detailed post-construction report that will be submitted to the agencies within 30 days of completion of the work.

Operation and monitoring of the treatment system will be directly supervised by a state certified wastewater operator. This person will be responsible for making adjustments in the plant equipment to meet discharge standards and for implementing a water discharge monitoring program that meets all the requirements of the site's CDPS Permit. A copy of this permit is included as Appendix L.

17. Plant Growth Medium (Soils)

The soil types and boundaries for the area are shown on Map C-1A. All soil information for these types is presented in Exhibit I. All of these soils support vegetation and no unsuitable or problematic soils have been identified.

All topsoil from previously reclaimed areas and newly disturbed areas will be salvaged and used for reclamation. The plans for this stockpiling are explained in Exhibit D. The Packrat power drop pad area currently has an infestation of Russian knapweed and field bindweed. This power drop area may need to be pretreated for the weeds prior to doing any topsoil stripping at this location.
All stockpiles will be seeded with the mix described in the Reclamation Plan once the piles are established. The process of spreading, grading, and harrowing the topsoil prior to reseeding has been described in the Exhibit E – Reclamation Plan. The topsoil will be tested to determine if any amendments are needed should the stockpiles exhibit poor revegetation.

It is expected that approximately 12 inches to 18 inches of topsoil will be salvaged from the previously undisturbed areas at the Whirlwind portal area. Based on recent test holes explained in Exhibit I, the estimated average thickness of topsoil replacement at the Whirwlind portal area and waste embankment is 14 inches. All calculations and reclamation costs have been based on this amount of topsoil fill over the Whirlwind area. Approximately 12 inches of topsoil will be salvaged from vent shaft and power drop areas and another 4-6 inches of imported topsoil will be salvaged from the outer slope of the existing Whirlwind pad and from the Packrat portal area. This material will all be stockpiled and used for reclamation.

18. Wildlife Protection

The Untreated Water Tank and all other tanks in the water treatment facility will be fully enclosed by a chain link fence (see Map C-2) to preclude domestic livestock and most wildlife. The Untreated Water Tank is only 0.1 acre in size.. The small pond footprint, mining activity in the immediate area, and the presence of other water sources nearby is expected to deter waterfowl from using the untreated water

pond on a frequent basis. Bird and bat escape structures will be installed on the water tanks during the warm weather months when wildlife may use the tanks more frequently as a water source.

As described in the reclamation plan, the site will be fully reclaimed to wildlife habitat once the mine is closed. One portal at the Packrat bench will be left open for bat habitat.

19. Disposal of Ore Pad Material and Sludge in Mine Workings

Over the life of the mine, percolation of rainwater through the ore may result in radionuclides leaching into the compacted ore pad. A geosynthetic clay liner (GCL) will be installed beneath the pad area to confine this potential contamination to the upper 3.5 feet of compacted pad area. During reclamation, the compacted soil cover and the liner will be excavated and placed in a dry area within the upper portion of the Whirlwind decline.

The accumulated sludge from the Settling Tank will be disposed of in either one of three ways: 1) mixed into concrete on site and disposed of in the upper decline in a designated (i.e., dry) area above the water table, 2) transported to a uranium mill with ore to be processed, or 3) transported to a suitable off-site landfill for disposal. For reclamation costing purposes, the former alternative is assumed. The sludge volume is estimated to be approximately 19 cubic yards (see Appendix H). The concrete grout produced is expected to be about 40 cubic yards. The grout would be pumped into the mine and placed over or next to the ore pad material.

MATERIALS CONTAINMENT PLAN

for the

WHIRLWIND MINE
30100 5/10 ROAD
GATEWAY, COLORADO 81522

Prepared by:

ENERGY FUELS RESOURCES CORPORATION

February 2012
Revised March 2025

TABLE OF CONTENTS

Attachments

Appendices

1.0 INTRODUCTION

The Whirlwind Mine is located approximately 5 miles southwest of Gateway, Colorado in Mesa County. Refer to Figure 1 for the layout of the Whirlwind Mine Site.

Mine dewatering is required as part of the mine rehabilitation process. The mine water is required to be treated prior to surface discharge into the middle fork of Lumsden Creek, located adjacent to the surface facilities at the Whirlwind Portal. Lumsden Creek is an ephemeral drainage that ultimately drains to the Dolores River, approximately 4.3 miles northeast of the mine site. Use of the treatment system located on-site is permitted under the Colorado Discharge Permit System (CDPS), Permit Number CO-0047562. This discharge permit requires preparation of a Materials Containment Plan for the as-built configuration of the treatment plant and mine site.

The Materials Containment Plan has been prepared to provide employees at the Whirlwind Mine site the necessary information to store, handle, and provide expedient and complete response to spills of materials that may cause harm to employees, the public, or the environment. For the purpose of this plan a spill is defined as *"The unintentional release of a material in use, process, or storage at the Whirlwind Mine that may result in a significant adverse impact on the environment."*

2.0 MATERIALS USED ON-SITE

The materials used, processed, or stored at the mine site that may have an adverse impact to the environment are identified in Table 1. Information sheets for each of these materials is provided in the attachments as identified in the table.

Table 1
On-Site Materials List

Attachment	Material	Location
1	Barium Chloride – Granular	Treatment Trailer
2	Barium Chloride – 10% to 15% Solution	Treatment Trailer
3	Ferric Sulfate – Granular	Treatment Trailer
4	Ferric Sulfate – 50% Solution	Treatment Trailer
5	Ferric Sulfate – 2% to 8% Solution	Treatment Trailer
6	Sulfuric Acid – 93% Solution	Treatment Trailer
7	Sulfuric Acid – 10% to 15% Solution	Treatment Trailer
8	Untreated/Partially Treated Mine Water	Treatment System Tanks
9	Treatment Precipitate	Settling Tank
10	Diesel Fuel, Low Sulfur	Fueling Station/Generators
11	New/Used Motor Oil	Shop/Waste Dump
12	New/Used Anti-freeze	Shop
13	Sodium Metabisulfite – Granular	Treatment Trailer
14	Sodium Metabisulfite – 1% to 10% Solution	Treatment Trailer
15	Hydrochloric Acid – 31% Solution	Treatment Trailer
16	Sodium Hydroxide – 25% Solution	Treatment Trailer

The information sheets for each material summarize the following material specific information:

- Maximum Quantity Stored On-Site
- Description of Material
- Potential Health Hazards
- Potential Environmental Hazards
- Handling Instructions
- First Aid Measures
- Containment Provided
- Maintenance Requirements
- Spill Response Instructions
- Spill Notification Requirements

3.0 SPILLS

Prevention of spills of materials potentially harmful to people, property, and the environment is a top priority when storing, handling, and using any of these materials. Should a spill occur, it is of utmost importance that information regarding the containment and clean-up of the spilled material be readily available to employees. This Materials Containment plan serves as a guide to timely and appropriate actions to be taken for spills of potentially harmful materials stored and used at the Whirlwind Mine. Please refer to Appendix A for a History of Spills that have occurred at the Whirlwind Mine. This form should be updated following any spill incidents.

