STATE OF COLORADO

Eschberger - DNR, Amy <amy.eschberger@state.co.us>

Grand Island Resources First Quarter 2022 Report

Daniel Takami <danieltakami@gmail.com> Thu, Mar 31, 2022 at 1:16 PM
To: "Mojar - DNR, Camille" <camille.mojar@state.co.us>, "Eschberger - DNR, Amy" <amy.eschberger@state.co.us>, "Cunningham - DNR, Michael" <michaela.cunningham@state.co.us>, Sergio Rivera <sergio.rivera@novametallix.com>, Richard Mittasch <rmittasch@nedmining.com>

All,

Enclosed is the first quarter report for Grand Island ResourcesI 2022. Please let me know if you have any questions.

Respectfully,

Daniel J. Takami
President, Sustainable Metal Solutions, LLC
President, Nederland Mining Consultants Inc.
President, Grand Island Resources, LLC
danieltakami@gmail.com
501.256.4444

MLRB - FIRST QUARTER 2022 REPORT - BOARD ORDER - v1r0-E-final.pdf
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MINED LAND RECLAMATION BOARD
BOARD ORDER FILE NO. M-1977-410, MV-2021-017

QUARTERLY REPORT
FIRST QUARTER 2022

GRAND ISLAND RESOURCES LLC
CROSS AND CARIBOU MINES
NEDERLAND, COLORADO

PREPARED BY:
GRAND ISLAND RESOURCES LLC
CROSS AND CARIBOU MINES
4415 CARIBOU ROAD
NEDERLAND, CO 80466

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1. CERTIFICATION

Name and Location of Project:
Grand Island Resources, LLC
Cross and Caribou Mines
4415 Caribou Road
Nederland, CO 80466

Operator:
Name: Daniel Takami – President Grand Island Resources
Address: 4415 Caribou Road, Nederland, CO 80466

2. INTRODUCTION

On February 18, 2022 the Colorado Mined Land Reclamation Board (Board) issued to Grand Island Resources LLC (Operator) it's Findings of Fact, Conclusions of Law and Order (Appendix A) on the matter of Notice of Violation No. MV-2021-017 brought before the Board by the Division of Reclamation, Mining & Safety (DRMS) on December 15, 2021 indicating possible violation by the Operator, Civil Penalties, Cease and Desist Order and Corrective Actions for Failure to Minimize Disturbances to the Prevailing Hydrologic Balance, File No. M-1977-410.

The Operator herby complies with Point 3 of the Order's Corrective Actions which mandates the following:

> ***Submit, by the end of every calendar quarter, beginning with the first quarter of 2022, a written report outlining the activities undertaken at the site during the current quarter and any activities planned for the next quarter to ensure compliance with section 34-32-116(7)(g), C.R.S. and Rule 3.1.6(1).***
>
> ***The quarterly reports shall also summarize any actions or findings of the Water Quality Control Division of the Colorado Department of Public Health and Environment regarding the site discharge permit, that were taken during the current quarter.***
>
> ***The Operator shall submit the quarterly reports until the Division issues a written notice to Operator indicating that the reports are no longer necessary***

Prior to the issuance of the Board Findings of Fact, Conclusions of Law and Order, an Enforcement Hearing was held by the Board with DRMS and the Operator on December 15th, 2021, where the Cease and Desist Order was upheld by the Board. A follow up Hearing with the Board was held on January 19, 2022, where DRMS requested that the Board imposed on the Operator the Financial Fine that had been tabled by the Board during the December Hearing.

As a result of the above timeline of events, some of the activities described in this report pre-date the February 18, 2022, Board Order.

3. MLRB ORDER

The Board found the Operator in violation of section 34-32-116(7)(g), C.R.S. and Rule 3.1.6(1).

3.1. CEASE AND DESIST – UNDERGROUND ACTIVITIES

BOARD ORDER: The Operator shall Cease and Desist any further activities underground, except for those activities approved by the Division, in writing, as necessary to comply with the conditions of the Order, protect water quality, prevent damage to off-site areas, complete reclamation, or to protect public health and safety, until all of the corrective actions have been resolved to the satisfaction of the Division.

OPERATORS ACTIONS: The Operator have taken the following actions

3.1.1. Underground Exploration and Ore Production Activities

The operator stopped all activities on November 30, 2021

3.1.2. DRMS Approved Activities

On December 21, 2021, the Operator requested, in written form, approval from DRMS (Appendix B-1) to conduct 17 specific activities underground activities considered by the Operator to be most pressing to comply with the intent of the Cease and Desist Order.

Table 3.1.2.1 below provides a status of Approval and Physical Progress on requested activities by the Operator. Not all requested activities were initially approved by the DRMS; the Operator provided additional information and clarifications at the requested of DRMS; the approval dates for the activities are reflected on the Table; communication between DRMS and the Operator are provided in Appendix B-2.

TABLE 3.1.2.1 DRMS Approved Activities and Progress Report

Priority	Location		Final Approval by DRMS	Progress (% complete)
Priority 1	Cross Mine	1.1.1. Cross Discharge lines installations. The scheduled installation of replacement water discharge lines must continue in the Cross Mine to connect underground drainage system to prevent the mine from flooding. Should flooding occur, ground water would report to the surface through the Cross Mine Adit in an uncontrolled fashion directly to the environment.	22-Dec-21	100.0%
		1.1.2. Refuge Chamber Construction. Construction of an MSHA compliant safety refuge toward the back of the Cross tunnel. This is a critical activity and essential for operations associated with water management (pumps, pipelines, utilities).	22-Dec-21	30.0%
		1.1.3. Utilities Installation for Safety and Operations. (Discharge, Compressed Air, Ventilation, Power and Water supply). Replacement of dated infrastructure (compressed air, water, and electrical lines) which must be installed such that mine dewatering pumps and ventilation systems are operational.	29-Dec-21	65.0%
		1.1.4. Auxiliary Fan installations. The ventilation system is a critical safety requirement for personnel attending and maintaining the pumping systems; these systems must be operational prior to the construction of water management sumps and for any associated activities.	29-Dec-21	100.0%
		1.1.5. Ground support installation. All areas leading to the mine pumping sites must be secured, bolted, and must comply with MSHA guidelines for safe personnel access.	29-Dec-21	100.0%
		1.1.6. Freeze Prevention Program. The groundwater conveyance systems must be insulated to prevent freezing of pipes and equipment and appurtenant facilities such that the water conveyance systems remain operational during the winter months.	22-Dec-21	85.0%
	Caribou Mine/Idaho Tunnel	1.2.1. Construction of Sediment Control Structures. Solids removal from groundwater within the mine workings prior to discharge to the sediment control ponds is critical for optimizing the performance of the settling ponds. The construction of a Cofferdam and Check dams in the Idaho tunnel is critical for water quality compliance. These activities include the extension of piping systems into the pumping areas.	22-Dec-21	80.0%
		1.2.2. "75" Sediment Control Sump Rehabilitation. Removal of sediment accumulated in the clarifying sump is a required O&M part of the system; GIR is planning to relocate the existing pump further into the sump to optimize sump storage capacity, an access walkway must be constructed to ensure the safety of maintenance personnel.	22-Dec-21	30.0%
		1.2.3. Freeze Prevention Program. The groundwater conveyance systems must be insulated to prevent freezing of pipes and equipment and appurtenant facilities such that the water conveyance systems remain operational during the winter months.	22-Dec-21	90.0%
Priority 2	Cross Mine	2.1.1. Cross Shaft and Old Access Road Surface Reclamation. Backfill, compact and recontour the terrain to reduce surface water inflow into the underground working. A detailed reclamation plan and design is currently being prepared for submittal under separate cover to DRMS	Activity not Approved by DRMS	0.0%
		2.1.2. Apache/Potosi Sump Development at 'G' Station. Construction of a water sedimentation and clarification system at a midpoint within the tunnel. Construction of underground sumps is required such that water flows are collected and controlled. The sumps would serve as sediments settling structures such that heavily sediment laden water is not delivered to the treatment plant.	22-Dec-21	35.0%
	Caribou Mine/Idaho Tunnel	2.2.1. Personnel Siding Development along Railway and Equipment Corridors. Safety step-aways from moving equipment.	22-Dec-21	80.0%
Priority 3	Cross Mine	3.1.1. Required infrastructure for safe construction and operation of water systems controls. Infrastructure construction required for control of fracture flow discharges reporting to the underground workings. The infrastructure is required to minimize suspended solids reporting to the treatment system and includes pipe installation at ground level where pre-mining construction will occur on the haulageway. This will protect the drainage ditch from collecting and discharging sediment.	Activity not Approved by DRMS	0.0%
		3.1.2. Winze Hoist and Winze Sump Rehabilitation. Essential activity required for access of lower mine levels for rehabilitation and water management.	18-Feb-22	20%
		3.1.3. Sublevel Sediment Sumps Rehabilitation and Development. Rehabilitation of currently flooded workings after groundwater table drawdown and release of groundwater via the water treatment system.	18-Feb-22	5%
	Caribou Mine/Idaho Tunnel	3.2.1. Sediment Control Pond Upgrades. Minor modifications to reduce the impact of freezing pipes and ice build-up.	29-Dec-21	15.0%
Site Wide		4. HYDROGEOLOGIC STUDY GIR intends to conduct a comprehensive Hydrogeologic Study of the Mining Complex. The Study is considered critical and essential for near future and long-term operations and water quantity and quality management. GIR anticipates that the Study will require access to the mining areas and activities that are not anticipated to result in high level of disturbance. GIR will provide, upon request, the Scope of Work for the Study. Approval of the Study is hereby requested.	Activity not Approved by DRMS	0.0%

3.2. CORRECTIVE ACTIONS

3.2.1. Water Treatment Modifications Technical Revision

On February 28, 2022, the Operator filed with DRMS a Request for Technical Revision (namely TR-10) in response to a Service of Notice of Violation/Cease and Desist Order (Number IO-211130-1) from Colorado Department of Public Health and Environment (CDPHE) dated November 30, 2021, in conjunction with Permit No. M-1977-410. TR10 (Appendix C-1) includes a detailed plan of action and current activities addressing surface water quality noted in the letter. The Technical Revision request describes measures that have been taken and are further proposed at the site to address water quality issues, including underground installations, a description of the new water treatment pilot system, results of the current system and a Ground Water Monitoring Plan (GWMP) as required by the NOV/C&D Order.

DRMS issued to the Operator on March 25, 2022, a Preliminary Adequacy Review Letter (Cross Gold Mine, Permit No. M-1977-410, Technical Revision No. 10 (TR-10)) (Appendix C-2).

The Preliminary Adequacy Review Letter by DRMS contains 27 main topics and 29 subtopics requiring clarification and/or additional information from the Operator and, given that a decision date was set for March 30, 2022, the Operator, therefore, requested an extension from the DRMS (Appendix C-3).

DRMS granted the extension to April 14, 2022, via written notification dated March 28, 2022 (Appendix C-4)

3.2.2. Financial Warranty to Operate the Water Treatment System

On March 16, 2022, the Operator filed with DRMS a FINANCIAL WARRANTY, CHECK FOR DEPOSIT IN THE STATE TREASURY Form, Check No. 125 for $162,841.00 (One Hundred and Sixty-Two Thousand Eight Hundred and Forty-One Dollars) (Appendix D-1); the check was deposited by the Operator on March 21, 2022 (Appendix D-2).

On March 21, 2022, the Operator issued to DRMS a check for $5,000.00 as payment to the Board Ordered Financial Fine for the violations. (Appendix D-3).

3.2.3. Written Quarterly Report

The subject of this First Quarterly Report

3.2.4. Appear Before the MLRB – December 2022

Hearing date to be scheduled by the Board.

4. CDPHE WATER QUALITY CONTROL DIVISION

Pursuant to Paragraph 24 of CDPHE-WQCD Notice of Violation/Cease and Desist Order Number IO-211130-1 dated November 30, 2021 ("Order"), as modified by correspondence with the Division, Grand Island Resources ("GIR") provided on March 30, 2022, Progress Report for the First Quarter, 2022 (Appendix E), select portions of the report are provided below:

4.1. NO WATER QUALITY DISCHARGE VIOLATION DURING THE QUARTER

Since late December of 2021, Mr. Patrick Delaney, Environmental Manager of the third-party company Black Fox Mining has been in charge for the operation, calibration, and optimization of the water treatment system at GIR facilities.

Mr. Delaney has also been responsible for collecting and/or supervising the collection of water quality compliance samples and has filed on behalf of GIR, with the Permits and Enforcement Section Water Quality Control Division CPDHE, Monthly Discharge Monitoring Reports - Cross Gold Mine CO0032751.

The Filings indicate that all compliance samples tested for the First Quarter of 2022 meet permit discharge standards including the WET testing, in accordance with EPA and State of Colorado procedures, in March 2022.

4.2. SECOND QUARTER OF 2022 PLANNED ACTIVITIES

Activities planned for second quarter of 2022 (April 1-June 30, 2022), subject to change based on time, staffing, and financial constraints:

4.2.1. Pursuant to Corrective Action No. 1 of the Board Order, the Technical Revision shall be approved by DRMS by April 28, 2022.

4.2.2. The following work will be done to prepare for high Spring runoff and ensure that the site remains in compliance with its permit effluent limits:

4.2.2.1. Management of high concentrated flow via attenuation measures is a component of GIR's water management strategy to remain in compliance with GIR's permits. GIR has identified points of concentrated infiltrated water flows into the Idaho Tunnel. GIR has identified an abandoned crosscut approximately 960 feet into the Idaho Tunnel which may be suitable for peak flow attenuation via a water door. Placement of a water door in the Caribou/Idaho Tunnel allows for planned release of the detained water and provides access to the underground workings as needed. Attenuation of high infiltration water flux would have important benefits to water treatment.

4.2.2.2. GIR has located various locations in the Cross mine in which the workings intersect fault systems. These highly fractured zones are susceptible to relatively high flow of infiltrated water into the mine which increases weathering of the surrounding rock and mobilizes sediment, thereby resulting in suspended solids laden water outflow requiring treatment prior to environmental release. To partially alleviate those conditions, GIR is planning the construction of catchment areas at the tunnel ribs, which will be collection points for water thereby allowing for improved drainage control into conveyance ditches. Additionally, shotcrete will be used at highly fractured and weathered areas to secure loose material in position and to limit sloughing and sediment generation.

4.2.2.3. GIR has determined that, in certain locations, open core drill holes become water conveyance conduits as rock fractures and groundwater are intercepted. GIR is identifying these specific

locations where core drill holes contribute significant water flows to peak discharge. GIR plans to apply industry and engineering standards to plug these holes possibly with a high compressive strength dry grout packing.

4.2.3. Install a new flowmeter at Outfall-001A.

4.2.4. Move the existing flowmeter at Outfall-001A to the Caribou Mine source stream for complete monitoring of all flow onsite, both source water and treated.

4.2.5. Enhance the mechanical equipment at the existing WTP to maximize throughput capabilities.

4.2.6. Install instrumentation to monitor the water level in the Winze. This is the current location of the Cross pump to limit manual checks and ensure proper operations of the Cross pump given that the vicinity of the Winze has been dewatered completely since March 26, 2022.

4.2.7. Continue to onboard the new Water Treatment Technician.

4.2.8. Weather permitting, dewater for retreatment and clean out Pond 2 from historic treatment practices that settled heavy metal particulate.

4.2.9. Establish a long-term sump solution in the Caribou Tunnel.

4.2.10. Install mitigation tools in both the Cross and Caribou portals to reduce sediment outflow.

4.2.11. Install mitigation tools in the Caribou outflow ponds to retain sediment prior to treatment.

4.2.12. Install an operational bypass of the Caribou Mine source stream before Pond 1 to the Cross workings to prevent Pond 1 overtopping.

4.2.13. Install increased heat trace and insulation in the Cross Tunnel to ensure no freezing will occur do to batch treatment.

4.3. COMMUNICATIONS AND STATUS

On March 13, 2022, GIR's consultant, Patrick Delaney of Blackfox Mining provided Mr. Dyste with the first set of February 2022 compliance samples and informed Mr. Dyste that GIR has been unable to submit the facility evaluation identified and outlined in Paragraph 21 of the Order due to Mr. Delaney's work in evaluating and establishing water treatment on site, training GIR staff onsite, and ensuring permit compliance. Mr. Dyste approved the delay and recognized that GIR has made significant progress towards compliance.

On March 10, 2022, GIR and the Division met to discuss this NOV, the contents of the facility evaluation, improvements made on site to date, and other planned activities to keep the facility in compliance and move towards negotiations of a consent order in this matter.

On March 14, 2022, Mr. Delaney submitted the second half of February sampling which also showed that GIR had no exceedances and was in compliance with its discharge permit.

5. COMMUNITY AWARENESS

5.1. CITIZENS COMPLAINTS DOMESTIC WATER

The Division of Reclamation, Mining and Safety (DRMS) received multiple citizen complaints from November 2021 through January 2022 regarding the Cross Gold Mine, File No. M-1977-410. While various concerns were expressed in the complaints, the primary concern (under DRMS jurisdiction) was regarding potential impacts the mine discharge may have had on surface water and groundwater resources in the vicinity of the mine, particularly to downstream wells.

DRMS issued on February 22, 2022 (Appendix F-1), a Notification stating the following:

> *Upon reviewing the available water quality data for the Cross Gold Mine and the surrounding area, DRMS has found no evidence indicating groundwater discharges from the mine led to degradation of surface and groundwater resources. DRMS reviewed all of the past data from the Cross Gold Mine, including exceedances of discharge standards and found that all discharges were below drinking water standards. DRMS also considered factors such as the distance from the mine to the nearest domestic wells and the quality of water in Coon Track Creek.*

5.2. PUBLIC LETTERS

5.2.1. GIR Open Letter to every resident in Nederland

Open letter from Daniel Takami, President of Grand Island Resources addressing the community regarding GIR. (Appendix F-2)

5.2.2. GIR Letter for Immediate Release

Grand Island Resources (GIR) has been founded on and dedicated to our mission which is to prove that existing contaminated mining sites and tailings can be remediated and operated while keeping the environment and our water clean and safe, all financed by private capital. We are working hand in hand with federal, state and local agencies, including the Colorado Department of Water Quality Control Division (WQCD), to make all the necessary investments and capital improvements that were not made by previous operators of the Cross and Caribou Mines in the mountains above Nederland, Colorado. We have retained world renowned experts and engineering firms and are working closely with the Division of Reclamation, Mining and Safety (DRMS) and the Colorado Department of Public Health & Environment (CDPHE).
(Appendix F-3)

5.2.3. GIR Letter sent to Mayor, BOT, Town Attorney and Town Administrator

Dear Mayor Larsen, et al.,

I represent Grand Island Resources, LLC (GIR), the owner and operator of the Caribou and Cross mines, and Sustainable Metal Solutions, LLC(SMS). We have become increasingly concerned by the tone of the rhetoric and the false and misleading statements being made by members of the Board of Trustees of the Town of Nederland. This letter explains why many of the statements appear to have been made with actual malice or reckless disregard for the truth, and are intended to result in the closure of our mines. If successful, this quickly organized and orchestrated campaign, which constitutes actionable corporate disparagement, libel and slander, could result in damages in excess of Five Hundred Million Dollars ($500,000,000.00).
(Appendix F-4)

5.2.4. Libelous Nederland Poster

WARNING Boulder County's watershed is being poison. Grand Island Resources LLC a Chinese funded Canadian held company that is currently mining gold at the top of Caribou Road….
(Appendix F-5)

5.2.5. Letter to the editor of the Mountain Ear (print version)

Caribou and Cross Mines part of Nederland's history for 152 years …
(Appendix F-7)

5.2.6. Letter to the editor "Mining with respect for the Environment"

Cross and Caribou Mines Carries on the Legacy of 'Mining with Respect for the Environment.' Many people don't realize the statue in front of the Boulder County Courthouse is Tom Hendricks, the legendary hard rock miner of the historic Cross and Caribou Mines. As the first President of Grand Island Resources, Hendricks placed a sign at the entrance of the Cross Mine that read, "Mining with respect for the environment." We continue forward with his legacy of responsible mining with the utmost respect for Boulder County's land, water, and people….
(Appendix F-8)

5.2.7. Letter to the editor "Mining with respect for the Environment" Printed version in the Mountain Ear

Carrying on the Legacy of "Mining with Respect for the Environment" …
(Appendix F-9)

5.2.8. Guest Opinion to the Boulder Daily Camera

GUEST OPINION – A Quick Fix Was Never the Answer for Nederland Mine Cleanup published in the Boulder Daily Camera on 12/21/2021.
(Appendix F-10)

5.2.9. Save the Colorado Letter to DRMS Response Letter, Dr. G. Miller

Dear Ms. Eschberger:

I am providing this letter on behalf of Grand Island Resources (GIR) in response to the comment letter you received from Save the Colorado (STC) on December 28, 2021 (STC Letter). STC has four issues with approval of the proposed Amendment 2 to the GIR 110(2) Limited Impact Mining Permit: (1) has there been no meaningful public participation in the AM-02 Application Review, (2) the AM-02 Application fails to demonstrate minimization of impacts to water quality, (3) the Cross Mine should be considered a Designated Mining Operation (DMO), and (4) the AM-02 Application fails to demonstrate compliance with HB 19-1113.
(Appendix F-11)

5.2.10. GIR Supplemental Timeline letter to DRMS

Past History By 1975, Hendricks Mining Co. (HMC) had begun the process of treating trace dissolved metals from the Cross Mine dewatering discharge. Analytical tests performed on the groundwater in the Cross and Caribou mines indicates that this water does not constitute acid mine drainage (AMD). A combination of lime treatment of Cross Mine effluent and dilution with Caribou Mine (Idaho Tunnel) water kept effluent discharges compliant with discharge standards of that time. The ores at the mine were subjected to, and passed, humidity cell and acid/base testing. The mine has maintained a CDPHE discharge permit for decades. (Appendix F-12))

6. CLOSING

Grand Island Resources LLC, Directors, Management and Technical Personnel appreciate the opportunity to submit this Quarterly Report to the Mined Land Reclamation Board in compliance with the Board's February 18 2022, Findings of Fact, Conclusions of Law and Order (appendix A) issued to Grand Island Resources LLC (Operator) on the matter of Notice of Violation No. MV-2021-017 brought before the Board by the Division of Reclamation, Mining & Safety (DRMS) on December 15, 2021. Specifically, to the Order: ***Submit, by the end of every calendar quarter, beginning with the first quarter of 2022, a written report outlining the activities undertaken at the site during the current quarter and any activities planned for the next quarter to ensure compliance with section 34-32-116(7)(g), C.R.S. and Rule 3.1.6(1).***

Grand Island Resources LLC would like to respectfully emphasize our commitment to the development of a mining operation that is compliant with all applicable regulatory framework. Our staff has been working diligently and tirelessly to address the temporary shortcoming faced by the operation. The Corporation has committed the necessary financial and personnel resources required to implement measures to ensure that the violations cited by the Board are remedied and that do not occur in the future.

Grand Island Resources has paid the Civil Penalty imposed by the Board. We have submitted to DRMS the Technical Revision for the Treatment System and have deposited the Financial Warranty to Operate the Water Treatment System to the Treasury of the State of Colorado.

The Water Treatment System installed to replace the limited previously authorized water treatment system has proven effective and reliable. All Water Quality Discharge Standards have been met since the system became fully operational.

Grand Island Resources LLC looks forward to the opportunity to discuss with the Board and DRMS steps needed to obtain a release from the Cease and Desist Order such that we are allowed to continue exploring and identifying the metal resources contained within our mining district and advance the development of our mining operation.

Respectfully Submitted

Grand Island Resources LLC,

Daniel Takami
President

Appendix A

A - Colorado Mined Land Reclamation Board (Board) - Findings of Fact, Conclusions of Law and Order

COLORADO
Division of Reclamation, Mining and Safety
Department of Natural Resources

February 18, 2022

Attn: Richard Mittasch
Grand Island Resources LLC
P.O. Box 3395
4415 Caribou Rd
Nederland, CO 80466

Re: Findings of Fact, Conclusions of Law, and Order, Grand Island Resources LLC
File No. M-1977-410, MV-2021-017

On February 18, 2022 the Mined Land Reclamation Board signed the enclosed Board Order for the above captioned operation. Because this document is the final order of the Board, it is legally binding on and affects the above-captioned operation, and we strongly advise that you read this document carefully.

Sincerely,

Camille Mojar
Board Administrator

Enclosure(s)

Certified Mail
7018 2290 0001 8923 1007

cc:
Amy Eschberger
Michael Cunningham
Jeff Fugate
Scott Schultz
Charles Kooyman
John Henderson, Esq.
Daniel Takami
Ed Byrne, Esq.
Gabe Racz, Esq.
Patrick Delaney
Greg Miller

BEFORE THE MINED LAND RECLAMATION BOARD
STATE OF COLORADO

Notice of Violation No. MV-2021-017

FINDINGS OF FACT, CONCLUSIONS OF LAW, AND ORDER

IN THE MATTER OF POSSIBLE VIOLATION BY GRAND ISLAND RESOURCES, LLC, CIVIL PENALTIES, CEASE AND DESIST ORDER, AND CORRECTIVE ACTIONS FOR FAILURE TO MINIMIZE DISTURBANCES TO THE PREVAILING HYDROLOGIC BALANCE, File No. M-1977-410

THIS MATTER came before the Mined Land Reclamation Board ("Board") on December 15, 2021, and on January 19, 2022 via videoconference to consider a possible violation by Grand Island Resources, LLC ("Operator"), civil penalties, cease and desist order, and corrective actions for failure to minimize disturbances to the prevailing hydrologic balance, File No. M-1977-410. Amy Eschberger, Michael Cunningham, Russ Means, and Assistant Attorney General Scott Schultz appeared on behalf of the Division of Reclamation, Mining and Safety ("Division"). John Henderson, Esq.; Daniel Takami; Ed Byrne, Esq.; Gabe Racz, Esq.; and Greg Miller appeared on behalf of the Operator.

The Board, having considered the parties' presentations, testimony, and the administrative record, and being otherwise fully informed of the facts in the matter, enters the following:

FINDINGS OF FACT

1. The Operator holds a 110(2) reclamation permit for an 8.95 acre gold, silver, zinc, copper, and lead mine located in Section 9, Township 1 South, Range 73 West, 6th Principal Meridian in Boulder County, Colorado, permit number M-1977-410. The permitted site, known as the Cross Gold Mine, is located outside Nederland, Colorado.

2. The permitted site consists of two mines, the Cross Mine and Caribou Mine, separated by Coon Track Creek. Coon Track Creek drains into tributaries before entering a Boulder City reservoir approximately 5 miles downstream and east of the Town of Nederland.. Water is discharged into Coon Track Creek from both mines under a discharge permit issued by the Colorado Department of Public Health and Environment's Water Quality Control Division ("WQCD"). Previously, prior to discharge, water from the Cross Mine was treated with lime, allowed to settle in a pond, and then moved to a second pond where it is mixed with outflow from the Caribou Mine. The treated water was then discharged into Coon Track Creek.

3. On June 27, 2019, the Division received an email from Tom Hendricks, the previous operator, regarding a planned water quality improvement project for the Cross Gold Mine. The Division requested the submittal of a formal proposal with more details so that the Division could determine an appropriate revision. No proposal was submitted by the Operator in 2019. Mr. Hendricks, who had been battling a serious illness, passed away in early January 2020 and the transition to new management began. Hendricks had managed both mines for more than 40 years.

4. On February 4, 2020, the Division received a notice of noncompliance from WQCD for zinc and cadmium levels in excess of levels set in Operator's WQCD discharge permit (CDPS Permit No. CO0032751).

5. On February 5, 2020, the Division received Operator's Compliance Advisory Response to WQCD. Operator attributed the water quality issues to disturbances in flow caused by a collapse in the Idaho Tunnel and associated rehabilitation activities in November 2019.

6. On February 12, 2020, the Division sent Operator a notice of compliance problems with required corrective actions. The notice required Operator to copy the Division on all future compliance notices issued by WQCD for the site and to submit a technical revision to the Division by April 12, 2020, with a detailed plan for addressing the impaired surface water quality.

7. On March 19, 2020, the Division received a response from Operator describing progress it had made in reestablishing flows from the Idaho Tunnel and resulting improvements to water quality at the permitted discharge location.

8. The Division conducted an inspection of the site on March 26, 2020, and provided the report to Operator on April 7, 2020. The Division's inspection report cited several problems at the site, including impaired surface water that was discussed in the Division's February 12, 2020, notice of compliance problems sent to Operator.

9. On April 29, 2020, the Division received Technical Revision No. 5 from Operator, which provided for the rehabilitation of the Idaho Tunnel portal to allow safe entry into the mine and to reestablish the flow of mine water from the Caribou Mine to meet Operator's WQCD permit discharge requirements.

10. The Division approved Technical Revision No. 5 on June 22, 2020.

11. On August 25, 2020, the Division received Operator's Technical Revision No. 8, which provided a detailed plan for the rehabilitation and replacement of pond liners at the Caribou Mine and additional improvements to the water treatment system, including the addition of a lime feed and control building.

12. The Division approved Technical Revision No. 8 on November 10, 2020.

13. On June 24, 2021, the Division inspected the site and met with the Operator. The Operator failed to inform the Division of any water quality issues at the site although work being done on the treatment ponds was discussed.

14. On September 21, 2021, the Division received a notice of non-compliance from WQCD for the site's exceedances at the permitted discharge location regarding zinc, cadmium, lead, copper, and silver. Some of the discharge exceedances went back to May 2020.

15. On October 1, 2021, the Division issued a Reason to Believe a Violation Exists and Notice of Board Hearing letter to Operator. The Notice described the alleged violation as the failure to minimize disturbances to the prevailing hydrologic balance of the affected land and of the surrounding area and to the quantity or quality of water in surface and groundwater systems both during and after the mining operation and during reclamation. 34-32-116(7)(g), C.R.S. and Rule 3.1.6(1).

16. The Division received a response from Operator on October 7, 2021, stating that activities at the site have stressed the lime-addition and detention pond water treatment system. The Operator's letter also stated that Operator was working on alternative water treatment systems, including ones that Operator tried but which were not fully effective at ensuring compliance with discharge standards. Operator had installed a first-generation active treatment plant was on-site for testing, but, despite contractual assurances to the contrary, the system had failed to meet the aquatic life standards for the discharge.

17. On November 5, 2021, WQCD issued Operator a Notice of Violation and Cease and Desist Order for violations of its discharge permit, including exceedances of lead, cadmium, zinc, silver, and copper.

18. On November 21, 2021, the Division began receiving complaints from downstream landowners regarding the situation at the site. The Division has been investigating those complaints and has met with other agencies, including WQCD, Boulder County, and the City of Boulder, who are also investigating the complaints.

19. On November 24, 2021, the Division met with Operator and its water treatment consulting firms to discuss the new water treatment system being installed at the site, costs associated with the system, and the expected timeline to achieve full compliance with Operator's discharge permit.

20. On November 30, 2021, WQCD withdrew the Notice of Violation and Cease and Desist Order it had issued on November 5, 2021 and issued a revised notice.

21. At the hearing held during the Board's December 15, 2021 meeting, the Division presented testimony and evidence regarding the violations. Under the current

reclamation permit, water discharged from the Cross Mine is treated with lime, settled in a pond, and then mixed with water flowing from the Caribou Mine before discharge to Coon Track Creek. Before mining and reclamation activities re-started at the site, this water treatment system seemed to have been effective in helping water from the Cross Mine meet discharge standards set by the Operator's discharge permit with WQCD.

22. According to testimony from the Division, the water quality issues began when a collapse in the Idaho Tunnel choked off the comparatively cleaner water flow from the Caribou Mine. The water quality issues are the result of the Operator's mining operation, including rehabilitation and reclamation, at the site. The Division learned of the collapse of the Idaho Tunnel from WQCD on February 4, 2020, and received some additional details from the Operator's February 5, 2020 Compliance Response and in the request for TR-5 on April 29, 2020, although further communication as to the extent of the collapse was lacking. Operator had also not informed the Division of or sought approval for the alternative water treatment systems it had tried in 2021. The lack of communication from Operator to the Division was a pattern that started in 2020 after the death of Mr. Hendricks and the transition to new management.

23. Operator presented testimony regarding the circumstances at the site and its efforts to address the water quality discharge issue. Operator presented testimony that the levels set in its WQCD permit were set to aquatic life rather than drinking water standards, and that exceedances were still below levels set for drinking water. The aquatic life standards are generally more stringent that drinking water standards.

24. Operator also presented argument that WCQD, not the Division or Board, had sole authority to enforce violations of WQCD imposed discharge limits at the site.

25. Operator did not present evidence to dispute that outflow from the mines exceeded its WQCD discharge permit. Rather, Operator's expert witness, Greg Miller, admitted that there were ongoing water quality issues but stated that there was no threat to human health and that Operator was diligently working to address the issue. Operator's expert stated his opinion that the low levels of metallics in the discharges could not threaten wells or water supplies miles downstream or in other drainages as Coon Track Creek was a gaining stream, resulting in further dilution of trace metallics already being discharged within safe drinking water limits.

26. Operator presented testimony explaining that because the threshold amounts set by its discharge permit were so low, testing discharge water required sending samples to off-site labs for processing. The low amounts of minerals at issue has also made finding functional alternative water treatment processes difficult because meeting the limits requires a high level of filtering and treatment; many types of equipment will treat to drinking water standards and could not treat to the parts per billion standards set for aquatic life. Operator has been working on doing so and had already tried one system that failed to perform as warranted in treating discharge water.

27. Operator described the work it had already done in addressing the issue and stated that it had been communicating with WQCD regarding those efforts. Operator committed to copying the Division on all future communications with WQCD and asked the Division to open its communications with WQCD as well.

28. Operator presented testimony regarding the potential downsides from a cease and desist order, which could impair its ability to conduct activities necessary to remedy the discharge issues. In particular, Operator expressed the need to continue its efforts to reduce sedimentation from the Cross Mine from entering the water being discharged. Operator asked that any cease and desist order be tailored to allow Operator to continue that work.

29. Operator also asked the Board to wait to assess civil penalties should it find a violation until after WQCD had made its decision regarding the exceedances.

30. The Board stayed a decision on the amount of suspended civil penalties until its January 2022 meeting to allow Operator and the Division time to work together and present further evidence regarding efforts to address the issue.

31. At the Board's January 19, 2022, meeting, the Division presented testimony that Operator had been working well with the Division, had been in compliance with the cease and desist order and was making progress. Discharge data from November 2021 showed only exceedances in the pH and lead levels. Though the Division recognized that Operator was making progress and has shown commitment to compliance, its previous recommendation on civil penalties remained unchanged because that recommendation was based on facts that occurred prior to the hearing at the Board's December 15, 2021 meeting.

32. Operator also presented testimony regarding its efforts to address the discharge issue, public outreach regarding the issue, and the new treatment and filtration system. Regarding the exceedances in the November 2021 data, Operator explained that the new system was not online at that time and expressed satisfaction that preliminary results from the new system appeared to be achieving compliance with additional adjustments to the new system still in progress. The new system has been running continuously, and Operator has installed a remote control that allows full automation and remote monitoring. The latest sampling data from December showed compliance, and Operator hoped to have a record of full compliance through the next few months.

CONCLUSIONS OF LAW

33. The Board has jurisdiction over this matter pursuant to the Colorado Mined Land Reclamation Act, Article 32 of Title 34, C.R.S. (2021) ("Act").

34. Under section 34-32-116(7)(g), C.R.S., operators are required to minimize disturbances to the prevailing hydrologic balance of the affected land and of the surrounding area and to the quantity or quality of water in surface and groundwater systems both during and after the mining operation and during reclamation. The Operator failed to minimize the disturbance to the quality of water in the surface system by allowing the discharge of water in excess of its allowable limits, in violation of section 34-32-116(7)(g), C.R.S.

35. Rule 3.1.6(1) of the Mineral Rules and Regulations of the Colorado Mined Land Reclamation Board for Hard Rock, Metal, and Designated Mining Operations (the "Rules") requires operators to minimize disturbances to the quality and quantity of surface and groundwater during the mining operation and reclamation as measured by compliance with applicable Colorado water quality laws and regulations, including statewide water quality standards and site-specific classifications and standards adopted by the Water Quality Control Commission. Operator violated Rule 3.1.6(1) by failing to comply with its site-specific discharge standards adopted by the Water Quality Control Division.

36. Pursuant to section 34-32-124(2), C.R.S., the Board may issue a cease and desist order if it determines that an operator or person violated any provisions of the Act, permit, or regulation issued or promulgated under the Act. The Operator violated section 34-32-116(7)(g), C.R.S. and Rule 3.1.6(1).

37. Pursuant to section 34-32-124(7), C.R.S., the Board may impose a civil penalty of not less than $50 per day nor more than $200 per day for each day of violation. The Board may impose a civil penalty against the Operator based on 85 days of violation for a civil penalty of $4,250 to $17,000.

ORDER

Based on the foregoing findings of fact and conclusions of law, the Board finds the Operator in violation of section 34-32-116(7)(g), C.R.S. and Rule 3.1.6(1) for its failures to minimize disturbances to the prevailing hydrologic balance of the affected land and of the surrounding area and to the quality of water in surface systems during the mining operation and during reclamation.

The Operator shall CEASE AND DESIST any further activities underground, except those activities approved by the Division, in writing, as necessary to comply with the conditions of this Order, protect water quality, prevent damage to off-site areas, complete reclamation, or to protect public health and safety, until all of the corrective actions have been resolved to the satisfaction of the Division.

The Board imposes against Operator the following CORRECTIVE ACTIONS: Operator shall:

1. File a Technical Revision by February 28, 2022, to modify the water management and treatment program for the site to sufficiently address all water quality issues, and provide a surface water and groundwater monitoring program that meets all applicable requirements of Rules 3.1.6, 3.1.7, 6.3.3, and 6.3.4. The Technical Revision shall be approved by the Division within 60 days of receipt, by April 28, 2022;

2. Submit, within 30 days of the effective date of this Order, an interim financial warranty in the amount of $162,841.00 to operate any necessary water treatment system at the site (based on an estimated cost of $6,785 per month over a 2-year period);

3. Submit, by the end of every calendar quarter, beginning with the first quarter of 2022, a written report outlining the activities undertaken at the site during the current quarter and any activities planned for the next quarter to ensure compliance with section 34-32-116(7)(g), C.R.S. and Rule 3.1.6(1). The quarterly reports shall also summarize any actions or findings of the Water Quality Control Division of the Colorado Department of Public Health and Environment regarding the site discharge permit, that were taken during the current quarter. Operator shall submit the quarterly reports until the Division issues a written notice to Operator indicating that the reports are no longer necessary; and

4. Appear at the Board's December 2022 meeting to provide a status update on the corrective actions required by this Order.

The Board imposes a CIVIL PENALTY for 85 days of violation pursuant to section 34-32-124(7), C.R.S. at $200 per day for a total civil penalty of $17,000. All but $5,000 of the civil penalty is suspended if Operator timely complies with all the corrective actions set forth in this Order. The portion of the civil penalty not suspended ($5,000), shall be due and payable within 30 days of the effective date of this Order. If Operator does not timely comply with the corrective actions set forth above, then the suspended civil penalty, in the total amount of $12,000, shall be due and payable within 30 days of the deadline for the corrective action.

DONE AND ORDERED this 18 day of February 2022.

FOR THE COLORADO MINED LAND RECLAMATION BOARD

John W. Singletary

John Singletary, Chair

NOTICE OF JUDICIAL REVIEW RIGHTS

This order becomes effective and final upon mailing. Any party adversely affected or aggrieved by agency action may commence an action for judicial review by filing a complaint with the district court within 35 days after the effective date of this order, pursuant to section 24-4-106, C.R.S. (2021) and the Colorado Rules of Civil Procedure. In the event that a complaint for judicial review is filed, designations of record made in accordance with section 24-4-106(6), C.R.S. should be served on the Board at: 1313 Sherman Street, Room 215, Denver, CO 80203, Attention: Camie Mojar.

CERTIFICATE OF SERVICE

This is to certify that I have duly served the within FINDINGS OF FACT, CONCLUSIONS OF LAW, AND ORDER upon all parties herein by depositing copies of same in the United States mail, first-class postage prepaid, at Denver, Colorado, this 18th day of February 2022 addressed as follows:

By certified mail:
7018 2290 0001 8923 1007

Attn: Richard Mittasch
Grand Island Resources LLC
P.O. Box 3395
4415 Caribou Rd
Nederland, CO 80466

By electronic mail:

John Henderson, Esq.
jrhcolaw@comcast.net

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Patrick Delaney
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Greg Miller
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By electronic mail to:

Amy Eschberger
Division of Reclamation, Mining & Safety
1313 Sherman Street, Room 215
Denver, CO 80203

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Camille Mojar, Board Administrator

Appendix B

B – MLR Board Order Approval by DRMS Required for Underground Activities

Appendix B-1

B-1 Operator Requested Approval from DRMS to perform underground activities

GRAND ISLAND
RESOURCES

4415 Caribou Rd.
Nederland CO. 80466

Division of Reclamation, Mining & Safety
c/o Ms Amy Eschberger
1001 E 62nd Ave,
Room 215
Denver, CO 80216

December 21, 2021

Ms Eschberger,

Pursuant with ongoing communications and our letter sent to the Division earlier today, Grand Island Resources (GIR) hereby requests approval of the following activities which are aimed to comply with the Cease-and-Desist order issued by the Board on December 15, 2021.

GIR has divided the activities and requests approval on a priority basis, for the following items which are based on critical and immediate term implications, as follows:

1. PRIORITY 1 – Immediate Approval Request

1.1. CROSS MINE

1.1.1. Cross Discharge lines installations. The scheduled installation of replacement water discharge lines must continue in the Cross Mine to connect underground drainage system to prevent the mine from flooding. Should flooding occur, ground water would report to the surface through the Cross Mine Adit in an uncontrolled fashion directly to the environment.

1.1.2. Refuge Chamber Construction. Construction of an MSHA compliant safety refuge toward the back of the Cross tunnel. This is a critical activity and essential for operations associated with water management (pumps, pipelines, utilities) cannot be

1.1.3. Utilities Installation for Safety and Operations. (Discharge, Compressed Air, Ventilation, Power and Water supply). Replacement of dated infrastructure (compressed air, water, and electrical lines) which must be installed such that mine dewatering pumps and ventilation systems are operational.

1.1.4. Auxiliary Fan installations. The ventilation system is a critical safety requirement for personnel attending and maintaining the pumping systems; these systems must be operational prior to the construction of water management sumps and for any associated activities.

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1.1.5. Ground support installation. All areas leading to the mine pumping sites must be secured, bolted, and must comply with MSHA guidelines for safe personnel access.

1.1.6. Freeze Prevention Program. The groundwater conveyance systems must be insulated to prevent freezing of pipes and equipment and appurtenant facilities such that the water conveyance systems remain operational during the winter months.

1.2. CARIBOU MINE/IDAHO TUNNEL

1.2.1. Construction of Sediment Control Structures. Solids removal from groundwater within the mine workings prior to discharge to the sediment control ponds is critical for optimizing the performance of the settling ponds. The construction of a Cofferdam and Check dams in the Idaho tunnel is critical for water quality compliance. These activities include the extension of piping systems into the pumping areas.

1.2.2. "75" Sediment Control Sump Rehabilitation. Removal of sediment accumulated in the clarifying sump is a required O&M part of the system; GIR is planning to relocate the existing pump further into the sump to optimize sump storage capacity, an access walkway must be constructed to ensure the safety of maintenance personnel.

1.2.3. Freeze Prevention Program. The groundwater conveyance systems must be insulated to prevent freezing of pipes and equipment and appurtenant facilities such that the water conveyance systems remain operational during the winter months.

2. PRIORITY 2 – Approval Requested by December 27th, 2021

2.1. CROSS MINE

2.1.1. Cross Shaft and Old Access Road Surface Reclamation. Backfill, compact and recontour the terrain to reduce surface water inflow into the underground working. A detailed reclamation plan and design is currently being prepared for submittal under separate cover to DRMS.

2.1.2. Apache/Potosi Sump Development at 'G' Station. Construction of a water sedimentation and clarification system at a midpoint within the tunnel. Construction of underground sumps is required such that water flows are collected and controlled. The sumps would serve as sediments settling structures such that heavily sediment laden water is not delivered to the treatment plant.

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2.2. CARIBOU MINE/IDAHO TUNNEL

2.2.1. Personnel Siding Development along Railway and Equipment Corridors. Safety step-aways from moving equipment.

3. PRIORITY 3 – Approval Requested by January 4th, 2022

3.1. CROSS MINE

3.1.1. Required infrastructure for safe construction and operation of water systems controls.
Infrastructure construction required for control of fracture flow discharges reporting to the underground workings. The infrastructure is required to minimize suspended solids reporting to the treatment system and includes pipe installation at ground level where pre-mining construction will occur on the haulageway. This will protect the drainage ditch from collecting and discharging sediment.

3.1.2. Winze Hoist and Winze Sump Rehabilitation. Essential activity required for access of lower mine levels for rehabilitation and water management.

3.1.3. Sublevel Sediment Sumps Rehabilitation and Development. Rehabilitation of currently flooded workings after groundwater table drawdown and release of groundwater via the water treatment system.

3.2. CARIBOU MINE/IDAHO TUNNEL

3.2.1. Sediment Control Pond Upgrades. Minor modifications to reduce the impact of freezing pipes and ice build-up.

4. HYDROGEOLOGIC STUDY

GIR intends to conduct a comprehensive Hydrogeologic Study of the Mining Complex. The Study is considered critical and essential for near future and long-term operations and water quantity and quality management. GIR anticipates that the Study will require access to the mining areas and activities that are not anticipated to result in high level of disturbance. GIR will provide, upon request, the Scope of Work for the Study. Approval of the Study is hereby requested.

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GIR looks forward to a timely response from the Division, due to the critical nature of completing each of the Priority 1 listed items. The recent stoppage of work mandated by the cease and desist order has increased time constraints and urgency for these projects. While we understand we are heading into the holiday season, GIR intends work diligently through the upcoming weeks to ensure water compliance and a safe environment for its workers. Additional delays to the Priority 1 List above have a great potential to create a scenario where the Cross winze may flood.

If you have any questions, feel free to reach out. Have a great day and a Happy Holiday Season.

Respectfully,

Daniel J. Takami
President Grand Island Resources LLC
danieltakami@gmail.com
501.256.4444

Appendix B-2

B-2 Communications between DRMS and Operator pertaining to activities approval

GRAND ISLAND
RESOURCES

4415 Caribou Rd,
Nederland CO, 80466

Division of Reclamation, Mining & Safety
c/o Ms Amy Eschberger
1001 E 62nd Ave,
Room 215
Denver, CO 80216

December 28, 2021

RE: Cross Gold Mine, Permit No. M-1977-410, Responses to DRMS' Responses to GIR's Proposed Activities letter dated December 21st, 2021.

Ms Eschberger,

Pursuant with DRMS' response requesting clarification to certain activities approved by DRMS on December 22nd, 2021, GIR provides answers below addressing each specific clarification point.

1) **DRMS** approves all proposed activities listed under "Priority 1".

   GIR: appreciates the approval of the work by DRMS. Please note that most of the activities described in the request for approval are planned activities, some of which were underway prior to work stoppage as mandated by the December 15th Cease-and-Desist Order. The activities are part of normal mine operations and environmental management. GIR requested approval in three stages based on the revised schedule and reduction in personnel resulting from work stoppage.

2) While DRMS approves all Priority 1 activities, we (DRMS) would appreciate some clarification on the following Priority 1 activities:

   a. **DRMS:** Please provide additional information on the proposed activities related to ventilation (1.1.3 and 1.1.4). Will upgrading the ventilation system include any surface disturbances? Which mine openings will be used for ventilation?

      GIR: *The ventilation system upgrade* ***will not include any surface disturbance****. All proposed work required will be implemented underground and will involve upgrading the existing fans at their respective locations with modern and efficient equipment. This is required to improve the air flow and quantity as required for personnel safety that will perform inspection activities of the water control, pumping and water conveyance systems. Please note this is consistent with the MSHA approved ventilation plan; as such, the Cross portal is the air intake, and* ***the cross ventilation/escapeway shaft is the air exhaust****, without making any modifications to these mine openings.*

   b. **DRMS**: Please provide additional information on the Ground Support Installation (1.1.5). Will these proposed activities occur completely underground?

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GIR: *All ground support installations* ***will occur underground exclusively*** *and will consist of installing rock bolts, in accordance with our ground support policy, design and engineering such that employee safe access is addressed for maintenance and operation of the underground water control, pumping and conveyance sites.*

c. **DRMS**: Please provide additional information on the "75" Sediment Control Sump Rehabilitation (1.2.2). What is the purpose of the "75" designation? Is this the 75th sump located in the Caribou Mine?

GIR: The rehabilitation of the sump consists of clean-up *(sediment and debris removal) within the sump such that the sump functions at higher efficiency for sediment removal. The* ***"75" designation indicates that the sump is located three quarters of the way (0.75) between two underground survey control points.*** *The number* ***does not imply that it is the 75th sump.***

d. **DRMS**: Please describe where sediment removed from underground sumps is laced.

