GENWAL™ RESOURCES, INC.

P.O. Box 910, East Carbon, Utah 84520 794 North "C" Canyon Rd, East Carbon, Utah 84520
Telephone (435) 888-4000 Fax (435) 888-4002

Daron Haddock
Permit Supervisor
Utah Division of Oil, Gas and Mining
P.O. Box 145801
1594 West North Temple, Suite 1210
Salt Lake City, Utah 84114-5801

July 09, 2014

Re: Revising of Polymer testing at Crandall Canyon, (ACT 015/032) (14-002)

Dear Mr. Haddock:

Please find attached five (3) copies of the changes in the MRP clarifying when polymer testing is required.

Since UEI is no longer using Polymer for Iron treatment at Crandall, a carryover test should not be required of polymers. The approved permit has been revised to reflect when carryover test are required.

Completed C1 and C2 forms as well as a redline strike copy is included.

If you have any questions please give me a call at (435) 888-4007.

Sincerely,

R. Jay Marshall

R. Jay Marshall P.E.
Resident Agent

Form DOGM - C1 (Last Revised July 9, 2014) File Folder # 3

APPLICATION FOR PERMIT PROCESSING

Permit Change ☐	New Permit ☐	Renewal ☐	Transfer ☐	Exploration ☐	Bond Release ☐	Permit Number: 015/032
Title of Proposal: Revised Polymer testing (14-002)						Mine: GENWAL Mine
						Permittee: **GENWAL Resources, Inc.**

Description, include reason for application and timing required to implement:.

Instructions: *If you answer yes to any of the first 8 questions (gray), submit the application to the Salt Lake Office. Otherwise, you may submit it to your reclamation specialist.*

☐ Yes	☐ No	1. Change in the size of the Permit Area? _____ acres Disturbed Area? _____ acres ☐ increase ☐ decrease.
☐ Yes	☐ No	2. Is the application submitted as a result of a Division Order?
☐ Yes	☐ No	3. Does application include operations outside a previously identified Cumulative Hydrologic Impact Area?
☐ Yes	☐ No	4. Does application include operations in hydrologic basins other than as currently approved?
☐ Yes	☐ No	5. Does application result from cancellation, reduction or increase of insurance or reclamation bond?
☐ Yes	☐ No	6. Does the application require or include public notice/publication?
☐ Yes	☐ No	7. Does the application require or include ownership, control, right-of-entry, or compliance information?
☐ Yes	☐ No	8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?
☐ Yes	☐ No	9. Is the application submitted as a result of a Violation?
☐ Yes	☐ No	10. Is the application submitted as a result of other laws or regulations or policies? Explain:
☐ Yes	☐ No	11. Does the application affect the surface landowner or change the post mining land use?
☐ Yes	☐ No	12. Does the application require or include underground design or mine sequence and timing?
☐ Yes	☐ No	13. Does the application require or include collection and reporting of any baseline information?
☐ Yes	☐ No	14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?
☐ Yes	☐ No	15. Does application require or include soil removal, storage or placement?
☐ Yes	☐ No	16. Does the application require or include vegetation monitoring, removal or revegetation activities?
☐ Yes	☐ No	17. Does the application require or include construction, modification, or removal of surface facilities?
☐ Yes	☐ No	18. Does the application require or include water monitoring, sediment or drainage control measures?
☐ Yes	☐ No	19. Does the application require or include certified designs, maps, or calculations?
☐ Yes	☐ No	20. Does the application require or include subsidence control or monitoring?
☐ Yes	☐ No	21. Have reclamation costs for bonding been provided for?
☐ Yes	☐ No	22. Does application involve a perennial stream, a stream buffer zone or discharges to a stream?
☐ Yes	☐ No	23. Does the application affect permits issued by other agencies or permits issued to other entities?

☐ **Attach _3_ complete copies of the application.**

I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations, herein. (R645-301-123)

R. Jay Marshall Resident Agent 7/9/14
Signed / Name - Position - Date

Subscribed and sworn to before me this 9th day of July 2014

Linda Kerns
Notary Public

My Commission Expires: 03.27.17
Attest: STATE OF Utah)
COUNTY OF Carbon)

LINDA KERNS
NOTARY PUBLIC • STATE of UTAH
COMMISSION # 663615
COMM. EXP. 03/27/2017

Received by Oil, Gas & Mining

ASSIGNED TRACKING NUMBER

Application for Permit Processing
Detailed Schedule of Changes to the MRP

Title of Application: Revise Polymer testing (14-002)

Permit Number: 015/032

Mine: GENWAL Mine

Permittee: Genwal Resources, Inc.

Provide a detailed listing of all changes to the mining and reclamation plan which will be required as a result of this proposed permit application. Individually list all maps and drawings which are to be added, replaced, or removed from the plan. Include changes of the table of contents, section of the plan, pages, or other information as needed to specifically locate, identify and revise the existing mining and reclamation plan. Include page, section and drawing numbers as part of the description.