3.1 Spill Response Procedures

General notification procedures for spills of any materials include immediate notification of the following persons:

Title	**Name**	**Primary**	**Secondary**
Mine Superintendent	Todd Eldredge	Verbal	435-459-1075

If Mine Superintendent cannot be reached, contact:

Safety and Compliance Officer Tyler Martin

The information that should be relayed in the initial notification is:

1) The location and nature of the incident
2) The type of material
3) Quantity, actual or estimated, of material released
4) Any potential or realized harm to employees or the public

The Mine Superintendent will notify the required internal personnel including the Director of Mining and the Director of Compliance. The Director of Compliance will evaluate this information and make a determination as to whether or not a spill has occurred or is about to occur, and if required, will make the required oral notifications to regulatory agencies. The agencies to be notified will vary based on the type of materials, nature of the spill, and quantity of material spilled and may include the National Response Center, the Colorado Department of Public Health and Environment (CDPHE), the Mesa County Local Emergency Planning Commission, Emergency Services, and the Bureau of Land

Management. At this time, there are no downstream water users of Lumsden Creek and the creek extends approximately 5 miles before reaching the Dolores River. Spill response procedures and contact information for these agencies are outlined in the attached material information sheets, the Emergency Response Plan, and the Spill Prevention, Control, and Countermeasure (SPCC) Plan. These plans are located on-site. Information to be provided during the initial oral notification of these agencies is included on the Spill Notification Form located in Appendix B.

In the event of a spill, the Mine Superintendent will seek assistance from other mine personnel, as needed, and will immediately initiate spill response procedures. Spill response will consist of evaluating potentially dangerous conditions, containing the spill, and cleaning the spill area. Containment of the spill will focus first on preventing materials from entering from waters of the State, then from entering other environmentally sensitive areas, then to the smallest area possible. Spill response materials located on-site include:

- Two 20-gallon spill response kits that include absorbents and a disposal bag. One kit will be located at the Water Treatment Plant and a second kit will be at or near fueling station;
- Oil dry and absorbent material located in the Mine Shop;
- Shovels, rakes, and other hand tools located in the tool trailer; and
- Heavy equipment on-site for berming and other earthmoving activities.

Spilled materials and contaminated soils recovered during the spill response effort will typically be placed in clean, empty drums for later disposal. Soils contaminated by petroleum products may be placed in the designated storage area on-site.

Sampling of the spill material may be necessary if the polluting constituents are not known. In addition, potentially affected and unaffected surface water or soil samples may be taken, if necessary. Determination of the necessity for collecting samples will be made by the Mine Superintendent or Safety and Compliance Officer in coordination with the Director of Compliance on a case-by-case basis.

3.2 Follow-Up Actions

Upon completion of the initial spill response and clean-up, measures that can be taken to

prevent a recurrence of the spill will be discussed and evaluated. Appropriate measures will be implemented to remedy the circumstances that led to the spill.

Written notification to the appropriate regulatory agencies is required and will be completed by Regulatory Affairs at Corporate Headquarters. Instructions for written notification will be provided by the agencies at the time of or following oral notification.

All records resulting from a spill will be retained for a minimum of five years, or longer, if requested by the Regional Administrator of the U.S. Environmental Protection Agency (U.S. EPA) or the Colorado Water Quality Control Division.

4.0 Plan Updates

The Materials Containment Plan will be updated whenever additional chemicals are stored on-site that may pose a threat to people, property, or the environment. In addition, the plan will be reviewed annually to ensure that all potentially harmful materials are included in the plan.

MATERIAL INFORMATION SHEETS

BARIUM CHLORIDE – GRANULAR

Maximum Quantity On-site: 1,000 pounds

Description: White granular powder, odorless

Potential Health Hazards

- Skin Contact: May cause irritation
- Eye: May cause irritation
- Inhalation: Harmful if inhaled
- Ingestion: Harmful if ingested
- Sensitization: May cause allergic skin reaction
- Not a carcinogen, teratogen, mutagen, or reproductive toxin

Potential Environmental Hazards

- This material does not contain any hazardous air pollutants
- This material is not listed as a hazardous or toxic substance under TSCA, the Clean Water Act, or CERCLA
- Dust clouds generated during handling or storage can form an explosive mixture with air

Handling

- Wear proper PPE including safety glasses, impervious gloves, and standard site PPE
- Use of a NIOSH approved dust respirator is recommended

First Aid

- Eyes: Flush eyes with large amount of water for 15 minutes while holding eyelids open. Seek medical attention.
- Skin: Wash skin with water and soap. Seek medical attention if irritation occurs or persists.
- Ingestion: Do not give liquids if person is unconscious or drowsy. Otherwise give one tablespoon of Epsom salts and seek immediate medical attention. Induce vomiting.
- Inhalation: Remove person to fresh air immediately. If breathing has stopped, apply artificial respiration and administer oxygen if necessary. Seek medical attention.

Containment

- Primary: Paper bags stacked on pallet
- Secondary: Stored inside treatment trailer, protected from weather
  Treatment trailer sump drains to external 400-gallon plastic tank

BARIUM CHLORIDE – GRANULAR (continued)

Maintenance Requirements

- Bags should be kept inside treatment trailer, protected from weather
- Bags should be kept off floor on pallet
- Care should be taken not to puncture bags
- Punctured bags should be placed in a closed container

Spill Response

- Control source of spill or leak, if possible.
- Small Spills: Sweep or scoop up and place in a closed container
- Large Spills: Contact Maintenance Supervisor for additional assistance

Spill Notification Requirements

- Immediately contact the Mine Superintendent (verbally)
- If not available contact Safety and Compliance Officer

- This material has no reportable quantity
- No agency notifications required unless spill enters waters of the State

- Report spills of any quantity which enter waters of the State to:
  - Colorado Department of Public Health and Environment
    Toll-Free 24-hour Environmental Spill Reporting Line
    (877) 518-5608
  - Bureau of Land Management, Grand Junction Field Office
    Alan Kraus
    (970) 244-3078

- Refer to the Spill Report in Appendix A for information to be provided to the above agencies during oral notification
- Follow-up written notification will be required by the above agencies and are required to be copied to the BLM. Instructions for submittal of the written notification will be provided by the agencies during or following oral notification.

BARIUM CHLORIDE – 10% to 15% SOLUTION

Maximum Quantity On-site: 370 gallons (barium chloride mix tank)

Description: Clear liquid, odorless

Potential Health Hazards

- Skin Contact: May cause irritation
- Eye: May cause irritation
- Inhalation: May cause irritation
- Ingestion: May cause irritation

Potential Environmental Hazards

- No fire or explosion hazards
- This material does not contain any hazardous air pollutants
- This material is not listed as a hazardous or toxic substance under TSCA, the Clean Water Act, or CERCLA

Handling

- Wear proper PPE including safety glasses, impervious gloves, and standard site PPE

First Aid

- Eyes: Flush eyes with large amount of water for 15 minutes while holding eyelids open.
- Skin: Wash skin with water and soap.
- Ingestion: Drink large volumes of water or milk. Do not give liquids if person is unconscious or drowsy. Do not induce vomiting. Seek medical attention.
- Inhalation: Remove person to fresh air.

Containment

- Primary: 370-gallon plastic tank
- Secondary: Treatment trailer sump drains to external 400-gallon plastic tank

Maintenance Requirements

- Inspect tanks and lines for cracks or punctures, repair or remove defective tanks and lines
- Do not overfill tanks

Spill Response

- Control source of spill or leak, if possible.
- Small Spills: Wash area with large volumes of water
- Large Spills: Contact Mine Superintendent for additional assistance

BARIUM CHLORIDE – 10% to 15% SOLUTION (continued)

Spill Notification Requirements

• Immediately contact the Mine Superintendent (verbally) If not available contact Safety and Compliance Officer
• This material has no reportable quantity • No agency notifications required unless spill enters waters of the State
• Report spills of any quantity which enter waters of the State to: o Colorado Department of Public Health and Environment Toll-Free 24-hour Environmental Spill Reporting Line (877) 518-5608 o Bureau of Land Management, Grand Junction Field Office Alan Kraus (970) 244-3078
• Refer to the Spill Report in Appendix A for information to be provided to the above agencies during oral notification • Follow-up written notification will be required by the above agencies and are required to be copied to the BLM. Instructions for submittal of the written notification will be provided by the agencies during or following oral notification.