GIR: *The sediment removed from the sumps is mucked with mine waste and* ***placed within the approved surface waste rock area.***

3) DRMS approves all proposed activities listed under "Priority 2", except for the Cross Shaft and Old Access Road Surface Reclamation (2.1.1), for which, DRMS has the following comments:

a. **DRMS**: Please provide additional information on this proposed activity. For example, where is this mine opening located? Is this the mine opening referred to in Amendment No. 2 (AM-2) as the "Cross Ventilation Shaft"? If so, in AM-2, GIR is proposing to continue using this opening as a vent shaft during mining, and to reclaim it with a precast concrete panel closure. The current proposal to backfill this shaft seems to contradict the proposed plan in AM-2.

GIR: *The feature consists of a land subsidence which has recently been identified as a potential surface water influx to the underground workings. The proposed work consists of re-establishing the natural surface topography and natural surface drainage.* ***This subsidence is not the Cross ventilation shaft referred to in AM-2.***

b. **DRMS:** Would all proposed surface disturbances occur within the current approved permit area?

GIR: ***The subsidence and area proposed for reclamation is within GIR's current approved permit area.*** *Access for reclamation activities would be via*

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an existing mine road located along the boundary of GIR's approved disturbance zone.

c. **DRMS**: This proposed activity was classified as "Priority 2 – Approval Requested by December 27, 2021"; does this mean GIR intends to perform the proposed earthwork activity in the coming weeks? Please explain why this activity is considered a high priority at this point in time.

GIR: *This activity has a very narrow window of opportunity which may have already passed; weather permitting, GIR would like to start backfill activities such that snow accumulation is prevented. Should the activities not be initiated at this time, access to the site may not be feasible until the summer of 2022 and the accumulated snow melt and run-off could enter the mine in spring.*

4) DRMS has the following comments regarding the proposed activities listed under "Priority 3":

a. **GIR**: Please provide additional information on the Winze Hoist and Winze Sump Rehabilitation (3.1.2). Where are these features located in the Cross Mine? Please be more specific in describing the proposed activities and explain why these activities are considered a high priority at this point in time.

GIR: *The winze (an internal underground shaft) is a historic but operational and essential part of the mine infrastructure which connects the main tunnel level with the underground lower levels. The winze hoist is the only means available for transporting equipment and timber to the lower levels of the mine and it is also serves as an accessway for dewatering pipes. The activities related to the winze hoist rehab consist of upgrading and repairing the mechanical hoisting mechanism and repair of timberwork. As indicated previously, Winze rehabilitation is essential for safe access to the lower levels of the mine for rehabilitation and environmental management pertaining to groundwater management.*

b. **DRMS**: Please provide additional information on the Sublevel Sediment Sumps Rehabilitation and Development (3.1.3). Please be more specific in describing the proposed activities and explain why these activities are considered a high priority at this point in time.

GIR: *The activities at the lower levels are critical to controlling water and sediments as the mine is being dewatered.*

c. Please provide additional information on the Sediment Control Pond Upgrades (3.2.1). Is this referring to sediment ponds 3A-3C at the Caribou Mine? Please describe the type of "minor modifications" anticipated. DRMS approved the rehabilitation of sediment ponds 3A-3C through Technical Revision No. 8 (TR-

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8) and needs to assess whether the proposed activities will require an additional revision submittal.

GIR: *The strategy simply comprises the installation of floating baffles (curtains) within the ponds to increase flow paths and reduce flow velocity aid in solids settling.*

5) DRMS has the following comments regarding the proposed Hydrogeologic Study (4):

a. **DRMS**: Please provide the Scope of Work which details the anticipated activities for this study.

GIR: *The Final Scope of Work and Schedule will be provided upon approval by GIR after receipt from the Hydrogeologic Independent Consultant. A Conceptual Hydrogeological Model will be prepared upon review of available geologic, hydrogeologic, topographic and historic mine dewatering records, among other data. Upon completion and acceptance by GIR of the Hydrogeologic Conceptual Model, a data collection strategy will be implemented. For purposes of Priorities 1 and 2, the Scope of Work will include discrete water source characterization prioritizing the Caribou Mine.*

If you have any additional questions or clarifications, please contact me and we will be happy to address your concerns.

Respectfully,

Daniel J. Takami
President Grand Island Resources LLC
danieltakami@gmail.com
501.256.4444

COLORADO
Division of Reclamation, Mining and Safety
Department of Natural Resources

December 29, 2021

Richard Mittasch
Grand Island Resources LLC
P.O. Box 3395
4415 Caribou Rd
Nederland, CO 80466

RE: Cross Gold Mine, Permit No. M-1977-410, Response to Proposed Activities

Mr. Mittasch:

The Division of Reclamation, Mining and Safety (DRMS) has completed its review of your response submitted on December 27, 2021 providing clarification on certain activities proposed in your December 21, 2021 letter. This request for DRMS approval of activities is in conformance with the Cease-and-Desist Order issued by the Mined Land Reclamation Board (Board) during the enforcement hearing held on December 15, 2021.

DRMS has the following additional comments regarding the proposed activities:

1) DRMS appreciates the operator providing additional information on the Priority 1 activities which were approved on December 22, 2021. No additional information is needed.

2) DRMS approved all Priority 2 activities on December 22, 2021, except for the Cross Shaft and Old Access Road Surface Reclamation (2.1.1). DRMS requested additional information on this proposed activity, including the location of this feature. The operator's response did not specify the location of this surface feature requiring reclamation, nor did it provide the level of detail needed in order for DRMS to determine whether this activity should be proposed through a Technical Revision submittal. Therefore, until sufficient information is provided, DRMS does not approve the activities proposed for Cross Shaft and Old Access Road Surface Reclamation (2.1.1).

3) With regard to the proposed Priority 3 activities, DRMS approves only the Sediment Control Pond Upgrades (3.2.1) at this time.

4) DRMS requested additional information on the proposed Priority 3 activities. The operator's response did not provide the level of detail needed in order for DRMS to determine whether these activities are necessary to comply with the conditions of the Board Order, protect water quality, prevent damage to off-site areas, complete reclamation, or protect public health and safety, per the Cease-and-Desist Order. It is not clear how continued dewatering of the Cross Mine is needed to support any activities other than mining, exploration, or rehabilitation activities intended to prepare the mine for mining and/or exploration. The intent of the Cease-and-Desist Order is to focus any

continued activities at the site on addressing the violation and preventing any further impacts to water quality, rather than continuing with previously planned activities to prepare the site for mining. Based on the information provided thus far, DRMS does not approve the activities proposed under Priority 3 for Required Infrastructure for Safe Construction and Operation of Water Systems Controls (3.1.1), Winze Hoist and Winze Sump Rehabilitation (3.1.2), or Sublevel Sediment Sumps Rehabilitation and Development (3.1.3).

5) DRMS requested the Scope of Work for the proposed Hydrogeologic Study (4), which the operator had offered to provide upon request. Based on the operator's response, this documentation is not currently available. DRMS cannot approve this proposed study until the operator has provided more information on the type of activities this study might entail, particularly with regard to any surface disturbance or drilling activities underground.

If you have any questions, you may contact me by telephone at 303-866-3567, ext. 8129, or by email at amy.eschberger@state.co.us.

Sincerely,

Amy Eschberger
Environmental Protection Specialist

Cc: Daniel Takami, Grand Island Resources LLC
Daniel Pollock, Grand Island Resources LLC
Michael Cunningham, DRMS

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RESOURCES

4415 Caribou Rd,
Nederland CO, 80466

Division of Reclamation, Mining & Safety
c/o Ms. Amy Eschberger
1001 E 62nd Ave,
Room 215
Denver, CO 80216

January 26, 2022

RE: Cross Gold Mine, Permit No. M-1977-410, Supplementary Information for Activities Related to the Winze Rehabilitation and Sublevel Sediment Sumps Development.

Ms. Eschberger,

Pursuant to DRMS' site visit to the Cross and Caribou Gold Mines on January 11th, 2022, and the discussions that took place on site with you, Mr. Cunningham and Mr. Means, regarding the activities associated with Winze rehabilitation and Sublevel Sumps, GIR herewith provides additional information for the requested activities; and, hereby requests approval of the Winze activities requested by GIR under 3.1.2 and 3.1.3

The winze, an internal underground shaft, connects the main tunnel level with the lower levels. The location of the winze with respect to the mine workings is shown in figure 1. The winze consists of two adjoined openings: the manway and the skip-way. The winze is the only means available for transport of personnel, equipment, and timber to the lower levels of the mine. The sublevel sediment sumps are critical features which will allow for the increased sediment control in select areas at the lower levels (figure 2).

The activities related to the winze rehabilitation and sublevel sediment sump development in sequential order consist of:

- Improve access and egress to the work area at the winze collar.
- Repair and improve the sheave wheel and its support structure, with an increased engineered safety factor.
- Below the collar;
    - Remove and replace the rotten ground support timber,
    - Scale the shaft walls and implement new shaft supports,
    - Isolate the manway from the skip-way with lacing and install new ladders.

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Nederland CO, 80466

  - Rebuild the landing doors and landings within 30 feet intervals, per MSHA regulation.
- Rehabilitation, cleaning of, and optimization of the existing winze sump at the bottom of the winze for discharge controls and pump maintenance.
- Inspect and rehabilitate the existing workings for safe access and egress to facilitate implementation of adequate ground support systems and development of additional sediment control sumps, starting from level 2 and working sequentially to level 3 and 4.

As indicated previously, Winze rehabilitation is essential for safe access to the lower levels of the mine for rehabilitation and environmental management pertaining to groundwater management.

If you have any questions, feel free to reach out.

Respectfully,

Daniel J. Takami
President Grand Island Resources, LLC
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501.256.4444

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4415 Caribou Rd,
Nederland CO, 80466

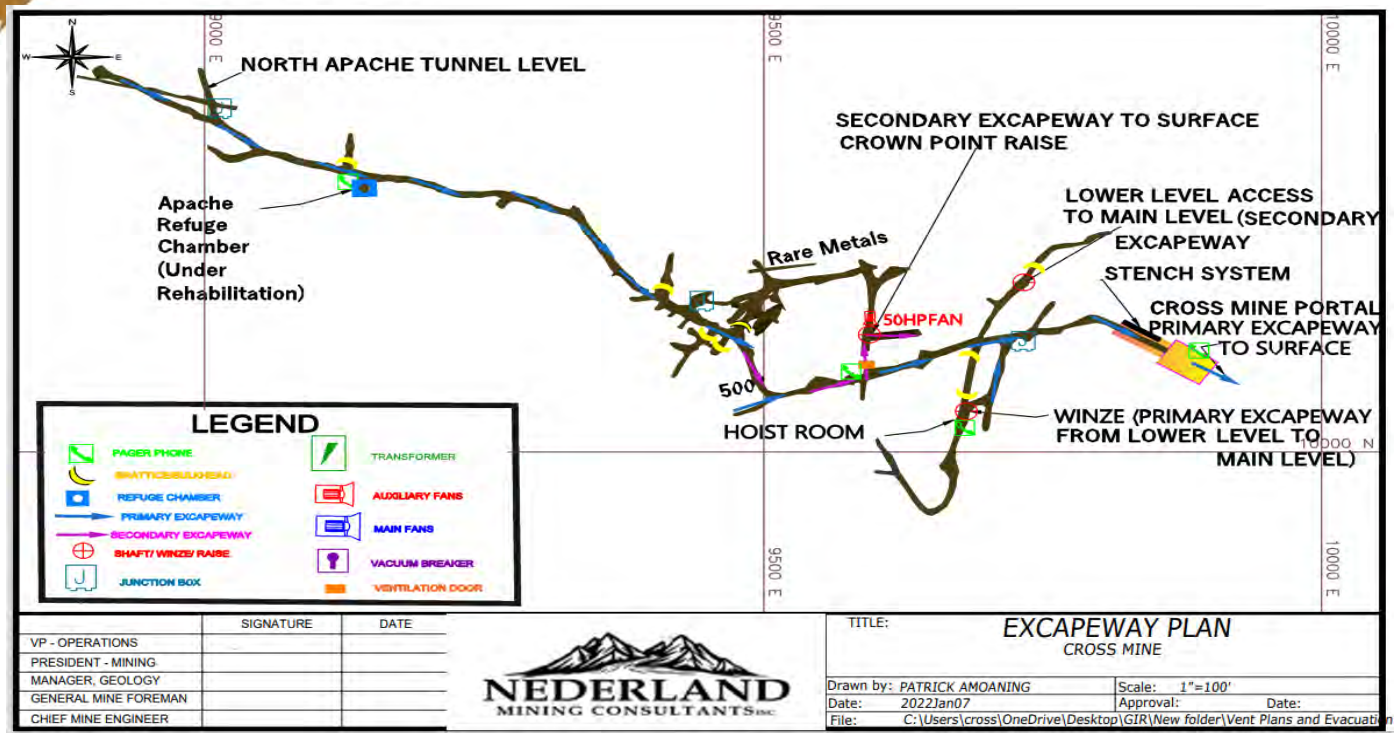


Figure 1: Cross mine escapeway plan with the location of the winze displayed.

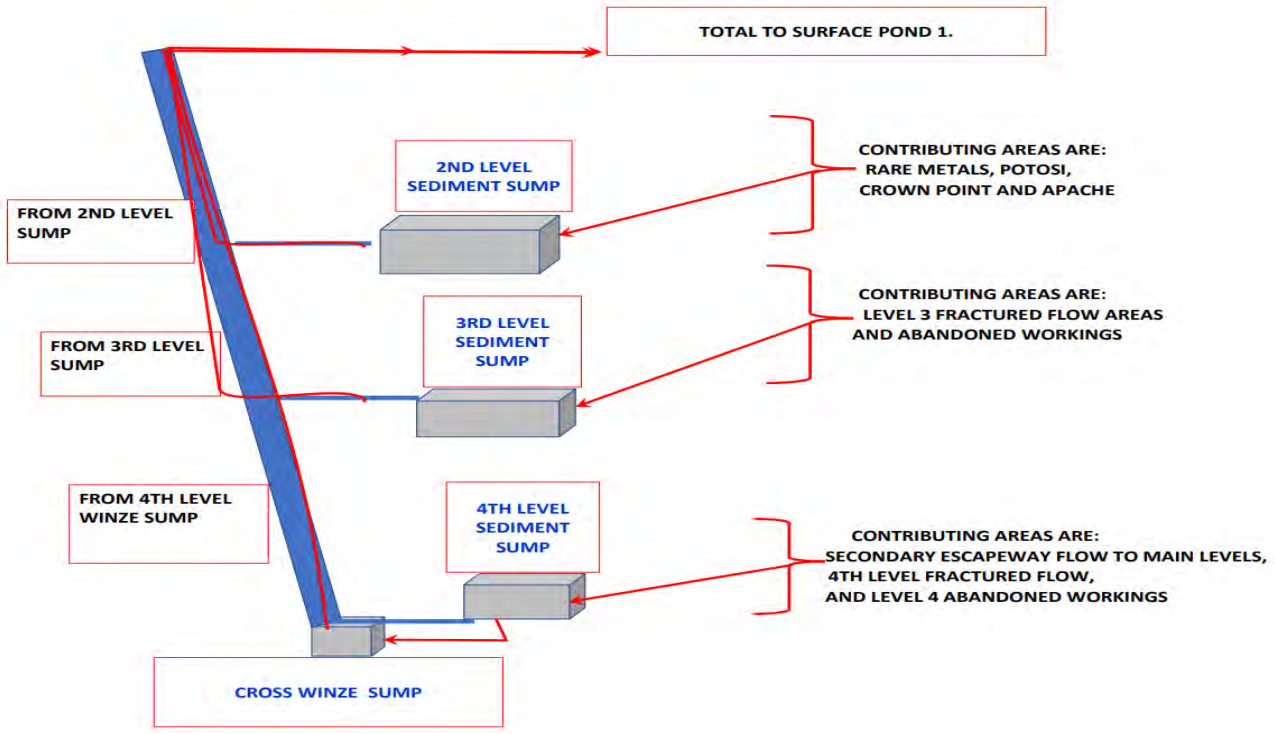


Figure 2: Schematic drawing of the proposed Cross sediment control system.

RE: Cross Gold Mine, Permit No. M-1977-410, Progress on GIR's proposed activities aimed to comply with the Cease-and-Desist order issued by the Board on December 15, 2021 and Proposed to DRMS on GIR letter dated December 21st, 2021

Priority	Location		Final Approval by DRMS	Progress (% complete)
Priority 1	Cross Mine	1.1.1. Cross Discharge lines installations. The scheduled installation of replacement water discharge lines must continue in the Cross Mine to connect underground drainage system to prevent the mine from flooding. Should flooding occur, ground water would report to the surface through the Cross Mine Adit in an uncontrolled fashion directly to the environment.	22-Dec-21	100.0%
		1.1.2. Refuge Chamber Construction. Construction of an MSHA compliant safety refuge toward the back of the Cross tunnel. This is a critical activity and essential for operations associated with water management (pumps, pipelines, utilities).	22-Dec-21	30.0%
		1.1.3. Utilities Installation for Safety and Operations. (Discharge, Compressed Air, Ventilation, Power and Water supply). Replacement of dated infrastructure (compressed air, water, and electrical lines) which must be installed such that mine dewatering pumps and ventilation systems are operational.	29-Dec-21	50.0%
		1.1.4. Auxiliary Fan installations. The ventilation system is a critical safety requirement for personnel attending and maintaining the pumping systems; these systems must be operational prior to the construction of water management sumps and for any associated activities.	29-Dec-21	95.0%
		1.1.5. Ground support installation. All areas leading to the mine pumping sites must be secured, bolted, and must comply with MSHA guidelines for safe personnel access.	29-Dec-21	100.0%
		1.1.6. Freeze Prevention Program. The groundwater conveyance systems must be insulated to prevent freezing of pipes and equipment and appurtenant facilities such that the water conveyance systems remain operational during the winter months.	22-Dec-21	70.0%
	Caribou Mine/Idaho Tunnel	1.2.1. Construction of Sediment Control Structures. Solids removal from groundwater within the mine workings prior to discharge to the sediment control ponds is critical for optimizing the performance of the settling ponds. The construction of a Cofferdam and Check dams in the Idaho tunnel is critical for water quality compliance. These activities include the extension of piping systems into the pumping areas.	22-Dec-21	70.0%
		1.2.2. "75" Sediment Control Sump Rehabilitation. Removal of sediment accumulated in the clarifying sump is a required O&M part of the system; GIR is planning to relocate the existing pump further into the sump to optimize sump storage capacity, an access walkway must be constructed to ensure the safety of maintenance personnel.	22-Dec-21	30.0%
		1.2.3. Freeze Prevention Program. The groundwater conveyance systems must be insulated to prevent freezing of pipes and equipment and appurtenant facilities such that the water conveyance systems remain operational during the winter months.	22-Dec-21	65.0%
Priority 2	Cross Mine	2.1.1. Cross Shaft and Old Access Road Surface Reclamation. Backfill, compact and recontour the terrain to reduce surface water inflow into the underground working. A detailed reclamation plan and design is currently being prepared for submittal under separate cover to DRMS	Activity not Approved by DRMS	0.0%
		2.1.2. Apache/Potosi Sump Development at 'G' Station. Construction of a water sedimentation and clarification system at a midpoint within the tunnel. Construction of underground sumps is required such that water flows are collected and controlled. The sumps would serve as sediments settling structures such that heavily sediment laden water is not delivered to the treatment plant.	22-Dec-21	30.0%
	Caribou Mine/Idaho Tunnel	2.2.1. Personnel Siding Development along Railway and Equipment Corridors. Safety step-aways from moving equipment.	22-Dec-21	60.0%
Priority 3	Cross Mine	3.1.1. Required infrastructure for safe construction and operation of water systems controls. Infrastructure construction required for control of fracture flow discharges reporting to the underground workings. The infrastructure is required to minimize suspended solids reporting to the treatment system and includes pipe installation at ground level where pre-mining construction will occur on the haulageway. This will protect the drainage ditch from collecting and discharging sediment.	Activity not Approved by DRMS	0.0%
		3.1.2. Winze Hoist and Winze Sump Rehabilitation. Essential activity required for access of lower mine levels for rehabilitation and water management.	Activity not Approved by DRMS	0.0%
		3.1.3. Sublevel Sediment Sumps Rehabilitation and Development. Rehabilitation of currently flooded workings after groundwater table drawdown and release of groundwater via the water treatment system.	Activity not Approved by DRMS	0.0%
	Caribou Mine/Idaho Tunnel	3.2.1. Sediment Control Pond Upgrades. Minor modifications to reduce the impact of freezing pipes and ice build-up.	29-Dec-21	15.0%
Site Wide		4. HYDROGEOLOGIC STUDY GIR intends to conduct a comprehensive Hydrogeologic Study of the Mining Complex. The Study is considered critical and essential for near future and long-term operations and water quantity and quality management. GIR anticipates that the Study will require access to the mining areas and activities that are not anticipated to result in high level of disturbance. GIR will provide, upon request, the Scope of Work for the Study. Approval of the Study is hereby requested.	Activity not Approved by DRMS	0.0%

COLORADO
Division of Reclamation, Mining and Safety
Department of Natural Resources

February 18, 2022

Daniel Takami
Grand Island Resources LLC
12567 West Cedar Dr.
Lakewood, CO 80228

RE: Cross Gold Mine, Permit No. M-1977-410, Response to Proposed Activities

Mr. Takami:

The Division of Reclamation, Mining and Safety (DRMS) has completed its review of your response submitted on February 18, 2022 providing additional clarification on certain activities first proposed in your December 21, 2021 letter. This request for DRMS approval of activities is in conformance with the Cease-and-Desist Order issued by the Mined Land Reclamation Board (Board) during the enforcement hearing held on December 15, 2021.

DRMS has the following comments regarding the proposed activities:

1) DRMS approves the following Priority 3 activities for the Cross Mine:
   a. Winze Hoist and Winze Sump Rehabilitation (3.1.2)
   b. Sublevel Sediment Sumps Rehabilitation and Development (3.1.3)

2) Until additional information is provided, the following proposed activities have not been approved by DRMS:
   a. Priority 2 – Cross Shaft and Old Access Road Surface Reclamation (2.1.1)
   b. Priority 3 – Required Infrastructure for Safe Construction and Operation of Water Systems of Water Systems Controls (3.1.1)
   c. Any disturbances related to the Hydrogeologic Study

If you have any questions, you may contact me by telephone at 303-866-3567, ext. 8129, or by email at amy.eschberger@state.co.us.

Sincerely,

Amy Eschberger

Amy Eschberger
Environmental Protection Specialist

Cc: Daniel Pollock, Grand Island Resources LLC
Richard Mittasch, Grand Island Resources LLC
Michael Cunningham, DRMS

GRAND ISLAND RESOURCES

4415 Caribou Rd,
Nederland CO, 80466

Division of Reclamation, Mining & Safety
c/o Ms Amy Eschberger
1001 E 62nd Ave,
Room 215
Denver, CO 80216

February 17, 2022

RE: DRMS response letter dated January 27, 2022; Cross Gold Mine, Permit No. M-1977-410, Responses to DRMS' Responses to GIR's Proposed Activities letter dated December 21st, 2021, subsequent communications and site visit by DRMS

Ms Eschberger,

Pursuant with DRMS' response requesting clarification to certain activities approved by DRMS on January 26, 2022, GIR provides answers below addressing each specific clarification point.

1) **DRMS:** With regard to the proposed Priority 3 activities, DRMS approved only the Sediment Control Pond Upgrades (3.2.1) in its December 29, 2021 letter. At that time, DRMS was unable to approve the Priority 3 activities associated with the Cross Mine (3.1.1, 3.1.2, and 3.1.3) without additional information being provided. In your recent response, approval is only requested for the winze activities proposed in 3.1.2 and 3.1.3.

2) **DRMS:** After reviewing the additional information provided on the proposed Priority 3 activities Winze Hoist and Winze Sump Rehabilitation (3.1.2) and Sublevel Sediment Sumps Rehabilitation and Development (3.1.3), the Division has the following questions:

    a. Does the operator expect these proposed activities to result in an increase of sediment in the mine discharge, at least temporarily?

GIR RESPONSE: Yes. Step 1 is to rehab the winze way, in its entirety, to allow safe access and egress to the mine's discharge pump and the existing sump for clean out. The procedure to mitigate material, tools, timber and personnel falling below our work area is to construct a temporary deck, absent of voids, below our immediate work site. This technique allows for the safe retrieval of dropped tools, storing of building materials and safety of workers, as well, confinement of woodchips, rotted timber, rock and sediment to be collected and disposed of at the end of each shift. Material escaping or falling through the deck as it is being progressively lowered ahead of the rehab will be extremely minimal in quantity and size. With regard to (3.1.3) a detailed plan of the work for each level consisting of water control, sediment control and ground control will follow upon the completion of the above tasks.

GRAND ISLAND
RESOURCES

4415 Caribou Rd,
Nederland CO, 80466

b. If the proposed activities will lead to an increase in sediment levels, please confirm the new water treatment system will be able to treat the increased sediment load to ensure compliance with discharge standards.

GIR RESPONSE: The water treatment system is capable of handling increased TSS that may arise from the work described above

If you have any questions, please contact me.

Respectfully,

Daniel J. Takami
President Grand Island Resources LLC
danieltakami@gmail.com
501.256.4444

Appendix C

C – Water Treatment Modifications Technical Revision

Appendix C-1

C-1 GIR Technical Revision No.10 – Effective Water Treatment Mine Effluent

COLORADO DIVISION OF RECLAMATION, MINING AND SAFETY
1313 Sherman Street, Room 215, Denver, Colorado 80203 ph(303) 866-3567

REQUEST FOR TECHNICAL REVISION (TR) COVER SHEET

File No.: M- 1977-410 Site Name: Cross Gold Mine

County Boulder TR# TR# 10 *(DRMS Use only)*

Permittee: Grand Island Resources, LLC

Operator (If Other than Permittee):

Permittee Representative: Daniel Takami

Please provide a brief description of the proposed revision:

Following the obvious need for a more effective water treatment of mine effluent than the historical lime application and settling pond approach, GIR went through a series of investigations and pilot scale testing programs in 2021 to determine the most reliable manner to achieve discharge compliance under our NPDES permit with CDPHE. The first system did not work as the contractor predicted and later in 2021, a system that does work was assembled and has been in use effectively without any evidence of exceedance of compliance stands. Essentially the system entails a 5 micron filtration for removal of TSS followed by a removal of TDS using a polishing medium called MetSorb.

As defined by the Minerals Rules, a Technical Revision (TR) is: "a change in the permit or application which does not have more than a minor effect upon the approved or proposed Reclamation or Environmental Protection Plan." The Division is charged with determining if the revision as submitted meets this definition. If the Division determines that the proposed revision is beyond the scope of a TR, the Division may require the submittal of a permit amendment to make the required or desired changes to the permit.

The request for a TR is not considered "filed for review" until the appropriate fee is received by the Division (as listed below by permit type). Please submit the appropriate fee with your request to expedite the review process. After the TR is submitted with the appropriate fee, the Division will determine if it is approvable within 30 days. If the Division requires additional information to approve a TR, you will be notified of specific deficiencies that will need to be addressed. If at the end of the 30 day review period there are still outstanding deficiencies, the Division must deny the TR unless the permittee requests additional time, in writing, to provide the required information.

There is no pre-defined format for the submittal of a TR; however, it is up to the permittee to provide sufficient information to the Division to approve the TR request, including updated mining and reclamation plan maps that accurately depict the changes proposed in the requested TR.

Required Fees for Technical Revision by Permit Type - Please mark the correct fee and submit it with your request for a Technical Revision.

Permit Type	**Required TR Fee**	**Submitted** (mark only one)
110c, 111, 112 construction materials, and 112 quarries	$216	☑
112 hard rock (not DMO)	$175	☐
110d, 112d(1, 2 or 3)	$1006	☐

Table of Contents

Section 1: Introduction and Site Description

Technical Revision 10 (TR10) is presented by Grand Island Resources, LLC (GIR) in response to a Service of Notice of Violation/Cease and Desist Order (Number IO-211130-1) from Colorado Department of Public Health and Environment (CDPHE) dated November 30, 2021 in conjunction with Permit No. M-1977-410. This TR10 includes a detailed plan of action and current activities addressing surface water quality noted in the letter. It describes measures that have been taken and are further proposed at the site to address water quality issues, including underground installations, a description of the new water treatment pilot system, results of the current system, and also includes a Ground Water Monitoring Plan (GWMP) as required by the NOV/C&D Order.

The Cross-Caribou mine site is located approximately 4 miles northwest of Nederland, Colorado adjacent to Roosevelt National Forest, at an elevation of ~9,700 ft above mean sea level (MSL). The general location of the property is in Section 9, Township 1 South, Range 73 West of the 6th Principal Meridian, County of Boulder, State of Colorado (**Map 1**). The current property is an existing hard rock mining operation owned by GIR and at present, no active mining is being conducted. The mine permit M-1977-410 was last revised through Amendment No. 2 (AM 2) and approved in February 2022. The AM 2 increased the permit area to the current 9.99 acres and provided an additional financial warranty for reclamation.

The site is bisected by Coon Track Creek, a tributary of Beaver creek which joins with Middle Boulder Creek near its discharge at the Barker Meadows Reservoir. The mine currently manages discharges directly into Coon Track Creek (**Figure 1** and **Map 2)** under CDPHE Water Quality Control Division (WQCD) National Pollutant Discharge Elimination System NPDES permit CO-0032751.

Section 2: Water System Timeline and Historical Background

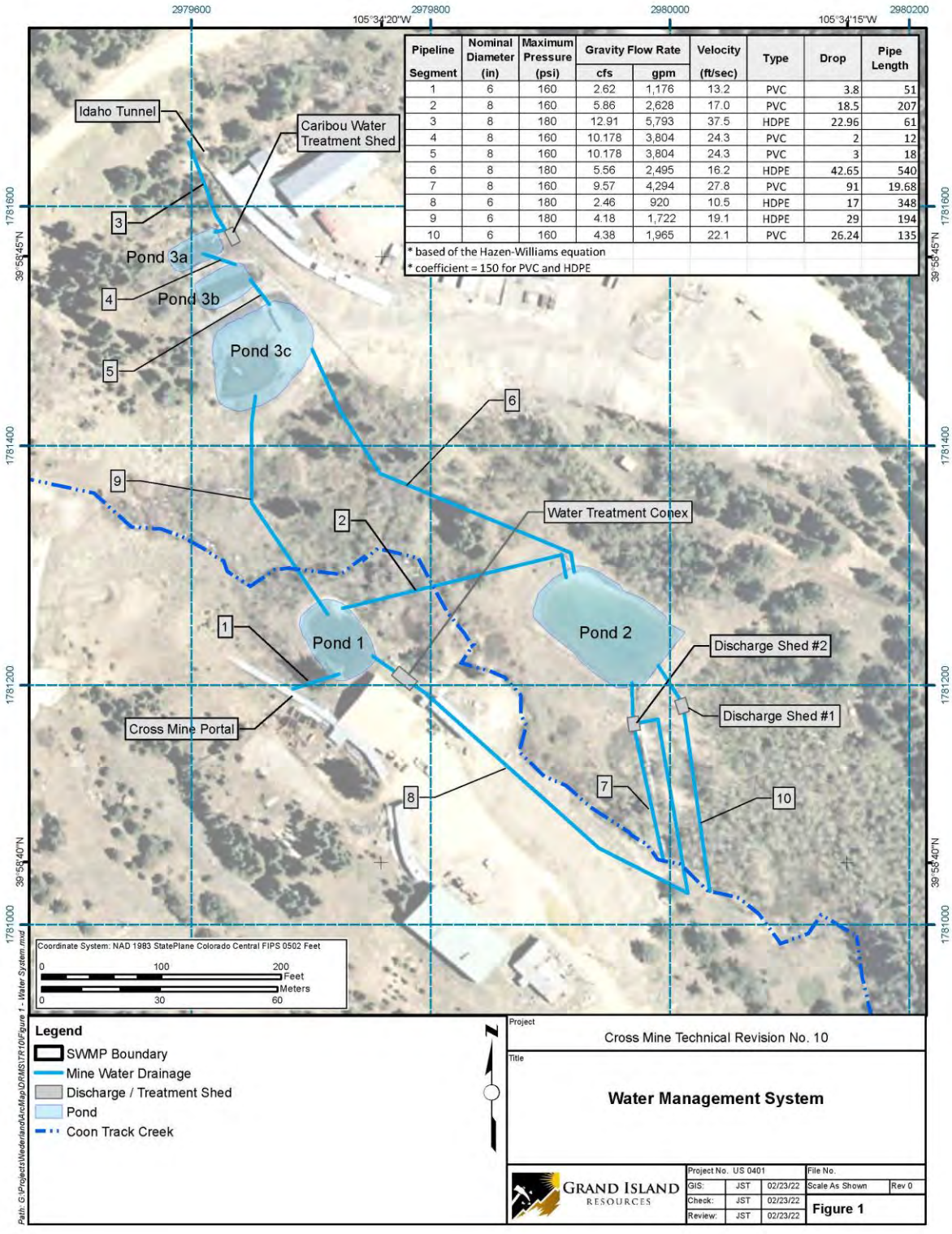
From 1975-1995, the previous owner of the Caribou-Cross Mines, Tom Hendricks of the Hendricks Mining Company (HMC), installed and tested a treatment system to meet the requirements of discharge permit CO-0032751. Hendricks constructed five (5) passive-discharge settling ponds (**Appendix A,** locations in **Figure 1**) and treated water from the Cross Mine portal by a combination of lime (to buffer any "potentially dissolved" soluble metal ions at a relatively lower pH) and dilution from waters emerging from the Caribou mine portal (also known as the Idaho Tunnel). These methods were initially successful in accordance with the water quality standards of the day, but subsequent and periodical lowering of metal concentration compliance standards resulted in mixed success of the water treatment system. Upon subsequent lowering of water quality standards, Hendricks then tested (1995) the feasibility of a gravity-fed absorptive medium consisting of zeolite, with mixed results, particularly during peak flow periods (typically during the spring and summer months). Tom Hendricks brought in another mining Company, Calais, who continued the sedimentation pond and lime treatment prior to discharge.

After Hendrick's death in 2020, the Cross-Caribou mine properties were obtained by GIR. GIR has since undertaken several mining-related activities (including, but not limited to underground construction and revamping of infrastructure, dewatering, and exploratory drilling) in order to meet their goals of creating a sustainable and actively producing mine. These activities, performed during two (2) 3-month seasons from 2020-2021 caused conditions that have overloaded the ability of the legacy system to meet today's compliance standards. Therefore, GIR has sought several alternatives with which to comply with the standards and continue the goals of mining development and production.

A general timeline of GIR's recent activities in relation to system upgrades and compliance are as follows:

- *August 2020* – reconstructed and relined settling ponds 3A, 3B, and 3C (locations in **Figure 1**) to maximize settling times (Technical Revision 8)
- *September 2020-present* – conducted underground construction, creating additional sediment traps and water diversion paths, to reduce discharge sediment volumes to settling ponds
- *April-June 2021* – sought alternative water treatment packages/systems, conducted May 2021 filtration study (**Figure 2** – see page 6**)** to aid in selection of water treatment packages/systems and applicable contractors
- *July 2021* – OPEL pilot approved by CDPHE, but failed to achieve compliance, despite a guaranteed performance warranty
- *August 2021* – identified non-compliance items to be the result of TSS (total suspended solids)
- *September 2021* – aggressively pursued alternative treatment vendors, including Environmental Site Solutions, Ensero and Graver; began Graver/MetSorb pilot feasibility study
- *October 2021* – Graver/MetSorb bench scale testing concluded as successful; continued filtration and metal adsorption pilot design
- *November 2021* – 11/15 set as startup date for Ensero particulate filtration and Graver/MetSorb metal polishing pilot system; Service of Notice of Violation/Cease and Desist Order, Number: IO-211130-1 received from CDPHE on November 30, 2021

- *December 2021* – commissioning and start-up of hybrid treatment system (Ensero filtration, Metsorb media and historic ponds); system was installed and sampling was initiated to determine its ability to achieve compliance
- *January 2022* – Black Fox Mining (Patrick Delaney – P.E., level-one certified water treatment) was retained as qualified consultant for water system evaluation - automation of treatment system is complete, so that it can run around the clock with minimal supervision and maximum efficiency. Compliance with discharge permit has occurred for each sampling event since automation was instituted
- *February 2022* – system 100% in compliance; see **Tables 2 and 3** for January 2022 in-compliance samples



Pipeline Segment	Nominal Diameter (in)	Maximum Pressure (psi)	Gravity Flow Rate cfs	Gravity Flow Rate gpm	Velocity (ft/sec)	Type	Drop	Pipe Length
1	6	160	2.62	1,176	13.2	PVC	3.8	51
2	8	160	5.86	2,628	17.0	PVC	18.5	207
3	8	180	12.91	5,793	37.5	HDPE	22.96	61
4	8	160	10.178	3,804	24.3	PVC	2	12
5	8	160	10.178	3,804	24.3	PVC	3	18
6	8	180	5.56	2,495	16.2	HDPE	42.65	540
7	8	160	9.57	4,294	27.8	PVC	91	19.68
8	6	180	2.46	920	10.5	HDPE	17	348
9	6	180	4.18	1,722	19.1	HDPE	29	194
10	6	160	4.38	1,965	22.1	PVC	26.24	135

* based of the Hazen-Williams equation
* coefficient = 150 for PVC and HDPE

Figure 1: General site map with the locations of the water management and treatment system, and specifications for piping through the system. Figure also displayed in Appendix B, but shown here for improved understanding.

Section 3: Discharge Limitations and Filtration Studies from 2020-2021

GIR Discharge Permit (CO-0032751) specifies discharge limitations defined below:

Table 1

Grand Island Resources – Cross & Caribou Mines Effluent Discharge Limitations for Outfall 001A					
Parameter		Limitation		Sampling	
		30-day avg.	Daily max.	Frequency	Type
Lead, potentially dissolved (µg/L), January		3.8	85	2 days/month	Two water samples collected before effluent discharge (One acidified for metals and one for hexavalent chromium
Lead, potentially dissolved (µg/L), April		3.6	94	2 days/month	Two water samples collected before effluent discharge (One acidified for metals and one for hexavalent chromium
Lead, potentially dissolved (µg/L), June		5.4	140	2 days/month	Two water samples collected before effluent discharge (One acidified for metals and one for hexavalent chromium
Lead, potentially dissolved (µg/L), July		4.6	118	2 days/month	Two water samples collected before effluent discharge (One acidified for metals and one for hexavalent chromium
Lead, potentially dissolved (µg/L), December		3.8	85	2 days/month	Two water samples collected before effluent discharge (One acidified for metals and one for hexavalent chromium
Lead, potentially dissolved (µg/L), January		13	18	2 days/month	Two water samples collected before effluent discharge (One acidified for metals and one for hexavalent chromium
Lead, potentially dissolved (µg/L), March		13	19	2 days/month	Two water samples collected before effluent discharge (One acidified for metals and one for hexavalent chromium
Lead, potentially dissolved (µg/L), April		13	20	2 days/month	Two water samples collected before effluent discharge (One acidified for metals and one for hexavalent chromium
Lead, potentially dissolved (µg/L), January		0.12	2.9	2 days/month	Two water samples collected before effluent discharge (One acidified for metals and one for hexavalent chromium
Whole Effluent Toxicity ("WET"), Chronic (%), January – March	7-day *Ceriodaphnia dubia*	--	NOEC or IC25 ≥ IWC (73%)	Quarterly	3 composites/test
	7-day *Pimephales promelas*	--	NOEC or IC25 ≥ ICW (73%)		

May 2021 – Filtration study

The Cross-Caribou mine dewatering and discharge geochemistry were tested and identified optimal filtration screen size to achieve compliance. Sampling and analysis were conducted using three filter sizes (0.1 µm, 0.45 µm, and 5 µm) to determine if non-compliance for "potentially dissolved" metals was related to particulate/sediment material. The results of this sampling concluded that when particulate matter is removed from the Caribou mine portal (Idaho Tunnel), the discharge passes compliance standards without the need for additional polishing. In contrast, when particulate matter is removed from the Cross mine adit dewatering flow, it is non-compliant for dissolved Zn and Cd.

Filtration Study	Caribou Tunnel Source Water PASS - FAIL Filtration size in microns				Cross Tunnel Source Water PASS - FAIL Filtration size in microns						
COMPLIANCE COMPOUND	Caribou UF	Caribou 5.0	Caribou 0.45	Caribou 0.10	Cross UF	Cross 5.0	Cross 0.45	Cross 0.10	30-Day Average	7-Day Average	Daily Maximum
Total Alkalinity	122.5	118.5	122.2	119.1	77.6	76.5	75.6	76.5			
Bicarbonate	122.5	118.5	122.2	119.1	77.6	76.5	75.6	76.5			
Carbonate											
Chloride	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6			
Fluoride	0.1			0.2							
Silica (as SI)	5.5	5.4	5.5	5.5	6.0	6.1	5.9	6.2			
Nitrate Nitrogen	0.5	0.3	0.3	0.3	0.2	0.2	0.2	0.2			
pH	8.0	8.1	8.1	8.1	7.8	7.8	7.8	7.8	6.5-9	6.5-9	6.5-9
Sulfate	12.0	11.9	12.0	11.9	11.1	11.2	11.1	11.2			
Total Suspended Solids	108.0	ND	ND	ND	10.0	ND	ND	ND	30	45	
Turbidity	43.00	0.03	0.04	0.02	5.96	0.08	0.10	0.17			
Total Hardness	132.5	117.2	117.6	118.5	77.3	78.1	77.5	77.2			
Aluminum (ug/L here down)	2,782	2	4	3	148	8	6	9			
Antimony	2	ND	ND	ND	ND	ND	ND	ND			
Arsenic	4	ND	1	1	ND	ND	ND	ND			
Barium	111	53	53	51	58	55	55	55			
Beryllium	0	ND	ND	ND	ND	ND	ND	ND			
Boron	30	30	20	90	ND	ND	ND	ND			
Cadmium	1.30	0.10	ND	ND	2.90	2.80	2.70	2.70	0.60 to 0.89		2.2 to 3.7
Calcium	28,800	25,800	26,000	26,100	19,100	19,500	19,200	19,000			
Chromium	20	ND	ND	ND	ND	ND	ND	ND			
Cobalt	5	ND	ND	ND	1	0	0	0			
Copper	26	ND	ND	ND	8	4	4	4	13 to 19		18 to 28
Iron	5,894	ND	ND	ND	349	ND	ND	8			
Lead	156	0	0	0	20	2	2	2	3.6 to 5.4		85 to 135
Magnesium	14,720	12,850	12,790	12,960	7,200	7,140	7,180	7,220			
Manganese	909	25	25	25	62	45	44	44			
Mercury	NA				NA				1		2
Molybdenum	6	6	6	6	7	6	6	6			
Nickel	11	ND	ND	ND	1	1	1	1			
Potassium	2,800	1,400	1,400	1,400	1,300	1,200	1,200	1,200			
Silver	5.30	ND	ND	ND	0.60	ND	ND	ND	0.11 to 0.17		
Sodium	2,400	2,300	2,300	2,300	1,800	1,800	1,800	1,800			
Strontium	417	380	382	370	143	137	135	135			
Uranium	7	6	6	6	1	1	1	1			
Vanadium	11	ND	ND	ND	2	ND	ND	ND			
Zinc	251	18	21	15	343	325	319	316	176 to 262		182 to 301

Figure 2: May 2021 Filtration Study that Compared the Effectiveness of Different Screen Size, May 31, 2021. Shows test results of unfiltered water (UF) from the Caribou and Cross mines, and results after filtration using filter sizes of 0.1 µm, 0.45 µm, and 5 µm (all data listed in units of ppb). As is shown above, filtration of water from the Caribou mine through a size 5 µm filter was effective at meeting compliance standards without the need of further polishing, and a filtration size of 0.10 µm was effective for Cross mine waters with the exception of Cd and Zn (2.70 and 316 ppb respectively).

Section 4: Summary of Previous Treatment Methods

Legacy treatment:

For approximately 30 years, the singular method by which water was treated at the Cross-Caribou mine was addition of lime (calcium hydroxide – Ca(OH)). Because of repeated exceedances following the GIR's acquisition of the Cross-Caribou mines, it sought out contracts from several companies with a reputation for treating similar exceedance issues. This GIR initiative for alternative treatment commenced well before the cease and desist order was issued by CDPHE later in November 2011.

OPEL treatment system:

GIR contracted OPEL Energy to obtain a ™AmberKleen 1200 mine waste system, and a ™AmberKleen 1250 polishing system, which were installed in July 2021. Exceedances of the OPEL system in July, August and September 2021 proved the system ineffective to treat the mines raw water and were the major impetus for removal of the OPEL system in October 2021, and replacement with another water treatment contractor and methodology for treatment.

Section 5: Selection Criteria for Pilot Treatment System

Graver Technologies (MetSorb©) bench-scale testing:

Because continued performance testing of the OPEL pilot system indicated that the treatment process was ineffective for Cross-Caribou waters, Graver Technologies was immediately retained to conduct bench-scale testing of the untreated discharge water from the Cross-Caribou mine using their MetSorb© HMRG proprietary adsorbent media. Metsorb©, which has polymetallic adsorption capabilities, has a proven history of effectively treating water from similar projects.

Samples of 5 µm filtered water were sent to Graver's facility in Glasgow, DE for bench testing. Graver then conducted kinetic and equilibrium bench-scale testing to evaluate the capacity and kinematics of their MetSorb© adsorbent for removal of Cd, Zn and other contaminants present in the Cross mine water. The summary conclusion of the complete bench testing analysis from Graver (**Appendix C**) prior to the installation of the current operational system is as follows (directly from Graver verbatim):

> *Graver has investigated the ability of MetSorb® HMRG to remove Cd and Zn from the water at the Nederland mine Cross site. MetSorb® HMRG has a capacity of over 15 mg/g for Zn and over 0.14 mg/g for Cd. The low concentration of Cd makes the HMRG kinetically hindered; a contact time of 10 minutes is not only practical but may be sufficient to remove the Cd. The kinetic data on Zn removal shows that 40% of the Zn can be removed within 10 minutes. In a full-scale vessel, this should be sufficient to remove a significant portion of the Zn from the Cross water. The major recommendation of this report is that a pilot test be conducted. A pilot test with a lead-lag configuration and appropriate sampling would provide a more complete evaluation of the media's ability to remove both Cd and Zn to the necessary requirements for the Cross site.*

Based on the success of the May 2021 Filtration Study and the Metsorb© bench test results, along with the ability of both Ensero and ESS to mobilize equipment as quickly as possible, GIR selected this system for field pilot testing.

Section 6: Pilot/Current Treatment System

Pilot system and water flow path:

Based on the results of the May 2021 filtration study and data from Graver's MetSorb© HMRG media bench-scale testing, a two-pronged approach for treating water from the Cross-Caribou mines was selected. First, the new pilot system treats water from the Cross-Caribou mines using a submersible pump fed filtration system provided by Ensero (**Appendix D**). Post 5 µm filtration, the water is polished through a vessel provided by Environmental Site Solutions (ESS) (**Appendix E**) using the Graver MetSorb© HMRG media. After polishing, the water is sufficiently treated to meet compliance to discharge into the Coon Track Creek watershed.

Water from the Caribou mine portal is piped into pond 3A by a sump pump located in the Caribou mine portal. During December 2021 and January 2022, a cofferdam was installed in the Caribou mine, upgradient of the sump pump, to limit the water being fed to the sump and later discharging into Pond 3A. From Pond 3A, 6" HDPE piping allows water at 3A to discharge into ponds 3B, and later 3C through 6" PVC piping, which increases the residence time for suspended solids to settle. At pond 3C, a 6" HDPE discharge pipe with a butterfly valve directs the Caribou mine water to Pond 1, where the pilot system has been installed.

Water from the Cross mine is also discharged to Pond 1. Dewatering from the Cross mine uses a centrifugal pump, 4" HDPE piping, and valve system installed in the winze located between the 100 and 200 levels. Below the 100 level, the mine is often flooded and necessitates dewatering from lower developmental levels, so as not to overflow the winze. The pump in the winze is controlled by a level transducer and connected to the PLC, which throttle the pump based on desired flow. Near the Cross mine portal, an electronic flow meter reports the rate of flow from the winze pump. Thereafter, water is directed by piping to Pond 1 where it is blended with the Caribou water. A 3 HP pump, also automatically controlled by a level transducer, pumps water in the treatment system.

The Graver/Ensero/ESS pilot system installed in November 2021 is located just to the southeast of Pond 1, approximately 15 feet from the pond margin. Because the level of water in pond 1 is affected by the flows of influent water from both the Cross and the Caribou mines, it is critical to monitor the water level of pond 1 so as not to cause overflow. If such an event were to occur, pond 1 will overflow into pond 2 at a level of 5.2 ft (measured from the bottom of pond 1), through an overflow pipe and be contained. Although pond 2 was previously used as another settling pond during the operation of the legacy systems, it is not currently in use other than as an emergency overflow point.