			DESCRIPTION OF MAP, TEXT, OR MATERIALS TO BE CHANGED
☐ ADD	☐ REPLACE	☐ REMOVE	Page 7-32 with new 7-32 in Chapter 7
☐ ADD	☐ REPLACE	☐ REMOVE	Page 3 with new Page 3 in Appendix 7-65
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	
☐ ADD	☐ REPLACE	☐ REMOVE	

Any other specific or special instructions required for insertion of this proposal into the Mining and Reclamation Plan?

WordPerfect Document Compare Summary

Original document: S:\GENWAL\Submittals\2014\14-002 Remove Polymer Test\Chapter 7 current with new monitoring requirements-approved-with new page 7-47 language-task 3941-clean-burma pending.wpd
Revised document: S:\GENWAL\Submittals\2014\14-002 Remove Polymer Test\14-002 Chapter 7 Text.wpd
Deletions are shown with the following attributes and color:
~~Strikeout~~, Blue RGB(0,0,255).
Deleted text is shown as full text.
Insertions are shown with the following attributes and color:
Double Underline, Redline, Red RGB(255,0,0).

The document was marked with 4 Deletions, 4 Insertions, 0 Moves.

TABLE 7-4(A)

Mine-Water Discharge Analysis List

Field Measurements:

Ferrous iron
pH
Dissolved oxygen
Conductivity
Temperature
Flow

Laboratory Measurements:

Calcium (dissolved)
Potassium (dissolved)
Sodium (dissolved)
Magnesium (dissolved)
Silica
Chloride
Hot acidity by Standard Method 2310B4(a)
Aluminum (total and dissolved)
Iron (total and dissolved)
Manganese (total and dissolved_
Sulfate
Alkalinity (total, carbonate, and bicarbonate)
TDS
Suspended solids

Note: All Mine-Water Discharge monitoring data will be submitted to the Division monthly. Water chemistry and field measurements data will be submitted electronically using the Division's water monitoring database EDI system. Mine-water discharge rate data will be provided in a spreadsheet format.

Note: A test for carry over of treatment chemicals will be done if Flocculent is being used in the treatment process. If flocculent is not used a carry over of treatment test is not required.

WordPerfect Document Compare Summary

Original document: S:\GENWAL\Submittals\2014\14-002 Remove Polymer Test\APPENDIX 7-65 IRON TREATMENTapproved with temporary sediment pond storage and response to DO 3582 and task 3714 and task 3827 and Task 3941 and Steves page 15 changes-approved clean.wpd
Revised document: S:\GENWAL\Submittals\2014\14-002 Remove Polymer Test\14-003 Appendix 7-65.wpd
Deletions are shown with the following attributes and color:
~~Strikeout~~, Blue RGB(0,0,255).
Deleted text is shown as full text.
Insertions are shown with the following attributes and color:
Double Underline, Redline, Red RGB(255,0,0).

The document was marked with 0 Deletion, 1 Insertion, 0 Moves.

the "Maelstrom Oxidizer Unit". (See Attachment 1 for additional information regarding this unit.) This oxidizer unit consists of a pre-fabricated high-density plastic structure equipped with a series of baffles and a 20 hp blower. The mine water is fed into one end of the unit where it then travels a serpentine route over and under the baffles, and at the same time, a large volume of air is forced through the water by way of a number of nozzles located in the bottom of the unit. The unit has been sized according to the anticipated flow rate, such that the dissolved oxygen in the water as it exits from the unit is nearly 100%. The high oxygen content then reacts chemically to change the dissolved iron from the ferrous state to the ferric state, which forms iron precipitates which can then be settled out. The maelstrom unit is located ahead of the settling basin, and is also the focal point for the injection of the coagulant and flocculant treatment processes and the sludge re-circulation system described below.

INSTALLATION OF CHEMICAL INJECTION SYSTEM

Based on field trials it was determined that, in order to successfully settle out the iron it was necessary to add a chemical coagulant to the water ahead of the maelstrom, and also add a chemical flocculant to the water after the maelstrom. The coagulant presently used is an aluminum chloride compound, specifically Nalco 8187. This coagulant provides the "seed" mechanism for the iron to adhere to as it goes through the oxidation process. After being oxidized the coagulated ferric iron particles are still too small to settle out on their own. Therefore, a flocculant is injected into the water after it exits from the maelstrom. The flocculant is a polyacrylamide, specifically Nalco 7763. The treated water is then sent to a settling basin. The MSDS sheets for both Nalco 8187 and Nalco 7763 are included in Attachment 10. Only treatment chemicals certified under NSF60 will be utilized for the mine water treatment system. The company will monitor the dosage rate (in mg/L) for all treatment chemicals used. The company will monitor treated water for carryover of treatment chemicals on a monthly basis or when dosage rates or chemical products are changed if no flocculent is being used no test is required. Dosage rates will not exceed the NSF60 certified concentrations without a prior demonstration to the Division, Forest Service and DWQ that elevated dosages rates are acceptable based on analytical results for treated water samples.