FERRIC SULFATE – GRANULAR

Synonyms: Iron sulfate

Maximum Quantity On-site: 1,000 pounds

Description: Yellowish crystals or grayish-white powder, slight odor

Potential Health Hazards

- Skin Contact: May cause irritation
- Eye: May cause irritation
- Inhalation: May cause irritation with coughing, sneezing, or difficulty breathing
- Ingestion: Low ingestion hazard
- Not a carcinogen

Potential Environmental Hazards

- No fire or explosion hazards
- None reported

Handling

- Wear proper PPE including safety glasses, impervious gloves, and standard site PPE

First Aid

- Eyes: Flush eyes with large volumes of water for 15 minutes while holding eyelids open. Seek medical attention immediately.
- Skin: Remove contaminated clothing immediately. Wash skin with water and soap until no evidence of chemical remains (at least 15-20 minutes).
- Ingestion: Induce vomiting. Follow with gastric lavage using deferoxamine solution (2 grams in 1 liter of water containing sodium bicarbonate). Maintain airway, blood pressure and respiratory function. Seek medical attention immediately.
- Inhalation: Remove person to fresh air immediately. Perform artificial respiration if necessary. Keep person warm and at rest. Treat symptomatically and supportively. Seek medical attention.

Containment

- Primary: Paper bags stacked on pallet
- Secondary: Stored inside treatment trailer, protected from weather
  Treatment trailer sump drains to external 400-gallon plastic tank

FERRIC SULFATE – GRANULAR (continued)

Maintenance Requirements

- Bags should be kept inside treatment trailer, protected from weather
- Bags should be kept off floor on pallet
- Care should be taken not to puncture bags
- Punctured bags should be placed in a closed container

Spill Response

- Control source of spill or leak, if possible.
- Small Spills: Sweep with minimum generation of dust and place in closed container
- Large Spills: Contact Mine Superintendent for additional assistance

Spill Notification Requirements

- Immediately contact the Mine Superintendent (verbally)
- If not available contact Safety and Compliance Officer

- Reportable quantity: 1,000 pounds
- Report spills of 1,000 pounds or more to:
  - National Response Center
    (800) 424-8802
  - Colorado Department of Public Health and Environment
    Toll-Free 24-hour Environmental Spill Reporting Line
    (877) 518-5608
  - Mesa County Local Emergency Planning Commission
    (970) 242-6707
  - Bureau of Land Management, Grand Junction Field Office
    (970) 244-3078

- Report spills of any quantity which enter waters of the State to:
  - National Response Center
    (800) 424-8802
  - Colorado Department of Public Health and Environment
    Toll-Free 24-hour Environmental Spill Reporting Line
    (877) 518-5608

- Refer to the Spill Report in Appendix A for information to be provided to the above agencies during oral notification
- Follow-up written notification will be required by the above agencies and are required to be copied to the BLM. Instructions for submittal of the written notification will be provided by the agencies during or following oral notification.

FERRIC SULFATE – 50% SOLUTION

Synonyms: Iron sulfate

Maximum Quantity On-site: 110 gallons

Description: Reddish-brown solution, slight odor

Potential Health Hazards

- Skin Contact: May cause burns
- Eye: May cause burns
- Inhalation: May cause irritation of mucous membranes
- Ingestion: Severe gastritis with abdominal pain and vomiting beginning 10-60 min. after ingestion. Diarrhea and dehydration. Shock, pallor, cyanosis, and coldness. Rapid, weak pulse, low blood pressure, drowsiness, hyporeflexia, dilated pupils, and coma.
- Not a carcinogen

Potential Environmental Hazards

- No fire or explosion hazards
- Designated as a hazardous material
- Highly corrosive

Handling

- Wear proper PPE including safety glasses, impervious gloves, protective work clothing, and standard site PPE
- Use with care

First Aid

- Eyes: Flush eyes with large volumes of water for at least 20 minutes while holding eyelids open. If irritation persists, seek medical attention.
- Skin: Remove contaminated clothing immediately. Wash skin with water and soap until no evidence of chemical remains (at least 15-20 minutes). If irritation persists, seek medical attention.
- Ingestion: Contact local poison control center or physician immediately. Give large quantities of water or milk, unless unconscious. If vomiting occurs, keep head lower than hips. Loosen tight clothing. Seek medical attention immediately.
- Inhalation: Remove person to fresh air immediately. Perform artificial respiration if necessary. Seek medical attention.

FERRIC SULFATE – 50% SOLUTION (continued)

Containment

- Primary: Steel, closed top, 55-gallon drums
- Secondary: 2-drum containment basin
  Stored inside treatment trailer, protected from weather
  Treatment trailer sump drains to external 400-gallon plastic tank

Maintenance Requirements

- Drums should be kept inside treatment trailer, protected from weather
- Inspect drums regularly for leaks or corrosion

Spill Response

- Control source of spill or leak, if possible.
- Small Spills: Absorb spill with sand or non-combustible dry material and collect in appropriate container for disposal. Flush area with water.
- Large Spills: Prevent entry into waters of the state. Isolate area and deny entry to unnecessary personnel. Absorb spill with sand or non-combustible dry material and collect in appropriate container for disposal. Flush area with water.

Spill Notification Requirements

- Immediately contact the Mine Superintendent
- If not available contact Safety and Compliance Officer

- Reportable quantity: 1,000 pounds
- Reportable quantity exceeds maximum site quantity (110 gallons of 50% solution is equivalent to approximately 800 lbs. of ferric sulfate)
- No agency notifications required unless spill enters waters of the State

- Report spills of any quantity which enter waters of the State to:
  - National Response Center
    (800) 424-8802
  - Colorado Department of Public Health and Environment
    Toll-Free 24-hour Environmental Spill Reporting Line
    (877) 518-5608
  - Bureau of Land Management, Grand Junction Field Office
    (970) 244-3078

- Refer to the Spill Report in Appendix A for information to be provided to the above agencies during oral notification
- Follow-up written notification will be required by the above agencies and are required to be copied to the BLM. Instructions for submittal of the written notification will be provided by the agencies during or following oral notification.

FERRIC SULFATE – 2% to 8% SOLUTION

Synonyms: Iron sulfate

Maximum Quantity On-site: 230 gallons (ferric sulfate mix tank)

Description: Clear, no odor

Potential Health Hazards

- Skin Contact: May cause burns
- Eye: May cause burns
- Inhalation: May cause irritation of mucous membranes
- Ingestion: Severe gastritis with abdominal pain and vomiting beginning 10-60 min. after ingestion. Diarrhea and dehydration. Shock, pallor, cyanosis, and coldness. Rapid, weak pulse, low blood pressure, drowsiness, hyporeflexia, dilated pupils, and coma.
- Not a carcinogen

Potential Environmental Hazards

- No fire or explosion hazards
- Corrosive

Handling

- Wear proper PPE including safety glasses, impervious gloves, protective work clothing, and standard site PPE
- Use with care

First Aid

- Eyes: Flush eyes with large volumes of water for at least 20 minutes while holding eyelids open. If irritation persists, seek medical attention.
- Skin: Remove contaminated clothing immediately. Wash skin with water and soap until no evidence of chemical remains (at least 15-20 minutes). If irritation persists, seek medical attention.
- Ingestion: Contact local poison control center or physician immediately. Give large quantities of water or milk, unless unconscious. If vomiting occurs, keep head lower than hips. Loosen tight clothing. Seek medical attention immediately.
- Inhalation: Remove person to fresh air immediately. Perform artificial respiration if necessary. Seek medical attention.