The pilot system is housed in an insulated conex trailer, with two overhead electrical heaters that are set to engage when the temperature drops, to ensure that the system does not freeze. A submersible pump in Pond 1, with a pressure transducer controlling the pump speed directs water to pond 1 through a 4" barracuda-style suction hose and into the pilot system. Here, the water is filtered through four (4) stainless steel filter bag housings with 5µ filtration bags (Ensero). The skid consists of 4" schedule-80 PVC piping between bag housings. The filtered water is then pumped through a 2" suction hose and into a vessel containing the Metsorb© adsorbent. Final polishing takes place in the ESS vessels through the Metsorb© media. The finished water then exits the vessel through 2" suction hose and is piped through 4" and 6" HDPE pipe from the pilot conex to the discharge monitoring shed located approximately 100 yards southeast of the conex. Additional monitoring, including a pH and temperature

probe, Total Dissolved Solids (TDS) meter and a discharge flow meter are located in the discharge shed. At this point, the water is sufficiently filtered and polished, and in compliance with GIR's discharge permit, to allow it to be discharged into the Coon Track Creek watershed through an 8" schedule-40 PVC discharge pipe.

Pilot system automation features:

The filtration and polishing pilot system has undergone significant automation upgrades in recent months, allowing for greater predictability, consistency and control of operations. The primary features of this automation system are a Variable Frequency Drive (VFD), which controls the power and speed of the electrical motor systems (e.g., the Pond 1 pump), and a Programable Logic Controller (PLC), which allows a user to interface with and edit the settings of the systems described below remotely.

The primary feature of the PLC is a real-time computer site display (Walchem) which reads and displays measurements of the Cross mine flow meter, Pond 1 pump speed and Pond 1 water level (controlled by a pressure transducer), and measurements collected by the pressure transmitters before and after the filter bag housings. The pressure drop between the influent source water and effluent (post-filtration) water determines the frequency of filter bag changes (i.e., when to remove old, spent filter bags to be replaced with fresh filter bags). While the manufacturer recommends a bag change at a drop of 2 psi, GIR has found that the filter bags will last significantly longer than a 2 psi drop without either break-through or sediment release. Analytics support extending the bag life and GIR will continue to monitor for optimal treatment as well as consumables cost. The PLC (photograph in **Appendix A**) also displays variable versus time graphs which aid in real-time visualization of changes to the system, assisting the operator to make quick changes to the system if/when necessary. All measurement data and graphs are viewable remotely via the Walchem Fluent website. Additional changes and features are programable on the PLC, and additional meters and measurements will be displayed upon their installation. These upgrades will provide additional data collection points and aid in making changes to the system quickly and as needed. Alarm features have also been programed into the PLC, which send a text message and email to alert the operators in the case that urgent changes must be made.

The pilot system described above is fully operational and since the installation of continuous 24/7 treatment (January 2021), has produced consistent results that are 100% in compliance with GIR's discharge permit (**Tables 2 and 3**). The pilot system in place has proven to be successful, and GIR will continue to make improvements and upgrades to the system as needed. GIR is committed to meeting compliance standards, and looks forward to working with the State in the future to ensure success for the future.

Table 2

Caribou-Cross Mine Pilot System Water Tests Summary of analytical results from January 17, 2022					
Analyte	Units (µg/L = ppb)	Specific Method	Basis	280-157829-3 INFLUENT 1/17/2022 3:00 PM	280-157829-4 OUTFALL-001 1/17/2022 3:15 PM
Cadmium	µg/L	Metals (ICP/MS)	Total Recoverable	1.5	ND
Cadmium	µg/L	Metals (ICP/MS)	Potentially Dissolved	1.0	ND
Copper	µg/L	Metals (ICP/MS)	Potentially Dissolved	3.5	0.76 J
Copper	µg/L	Metals (ICP/MS)	Total Recoverable	2.8	ND
Lead	µg/L	Metals (ICP/MS)	Potentially Dissolved	6.8	0.48 J
Lead	µg/L	Metals (ICP/MS)	Total Recoverable	6.5	0.45 J
Silver	µg/L	Metals (ICP/MS)	Potentially Dissolved	ND	ND
Zinc	µg/L	Metals (ICP/MS)	Total Recoverable	130 B	2.0 J B
Zinc	µg/L	Metals (ICP/MS)	Potentially Dissolved	130 B	11 B
J = below reportable limit, but ≥ detection limit B = compound found in blank and sample ND = not detectable					

Table 3

Caribou-Cross Mine Pilot System Water Tests Summary of analytical results from January 18, 2022					
Analyte	Units (µg/L = ppb)	Specific Method	Basis	280-157829-1 INFLUENT 1/18/2022 10:45 AM	280-157829-2 OUTFALL-001 1/18/2022 11:00 AM
Cadmium	µg/L	Metals (ICP/MS)	Total Recoverable	0.97 J	ND
Cadmium	µg/L	Metals (ICP/MS)	Potentially Dissolved	1.3	ND
Copper	µg/L	Metals (ICP/MS)	Potentially Dissolved	2.9	ND
Copper	µg/L	Metals (ICP/MS)	Total Recoverable	2.6	ND
Lead	µg/L	Metals (ICP/MS)	Potentially Dissolved	6.0	0.45 J
Lead	µg/L	Metals (ICP/MS)	Total Recoverable	6.4	0.47 J
Silver	µg/L	Metals (ICP/MS)	Potentially Dissolved	ND	0.048 J
Zinc	µg/L	Metals (ICP/MS)	Total Recoverable	130 B	ND
Zinc	µg/L	Metals (ICP/MS)	Potentially Dissolved	120 B	4.8 J B
J = below reportable limit, but ≥ detection limit B = compound found in blank and sample ND = not detectable					

Appendices

Appendix A – Site Pictures

Appendix B – Site and System Maps

Appendix C – Graver/Metsorb

Appendix D – Ensero

Appendix E – Environmental Site Solutions (ESS)

Appendix F – Equipment

Appendix G – SOP's and O&M's

Appendix H – Ground Water Monitoring Plan

Appendix A – Site Pictures

Caribou Ponds

Figure 1 Ponds 3A and 3B (Frozen)

Figure 2 Pond 3C Frozen

Cross Ponds

Figure 3 Pond 2 (Frozen) Emergency Overflow Only

Figure 4 Pond 1 (Frozen) With Submersible Pump and Float

Figure 5 Walking Bridge over Coon Track Creek

Cross Discharge Sheds 1 and 2

Figure 6 Cross Discharge Sheds 1 and 2. Cross Effluent Discharge Pipe to Coon Track Creek

Figure 7 - 6" Gravity Discharge Pipe and Monitoring Equipment in Shed 2

Cross Underground Infrastructure

Figure 8 Cross Winze Pump VFD/Enclosure and Cross Discharge Meter

Figure 9 Cross Winze Valve Upgrade and XXX(Future Picture)

Insert picture of Cross Winze or pump or piping

Treatment Trailer and System

Figure 10 - 40'L x 8'W x 9'6"H Storage Conex

Figure 11 Treatment System Discharge Pipe and Intake Hose

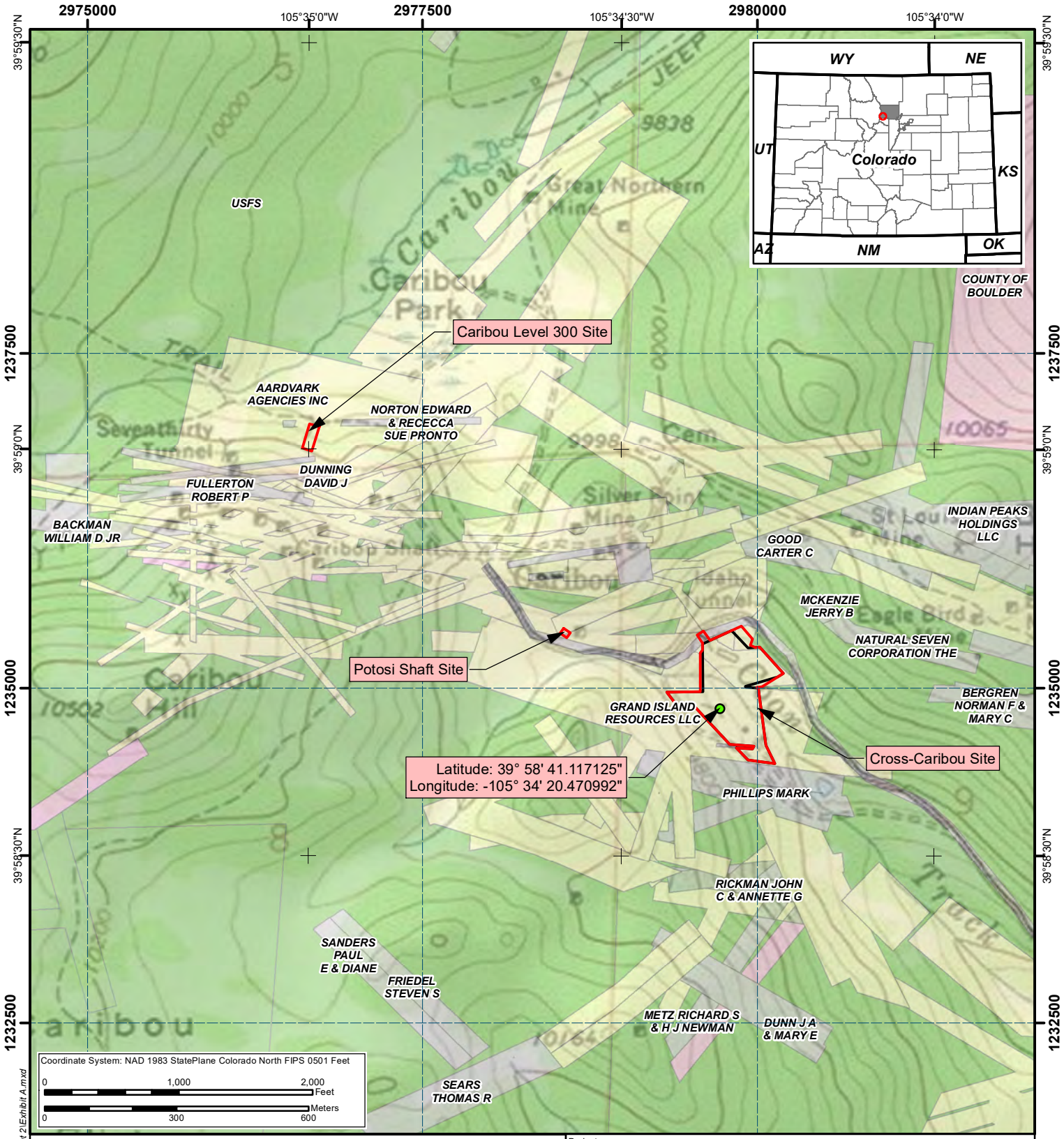
Figure 12 Skid Mounted Filtration System (provided by Ensero)
4 Stainless Steel Vessels – Housing 5-Micron Filtration Bags

Figure 13 Vessels (provided by ESS) housing Metsorb Adsorptive Media (provided by Graver)

Figure 14 Isolation Valve and Backwash Tank

Figure 15 Programmable Logic Center (PLC) and Variable Frequency Drive (VFD)

Appendix B – Site and System Maps



Legend

- Permit Boundary - Modified (9.99 ac)
- Permit Boundary - Current (8.95 ac)

Assessor Data

- Grand Island Resources
- Private Land Owners
- Boulder County
- US Forest Service

Project: DRMS Amendment 2

Title: **Proposed Permit Boundary Modifications**

Project No. 0801			File No.	
GIS:	JST	01/25/21	Scale As Shown	Rev 0
Check:	JST	01/25/21	**Exhibit A**	
Review:	DP	01/25/21		

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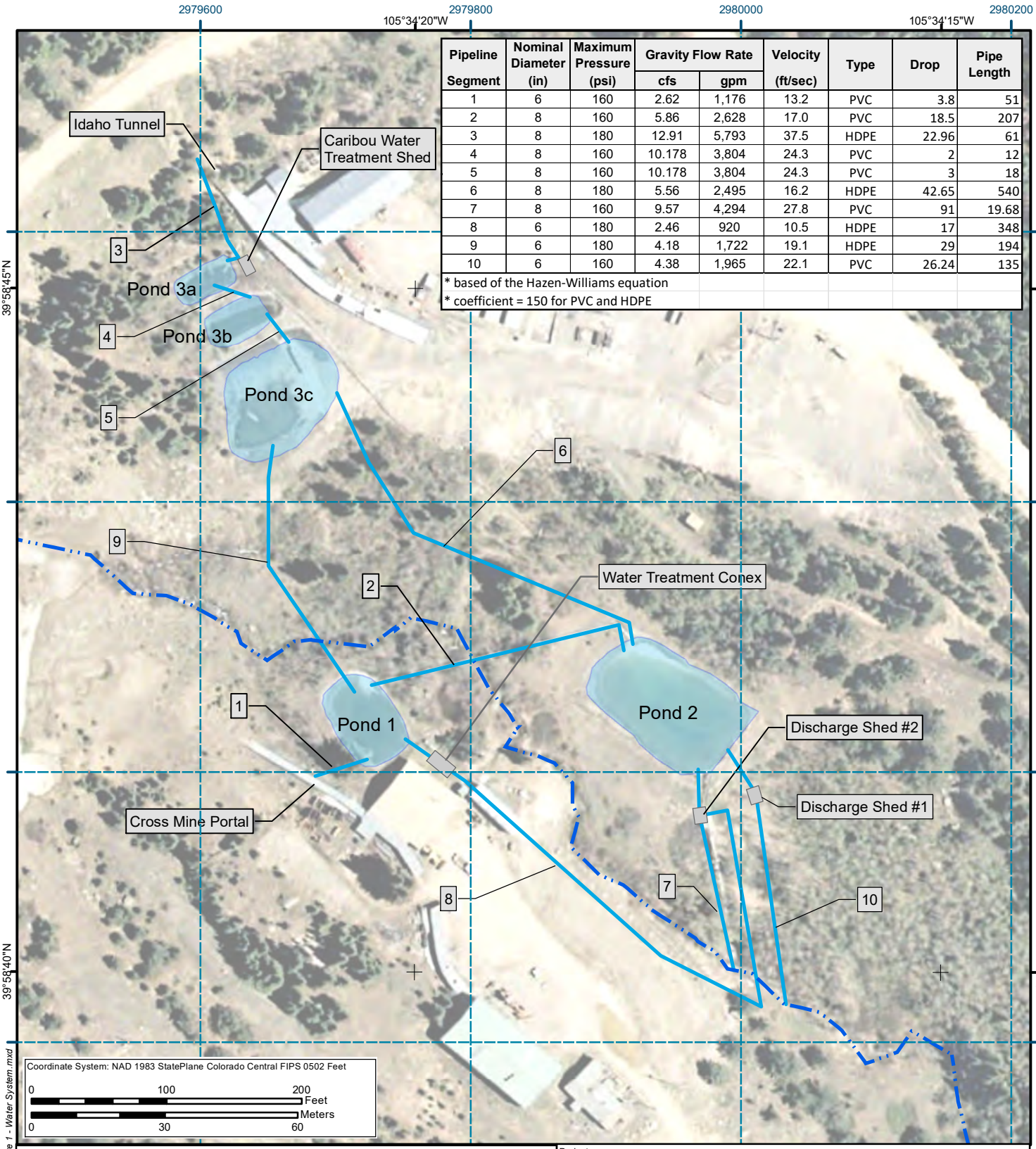

Pipeline Segment	Nominal Diameter (in)	Maximum Pressure (psi)	Gravity Flow Rate cfs	Gravity Flow Rate gpm	Velocity (ft/sec)	Type	Drop	Pipe Length
1	6	160	2.62	1,176	13.2	PVC	3.8	51
2	8	160	5.86	2,628	17.0	PVC	18.5	207
3	8	180	12.91	5,793	37.5	HDPE	22.96	61
4	8	160	10.178	3,804	24.3	PVC	2	12
5	8	160	10.178	3,804	24.3	PVC	3	18
6	8	180	5.56	2,495	16.2	HDPE	42.65	540
7	8	160	9.57	4,294	27.8	PVC	91	19.68
8	6	180	2.46	920	10.5	HDPE	17	348
9	6	180	4.18	1,722	19.1	HDPE	29	194
10	6	160	4.38	1,965	22.1	PVC	26.24	135

* based of the Hazen-Williams equation
* coefficient = 150 for PVC and HDPE

Legend

- SWMP Boundary
- Mine Water Drainage
- Discharge / Treatment Shed
- Pond
- Coon Track Creek

N

Project: Cross Mine Technical Revision No. 10

Title: **Water Management System**

GRAND ISLAND RESOURCES

Project No. US 0401			File No.
GIS:	JST	02/23/22	Scale As Shown — Rev 0
Check:	JST	02/23/22	**Figure 1**
Review:	JST	02/23/22	

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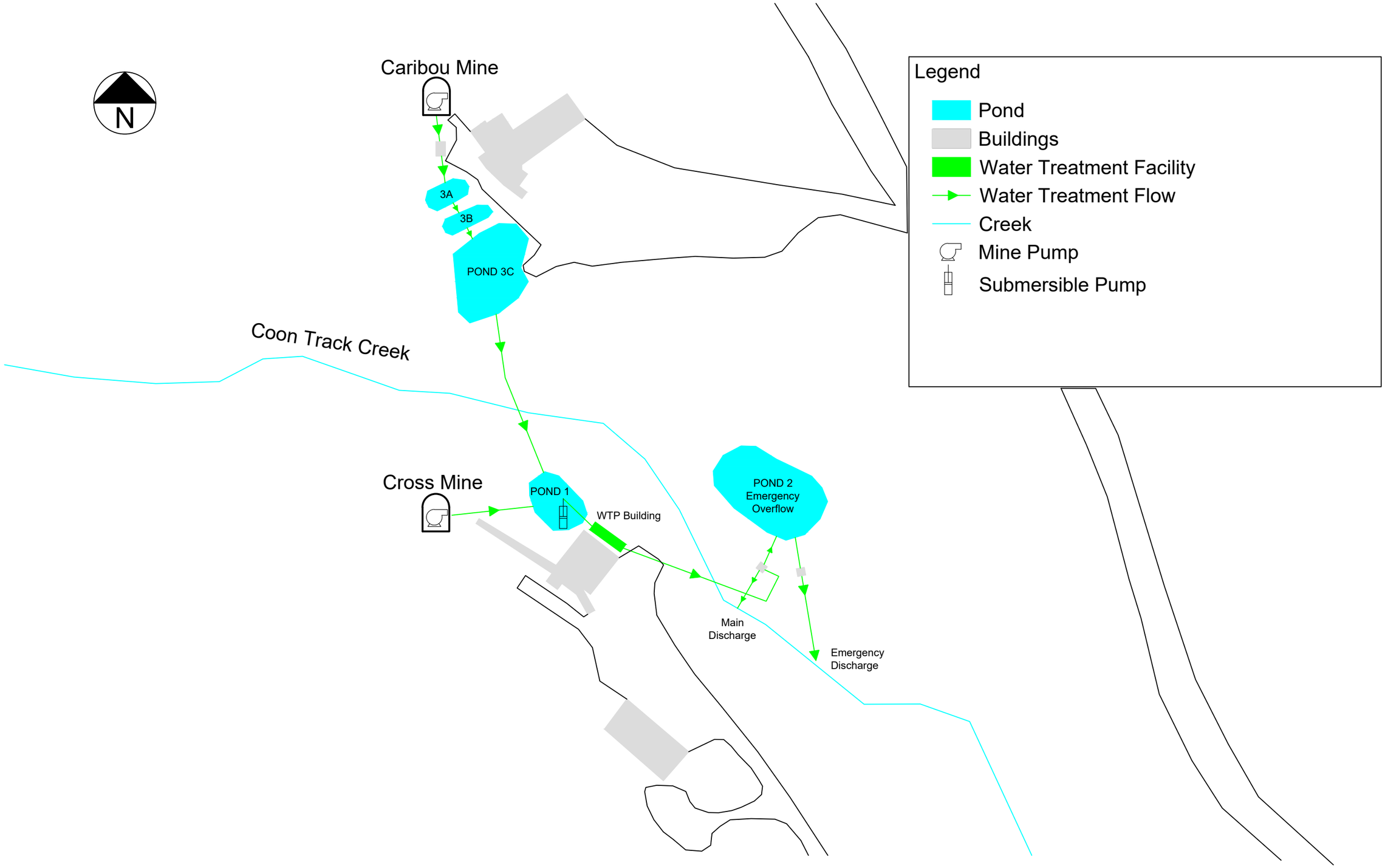


Notes:	Scale: 1" =100'
	Date: 02/22/22
	Drawn By:
	Checked By:
	Engineered By:
	Approved By:
File Name:	Revision: 2

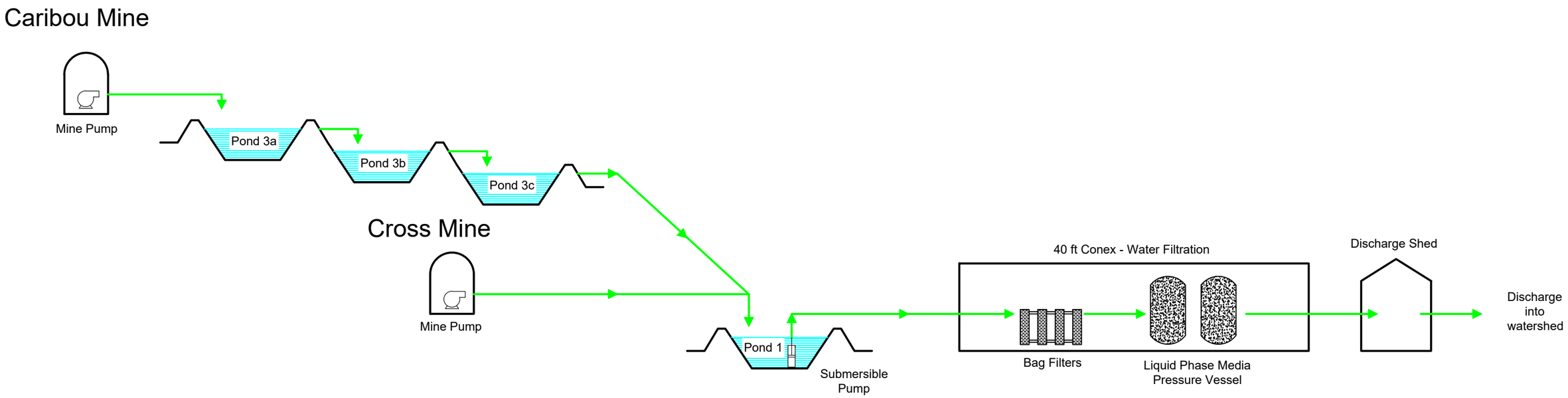
BLACK FOX MINING LLC
MATT COLLINS, PE, QP
1508 Ridge Rd, Nederland, CO, 80466
Phone: (303) 303-570-6269
Email: mcollins@blackfoxmining.com

Cross-Caribou Project

WTP System

DWG #

Sheet # 1 of 2



Notes:	Scale: Not to scale	BLACK FOX MINING LLC MATT COLLINS, PE, QP 1508 Ridge Rd, Nederland, CO, 80466 Phone: (303) 303-570-6269 Email: mcollins@blackfoxmining.com	Cross-Caribou Project WTP System Flow Sheet
	Date: 2/22/22		
	Drawn By: GML		
	Checked By:		
	Engineered By:		
	Approved By:		
File Name: CC Flow Sheet	Revision: 2		DWG # Sheet # 2 of 2

Appendix C – Graver/Metsorb

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Preliminary Investigation in Nederland Mine (Cross) Water Treatment by MetSorb® HMRG

1.0 Summary

Environmental Site Solutions is working with Nederland to remove zinc (Zn) and cadmium (Cd) from their mining sites to meet regulatory limits. MetSorb® HMRG, an adsorbent by Graver Technologies, has historically been able to treat water for both Cd and Zn. Contaminated water from the Cross mine was sent to Graver's facility in Glasgow, DE, USA for testing. A series of batch tests (kinetic and equilibrium) were conducted to evaluate the capacity and kinetics of MetSorb® HMRG for removing Cd and Zn present in the Cross water. In the Cross water MetSorb® HMRG was found to have a capacity of over 15 mg/g for Zn and over 0.14 mg/g for Cd. Typical contact time for HMRG is usually between 1.5 – 3 minutes. The low concentration of Cd in the Cross water makes the HMRG kinetically hindered; a contact time of 10 minutes is not only practical but should be sufficient to remove the Cd. The kinetic data on Zn removal shows that 40% of the Zn can be removed within 10 minutes. In a vessel configuration (lead-lag), this should be sufficient to remove a significant portion of the Zn from the Cross water. The major recommendation of this report is that a pilot test be conducted. A pilot test with a lead-lag configuration and appropriate sampling would provide a more complete evaluation of the media's ability to remove both Cd and Zn to the necessary requirements for the Cross site.

2.0 Introduction:

Environmental Site Solutions and Nederland contacted Graver Technologies to determine if mine water containing cadmium, zinc, and other contaminants could be treated by MetSorb® products. There are two sites that can be compared based on the data presented to Graver. Site 1 is the Caribou Tunnel Site. Site 2 is the Cross Tunnel Site (Cross).

Both water chemistries have been analyzed by Nederland. Both water samples were treated by filtration: a 5 um, 0.45 um and a 0.1 um filter. The samples for Caribou show that filtration removes all of the contaminants including cadmium, zinc, copper, lead, and silver. This indicates that contamination in the Caribou water is mostly solid. Filtration alone should clean the water from the site. The same filtration was carried out on the Cross water. The Cross water, however, did not filter as well. The cadmium was mostly soluble with ~ 93% of the concentration passing through the filters. The zinc was also mostly soluble with 92% of the concentration passing through the filters. Lead and silver were removed completely.

MetSorb® products have been known and used to treat many ions. Cadmium, one of the contaminants of concern, should be mostly Cd^{2+} in a pH of 0-7. Above 7, the Cd may convert to

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cadmium hydroxide ($Cd(OH)_2$).[1] Other Pourbaix diagrams show the conversion of Cd to other species around a pH of 8.5 or higher. These Pourbaix diagrams are guiding documents to determine how media may adsorb the contaminant. Zinc, the other major contaminant at Cross is also mostly Zn^{2+} at a pH of 0-7.5. After 7.5, the zinc starts converting to zinc oxide. [2]

MetSorb® HMRG is known to remove both cations and anions, depending on the specific water chemistry. There are several case studies and experimental results that show MetSorb® HMRG can remove both cadmium and zinc.

One case study for cadmium removal concluded:

> "Despite being at a significantly lower concentration than the other metals, cadmium adsorption performance also followed a trend of steady concentration decrease over time. The fine (0.1µm) filtration step reduced the starting concentration by 13% indicating the presence of insoluble cadmium . The separate granular activated carbon (GAC) filtration step removed only 5% of the cadmium present and not much more than the (2.7um) pre-filter used prior to beginning the stirred batch equilibrium testing. The stirred batch equilibrium testing demonstrated the selectivity of MetSorb® HMRG for cadmium in this wastewater matrix despite the much higher concentration of other metals present. Due to the evidenced selectivity, it is clear that cadmium removal will occur and that the extent of reduction will be a function of media volume and contact time."

This study was conducted at a customer site with over 350 ppb of cadmium.

In testing for zinc removal, one experimental study showed that HMRP (the powdered version of MetSorb® HMRG) could remove 97% of the zinc from a pH 6.5 and a pH 8.5 solution. The zinc had initial concentrations from 291-815 ppb. The measured capacity of the media for this test was 0.768 mg Zn/ dry gram of media. Other media specifically designed for cation removal resulted in higher percent removal and capacities.

Another case study tested both MetSorb® HMRG and MetSorb® STG for the removal of multiple metals. Both HMRG and STG removed Cd and Zn at over 7,000 bed volumes (BVs) before Zn broke through (~ 800 ppb initial) and over 8,000 BVs before Cd broke through (~550 ppb initial).

Testing was conducted on the Cross water to confirm the capacity and effectiveness of MetSorb® HMRG media relative to the specific water conditions at the Cross site.

3.0 Method:

3.1 Equilibrium batch testing - Efficiency

To a 125 mL polypropylene container was added 1.0 dry grams of MetSorb® HMRG and 100 mL of water from Cross. This is a volume to mass ratio of 100 mL of solution per dry gram of media.

[1] https://boris.unibe.ch/109643/1/1.4980127.pdf
[2] https://commons.wikimedia.org/wiki/File:Zn-pourbaix-diagram.svg

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The sample was capped and placed on a shaker table. The sample was contacted at 250 rpm overnight for a total of about 22 hours. The water was removed and filtered with a 0.45 um syringe filter. Samples were preserved with nitric acid and then analyzed by inductively coupled plasma mass spectrometry (ICP-MS).

3.2 Kinetic batch testing.

3.2.1 Ratio of 100,000 mL/g

To a 4 L plastic beaker was added 5050 g of water from Cross. A stir bar was added, and the sample was stirred for 2 minutes. 40 g of water was removed and designated as "Time 0". To the beaker was added 51.0 dry milligrams of MetSorb® HMRG (moisture of 10.39%). 40 mL samples were removed from the container at the following intervals: 1 minute, 5 minutes, 10 minutes, 30 minutes, 60 minutes and > 18 hours. When a sample was removed, it was filtered with a 0.45 um filter and preserved with nitric acid. Samples were analyzed by ICP-MS.

3.2.1 Ratio of 50,000 mL/g

To a half-gallon plastic container was added 2040 g of water from Cross. A stir bar was added, and the sample was stirred for 2 minutes. 40 g of water was removed and designated as "Time 0". To the beaker was added 43.9 dry milligrams of MetSorb® HMRG (moisture of 10.39%). 40 mL samples were removed from the container at the following intervals: 1 minute, 5 minutes, 10 minutes, 60 minutes and > 18 hours. When a sample was removed, it was filtered with a 0.45 um filter and preserved with nitric acid. Samples were analyzed by ICP-MS.

3.2.1 Ratio of 1,000 mL/g

To a one-liter plastic container was added 943.5 g of water from Cross. The sample was manually stirred. 40 g of water was removed and designated as "Time 0". To the container was added 896.7 dry milligrams of MetSorb® HMRG (moisture of 10.39%). The container was placed on a shaker table at 250 rpm. The shaker table was stopped prior to and restarted after samples were collected. 40 mL samples were removed from the container at the following intervals: 1 minute, 5 minutes, 10 minutes, 60 minutes and > 18 hours. When a sample was removed, it was filtered with a 0.45 um filter and preserved with nitric acid. Samples were analyzed by ICP-MS.

3.3 Analytical

All samples were analyzed by Graver Technologies and an independent third-party laboratory, Eurofins Test America. Both techniques used an ICP-MS to evaluate the results. Graver's results were used to quickly determine the analyte concentrations, while the Eurofins Test America results were used based on their knowledge and expertise as a certified laboratory running tests under EPA method 6020B.

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4.0 Results and Discussion

Two samples of water were received by Graver Technologies in October 2021. One sample was from the Cross site and the other was from the Caribou site. Since the Cross site was contaminated with water that was ionic (not filterable) only water from the Cross site was utilized in testing.

4.1 Removal Efficiency Testing

Removal efficiency testing was conducted on the Cross water to demonstrate that the Cd and the Zn could be removed using the media. Removal efficiency is defined as percent removal and does not provide useful data with regard to the capacity of a media. This test was conducted at a V/m ratio of 100 mL of solution to 1 dry gram of media. The results of both the Cd and Zn tests showed non-detected levels.

The calculated results are limited by the non-detect levels as reported by Eurofins Test America. For this test, the Cd detection limit was 0.39 ppb, and the Zn detection limit was 6.5 ppb. The percent removal was > 67.5% for Cd and > 95.3% for Zn. These values are relatively low, because the EPA method contains statistical analyses that limit the detection level. Graver's preliminary data was based on raw data generated from the ICP. The limit of detection based on the Graver ICP-MS was not only smaller, but the initial concentrations of the Zn and Cd in the Cross water were higher. The percent removal using the Graver analysis was > 99% for Cd and Zn.

4.2 Total Capacity Estimation

Section 3.2 describes kinetic batch testing. However, when an overnight contact time is used the reactions are typically considered to be "at equilibrium". Samples of the reactions at > 18 hours with different V/m ratios were combined to generate an isotherm. Isotherms can be used to show the capacity of the media. These capacities do not show breakthrough (bed volumes). Instead, they show what may be the maximum loading of the contaminants on the media at the tested concentration of water.

In the Cross water, zinc was present at 169.5 ppb, on average (Eurofins TA data). It is estimated that the capacity for Zn of HMRG on the Cross site will be approximately 15 mg of Zn per dry gram of media (mg/g). The capacity of MetSorb® HMRG for Zn is expected to be higher than 15 mg/g as a full isotherm curve could not be fully evaluated.

The cadmium capacities will be lower than zinc because the Cross water had a much lower concentration of Cd (1.55 ppb, on average). The maximum measured capacity of MetSorb® HMRG for Cd was 0.14 mg/g. Again, the capacity is expected to be higher than reported as the curve could not be fully evaluated.

Isotherm tests typically generate nice visible curves based on the equilibrium concentration (*x*-axis) and the calculated capacities (*y*-axis). In this case, the equilibrium concentrations were skewed by the method detection limit reported by Eurofins Test America. The graphical analysis could not be completed and used to extrapolate a maximum capacity. Instead, the capacities reported are based on the very high V/m ratio of 100,000 mL/g. Since the equilibrium

concentration of these samples was not near the initial concentration of either Cd or Zn, the capacities are likely to be larger than the reported values.

These equilibrium batch isotherm tests serve as guidance to initial capacity estimates. They do not factor in or correct for capacity changes with respect to kinetic or other engineering effects. The best way to gauge the capacity of the media is to perform a pilot test and get the real capacity of the media under actual process conditions.

4.3 Kinetic Testing Evaluation

Kinetic evaluations of the media were conducted by extracting a small amount of water out of a single reaction at specific intervals. For the sake of this test, samples were taken at 1 minute, 5 minutes, 10 minutes, 60 minutes and overnight (equilibrium contact). After careful evaluation, the results appear best in the V/m ratio of 1000 mL/g. At this ratio, there is sufficient contact with the media during the kinetic testing that an effect can be evaluated.

The cadmium data show that only about slightly more than 0% of the Cd is removed at 5 minutes of contact. At 10 minutes of contact, the removal percentage goes up to about 10% (Figure 1). At 60 minutes of contact, the removal is over 70%. The actual reduction should be higher, but the calculation is limited by the ICP-MS detection limit.

The data from the Zn analysis shows that less than 40% of the Zn is removed at 10 minutes. At 60 minutes, the percent removal increases to 86% (Figure 2).

The media appears kinetically hindered for both Zn and Cd removal. The Cd is probably hindered due to the lower concentrations; it takes longer for the ions to find the surface of the media and to be sufficiently adsorbed.

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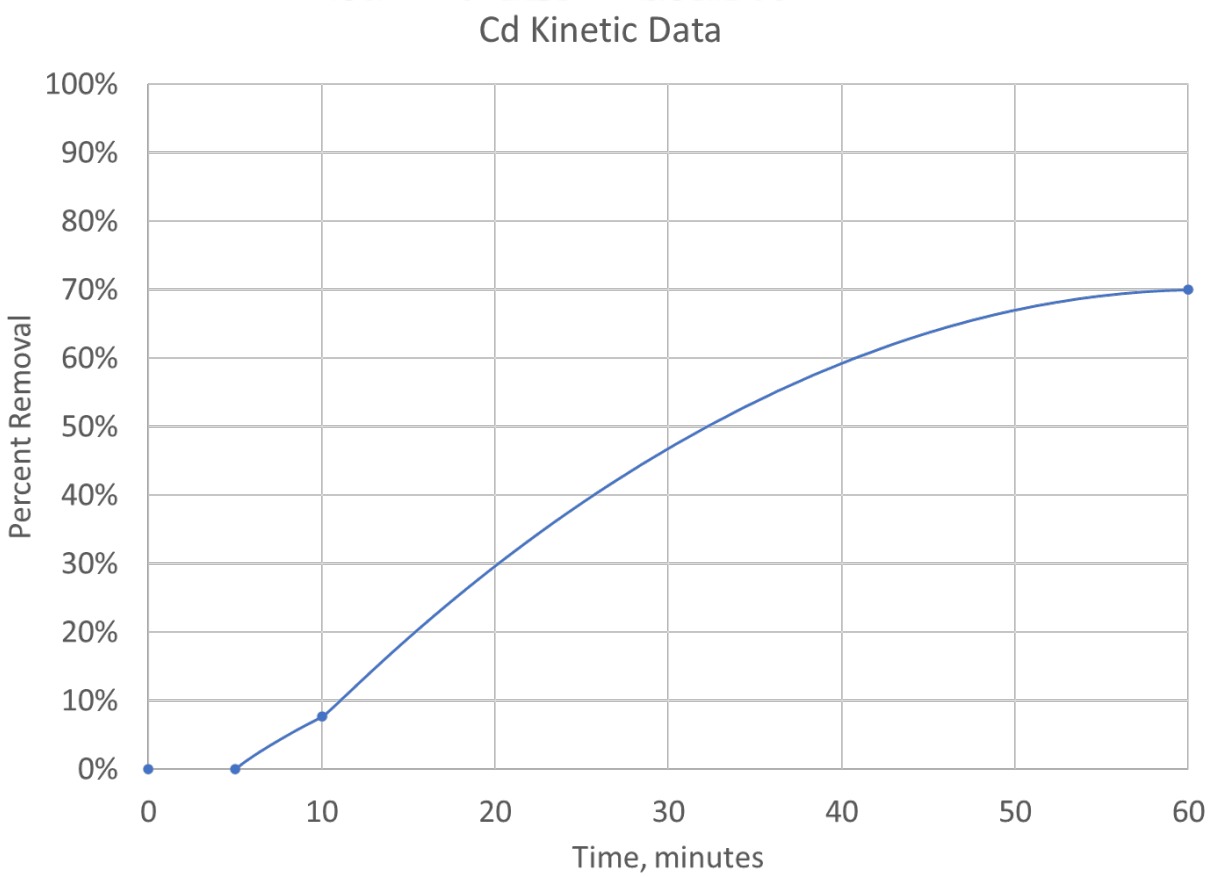


Figure 1. The Cd kinetic test at a V/m ratio of 1000 mL/dry gram of media. The test is limited by the method detection limit. A 10-minute contact time (at a very low concentration) only removes about 10% of the contaminant. At 60 minutes the % removal is much higher, but the calculation is limited by the detection limit. Note that the lines drawn are just connecting the dots to emphasize the change in efficiency. The connecting line is not a fit for the data; it is just a visual cue.

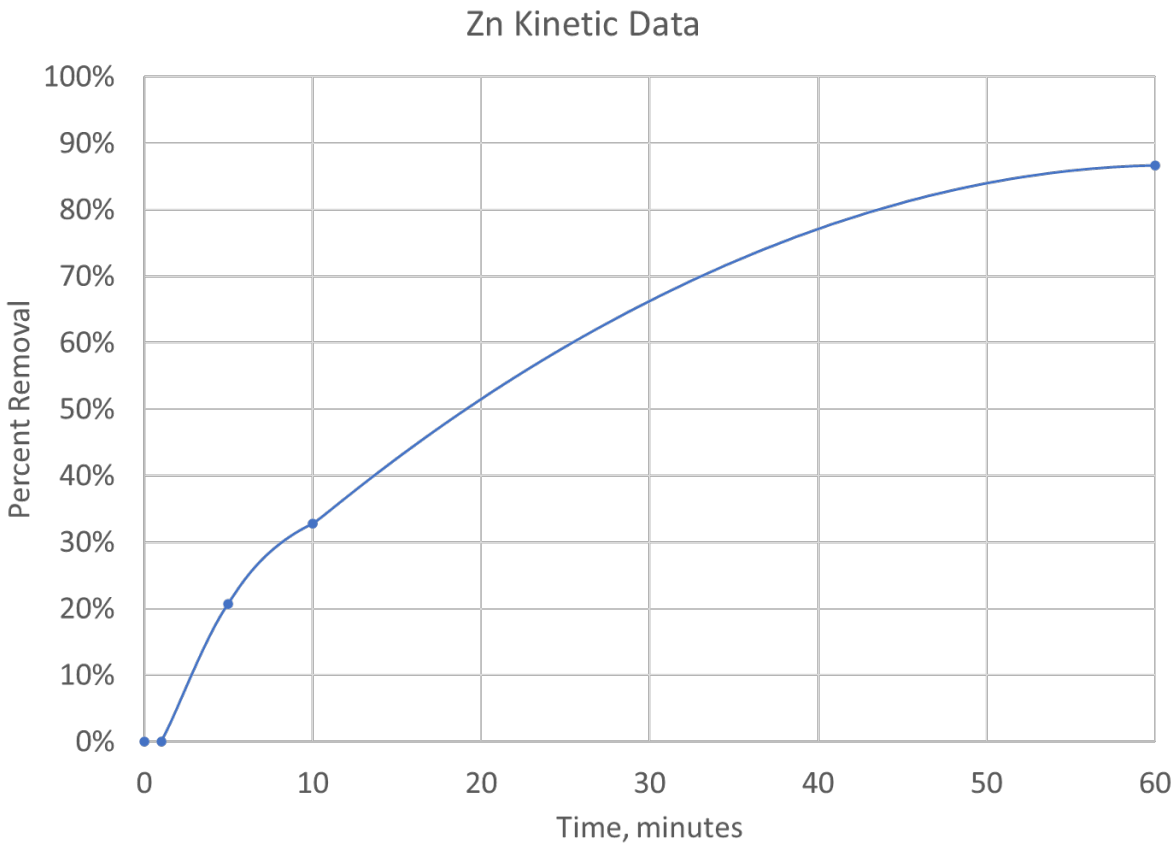


Figure 2. The Zn kinetic test at a V/m ratio of 1000 mL/dry gram of media. The test is limited by the method detection limit. A 10-minute contact time (at a very low concentration) only removes about 32% of the contaminant. At 60 minutes the % removal is much higher, ~85%. Note that the lines drawn are just connecting the dots to emphasize the change in efficiency. The connecting line is not a fit for the data; it is just a visual cue.

This analysis demonstrates that the media does remove a significant amount of both Cd and Zn but may have some kinetic hinderance. These tests were completed in a batch-like style which is not as efficient as a column test. In a column test, media is not distributed randomly in the fluid. Instead, the fluid passes through a bed, making the removal significantly more efficient. Based on the data gathered, the standard recommendation of one to three minutes empty bed contact time (EBCT) for HMRG is not likely to be effective. A ten-minute contact time shows some removal and is more practical than a 60-minute contact time. A pilot study with a 10-minute EBCT is recommended to increase confidence in the ability for the media to successfully remove the contaminants with the desired engineering design.

5.0 Conclusions

Graver has investigated the ability of MetSorb® HMRG to remove Cd and Zn from the water at the Nederland mine Cross site. MetSorb® HMRG has a capacity of over 15 mg/g for Zn and over 0.14 mg/g for Cd. The low concentration of Cd makes the HMRG kinetically hindered; a contact time

of 10 minutes is not only practical but may be sufficient to remove the Cd. The kinetic data on Zn removal shows that 40% of the Zn can be removed within 10 minutes. In a full-scale vessel, this should be sufficient to remove a significant portion of the Zn from the Cross water. The major recommendation of this report is that a pilot test be conducted. A pilot test with a lead-lag configuration and appropriate sampling would provide a more complete evaluation of the media's ability to remove both Cd and Zn to the necessary requirements for the Cross site.

Graver Technologies

200 Lake Drive
Glasgow, DE 19702

MetSorb® HMRG (Heavy Metal Removal Granules) – 16/60 US Mesh

Recommended Operational Design Parameters

OPERATING PARAMETER	MetSorb® HMRG 16/60
Service Flow Rate (Hydraulic Loading)	3-12 gpm/ft^2
Flow Direction	Typically Downward (Up-flow under certain conditions)
Empty Bed Contact Time (EBCT)	1.5-3.0 Minutes (Water Quality Dependent)
Maximum System Pressure	100 psi
Backwash Flow Rate	3-7 gpm/ft2
Backwash Bed Expansion	40%
Backwash Volume	5-7 Bed Volumes
Vessel Freeboard	50% of Bed Depth
Typical Minimum Bed Depth	22 Inches
Maximum Continuous ORP	400 mV
Sanitization Chlorine Concentration	25-50 ppm (for max 24 hr. hold)
Incoming Chlorine Concentration	0.5 ppm

MetSorb® HMRG is a highly effective granular adsorbent that reduces Arsenic III & V and a wide variety of heavy metals including Lead, Uranium, Antimony, Zinc, Radium, Cadmium, Copper, Chromium and Vanadium from drinking water and process solutions. For more information on MetSorb® adsorptive media, please contact Bennett Buchsieb at 302-383-9310 or by email at bbuchsieb@gravertech.com

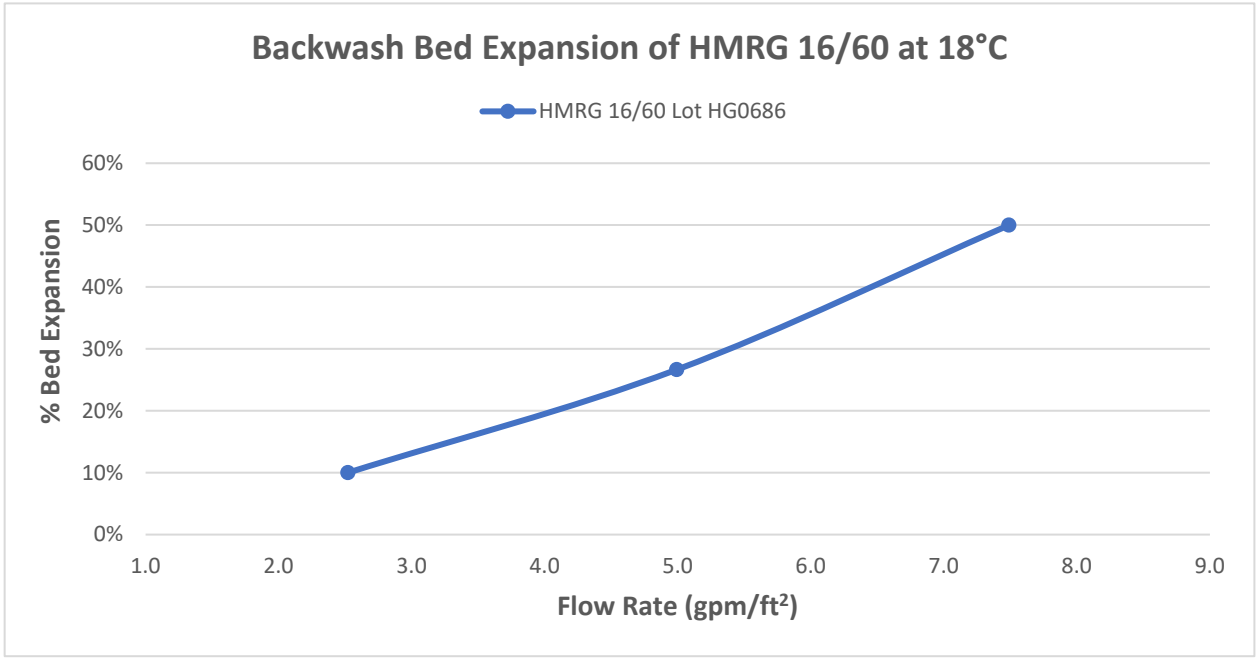
Graver Technologies - HMRG 16/60 Backwash Study at 18°C

HMRG 16/60 Lot HG0686

Temperature held at 18.0 ± 0.5°C using a Fisher Scientific Isotemp Refrigerated Circulator, Model 910

Column Diameter	1	inch
	0.785	square inches
	0.005451389	square feet
Initial Media Bed Height	7.5	inches

Target Flux (gpm/ft^2)	Target Flow Rate (mL/min)	Actual Flow Rate (mL/min)	Actual Flux (gpm/ft^2)	Bed Expansion (inches)	Bed Expansion %
2.5	51.6	52	2.521	8.25	10.0%
5.0	103.2	103	4.993	9.50	26.7%
7.5	154.8	155	7.490	11.25	50.0%



SAFETY DATA SHEET

MetSorb® HMRG, HMRP

Prepared to U.S. OSHA, CMA, ANSI, Canadian WHMIS, Australian WorkSafe, Japanese Industrial Standard JIS Z 7250:2000, and European Union REACH Regulations

Graver Technologies

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:	**MetSorb® HMRG, HMRP**
CAS NUMBER:	Mixture
PRODUCT USE:	Various
U.N. NUMBER:	Not Applicable
U.N. DANGEROUS GOODS CLASS:	Non-Regulated Material
SUPPLIER/MANUFACTURER'S NAME:	**Graver Technologies LLC**
ADDRESS:	200 Lake Drive, Glasgow, Delaware 19702-3319 USA
EMERGENCY PHONE:	**800-249-1990**
BUSINESS PHONE:	(302) 731-1700
BUSINESS FAX:	(302) 731-1707
DATE OF CURRENT REVISION:	July 23, 2015
DATE OF LAST REVISION:	October 20, 2011

SECTION 2 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: This product is a dry, white powder or granules (solid) with no odor. Exposure can be irritating to eyes, respiratory system and skin. May be harmful if swallowed. It is a non-flammable solid. Excessive airborne dust creates a dust explosion hazard. The Environmental effects of this product have not been investigated, however this product is not expected to have any adverse effects.