The chemical treatment equipment is housed within a pre-existing shed located adjacent to the settling basin. The shed has been retrofitted to accommodate the chemical injection apparatus, including new roofing, interior walls, insulation, heating, and lighting. Two overhead equipment doors have been installed to allow for bulk storage of the chemicals within the shed, and a 2-ton jib crane has been installed to allow handling of the chemical storage totes. The shed is divided into two bays; a storage bay and a treatment bay. Both bays are heated and insulated. The storage bay is designed to store up to 6000 gallons of coagulant. The bay also can store up to 2500 gallons of clean water to be used as make-up water for the chemical system.

The treatment bay houses the chemical mixing and injection system. The coagulant is injected into the discharge water through an adjustable metering pump. This chemical is added

TABLE 7-4(A)

Mine-Water Discharge Analysis List

Field Measurements:

Ferrous iron
pH
Dissolved oxygen
Conductivity
Temperature
Flow

Laboratory Measurements:

Calcium (dissolved)
Potassium (dissolved)
Sodium (dissolved)
Magnesium (dissolved)
Silica
Chloride
Hot acidity by Standard Method 2310B4(a)
Aluminum (total and dissolved)
Iron (total and dissolved)
Manganese (total and dissolved_
Sulfate
Alkalinity (total, carbonate, and bicarbonate)
TDS
Suspended solids

Note: All Mine-Water Discharge monitoring data will be submitted to the Division monthly. Water chemistry and field measurements data will be submitted electronically using the Division's water monitoring database EDI system. Mine-water discharge rate data will be provided in a spreadsheet format.

Note: A test for carry over of treatment chemicals will be done if Flocculent is being used in the treatment process. If flocculent is not used a carry over of treatment test is not required.

the "Maelstrom Oxidizer Unit". (See Attachment 1 for additional information regarding this unit.) This oxidizer unit consists of a pre-fabricated high-density plastic structure equipped with a series of baffles and a 20 hp blower. The mine water is fed into one end of the unit where it then travels a serpentine route over and under the baffles, and at the same time, a large volume of air is forced through the water by way of a number of nozzles located in the bottom of the unit. The unit has been sized according to the anticipated flow rate, such that the dissolved oxygen in the water as it exits from the unit is nearly 100%. The high oxygen content then reacts chemically to change the dissolved iron from the ferrous state to the ferric state, which forms iron precipitates which can then be settled out. The maelstrom unit is located ahead of the settling basin, and is also the focal point for the injection of the coagulant and flocculant treatment processes and the sludge re-circulation system described below.

INSTALLATION OF CHEMICAL INJECTION SYSTEM

Based on field trials it was determined that, in order to successfully settle out the iron it was necessary to add a chemical coagulant to the water ahead of the maelstrom, and also add a chemical flocculant to the water after the maelstrom. The coagulant presently used is an aluminum chloride compound, specifically Nalco 8187. This coagulant provides the "seed" mechanism for the iron to adhere to as it goes through the oxidation process. After being oxidized the coagulated ferric iron particles are still too small to settle out on their own. Therefore, a flocculant is injected into the water after it exits from the maelstrom. The flocculant is a polyacrylamide, specifically Nalco 7763. The treated water is then sent to a settling basin. The MSDS sheets for both Nalco 8187 and Nalco 7763 are included in Attachment 10. Only treatment chemicals certified under NSF60 will be utilized for the mine water treatment system. The company will monitor the dosage rate (in mg/L) for all treatment chemicals used. The company will monitor treated water for carryover of treatment chemicals on a monthly basis or when dosage rates or chemical products are changed if no flocculent is being used no test is required. Dosage rates will not exceed the NSF60 certified concentrations without a prior demonstration to the Division, Forest Service and DWQ that elevated dosages rates are acceptable based on analytical results for treated water samples.

The chemical treatment equipment is housed within a pre-existing shed located adjacent to the settling basin. The shed has been retrofitted to accommodate the chemical injection apparatus, including new roofing, interior walls, insulation, heating, and lighting. Two overhead equipment doors have been installed to allow for bulk storage of the chemicals within the shed, and a 2-ton jib crane has been installed to allow handling of the chemical storage totes. The shed is divided into two bays; a storage bay and a treatment bay. Both bays are heated and insulated. The storage bay is designed to store up to 6000 gallons of coagulant. The bay also can store up to 2500 gallons of clean water to be used as make-up water for the chemical system.

The treatment bay houses the chemical mixing and injection system. The coagulant is injected into the discharge water through an adjustable metering pump. This chemical is added