Containment

- Primary: 230-gallon plastic tank
- Secondary: Treatment trailer sump drains to external 400-gallon plastic tank

FERRIC SULFATE – 2% to 8% SOLUTION (continued)

Maintenance Requirements

- Inspect tank and lines for cracks or punctures, repair or remove defective tank and lines
- Do not overfill tanks

Spill Response

- Control source of spill or leak, if possible.
- Small Spills: Absorb spill with sand or non-combustible dry material and collect in appropriate container for disposal. Flush area with water.
- Large Spills: Prevent entry into waters of the state. Isolate area and deny entry to unnecessary personnel. Absorb spill with sand or non-combustible dry material and collect in appropriate container for disposal. Flush area with water.

Spill Notification Requirements

- Immediately contact the Mine Superintendent
- If not available contact Safety and Compliance Officer

- Reportable quantity: 1,000 pounds
- Reportable quantity exceeds maximum site quantity (230 gallons of 4% solution is equivalent to approximately 135 lbs. of ferric sulfate)
- No agency notifications required unless spill enters waters of the State

- Report spills of any quantity which enter waters of the State to:
  - National Response Center
    (800) 424-8802
  - Colorado Department of Public Health and Environment
    Toll-Free 24-hour Environmental Spill Reporting Line
    (877) 518-5608
  - Bureau of Land Management, Grand Junction Field Office
    (970) 244-3078

- Refer to the Spill Report in Appendix A for information to be provided to the above agencies during oral notification
- Follow-up written notification will be required by the above agencies and are required to be copied to the BLM. Instructions for submittal of the written notification will be provided by the agencies during or following oral notification.

SULFURIC ACID – 93% SOLUTION

Synonyms: Hydrogen sulfate, oil of vitriol, mattling acid, battery acid, electrolyte acid, dihydrogen sulfate, chamber acid.

Maximum Quantity On-site: 110 gallons

Description: Clear colorless to yellow liquid

Potential Health Hazards

- Skin Contact: Causes skin burns.
- Eye: Causes severe eye burns. May cause irreversible eye injury, blindness, and/or corneal opacification.
- Inhalation: May cause irritation of the respiratory tract with burning pain in nose and throat, coughing, wheezing, shortness of breath, and pulmonary edema. Causes chemical burns to the respiratory tract. Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema.
- Ingestion: May cause severe and permanent damage to the digestive tract. Causes gastrointestinal tract burns.
- Known carcinogen

Potential Environmental Hazards

- Not a fire hazard
- May react vigorously, violently, or explosively with many organic and inorganic chemicals and with water
- Highly corrosive

Handling

- Wear proper PPE including safety glasses, face shield, neoprene gloves, apron, and/or clothing, protective work clothing, and standard site PPE
- Use with care and with adequate ventilation
- Wash thoroughly after handling

First Aid

- Eyes: Flush eyes with large volumes of water for at least 15 minutes. Seek medical attention immediately.
- Skin: Wash skin with water for at least 15 minutes while removing contaminated clothing and shoes. Seek medical attention immediately.
- Ingestion: Do not induce vomiting. If fully conscious, ingest cupful of water. Seek medical attention immediately.
- Inhalation: Remove person to fresh air immediately. Perform artificial respiration if necessary. Seek medical attention immediately.

SULFURIC ACID – 93% SOLUTION (continued)

Containment

- Primary: Steel, closed top, 55-gallon drums
- Secondary: 2-drum containment basin
  Stored inside treatment trailer, protected from weather
  Treatment trailer sump drains to external 400-gallon plastic tank

Maintenance Requirements

- Drums should be kept inside treatment trailer, protected from weather
- Inspect drums regularly for leaks or corrosion

Spill Response

- Control source of spill or leak, if possible.
- Small Spills: Absorb spill with sand or non-combustible dry material and cover with plastic to minimize contact with water. Carefully scoop up and place in appropriate disposal container. Provide ventilation. Do not flush with water.
- Large Spills: Prevent entry into waters of the state. Isolate area and deny entry to unnecessary personnel. Absorb spill with sand or non-combustible dry material and cover with plastic to minimize contact with water. Carefully scoop up and place in appropriate disposal container. Provide ventilation. Do not flush with water.

SULFURIC ACID – 93% SOLUTION (continued)

Spill Notification Requirements

- Immediately contact the Mine Superintendent
- If not available contact Safety and Compliance Officer

- Reportable quantity: 1,000 pounds
- Report spills of 1,000 pounds (70 gallons) or more to:
  - National Response Center
    (800) 424-8802
  - Colorado Department of Public Health and Environment
    Toll-Free 24-hour Environmental Spill Reporting Line
    (877) 518-5608
  - Mesa County Local Emergency Planning Commission
    (970) 242-6707
  - Bureau of Land Management, Grand Junction Field Office
    (970) 244-3078

- Report spills of any quantity which enter waters of the State to:
  - National Response Center
    (800) 424-8802
  - Colorado Department of Public Health and Environment
    Toll-Free 24-hour Environmental Spill Reporting Line
    (877) 518-5608
  - Bureau of Land Management, Grand Junction Field Office
    (970) 244-3078

- Refer to the Spill Report in Appendix A for information to be provided to the above agencies during oral notification
- Follow-up written notification will be required by the above agencies and are required to be copied to the BLM. Instructions for submittal of the written notification will be provided by the agencies during or following oral notification.

SULFURIC ACID – 10% to 15% SOLUTION

Synonyms: Hydrogen sulfate, oil of vitriol, mattling acid, battery acid, electrolyte acid, dihydrogen sulfate, chamber acid.

Maximum Quantity On-site: 300 gallons (sulfuric acid mix tank)

Description: Clear colorless liquid

Potential Health Hazards

- Skin Contact: May cause skin burns.
- Eye: May cause severe eye burns. May cause irreversible eye injury, blindness, and/or corneal opacification.
- Inhalation: May cause irritation of the respiratory tract with burning pain in nose and throat, coughing, wheezing, shortness of breath, and pulmonary edema.
- Ingestion: May cause severe and permanent damage to the digestive tract.
- Known carcinogen

Potential Environmental Hazards

- Not a fire hazard
- Highly corrosive

Handling

- Wear proper PPE including safety glasses, face shield, protective work clothing, and standard site PPE
- Use with care

First Aid

- Eyes: Flush eyes with large volumes of water for at least 15 minutes. Seek medical attention immediately.
- Skin: Wash skin with water for at least 15 minutes while removing contaminated clothing and shoes. Seek medical attention immediately.
- Ingestion: Do not induce vomiting. If fully conscious, ingest cupful of water. Seek medical attention immediately.
- Inhalation: Remove person to fresh air immediately. Perform artificial respiration if necessary. Seek medical attention immediately.

SULFURIC ACID – 10% to 15% SOLUTION (continued)

Containment

- Primary: 230-gallon plastic tank
- Secondary: Treatment trailer sump drains to external 400-gallon plastic tank

Maintenance Requirements

- Inspect tank and lines for cracks or punctures, repair or remove defective tank and lines
- Do not overfill tanks

Spill Response

- Control source of spill or leak, if possible.
- Small Spills: Absorb spill with sand or non-combustible dry material. Carefully scoop up and place in appropriate disposal container. Flush area with water.
- Large Spills: Prevent entry into waters of the state. Isolate area and deny entry to unnecessary personnel. Absorb spill with sand or non-combustible dry material. Carefully scoop up and place in appropriate disposal container. Flush area with water.