US DOT SYMBOLS	CANADA (WHMIS) SYMBOLS	EUROPEAN and (GHS) Hazard Symbols
Non-Regulated	Complies with WHMIS 2015	 Signal Word: **Warning!**

GHS LABELING AND CLASSIFICATION:

This product does meet the definition of a hazardous substance or preparation as defined by 29 CFR 1910. 1200 AND the European Union Council Directives 67/548/EEC, 1999/45/EC, 1272/2008/EC and subsequent Directives.

Classification of the substance or mixture according to Regulation (EC) No1272/2008 Annex VI
EC# 236-675-5 This substance is not classified in the Annex I of Directive 67/548/EEC
EC# 243-744-3 This substance is not classified in the Annex I of Directive 67/548/EEC
CAS# 9002-89-5 This substance is not classified in the Annex I of Directive 67/548/EEC

GHS Hazard Classification(s):
Eye Damage/Irritation Category 2B

Hazard Statement(s):
H320:Causes eye irritation

Precautionary Statement(s):
P264: Wash hands thoroughly after handling
P280: Wear protective gloves/protective clothing/eye protection/face protection.

Hazard Symbol(s):
[Xi] Irritant

Risk Phrases:
R36: Irritating to eyes

Safety Phrases:
S24/25: Avoid contact with skin and eyes

HEALTH HAZARDS OR RISKS FROM EXPOSURE:

ACUTE: Exposure can be irritating to eyes, respiratory system and skin.
INHALATION: Inhalation of dusts may cause nose, throat and respiratory tract irritation.
EYE: Direct contact causes irritation with pain and redness.
SKIN: Prolonged or repeated contact may cause skin irritation with redness.
INGESTION: Ingestion may cause irritation to gastrointestinal tract

CHRONIC: None known

TARGET ORGANS: ACUTE: Eye, Respiratory System, Skin CHRONIC: None Known

SECTION 3 - COMPOSITION and INFORMATION ON INGREDIENTS

HAZARDOUS INGREDIENTS:	CAS #	EINECS #	ICSC #	WT %	HAZARD CLASSIFICATION; RISK PHRASES
Titanium Dioxide	13463-67-7	236-675-5	0338	30 - 100%	HAZARD CLASSIFICATION: [Xi] Irritant RISK PHRASES: R36
Titanium Hydroxide	20338-08-3	243-744-3	Not Listed	0 – 30%	HAZARD CLASSIFICATION: [Xi] Irritant RISK PHRASES: R36
Ethenol Homopolymer	9002-89-5	Not Listed in ESIS	Not Listed	0 – 10%	HAZARD CLASSIFICATION: Not Classified RISK PHRASES: None
Balance of other ingredients are non-hazardous or less than 1% in concentration (or 0.1% for carcinogens, reproductive toxins, or respiratory sensitizers).					

NOTE: ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-2004 format. This product has been classified in accordance with the hazard criteria of the CPR and the SDS contains all the information required by the CPR, EU Directives and the Japanese Industrial Standard *JIS Z 7250: 2000*.

SECTION 4 - FIRST-AID MEASURES

Contaminated individuals of chemical exposure must be taken for medical attention if any adverse effect occurs. Rescuers should be taken for medical attention, if necessary. Take copy of label and SDS to health professional with contaminated individual.

EYE CONTACT: If product enters the eyes, open eyes while under gentle running water for at least 15 minutes. Seek medical attention if irritation persists.

SKIN CONTACT: Wash skin thoroughly after handling. Seek medical attention if irritation develops and persists. Remove contaminated clothing. Launder before re-use.

INHALATION: If breathing becomes difficult, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Seek medical attention.

INGESTION: If product is swallowed, call physician or poison control center for most current information. If professional advice is not available, do not induce vomiting. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or who cannot swallow. Seek medical advice. Take a copy of the label and/or MSDS with the victim to the health professional.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing skin, respiratory system or eye problems may be aggravated by prolonged contact.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and reduce over-exposure.

SECTION 5 - FIRE-FIGHTING MEASURES

FLASH POINT: Non-Flammable

AUTOIGNITION TEMPERATURE: Not Applicable

FLAMMABLE LIMITS (in air by volume, %): Lower (LEL): NA Upper (UEL): NA

FIRE EXTINGUISHING MATERIALS: As appropriate for surrounding fire. Carbon dioxide, foam, dry chemical, halon, or water spray. Do not release runoff from fire control methods to sewers or waterways.

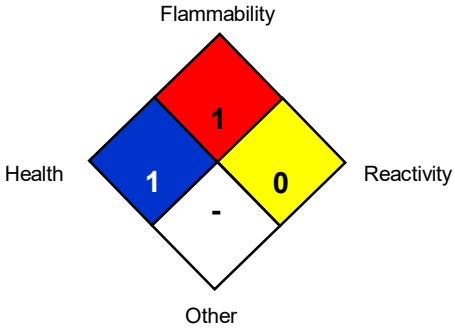
UNUSUAL FIRE AND EXPLOSION HAZARDS: High dust concentration may form explosive mixtures with air, which can be ignited by spark, flame or static discharge.

Explosion Sensitivity to Mechanical Impact: Not Sensitive.

Explosion Sensitivity to Static Discharge: Sensitive (Air/Dust mixtures)

SPECIAL FIRE-FIGHTING PROCEDURES: Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Isolate materials not yet involved in the fire and protect personnel. Move containers from fire area if this can be done without risk; otherwise, cool with carefully applied water spray. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.

NFPA RATING SYSTEM



HMIS RATING SYSTEM

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM	
HEALTH HAZARD (BLUE)	1
FLAMMABILITY HAZARD (RED)	1
PHYSICAL HAZARD (YELLOW)	0

PROTECTIVE EQUIPMENT			
EYES	RESPIRATORY	HANDS	BODY
	See Sect 8		See Sect 8

For Routine Industrial Use and Handling Applications

Hazard Scale: **0** = Minimal **1** = Slight **2** = Moderate **3** = Serious **4** = Severe * = Chronic hazard

SECTION 6 - ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Personnel should be trained for spill response operations.
SPILLS: Contain spill if safe to do so. Prevent entry into drains, sewers, and other waterways. Sweep, shovel or vacuum (HEPA vacuum) spilled material and place in an appropriate container for re-use or disposal. Avoid dust generation if possible. For large spills, use wet methods and dike far ahead of any liquid spill. Do not release into sewers or waterways.
Dispose of in accordance with applicable Federal, State, and local procedures (see Section 13, Disposal Considerations).

SECTION 7 - HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat, drink, smoke, or apply cosmetics while handling this product. Avoid breathing dusts generated by this product. Use in a well-ventilated location. Remove contaminated clothing immediately. Do not enter places where bulk material is used or stored until adequately ventilated to prevent asphyxiation.

As with all finely divided materials, precautions should be taken to avoid inhalation and eye contact. Ground all transfer, blending and dust collecting equipment to prevent static discharge in accordance with NFPA 70, "National Electric Code;" NFPA 499, "Recommended Practice for the Classification of Combustible Dusts and of Hazardous (classified) Locations for Electrical Installations in Chemical Process Areas;" NFPA 654, "Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids" and OSHA Combustible Dust standards. Remove all ignition sources from material handling, transfer and processing areas where dust may be present.

STORAGE AND HANDLING PRACTICES: Containers of this product must be properly labeled. Store containers in a cool, dry location away from heat, flame and incompatible materials. Keep container tightly closed when not in use.

SECTION 8 - EXPOSURE CONTROLS - PERSONAL PROTECTION

EXPOSURE LIMITS/GUIDELINES:

Chemical Name	CAS#	ACGIH TWA	OSHA TWA
Titanium Dioxide	13463-67-7	10 mg/m³ Dust	15 mg/m³ Total Dust
Titanium Hydroxide	20338-08-3	Not Listed	Not Listed
Ethenol Homopolymer	9002-89-5	Not Listed	Not Listed

Currently, International exposure limits are established for the components of this product. Please check with competent authority

in each country for the most recent limits in place.

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to ensure exposure levels are maintained below the limits provided below. Use local exhaust ventilation to control airborne dust. Ensure eyewash/safety shower stations are available near areas where this product is used.

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132) or equivalent standard of Canada, or standards of EU member states (including EN 149 for respiratory PPE, and EN 166 for face/eye protection), and those of Japan. Please reference applicable regulations and standards for relevant details.

RESPIRATORY PROTECTION: Maintain airborne contaminant concentrations below guidelines listed above, if applicable. If necessary, use only respiratory protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), equivalent U.S. State standards, Canadian CSA Standard Z94.4-93, the European Standard EN149, or EU member states.

EYE PROTECTION: Safety glasses are recommended. If necessary, refer to U.S. OSHA 29 CFR 1910.133 or appropriate Canadian Standards.

HAND PROTECTION: Use protective gloves to minimize skin contact. If necessary, refer to U.S. OSHA 29 CFR 1910.138 or appropriate Standards of Canada.

BODY PROTECTION: Use body protection appropriate to prevent contact (e.g. lab coat, overalls). If necessary, refer to appropriate Standards of Canada, or appropriate Standards of the EU, Australian Standards, or relevant Japanese Standards.

SECTION 9 - PHYSICAL and CHEMICAL PROPERTIES

PHYSICAL STATE:	Powder or Granular (Solid)
APPEARANCE & ODOR:	White powder or granular with no odor.
ODOR THRESHOLD (PPM):	Not Available
VAPOR PRESSURE (mmHg):	Not Applicable
VAPOR DENSITY (AIR=1):	Not Applicable.
PACKING DENSITY:	Not Available
EVAPORATION RATE (nBuAc = 1):	Not Applicable.
BOILING POINT (C°):	2,500 – 3,000°C (4,532 - 5,432°F)
MELTING POINT (C°):	1,855°C (3,371°F)
pH:	6 – 7 (Slurry)
SPECIFIC GRAVITY 4°C: (Water = 1)	4.26
SOLUBILITY IN WATER (%)	Insoluble in water
VOC:	0

SECTION 10 - STABILITY and REACTIVITY

STABILITY: Product is stable

DECOMPOSITION PRODUCTS: Thermal decomposition (burning) may produce irritating and toxic fumes of carbon (carbon dioxide, carbon monoxide).

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: None known

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Dust generation.

SECTION 11 - TOXICOLOGICAL INFORMATION

TOXICITY DATA: There is no available data for the product

CAS# 13463-67-7 LD50, Oral - Rat >10,000 mg/kg

SUSPECTED CANCER AGENT: One or more of the ingredients are found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, IARC and therefore is considered to be, nor suspected to be a cancer-causing agent by these agencies.

Titanium Dioxide CAS# 13463-67-7 ACGIH A4, IARC Group 3

IRRITANCY OF PRODUCT: Contact with this product can be irritating to exposed skin, eyes and respiratory system.

SENSITIZATION OF PRODUCT: This product is not considered a sensitizer.

REPRODUCTIVE TOXICITY INFORMATION: No information concerning the effects of this product and its components on the human reproductive system.

SECTION 12 - ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY: The ecological characteristics of this product have not been fully investigated. The product should not be discharged unmonitored into the environment.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: No evidence is currently available on this product's effects on plants or animals.

EFFECT OF CHEMICAL ON AQUATIC LIFE: No Data Available for this product at this time.

SECTION 13 - DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations, those of Canada, Australia, EU Member States and Japan.

SECTION 14 - TRANSPORTATION INFORMATION

US DOT; IATA; IMO; ADR:

THIS PRODUCT IS NOT HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME: Non-Regulated Material

HAZARD CLASS NUMBER and DESCRIPTION: Not Applicable

UN IDENTIFICATION NUMBER: Not Applicable

PACKING GROUP: Not Applicable.

DOT LABEL(S) REQUIRED: Not Applicable

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2004): Not Applicable

U.S. DEPARTMENT OF TRANSPORTATION (DOT) SHIPPING REGULATIONS:

This product is not classified as dangerous goods, per U.S. DOT regulations, under 49 CFR 172.101.

TRANSPORT CANADA, TRANSPORTATION OF DANGEROUS GOODS REGULATIONS:

This product is not classified as Dangerous Goods, per regulations of Transport Canada.

INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA):

This product is not classified as Dangerous Goods, by rules of IATA:

INTERNATIONAL MARITIME ORGANIZATION (IMO) DESIGNATION:

This product is not classified as Dangerous Goods by the International Maritime Organization.

EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR):

This product is not classified by the United Nations Economic Commission for Europe to be dangerous goods.

SECTION 15 - REGULATORY INFORMATION

UNITED STATES REGULATIONS

SARA REPORTING REQUIREMENTS: This product is not subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act., as follows: None

TSCA: All components in this product are listed on the US Toxic Substances Control Act (TSCA) inventory of chemicals.

SARA 311/312:

Acute Health:	Yes	Chronic Health:	No	Fire:	No	Reactivity:	No

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for this product. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lb (4,540 kg) may apply, per 40 CFR 370.20.

U.S. CERCLA REPORTABLE QUANTITY (RQ):

CERCLA Reportable Quantity (RQ), Sodium Hydroxide CAS# 1310-73-2 1,000 Lb RQ

CLEAN WATER ACT:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

STATE REGULATIONS:

None.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): One or more of the ingredients are on the California Proposition 65 lists.

WARNING! This product contains ingredients known by the State of California to cause cancer or reproductive harm.

CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: All of the components of this product are on the DSL Inventory

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: No component of this product is on the CEPA First Priorities Substance Lists.

CANADIAN WHMIS CLASSIFICATION and SYMBOLS: Complies with WHMIS 2015

EUROPEAN ECONOMIC COMMUNITY INFORMATION:

EU LABELING AND CLASSIFICATION:

Classification of the mixture according to Regulation (EC) No1272/2008. See section 2 for details.

AUSTRALIAN INFORMATION FOR PRODUCT:

AUSTRALIAN INVENTORY OF CHEMICAL SUBSTANCES (AICS) STATUS: All components of this product are listed on the AICS.

STANDARD FOR THE UNIFORM SCHEDULING OF DRUGS AND POISONS: Not applicable.

JAPANESE INFORMATION FOR PRODUCT:

JAPANESE MINISTER OF INTERNATIONAL TRADE AND INDUSTRY (MITI) STATUS: The components of this product are not listed as Class I Specified Chemical Substances, Class II Specified Chemical Substances, or Designated Chemical Substances by the Japanese MITI.

INTERNATIONAL CHEMICAL INVENTORIES:

Listing of the components on individual country Chemical Inventories is as follows:

Asia-Pac:	Listed
Australian Inventory of Chemical Substances (AICS):	Listed
Korean Existing Chemicals List (ECL):	Listed
Japanese Existing National Inventory of Chemical Substances (ENCS):	Listed
Philippines Inventory if Chemicals and Chemical Substances (PICCS):	Listed
Swiss Giftliste List of Toxic Substances:	Listed
U.S. TSCA:	Listed

SECTION 16 - OTHER INFORMATION

PREPARED BY: Paul Eigbrett MSDS Compliance PLUS

Appendix D - Ensero

Environmental Site Solutions, LLC

DATE	:	11-03-2021
TO	:	Danny Pollock / Greg Miller
COMPANY	:	Grand Island Resources LLC - Nederland Mine
FROM	:	Mike Tallering
SUBJECT	:	Phase I & Phase II Temporary Water Treatment Systems
PAGES	:	2 (Including Cover)

Danny / Greg,

Per your request, please see the following revised pricing for supply and delivery of temporary water treatment system for your project while permanent system is designed & fabricated

Phase #1 – Emergency Treatment (7-10 Day Lead Time)

We can provide treatment vessels & Graver Metsorb HMRG media to polish metals and 'pilot' removal efficiency & EBCT.

(2)	**2,000 lb. Media Pressure Vessels for Metsorb Media**		**$975/vessel/mnth**

Additional Fixed Costs:

(1)	**Mobilization & Delivery of Systems to Project Site**		**$5,850**
(1)	**Metsorb HMRG Media for Above Media Filters**	**$24,750/vessel**	**$49,500**
(1)	**End of Project Demob & Delivery back to ESS**		**$5,850**

Note:

- We do not currently have rental pump or bag filter housing but can help you source locally for short term rental

14450 Austin Place ▪ Anacortes, WA 98221 ▪ Phone: 360-503-7299 ▪ mike.tallering@envirositesolutions.com

Phase #2 – Temporary Treatment System (3-5 Week Lead Time)

Rental Pricing for the Below Equipment System: $14,850/month

Includes:

(1) 20' Shipping Container: Insulated with Double Coat Temp Coat 101, Heater (2x), 480V Service Disconnect, Interconnecting Plumbing/Hoses w/ 4" Flanged Inlet/Outlet

(1) 10 HP Pump w/ Controls

(2) Dual Stage Bag Filter Units, Manual Operations Req'd.

(2) 2,000 lb. Media Pressure Vessels for Metsorb Media

Additional Fixed Costs:

(1)	**Mobilization & Delivery of Systems to Project Site**		**$8,750**
(1)	**Metsorb HMRG Media for Above Media Filters**	**$24,750/vessel**	**$49,500**
(1)	**Installation, Start-up & Training** - Includes (3) days on-site, (2) ½-day, & travel & per diem costs		**$5,500**
(1)	**End of Project Demob & Delivery back to ESS**		**$8,750**

Notes:

- Above Pricing is for a minimum of (6) month duration
- Lead time to ship is 3-5 weeks ARO
- System will be manually operated. Permanent system will be automated

Not Included In Above Scope :

- Off-loading at site and placement of containerized system not included in above
- Plumbing from pump to containerized system not included in above
- Electrical work not included in above
- Operation of system not included in above

All pricing is valid for 60 days from above date. Pricing does not include any taxes, duties or applicable fees.

Thank you for the opportunity to provide pricing to you on your activated carbon needs. Please feel free to contact me with any questions or comments that you may have. You can reach me at 360-503-7299 or via email at mike.tallering@envirositesolutions.com.

Mike Tallering
Environmental Site Solutions
mike.tallering@envirositesolutions.com
www.envirositesolutions.com
360-503-7299

SERVICES AGREEMENT

GRAND ISLAND RESOURCES, LLC
&

ENSERO SOLUTIONS US, INC.

TABLE OF CONTENTS

SERVICES AGREEMENT

THIS AGREEMENT is effective the 8th day of November, 2021.

BETWEEN:

GRAND ISLAND RESOURCES with its mailing address at 12567 W CEDAR DR, LAKEWOOD, CO 80228 (the "**Owner**")

AND:

ENSERO SOLUTIONS US, INC., with its mailing address at 12150 E. Briarwood Avenue, Suite 135, Centennial, CO 80112

(the "**Contractor"**)

WHEREAS:

A. the Owner is responsible for the development and operation of the Caribou and Cross mines, located approximately 4.5 miles west of Nederland, CO (the "**Project**");

B. the Owner wishes to engage the Contractor to provide certain services for the Project at the direction of the Owner's designate; and

C. the Owner and the Contractor have agreed to enter into this Agreement to provide for the terms and conditions of such engagement.

THEREFORE in consideration of the agreements and covenants set out in this Agreement the Owner and the Contractor agree as follows:

1. INTERPRETATION

1.1 Definitions

In this Agreement:

"**Affiliate**" means any person which directly or indirectly controls, is controlled by, or is under common control with, a Party;

"**Agreement**" means this agreement, including all Schedules;

"**Business Day**" means any day other than Saturday, Sunday or statutory holiday;

"**Effective Date**" means the date first written above;

"**Fees**" has the meaning set out in Section 3.1;

"**Notice**" has the meaning set out in Section 8.9;

"**Parties**" means the Owner and the Contractor, and "Party" means any one of them;

"**Project**" has the meaning set out in recital A; and

"**Services**" means the services described in Schedule A.

1.2 Construction and Interpretation

In this Agreement, including the recitals to this Agreement, except where expressly stated to the contrary or the context otherwise requires:

(a) the recitals and headings to Sections and Schedules are for convenience only and will not affect the interpretation of this Agreement;

(b) each reference in this Agreement to "**Section**" and "**Schedule**" is to a Section of, and a Schedule to, this Agreement;

(c) each reference to a statute is deemed to be a reference to that statute and any successor statute, and to any regulations, rules, policies and criteria made under that statute and any successor statute, each as amended or re-enacted from time to time;

(d) words importing the singular include the plural and vice versa and words importing gender include all genders;

(e) unless otherwise stated in this Agreement, all references to amounts of money mean lawful currency of the United States;

(f) an accounting term has the meaning assigned to it, and all accounting matters will be determined, in accordance with generally accepted accounting principles consistently applied;

(g) the word "written" includes printed, typewritten, faxed, e-mailed or otherwise capable of being visibly reproduced at the point of reception and "in writing" has a corresponding meaning;

(h) the words "include" and "including" are to be construed as meaning "including, without limitation"; and

(i) this Agreement shall be construed as though both Parties drafted it.

1.3 Governing Law

This Agreement will be governed by and construed in accordance with the laws of Colorado and the laws of the United States applicable in therein.

2. PROJECT SERVICES

2.1 Appointment

The Owner hereby appoints the Contractor, and the Contractor hereby accepts the appointment, to perform the Services set out in Schedule A at the direction of the Owner's Representative. For greater certainty, nothing in this Agreement will purport to grant any right, power or authority, on behalf of or in the name of the Owner, to participate in the management, direction or control of the Owner or to relieve the Owner of its obligations.

2.2 Term

This Agreement will be effective from the Effective Date until the earlier of:

(a) the date on which each of the Contractor and the Owner have fulfilled their obligations pursuant to this Agreement;

(b) the date as of which this Agreement is terminated by mutual written agreement of the Parties; and

(c) the date this Agreement is terminated in accordance with Section 4.

2.3 Standard of Care

The Contractor will perform the Services with a level of effort indicated by the budget and a degree of care, skill and diligence normally provided by a qualified and experienced practitioner performing services similar to the Services in relation to projects similar to the Project.

2.4 Compliance with Laws

In performing the Services, the Contractor will comply in all material respects with all applicable laws.

2.5 Reports

Any report prepared by the Contractor in connection with the Services (a "**Report**") will upon full payment of the Services be for the exclusive use of the Owner, and for the limited purpose as may be expressly set out in Schedule A. The Contractor will not release or distribute, or permit the release of distribution of any Report to any other person without the Owner's written approval not to be unreasonably withheld.

2.6 Qualified Personnel

The Contractor will provide professional personnel who have the qualifications, experience and capabilities to perform the Services.

2.7 Independent Contractor

The Parties acknowledge that in entering into this Agreement and in performing the Services, the Contractor has and will have the status of an independent contractor and that nothing in this Agreement will contemplate or constitute the Contractor or any subcontractor as a partner or employee of the Owner for any purpose.

3. FEES AND PAYMENT

3.1 Fees

The Owner will pay to the Contractor the fees and disbursements described in Schedule B (the "**Fees**") plus applicable taxes.

3.2 Payment Terms

The Contractor will submit monthly invoices to the Owner for Fees (plus all applicable taxes) related to Services provided in the previous month. The Owner will pay all invoices within 30 days of the date of receipt of the invoice. All invoiced amounts not paid when due shall bear interest from the required payment date of the corresponding invoice at the rate of 1.5% per month, compounding monthly until paid.

If the Owner disputes any portion of an invoice, then the Owner shall notify the Contractor with 7 Business Days of receipt of such invoice with details of the disputed amount and the Owner may withhold the disputed amount and pay the outstanding amount by the due date. If the Owner and Contractor cannot resolve such disputed amounts; then the issue shall be referred to Section 6, Dispute Resolution.

If the undisputed portion of any invoice is not paid by the Owner by its due date and the Owner does not rectify within 7 Business Days of notification by the Contractor, the Contractor may suspend performance of the Services and withhold documentation until all outstanding amounts are paid and received.

3.3 Records

If the Owner reasonably requests, then the Contractor shall provide the Owner daily, weekly, or monthly reports of labour hours by task, equipment hours, subcontractor hours and materials chargeable to the Owner in accordance with Schedule B in connection with the Services. The Owner shall approve or dispute

in part or in whole such reports within 48 hours of receipt of the report otherwise it shall be deemed to be accepted.

The Contractor will prepare and maintain proper records related to the Services, including records, receipts and invoices relating to disbursements. On request from the Owner, the Contractor will make the records available open to audit examination by the Owner at any time during regular business hours during the time the Contractor is providing the Services and for a period of 1 year after the expiry of the Term.

4. TERMINATION

4.1 Termination by Owner

The Owner may terminate this Agreement if the Contractor is adjudged bankrupt, or makes a general assignment for the benefit of creditors because of its insolvency, or if a receiver is appointed because of its insolvency, the Owner may, without prejudice to any other right or remedy the Owner may have, terminate this Agreement by giving the Contractor or receiver or trustee in bankruptcy written notice; or if the Contractor materially breaches its obligations under this Agreement and any such breach is not remedied to the reasonable satisfaction of the Owner within 20 Business Days after delivery of written notice from the Owner to the Contractor (or such longer period as may be agreed to by the Owner), then the Owner may, without prejudice to any other right or remedy the Owner may have, terminate this Agreement by giving the Contractor further written notice.

4.2 Termination by Contractor

The Contractor may terminate this Agreement if the Owner is adjudged bankrupt, or makes a general assignment for the benefit of creditors because of its insolvency, or if a receiver is appointed because of its insolvency, the Contractor may, without prejudice to any other right or remedy the Contractor may have, terminate this Agreement by giving the Owner or receiver or trustee in bankruptcy written notice; or if the Owner materially breaches its obligations under this Agreement and any such breach is not remedied to the reasonable satisfaction of the Contractor within 20 Business Days after delivery of written notice from the Contractor to the Owner (or such longer period as may be agreed to by the Contractor), then the Contractor may, without prejudice to any other right or remedy the Contractor may have, terminate this Agreement by giving the Owner further written notice.

4.3 Payment on Termination

Upon termination of this Agreement in accordance with Sections 4.1 or 4.2, the Owner will pay the Contractor Fees for services rendered by the Contractor up to the effective date of termination, plus all costs associated with demobilization and cancellation of third-party contracts.

5. INDEMNITY AND INSURANCE

5.1 Indemnification by Contractor

The Contractor will indemnify and save harmless the Owner, their respective subsidiary and affiliated companies, and all of its directors, officers, employees, agents, representatives and indemnities, from and against all claims, demands, causes of action, suits, losses, damages and costs, liabilities, expenses and judgments (including all actual legal costs) which any of the indemnified Parties incur, suffer or are put to arising out of or in connection with:

(a) any failure, breach, misrepresentation, breach of representation or warranty or non-fulfillment of any covenant or obligation on the part of the Contractor under this Agreement or any wrongful or negligent act, error or omission of the Contractor or any official, director, employee, agent, sub-Contractor, representative or subcontractor of the Contractor; and

(b) any and all claims, actions, suits, proceedings, demands, assessments, judgments, costs and legal and other expenses arising from third parties or incident to any of the matters in Section 5.1(a), except to the extent caused or contributed by breach of any provision of this Agreement by the Owner, its directors, officers, employees, agents or representatives or any negligent act, omission or willful misconduct of or by any of them.

5.2 Indemnification by Owner

The Owner will indemnify and save harmless the Contractor and all of its directors, officers, employees, agents, representatives and indemnities, from and against all claims, demands, causes of action, suits, losses, damages and costs, liabilities, expenses and judgments (including all actual legal costs) which the indemnified Parties incur, suffer or are put to arising out of or in connection with:

(a) any failure, breach, misrepresentation, breach of representation or warranty, or nonfulfillment of any covenant or obligation on the part of the Owner under this Agreement;

(b) any wrongful or negligent act of the Owner or any official, employee, agent of the Owner (other than the Contractor and its subcontractors); and

(c) any and all claims, actions, suits, proceedings, demands, assessments, judgments, costs and legal and other expenses arising from or incident to any of the matters in Section 5.2(a), except to the extent caused or contributed by breach of any provision of this Agreement by or any negligent act, omission or willful misconduct of or by the Contractor, its directors, officers, employees, agents or representatives, indemnities or any of them.

5.3 Insurance

The Contractor will at its own cost and expense at all times during the term of this Agreement maintain adequate and appropriate insurance needed to perform the Services. Proof of insurance will be provided to the Owner upon request.

5.4 No Consequential Damages

The liability of each Party with respect to a claim against the other under this Agreement is limited to direct damages only and neither Party will have any liability whatsoever for consequential or indirect loss or damage (such as, but not limited to, claims for loss of profit, revenue, production, business, contracts or opportunity and increased cost of capital, financing or overhead) incurred by the other Party. In no event shall the Contractor's maximum liability to the Owner with respect to the Services or otherwise relating to this Agreement exceed an amount equal to 100% of the aggregate amount of Fees paid by the Owner the Contractor under this Agreement in respect of the Services (as described on Schedule A) to which the applicable losses or liabilities relate.

6. DISPUTE RESOLUTION

6.1 Referral

If any dispute or difference between the Parties arises with respect to this Agreement, with the exception of any issue regarding non or late payment of undisputed invoice(s) or portions thereof, which is not settled informally or by mediation within a reasonable time, the Parties or their respective successors and assigns, will refer such dispute or difference to arbitration in accordance with the terms of this Agreement.

6.2 Appointment of Arbitrators and Procedure

The Party desiring to refer a matter to arbitration will notify the other Party of its intention to do so. If the Parties cannot agree upon a single arbitrator within fourteen (14) days of such notice, then each Party will

appoint an arbitrator and the two appointed arbitrators will together select a third neutral arbitrator. Except as specifically provided in this Section, the arbitration will be conducted in the exclusive jurisdiction of Denver, Colorado, in accordance with the American Arbitration Association rules of commercial disputes. The arbitration award will be binding upon the Parties to this Agreement.

7. CONFIDENTIALITY

Confidential Information means all non-public information, whether disclosed before or after the effective date of this Agreement, that is conveyed from the one Party to the other, orally or in electronic or tangible form, or otherwise obtained by the receiving Party through observation or examination of the disclosing Party's operations or Confidential Information, and (i) is marked as "confidential," (ii) is orally designated by as "confidential" and confirmed in writing within thirty (30) days of disclosure, or (iii) due to the circumstances surrounding its disclosure would be reasonably construed as "confidential." Confidential Information does not include any information which (a) was rightfully in the possession of the Contractor prior to receiving it from the Owner, (b) is independently developed by the Contractor without use of or reliance upon the Confidential Information from the Owner, (c) was in the public domain at or subsequent to the time of disclosure (through no breach of the Contractor) or (d) is obtained in good faith from a third Party not under any obligation of confidentiality.

The Contractor acknowledges it has acquired and will acquire Confidential Information of the Owner in connection with the performance of the Services. The Contractor shall:

(a) during the term of this Agreement and indefinitely thereafter, treat Confidential Information as strictly confidential and shall not disclose or permit the disclosure of Confidential Information except to those officers and employees of the Contractor with a need to know, and upon whom confidentiality obligations have been imposed, or except as required by law;

(b) during the term of this Agreement and for two years thereafter, not make use of Confidential Information other than as required for the sole and exclusive purpose of performing the Services; and

(c) promptly return to the Owner, upon written request, or provide confirmation of destruction of, all Confidential Information.

8. GENERAL

8.1 Entire Agreement

This Agreement contains the entire agreement of the Parties regarding the performance of the Services and no understandings or agreements, oral or otherwise, exist between the Parties except as expressly set out in this Agreement.

8.2 Amendment

This Agreement may be amended only by agreement in writing, signed by both Parties.

8.3 Changes

Changes to Schedule A – Services and Schedule B – Fees may occur from time to time, provided that such changes shall be amended by the use of a Change Order signed by both Parties.

8.4 Assignment and Enurement

This Agreement shall not be assigned by either Party, without the prior consent of the other Party which shall not to be unreasonably withheld**.** This Agreement shall be binding upon the Parties respective administrators, trustees, receivers, successors and permitted assigns.

8.5 Unenforceability

If any provision of this Agreement is invalid or unenforceable, it will be severed from the Agreement and will not affect the enforceability or validity of the remaining provisions of the Agreement.

8.6 Waiver

No waiver by either Party of any breach by the other Party of any of its covenants, obligations and agreements will be a waiver of any subsequent breach or of any other covenant, obligation or agreement, nor will any forbearance to seek a remedy for any breach be a waiver of any rights and remedies with respect to such or any subsequent breach.

8.7 Force Majeure

Event of Force Majeure means acts of God or public enemy, wars (declared or undeclared), revolution, riots, insurrections, civil commotions, fires, floods, slides, earthquakes, epidemics, pandemics, quarantine restrictions, strikes or lockouts, including illegal work stoppages or slowdowns, or stop work orders issued by a court or statutory authorities (providing that such orders are not issued nor any such labour disputes occasioned as a result of an act or omission of either Party, or any one employed or retained by either Party), freight embargoes or power failures, or any event or circumstance which reasonably constitutes a material disabling event or circumstance, which is beyond the reasonable control of a Party, which does not arise from the neglect or default of a Party, and which results in material delay, interruption or failure by a Party in carrying out its duties, covenants or obligation under this Agreement, but which does not mean or include any delay caused by a Party's lack of funds or financial condition.

If any Party is bona fide delayed or hindered in or prevented from the performance of any obligation, covenant or other act required under this Agreement, by reason of an Event of Force Majeure, the said Party will be relieved from the fulfillment of such obligation, covenant or act during the period of such interruption and the period for the performance of any such obligation, covenant or other act will be extended for a period equivalent to the period of such delay.

8.8 Language

All communication and documentation will be in English unless agreed otherwise.

8.9 Notices

Any notice, approval, election, demand, direction, consent, designation, request, agreement, instrument, certificate, report or other communication required or permitted to be given or made under this Agreement (each, a "**Notice**") to a Party must be given in writing. A Notice may be given by delivery to an individual or electronically by email, and will be validly given if delivered on a Business Day at the following address, or, if transmitted on a Business Day by email addressed to the following Party:

To the Owner:	To the Contractor:
GRAND ISLAND RESOURCES, LLC	Ensero Solutions US, Inc.
Attention: Danny Pollock	12150 E. Briarwood Avenue, Suite 135
Email: dpollock@nedmining.com	Centennial, CO 80112
	Attention: Billy Ray
	Email: bray@ensero.com

or to any other address, email address or individual that the Party designates in writing in accordance with this Section.

8.10 Time

Time is of the essence of this Agreement.

8.11 Counterparts; Execution

This Agreement may be executed and delivered electronically and in counterparts, and any such documents shall be deemed to be an original, and one and the same instrument.

IN WITNESS WHEREOF the Parties have duly executed this Agreement as of the Effective Date.

GRAND ISLAND RESOURCES, LLC

Per: _____

Name: Anthony R Russo

Title: Chief Financial Officer

ENSERO SOLUTIONS US, INC.

Per: _____

Name: Paul Barnes

Title: Chief Operating Officer

SCHEDULE A

SERVICES

Contractor shall provide services for the following scopes of work:

The Scope of work will include the design, installation, and commissioning of a TSS filtration system in support of the water management at the Caribou/Cross mines as defined in the Ensero proposal dated November 6, 2021.

SCHEDULE B

FEES

The project will be invoiced monthly on a Time and Materials basis using the Contractor's standard 2021 unit rate schedule. A detailed cost estimate is provided in Ensero's proposal dated November 6, 2021.

Appendix E – Environmental Site Solutions (ESS)

2K Liquid Phase Media Pressure Filter

Product Description

These units are designed for the efficient purification of contaminated water or liquid streams. These filters have the ability to remove contaminants to non-detectable levels. The vessels are constructed of heavy-duty mild steel and are lined with a double-layer epoxy coating.

Technical Data

Weights and Measures

Max. Flowrates	100 gpm
Max. Pressure	75 psi
Max. Temperature	150°F
Height	94"
Diameter	48"

Shipping Weight*
Vessel Only *1,100 lbs*
Vessel & Media (Media Dependent) 3100 lbs. – 5100 lbs.

Wetted Materials *for material compatibility check*

Carbon Steel*	Shell and heads
PVC	Bottom underdrain
Neoprene	Manway gaskets
Carboline Plasite 4110	Internal Liner

* Theoretically if the vessel has an interior liner, no carbon steel should be exposed to the liquid. However, if there are areas of thin or missing liner, bare carbon steel will be exposed. It is always a good idea to check compatibility of carbon steel even if the vessel interior is lined.

Filter Media

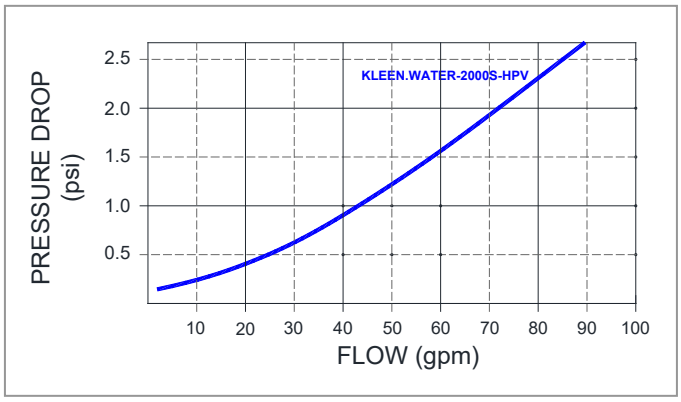
Types	• Activated Carbon • Organoclay • Ion Exchange Resin • Specialty Media
Volume	68 cu. ft
Weight	2000 lbs. – 4000 lbs. *(media dependent)*

Miscellaneous Data

Inlet	4" Female NPT
Outlet	4" Female NPT
Interior Coating	Double-layered epoxy coating
Internals	PVC underdrain
Media Access	Top & side 12"x16" manways *(neoprene gaskets)*

⚠ NOTE: Wet activated carbon preferentially removes oxygen from air. In closed or partially closed containers and vessels, oxygen depletion may reach hazardous levels. If workers are to enter a vessel containing carbon, appropriate procedures for potentially low oxygen spaces must be followed, including all federal and state requirements.

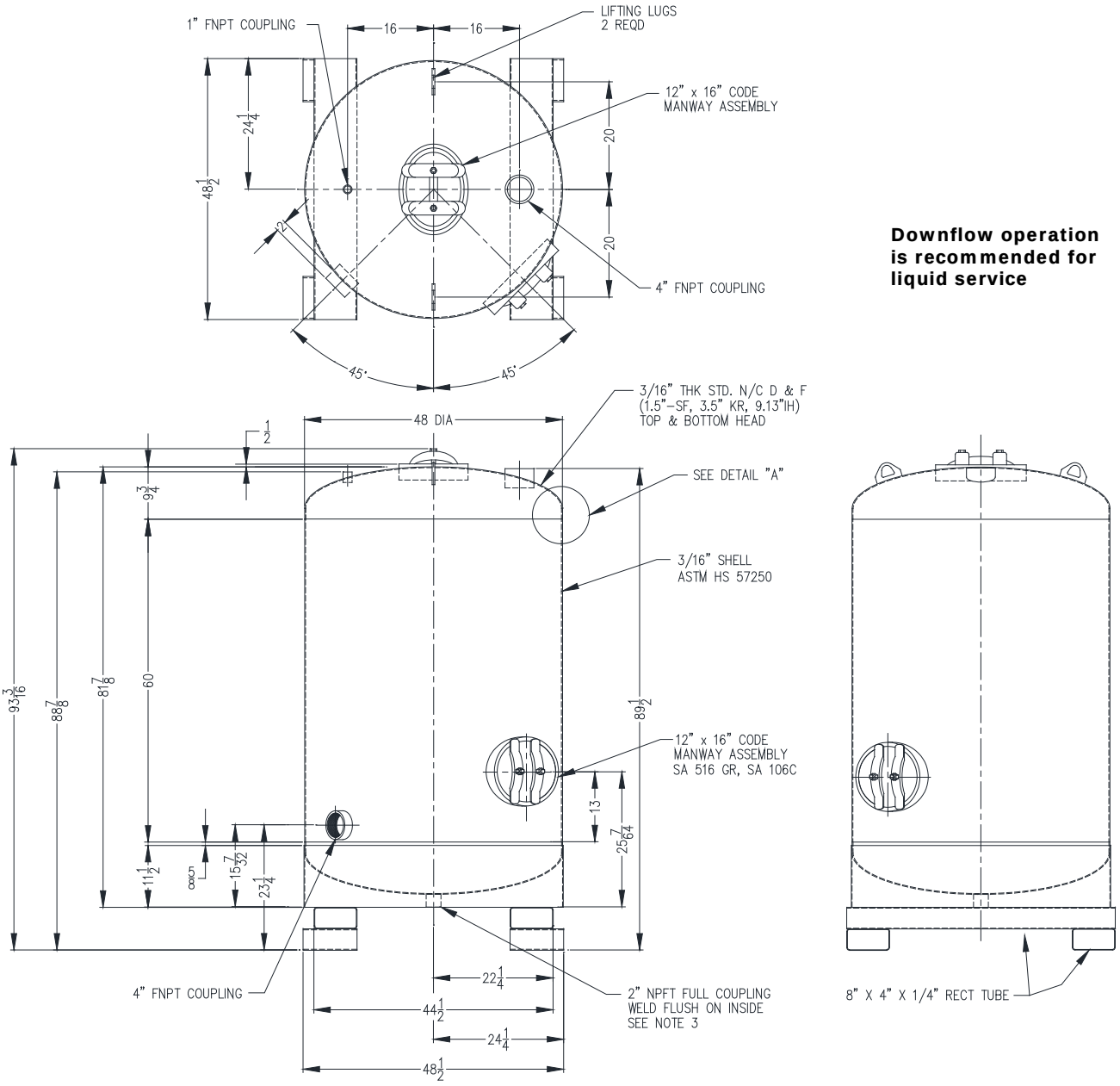
Pressure Drop Data



Environmental
Site Solutions
www.envirositesolutions.com
360-503-7299

Data Sheet

2K Liquid Phase Media Pressure Filter



Downflow operation is recommended for liquid service

Appendix F – Equipment

TSURUMI PUMP

NK - SERIES
SEMI-VORTEX - DEWATERING PUMP

SPECIFICATIONS

FEATURES

1. Double inside mechanical seals with silicon carbide faces, running in an oil filled chamber and further protected by a lip seal running against a replaceable, stainless steel shaft sleeve provides for the most durable seal design available.

2. Highly efficient, continuous duty, air filled, copper wound motor with class B insulation minimizes the cost of operation.

3. Built in thermal & amperage sensing protector prevents motor failure due to overloading or accidental run dry conditions.

4. Double shielded, permanently lubricated, high temperature C3 ball bearings rated for a B-10 life of 60,000 hours extend operational life.

5. Top discharge, flow-thru design enables operation at low water levels for extended periods.

Sand Kit : NK2-15SK / NK2-22SK
The Sand Kit can be added to the NK series to suspend sand and prevent sand lock.

APPLICATIONS

1. Residential, commercial, industrial wastewater and construction site drainage.

2. Effluent transfer.

3. Decorative waterfalls and fountains.

4. Raw water supply from rivers or lakes..

C ETL US LISTED Intertek

OIL LIFTER EQUIPPED

SPECIFICATIONS

Discharge Size	3" NPT (80 mm)
Horsepower Range	2 ~ 3 HP. (1.5 ~ 2.2 kW)
Performance Range Capacity	55.5 ~ 211.0 GPM. (0.21 ~ 0.80 m^3/min)
Head	34.4 ~ 85.0 Ft. (10.50 ~ 25.91 m)
Maximum water temperature	104° F. (40.0° C.)
Materials of Construction	
Casing	Butadiene Rubber + Natural Rubber , Cast Iron (NK2-22L)
Impeller	Ductile Cast Iron , High Chrome Cast Iron (NK2-22L , NK2-15SK/22SK)
Shaft	420 , 403 Stainless Steel
Motor Frame	Aluminum alloy
Fasteners	304 Stainless Steel
Mechanical Seal	Silicon Carbide
Elastomers	NBR (Nitril Butadiene Rubber)
Impeller Type	Semi-vortex, solids handling.
Solids Handling Capability	0.334” (8.5mm)
Bearings	Prelubricated, Double Shielded
Motor Nomenclature	
Type, Speed, Hz.	Air Filled, 3600 RPM, 60 Hz.
Voltage, Phase	110/220 V., 1 Ph (NK2-15 Dual Voltage)
Insulation	Class B
Accessories	Submersible Power Cable 32' (10.0 m)
Operational Mode	Manual

STANDARD

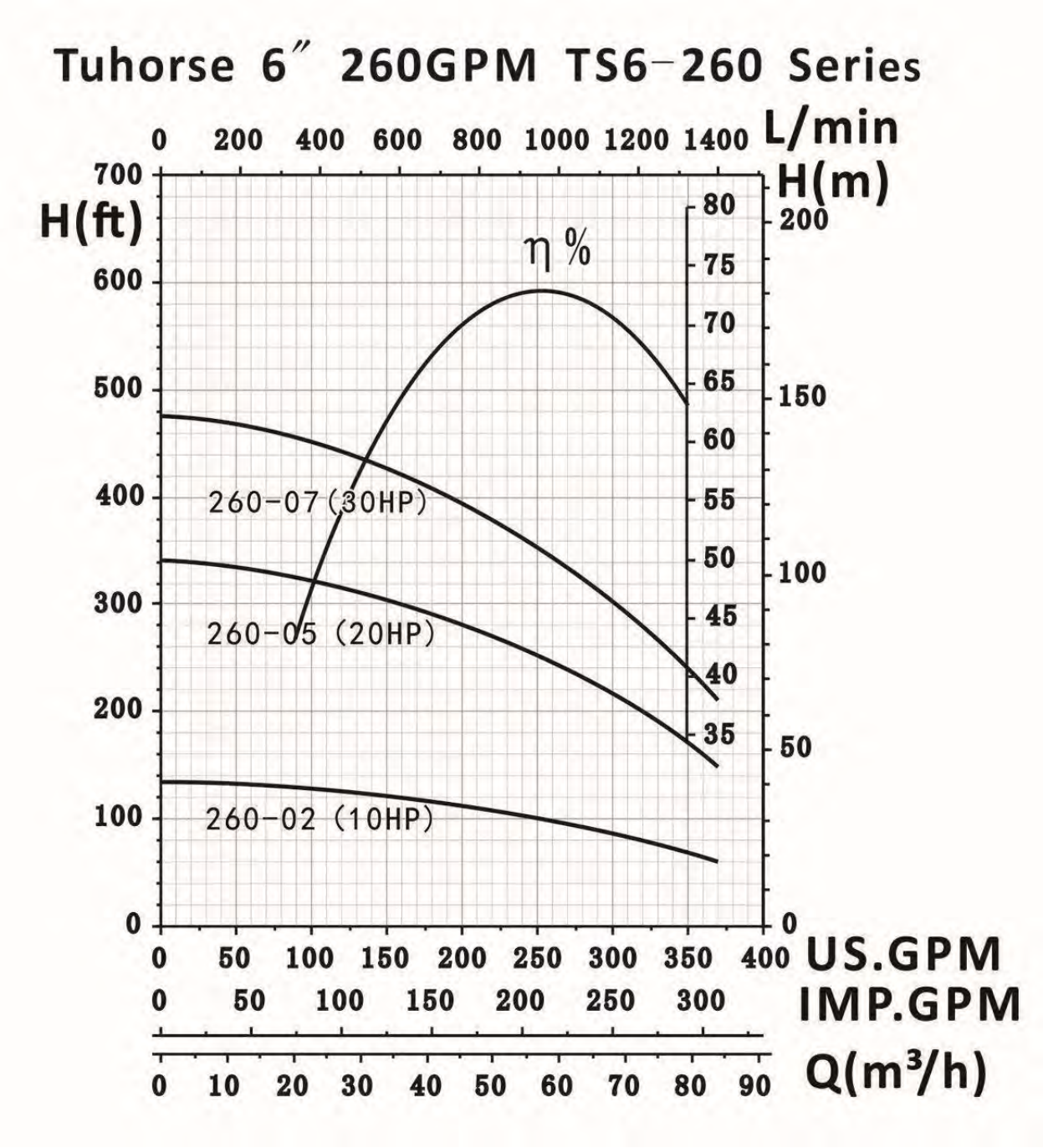
OPTIONS

Length as Required

TS-301 Float Switch

Cross Winze Pump Specifications

- **HP:** 20HP
- **Voltage:** 460V Three Phase
- **Cycle:** 60 Hz
- **Operating Amperage:** 26.2A
- **Motor RPM:** 3450 RPM
- **Stages:** 5
- **Maximum Head (cut off):** 340 ft.
- **Maximum Flow(0-140ft.):** 370 GPM
- **Rated Flow:** 260GPM
- **Free Flow Rate:** 350GPM @ 170ft; 300GPM @ 210ft; 260GPM @ 240ft; 200GPM @ 280 ft; 150GPM @ 300ft.
- **Suction Port:** Center Suction
- **Discharge Port:** 3 inch NPT Female (4" version is available, customer must notice us before shipping)
- **Built-in Check-valve:** Yes
- **Housing Material:** Stainless Steel 304
- **Impeller Material:** stainless steel 304
- **Motor Enclosure:** Stainless steel 304
- **Discharge and Suction Port Material:** Stainless Steel 304
- **Motor Bearing / Lubrication:** Water lubricated thrust bearing, water filled lubrication
- **Duty:** Continuous or allow maximum 15 restarting cycles / hour
- **Control Box:** Three phase power switch with overload protection is required(not included)
- **Net Weight:** 199 lbs
- **Shipping weight:** 209 Lbs
- **Dimensions/Length(pump and motor assembly):**
- **Shipping Dimensions:** Motor and pump separately packed



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- **Suction Port:** Center Suction
- **Discharge Port:** 3 inch NPT Female (4" version is available, customer must notice us before shipping)
- **Built-in Check-valve:** Yes
- **Housing Material:** Stainless Steel 304
- **Impeller Material:** stainless steel 304
- **Motor Enclosure:** Stainless steel 304
- **Discharge and Suction Port Material:** Stainless Steel 304
- **Motor Bearing / Lubrication:** Water lubricated thrust bearing, water filled lubrication
- **Duty:** Continuous or allow maximum 15 restarting cycles / hour
- **Control Box:** Three phase power switch with overload protection is required(not included)
- **Net Weight:** 199 lbs
- **Shipping weight:** 209 Lbs
- **Dimensions/Length(pump and motor assembly):**
- **Shipping Dimensions:** Motor and pump separately packed

Minimum requirement for operating the motor is a non-fused 3-phase power switch and a 3-phase overload protector / Circuit breaker. The protector / breaker must be the type of those that shut off all 3-phase when one or more phase is overloaded. Do **NOT** use a fused switch that could burn out one of the phase. Do NOT use three individual 1-Phase breakers. You must use a real 3-phase protector / breaker or a protection device that does not cause phase loss (missing phase) problem.