Spill Notification Requirements

- Immediately contact the Mine Superintendent
- If not available contact Safety and Compliance Officer

- Reportable quantity: 1,000 pounds
- Reportable quantity exceeds maximum site quantity (300 gallons of 15% solution is equivalent to approximately 325 lbs. of sulfuric acid)
- No agency notifications required unless spill enters waters of the State

- Report spills of any quantity which enter waters of the State to:
  - National Response Center
    (800) 424-8802
  - Colorado Department of Public Health and Environment
    Toll-Free 24-hour Environmental Spill Reporting Line
    (877) 518-5608
  - Bureau of Land Management, Grand Junction Field Office
    (970) 244-3078

- Refer to the Spill Report in Appendix A for information to be provided to the above agencies during oral notification
- Follow-up written notification will be required by the above agencies and are required to be copied to the BLM. Instructions for submittal of the written notification will be provided by the agencies during or following oral notification.

UNTREATED/PARTIALLY TREATED MINE WATER

Synonyms: Raw water, treatment water

Maximum Quantity On-site: 164,000 gallons (untreated water tank)
770 gallons (2 reaction tanks, 335 gallon each)
7,500 gallons (settling tank)
7,500 gallons (polishing tank)
~180,000 gallons total

Description: Clear, no odor
May contain elevated levels of radium-226, uranium, or other metals above effluent limitations set forth in NPDES Permit No. CO-0047562

Potential Health Hazards

- Skin Contact: Not a hazard
- Eye: Not a hazard
- Inhalation: Not a hazard
- Ingestion: Not a hazard

Potential Environmental Hazards

- No fire or explosion hazards
- May exceed effluent limitations for radium-226, uranium, or other metals

Handling

- Wear proper PPE including standard site PPE

First Aid

- Eyes: None required
- Skin: None required
- Ingestion: None required
- Inhalation: None required

Containment

Untreated Water Tank, Settling Tank, and Polishing Tank

- Primary: Geomembrane liner
- Secondary: Secondary geomembrane liner, leak detection between geomembrane liners, claymax underliner, and downgradient sediment pond.

Reaction Tanks

- Primary: Plastic Tanks
- Secondary: Treatment trailer sump drains to external 400-gallon plastic tank

UNTREATED/PARTIALLY TREATED MINE WATER (continued)

Maintenance Requirements

- Inspect tanks and lines for cracks or punctures, repair or remove defective tanks and lines
- Do not overfill tanks

Spill Response

- Control source of spill or leak, if possible.
- Small Spills: Within Trailer, direct spilled water into external 400-gallon tank via trailer sump drain.
  Outside of Trailer, stop source of the spill and contact Maintenance Supervisor. Source control of spill may require pumping of water into another tank or back into the mine.
- Large Spills: Contact Maintenance Supervisor for additional assistance.

Spill Notification Requirements

- Immediately contact the Mine Superintendent
- If not available contact Safety and Compliance Officer

- Reportable quantities: Selenium = 100 pounds
  Arsenic = 1 pound
  Radium-226 = 52,000,000 ρCi
  Uranium = 53,000,000 ρCi
- Reportable quantity exceeds maximum site quantities
  - 180,000 gallons of untreated mine water is equivalent to:
    - 0.05 pounds of Selenium (calculated based on 35 µg/L)
    - 0.04 pounds of Arsenic (calculated based on 27 µg/L)
    - 190 ρCi of Radium-226 (calculated based on 9.7 ρCi/L)
    - 15 ρCi of Uranium (calculated based on 126.6 ρCi/L)
  - Based on maximum detected levels of these constituents in untreated mine water
  - No EPA spill notification is required

- Spills of any quantity which enter waters of the state must be reported to:
  - Colorado Department of Public Health and Environment
    Toll-Free 24-hour Environmental Spill Reporting Line
    (877) 518-5608
  - Bureau of Land Management, Grand Junction Field Office
    (970) 244-3078

- Refer to the Spill Report in Appendix A for information to be provided to the above agencies during oral notification
- Follow-up written notification will be required by the above agencies and are required to be copied to the BLM. Instructions for submittal of the written notification will be provided by the agencies during or following oral notification.

TREATMENT PRECIPITATE

Synonyms: Settling tank sludge

Maximum Quantity On-site: 22,343 pounds (estimated at end of mine life)

Constituents: Low levels of Radium-226, Uranium, and other metals

Potential Health Hazards

- Skin Contact: Not a hazard
- Eye: Not a hazard
- Inhalation: Not a hazard
- Ingestion: Not a hazard

Potential Environmental Hazards

- No fire or explosion hazards
- None Reported

Handling

- Wear proper PPE including standard site PPE

First Aid

- Eyes: None required
- Skin: None required
- Ingestion: None required
- Inhalation: None required

Containment

- Primary: Geomembrane liner
- Secondary: Secondary geomembrane liner, leak detection between geomembrane liners, claymax underliner, and downgradient sediment pond.

Maintenance Requirements

- Inspect tanks for cracks or punctures, repair or remove defective tanks
- Measure precipitate levels

Spill Response

- Control source of spill or leak, if possible.
- Small Spills: Collect and place in container or return to settling tank
- Large Spills: Contact Maintenance Supervisor for additional assistance

TREATMENT PRECIPITATE (continued)

Spill Notification Requirements

- Immediately contact the Maintenance Supervisor (verbally)
- If not available contact Environmental Manager at (303) 864-7775

- Reportable quantities: Radium-226 = 0.052 Ci
  Uranium = 0.053 Ci
  - 600 pounds of precipitate may be equivalent to the reportable quantity of uranium
  - Reportable quantity exceeds the maximum quantity for radium-226 on-site
  - Concentrations based on sludge sample from settling pond of a similar treatment system in Utah
- Report spills of 600 pounds (0.5 cubic yards) or more of precipitate to:
  - National Response Center
    (800) 424-8802
  - Colorado Department of Public Health and Environment
    Toll-Free 24-hour Environmental Spill Reporting Line
    (877) 518-5608
  - Mesa County Local Emergency Planning Commission
    (970) 242-6707
  - Bureau of Land Management, Grand Junction Field Office
    (970) 244-3078

- Spills of any quantity which enter waters of the state must be reported to:
  - Colorado Department of Public Health and Environment
    Toll-Free 24-hour Environmental Spill Reporting Line
    (877) 518-5608
  - Bureau of Land Management, Grand Junction Field Office
    (970) 244-3078

- Refer to the Spill Report in Appendix A for information to be provided to the above agencies during oral notification
- Follow-up written notification will be required by the above agencies and are required to be copied to the BLM. Instructions for submittal of the written notification will be provided by the agencies during or following oral notification.

DIESEL FUEL, LOW SULFUR

Synonyms: Diesel Fuel #2, NA 1993, Petroleum Distillate, Diesel, #2 Fuel Oil, On-Road Diesel, Ultra Low Sulfur Diesel, Off-Road Diesel

Maximum Quantity On-site: 1,800 gallons

Potential Health Hazards

• Skin Contact:	Prolonged exposure may cause moderate irritation, cracking, redness, itching, inflammation, dermatitis, and possible secondary infection
• Eye:	May cause sever irritation, redness, tearing, blurred vision, and conjunctivitis
• Inhalation:	Nasal and respiratory tract infection, central nervous system effects including excitation, euphoria, contracted eye pupils, dizziness, drowsiness, blurred vision, fatigue, nausea, headache, loss of reflexes, tremors, convulsions, seizures, loss of consciousness, coma, respiratory arrest, and sudden death could occur as a result of long term and/or high concentration exposure to vapors.
• Ingestion:	Toxic if swallowed. May cause burns to mouth or stomach. May cause nausea, vomiting, diarrhea, and restlessness. May cause nervous system effects similar to those listed for inhalation.

Potential Environmental Hazards

- Combustible, flammable in presence of open flames
- None Reported

Handling

- Wear proper PPE including standard site PPE

First Aid

• Eyes:	Flush eyes with large volumes of water for at least 15 minutes while holding eyelids open. If pain or redness persists, seek medical attention.
• Skin:	Immediately flush skin with water. Remove contaminated clothing and shoes. Wash clothing and clean shoes thoroughly before reuse. Wash exposed area with water and soap. If irritation persists, seek medical attention.
• Ingestion:	Do not induce vomiting. Seek medical attention immediately.
• Inhalation:	Remove person to fresh air immediately. Perform artificial respiration if necessary. Give oxygen if breathing is difficult. Seek medical attention.

DIESEL FUEL, LOW SULFUR (continued)

Containment

- Primary: Above-ground steel storage tanks
- Secondary: Fuel Stop: Metal basin and downgradient sediment pond
  Generators: Bermed area around generator and tank

Maintenance Requirements

- Inspect tanks, hoses, and dispensers for corrosion or leakage; repair or remove defective tanks, hoses, or dispensers

Spill Response

- Control source of spill or leak, if possible.
- Small Spills: Absorb spilled material with absorbent, sand, or soil. Collect contaminated soil. Place absorbent and soil in designated contaminated soil storage area.
- Large Spills: Contact Maintenance Supervisor for additional assistance

Spill Notification Requirements

- Immediately contact the Mine Superintendent
- If not available contact Safety and Compliance Officer

- Reportable quantity: 25 Gallons
- Report spills of 25 gallons or more to:
  - Division of Oil & Public Safety - Dept of Labor and Employment (during business hours)
    303-318-8547
  - Colorado Department of Public Health and Environment (after business hours)
    Toll-Free 24-hour Environmental Spill Reporting Line
    (877) 518-5608
  - Bureau of Land Management, Grand Junction Field Office
    (970) 244-3078

- Report spills of any quantity which enter waters of the State to the above agencies as well as:
  - National Response Center
    (800) 424-8802

- Refer to the Spill Report in Appendix A for information to be provided to the above agencies during oral notification
- Follow-up written notification will be required by the above agencies and are required to be copied to the BLM. Instructions for submittal of the written notification will be provided by the agencies during or following oral notification.

NEW AND USED LUBRICATING OIL

Synonyms: Lubricating oil, engine oil, crankcase oil, machinery oil, motor oil

Maximum Quantity On-site: 800 gallons

Description: Dark brown to black, viscous, oily liquid, pronounced hydrocarbon odor

Potential Health Hazards

- Eye: Contact may cause slight to moderate irritation, including burning, redness, and tearing. Contact with hot material may cause thermal burns.
- Skin: Prolonged and/or repeated exposure may cause mild skin irritation, including redness, burning, temporary drying/cracking, and acute dermatitis. Contact with hot material may cause thermal burns. Used motor oil and some cutting oils are possible skin cancer hazards based on animal testing.
- Inhalation: High concentrations of aerosol or mist may be generated at high temperatures and may be irritating to the respiratory tract, including nose and throat, and may cause difficulty breathing. This material is not expected to present an inhalation exposure hazard at ambient conditions.
- Ingestion: May cause mild irritation of the digestive tract, including cramping, diarrhea, nausea and vomiting. Aspiration into the lungs – by initial ingestion or vomiting – may cause mild to severe pulmonary injury.

Potential Environmental Hazards

- May become combustible or flammable in presence of open flames
- None Reported

Handling

- Keep away from heat, sparks and flames
- Avoid generating oil mists or aerosols
- Wear proper PPE including standard site PPE

NEW AND USED LUBRICATING OIL (continued)

First Aid

- Eyes: Immediately flush eyes with large amounts of water for a minimum of 15 minutes. If redness or irritation persists, continue flushing until the irritation subsides. If the material is hot, seek medical attention immediately for thermal burns.
- Skin: Wash contact area with water and soap. If clothing is contaminated, minimize contact time on skin by removing contaminated clothing (if applicable) and washing contact area thoroughly with water and soap. If material is hot, flush or submerge affected area in cold water, and seek medical attention immediately for thermal burns.
- Ingestion: This material does not present an ingestion hazard if a very small quantity is accidentally swallowed. May act as a laxative. No treatment is necessary under ordinary circumstances. If cramping and/or diarrhea are present following ingestion, seek medical attention.
- Inhalation: If symptoms are present, remove to fresh air immediately. If irritation persists, seek medical attention.

Containment

- Primary: Steel 55-gallon drums
- Secondary: Shop walls, metal basin, and downgradient sediment pond

Maintenance Requirements

- Inspect drums for corrosion or leakage, repair or remove damaged drums

Spill Response

- Control source of spill or leak, if possible.
- Small Spills: Absorb spilled material with absorbent, sand, or soil. Collect contaminated soil. Place absorbent and soil in designated contaminated soil storage area.
- Large Spills: Contact Mine Superintendent for additional assistance

NEW AND USED LUBRICATING OIL (continued)

Spill Notification Requirements

• Immediately contact the Mine Superintendent • If not available contact Safety and Compliance Officer
• Reportable quantity: 25 Gallons • Report spills of 25 gallons or more to: o Division of Oil & Public Safety - Dept of Labor and Employment (during business hours) 303-318-8547 o Colorado Department of Public Health and Environment (after business hours) Toll-Free 24-hour Environmental Spill Reporting Line (877) 518-5608 o Bureau of Land Management, Grand Junction Field Office (970) 244-3078
• Report spills of any quantity which enter waters of the State to the above agencies as well as: o National Response Center (800) 424-8802
• Refer to the Spill Report in Appendix A for information to be provided to the above agencies during oral notification • Follow-up written notification will be required by the above agencies and are required to be copied to the BLM. Instructions for submittal of the written notification will be provided by the agencies during or following oral notification.

NEW AND USED ANTI-FREEZE

Synonyms: Coolant, ethylene glycol

Maximum Quantity On-site: 275 gallons

Description: Yellow-green to dark green, slightly viscous liquid, oily to the touch, slight odor

Potential Health Hazards

- Eye: May cause slight to moderate irritation, including burning, redness, and tearing. Contact with hot material may cause thermal burns.
- Skin: Prolonged and/or repeated exposure may cause mild skin irritation to sensitive individuals, including redness, burning, temporary drying/cracking, and dermatitis. Contact with hot material may cause thermal burns.
- Inhalation: Under normal exposure conditions, may cause systemic irritation of the nose and throat with accompanying headache. In a highly concentrated vapor environment, exposure may additionally produce nausea, vomiting, dizziness, severe headaches, and possibly unconsciousness.
- Ingestion: May be fatal if swallowed. May cause abdominal pain, dizziness, malaise, lumbar pain, oliguria, uremia, and CNS depression. Severe kidney damage, and subsequent renal collapse and failure, follows the ingestion of large volumes of ethylene glycol.