* Not exactly as shown in photos due to stages and HP vary from models. Photos are taken from one of the 10HP for illustrations only.

ProSense® SLT Series Submersible Level Transmitters

Part No. SLT1-005-L30

Part No. SLT2-005-L30

Submersible Level Transmitters

The ProSense SLT series submersible level sensors provide continuous liquid level measurement by sensing the hydrostatic pressure produced by the height of liquid above the sensor and providing a 4-20 mA output signal compatible with PLCs, panel meters, data loggers, and other electronic equipment. The shielded cable with atmospheric vent tube and a tough polyurethane jacket incorporating an exclusive "water block" liner beneath the jacket is attached to the sensor using an over-molding process that prevents moisture intrusion. The SLT1 series has a slim 1-inch diameter housing and a ported bullet nose cap for protection of the sensor diaphragm. The SLT2 series features a large 2.75 inch diameter PTFE flexible diaphragm surrounded by a 316 stainless steel non-fouling protective cage. Accessories include a desiccant vent filter, aneroid bellows, junction boxes, and replacement nose caps.

Features

- Models with ported nose cap or non-fouling cage for diaphragm protection
- Durable 316 SS construction for reliable, long life in harsh environments
- Shielded cable with atmospheric vent; over-molded to prevent moisture intrusion
- 1/2 inch NPT male threaded conduit connection on the sensor housing standard
- Pre-calibrated ranges up to 50 psig (115.3 ftWC) to meet the most common submersible level applications in vented tanks, reservoirs & ground water systems
- +/-0.25% accuracy standard
- All sensors include UL and FM hazardous location approvals for intrinsically safe applications and are CE marked
- Made in the USA

Applications

- Lift station monitoring
- Liquid level in vented tank
- Landfill leachate monitoring
- Construction by-pass pumping
- Dewatering
- Pump control
- Slurry tank liquid level

SLT Series Submersible Level Transmitters

Model	Range	Cable Length*	Diaphragm / Protection	Price	Weight (lbs)
SLT1-005-L30	0–5 psig (11.5 ftWC)	30ft (9.1 m)	316 Stainless steel diaphragm / Ported POM (polyoxymethylene) nose cap	$349.00	1.9
SLT1-010-L40	0–10 psig (23.1 ftWC)	40ft (12.2 m)		$366.00	2.4
SLT1-015-L60	0–15 psig (34.6 ftWC)	60ft (18.3 m)		$402.00	3.4
SLT1-020-L60	0–20 psig (46.1 ftWC)	60ft (18.3 m)		$402.00	3.4
SLT1-030-L100	0–30 psig (69.2 ftWC)	100ft (30.5 m)		$468.00	5.4
SLT1-050-L140	0–50 psig (115.3 ftWC)	140ft (42.7 m)		$540.00	7.4
SLT2-005-L30	0–5 psig (11.5 ftWC)	30ft (9.1 m)	Flexible PTFE (polytetrafluoroethylene) diaphragm / Non-fouling stainless steel cage	$549.00	5.0
SLT2-010-L40	0–10 psig (23.1 ftWC)	40ft (12.2 m)		$565.00	5.5
SLT2-015-L60	0–15 psig (34.6 ftWC)	60ft (18.3 m)		$600.00	6.5
SLT2-020-L60	0–20 psig (46.1 ftWC)	60ft (18.3 m)		$600.00	6.5
SLT2-030-L100	0–30 psig (69.2 ftWC)	100ft (30.5 m)		$669.00	8.5

** It is required that any excess cable length be accommodated in a service loop and that the cable NOT be shortened as this will void the warranty. If longer transmitter cable is needed, terminate the sensor in an SLT-JB1 or SLT-JB2 junction box and run standard non-vented instrumentation cable between the junction box and the measuring electronics.*

ProSense® SPT25 Series Pressure Transmitters

The ProSense SPT25 pressure transmitter series is engineered to meet many industrial, commercial, and OEM pressure measurement applications. The all stainless steel welded thin film sensing element provides very fast response time and is compatible with many different media sensing applications. With a robust design resistant to vibration, shock, and EMI/RFI, the SPT25 series provides high accuracy over a wide compensated temperature range. Pressure sensing ranges from vacuum to 5000 psig are available along with a ¼ inch NPT male threaded process connection. Choose from linear outputs of 4-20 mA or 0-10VDC with electrical connections of either a DIN 175301-803C L-connector or 6.6 foot (2 m) integral shielded cable.

Applications

- Process control & automation
- Pump & compressor control
- Hydraulic systems
- Pneumatic systems
- Engine monitoring
- Refrigeration equipment
- Presses
- Machine tools

Features

- All stainless steel welded sensing element
- Fast response time
- Pressure sensing ranges from vacuum to 5000 psig
- 1/4 inch NPT male threaded process connection
- Output options: 4-20 mA or 0-10 VDC
- Integral 6.6 foot shielded cable or DIN form C electrical connections
- Made in the USA
- CE marked
- 3-year warranty

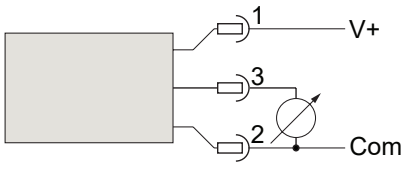
Click on the thumbnail or go to https://www.automationdirect.com/VID-PR-0001 for a short video on ProSense Air Differential and Pressure Transmitters

ProSense SPT25 Series Pressure Transmitters (Shielded Cable)					
Part Number	**Description**	**Electrical Connection**	**Input Voltage**	**Wt(lb)**	**Price**
SPT25-20-V30A	Pressure transmitter, 4 to 20 mA output, -14.7 vacuum to 30 psig range, 1/4" NPT male port	Integral 6.6 ft (2m) shielded cable	9 - 36 VDC	0.38	$132.00
SPT25-20-0030A	Pressure transmitter, 4 to 20 mA output, 0 to 30 psig range, 1/4" NPT male port				$132.00
SPT25-20-0060A	Pressure transmitter, 4 to 20 mA output, 0 to 60 psig range, 1/4" NPT male port				$132.00
SPT25-20-0100A	Pressure transmitter, 4 to 20 mA output, 0 to 100 psig range, 1/4" NPT male port				$132.00
SPT25-20-0150A	Pressure transmitter, 4 to 20 mA output, 0 to 150 psig range, 1/4" NPT male port				$132.00
SPT25-20-0200A	Pressure transmitter, 4 to 20 mA output, 0 to 200 psig range, 1/4" NPT male port				$132.00
SPT25-20-0300A	Pressure transmitter, 4 to 20 mA output, 0 to 300 psig range, 1/4" NPT male port				$132.00
SPT25-20-0500A	Pressure transmitter, 4 to 20 mA output, 0 to 500 psig range, 1/4" NPT male port				$132.00
SPT25-20-1000A	Pressure transmitter, 4 to 20 mA output, 0 to 1000 psig range, 1/4" NPT male port				$132.00
SPT25-20-1500A	Pressure transmitter, 4 to 20 mA output, 0 to 1500 psig range, 1/4" NPT male port				$132.00
SPT25-20-2000A	Pressure transmitter, 4 to 20 mA output, 0 to 2000 psig range, 1/4" NPT male port				$132.00
SPT25-20-3000A	Pressure transmitter, 4 to 20 mA output, 0 to 3000 psig range, 1/4" NPT male port				$132.00
SPT25-20-5000A	Pressure transmitter, 4 to 20 mA output, 0 to 5000 psig range, 1/4" NPT male port				$132.00
SPT25-10-V30A	Pressure transmitter, 0 to 10 V output, -14.7 vacuum to 30 psig range, 1/4" NPT male port		14 - 36 VDC		$132.00
SPT25-10-0030A	Pressure transmitter, 0 to 10 V output, 0 to 30 psig range, 1/4" NPT male port				$132.00
SPT25-10-0060A	Pressure transmitter, 0 to 10 V output, 0 to 60 psig range, 1/4" NPT male port				$132.00
SPT25-10-0100A	Pressure transmitter, 0 to 10 V output, 0 to 100 psig range, 1/4" NPT male port				$132.00
SPT25-10-0150A	Pressure transmitter, 0 to 10 V output, 0 to 150 psig range, 1/4" NPT male port				$132.00
SPT25-10-0200A	Pressure transmitter, 0 to 10 V output, 0 to 200 psig range, 1/4" NPT male port				$132.00
SPT25-10-0300A	Pressure transmitter, 0 to 10 V output, 0 to 300 psig range, 1/4" NPT male port				$132.00
SPT25-10-0500A	Pressure transmitter, 0 to 10 V output, 0 to 500 psig range, 1/4" NPT male port				$132.00
SPT25-10-1000A	Pressure transmitter, 0 to 10 V output, 0 to 1000 psig range, 1/4" NPT male port				$132.00
SPT25-10-1500A	Pressure transmitter, 0 to 10 V output, 0 to 1500 psig range, 1/4" NPT male port				$132.00
SPT25-10-2000A	Pressure transmitter, 0 to 10 V output, 0 to 2000 psig range, 1/4" NPT male port				$132.00
SPT25-10-3000A	Pressure transmitter, 0 to 10 V output, 0 to 3000 psig range, 1/4" NPT male port				$132.00
SPT25-10-5000A	Pressure transmitter, 0 to 10 V output, 0 to 5000 psig range, 1/4" NPT male port				$132.00

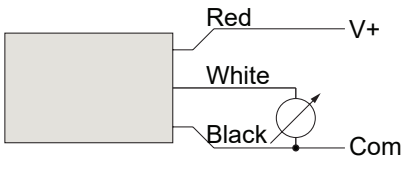
ProSense® SPT25 Series Pressure Transmitters

ProSense SPT25 Series Pressure Transmitters (DIN Connector)					
Part Number	*Description*	*Electrical Connection*	*Input Voltage*	*Wt(lb)*	*Price*
SPT25-20-V30D	Pressure transmitter, 4 to 20 mA output, -14.7 vacuum to 30 psig range, 1/4" NPT male port	DIN 175301-803C L-connector	9 - 36 VDC	0.30	$126.00
SPT25-20-0030D	Pressure transmitter, 4 to 20 mA output, 0 to 30 psig range, 1/4" NPT male port				$126.00
SPT25-20-0060D	Pressure transmitter, 4 to 20 mA output, 0 to 60 psig range, 1/4" NPT male port				$126.00
SPT25-20-0100D	Pressure transmitter, 4 to 20 mA output, 0 to 100 psig range, 1/4" NPT male port				$126.00
SPT25-20-0150D	Pressure transmitter, 4 to 20 mA output, 0 to 150 psig range, 1/4" NPT male port				$126.00
SPT25-20-0200D	Pressure transmitter, 4 to 20 mA output, 0 to 200 psig range, 1/4" NPT male port				$126.00
SPT25-20-0300D	Pressure transmitter, 4 to 20 mA output, 0 to 300 psig range, 1/4" NPT male port				$126.00
SPT25-20-0500D	Pressure transmitter, 4 to 20 mA output, 0 to 500 psig range, 1/4" NPT male port				$126.00
SPT25-20-1000D	Pressure transmitter, 4 to 20 mA output, 0 to 1000 psig range, 1/4" NPT male port				$126.00
SPT25-20-1500D	Pressure transmitter, 4 to 20 mA output, 0 to 1500 psig range, 1/4" NPT male port				$126.00
SPT25-20-2000D	Pressure transmitter, 4 to 20 mA output, 0 to 2000 psig range, 1/4" NPT male port				$126.00
SPT25-20-3000D	Pressure transmitter, 4 to 20 mA output, 0 to 3000 psig range, 1/4" NPT male port				$126.00
SPT25-20-5000D	Pressure transmitter, 4 to 20 mA output, 0 to 5000 psig range, 1/4" NPT male port				$126.00
SPT25-10-V30D	Pressure transmitter, 0 to 10 V output, -14.7 vacuum to 30 psig range, 1/4" NPT male port		14 - 36 VDC		$126.00
SPT25-10-0030D	Pressure transmitter, 0 to 10 V output, 0 to 30 psig range, 1/4" NPT male port				$126.00
SPT25-10-0060D	Pressure transmitter, 0 to 10 V output, 0 to 60 psig range, 1/4" NPT male port				$126.00
SPT25-10-0100D	Pressure transmitter, 0 to 10 V output, 0 to 100 psig range, 1/4" NPT male port				$126.00
SPT25-10-0150D	Pressure transmitter, 0 to 10 V output, 0 to 150 psig range, 1/4" NPT male port				$126.00
SPT25-10-0200D	Pressure transmitter, 0 to 10 V output, 0 to 200 psig range, 1/4" NPT male port				$126.00
SPT25-10-0300D	Pressure transmitter, 0 to 10 V output, 0 to 300 psig range, 1/4" NPT male port				$126.00
SPT25-10-0500D	Pressure transmitter, 0 to 10 V output, 0 to 500 psig range, 1/4" NPT male port				$126.00
SPT25-10-1000D	Pressure transmitter, 0 to 10 V output, 0 to 1000 psig range, 1/4" NPT male port				$126.00
SPT25-10-1500D	Pressure transmitter, 0 to 10 V output, 0 to 1500 psig range, 1/4" NPT male port				$126.00
SPT25-10-2000D	Pressure transmitter, 0 to 10 V output, 0 to 2000 psig range, 1/4" NPT male port				$126.00
SPT25-10-3000D	Pressure transmitter, 0 to 10 V output, 0 to 3000 psig range, 1/4" NPT male port				$126.00
SPT25-10-5000D	Pressure transmitter, 0 to 10 V output, 0 to 5000 psig range, 1/4" NPT male port				$126.00

0 to 10 VDC Output Wiring Diagram



With DIN Connector

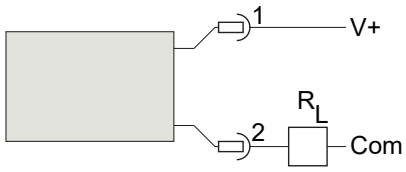


With Integral Cable

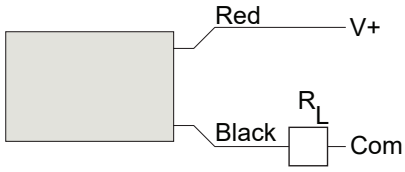
Shielded Cable Models Wire Designation		
Wire Color	*0 - 10 VDC Output*	*4 - 20 mA Output*
Red	V +	V +
Black	Com	Output
White	Output	None
*Bare**	Shield Drain Wire	Shield Drain Wire

** Where shielded wiring is being used; Connect the drain wire to the guard terminal on the read out device or measuring instrument if available. In all other cases connect to the power supply negative terminal.*

4 to 20 mA Output Wiring Diagrams



With DIN Connector



With Integral Cable

DIN Form C Models Pin Designation		
Pin No.	*0 - 10 VDC Output*	*4 - 20 mA Output*
1	V+	V+
2	Com	Output
3	Output	None
4	Case Ground	Case Ground

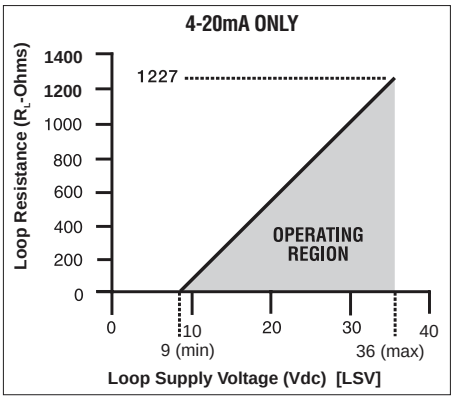
ProSense® SPT25 Series Pressure Transmitters

ProSense SPT25 Series General Specifications	
Housing Material	20% Glass Reinforced Nylon, Fire retardant to UL94 V1 / 304 Series Stainless steel
Materials (wetted parts)**	304 Series Stainless steel / 17-4PH Stainless Steel
Operating Temperature	–40 to 257°F (–40 to 125°C)
Medium Temperature	–40 to 257°F (–40 to 125°C)
Storage Temperature	–40 to 257°F (–40 to 125°C)
Protection	IP 67 for cabled models IP 65 For DIN connector models
Accuracy*	± 0.50% of full range
Temperature Coefficient	0.15% of full range / 10°F (0.25% of full range / 10°C)
Reference Temperature	70°F ± 1°F (21°C ± 1°C)
Compensated Temperature	–4 to 185°F (–20 to 85°C)
Insulation Resistance	Greater than 100 megohms at 100 VDC
Shock Resistance	100 gs, 6 ms
Vibration Resistance	Random vibration (20 g) over temperature range (-40° to 125°C). Exceeds typical MIL. STD. requirements
Drop Test	Withstands 1 meter on concrete 3 axis
Response Time	Less than 1 msec
Warm-up time	Less than 500 msec
Position Effect	Less than ±0.01% span, typical
Insulation Breakdown Voltage	100 VAC
Reverse Polarity & Miswired Protected	Yes
Durability	Tested to 50 million cycles
Humidity	0 to 100% R.H., no effect
Stability	Less than ±0.25% full range / year
Agency Approvals	CE
**Note - Includes non-linearity, hysteresis & non-repeatability.*	
*** Not cleaned for oxygen service*	

DIN Connector Specifications	
Number of contacts	3 + PE
Cable glands	PG 7
Conductor size max.	0.75 mm² / 18AWG
Type of termination	Screw
Suitable cables	4.5 mm to 6mm
Standard DIN	EN 175 301-803-C

ProSense SPT25 Series Technical Specifications	
Technical Specifications SPT25-20-xxxx	
Operating Voltage	9 – 36 VDC
Analog Output	4 – 20 mA
Maximum Load	Determine Maximum Loop Resistances $\frac{V_L - 9\ VDC}{0.022\ amps} = R_L$ For example [(24 VDC – 9 VDC) / 0.022 amps] = 681Ω
Technical Specifications SPT25-10-xxxx	
Operating Voltage	14 – 36 VDC
Current Consumption	4 mA
Minimum Load	10 kΩ

Power Supply Voltage vs Loop Resistance

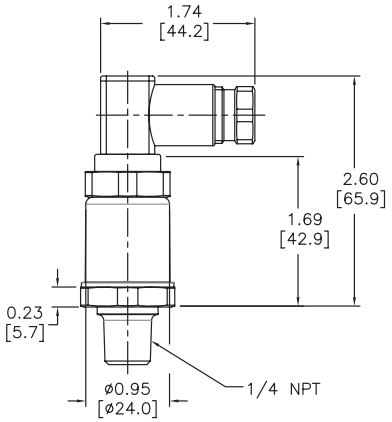


ProSense SPT25 Proof & Burst Pressures		
	Proof	***Burst***
500 psig & below	200% full scale	1000% full scale
1000 – 2000 psig	200% full scale	500% full scale
3000 psig	200% full scale	500% full scale
5000 psig	150% full scale	500% full scale

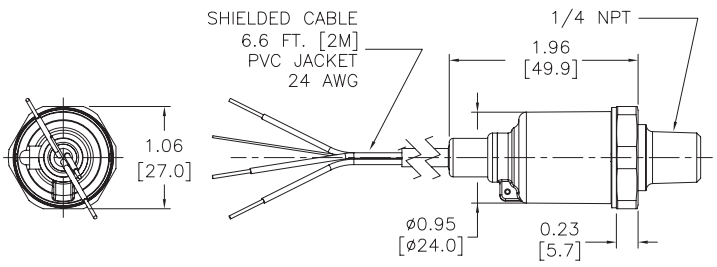
See our website www.AutomationDirect.com for complete Engineering drawings.

Dimensions

inches [mm]



DIN Connector Models



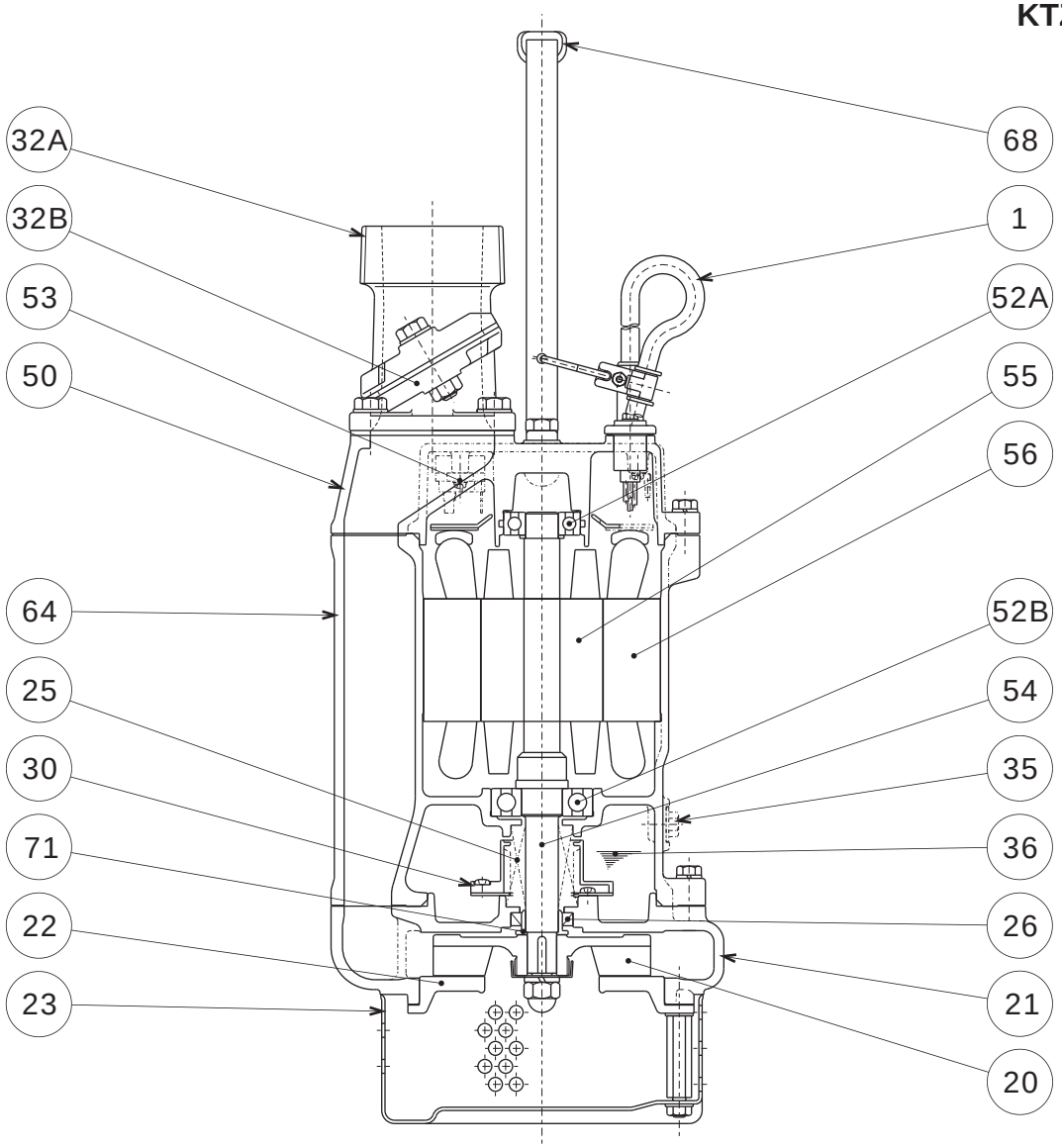
Shielded Cable Models

TSURUMI PUMP

KTZ - SERIES
DEWATERING PUMPS

SECTIONAL VIEW

KTZ22.2-61
KTZ32.2-61



ITEM#	DESCRIPTION	MAIN MATERIAL / NOTE	RELATED ASTM, AISI CODE	RELATED EN CODE	Q'TY
1	Power Cable	PVC Sheath AWG16/4-50ft			1
20	Pump Casing	Cast Iron	A48M Class30B	EN 1561 GJL-200	1
21	Impeller	High Chrome Cast Iron	A532 Class III Type A	DIN 1695 G-X260Cr27	1
22	Suction Cover	Ductile Cast Iron	A536 80-55-06	EN 1563 GJS-500-7	1
23	Suction Strainer	Steel (Cold Rolled)	A109/A1008	EN 10130	1
25	Mechanical Seal	Silicon Carbide / H-20T			1
26	Oil Seal	Nitrile Butadiene Rubber / TC-25388			1
30	Oil Lifter	PBT Resin			1
32A	Discharge Connection	Cast Iron / NPT 2" or 3"	A48M Class30B	EN 1561 GJL-200	1
32B	Attachment	Aluminum Alloy Die Casting	B85 383.0	EN 1706 AC-46100	1
35	Oil Plug	Stainless Steel	S 30400	1.4301	1
36	Lubricant	Turbine Oil ISO VG32 or SAE10W-20			
50	Motor Head Cover	Cast Iron	A48M Class25B	EN 1561 GJL-150	1
52A	Upper Bearing	#6204ZZC3			1
52B	Lower Bearing	#6305ZZC3			1
53	Motor Protector				1
54	Shaft	Stainless Steel	S 42000	1.4028	1
55	Rotor				1
56	Stator				1
64	Motor Housing	Cast Iron	A48M Class25B	EN 1561 GJL-150	1
68	Handle	Steel (Cold Rolled) + NBR Rubber	A109/A1008	EN 10130	1
71	Shaft Sleeve	Stainless Steel	S 30400	1.4301	1

TSURUMI PUMP

KTZ - SERIES
DEWATERING PUMPS

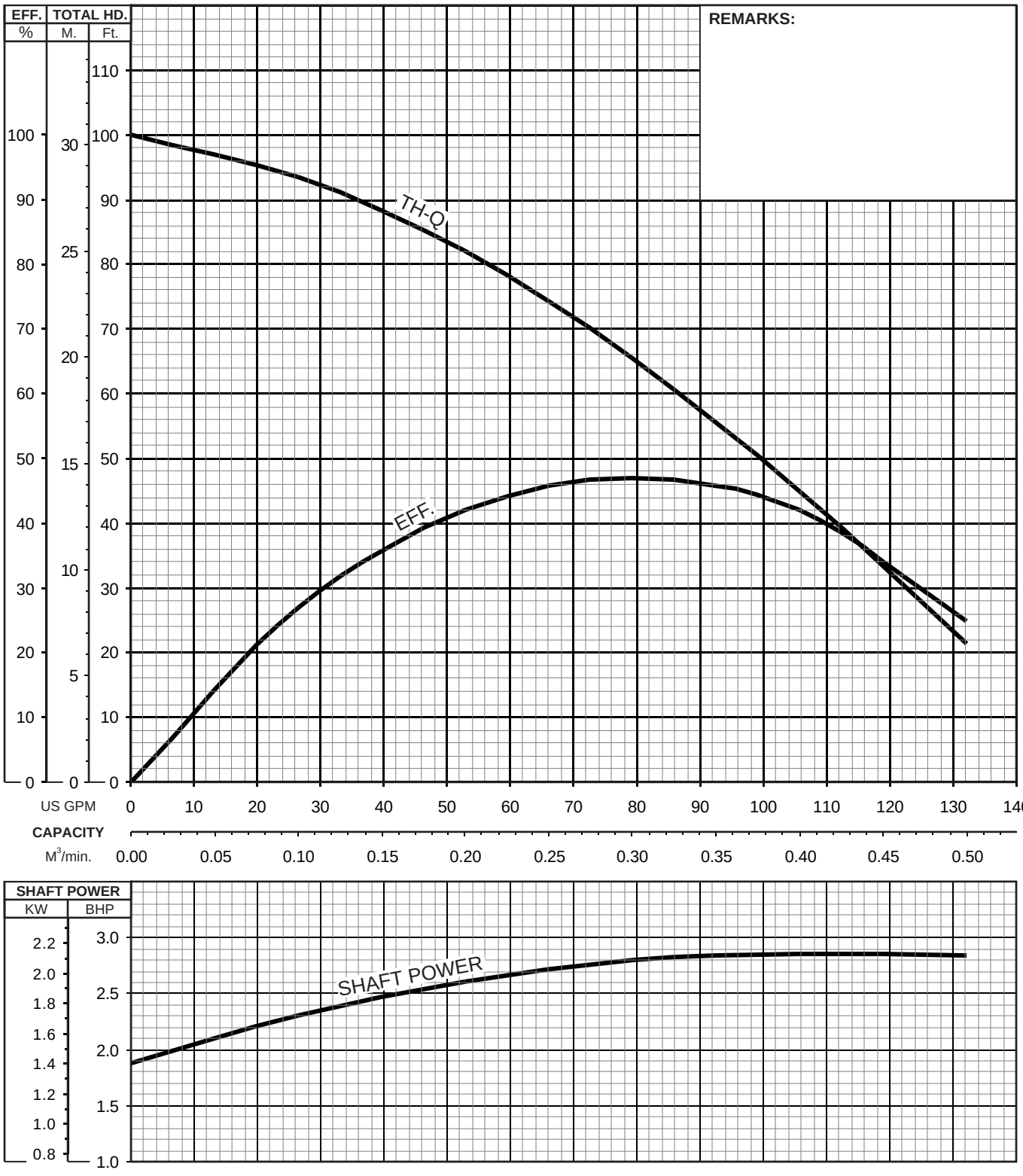
PERFORMANCE CURVE

MODEL	BORE	HP	KW	RPM	SOLIDS DIA	LIQUID	SG.	VISCOSITY	TEMP.
KTZ22.2-61	2"/50mm	3	2.2	3410	0.334"/8.5mm	Water	1.0	1.123 cSt.	60°F

PUMP TYPE	PHASE	VOLTAGE	AMPERAGE	HZ	STARTING METHOD	INS. CLASS
Dewatering Pump	3	208-230/460/575	9.4-9.0 / 4.5 / 3.5	60	Direct On Line	F

CURVE No.	DATE	PHASE	VOLTAGE	AMPERAGE	HZ	STARTING METHOD	INS. CLASS
-	-	-	-	-	-	-	-

REMARKS:



Frequency Inverter

CFW500 V2.2X

Programming Manual

Conductivity, pH/ORP + Disinfection

Intuition-9™ Series
Water Treatment Controllers

Enjoy unparalleled versatility and a collection of sensors and powerful built-in algorithms for control of chemical metering pumps and valves in a broad range of water treatment applications

KEY BENEFITS

- Email, alarm messages, datalog, graph, or system summary reports
- Datalogging
- Ethernet or WiFi for remote access via the Internet, LAN,or optional BACnet or Modbus/TCP
- Large, full-color touchscreen display with icon based programming makes setup easy
- Universal sensor input provides extraordinary flexibility; the same controller can be used with almost any type of sensor needed
- Four I/O slots allow complete flexibility in adding sensors, analog outputs and Linear Polarization Resistance (LPR) corrosion sensors
- Multiple language support allows simple setup
- Three to twelve relay control outputs allow the controller to be used in more applications
- Sixteen virtual inputs and sixteen virtual outputs
- Economical wall-mount package for easy installation
- On-screen and web page graphing of sensor values and control output status
- Complete flexibility in the function of each relay

Intuition 9™

WALCHEM
IWAKI America Inc.

SPECIFICATIONS

MEASUREMENT PERFORMANCE

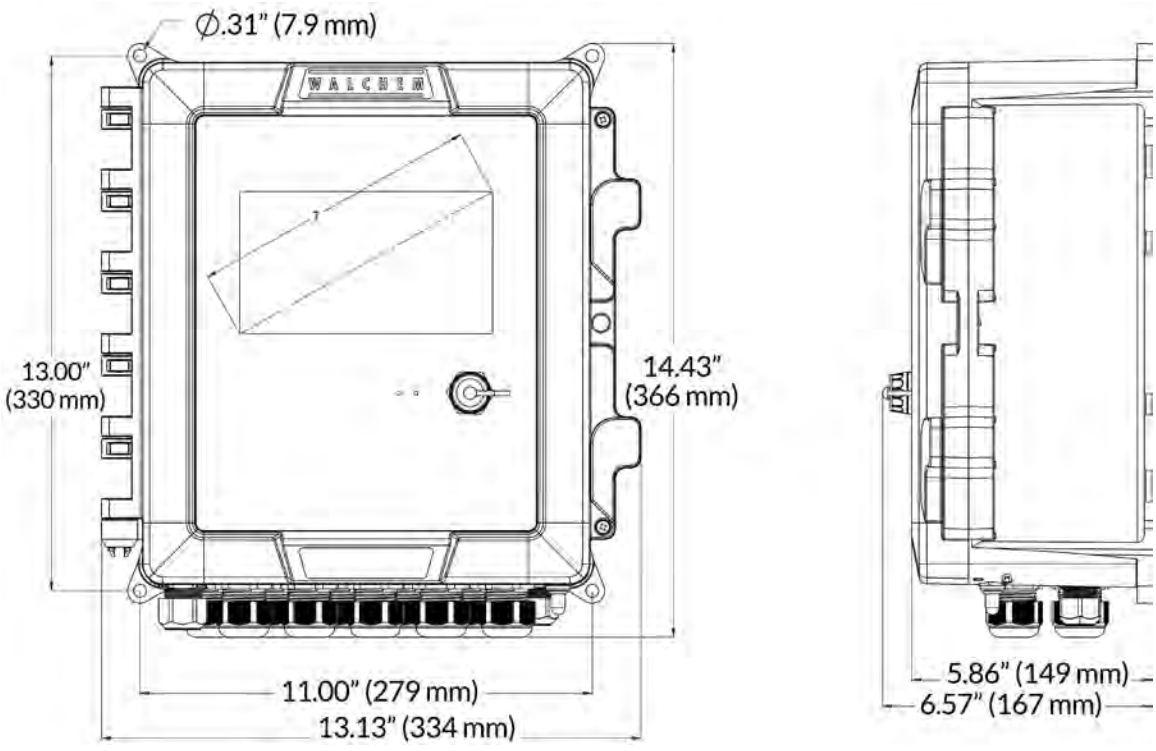
	Range	Resolution	Accuracy
0.01 Cell Contacting Conductivity	0-300 µS/cm	0.01 µS/cm, 0.0001 mS/cm, 0.001 mS/m, 0.0001 S/m, 0.01 ppm	±1% of reading
0.1 Cell Contacting Conductivity	0-3,000 µS/cm	0.1 µS/cm, 0.0001 mS/cm, 0.01 mS/m, 0.0001 S/m, 0.1 ppm	±1% of reading
1.0 Cell Contacting Conductivity	0-30,000 µS/cm	1 µS/cm, 0.001 mS/cm, 0.1 mS/m, 0.0001 S/m, 1 ppm	±1% of reading
10.0 Cell Contacting Conductivity	0-300,000 µS/cm	10 µS/cm, 0.01 mS/cm, 1 mS/m, 0.001 S/m, 10 ppm	±1% of reading
pH	-2 to 16 pH units	0.01 pH units	±0.01% of reading
ORP/Ion Selective Electrode	-1500 to 1500 mV	0.1 mV	±1 mV
Disinfection sensors	-2000 to 1500 mV	0.1 mV	±1 mV
	0 - 2 ppm to 0 - 20,000 ppm	Varies with range and slope	Varies with range and slope
Electrodeless Conductivity	500 - 12,000 µS/cm	1 µS/cm, 0.01 mS/cm, 0.1 mS/m, 0.001 S/m, 1 ppm	±1% of reading
	3,000-40,000 µS/cm	1 µS/cm, 0.01 mS/cm, 0.1 mS/m, 0.001 S/m, 1 ppm	±1% of reading
	10,000-150,000 µS/cm	10 µS/cm, 0.1 mS/cm, 1 mS/m, 0.01 S/m, 10 ppm	±1% of reading
	50,000-500,000 µS/cm	10 µS/cm, 0.1 mS/cm, 1 mS/m, 0.01 S/m, 10 ppm	±1% of reading
	200,000-2,000,000 µS/cm	100 µS/cm, 0.1 mS/cm, 1 mS/m, 0.1 S/m, 100 ppm	±1% of reading
Temperature	23 to 500°F (-5 to 260°C)	0.1°F (0.1°C)	±1% of reading within range

Temp.°C	Range Multiplier%
0	181.3
10	139.9
15	124.2
20	111.1
25	100.0
30	90.6
35	82.5
40	75.5
50	64.3
60	55.6
70	48.9

Temp.°C	Range Multiplier%
80	43.5
90	39.2
100	35.7
110	32.8
120	30.4
130	28.5
140	26.9
150	25.5
160	24.4
170	23.6
180	22.9

Note: Conductivity ranges above apply at 25°C. At higher temperatures, the range is reduced per the range multiplier chart.

DIMENSIONS



Appendix G – Standard Operating Procedures (SOP's) and Operation & Maintenance (O&M) Manuals

Appendix H – Ground Water Monitoring Plan (GWMP)

GROUNDWATER MONITORING PLAN
CROSS GOLD MINE
NEDERLAND, COLORADO

Grand Island Resources LLC
P.O. Box 3395
4415 Caribou Road
Nederland, Colorado 80466

December 2021

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1 INTRODUCTION

This is a groundwater monitoring plan (GWMP) for the Grand Island Resources LLC (GIR) Cross Gold Mine operating under Colorado Permit M1977-410. The plan is required by Colorado Division of Reclamation, Mining and Safety (DRMS) rules and is being submitted in partial requirements for the current permit. The DRMS guidance document "Groundwater Monitoring and Protection Technical Bulletin" of November 19, 2019 was used in preparation of this site-specific monitoring plan and this plan conforms to DRMS guidance. Tables and Figures follow the main body of the plan. Supplementary documents are attached as Appendices.

The Cross Mine surface site is located within Sections 5, 8, and 9, in Township 1 South and Range 73 West or 39°58'41.3"N latitude and 105°34' 20.9"W longitude (UTM coordinates 4,425,324N and 548,861W, Zone 48, N), being approximately 3 miles west of Nederland, Colorado. The street address of the facility is 4415 Caribou Road, Nederland, CO 80466. The general location of the property is depicted in **Figure 1** and the features of the property are displayed in **Figure 2**.

Two small areas separate from the main mine site (not shown in the Figures) have been added to the M1977-410 permit disturbance area; the Caribou 300 Level Portal and the Potosi Shaft. These two parcels, totaling 0.39 acre combined, are intended for future use as mine ventilation and access. Use of these areas is not reasonably expected to alter the hydrologic balance or water quality at the site, or beyond, and they are not included in the groundwater monitoring plan for that reason. The groundwater monitoring plan is to monitor groundwater quality within the 9.60-acre disturbance area depicted in **Figure 2**. The DRMS disturbance boundary in **Figure 2** is proposed here as the compliance boundary with respect to groundwater monitoring.

Colorado hard rock mining operations have requirements to minimize degradation of the hydrologic environment. The DRMS has primacy for groundwater monitoring at hard rock mines. DRMS is the implementing agency for groundwater monitoring compliance standards and regulations set by the Colorado Department of Public Health and Environment (CDPHE) Water Quality Control Commission (WQCC - standards setting) and the Water Quality Control Division (WQCD - technical evaluation and enforcement) at hard rock mines. Groundwater monitoring planning, implementation and reporting by the mine must conform to WQCD Regulation No. 41 – The Basic Standards for Groundwater, and Regulation No. 42 Site-Specific Water Quality Classifications and Standards for Groundwater.

The CDPHE WQCC has not established Regulation 42 use classifications or site-specific numerical standards for groundwater quality beneath the mine; other than applicable state-wide standards. The Cross Mine is subject to the state-wide water

quality standards for drinking water found in Rule 41 as the mine is not located in a classified area found in Rule 42.

Based on site-specific conditions, regional to local studies of surface and groundwater quality, baseline sampling for this plan, and the lack of observations of acid-rock drainage or seepage over the 150-year history of the Caribou and Grand Island mining districts, GIR does not believe that operations at the Cross Gold Mine have the potential to impact water quantity, or groundwater quality beyond standards imposed by the WQCC.

The site-wide hydrogeologic characterization is ongoing at the property. The current understanding is sufficient to support development of a groundwater monitoring plan as it covers areas and activities currently permitted at the Cross Gold Mine. GIR is expanding the characterization by:

- collecting existing water well and in-mine water level data using equipment downloaded at regular intervals,
- testing aquifer properties at water wells and core holes,
- evaluating in-stream flows and groundwater surface water interaction as part of a separate investigation to support water court determinations, and,
- an engineering evaluation of in-mine groundwater flows to be expected under different underground development and mining scenarios.

2 CLIMATE AND PHYSIOGRAPHY

Colorado is divided into two major geographical regions, the Eastern Plains, and the Rocky Mountains. The facility is located along the eastern flank of the Front Range of the Southern Rocky Mountains at an elevation of 9,000 to 10,500 feet above sea level. The facility is located in sub-alpine terrain upslope of the Town of Nederland, Colorado, in the Coon Track Creek sub-basin of Middle Boulder Creek basin. The topography of the mine site is fairly gentle however many of the surrounding mountains are steep and rugged. Similarly, many of the nearby drainages are deeply incised. The hills and ridges are covered mainly by residual soil and glacial till, which is drained by slightly to deeply incised creeks. Rock outcrop is generally rare, perhaps 5% or less over the entire property.

The climate of this sub-alpine zone is cool, with summer highs reaching 75 °F only on the warmest days. Frost may occur any day of the year. High winds are common throughout the year, with potential gusts up to 130 miles per hour. Snow is a common occurrence for most of the year, except for July and August. Average minimum winter temperatures are 20 to 30 °F and maximum summer temperatures are 65 to 75 °F. Annual precipitation averages 18 inches of rain and 139 inches of snow. April and May

have the most precipitation; summers are generally dry with brief but intense thunderstorms associated with the Southwestern US Monsoon season.

Vegetation is typical of the Front Range, varying locally between heavy forest and mountain meadows. The north facing slopes are densely wooded with Lodgepole Pine, Engleman Spruce and Douglas fir. The low-lying areas are forested with Quaking Aspen, Western Willow and Red Alder. South facing slopes are lightly wooded with Ponderosa Pine, Lodgepole Pine, Rocky Mountain Juniper and Quaking Aspen (Turnburke, 2007).

The mine portals and auxiliary buildings are located on the south side of a moderately steep valley formed by Coon Track Creek. This drainage separates Caribou Hill to the west and Boulder County Hill to the east. Local relief as measured from the hilltops to the valley floor is approximately 1500 feet.

3 GEOLOGY

3.1 Regional Setting

This portion of Colorado is underlain by basement rocks comprising the North American Craton, which has been intruded by Late Cretaceous igneous units. Deeply rooted structural zones within the Precambrian rocks are linked to the development of the much younger Colorado Mineral Belt. This belt consists of a northeast-southwest regional trend of mineralization and ore deposits that is approximately 250 miles long and 80 miles wide.

The Caribou, or Grand Island, mining district is located near the northeastern exposed limit of the Colorado Mineral Belt. At a smaller scale, the area is part of the Front Range mineral belt on the northern margin of the Idaho Springs-Ralston shear zone of the Colorado lineament. This Precambrian fracture zone localized alkaline and calc-alkaline igneous activity and associated mineral deposits during the Laramide orogeny. Deposits in the district have been described by the U.S. Geological Survey as “polymetallic veins with abundant carbonates or that occur in wallrock altered to contain carbonates.” The geologic map from that study is presented here as **Figures 3, 4, and 5** (Moore et al.,1957). Confidential mapping of numerous veins, faults and fractures on the Cross Mine property is available for inspection by DRMS at the mine site.

3.2 Geologic Units

The Cross-Caribou Consolidated claims area is underlain by the Precambrian age Idaho Springs Gneiss, Boulder Creek Granodiorite, and Swandyke Hornblende Gneiss, and the Tertiary age Caribou Monzonite. Precious metal veins are located hosted exclusively within the Idaho Springs Gneiss and the Caribou Monzonite. Descriptions of the geologic units and formations presented here are adapted from Moore et al., 1957 and Holland 1994.

The Idaho Springs Gneiss consists of a well-foliated and banded gneiss composed of medium to coarse grained quartz-biotite-plagioclase-orthoclase with accessory magnetite and apatite. The unit has a zebra appearance due to biotite banding. Granite migmatites comprise nearly one-half of its total volume. The migmatite consists of coarse grained, fairly planar bodies which are predominantly parallel to foliation. Mica rich schist units also occur within the gneiss, hosting sillimanite that indicates a high peak metamorphic grade.

The Caribou Monzonite Stock is variable in composition. It consists predominantly of monzonite and quartz-monzonite but also ranges to mafic phases as lenses, pods and dikes. The monzonite phases are composed of medium-grained plagioclase-orthoclase-quartz-biotite-clinopyroxene-hornblende with accessory magnetite and apatite, giving the unit a black color.

The Swandyke Hornblende Gneiss is present approximately one mile south of the Cross Mine in two relatively continuous bodies. It consists of a dark gray to black, medium to fine grained, well-foliated amphibolite unit. Composed primarily of hornblende and plagioclase with lesser pyroxene, biotite and quartz. The unit likely represents small, localized mafic intrusions that were subsequently metamorphosed in the Precambrian.

The Boulder Creek Granodiorite is located approximately one-half mile northeast of the Cross deposit. It consists of a weakly foliated paleo-igneous unit. It is composed of fine to medium-grained quartz-orthoclase-plagioclase-biotite and minor hornblende. It is differentiated from the gneiss mainly by the lack of conspicuous banding, but does have well developed foliation near its contacts.

The contact between the Idaho Springs Gneiss and the Caribou Monzonite Stock strikes northwest-southeast through the mine area, dipping near vertical. The Cross Gold Mine is developed in veins near this contact.

3.3 Faults, Veins and Fractures

The Cross Mine site has a complex tectonic history. Forces in the Colorado Front Range have left an overprint of regional to local scale faults and fracture zones through the terrain. The Cross Gold Mine is located in highly faulted and fractured geologic units. At the scale of rock outcrop, and in the underground working, pervasive blocky jointing is noted in all rock types.

A published 1969 USGS map maps a fault at the ground surface approximately 700 feet east of the Cross Mine site (Gabel, 1969). Holland (1994) refers to numerous faults encountered underground within the Cross Mine deposit, and many of the veins encountered in the mine are the result of mineralization along fault planes. The major fault structures appear to be oriented along an east-west strike and dip steeply north to vertical. These structures locally cut all rock types. Last movement on these faults was

associated with the late Laramide orogeny and they are now considered inactive.

Holland (1994) noted two episodes of fault movement. The earliest was left lateral strike-slip movement along the east-west striking structures. This was overprinted by right lateral strike-slip movement along minor east-northeast striking structures. The northeast-trending veins on Caribou Hill are interpreted as occupying shear zones and the east- and west-trending veins are interpreted as occupying tension fractures branching from the shear zones.

Holland (1994) proposed that the structures present at the Cross Gold Mine tie into the regional Arapaho Pass Fault and the Junction Ranch Fault. The Arapaho Pass Fault is mapped along strike to the west where it disappears under glacial cover. The Junction Ranch Fault is also mapped along strike but to the southeast.

The veins are distributed within two main sets. One striking north-northeast with most of the veins considered to be open along strike and depth, except where they enter the monzonite. In contrast, the east-west striking veins located west of the historic mine area do not decrease in magnitude where they cross into the monzonite.

Holland (1994) proposed that left lateral movement created a dilatational fault jog between the Arapaho Pass Fault and the Junction Ranch Fault. This same model is then used to explain the presence of the large open space fill veins at the Cross Mine. The north-north east striking vein sets appear to be largely dilatational structures. The east-west striking set of veins appear to be localized along earlier fault structures.

Individual steeply dipping veins range in width from inches to tens of feet and consist of open space fill zones containing quartz and disseminated sulfides flanked by mineralized and non-mineralized alteration zones. A late stage of carbonate mineralization was the last emplacement before weathering and supergene enrichment of the upper ore body. Weathering has partially oxidized sulfide minerals to all depths tested to date.