Potential Environmental Hazards

- May become combustible or flammable in presence of open flames
- None Reported

Handling

- Always keep away from sources of heat or flame, incompatible materials (e.g., oxidizers and strong acids), foodstuffs and personal effects.
- Wear proper PPE including standard site PPE

First Aid

- Eyes: Immediately flush eyes with large amounts of water for a minimum of 15 minutes. If redness or irritation is persistent, continue flushing until the irritation subsides. If the material is hot, seek medical attention immediately for thermal burns.
- Skin: Wash contact area with soap and water. If clothing is contaminated, remove contaminated clothing and wash contact area thoroughly with soap and water. If material is hot, flush or submerge affected area in cold water, and seek medical attention immediately for thermal burns.

NEW AND USED ANTI-FREEZE (continued)

First Aid (continued)

- Ingestion: Call a physician immediately. Induce vomiting by administering ipecac. Ethanol may be administered *in very small quantities* as an antidote; if the victim becomes pale and weak, cease administration immediately. Seek medical attention immediately.
- Inhalation: Remove to fresh air immediately. If breathing is difficult, give oxygen until victim's respiration rate returns to normal and seek medical attention immediately.

Containment

- Primary: Steel 55-gallon drums
- Secondary: Shop floor and downgradient sediment pond

Maintenance Requirements

- Inspect drums for corrosion or leakage, repair or empty damaged drums

Spill Response

- Control source of spill or leak, if possible.
- Small Spills: Absorb spilled material with absorbent, sand, or soil. Collect contaminated soil. Place absorbent and soil in designated contaminated soil storage area.
- Large Spills: Contact Mine Superintendent for additional assistance

NEW AND USED ANTI-FREEZE (continued)

Spill Notification Requirements

• Immediately contact the Mine Superintendent • If not available contact Safety and Compliance Officer
• Reportable quantity: 5,000 pounds of ethylene glycol   o equivalent to 630 gallons of new, unmixed antifreeze or 900 gallons of used antifreeze • Reportable quantity exceeds maximum on-site quantity (275 gallons) • No agency notifications required unless spill enters waters of the State

• Report spills of any quantity which enter waters of the State to:
  o National Response Center
  (800) 424-8802
  o Colorado Department of Public Health and Environment (after business hours)
  Toll-Free 24-hour Environmental Spill Reporting Line
  (877) 518-5608
  o Bureau of Land Management, Grand Junction Field Office
  (970) 244-3078

• Refer to the Spill Report in Appendix A for information to be provided to the above agencies during oral notification • Follow-up written notification will be required by the above agencies and are required to be copied to the BLM. Instructions for submittal of the written notification will be provided by the agencies during or following oral notification.

SODIUM METABISULFITE – GRANULAR

Maximum Quantity On-site: 1,000 pounds

Description: Fine, white granular powder, pungent sulfur dioxide odor

Potential Health Hazards

- Skin Contact: Repeated or prolonged contact with dust may cause irritation
- Eye: Dust or mist may cause irritation or burning
- Inhalation: Dust or mist may cause irritation. May cause severe or deadly allergic reactions in asthmatics and sulfite sensitive individuals.
- Ingestion: May cause irritation. May cause severe or deadly allergic reactions in asthmatics and sulfite sensitive individuals.
- Sensitization: May cause allergic skin reaction
- Not a carcinogen, teratogen, mutagen, or reproductive toxin

Potential Environmental Hazards

- This material does not contain any hazardous pollutants
- This material is not listed as a hazardous or toxic substance under TSCA, the Clean Water Act, or CERCLA

Handling

- Wear proper PPE including safety glasses, impervious gloves, and standard site PPE
- Recommend use of air-purifying respirator when mixing or in close contact
- Avoid unintentional contact with water, ice, acids, heat, and oxidizing agents

First Aid

- Eyes: Flush eyes with large amount of water for 15 minutes. Remove contact lenses if present after 5 minutes. Seek medical attention if irritation persists.
- Skin: Wash skin with water and soap. Remove contaminated clothing. Seek medical attention if irritation persists.
- Ingestion: If conscious, rinse mouth with water and give 1 glass of water to drink. Do not induce vomiting. Seek immediate medical attention.
- Inhalation: Remove person to fresh air. Seek medical attention if signs of suffocation, irritation, or other symptoms develop.

Containment

- Primary: Plastic bags stacked on pallet
- Secondary: Stored inside treatment trailer, protected from weather
  Treatment trailer sump drains to external 400-gallon plastic tank

SODIUM METABISULFITE – GRANULAR (continued)

Maintenance Requirements

- Bags should be kept inside treatment trailer, protected from weather, water, ice, acids, and oxidizing agents
- Bags should be kept off floor on pallet
- Care should be taken not to puncture bags
- Punctured bags should be placed in a closed container

Spill Response

- Control source of spill or leak, if possible.
- Small Spills: Sweep or scoop up and place in a closed container
- Large Spills: Contact Mine Superintendent for additional assistance

Spill Notification Requirements

- Immediately contact the Mine Superintendent
- If not available contact Safety and Compliance Officer

- This material has no reportable quantity
- No agency notifications required unless spill enters waters of the State

- Report spills of any quantity which enter waters of the State to:
  - Colorado Department of Public Health and Environment
    Toll-Free 24-hour Environmental Spill Reporting Line
    (877) 518-5608
  - Bureau of Land Management, Grand Junction Field Office
    (970) 244-3078

- Refer to the Spill Report in Appendix A for information to be provided to the above agencies during oral notification
- Follow-up written notification will be required by the above agencies and are required to be copied to the BLM. Instructions for submittal of the written notification will be provided by the agencies during or following oral notification.

SODIUM METABISULFITE – 1% to 10% SOLUTION

Maximum Quantity On-site: 300 gallons (sodium metabisulfite mix tank)

Description: Clear liquid, sulfur dioxide odor

Potential Health Hazards

- Skin Contact: May cause irritation or chemical burns
- Eye: May cause irritation or chemical burns. Possible permanent eye injury.
- Inhalation: May cause irritation
- Ingestion: May cause irritation

Potential Environmental Hazards

- This material does not contain any hazardous pollutants
- This material is not listed as a hazardous or toxic substance under TSCA, the Clean Water Act, or CERCLA

Handling

- Wear proper PPE including safety glasses, impervious gloves, and standard site PPE
- Recommend use of air-purifying respirator when mixing or in close contact

First Aid

- Eyes: Flush eyes with large amount of water for 15 minutes. Remove contact lenses if present after 5 minutes. Seek medical attention if irritation persists.
- Skin: Wash skin with water and soap. Remove contaminated clothing. Seek medical attention if irritation persists.
- Ingestion: If conscious, rinse mouth with water and give 1 glass of water to drink. Do not induce vomiting. Seek immediate medical attention.
- Inhalation: Remove person to fresh air. Seek medical attention if signs of suffocation, irritation, or other symptoms develop.

Containment

- Primary: 300-gallon plastic tank
- Secondary: Treatment trailer sump drains to external 400-gallon plastic tank

Maintenance Requirements

- Inspect tanks and lines for cracks or punctures, repair or remove defective tanks and lines
- Do not overfill tanks

SODIUM METABISULFITE – 1% to 10% SOLUTION (continued)

Spill Response

- Control source of spill or leak, if possible.
- Small Spills: Wash area with water
- Large Spills: Contact Mine Superintendent for additional assistance

Spill Notification Requirements

- Immediately contact the Mine Superintendent
- If not available contact Safety and Compliance Officer

- This material has no reportable quantity
- No agency notifications required unless spill enters waters of the State

- Report spills of any quantity which enter waters of the State to:
  - Colorado Department of Public Health and Environment
    Toll-Free 24-hour Environmental Spill Reporting Line
    (877) 518-5608
  - Bureau of Land Management, Grand Junction Field Office
    Alan Kraus
    (970) 244-3078

- Refer to the Spill Report in Appendix A for information to be provided to the above agencies during oral notification
- Follow-up written notification will be required by the above agencies and are required to be copied to the BLM. Instructions for submittal of the written notification will be provided by the agencies during or following oral notification.