4 HYDROLOGY

4.1 Aquifers and Adjacent Use

The groundwater beneath and adjacent to the Cross Mine is present in a single aquifer, the Mountain Crystalline Bedrock Aquifer as mapped in the ON-010 Colorado Groundwater Atlas (Barkmann et al., 2020). Unlike sedimentary rock aquifers, igneous and metamorphic crystalline rocks have no primary porosity; water is stored in fractures within the rocks. Groundwater flow proximal to and within the compliance boundaries is wholly with the Idaho Springs Gneiss and the Caribou Monzonite Stock geologic units.

Within the subalpine and alpine basins of the facility area ground water use is restricted to private wells (Flynn, 2003, Bruce and O'Riley, 1997). Other than the onsite wells there are no state-permitted wells within one mile of the compliance boundary. The closest

public water supplies (Nederland, Boulder) rely on surface water sources (Weritz, 2015).

4.2 Generalized Conceptual Model

The hydrology of alpine and subalpine basins in the Colorado Front Range has been a topic of research since the 1920's. Recent research using naturally-occurring chemical tracers and groundwater dating has refined the conceptual model for recharge, groundwater flow, and surface water groundwater interaction (Frisbee et al., 2011).

Hydrologic and climatic conditions cause the majority of precipitation to be released as spring and summer snowmelt which drains rapidly from the mountain front and shallow aquifers to streams over the course of months. During snowmelt, the majority of water recharge infiltrates shallow regolith and fractures and is discharged to streams with minimal delay (hour to weeks). However, significant amounts of groundwater are detained for much longer lag periods; months to decades. Overland flow will occur if the infiltration capacity of the shallow regolith is exceeded.

The sub-alpine hydrology conceptual model indicates that high elevation steep catchments recharge only a small percentage of total snowmelt to slow, deep, ground water circulation, and that all ground water flow returns to the surface due to topographically-driven-flow. The discharge of this older deeper water may not take place in the same catchment, but does discharge within some scale of sub-basin to basin drainage. This reemergence as surface water happens because of topography-driven-flow and hydraulic conductivity contrasts with depth (Frisbee et al., 2013; Bukoski et al., 2021; Foks et al., 2017; Tóth, 1963).

The time between snowmelt and discharge to streams can be highly variable depending on path, but the steady-state mass balance is nearly complete within sub-alpine basins. Because of the complete discharge to streams and springs, changes in groundwater quality are detectable in surface water quality in sub-alpine basins such as Coon Track Creek.

Groundwater flow at the facility is generally to the south-east, following topography and the track of Coon Track Creek. A water table map for late July 2021 is presented as **Figure 6**. The water table map was created by hand-contouring linear interpolations between water level measurements made at the three wells (**Table 1**) and the water level in the Cross Winze. A non-pumping condition for the Cross Winze (water table at the collar of the winze) was assumed.

4.3 Groundwater Flow Controls

Groundwater flow at the Cross Gold Mine is controlled by faults, fractures and jointing. The primary porosity of un-weathered igneous and metamorphic crystalline rock is generally too low to meaningfully contribute to flow. Flow is confined to secondary

porosity; joints, fractures and faults in the rock units. As previously described and illustrated the fracture and fault density in the Front Range was caused by regional tectonics. Mines in fractured terrain are often located in the most fractured portion of the terrain; this is the case for the Cross Gold Mine. The mapped fault and fracture density at the mining district is higher than areas immediately adjacent (Holland, 1994; Gabel, 1969). Because most veins and associated fracture sets trend east-west or northeast-southwest it is expected that these are preferred flow directions causing significant anisotropy in transmissivity.

With enough fracture and joint density, fractured bedrock hydrology may behave hydro-geologically as a granular aquifer, except the 'grains' are fist to boulder sized. This "representative porous media" (RPM) when present in fractured bedrock reduces fracture-based anisotropy, and simplifies understanding of the system. Recent work in the Front Range on the Turkey Creek basin about 35 miles south of the mine (Aspen Park) has found that the fractured aquifer can be numerically modeled as RPM in the highest fracture density areas (Cain and Tomusiak, 2003). As the Cross Mine is located in a high fracture density area the RPM approach may be usable in the conceptual hydrogeologic model for the site.

The water table is influenced by mine dewatering. The Cross Winze is a near-vertical (70° incline) internal shaft within the Cross Mine that intercepts the Cross Adit (tunnel) at the point projected to the surface in **Figure 6**. The water level in the Cross Winze will quickly rise to the level of the tunnel in snowmelt season if the winze is not pumped to Coon Track Creek. The bottom of the Winze is approximately 235 feet below the floor of the tunnel. Pumping the winze has been noted to influence the water level in the Cross Well. A non-pumping condition was assumed for the July 2021 water table map and the water level at the Cross Winze set to the tunnel floor (9,700 feet above mean sea level - amsl). The full influence of pumping and water chemistry will be determined over time.

The shallow ground water system is also seasonally dynamic, being strongly influenced by annual snowmelt. Much of the observed flow within the mine comes from fractures, veins, and faults, changing from just-damp to fully-flowing streams during snowmelt. In the snowmelt season the ground water flow increases greatly and the water table rises. Casual observations of the Cross Mine Winze show tens of feet of water table rise in the snowmelt season.

According to the conceptual model the large increases in streamflow flow and water table rise will be forced by young water from snowmelt. Most of the snowmelt will enter shallow flow zones where it will reside a year to tens of years before discharge to surface water. The mine workings lie within this shallow flow zone. A large portion of water in this zone will be displaced by each snowmelt, and will have a lithogenic signature that roughly corresponds with its residence time. The time from infiltration to discharge can be roughly estimated to be from 1 month to 100 years for shallow ground water (Frisbee

et al., 2013). Residence time is primarily controlled by transmissivity and transmissivity decreases with depth in fractured rock aquifers. Deep ground water circulation in alpine basins can approach 7000 feet in depth and still return to surface within a basin, but may take over 5000 years to do so.

Transmissivity estimates are difficult in fractured bedrock due to the discontinuous nature of hydraulic conductivity as compared to granular aquifers. Point estimates from single well tests conducted for well rehabilitation this summer may not be representative if applied over large areas. Transmissivity estimates are being prepared as part of the mine's water rights evaluation with the Colorado Department of Water Resources (DWR) and State Engineers Office (SEO).

A vertically and horizontally averaged estimate of bulk transmissivity is possible using historic dewatering records. Long ago dewatering of the Caribou Mine could be accomplished by pumping 100 gpm, six hours per day (36,000 gallons/day) to keep the mine dry in peak snowmelt (Zulch, 1919). In 1919 the Caribou mine had over 5,000 linear feet of workings below the water table. It extended to a depth of over 1,000 feet below ground surface. Assuming an 8x8 (foot) opening dimension over this length results in 320,000 square feet of discharge area. Using 600 feet of head loss to dewatering (400 level to 1000 level dewatering), a transmissivity of 1.88x10-4 gallon/day/ft^2 is calculated. This is a comparatively low transmissivity for highly fractured rock. The low value may reflect the lower transmissivity of fractured aquifers with depth, particularly over 400-500 feet deep (Freeze and Cherry, 1979).

4.4 Groundwater Discharge

Groundwater discharges to surface water at the mine as Coon Track Creek baseflow, from scattered springs and seeps, and as drainage from the Cross Adit and the Idaho Tunnel of the Caribou mine. Groundwater from the tunnels is treated before discharge to Coon Track Creek. In late summer and fall months the only flow in Coon Track Creek is from treated groundwater discharge from drains (tunnels). This was the condition in late July 2021 when the data for the water table map in **Figure 6** was collected.

The Middle Boulder Creek basin (containing the Coon Track Creek sub-basin or catchment) has been the location of precious and base metal mining, milling, and smelting for over 150 years. The Cross Gold Mine is the only currently operating mine in the historic district. Much of the district's ore deposits have metals hosted in sulfide minerals. Long-term watershed studies note some increases in dissolved constituents attributed to reaction with rocks in the basin (Murphy et al., 2003). However, decades of unregulated mining on Middle Boulder Creek have not affected in-stream water quality for pH, dissolved solids, or toxic metals (Murphy, 2006).

The water quality is best explained by the mineralogy of the ore and the local geology. Because the deposit is generally low in reactive iron sulfides (e.g. pyrite, pyrrhotite,

marcasite, chalcopyrite) as compared to other base metal sulfide deposits, the acid generation is low. Acid-neutralizing-minerals are present in sufficient quantities in the calc-alkaline intrusives that ground water is near neutral to slightly basic pH (Knight Piésold, 2004). Ground water becomes surface water in Front Range catchments like Middle Boulder Creek. The degree of leaching of rocks infiltrated by snowmelt, equivalent to residence time in the aquifer, is determined from sampling and analysis.

The general absence of iron staining in oxygenated environments at the facility suggests that there is a limited quantity of reactive iron pyrites to free acid and dissolved iron in the subsurface, and that the dissolved iron and acid that is created is attenuated before it discharges to the surface. This concept is further borne out by several studies noting the lack of general water quality deterioration related to historic mining in Middle Boulder Creek, other than sulfate (SO_4^{2-}) ions (Murphy et al., 2003. Chpt. 3 & 4). The source of the sulfate increase is attributed to the sulfur in pyrites at mines and ore bodies being oxidized.

5 MONITORING WELL NETWORK

5.1 Overview

The mine has three existing wells on site that are listed in **Table 2** and depicted in **Figure 2**. Historically, operations have used the three wells to supply water for domestic and potable use. The three wells used for domestic use (Cross, Cabin, and Caribou) have been re-permitted as domestic/industrial with the Division of Water Resources, applications filed May 5, 2021. The well ownership was changed at that time to Grand Island Resources LLC to align with water rights ownership.

Links to the Department of Water Resources (DWR) well permits are provided in **Table 2** and the well drillers logs and construction diagrams, as retrieved from DWR files, are contained in **Appendix A**. Water rights are provided through a 1/8 share in the Farmers Ditch Company adjudicated and decreed for use from mine workings in case number W-8261-76. A substitute Water Supply Plan was filed May 19, 2021 to allow use of W-8261-76 mine workings water from existing drilled wells.

5.2 Well Evaluation

McGrane Water Engineers, LLC. (MWE) of Lyons, Colorado performed an evaluation of the three existing wells in 2021 (MWE, 2021). The evaluation consisted of:

- Pulling the existing pumps;
- Conducting well videos and evaluating casing condition;
- Performing and evaluating pumping tests;
- Estimation of the well yield and production capacities;

- Recommending permanent pumping systems; and
- Establishing permanent water level monitoring.

The results of the evaluation are found in **Table 3.** There is uncertainty in MWE's yield and production estimate due to:

- Uncertainty in the extent and connected fractures in the bedrock aquifer;
- Variability in seasonal recharge;
- Unknown hydraulic connection to nearby Coon Track Creek;
- Well-to-well interference from the other wells; and
- Mine dewatering.

These uncertainties can be reduced by continued water level and production monitoring, constructing a groundwater model for improved yield and production estimates, and evaluate the estimate's sensitivity to factors described above.

Despite the uncertainties the sustainable yield (GPM) results are significantly higher (2 times or more) than the mean and median yield found by Cain (2003) for wells in the Turkey Creek basin. This suggests that the Coon Track Creek basin has higher fracture density, providing higher average well yields, than some sub-alpine basins in the region.

5.3 Detection Monitoring Well

We are proposing to use one of the three wells, the Cabin Well, for detection monitoring inside the compliance boundary. Existing wells are preferred because they are known to have intercepted water-bearing fractures rather than being completed in low-yielding zones. Because they are used for groundwater withdrawal year-round, they induce gradients in the aquifer, capturing more water of in-situ quality than that obtained by small-diameter monitoring wells that are pumped infrequently.

The Cabin well was selected because is in good hydraulic connection with the surrounding aquifer (MWE, 2021) and is located downhill and downgradient of the Cross Mine surface complex. It is use is currently limited to manually filling water trucks for on-site construction. The Cabin Well is in an area where flow from other parts of the mine and underground workings converge. The east-west fracture sets intercepted by the Cabin well are sub-perpendicular to perpendicular to groundwater flow gradients, allowing the Cabin well to capture a larger area of flow from upgradient areas than if the fracture orientation was different.

The Cabin Well is equipped with a new variable frequency drive Grundfos stainless steel pump, epoxy coated steel riser pipe and a recording water level pressure transducer collecting hourly data. The Cross and Caribou wells are also equipped with recording water level pressure transducers, collecting hourly data. Data is downloaded monthly from all three wells.

The Cross Well is not a preferred choice for monitoring because it is influenced by mine dewatering. Additionally, the Cross Well is located near the center of surface activity rather than downgradient of all activities that could potentially affect groundwater quality. The Caribou Well is upgradient of the permitted mine workings and lies across a probable groundwater divide, Coon Track Creek, from the Cross Mine.

5.4 Sampling Frequency

The Cabin well will be sampled quarterly for the Analytical Parameters in **Table 4**.

5.5 Analytical Parameters

The analytical parameters for sampling are specified by DRMS and consist of the most stringent of the criteria contained in Tables 1-4 of WQCC Regulation No. 41. WQCC Table 1 and 2 standards are for drinking water, Table 3 contains agricultural standards and Table 4 is a Total Dissolved Solids (TDS) criterion. Code of Colorado Regulations, WQCC at 5 CCR 1002-41 2. exempts the Cross Mine groundwater from Agricultural use standards when "…other information demonstrates that agricultural use is not being made of the groundwater and is not likely to be made…" The sub-alpine to alpine climate of the mine area is unsuitable for agriculture. A collated list of the Rule 41 Table 1, 2, and 4 analytical parameters is found in **Table 4**.

5.6 Reporting

GIR will report sampling results to DRMS within 30 calendar days of GIR receipt of a complete analytical results package from the Colorado Certified analytical laboratory. The reporting will include a potentiometric surface (water table) map constructed from measurements made during sampling events and will note any exceedances of Regulation 41 Table 1-4 water quality standards.

6 BASELINE GROUNDWATER SAMPLING

Water quality sampling was conducted at the Caribou, Cross, and Cabin wells on November 9 (**Table 5**) and December 17, 2021 (**Table 6**). The November 2021 samples for dissolved metals were not filtered properly and some **Table 4** parameters were omitted by the laboratory. The December 2021 sampling and analysis were conducted using the procedures and methods presented in this GWMP. The sample bottle for the Cabin well phenolic compounds was broken in transit and so was not analyzed. Additionally, the analytical laboratory failed to analyze the provided samples for color, odor, and foaming agents. Radiological results have an extended laboratory turnaround time and results are not expected until the first quarter of 2022 and will be reported then. Low laboratory pH results are not reflected in field pH measurements contained in **Appendix B**. The November results are presented in **Table 5**, December in **Table 6**,

with comparison to regulatory compliance limits from Tables 1, 2 and 4 of Regulation 41. The groundwater at the Cross Gold Mine is within regulatory limits with exception of manganese at the Cabin Well, a high copper value at the Caribou Well, and anomalous laboratory pH readings from the December 2021 sampling.

Inspection of **Tables 5 and 6** reveals clear trends in water quality. These trends confirming the conceptual model and the geochemical evolution proposed by Frisbee and others.

The most upgradient Caribou Well has a very low dissolved solids content and the most acidic water (pH 5.76 to 7.50) sampled. The Caribou Well water has had a very short residence time in the aquifer. This is Caribou water analytical results exhibit has the most non-detects of the tree wells. This is also why water from the Caribou Well is corrosive using the Langlier Index. The copper exceedance may be due to the corrosivity of the water and the copper plumbing used in in the Caribou water supply system.

At the Cross Well, alkalinity and pH increase, and the longer residence time results in a larger suite of detectable trace metals. The midpoint well reflects the geochemical evolution of water along flow path. The proximity of the well to ore bodies is noted in the Cross Well having elevated trace metal values as compared to the other two wells.

The Cabin Well chemical data reveals increasing concentrations of general water quality parameters (major ions as TDS) but a decrease in regulated metals as compared to the Cross Well. This trend is most evident in major ions (calcium, sulfate, and sodium), pH, and alkalinity. The Cabin Well water exceeded the MCL for manganese in the December 2021 sampling event.

7 GROUNDWATER SAMPLING AND ANALYSIS

This section describes procedures that will be used at the mine for groundwater sampling and analysis.

7.1 Water Level Measurement

At the start of each monitoring event, GIR will measure the depth-to-water in the detection monitoring (drinking water) wells prior to sampling. Water levels will be measured within a period of time short enough to avoid temporal variations in groundwater elevation which could prevent an accurate determination of the groundwater flow rate and direction. This will be accomplished by connecting to the In-Situ™ Troll500 data-logging pressure transducer in each well and downloading sufficient time-series data to determine:

- The water level at the well,
- If that water level is representative for the time of year,
- If the water level is representative of static or pumping conditions.

Using the pressure transducer to obtain water levels is preferable to opening the sanitary seal on a drinking water well. Water levels are only measured manually to set and calibrate pressure transducers and as a substitute measurement for a failed transducer. If a transducer has failed or is not present in a well, the sanitary seal is opened and a manual measurement is made.

The mine's In-Situ™ M-Scope 300-foot electronic tape used to manually measure water levels is capable of achieving a measurement precision of ±0.01 feet. The procedure for manually measuring water levels in wells is described below.

1. Obtain top of casing (TOC) and ground surface elevations for the well and past readings for the time of year. Record this data on the field data sheet or field notebook used for this sampling round so that it is available at the well.
2. Before any measurement is taken, the water level probe and cable should be properly decontaminated/disinfected.
3. Remove the sanitary seal from the top of the drinking water well and place in a clean and secure location.
4. The measuring point for all wells is at the top of the casing mark on the well casing. The measuring point is marked by permanent marker on the inside of the steel well casings. If no mark is found, measurements will be collected from the top of the north side of the casing.
5. Make a measurement according to manufacturer instructions at the top of casing mark.
6. The static water level depth shall be written down on the field data sheet or field notebook, and rechecked before the indicator is removed from the well.
7. If the water level is fluctuating due to pumping make a best estimate of pumping water level and note a best estimate static level based on downloaded data record.
8. The water level depth below the measuring point (in feet) will be subtracted from the measuring point elevation to calculate the elevation of the static water level.
9. Water levels will be compared with past measurements to help verify the reasonableness of readings before completing the measurement process.

7.2 Water Quality Meter Calibration

This sampling plan will use hand held water quality probes (pH, temperature, and specific conductance) to document stabilization of parameters during well purging. Meters are to be operated after the operator is with the manufacturer's instructions. Meter calibration will also follow those same instructions. Conductivity and pH meters should be calibrated daily using fresh buffers and standards. Record calibration results in a field logbook or a sampling sheet. Perform a calibration check at the end of each days use. The digital thermometers used are precise to 0.1 degree and are calibrated by the manufacturer. The meter can be checked for gross errors using ice water.

7.3 Well Purging

Before collecting samples, detection monitoring wells will be purged until a minimum of three well casing volumes have been removed and field parameters have stabilized (i.e., temperature, pH, and conductivity). Specific well purging and sampling requirements for each of the existing wells is provided in **Table 7**. Approximately 100 gallons will be purged from the existing wells prior to sampling. The wells all have sanitary seals and internal pump wiring making deployment of a portable or dedicated sampling pump difficult. The existing pumps and piping are used for sample collection and samples are collected at a sampling port. If the well is in use during sampling the required purging protocol is still to be followed.

Purging will commence by connecting a garden-type hose to the hose bib located next to each well's pressure tank. Inspect and clean the exterior of the hose bib using decontamination procedures. The purged groundwater will be directed to a 5-gallon bucket or other container of known volume to measure the cumulative amount of water removed from the well. The purge water can be put to ground, or discharged to any sanitary drain.

At the beginning of purging and at every 10 gallons, the field sampler will measure the field parameters to confirm that the water chemistry is stabilizing. The sampler will also make note of the water color and clarity. Generally, temperature within 1° Celsius, pH within ± 0.1 units, and conductivity within ± 10 percent for consecutive readings indicate stable water chemistry. Field meters for measuring temperature, pH, and conductivity will be calibrated daily and operated according to the manufacturers' instructions. Purging data is to be recoded on the sampling field sheet or logbook.

The purging garden hose is removed from the hose bib and replaced with a pre-cleaned plastic hose-bib to hose-barb connector (3/4" GHT to 3/8" barb) is used to attach 1-3 feet of new 3/8" inside-diameter Tygon or similar clear plastic tubing to the hose bib. Using a 5-gallon bucket or other container to collect overflow set the hose bib to discharge at a reduced flow rate, 1 GPM or less.

7.4 Sample Collection

The field sampler will don new disposable nitrile gloves after purging for sampling and will fill the laboratory-supplied sample containers directly from the hose bib discharge line. Unfiltered samples are collected first. With the hose bib running fit a disposable 0.45-micron, medium capacity flow through groundwater filter to the 3/8" line and allow to rinse 2-3 filter volumes before filling filtered sample bottles. Obtain groundwater filters from a commercial supplier. Discard sample tubing. Use a fresh hose bib connector and sample tubing at each well.

Groundwater samples are field filtered and preserved as necessary as shown in the

analytical table. Sample containers should be filled with minimal turbulence and should not be overfilled to avoid spilling the sample preservative (where applicable). Groundwater samples will be collected in such a way as to minimize potential contamination of the sample. Measures to help prevent contamination will include using dedicated sampling equipment, wearing a new pair of disposable gloves at each well, and decontaminating any reusable equipment (water level indicator) between wells.

Field notes will be kept by sampling personnel either in a field log book or on groundwater sampling forms. The field notes will include sampler name(s), well identification numbers, the date and time, instrument calibration notes, water-level measurements, well purging volumes, well recharge conditions, and other notable site observations. These records will be maintained by mine personnel.

7.5 Sample Preservation and Shipment

Sample will be preserved as appropriate, and sample containers will be labeled and placed in appropriate shipping containers. **Table 4** lists the required preservative for each analytical constituent. Sample containers will be placed on ice/cold packs following sample collection and during transport to the laboratory. Prior to sample collection, the laboratory will place the preservatives into the bottles used to contain the samples for metals and mercury analysis, or provide pre-measured, containerized, bottle-specific aliquots of preservation compounds. Samples will be transported under chain-of-custody (COC) control to a Colorado State Certified Laboratory, or shipped to an alternate appropriately certified laboratory.

7.6 Analytical Procedures

Cabin well samples will be analyzed for the constituents and by the methods shown in **Table 4**.

7.7 Chain-of-Custody Control

Laboratory standard COC procedures will be followed on all samples collected. Custody is recorded through a series of signatures on the COC form as sample possession changes from one person or organization to another. For each sample location, the sample name, date and time of collection, and requested analyses will be recorded on the COC form. The field sampler will provide the original COC form to the laboratory at the time of sample delivery. COC records will be maintained by the mine.

7.8 Decontamination and Disinfection

Decontaminate water level probes by donning nitrile gloves and safety glasses and wiping them successively with paper towels wetted with mild detergent solution, potable water, and deionized water. Rinse the water level probe with deionized water before use.

Store the water level probe in a plastic bag after decontamination.

When deploying the water level probe into a drinking water well it must be decontaminated first. Use a paper towel wetted with 150 ppm bleach solution (7.5% sodium hypochlorite solution diluted 500:1 with deionized water) to wipe the probe tip and first few feet of probe cable. Deploy cable in well, wiping cable as it comes off the reel with paper towels and bleach solution. If the water level probe is used again immediately in a drinking water well, wipe cable again with fresh paper towels wetted with bleach solution as it is reeled out of the well. Store the water level probe in a plastic bag after disinfection for transport between wells. Do not rinse probe between sterilization and use.

7.9 Field Notes

Documentation of observations and data acquired in the field provide information on sample acquisition, field conditions at the time of sampling, and a permanent record of field activities. Record field observations and data collected during routine monitoring activities with waterproof ink in a permanently bound weatherproof field log book with consecutively numbered pages or on field data sheets (**Appendix B**).

Field notebook and data sheet entries will include at least the following information. Consult relevant sampling and decontamination SOPs to supplement this list.

- Project name
- Location of sample
- Sampler's printed name and signature
- Data and time of sample collection
- Sample identification numbers
- Description of sample (matrix sampled)
- Sample depth (if applicable)
- Number and volume of samples
- Sample methods, or reference to the appropriate SOP
- Field observations
- Results of any field measurements, such as depth to water, pH, temperature, specific conductance
- Personnel present
- Decontamination procedures

Strike out changes or deletions in the field book or on the data sheets with a single strike mark and be sure that the original information remains legible. Record enough information to allow the sampling event to be reconstructed from the notes alone. Completely fill out field data sheets and do not leave blank lines. Write “Not Applicable” or “NA” on blank lines. All field books will be signed daily by the person who made the entries.

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9 TABLES

Table 1. July 2021 Manual Water Level Measurements

Well	Date	Time	Raw Depth to Water (DTW)	Ground Elev. (GS)	Top of Casing (TOC) Stickup (ft)	DTW BGS (ft)	WT Elevation (ft. amsl)
Caribou	7/30/2021	16:14	22.71	9743.67	2.45	20.26	9723.41
Cross	7/27/2021	16:42	29	9693.49	5.7	23.3	9670.19
Cross	7/28/2021	13:56	23.74	9693.49	0.17	23.57	9669.92
Cabin	7/26/2021	10:30	39	9678.13	1	38	9640.13
Cabin	7/27/2021	13:30	42.7	9678.13	2.35	40.35	9637.78
Cabin	7/28/2021	9:57	42.52	9678.13	3.1	39.42	9638.71
Cross Winze							9700

Table 2. Well Details

Well	Permit Link
Caribou	https://dwr.state.co.us/Tools/WellPermits/0208135
Cross	https://dwr.state.co.us/Tools/WellPermits/0111941B
Cabin	https://dwr.state.co.us/Tools/WellPermits/0111941A

	Permit No.	Q40	Q160	Section	Township	Range	Prime Meridian
Caribou	116655	SW	NW	9	1 S	73 W	6th
Cross	111953	SW	NW	9	1 S	73 W	6th
Cabin	111951	SW	SW	9	1 S	73 W	6th

	UTM X	UTM Y	Latitude	Longitude	Ground Elevation (ft. amsl)	Top of Casing Elevation (ft. amsl)
Caribou	451137	4425647	39.979581	-105.572275	9743.7	9746.12
Cross	451086	4425477	39.978047	-105.572859	9693.5	9694.66
Cabin	451190	4425389	39.977260	-105.571634	9678.1	9679.13

	Drilled Depth (ft. BGS)	Top of Screen (ft. BGS)	Bottom of Screen (ft. BGS)	Drilled Diameter (ft)	Driller Reported Yield (GPM)
Caribou	165	25	165	0.5	12
Cross	205	15	205	0.5	25
Cabin[1]	165	65	165	0.5	25

[1] Cabin well impassable past 135 feet BGS.

Table 3 – Well Test Results and Production Estimates

Test and Forecast Summary

Well	Year Drilled	Test Rate when Drilled (gpm for 1 hr)	2021 Test Rate (gpm)	Test Length (hrs)	7-Day Yield Estimate (gpm) w/ Existing Equipment	7-Day Production Estimate w/ Existing Equipment (gals)	7-Day Production Est. w/ Rehabilitation or Pump Upgrade (gals)	Current VFD Yield Setting (gpm)	Drive Setting
Caribou	1980	12	9.5 and 7.2	5.5	7	70000	Same	7	Constant pressure (60 psi)
Cross	1980	25	15	23.5	10 - 15	100,000 - 150,000	Capable of ~45 gpm (max 450,000 gals/wk) with equipment upgrade	10 - 15 gpm	Constant pressure (60 psi)
Cabin	1979	25	19	20	15	150,000	Expect increase if fill were removed from well	30 gpm for ~100 mins	Constant 35 hz

Pumping Equipment

Well	Well Condition	Pump Type (age)	Design Yield (gpm)	Design TDH (ft)	Horse Power	Variable Speed Drive	Pressure Tank	Setting Depth	Drop Pipe (diameter)
Caribou	Good	Grundfos GM102-10S10 (2019)	7	350	1	Existing	new	148	1-in
Cross	Good	Webtrol10S07 (new)	12.5	185	1.5	Existing	new	174	1.25-in
Cabin	Fill in and around well*	Gould 40S50-15 (new)	30	320	5	New 5 hp	NA	126	1.25-in

*Cabin well has 30 ft of fill in well and accelerated drawdown beyond 63 ft.

Table 4. Cross Gold Mine Semi-Annual Groundwater Sampling Parameter List

Parameter	Standard	Unit	Method	Preservation	Reg. 41 Table
Unfiltered Samples					
pH	6.5 - 8.5	pH units	SM[a] 4500-H-B	≤ 4°C	Table 2
TDS	400	mg/l	SM 2540-C	≤ 4°C	Table 4
Corrosivity	Non Corrosive	Langlier Units	SM 2330-B	≤ 4°C	Table 2
Alkalinity	Non Scaling	mg/l as $CaCO_3$	SM 2320-B	≤ 4°C	Table 2
Chloride	250	mg/l	EPA 300.0	≤ 4°C	Table 2
Fluoride	4	mg/l	EPA 300.0	≤ 4°C	Table 1
Cyanide [Free]	0.2	mg/l	EPA 335.4	NaOHpH≥12,≤6°C	Table 1
Nitrate	10	mg/l as N	EPA 300.0	≤ 4°C	Table 1
Nitrite	1	mg/l as N	EPA 300.0	≤ 4°C	Table 1
Nitrate+Nitrite	10	mg/l as N	Calculation	≤ 4°C	Table 1
Sulfate	250	mg/l	EPA 300.0	≤ 4°C	Table 2
Chlorophenol	0.0002	mg/l	EPA 420.1	H_2SO_4 pH<2,≤ 4°C	Table 2
Phenol	0.3	mg/l	EPA 420.1	H_2SO_4 pH<2,≤ 4°C	Table 2
Odor	3	odor units	SM 2150 B	≤ 4°C	Table 2
Color	15	color units	SM 2120 A	≤ 4°C	Table 2
Foaming Agents	0.5	mg/l	SM 5540 C	≤ 4°C	Table 2
Asbestos	7,000,000	fibers/liter	EPA 100.1	≤ 4°C	Table 1
30-day Total Coliforms	2.2	org/100 ml	SM 9221-9223	≤ 4°C	Table 1
Max Total Coliforms	23	org/100 ml	SM 9221-9223	≤ 4°C	Table 1
Samples Field-Filtered To 0.45 Micron					
Gross Alpha	15	pCi/l	EPA 900.0	≤ 4°C	Table 1
Beta and Photon	4	mrem/year	EPA 900.0	≤ 4°C	Table 1
Antimony	0.006	mg/l	EPA 200.8	HNO_3 pH <2, ≤ 4°C	Table 1
Arsenic	0.01	mg/l	EPA 200.8	HNO_3 pH <2, ≤ 4°C	Table 1
Barium	2	mg/l	EPA 200.8	HNO_3 pH <2, ≤ 4°C	Table 1
Beryllium	0.004	mg/l	EPA 200.8	HNO_3 pH <2, ≤ 4°C	Table 1
Cadmium	0.005	mg/l	EPA 200.8	HNO_3 pH <2, ≤ 4°C	Table 1
Calcium	NA	mg/l as $CaCO_3$	EPA 200.7	HNO_3 pH <2, ≤ 4°C	Corrosivity[b]
Chromium	0.1	mg/l	EPA 200.8	HNO_3 pH <2, ≤ 4°C	Table 1

Parameter	Standard	Unit	Method	Preservation	Reg. 41 Table
Copper	1	mg/l	EPA 200.8	HNO_3 pH <2, ≤ 4°C	Table 2
Iron	0.3 mg/l		EPA 200.7	HNO_3 pH <2, ≤ 4°C	Table 2
Lead	0.05	mg/l	EPA 200.8	HNO_3 pH <2, ≤ 4°C	Table 1
Manganese	0.05	mg/l	EPA 200.8	HNO_3 pH <2, ≤ 4°C	Table 2
Mercury	0.002	mg/l	EPA 200.8	HNO_3 pH <2, ≤ 4°C	Table 1
Molybdenum	0.21	mg/l	EPA 200.8	HNO_3 pH <2, ≤ 4°C	Table 1
Nickel	0.1	mg/l	EPA 200.8	HNO_3 pH <2, ≤ 4°C	Table 1
Selenium	0.05	mg/l	EPA 200.8	HNO_3 pH <2, ≤ 4°C	Table 1
Silver	0.05	mg/l	EPA 200.8	HNO_3 pH <2, ≤ 4°C	Table 1
Thallium	0.002	mg/l	EPA 200.8	HNO_3 pH <2, ≤ 4°C	Table 1
Uranium	0.0168 - 0.03	mg/l	EPA 200.8	HNO_3 pH <2, ≤ 4°C	Table 1
Zinc	5	mg/l	EPA 200.8	HNO_3 pH <2, ≤ 4°C	Table 1

Notes:

[a] SM methods are from Standard Methods for the Examination of Water and Wastewater (APHA et al. 1998).

[b] Calcium data needed for corrosivity/scaling calculations .

Table 5. November 9, 2021 Groundwater Sampling Results

Parameter	Standard	Caribou	Cross	Cabin	Units
pH	6.5 - 8.5	7.50	7.38	8.27	pH units
TDS	400	32	125	134	mg/l
Corrosivity	Non-Corrosive	**-2.01**	**-0.94**	0.11	Langlier Units
Alkalinity	Non-Scaling	18.0	80.5	83.3	mg/l as $CaCO_3$
Chloride	250	0.5	2.6	0.9	mg/l
Fluoride	4	ND	ND	ND	mg/l
Nitrate	10	0.27	0.22	0.18	mg/l as N
Nitrite	1	ND	ND	ND	mg/l as N
Nitrate+Nitrite	10	0.27	0.22	0.18	mg/l as N
Sulfate	250	2.7	8.3	11.1	mg/l
30-day Total Coliforms	2.2	Absent	Absent	Absent	org/100 ml
Max Total Coliforms	23	Absent	Absent	Absent	org/100 ml

Table 6. December 17, 2021 Groundwater Sampling Results

Parameter	Standard	Caribou	Cross	Cabin	Units
pH	6.5 - 8.5	**5.76**	**6.44**	7.26	pH units
TDS	400	43	107	140	mg/l
Corrosivity	Non-Corrosive	**-3.69**	**-1.89**	**-0.71**	Langlier Units
Alkalinity	Non-Scaling	18.5	62.5	102.6	mg/l as $CaCO_3$
Chloride	250	0.4	4.3	0.6	mg/l
Fluoride	4	0.63	0.56	ND	mg/l
Cyanide [Free]	0.2	ND	ND	ND	mg/l
Nitrate	10	0.08	0.35	ND	mg/l as N
Nitrite	1	ND	ND	ND	mg/l as N
Nitrate+Nitrite	10	0.08	0.35	ND	mg/l as N
Sulfate	250	2.8	15.1	11.8	mg/l
Chlorophenol	0.0002	ND	ND	NA	mg/l
Phenol	0.3	ND	ND	NA	mg/l
Odor	3	NA	NA	NA	odor units
Color	15	NA	NA	NA	color units
Foaming Agents	0.5	NA	NA	NA	mg/l
Asbestos	7,000,000	ND	ND	ND	fibers/liter
30-day Total Coliforms	2.2	Absent	Absent	Absent	org/100 ml

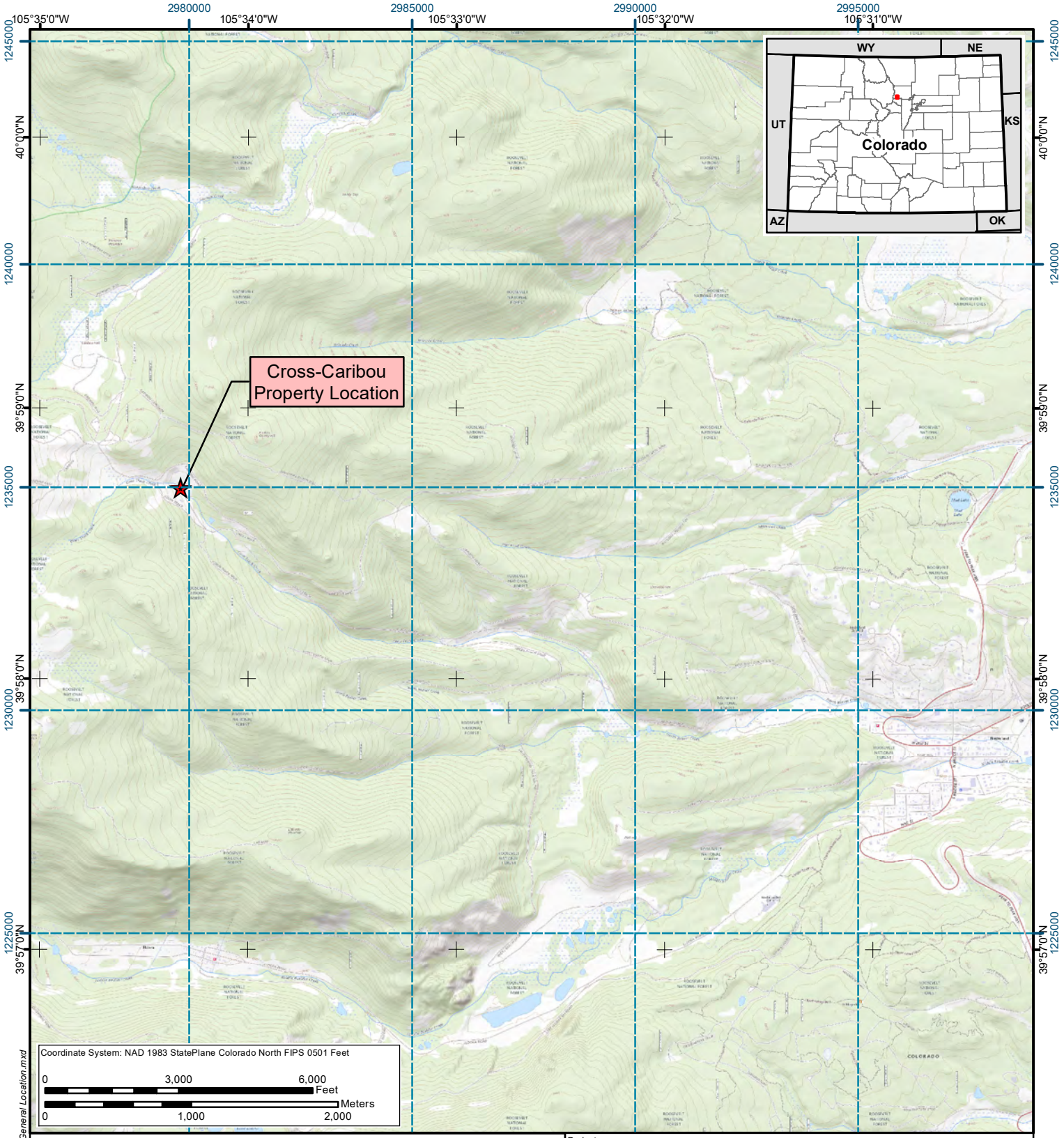
Parameter	Standard	Caribou	Cross	Cabin	Units
Max Total Coliforms	23	Absent	Absent	Absent	org/100 ml
Gross Alpha	15	Pending	Pending	Pending	pCi/l
Beta and Photon	4	Pending	Pending	Pending	mrem/year
Antimony	0.006	ND	ND	ND	mg/l
Arsenic	0.01	ND	ND	ND	mg/l
Barium	2	0.0056	0.0272	0.0980	mg/l
Beryllium	0.004	ND	ND	ND	mg/l
Cadmium	0.005	ND	0.0002	ND	mg/l
Calcium	NA	9.8	44.7	63.6	mg/l as $CaCO_3$
Chromium	0.1	ND	ND	ND	mg/l
Copper	1	**1.2441**	0.0085	ND	mg/l
Iron	0.3 mg/l	0.006	0.006	0.037	mg/l
Lead	0.05	0.0007	0.0018	0.0004	mg/l
Manganese	0.05	ND	0.0067	**0.1369**	mg/l
Mercury	0.002	ND	ND	ND	mg/l
Molybdenum	0.21	ND	0.0006	0.0241	mg/l
Nickel	0.1	ND	ND	ND	mg/l
Selenium	0.05	ND	ND	ND	mg/l
Silver	0.05	ND	ND	ND	mg/l
Thallium	0.002	ND	ND	ND	mg/l
Uranium	0.0168 - 0.03	ND	ND	0.0005	mg/l
Zinc	5	0.013	4.226	0.569	mg/l

ND – Non-Detect, NA – Not Analyzed

Table 7. Well Purging

Name	High Est. Depth to Water (ft)	Drilled Depth (ft. BGS)	Drilled Diameter (ft)	Casing Length (ft)	Casing Volume (gal.)	3 Casing Volumes (gal.)
Caribou	15	165	0.5	150	29	88
Cross	15	205	0.5	190	37	112
Cabin	20	165	0.5	145	28	85

10 FIGURES



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Project: Groundwater Monitoring Plan

Title: **General Location**

GRAND ISLAND RESOURCES

Project No. US 0801			File No.	
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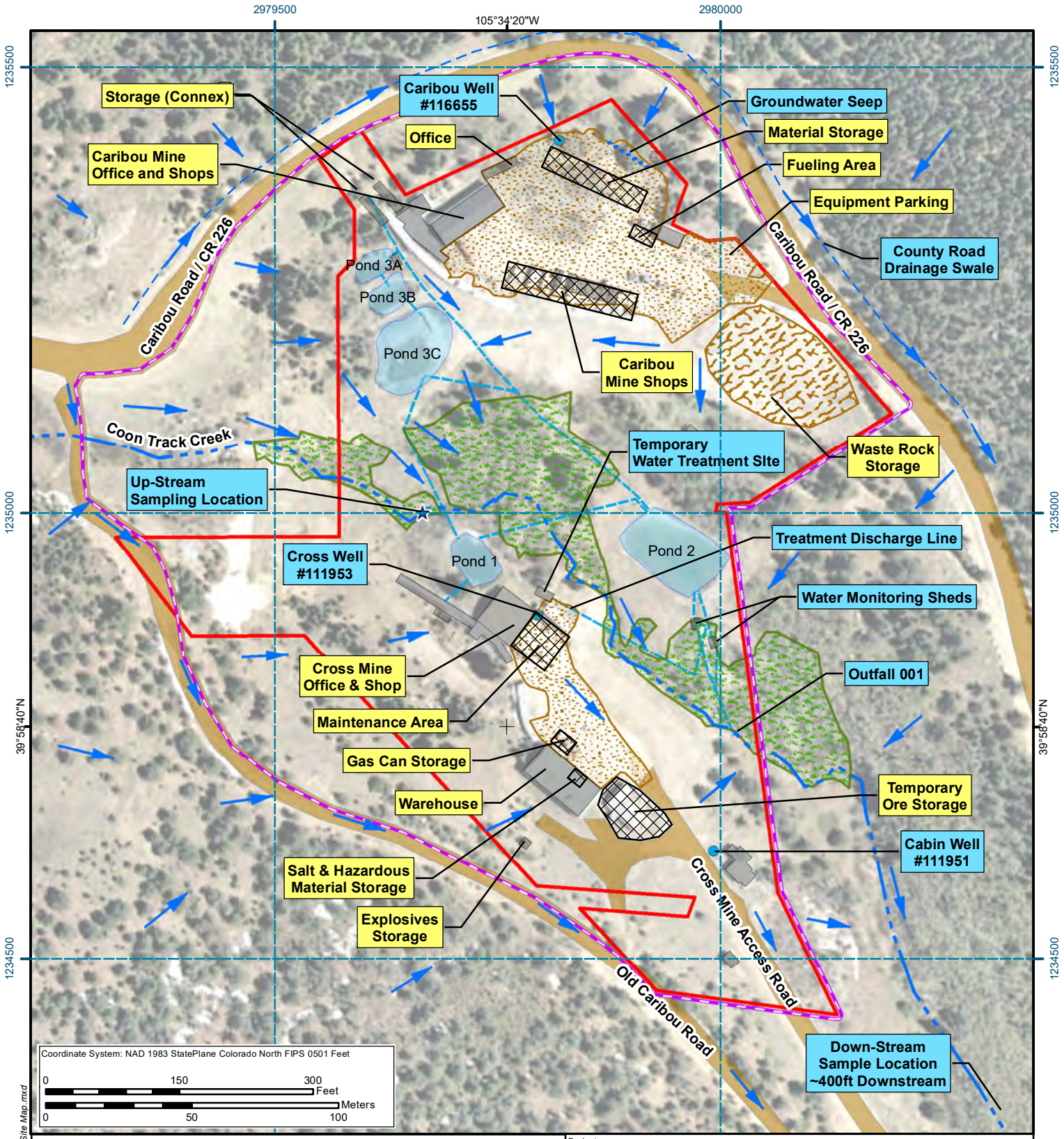
Review:	JST	11/22/21		



Permit Boundary (9.6 ac)
Groundwater Wells
Coon Track Creek Sampling Location
Mine Water Drainage Pipe
Stormwater Flow

Existing Roads
Parking
Settling Ponds
Wetlands
Buildings
Drainage Boundary
(Offset for mapping clarity)

Path: G:\Projects\Nederland\ArcMap\GW Plan\Map 2 - Site Map.mxd

Project: Groundwater Monitoring Plan

Title: **Site Map**

GRAND ISLAND RESOURCES

Project No. US 0801			File No.	
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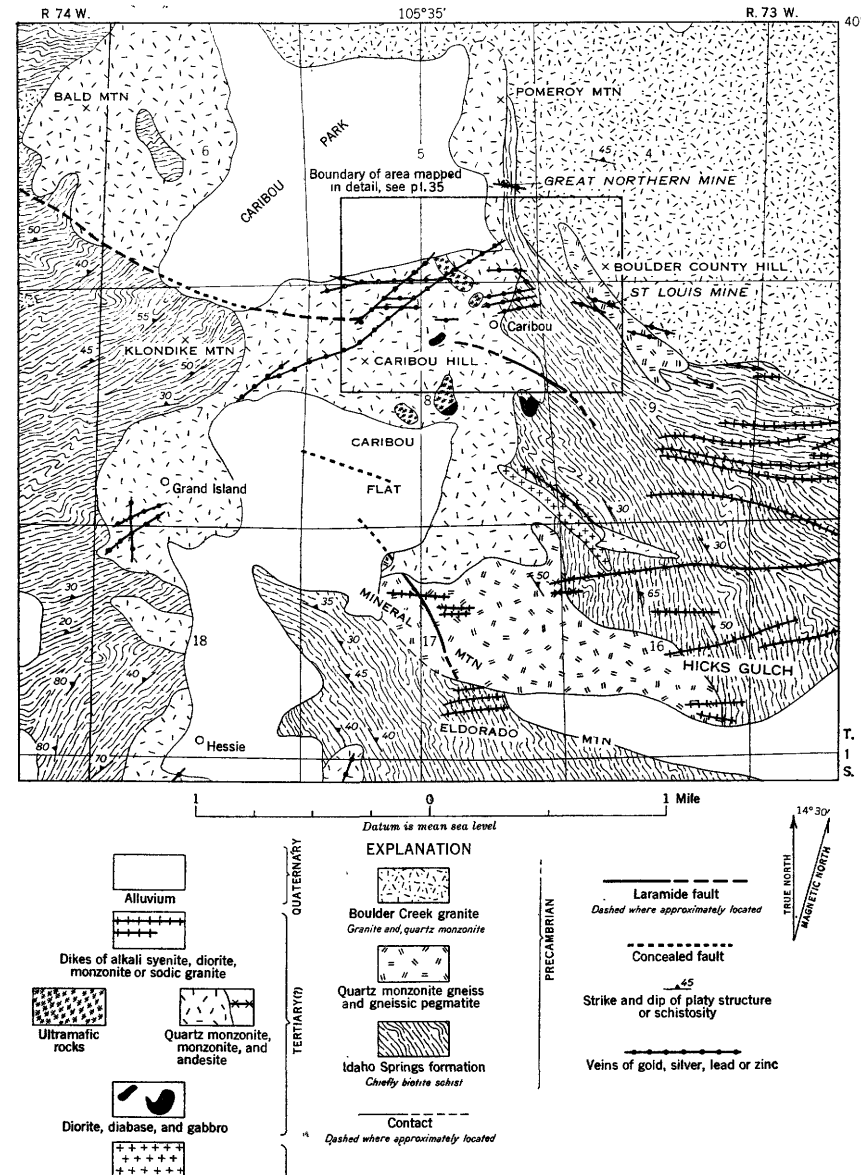
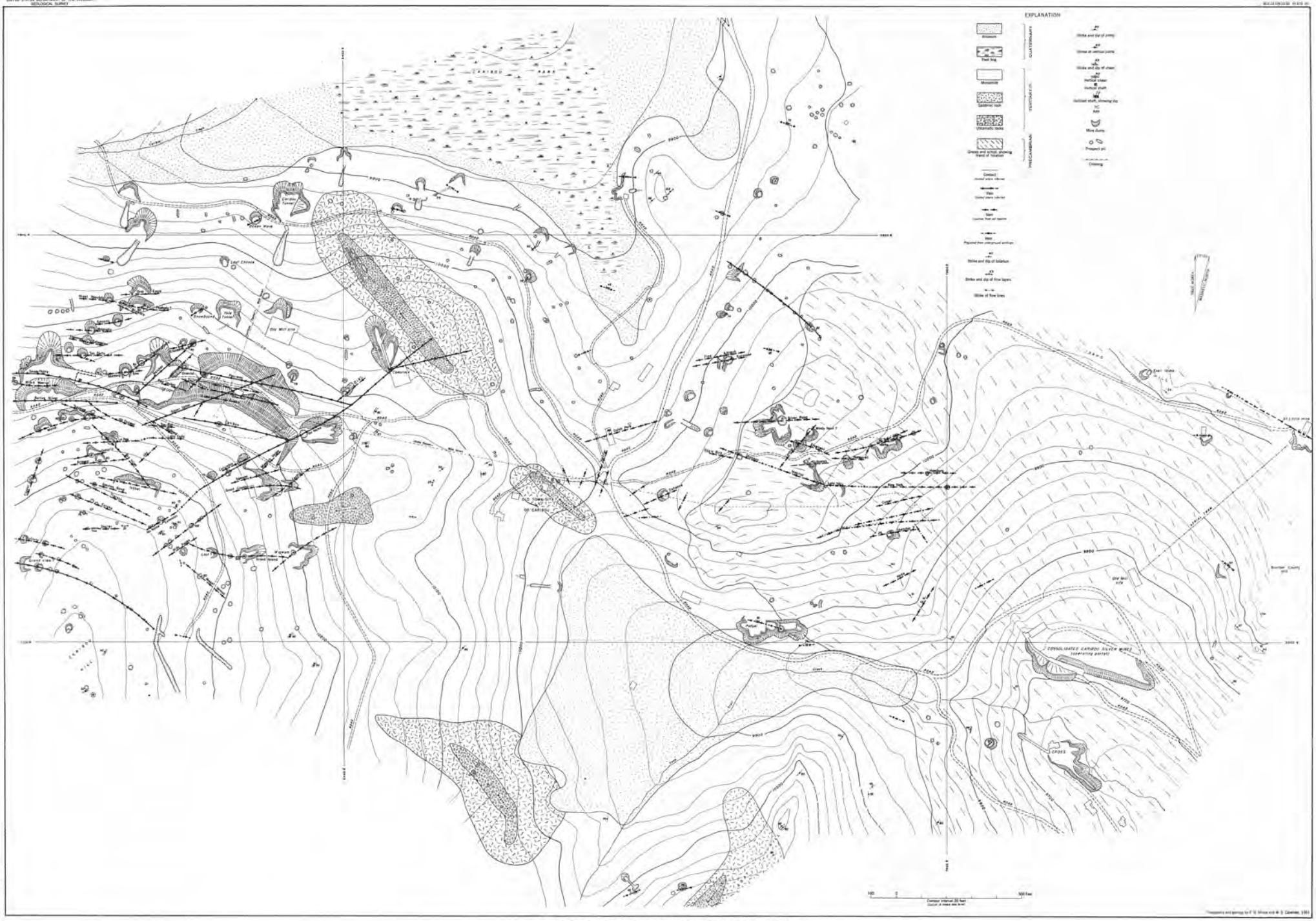
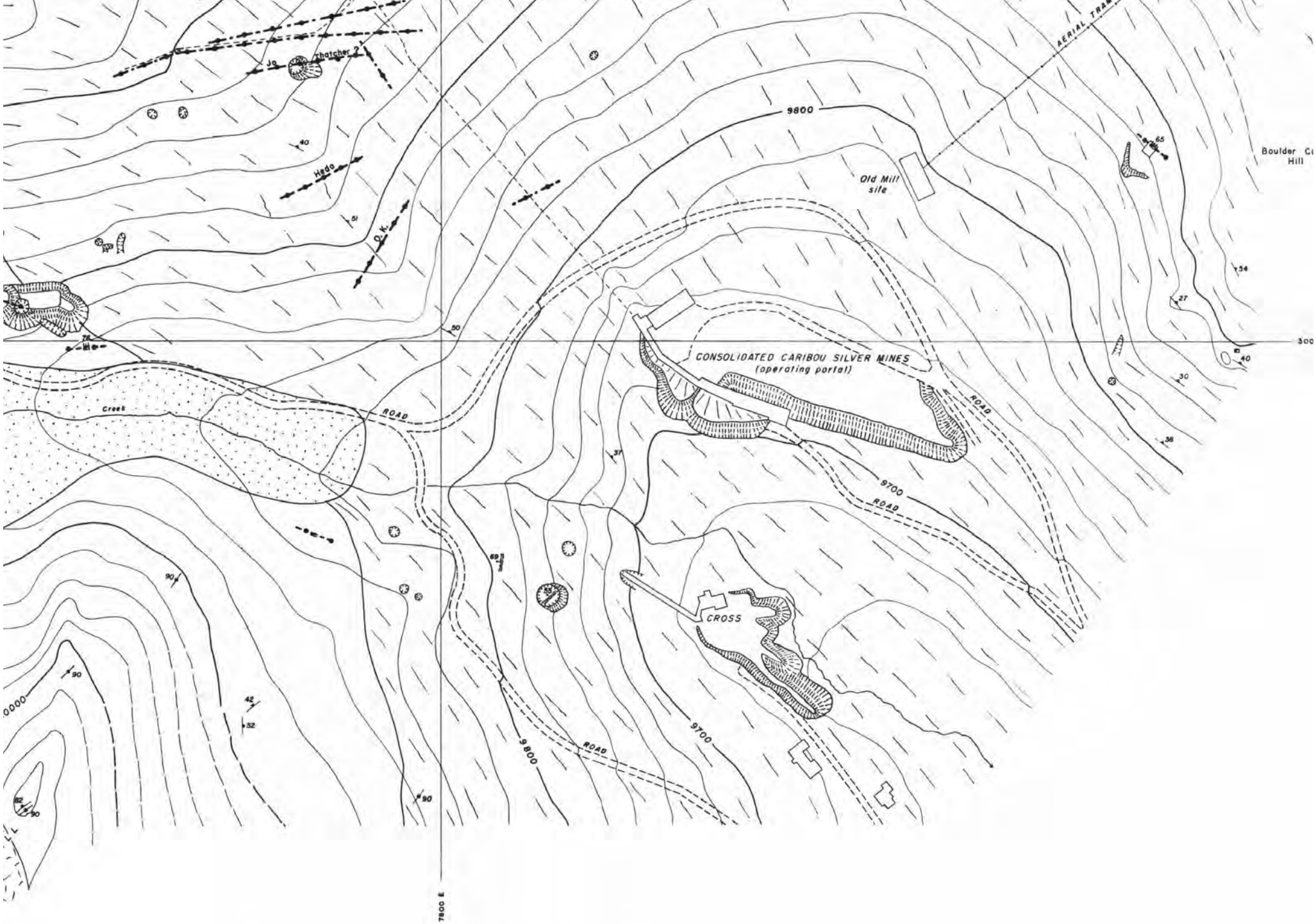
Review:	JST	11/22/21		


R 74 W.
105°35'
R. 73 W.
40
BALD MTN
PARK
CARIBOU
Boundary of area mapped in detail, see pl. 35
POMEROY MTN
GREAT NORTHERN MINE
BOULDER COUNTY HILL
ST LOUIS MINE
Caribou
CARIBOU HILL
KLONDIKE MTN
CARIBOU FLAT
Grand Island
MINERAL MTN
HICKS GULCH
ELDORADO MTN
Hessie
T. 1 S.
1 0 1 Mile
Datum is mean sea level
14°30'
TRUE NORTH
MAGNETIC NORTH
EXPLANATION
QUATERNARY
TERTIARY(?)
PRECAMBRIAN
Alluvium
Dikes of alkali syenite, diorite, monzonite or sodic granite
Ultramafic rocks
Quartz monzonite, monzonite, and andesite
Diorite, diabase, and gabbro
Pegmatite
Boulder Creek granite
Granite and quartz monzonite
Quartz monzonite gneiss and gneissic pegmatite
Idaho Springs formation
Chiefly biotite schist
Contact
Dashed where approximately located
Laramide fault
Dashed where approximately located
Concealed fault
Strike and dip of platy structure or schistosity
Veins of gold, silver, lead or zinc

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



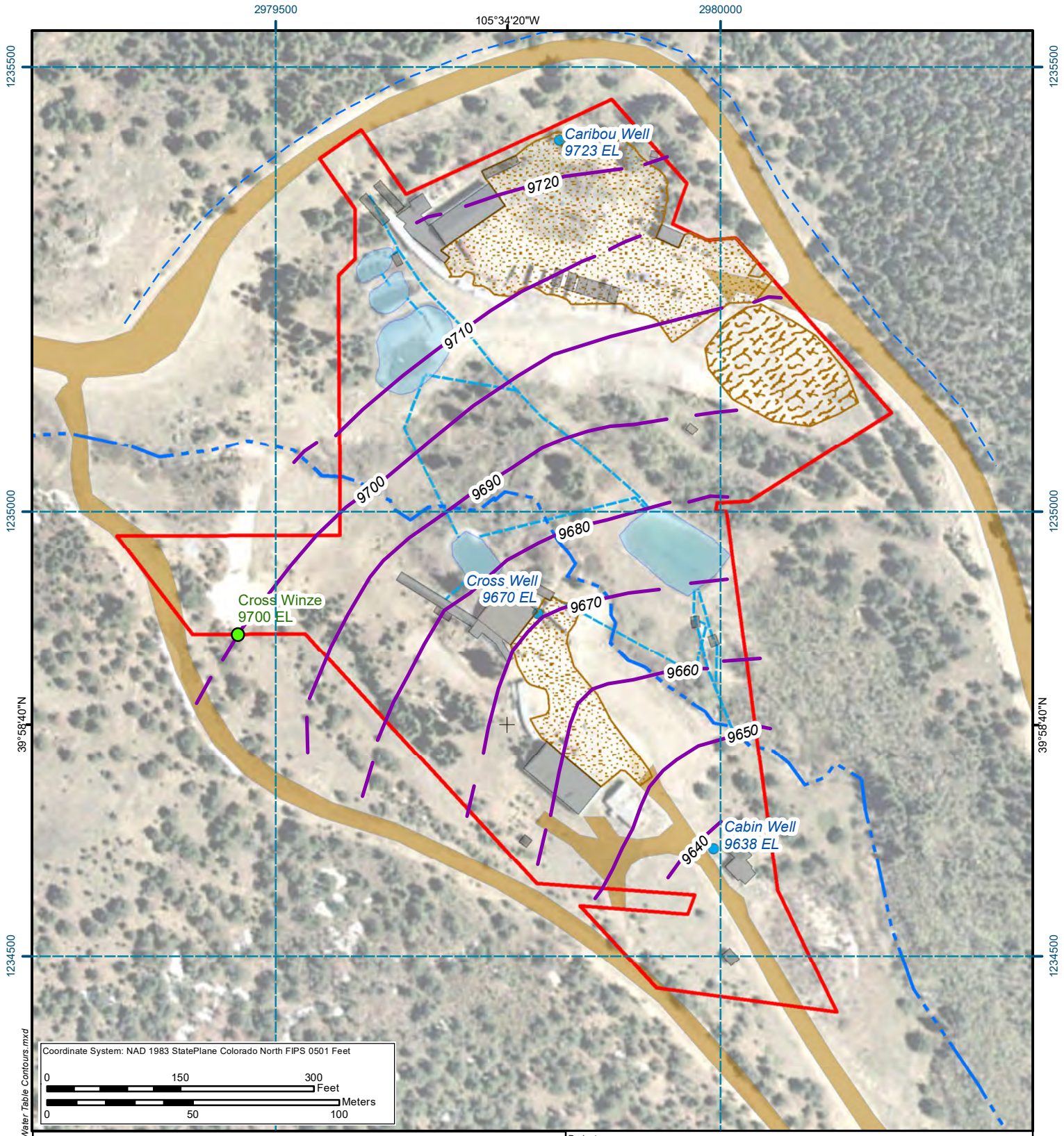
GEOLOGIC MAP OF THE CARIBOU AREA, BOULDER COUNTY, COLORADO



100 0 500 Feet

Contour interval 20 feet
Datum is mean sea level

Topography and geology by F. B. Moore and W. S. Cave



Path: G:\Projects\Nederland\ArcMap\GW Plan\Map 3 - Water Table Contours.mxd

Project: Groundwater Monitoring Plan

Title

Groundwater Table Contours
July 30, 2021

GRAND ISLAND RESOURCES

Project No. US 0801			File No.	
GIS:	JST	11/22/21	Scale As Shown	Rev 0
Check:	JST	11/22/21	Map 3	
Review:	JST	11/22/21		

Appendix A – Well Logs and Construction Diagrams

E

THIS FORM MUST BE SUBMITTED WITHIN 60 DAYS OF COMPLETION OF THE WORK DESCRIBED HEREON. TYPE OR PRINT IN BLACK INK.

COLORADO DIVISION OF WATER RESOURCES

1313 Sherman Street - Room 818
Denver, Colorado 80203

RECEIVED
NOV 13 1980
WATER RESOURCES
STATE ENGINEER
COLO.

WELL COMPLETION AND PUMP INSTALLATION REPORT

PERMIT NUMBER 111951

WELL OWNER Hendricks Mining Company

SW ¼ of the NW ¼ of Sec. 9

ADDRESS P.O. Box 653 Nederland, CO 80466

T. 1 S, R. 73 W, 6th P.M.

DATE COMPLETED November 3, 1980

WELL LOG

From	To	Type and Color of Material	Water Loc.

TOTAL DEPTH

Use additional pages necessary to complete log.

HOLE DIAMETER

in. from to ft.

in. from to ft.

in. from to ft.

DRILLING METHOD

CASING RECORD: **Plain Casing**

Size & kind from to ft.

Size & kind from to ft.

Size & kind from to ft.

Perforated Casing

Size & kind from to ft.

Size & kind from to ft.

Size & kind from to ft.

GROUTING RECORD

Material

Intervals

Placement Method

GRAVEL PACK: Size

Interval

TEST DATA

Date Tested , 19

Static Water Level Prior to Test ft.

Type of Test Pump

Length of Test

Sustained Yield (Metered)

Final Pumping Water Level

PUMP INSTALLATION REPORT

Pump Make McDonalds

Type submersible

Powered by 115V HP 1/3

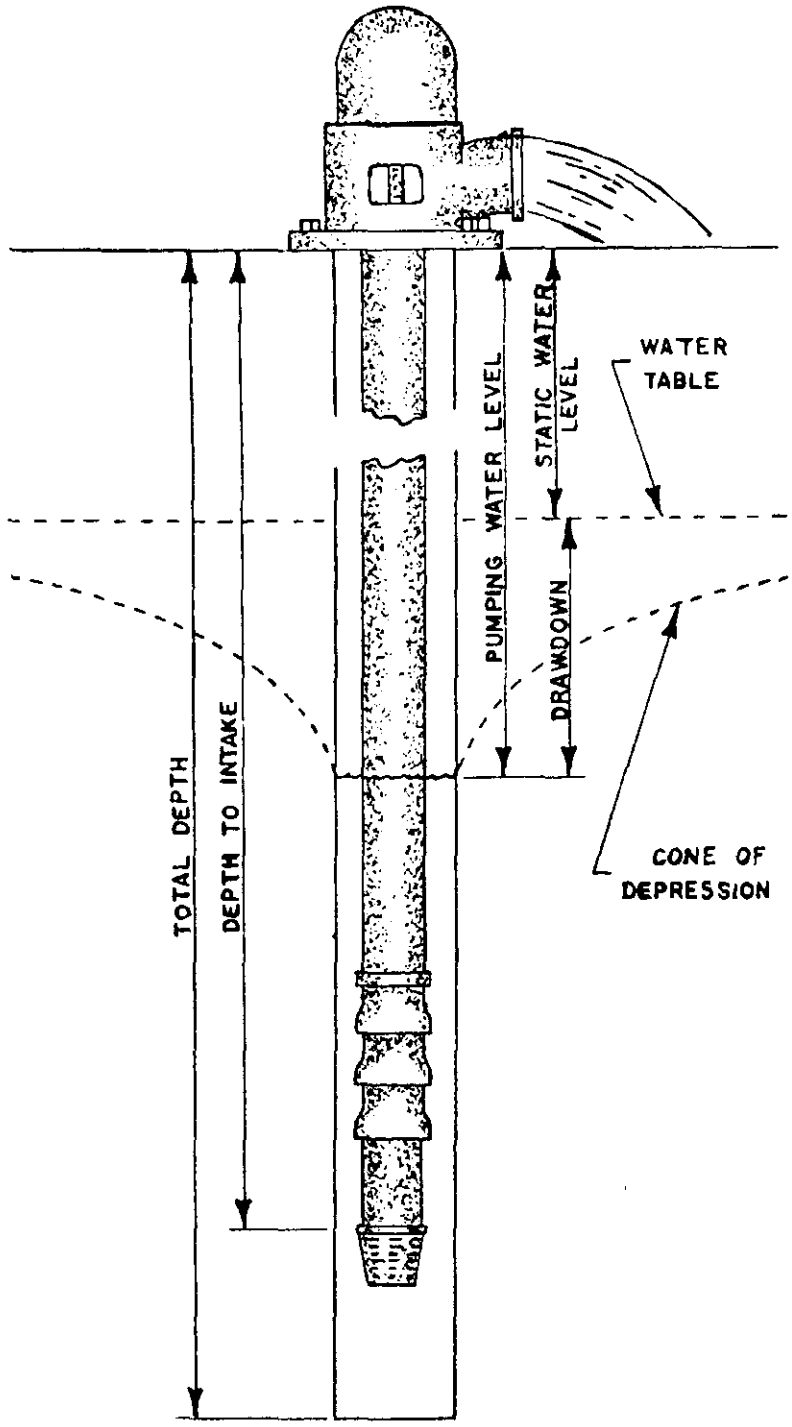
Pump Serial No. J80914S

Motor Serial No. NA

Date Installed September 3, 1980

Pump Intake Depth 150'

Remarks



WELL TEST DATA WITH PERMANENT PUMP

Date Tested not tested

Static Water Level Prior to Test

Length of Test Hours

Sustained yield (Metered) GPM

Pumping Water Level

Remarks

CONTRACTORS STATEMENT

The undersigned, being duly sworn upon oath, deposes and says that he is the contractor of the well or pump installation described hereon; that he has read the statement made hereon; knows the content thereof, and that the same is true of his own knowledge.

Signature Lloyd H Miller License No. 625

State of Colorado, County of Boulder SS

Subscribed and sworn to before me this 11 day of November, 1980.

My Commission expires July 3, 1982

My Commission expires: , 19 .

Notary Public Roi English

FORM TO BE MADE OUT IN QUADRUPLICATE: WHITE FORM must be an original copy on both sides and signed. WHITE AND GREEN copies must be filed with the State Engineer. PINK COPY is for the Owner and YELLOW COPY is for the Driller.

W.R.-20-77

THIS FORM MUST BE SUBMITTED WITHIN 60 DAYS OF COMPLETION OF THE WORK DESCRIBED HEREON. TYPE OR PRINT IN BLACK INK.

COLORADO DIVISION OF WATER RESOURCES

1313 Sherman Street - Room 818
Denver, Colorado 80203

WELL COMPLETION AND PUMP INSTALLATION REPORT

PERMIT NUMBER 111951

RECEIVED
DEC 3 1 1979
WATER RESOURCES
STATE ENGINEER
COLO.

WELL OWNER Tom Hendricks
ADDRESS PO Box 653 Nederland, CO 80466

SW ¼ of the NW ¼ of Sec. 9
T. 1 S , R. 73 N , 6th P.M.

DATE COMPLETED December 21 , 1979

WELL LOG

From	To	Type and Color of Material	Water Loc.
0	3	Fill	
3	42	Overburden	
42	75	Brown granite	
75	80	Granite/quartz	
80	145	Grey granite	
145	150	Quartz	
150	165	Grey granite	
		5 GPM @ 75'	
		20 GPM @ 145'	

The testing of production of water from this well [illegible] by this report, is [illegible] upon conditions [illegible] date of testing and does not reflect any projection as to future production. This [illegible] dependent upon future [illegible]

TOTAL DEPTH 165'

Use additional pages necessary to complete log.

HOLE DIAMETER

9 in. from 0 to 50 ft.
6 in. from 50 to 165 ft.
in. from to ft.

DRILLING METHOD Air percussion

CASING RECORD: Plain Casing

Size 6 5/8& kind Steel from -1 to 50 ft.
Size 4 1/2& kind PVC from 15 to 65 ft.
Size & kind from to ft.

Perforated Casing

Size 4 1/2& kind PVC from 65 to 165 ft.
Size & kind from to ft.
Size & kind from to ft.

GROUTING RECORD

Material Cement
Intervals 15' - 60'
Placement Method Poured

GRAVEL PACK: Size N A
Interval

TEST DATA

Date Tested December 21 , 1979
Static Water Level Prior to Test ft.
Type of Test Pump Air
Length of Test One hour
Sustained Yield (Metered) 25 GPM
Final Pumping Water Level 165'

WRJ 5 Rev. 7/

COLORADO DIVISION OF WATER RESOURCES

818 Centennial Bldg., 1313 Sherman St., Denver, Colorado 80203

RECEIVED
NOV 19 1979
WATER RESOURCES
STATE ENGINEER
COLO.

RECEIVED
OCT 10 1979
WATER RESOURCES
STATE ENGINEER
COLO.

PERMIT APPLICATION FORM

Application must be complete where applicable. Type or print in BLACK INK. No overstrikes or erasures unless initialed.

FOR: (X) A PERMIT TO USE GROUND WATER
(X) A PERMIT TO CONSTRUCT A WELL
(X) A PERMIT TO INSTALL A PUMP
( ) REPLACEMENT FOR NO. _____
( ) OTHER _____
WATER COURT CASE NO. _____

(1) APPLICANT - mailing address

NAME Tom Hendricks
STREET PO Box 653
CITY Nederland, CO (State) 80466 (Zip)
TELEPHONE NO. 258-3806

(2) LOCATION OF PROPOSED WELL

County Boulder
SW ¼ of the NW ¼, Section 9
Twp 1 S (N.S) Rng 73 W (E.W) 6th P.M.

(3) WATER USE AND WELL DATA

Proposed maximum pumping rate (gpm) 15
Average annual amount of ground water to be appropriated (acre-feet): 1
Number of acres to be irrigated. 0
Proposed total depth (feet): 200
Aquifer ground water is to be obtained from: Granite
Owner's well designation _____

GROUND WATER TO BE USED FOR:

(X) HOUSEHOLD USE ONLY no irrigation (0)
( ) DOMESTIC (1) ( ) INDUSTRIAL (5)
( ) LIVESTOCK (2) ( ) IRRIGATION (6)
( ) COMMERCIAL (4) ( ) MUNICIPAL (8)
( ) OTHER (9) _____
DETAIL THE USE ON BACK IN (11)

(4) DRILLER

Name Norris & Sons Drilling Co.
Street 4599 North Broadway
City Boulder, CO (State) 80302 (Zip)
Telephone No. 442-4083 Lic. No. 716

FOR OFFICE USE ONLY: DO NOT WRITE IN THIS COLUMN

Receipt No. 11941 A
Basin _____ Dist. _____

CONDITIONS OF APPROVAL

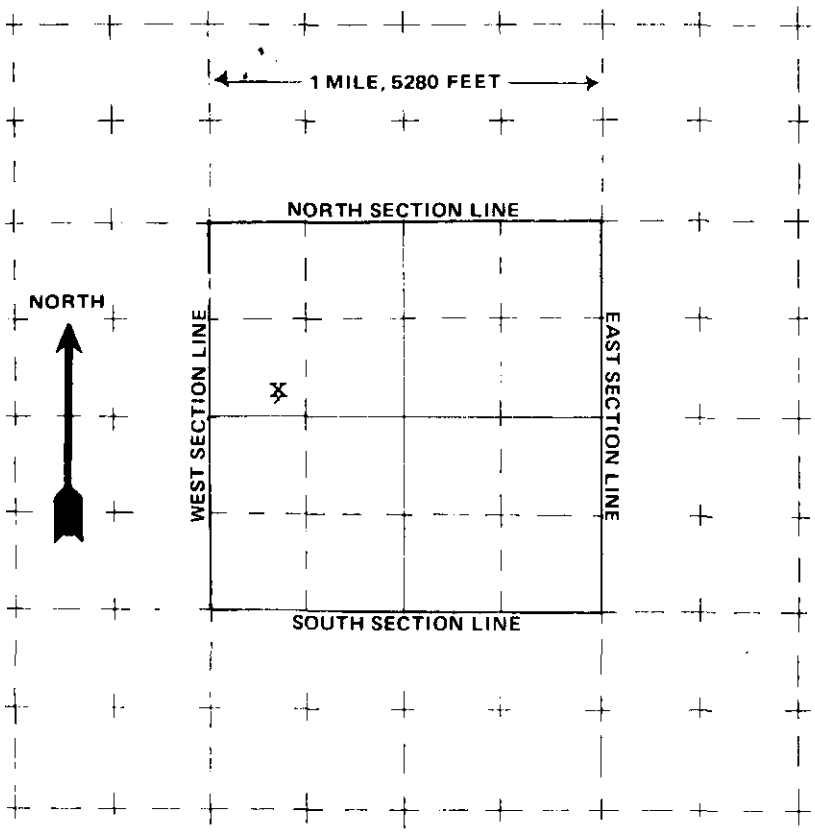
This well shall be used in such a way as to cause no material injury to existing water rights. The issuance of the permit does not assure the applicant that no injury will occur to another vested water right or preclude another owner of a vested water right from seeking relief in a civil court action.

APPROVED FOR HOUSEHOLD USE ONLY, FOR ONE (1) SINGLE FAMILY DWELLING AND NOT TO BE USED FOR IRRIGATION. THE RETURN FLOW FROM THE USE OF THIS WELL MUST BE RETURNED TO THE SAME STREAM SYSTEM IN WHICH THE WELL IS LOCATED.

APPLICATION APPROVED

PERMIT NUMBER 11951
DATE ISSUED NOV 30 1979
EXPIRATION DATE NOV 30 1981
Bruce E. DeBrine (STATE ENGINEER)
BY DEPUTY R.D. Hanbold
ID 166 COUNTY 07

(5) THE LOCATION OF THE PROPOSED WELL and the area on which the water will be used must be indicated on the diagram below. Use the CENTER SECTION (1 section, 640 acres) for the well location.



The scale of the diagram is 2 inches = 1 mile
Each small square represents 40 acres.

WATER EQUIVALENTS TABLE (Rounded Figures)

An acre-foot covers 1 acre of land 1 foot deep
1 cubic foot per second (cfs) . . . 449 gallons per minute (gpm)
A family of 5 will require approximately 1 acre-foot of water per year.
1 acre-foot . . . 43,560 cubic feet . . . 325,900 gallons.
1,000 gpm pumped continuously for one day produces 4.42 acre-feet.

(6) THE WELL MUST BE LOCATED BELOW by distances from section lines.

2200 ft. from North (north or south) sec. line

1000 ft. from West (east or west) sec. line

LOT _____ BLOCK _____ FILING # _____

SUBDIVISION Rare Metals Mill Site #20681-B

(7) TRACT ON WHICH WELL WILL BE LOCATED Owner: Same

No. of acres 5 . Will this be the only well on this tract? Yes

(8) PROPOSED CASING PROGRAM

Plain Casing

6 5/8 in. from -1 ft. to 20 ft.

_____ in. from _____ ft. to _____ ft.

Perforated casing

4 1/2 in. from 15 ft. to 200 ft.

_____ in. from _____ ft. to _____ ft.

(9) FOR REPLACEMENT WELLS give distance and direction from old well and plans for plugging it:

(10) LAND ON WHICH GROUND WATER WILL BE USED:

Owner(s): Tom Hendricks No. of acres: 5

Legal description: SW¼ of NW¼, Sec. 9, T 1S, R 73W

(11) DETAILED DESCRIPTION of the use of ground water: **Household use and domestic wells must indicate type of disposal system to be used.**

Household use only -- septic tank with absorption bed

(12) OTHER WATER RIGHTS used on this land, including wells. Give Registration and Water Court Case Numbers.

Type or right	Used for (purpose)	Description of land on which used
None		

(13) THE APPLICANT(S) STATE(S) THAT THE INFORMATION SET FORTH HEREON IS TRUE TO THE BEST OF HIS KNOWLEDGE.

Thomas S. Hendricks

SIGNATURE OF APPLICANT(S)

Use additional sheets of paper if more space is required.

E

THIS FORM MUST BE SUBMITTED WITHIN 60 DAYS OF COMPLETION OF THE WORK DESCRIBED HEREON. TYPE OR PRINT IN BLACK INK.

COLORADO DIVISION OF WATER RESOURCES

1313 Sherman Street - Room 818
Denver, Colorado 80203

WELL COMPLETION AND PUMP INSTALLATION REPORT

PERMIT NUMBER 111953

RECEIVED
NOV 13 1980
WATER RESOURCES
STATE ENGINEER
COLO.

WELL OWNER Hendricks Mining Company

ADDRESS P.O. Box 653, Nederland, CO 80466

DATE COMPLETED September 3, 19 80

SW ¼ of the NW ¼ of Sec 9

T. 1 S, R. 73 W 6th P.M.

WELL LOG

From	To	Type and Color of Material	Water Loc.

TOTAL DEPTH

Use additional pages necessary to complete log.

HOLE DIAMETER

in. from to ft.

in. from to ft.

in. from to ft.

DRILLING METHOD

CASING RECORD: Plain Casing

Size & kind from to ft.

Size & kind from to ft.

Size & kind from to ft.

Perforated Casing

Size & kind from to ft.

Size & kind from to ft.

Size & kind from to ft.

GROUTING RECORD

Material

Intervals

Placement Method

GRAVEL PACK: Size

Interval

TEST DATA

Date Tested , 19

Static Water Level Prior to Test ft.

Type of Test Pump

Length of Test

Sustained Yield (Metered)

Final Pumping Water Level

PUMP INSTALLATION REPORT

Pump Make Jacuzzi

Type 3 - wire submersible

Powered by 230V HP 3/4

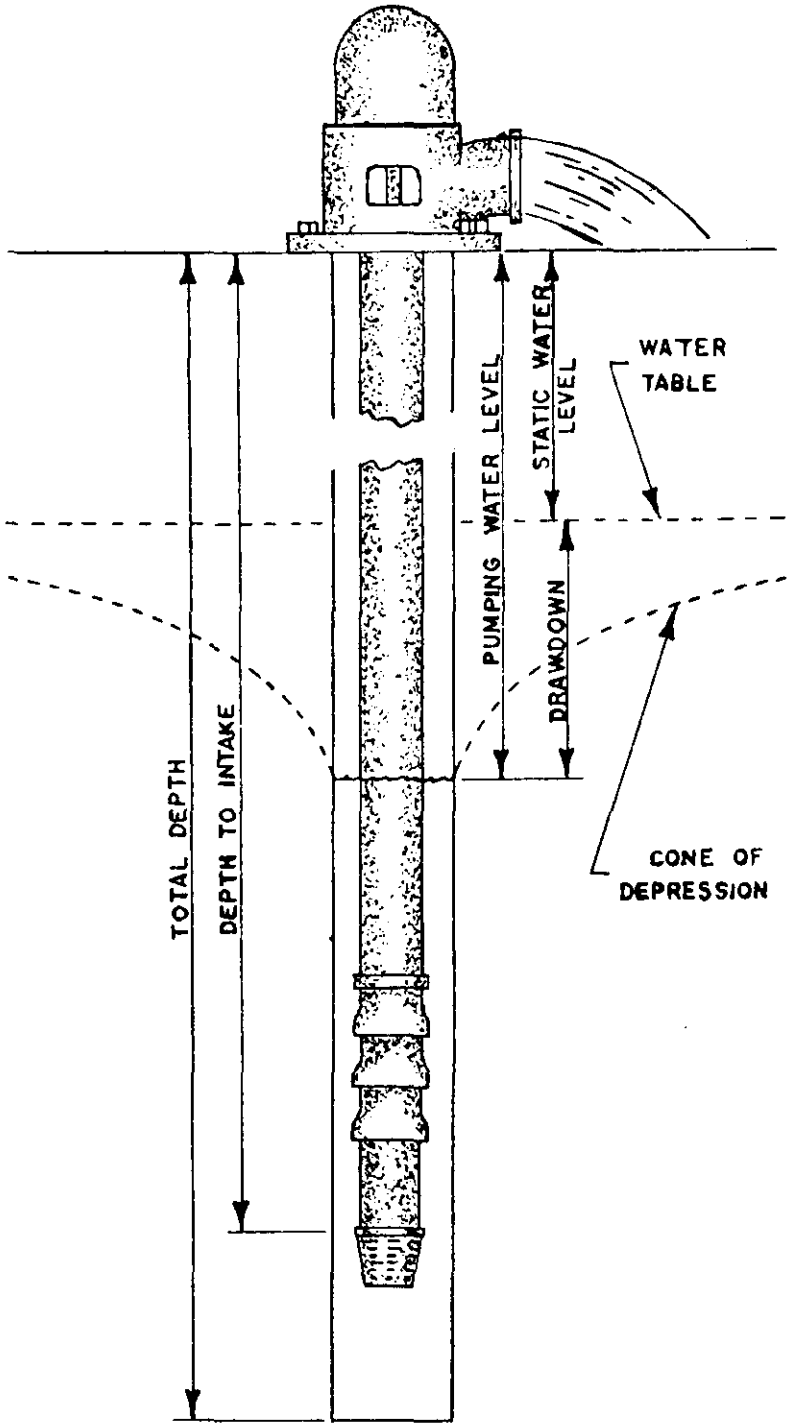
Pump Serial No. 7S4B-S2

Motor Serial No. NA

Date Installed 9/3/80

Pump Intake Depth 190'

Remarks



WELL TEST DATA WITH PERMANENT PUMP

Date Tested not tested

Static Water Level Prior to Test

Length of Test Hours

Sustained yield (Metered) GPM

Pumping Water Level

Remarks

CONTRACTORS STATEMENT

The undersigned, being duly sworn upon oath, deposes and says that he is the contractor of the well or pump installation described hereon; that he has read the statement made hereon; knows the content thereof, and that the same is true of his own knowledge.

Signature Lloyd H Miller License No 625

State of Colorado, County of Boulder SS

Subscribed and sworn to before me this 11 day of November, 1980.

My Commission expires July 3, 1982

My Commission expires: , 19 .

Notary Public Lou English

FORM TO BE MADE OUT IN QUADRUPLICATE: WHITE FORM must be an original copy on both sides and signed. WHITE AND GREEN copies must be filed with the State Engineer. PINK COPY is for the Owner and YELLOW COPY is for the Driller.

THIS FORM MUST BE SUBMITTED WITHIN 60 DAYS OF COMPLETION OF THE WORK DESCRIBED HEREON. TYPE OR PRINT IN BLACK INK.

COLORADO DIVISION OF WATER RESOURCES

1313 Sherman Street - Room 818
Denver, Colorado 80203

RECEIVED
AUG 01 1980
WATER RESOURCES
STATE ENGINEER
COLO.

RECEIVED
JUN 26 1980
WATER RESOURCES
STATE ENGINEER
COLO.

WELL COMPLETION AND PUMP INSTALLATION REPORT

PERMIT NUMBER 111953

WELL OWNER Hendricks Mining Co.
PO Box 653
ADDRESS Nederland, CO 80466

SW ¼ of the NW ¼ of Sec. 9
T 1 S, R 73 W, 6th P.M.

DATE COMPLETED June 19, 1980

WELL LOG

From	To	Type and Color of Material	Water Loc.
0	39	Overburden	
39	75	Schist with quartz	
75	205	Granite	
		25 GPM @ 175'	

The testing of production of water from this well, as reflected by this report, is totally dependent upon conditions existing as of the date of testing and does not reflect any projection as to future production. This is dependent upon future conditions.

TOTAL DEPTH 205'

Use additional pages necessary to complete log.

HOLE DIAMETER

9 in. from 0 to 40 ft.
5 7/8 in. from 40 to 205 ft.
___ in. from ___ to ___ ft.

DRILLING METHOD Air percussion

CASING RECORD:

Plain Casing

Size 6 5/8 & kind Steel from -1 to 40 ft.
Size ___ & kind ___ from ___ to ___ ft.
Size ___ & kind ___ from ___ to ___ ft.

Perforated Casing

Size 4 1/2 & kind PVC from 15 to 205 ft.
Size ___ & kind ___ from ___ to ___ ft.
Size ___ & kind ___ from ___ to ___ ft.

GROUTING RECORD

Material Cement
Intervals 8' - 40'
Placement Method Poured

GRAVEL PACK: Size N A
Interval ___

TEST DATA

Date Tested June 19, 1980
Static Water Level Prior to Test 35 ft.
Type of Test Pump Air
Length of Test One hour
Sustained Yield (Metered) 25 GPM
Final Pumping Water Level 205'

PUMP INSTALLATION REPORT

Pump Make _____

Type _____

Powered by _____ HP _____

Pump Serial No. _____

Motor Serial No. _____

Date Installed _____

Pump Intake Depth _____

Remarks _____

_____

WELL TEST DATA WITH PERMANENT PUMP

Date Tested _____

Static Water Level Prior to Test _____

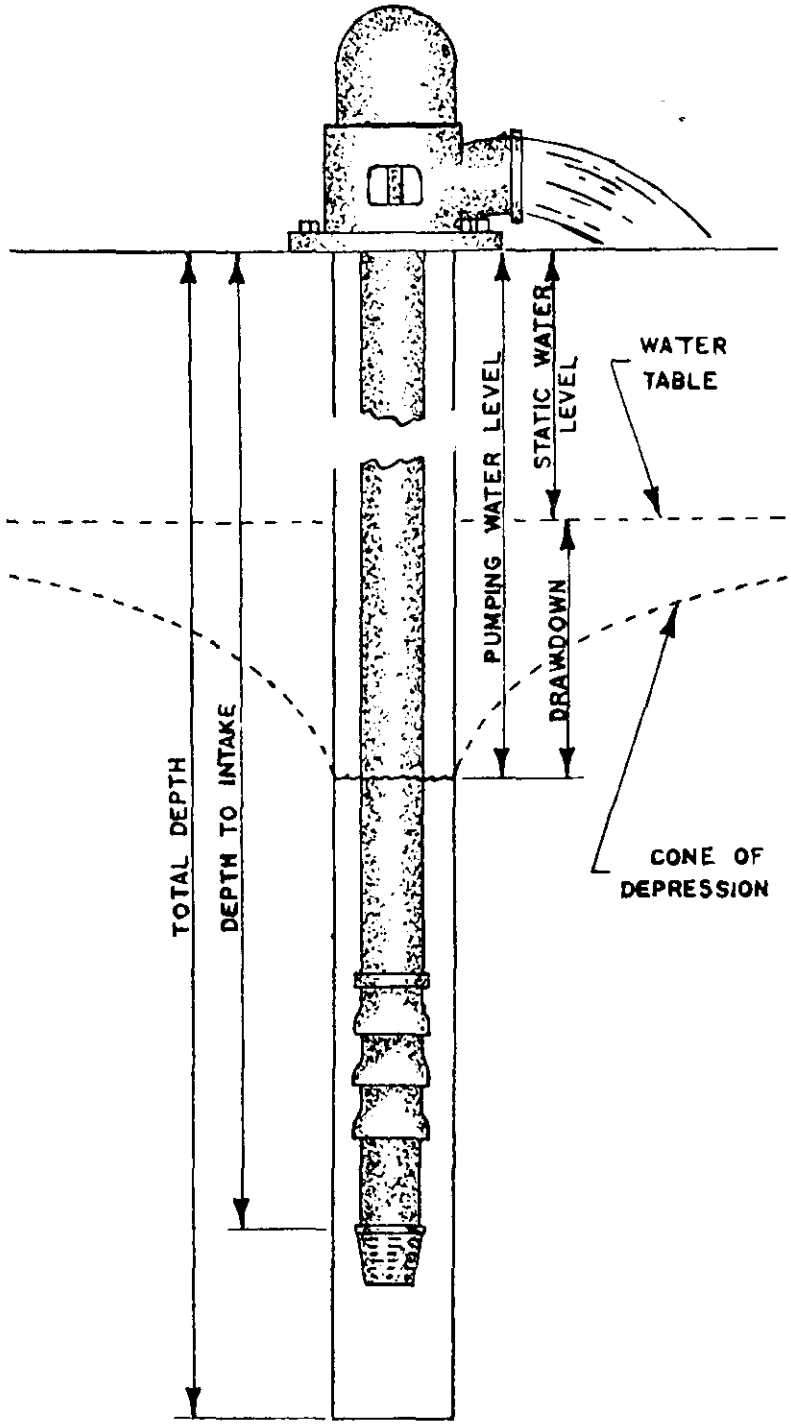
Length of Test _____ Hours

Sustained yield (Metered) _____ GPM

Pumping Water Level _____

Remarks _____

_____



CONTRACTORS STATEMENT

The undersigned, being duly sworn upon oath, deposes and says that he is the contractor of the well or pump installation described hereon; that he has read the statement made hereon; knows the content thereof, and that the same is true of his own knowledge.

Signature Richard R. Wilson License No. 716

State of Colorado, County of Boulder SS

Subscribed and sworn to before me this 23 day of June, 1980.

My Commission expires: Febr. 22, 19 84.

Notary Public Roger H. Williams

FORM TO BE MADE OUT IN QUADRUPLICATE: WHITE FORM must be an original copy on both sides and signed. WHITE AND GREEN copies must be filed with the State Engineer. PINK COPY is for the Owner and YELLOW COPY is for the Driller.

WRJ-S-Rev. 76

COLORADO DIVISION OF WATER RESOURCES

818 Centennial Bldg., 1313 Sherman St., Denver, Colorado 80203

RECEIVED
OCT 19 1979
WATER RESOURCES
STATE ENGINEER
COLO.

RECEIVED
OCT 10 1979
WATER RESOURCES
STATE ENGINEER
COLO.

PERMIT APPLICATION FORM

Application must be complete where applicable. Type or print in BLACK INK. No overstrikes or erasures unless initialed.

FOR: (X) A PERMIT TO USE GROUND WATER
(X) A PERMIT TO CONSTRUCT A WELL
(X) A PERMIT TO INSTALL A PUMP
( ) REPLACEMENT FOR NO. _____
( ) OTHER _____
WATER COURT CASE NO. _____

(1) APPLICANT · mailing address

NAME Hendricks Mining Co.

STREET PO Box 653

CITY Nederland, Colorado (State) 80466 (Zip)

TELEPHONE NO. 258-3806

(2) LOCATION OF PROPOSED WELL

County Boulder

SW ¼ of the NW ¼, Section 9

Twp. 1 S (N.S.) Rng. 73 W (E.W.) 6th P.M.

(3) WATER USE AND WELL DATA

Proposed maximum pumping rate (gpm) 15

Average annual amount of ground water to be appropriated (acre-feet): 1

Number of acres to be irrigated: 0

Proposed total depth (feet): 200

Aquifer ground water is to be obtained from:

Granite

Owner's well designation None

GROUND WATER TO BE USED FOR:

(X) HOUSEHOLD USE ONLY no irrigation (0)
( ) DOMESTIC (1)
( ) LIVESTOCK (2)
( ) COMMERCIAL (4)
( ) INDUSTRIAL (5)
( ) IRRIGATION (6)
( ) MUNICIPAL (8)
( ) OTHER (9)

DETAIL THE USE ON BACK IN (11)

(4) DRILLER

Name Norris & Sons Drilling Co.

Street 4599 No. Broadway

City Boulder, CO (State) 80302 (Zip)

Telephone No. 442-4083 Lic. No. 716

FOR OFFICE USE ONLY: DO NOT WRITE IN THIS COLUMN

Receipt No. 11944 B

Basin _____ Dist. _____

CONDITIONS OF APPROVAL

This well shall be used in such a way as to cause no material injury to existing water rights. The issuance of the permit does not assure the applicant that no injury will occur to another vested water right or preclude another owner of a vested water right from seeking relief in a civil court action.

APPROVED PURSUANT TO CRS 1973, 37-92-602 (1)(c) FOR DRINKING AND SANITARY FACILITIES ONLY AT THE CROSS MILL MINING SITE # 20681-B.

AVERAGE DAILY APPROPRIATION FROM THIS WELL SHALL NOT EXCEED 300 GALLONS

APPLICATION APPROVED

PERMIT NUMBER 11953

DATE ISSUED NOV 30 1979

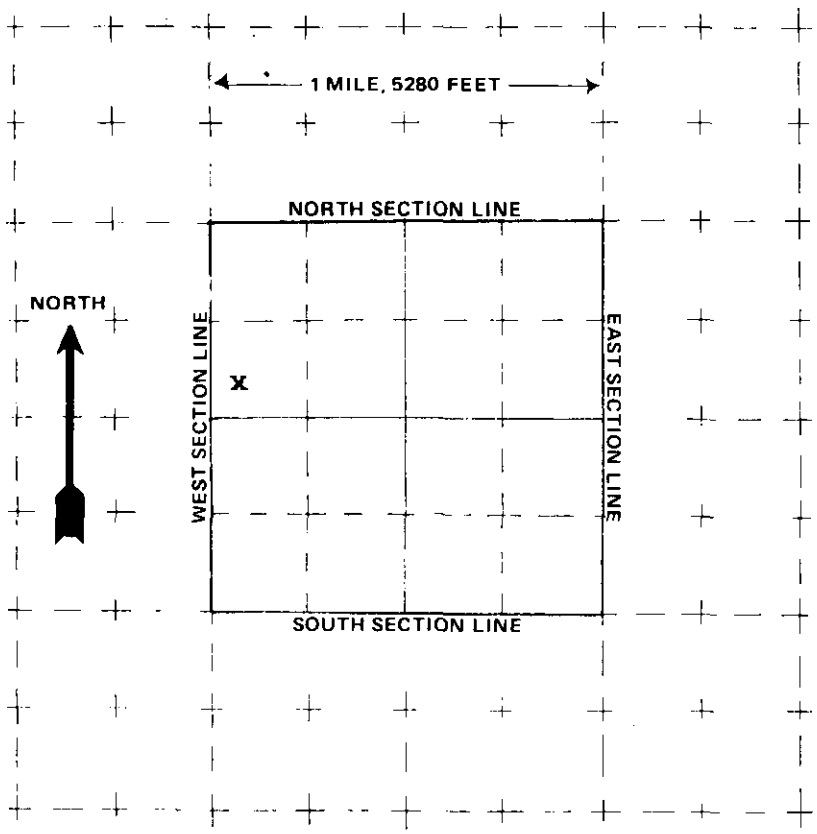
EXPIRATION DATE NOV 30 1981

Bruce E. DeBrine (STATE ENGINEER)

BY DEPUTY R.A. Saubold

I.D. ICC COUNTY 07

(5) THE LOCATION OF THE PROPOSED WELL and the area on which the water will be used must be indicated on the diagram below. Use the CENTER SECTION (1 section, 640 acres) for the well location.



The scale of the diagram is 2 inches = 1 mile
Each small square represents 40 acres.

WATER EQUIVALENTS TABLE (Rounded Figures)
An acre-foot covers 1 acre of land 1 foot deep
1 cubic foot *per second (cfs)* . . . 449 *gallons per minute (gpm)*
A family of 5 will require approximately 1 acre-foot of water per year.
1 acre-foot . . . 43,560 cubic feet . . . 325,900 gallons.
1,000 gpm pumped continuously for one day produces 4.42 acre-feet.

(6) THE WELL MUST BE LOCATED BELOW by distances from section lines.

1900 ft. from North (north or south) sec. line

650 ft. from West (east or west) sec. line

LOT _____ BLOCK _____ FILING # _____

SUBDIVISION Cross Mill Site #20681-B

(7) TRACT ON WHICH WELL WILL BE LOCATED Owner: Same

No. of acres 5 . Will this be the only well on this tract? Yes

(8) PROPOSED CASING PROGRAM

Plain Casing

6 5/8 in. from -1 ft. to 20 ft.

_____ in. from _____ ft. to _____ ft.

Perforated casing

4 1/2 in. from 15 ft. to 200 ft.

_____ in. from _____ ft. to _____ ft.

(9) FOR REPLACEMENT WELLS give distance and direction from old well and plans for plugging it:

(10) LAND ON WHICH GROUND WATER WILL BE USED:

Owner(s): Hendericks Mining Co. No. of acres: 5

Legal description: SW¼ of NW¼, Sec. 9, T 1S, R 73W

(11) DETAILED DESCRIPTION of the use of ground water: **Household use and domestic wells must indicate type of disposal system to be used.**

Household Use Only -- Septic Tank with Absorption Bed
Sanitary Facilities for Mine

(12) OTHER WATER RIGHTS used on this land, including wells. Give Registration and Water Court Case Numbers.

Type or right	Used for (purpose)	Description of land on which used
None		

(13) THE APPLICANT(S) STATE(S) THAT THE INFORMATION SET FORTH HEREON IS TRUE TO THE BEST OF HIS KNOWLEDGE.

Thomas S. Hendricks

SIGNATURE OF APPLICANT(S)

Use additional sheets of paper if more space is required.

WJR-26-77

THIS FORM MUST BE SUBMITTED WITHIN 60 DAYS OF COMPLETION OF THE WORK DESCRIBED HEREON. TYPE OR PRINT IN BLACK INK.