HYDROCHLORIC ACID – 31% SOLUTION

Maximum Quantity On-site: 275 gallons (tote in Water Treatment Plan)

Description: Clear liquid, may produce acid vapors

Potential Health Hazards

- Skin Contact: Rapidly causes severe chemical burns
- Eye: Rapidly causes severe chemical burns, possibly with permanent impairment of vision.
- Inhalation: Can cause choking, coughing, headache dizziness, destroy mucous membranes.
- Ingestion: Severe burning of mouth, pharynx, abdomen, dental erosions, asphyxia, corrosion of upper gastro-intestinal tract with vomiting.

Potential Environmental Hazards

- Likely mobile in the environment due to its water solubility.
- Large amounts will affect pH and harm aquatic organisms

Handling

- Protect containers from mechanical damage
- If possible, provide sufficient mechanical ventilation
- Do not store or mix with cyanides, amines, sulfides, oxidizers or formaldehyde
- Keep in cool place
- Keep away from heat, sparks and flame
- Keep containers tightly closed
- Wear proper PPE including chemical splash goggles (face shield use is also advisable), Rubber or plastic apron/coat, shoes, hard hat with brim. glasses, acid impervious gloves, and standard site PPE
- Avoid breathing vapors
- Do not get in eyes, on skin or clothing
- Wash thoroughly with soap and water after handling
-

HYDROCHLORIC ACID – 31% SOLUTION
(Continued)

First Aid

• Eyes:	Flush eyes with large amount of clean water, holding eyelids open for 15 minutes. Do not use chemical antidotes, speed is essential
• Skin:	Immediately flush exposed area with water for 15 minutes. Remove all contaminated clothing and wash. Seek medical attention. Keep affected area cool.
• Ingestion:	DO NOT INDUCE VOMITING! Give large quantities of water. See medical attention immediately. Keep warm. Never give anything by mouth if person is unconscious.
• Inhalation:	Remove person to fresh air. Seek medical attention immediately. If breathing is difficult, give oxygen (6 liters per minute). If breathing has stopped, give artificial respiration.

Containment

• Primary:	275-gallon IBC tote
• Secondary:	Individual containment vessel
• Tertiary:	Treatment trailer sump drains to external 275-gallon plastic tank

Maintenance Requirements

- Inspect tanks and lines for cracks or punctures, repair or remove defective tanks and lines
- Do not overfill tanks

Spill Response

- Control source of spill or leak, if possible.
- Small Spills: Cover the contaminated surface with Sodium Bicarbonate, Soda Ash or Lime. Mix and add water if necessary to form a slurry. Scoop up slurry and wash site with Sodium Bicarbonate solution.
- Large Spills: Evacuate persons from area that are not equipped with proper PPE. Stay upwind of any spill. Stop leak at source if safe to do so. Dike to prevent spreading. Pump to non-metallic salvage truck/tank.

HYDROCHLORIC ACID – 31% SOLUTION
(Continued)

Spill Notification Requirements

• Immediately contact the Mine Superintendent (verbally) • If not available contact Safety and Compliance Officer
• Reportable quantity is 5,000 lb approx.. 1,300 gallons • No agency notifications required unless spill enters waters of the State
• Report spills of any quantity which enter waters of the State to: o Colorado Department of Public Health and Environment Toll-Free 24-hour Environmental Spill Reporting Line (877) 518-5608 o Bureau of Land Management, Grand Junction Field Office (970) 244-3078
• Refer to the Spill Report in Appendix A for information to be provided to the above agencies during oral notification • Follow-up written notification will be required by the above agencies and are required to be copied to the BLM. Instructions for submittal of the written notification will be provided by the agencies during or following oral notification.

SODIUM HYDROXIDE – 25% SOLUTION

AKA Caustic Soda

Maximum Quantity On-site: 55-gallon drum

Description: Clear liquid, odorless

Potential Health Hazards

- Skin Contact: Severe chemical burns
- Eye: Severe chemical burns. Possible permanent eye injury.
- Inhalation: May cause irritation
- Ingestion: May cause irritation

Potential Environmental Hazards

- Prevent product from entering drains
- This material is listed on TSCA, however, no component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

Handling

- Wear proper PPE including tight fitting safety glasses, face shield and protective suit. Use impervious gloves, and standard site PPE

First Aid

- Eyes: Flush eyes with large amount of water and seek medical advice. Remove contact lenses. Keey eye open while rinsing.
- Skin: Wash skin with water. Immediate medical treatment is necessary. Remove contaminated clothing
- Ingestion: Do not induce vomiting without medical advice. Do not give milk or alcoholic beverages. Take person to hospital immediately.
- Inhalation: Remove person to fresh air. If unconscious place in recovery position and seek medical advice. If symptoms persist, call doctor.

Containment

- Primary: 55-gallon drum
- Secondary: Individual containment vessel
- Tertiary: Treatment trailer sump drains to external 275-gallon plastic tank

SODIUM HYDROXIDE – 25% SOLUTION
(Continued)

Maintenance Requirements

- Inspect tanks and lines for cracks or punctures, repair or remove defective tanks and lines
- Do not overfill tanks

Spill Response

- Control source of spill or leak, if possible.
- Small Spills: Neutralize with acid. Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).
- Large Spills: Contact Mine Superintendent or Safety and Compliance Officer for additional assistance

Spill Notification Requirements

- Immediately contact the Mine Superintendent (verbally)
- If not available contact Safety and Compliance Officer at (303) 864-7775

- This material has no reportable quantity
- No agency notifications required unless spill enters waters of the State

- Regulatory Affairs will report spills of any quantity which enter waters of the State to:
  - Colorado Department of Public Health and Environment
    Toll-Free 24-hour Environmental Spill Reporting Line
    (877) 518-5608
  - Bureau of Land Management, Grand Junction Field Office
    (970) 244-3078

- Refer to the Spill Report in Appendix A for information to be provided to the above agencies during oral notification
- Follow-up written notification will be required by the above agencies and are required to be copied to the BLM. Regulatory Affairs will prepare and submit written notifications to the appropriate agencies following oral notification.

APPENDIX A
HISTORY OF SPILLS

APPENDIX A
HISTORY OF SPILLS AT THE WHIRLWIND MINE

Spilled Material	Date/Time	Cause of Spill	Remedial Actions
Untreated Mine Water	11/28/07 4:00 pm – 11/29/07 6:30 am	Valve at untreated water tank froze overnight and cracked. Approximately 300 gallons of water leaked to adjacent soils and froze. Water did not reach waters of the State.	Spilled, frozen water was removed and placed into mine portal. Damaged valve was replaced with additional insulation and heat tape.

APPENDIX B
SPILL NOTIFICATION FORM

APPENDIX B
SPILL NOTIFICATION FORM

INITIAL INFORMATION:

Date:	Time Reported ( ) AM ( ) PM	Time Occurred ( ) AM ( ) PM
Individual Reporting: (Your Name)		
Phone #	Company Name:	
Location of Spill:	Address:	
Product Spilled	Estimated Amount	County, City, State, Zip
Source & Cause of Incident:		
Person Reported To:	Weather/Stream Conditions:	
Severity of Spill:	Meeting Federal Obligations to Report?	

CURRENT CONDITIONS

(Include Containment and/or Clean-up Efforts)

NOTIFICATIONS

Persons and/or Agencies Notified	Phone Number	Date and Time Notified	Written Follow-up Report Required (yes/no)