COLORADO DIVISION OF WATER RESOURCES

1313 Sherman Street - Room 818
Denver, Colorado 80203

WELL COMPLETION AND PUMP INSTALLATION REPORT

PERMIT NUMBER 116655

RECEIVED
NOV 13 1980
WATER RESOURCES
STATE ENGINEER
COLO.

WELL OWNER HENDRICKS-GOOD MINING CO.
ADDRESS 3000 N. 63rd Street
Boulder, CO 80301

SW ¼ of the NW ¼ of Sec. 9,
T. 1 S, R. 73 W, 6th P.M.

DATE COMPLETED November 4, 1980

WELL LOG

From	To	Type and Color of Material	Water Loc.
0	10	Clay, gravel, boulders	
10	70	Schist	
70	90	Brown granite/quartz	
90	100	Grey granite	
100	165	Schist	
		12 GPM @ 70' - 90'	

The testing of production of water from this well, as reflected by this report, is totally dependent upon conditions existing as of the date of testing and does not reflect any projection as to future production. This is dependent upon future conditions.

TOTAL DEPTH 165'

Use additional pages necessary to complete log.

HOLE DIAMETER

9 in. from 0 to 26 ft.
6 in. from 26 to 165 ft.
___ in. from ___ to ___ ft.

DRILLING METHOD Air percussion

CASING RECORD:

Plain Casing

Size 6 5/8 & kind Steel from -1 to 26 ft.
Size 4 1/2 & kind PVC from 15 to 25 ft.
Size ___ & kind ___ from ___ to ___ ft.

Perforated Casing

Size 4 1/2 & kind PVC from 25 to 165 ft.
Size ___ & kind ___ from ___ to ___ ft.
Size ___ & kind ___ from ___ to ___ ft.

GROUTING RECORD

Material Cement
Intervals 8' - 26'
Placement Method Poured

GRAVEL PACK: Size N A
Interval

TEST DATA

Date Tested November 4, 1980
Static Water Level Prior to Test 20 ft.
Type of Test Pump Air
Length of Test One hour
Sustained Yield (Metered) 12 GPM
Final Pumping Water Level 165'

PUMP INSTALLATION REPORT

Pump Make _____

Type _____

Powered by _____ HP _____

Pump Serial No. _____

Motor Serial No. _____

Date Installed _____

Pump Intake Depth _____

Remarks _____

_____

WELL TEST DATA WITH PERMANENT PUMP

Date Tested _____

Static Water Level Prior to Test _____

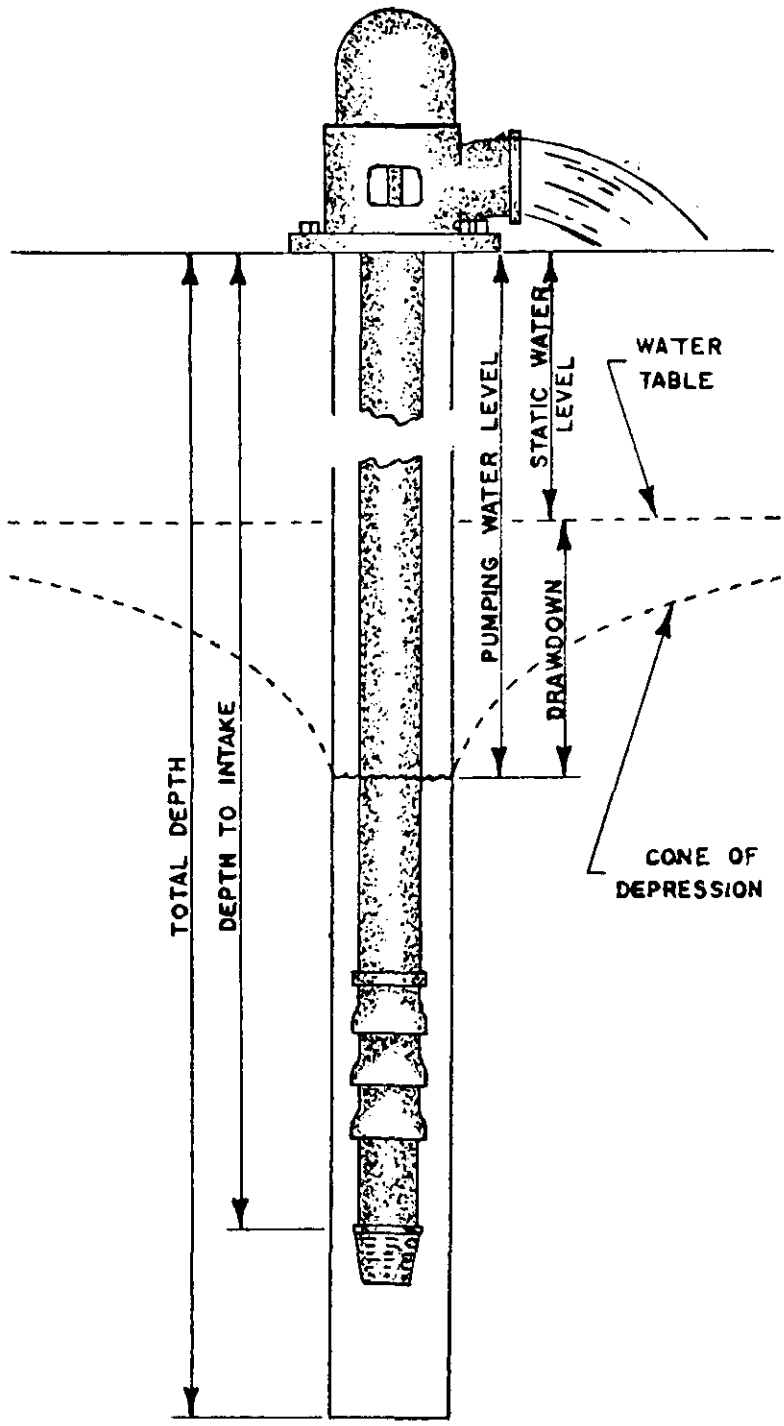
Length of Test _____ Hours

Sustained yield (Metered) _____ GPM

Pumping Water Level _____

Remarks _____

_____



CONTRACTORS STATEMENT

The undersigned, being duly sworn upon oath, deposes and says that he is the contractor of the well or pump installation described hereon; that he has read the statement made hereon; knows the content thereof, and that the same is true of his own knowledge.

Signature Richard R. Wilson License No. 716

State of Colorado, County of Boulder SS

Subscribed and sworn to before me this 5 day of November, 1980.

My Commission expires: Febr. 22, 1984.

Notary Public Roger H. Williams

FORM TO BE MADE OUT IN QUADRUPLICATE: WHITE FORM must be an original copy on both sides and signed. WHITE AND GREEN copies must be filed with the State Engineer. PINK COPY is for the Owner and YELLOW COPY is for the Driller.

WJR-26-77

THIS FORM MUST BE SUBMITTED WITHIN 60 DAYS OF COMPLETION OF THE WORK DESCRIBED HEREON. TYPE OR PRINT IN BLACK INK.

COLORADO DIVISION OF WATER RESOURCES

1313 Sherman Street - Room 818
Denver, Colorado 80203

WELL COMPLETION AND PUMP INSTALLATION REPORT

PERMIT NUMBER 116655

RECEIVED
NOV 13 1980
WATER RESOURCES
STATE ENGINEER
Colo. 9

WELL OWNER Hendricks Mining Company

ADDRESS P.O. Box 653, Nederland, CO 80466

DATE COMPLETED November 10, 1980

SW ¼ of the NW ¼ of Sec. ____,

T. 1 S, R. 73 W, 6th P.M.

WELL LOG

From	To	Type and Color of Material	Water Loc.

TOTAL DEPTH ____

Use additional pages necessary to complete log.

HOLE DIAMETER

____ in. from ____ to ____ ft.

____ in. from ____ to ____ ft.

____ in. from ____ to ____ ft.

DRILLING METHOD ____

CASING RECORD:

Plain Casing

Size ____ & kind ____ from ____ to ____ ft.

Size ____ & kind ____ from ____ to ____ ft.

Size ____ & kind ____ from ____ to ____ ft.

Perforated Casing

Size ____ & kind ____ from ____ to ____ ft.

Size ____ & kind ____ from ____ to ____ ft.

Size ____ & kind ____ from ____ to ____ ft.

GROUTING RECORD

Material ____

Intervals ____

Placement Method ____

GRAVEL PACK: Size ____

Interval ____

TEST DATA

Date Tested ____, 19 ____

Static Water Level Prior to Test ____ ft.

Type of Test Pump ____

Length of Test ____

Sustained Yield (Metered) ____

Final Pumping Water Level ____

PUMP INSTALLATION REPORT

Pump Make Jacuzzi

Type 3 - wire submersible

Powered by 230V HP 1

Pump Serial No. 1S4C-S2-14

Motor Serial No. 0H8-660706

Date Installeo November 10, 1980

Pump Intake Depth 165'

Remarks

WELL TEST DATA WITH PERMANENT PUMP

Date Tested not tested

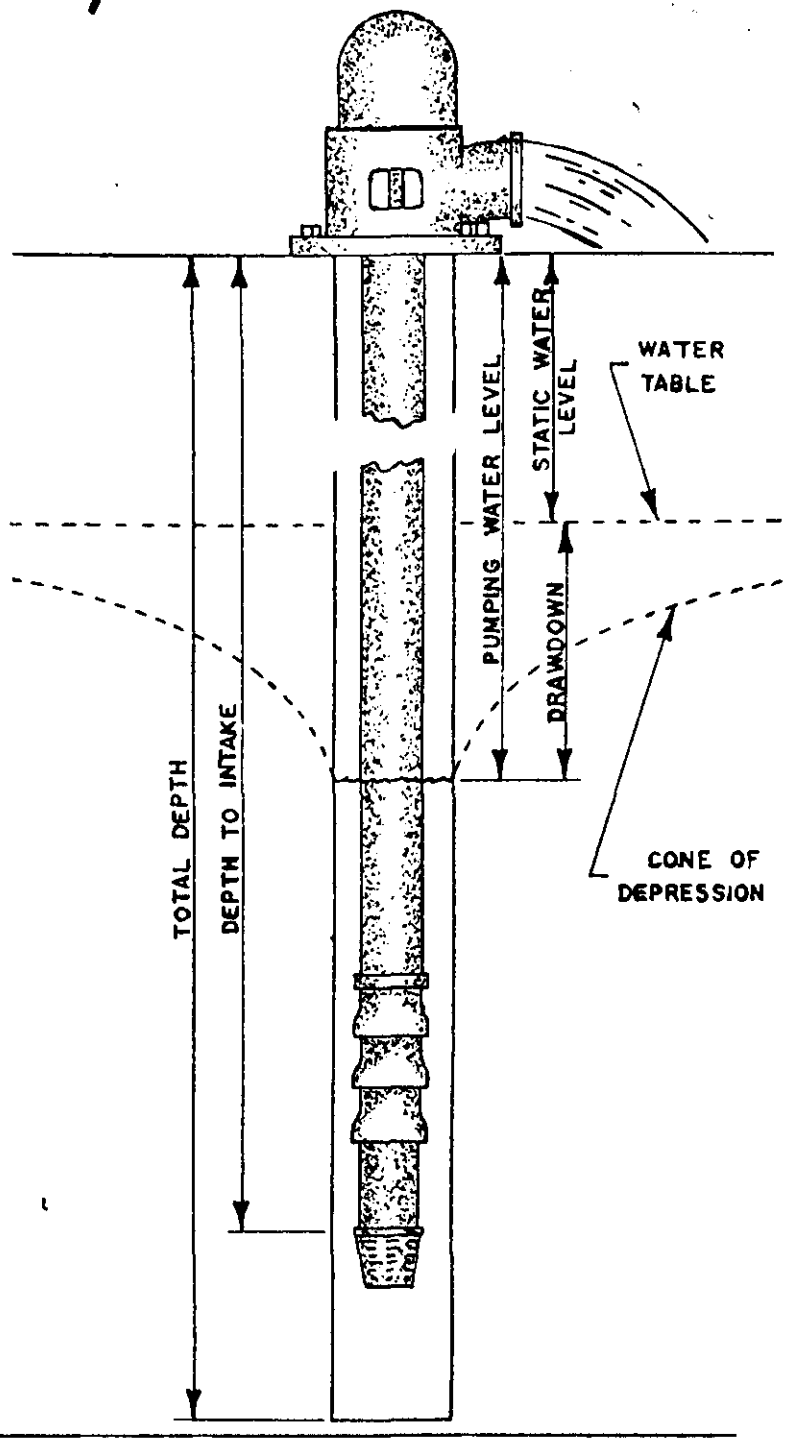
Static Water Level Prior to Test

Length of Test Hours

Sustained yield (Metered) GPM

Pumping Water Level

Remarks



CONTRACTORS STATEMENT

The undersigned, being duly sworn upon oath, deposes and says that he is the contractor of the well or pump installation described hereon; that he has read the statement made hereon; knows the content thereof, and that the same is true of his own knowledge.

Signature Lloyd H Miller License No. 675

State of Colorado, County of Boulder SS

Subscribed and sworn to before me this 11 day of November, 1980.

My Commission expires July 3, 1982

My Commission expires: , 19 .

Notary Public Lori English

FORM TO BE MADE OUT IN QUADRUPLICATE: WHITE FORM must be an original copy on both sides and signed. WHITE AND GREEN copies must be filed with the State Engineer. PINK COPY is for the Owner and YELLOW COPY is for the Driller.

WRJ-5-Rev 76

COLORADO DIVISION OF WATER RESOURCES

818 Centennial Bldg., 1313 Sherman St., Denver, Colorado 80203

RECEIVED
SEP 11 1980
WATER RESOURCES
STATE ENGINEER
COLO.

PERMIT APPLICATION FORM

Application must be complete where applicable. Type or print in BLACK INK. No overstrikes or erasures unless initialed.

FOR: (X) A PERMIT TO USE GROUND WATER
(X) A PERMIT TO CONSTRUCT A WELL
(X) A PERMIT TO INSTALL A PUMP

( ) REPLACEMENT FOR NO. _____
( ) OTHER _____
WATER COURT CASE NO. _____

(1) APPLICANT - mailing address

NAME Hendricks-Good Mining Co.

STREET 3000 N. 63rd St.

CITY Boulder, CO 80301 (State) (Zip)

TELEPHONE NO. 443-1502

(2) LOCATION OF PROPOSED WELL

County Boulder

SW ¼ of the NW ¼, Section 9

Twp. 1 S (N.S), Rng. 73 W (E,W), 6th P.M.

(3) WATER USE AND WELL DATA

Proposed maximum pumping rate (gpm) 15

Average annual amount of ground water to be appropriated (acre-feet): 1

Number of acres to be irrigated: 0

Proposed total depth (feet): 200

Aquifer ground water is to be obtained from:

Granite

Owner's well designation None

GROUND WATER TO BE USED FOR:

(XX) HOUSEHOLD USE ONLY - no irrigation (0)
( ) DOMESTIC (1)
( ) LIVESTOCK (2)
( ) COMMERCIAL (4)
( ) INDUSTRIAL (5)
( ) IRRIGATION (6)
( ) MUNICIPAL (8)

( ) OTHER (9) _____

DETAIL THE USE ON BACK IN (11)

(4) DRILLER

Name Norris & Sons Drilling Co.

Street 4599 No. Broadway

City Boulder, CO 80302 (State) (Zip)

Telephone No. 442-4083 Lic. No. 716

FOR OFFICE USE ONLY: DO NOT WRITE IN THIS COLUMN

Receipt No. 8135 / _____

Basin _____ Dist. _____

CONDITIONS OF APPROVAL

This well shall be used in such a way as to cause no material injury to existing water rights. The issuance of the permit does not assure the applicant that no injury will occur to another vested water right or preclude another owner of a vested water right from seeking relief in a civil court action.

APPROVED FOR HOUSEHOLD USE ONLY, FOR ONE (1) SINGLE FAMILY DWELLING AND NOT TO BE USED FOR IRRIGATION. THE RETURN FLOW FROM THE USE OF THIS WELL MUST BE RETURNED TO THE SAME STREAM SYSTEM IN WHICH THE WELL IS LOCATED.

THE MUNICIPAL OR COUNTY GOVERNMENT SHALL BE CONSULTED WHEN LOCATING THIS WELL, AND THEIR REGULATIONS SHALL BE COMPLIED WITH.

APPLICATION APPROVED

PERMIT NUMBER 116655

DATE ISSUED OCT 16 1980

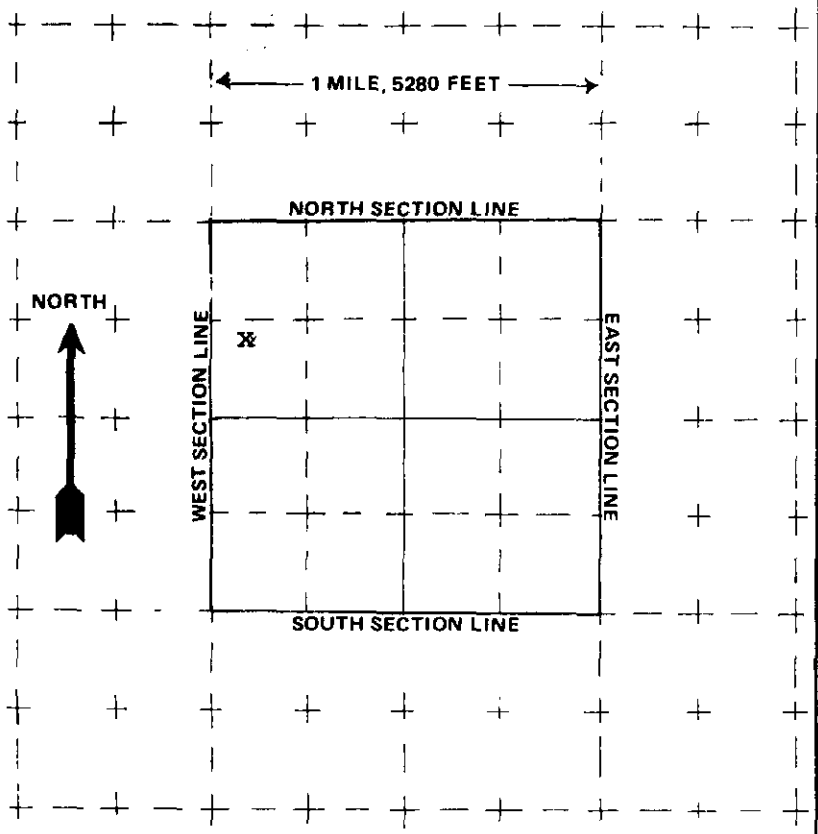
EXPIRATION DATE OCT 16 1982

Bruce E. DeBuin (STATE ENGINEER)

BY DEPUTY RGHaubold

I.D. 1-06 COUNTY 07

(5) THE LOCATION OF THE PROPOSED WELL and the area on which the water will be used must be indicated on the diagram below. Use the CENTER SECTION (1 section, 640 acres) for the well location.



The scale of the diagram is 2 inches = 1 mile
Each small square represents 40 acres.

WATER EQUIVALENTS TABLE (Rounded Figures)

An acre-foot covers 1 acre of land 1 foot deep
1 cubic foot per second (cfs) . . . 449 gallons per minute (gpm)
A family of 5 will require approximately 1 acre-foot of water per year.
1 acre-foot . . . 43,560 cubic feet . . . 325,900 gallons.
1,000 gpm pumped continuously for one day produces 4.42 acre-feet.

(6) THE WELL MUST BE LOCATED BELOW by distances from section lines.

1500 ft. from North (north or south) sec. line

600 ft. from West (east or west) sec. line

LOT -- BLOCK -- FILING # --

SUBDIVISION Brazilian Mill Site, U.S. Survey #13367-B

(7) TRACT ON WHICH WELL WILL BE LOCATED Owner: Same

No. of acres 3.23 . Will this be the only well on this tract? Yes

(8) PROPOSED CASING PROGRAM

Plain Casing

6 5/8 in. from -1 ft. to 20 ft.

4 1/2 in. from 15 ft. to 100 ft.

Perforated casing

4 1/2 in. from 100 ft. to 200 ft.

____ in. from ____ ft. to ____ ft.

(9) FOR REPLACEMENT WELLS give distance and direction from old well and plans for plugging it:

(10) LAND ON WHICH GROUND WATER WILL BE USED:

Owner(s): Hendricks-Good Mining Co. No. of acres: 3.23

Legal description: SW¼ of NW¼, Sec. 9, T 1S, R 73W

(11) DETAILED DESCRIPTION of the use of ground water: **Household use and domestic wells must indicate type of disposal system to be used.**

Household use only -- septic tank with absorption bed

(12) OTHER WATER RIGHTS used on this land, including wells. Give Registration and Water Court Case Numbers.

Type or right	Used for (purpose)	Description of land on which used
None		

(13) THE APPLICANT(S) STATE(S) THAT THE INFORMATION SET FORTH HEREON IS TRUE TO THE BEST OF HIS KNOWLEDGE.

X James S. Hendricks Hendricks-Good Mining Co. Inc.

SIGNATURE OF APPLICANT(S)

Use additional sheets of paper if more space is required.

Appendix B – Sample and December 2021 Groundwater Sampling Data Sheet

GROUND WATER SAMPLING DATA SHEET

IDENTIFICATION Project Number:

Sample Location_____Date_____Start Time_____Stop time_____Page of Sample Control Number_____Samplers_____

WEATHER CONDITIONS

Ambient Air Temperature:_____°C☐ °F☐ Not Measured ☐ **Wind**: Heavy☐ Moderate☐ Light☐

Precipitation: None☐ Rain☐ Snow☐ Heavy☐ Moderate☐ Light☐ Sunny☐ Partly Cloudy☐

INITIAL WELL MEASUREMENTS (Measurements in feet made from top of well casing)

Static Water Level____Total Depth_____Top of Screen_____Filter Pack Interval_____Borehole Diameter(inches)_____

2-inch = 0.1632 gal/ft 4-inch = 0.6528 gal/ft 6-inch = 1.4688 gal/ft Casing Volume:_____gallons

Well Casing ID_____Well Casing OD_____Protective Casing Stickup____Well Casing Stickup_____Feet of Water_____

Well purged with:

FINAL WELL MEASUREMENTS

Static Water Level___ Total Depth___Total Volume Purged___ Saturated Borehole Volume (gal)____Max Pumping Rate _____

INSTRUMENT CALIBRATION

pH Meter: Meter Number_____ **Conductivity Meter:** Meter Number_____

Buffer___Measured Value_____Temp.____°C Standard_____mS/cm Measured Value_____mS/cm

Temp.___°C Buffer___Measured Value____Temp.___°C Standard_____mS/cm

Measured Value_____mS/cm Temp.__°C **Turbidity Meter:**_____Standard_____NTU Measured Value_____NTU

Standard__NTU Measured Value_NTU

FIELD PARAMETER MEASUREMENTS DURING PURGING

Time	Volume (gallons)	pH	Cond. (µS/cm)	Temp. °C☐ °F☐	Turbidity Visual Est.☐ Measured☐	Comments

FINAL SAMPLE PARAMETERS

Sample Date	Sample Time	Discharge cfs☐ gpm☐	pH	Cond. (µS/cm)	Temp. (°C)	Turbidity Visual Est.☐ Measured☐		

Notes:

Sampler's Signature

Appendix C-2

C-2 DRMS issued to the Operator on March 25, 2022, a Preliminary Adequacy Review Letter

COLORADO
Division of Reclamation, Mining and Safety
Department of Natural Resources

March 25, 2022

Daniel Takami
Grand Island Resources, LLC
12567 West Cedar Dr
Lakewood, CO 80228

RE: Cross Gold Mine, Permit No. M-1977-410, Technical Revision No. 10 (TR-10), Preliminary Adequacy Review

Mr. Takami:

On February 28, 2022, the Division of Reclamation, Mining and Safety (Division) received your Technical Revision application (TR-10) to address corrective action #1 of the Mined Land Reclamation Board (Board) Order that was issued on February 18, 2022 for Violation No. MV-2021-017.

After reviewing the materials submitted, the Division has identified the following adequacy item(s) that must be addressed before an approval of TR-10 can be issued:

1) Per the Board Order, the purpose of this revision shall be to modify the water management and treatment program for the site to sufficiently address all water quality issues, and to provide a surface water and groundwater monitoring program that meets all applicable requirements of Rules 3.1.6, 3.1.7, 6.3.3, and 6.3.4. The description of this revision provided on the cover sheet does not clearly state this purpose. To make it clear that this revision was submitted to address corrective action #1 of the Board Order, please modify the description provided on the cover sheet to match the language from the Board Order.

2) On page 2, under section 1, the operator describes the purpose of this revision as being a "response to a Service of Notice of Violation/Cease and Desist Order (Number IO-211130-1) from Colorado Department of Public Health and Environment (CDPHE) dated November 30, 2021 in conjunction with Permit No. M-1977-410". This description does not refer to the Order issued by the Mined Land Reclamation Board (Board) on February 18, 2022 for Violation No. MV-2021-017, in which, submittal of this revision is a required corrective action. Please modify the language in this section to clarify that TR-10 is being submitted to address corrective action #1 of the Board Order issued for Violation MV-2021-017.

3) The Division has the following comments pertaining to Figure 1 – Water Management System:

    a. Please add the approved permit boundary (at least the portions visible in the view shown).

    b. Please show the location of the permitted outfall on Coon Track Creek.

c. Please include arrows on the pipelines indicating the flow direction.

d. Please differentiate the pipelines recently installed to support the new water treatment system.

e. Please clarify whether discharge from the Cross Mine receives any pre-treatment (e.g., lime) prior to entering the new treatment system.

f. Please clarify whether discharge from the Caribou Mine (Idaho Tunnel) receives any pre-treatment (e.g., lime) prior to entering the new treatment system. What treatment, if any, occurs via the existing "Caribou Water Treatment Shed"?

g. Please clarify whether untreated water from Pond 1 can still flow directly to Pond 2, and if so, under what conditions.

h. Please clarify whether untreated water from Pond 3c can still flow directly to Pond 2, and if so, under what conditions.

i. Please clarify if untreated water from Pond 2 can still flow directly to Coon Track Creek via each of the two existing discharge lines, and if so, under what conditions.

4) The Division has the following comments pertaining to Table 1 – Effluent Discharge Limitations for Outfall 001A:

a. Please reference this table in the text to provide context for the information presented in the table.

b. The only parameters included in this table are Lead and Whole Effluent Toxicity. However, it is the Division's understanding the operator's discharge permit requires monitoring for additional parameters. Please modify this table to include all monitoring parameters and associated limitations required by the discharge permit.

5) Figure 2 – May 2021 Filtration Study that Compared the Effectiveness of Different Screen Size, May 31, 2021 is low resolution, making it difficult to read the data provided in this table. Please submit a higher resolution version of this table that is easier to read.

6) On page 8, under section 4, the operator states "This GIR initiative for alternative treatment commenced well before the cease and desist order was issued by CDPHE later in November 2011". The Division is not aware of a cease and desist order issued by CDPHE in 2011. Did the operator mean to state "November 2021"? If so, please correct this date accordingly.

7) On page 10, under section 6, the operator states that overflow from Pond 1 would go to Pond 2 via overflow pipe, where it would be contained. If Pond 1 were to overflow into Pond 2, please describe what would happen to this untreated water. Does the operator have a way of treating water from Pond 2, if needed?

8) On pages 10 and 11, under section 6, the operator describes the new water treatment system operating at the site, which includes a combination of filtration and polishing components. The Division has the following comments pertaining to this system:

    a. Please describe the current frequency of filter bag changes. Does the operator expect this frequency to change throughout the year?

    b. Please describe how the spent filter bags are disposed of. Are the spent filter bags considered hazardous waste?

    c. Please describe the current expected lifespan of the polishing vessel (using the Graver MetSorb© HMRG media).

    d. Please describe how the spent polishing vessel will be disposed of. Would this vessel be considered hazardous waste?

    e. While the operator refers to only one polishing vessel in use by the current treatment operation, the Division is aware of a 2nd vessel present in the new treatment shed (as shown on Figure 13 in Appendix A). Please clarify the use of the 2nd polishing vessel, if any. Is it considered a backup only, at this time?

    f. Please provide a discussion regarding the mine discharge rates throughout different seasons of the year, and whether the current water treatment system is designed to handle maximum flows.

    g. On page 11, last paragraph, first sentence, the operator states "The pilot system described above is fully operational and since the installation of continuous 24/7 treatment (January 2021)…". The date given is inconsistent with the timelines provided in the application. Please correct the date accordingly.

9) Tables 2 and 3 provide a summary of analytical results from sampling that occurred on January 17 and 18, 2022, to show the new water treatment system is producing results that are compliant with the discharge permit. Please add a column to these tables which includes the discharge permit limitations. Additionally, please explain why Zinc was detected in the Blank samples. Lastly, please provide any additional water quality data that has been collected since January 2022.

10) In Appendix A – Site Pictures, the Figure 9 caption reads "Cross Winze Valve Upgrade and XXX(Future Picture)". Additionally, below this caption, a statement reads "Insert picture of Cross Winze or pump or piping". Please add the intended photo or remove the confusing language which implies another photo was intended.

11) In Appendix A – Site Pictures, Figure 14 shows a photo of the "backwash tank" located inside the new water treatment shed. Please provide some additional information on the purpose of this tank, the nature of the water present inside the tank, whether the tank must be emptied regularly, and if so, where the water is poured.

12) Please provide a bond estimate that includes costs for operating and maintaining the entire water treatment system on a monthly basis.

13) The bond estimate calculated for Amendment No. 2 (AM-2; approved on February 8, 2022) includes costs for removing and disposing of a total of 777 feet of 6 inch diameter pipeline. According to Figure 1 – Water Management System, a total of 1,585.68 feet of pipeline is installed at the site, including a combination of 6 inch diameter and 8 inch diameter PVC and HDPE pipeline. Please provide a bond estimate that includes costs for removing and disposing of the additional 808.68 feet of pipeline.

14) The application includes a cover sheet for Appendix G – Standard Operating Procedures (SOP's) and Operation & Maintenance (O&M) Manuals. However, the Division could find no information submitted with this appendix. Please submit the information intended for Appendix G.

15) A groundwater monitoring plan is included in Appendix H. However, the Division could not find a surface water monitoring plan as required by corrective action #1 of the Board Order issued for Violation No. MV-2021-017. Please modify the monitoring plan provided to include both a groundwater and surface water monitoring plan. The surface water monitoring plan must include at a minimum, sampling locations along Coon Track Creek at a point upgradient of the mine site, at the discharge point, and at a point downgradient of the mine site. The list of surface water sampling parameters must include, at a minimum, the parameters required under the CDPHE discharge permit.

16) On page 10 of the groundwater monitoring plan, under section 5.3, the operator is proposing to use one of the three existing wells, the Cabin Well, as the point of compliance. The operator states the Cross Well is not a preferred choice for monitoring because it is influenced by mine dewatering and is located near the center of surface activity rather than downgradient of all activities that could potentially affect groundwater quality. The operator states the Caribou Well is installed upgradient of the permitted mine workings and lies across a probable groundwater divide (Coon Track Creek) from the Cross Mine. Based on the information provided thus far, the Division agrees that, of the three existing wells, the Cabin Well may be better suited as a point of compliance. However, monitoring from the other two existing wells could provide valuable data for understanding groundwater at the site (including characterizing any potentially impacted groundwater quality). Therefore, please include all three existing wells in the groundwater monitoring plan.

17) Please add the following two sampling locations to the groundwater monitoring plan: water from the Cross Mine prior to entering the treatment system and water from the Caribou Mine prior to entering the treatment system. Additionally, please be sure these monitoring locations are included on all applicable maps showing the proposed monitoring locations.

18) Please describe the "probable groundwater divide" and how it may affect using water level data from the Caribou Well to generate the potentiometric map.

19) On page 11 of the groundwater monitoring plan, under section 5.5, the operator states the analytical parameters for sampling (presented in Table 4) will consist of the most stringent of the criteria contained in Tables 1-4 of the Water Control Commission (WQCC) Regulation No. 41. However, the operator goes on to state that Regulation No. 41 (at 5 CCR 1002-41 2) exempts the Cross Gold Mine groundwater from complying with Agricultural use standards when "…other information demonstrates that agricultural use is not being made of the groundwater and is not likely to be made…". The operator states the sub-alpine to alpine climate of the mine area is unsuitable for agriculture, and accordingly, the list of proposed sampling parameters presented in Table 4 does not

include the Agricultural specific standards listed in the Interim Narrative Standard Table 3 of WQCC's Regulation No. 41 - The Basic Standards for Ground Water.

Please be advised, the "exemption" referred to by the operator [and detailed in section 41.4(B)(2) of Regulation No. 41] applies only to classified groundwater areas. Because the Cross Gold Mine is located in an unclassified groundwater area, and the operator has not provided groundwater data demonstrating existing ambient quality as of January 31, 1994, the site must comply with the Interim Narrative Standard set by the WQCC in Regulation No. 41 – The Basic Standards for Ground Water. The Interim Narrative Standard requires that groundwater quality be maintained for each parameter at that quality which meets the most stringent criteria set forth in Tables 1 through 4 of The Basic Standards for Ground Water.

Therefore, please revise the sampling parameter list provided in Table 4 to include the following parameters and associated standards:

Aluminum, dissolved	5 mg/l
Boron, dissolved	0.75 mg/l
Cobalt, dissolved	0.05 mg/l
Copper, dissolved	0.2 mg/l
Fluoride, dissolved	2 mg/l
Lithium, dissolved	2.5 mg/l
Selenium, dissolved	0.02 mg/l
Vanadium, dissolved	0.1 mg/l
Zinc, dissolved	2 mg/L

20) On page 11 of the groundwater monitoring plan, under section 5.6, the operator states the quarterly sampling results will be reported to the Division within 30 calendar days of the operator's receipt of a complete analytical results package from the laboratory. Please commit to providing the quarterly water monitoring reports by the following deadlines:

- First quarter report due by May 1st of every year.
- Second quarter report due by August 1st of every year.
- Third quarter report due by November 1st of every year.
- Fourth quarter report due by February 1st of the following year.

21) Please commit to providing the Division a written report within five (5) working days when there is evidence of groundwater discharges exceeding applicable groundwater standards or permit conditions imposed to protect groundwater quality, in accordance with Rule 3.1.7(9). Please be advised, this notice requirement would apply to any exceedance of the approved groundwater monitoring standards set for the point of compliance well(s).

22) On page 11 of the groundwater monitoring plan, under section 5.6, the operator states the quarterly monitoring report will include a potentiometric surface (water table) map constructed from measurements made during sampling events and will note any exceedances of Regulation 41 Tables 1-4 water quality standards. Please commit to also including the following with the quarterly monitoring reports:

a. A map showing the approved groundwater and surface water monitoring locations.

b. The laboratory data packages and Chain of Custody sheets.

c. Field sheets for the sampling event(s).

23) On pages 11 and 12 of the groundwater monitoring plan, under section 6, the operator describes the water quality sampling conducted at the site on November 9 and December 17, 2021, referred to as "baseline groundwater sampling". The water quality data for these two sampling events is presented in Tables 5 and 6. The operator indicates this data reveals "clear trends in water quality". The Division has the following comments pertaining to the data provided in Tables 5 and 6:

a. Please update these tables to include a footnote stating the November 2021 samples were not correctly filtered in the field. Additionally, please provide a discussion on how the samples were incorrectly filtered in the field and what affects this had on the laboratory data.

b. Please provide the field sampling data sheets from the November and December 2021 sampling events.

c. This "baseline" data set is incomplete as it does not include all sampling parameters required by WQCC's Interim Narrative Standard for unclassified groundwater, and it was collected from only two sampling events (one of which was incorrectly collected in the field) that occurred a little more than a month apart. No discernible trends can be determined from this data. In order to establish "baseline" groundwater quality conditions, the operator will need to provide five consecutive quarters of groundwater monitoring data that include all sampling parameters and standards required by the Interim Narrative Standard. Please describe how the operator intends to collect the required baseline groundwater data in a manner that ensures groundwater quality at the site is not impacted by site activities in any way during the collection period.

d. Given the current Board-Ordered deadline of approving this revision no later than April 28, 2022, the Division expects the required five quarters of baseline groundwater monitoring data will need to be provided in a subsequent revision. Therefore, please commit to submitting a subsequent Technical Revision, which includes five quarters of groundwater sampling data from all three existing wells plus the two additional sampling points requested above (inside Cross Mine and Caribou Mine), for all parameters and standards required by the Interim Narrative Standard. This revision must include an evaluation of the data obtained, including a side-by-side comparison of the laboratory results for each parameter with its associated Interim Narrative Standard. In its review of this subsequent revision, the Division will reassess the sampling parameters and standards for the continued monitoring program.

24) There is no discussion in the sampling plan regarding Quality Assurance and Quality Control (QA/QC) sampling (e.g., rate of duplicate collection, rinsate blanks, field blanks, trip blanks). Please update this sampling plan to address how QA/QC sampling will be conducted at the site for both surface and groundwater sampling.

25) Please provide a generalized cross-section of the site which includes the approximate mine pool level of the Cross Mine (at both natural and dewatered conditions), groundwater levels in the Cross Well and Cabin Well, and shows the approximate location of any applicable surface features, including mine features and Coon Track Creek.

26) Please provide a generalized cross-section of the site which includes the approximate mine pool level of the Caribou Mine (at both natural and dewatered conditions), groundwater levels in the Caribou Well and Cabin Well, and shows the approximate location of any applicable surface features, including mine features and Coon Track Creek.

27) The Division has the following comments regarding Map 2 – Site Map – Groundwater Monitoring Plan:

    a. Please change the map title to "Surface and Groundwater Monitoring Plan".

    b. Please clearly label all proposed surface and groundwater monitoring locations.

    c. Please clearly label the proposed compliance well.

    d. Please be sure the mine features shown on this map correlate with those shown on the maps approved in AM-2. For example, this map shows a "Temporary Ore Storage" area located just south of the Cross Warehouse, which was removed from the maps in AM-2.

This completes the Division's preliminary adequacy review of the materials submitted for TR-10. The decision date for TR-10 is currently set for **March 30, 2022**. If additional time is needed to address the adequacy item(s), an extension request must be received by our office prior to the decision date. Please be advised, the Board Order issued for Violation No. MV-2021-017 requires this revision to be approved within 60 days of receipt, no later than April 28, 2022. Therefore, the Division will be unable to approve any extensions beyond that date.

If you have any questions, you may contact me by telephone at 303-866-3567, ext. 8129, or by email at amy.eschberger@state.co.us.

Sincerely,

Amy Eschberger

Amy Eschberger
Environmental Protection Specialist

Cc: Richard Mittasch, Grand Island Resources, LLC
Patrick Lennberg, DRMS
Jared Ebert, DRMS
Michael Cunningham, DRMS

Appendix C-3

C-3 Operator request for extension to address Preliminary Adequacy Review (March 25, 2022)

GRAND ISLAND RESOURCES

P.O. Box 3395
Nederland, CO 80466
March 25, 2022

Ms. Amy Eschberger
Environmental Protection Specialist
Colorado Division of Reclamation, Mining and Safety
1313 Sherman Street, Room 215
Denver, CO 80203

RE: Cross Gold Mine, Permit No. M-1977-410 Technical Revision No. 10 (TR10).

Dear Ms. Eschberger:

In response to your email dated March 25, 2022, regarding Cross Gold Mine TR No. 10 and the preliminary adequacy review, please consider this a request for a 15-day extension. Due to the limited time available under the initial review period and the extensive information requested, it is imperative that we have more time to address the issues brought up in the review.

Thank you for continuing to work with us throughout this proposed TR No. 10 and I look forward to providing you the requested information once the extension is approved.

Please do not hesitate to contact me directly with any additional questions or concerns.

Respectfully,

Daniel J. Takami
President, Sustainable Metal Solutions, LLC
President, Nederland Mining Consultants Inc.
President, Grand Island Resources, LLC
danieltakami@gmail.com
501.256.4444

Appendix C-4

C-4 DRMS Response to extension request (March 28, 2022)

COLORADO
Division of Reclamation, Mining and Safety
Department of Natural Resources

March 28, 2022

Daniel Takami
Grand Island Resources, LLC
12567 West Cedar Dr
Lakewood, CO 80228

RE: Cross Gold Mine, Permit No. M-1977-410, Technical Revision No. 10 (TR-10), Approval of Decision Date Extension

Mr. Takami:

On March 25, 2022, the Division of Reclamation, Mining and Safety (Division) received your request to extend the decision date for Technical Revision No. 10 (TR-10) by 15 days. Per your request, the Division has extended the decision date from March 30, 2022 to **April 14, 2022**.

If you have any questions, you may contact me by telephone at (303) 866-3567, ext. 8129, or by email at amy.eschberger@state.co.us.

Sincerely,

Amy Eschberger
Environmental Protection Specialist

Cc: Richard Mittasch, Grand Island Resources, LLC
Patrick Lennberg, DRMS
Jared Ebert, DRMS
Michael Cunningham, DRMS

Appendix D

D – Financial Warranty to Operate the Water Treatment System and Payment of Fine

Appendix D-1

D-1 State of Colorado Bond Form

STATE OF COLORADO

DIVISION OF RECLAMATION, MINING AND SAFETY
Department of Natural Resources

1313 Sherman St., Room 215
Denver, Colorado 80203
Phone: (303) 866-3567
FAX: (303) 832-8106

COLORADO DIVISION OF RECLAMATION MINING & SAFETY

FINANCIAL WARRANTY

CHECK FOR DEPOSIT IN STATE TREASURY

Operator Grand Island Resources, LLC

Operation Cross Gold Mine

Permit No. M-1977-410 Check No. 1025

This form has been approved by the Mined Land Reclamation Board pursuant to sections 34-32-117, C.R.S., of the Mined Land Reclamation Act and 34-32.5-117, C.R.S., of the Colorado Land Reclamation Act for the Extraction of Construction Materials. Any alteration or modification of this form, without approval by the Board shall result in the financial warranty being invalid and result in the voiding of any permit issued in conjunction with such invalid financial warranty and subject the operator to cease and desist orders and civil penalties for operating without a permit pursuant to sections 34-32-123, C.R.S., of the Mined Land Reclamation Act and 34-32.5-123, C.R.S., of the Colorado Land Reclamation Act for the Extraction of Construction Materials.

KNOW ALL MEN BY THESE PRESENTS, THAT:

WHEREAS, the Colorado Mined Land Reclamation Act, C.R.S. 1973, 34-32-101 et seq. (the "Act"), as amended, provides that no permit may be issued under the Act until the Mined Land Reclamation Board (the "Board") receives a financial warranty (or warranties) as described in the Act.

WHEREAS, Grand Island Resources, LLC (the "Operator), a wyoming corporation, has applied for a permit to conduct a mining operation known as Cross Gold Mine (the "Operation"), on certain lands in Boulder County, Colorado. These are described in the permit application, as amended and supplemented, and are referred to herein as the "Affected Lands".

WHEREAS, in the application for the permit the Operator has agreed to be bound by all requirements of the Act and all applicable rules and regulations of the Board, as amended from time to time.

WHEREAS, in the application for the permit, the Operator has agreed with the Board to provide for reclamation of the Affected Lands, that are now or may become subject to the permit, as required by law.

WHEREAS, the Board has determined in accordance with the Act that the estimated costs of reclamation of the Affected Lands are those amounts for the stated periods of time as set forth herein. Said amount may be amended from time to time to reflect revised estimates of said costs of reclamation.

WHEREAS, the Board has determined that the financial warranty by the Operator equals the estimated costs of reclamation, as approved by the Board, with regard to the Affected Lands.

WHEREAS, the Operator, in accordance with the Act has promised and hereby promises the Board that it will be responsible for all of the estimated costs of reclamation with regard to the Affected Lands.

WHEREAS, as proof of its financial responsibility the Operator has proceeded pursuant to Section 34-32-117(3)(a) of the Act and has executed a personal check, business check, cashier's check, or certified check No. 1025, payable to the Mined Land Reclamation Board in the amount of one hundred sixty-two thousand eight hundred forty-one dollars ($162,841.00).

The Board has deposited the executed personal or business check, cashier's check or certified funds in the State of Colorado Treasury ("state treasury"). The above-mentioned sum is to be held as proof of the Operator's financial responsibility under this financial warranty.

The Operator has provided to the Board as proof of its authority to execute the above-mentioned personal or business check, by one of the following methods, as it applies to the Operator:

1. If the operator is a corporation, a copy of the corporate resolution, specifying the individuals that have authority to execute checks on behalf of the corporation.

2. If the Operator is a partnership, a copy of the partnership resolution, specifying the individuals that have authority to execute checks on behalf of the partnership.

3. If the Operator is an individual or a sole proprietor, confirmation from the bank stating the individuals that have authority to execute the above-mentioned check.

If the Operator has elected to proceed with a personal or business check, this financial warranty is not effective until the personal or business check has cleared the bank upon which it was drawn.

NOW THEREFORE, the operator is held hereby firmly unto the State of Colorado in the amount of those sums for those periods of time as set forth herein, until this financial warranty is amended or released in accordance with applicable law.

The Board may, for good cause shown, increase or decrease the amount and duration of this Financial Warranty. The Operator shall have sixty (60) days after the date of notice of any such adjustment to fulfill all new requirements.

The Operator shall notify the Board immediately of any event which may impair this Financial Warranty. If the Board receives such notice or otherwise has reason to believe that this Financial Warranty has been materially impaired, it may convene a hearing in accordance with the Act for the purpose of determining whether impairment has occurred.

The Board may withdraw the funds deposited in the state treasury held hereunder, if the Board determines that reclamation which ought to have been performed by the Operator, or its successors or assigns, remains unperformed. No other condition precedent need be fulfilled to entitle the Board to receive the funds deposited in the state treasury.

In the event of forfeiture of this financial warranty by the Board, if upon completion of reclamation by the Board the cost of reclamation shall be less than the amount received from the state treasury, the excess shall be promptly refunded to the Operator.

The obligation of the Operator shall continue until the Board has released this financial warranty or has ordered it forfeited in accordance with applicable provisions of the Act. It is understood that periods of years may necessarily be required before determination can be made that reclamation of the Affected Lands has been satisfactorily completed. It is also recognized that, as reclamation is accomplished, the amount of this financial warranty may be reduced with the approval of the board so that it reflects the then current estimated cost of the remaining reclamation of the Affected Lands. No revision, extension, or renewal of the permit or of the time allowed to complete reclamation shall diminish the Operator's obligation under this Financial Warranty.

Upon completion of reclamation by the Operator, and if the Board finds the reclamation satisfactory, the Board shall release the Financial Warranty and cause the state treasury to issue a check payable to the Operator in the amount of the original Financial Warranty and to include all accrued interest.

In any single year during the life of the permit, the amount of the Financial Warranty shall not exceed the estimated cost of fully reclaiming all lands to be affected in said year, plus all lands affected in previous permit years and not yet fully reclaimed. Reclamation costs shall be computed with reference to current reclamation costs.

The amount of this Financial Warranty is based upon estimates as to the cost of reclamation, and does not operate to liquidate, limit, enlarge, or restrict the Operator's obligations to complete the reclamation, even though the actual costs thereof may substantially exceed the amount of this Financial Warranty.

This Financial Warranty shall be subject to forfeiture whenever the Board determines that any one or more of the following circumstances exist:

1. A Cease and Desist Order entered pursuant to Section 34-32-124 of the Act has been violated, and the corrective action proposed in such order has not been completed although ample time to have done so has elapsed; or

2. The Operator is in default under its Performance Warranty, and such default has not been cured although written notice and ample time to cure such default has been given; or

3. The Operator has failed to maintain its Financial Warranty in good standing as required by the Act; or

4. The Operator no longer has the financial ability to carry out its obligations in accordance with the Act.

The description of lands herein is for convenience of reference only, and no error in such description, nor any revision of the permitted mining area, nor the disturbance by the Operator of lands outside of the permitted mining area shall alter or diminish the obligations of the Operator hereunder, which shall extend to the reclamation of all such lands disturbed.

If this Financial Warranty applies to National Forest System lands, and if this Financial Warranty is accepted by the United States Forest Service ("U.S.F.S.") as the bond required under 36 C.F.R. 228.13, then, the Operator having requested that the Board and the U.S.F.S. accept this single Financial Warranty in lieu of the separate bonds which would otherwise be required by applicable law, hereby agrees that, notwithstanding any other provision hereof, or of law, this Financial Warranty shall remain in full force and effect until U.S.F.S. has advised the Board by written notice that the Operator's obligations to U.S.F.S. for which this warranty is executed have been satisfied and until its release has been approved by the Board.

If this Financial Warranty applies to lands under the jurisdiction of the State Board of Land Commissioners ("Land Board"), and if this Financial Warranty, in whole or in part, is accepted by the Land Board as the bond required under its applicable law and procedures, then, the Operator having requested that the state accept this Financial Warranty in lieu of the separate bonds which would otherwise be required by the Colorado Mined Land Reclamation Board or Division of Reclamation, Mining and Safety and by the Land Board, hereby agrees that, notwithstanding any other provision hereof, or of law, this Financial Warranty shall remain in full force and effect until the Board is notified in writing by the Land Board that the Operator's obligations to the Land Board, for which this warranty is executed, have been satisfied and until its release is approved by the Board.

If all or any part of the Affected Lands are under the jurisdiction of the Bureau of Land Management, United States Department of the Interior, ("the BLM") and if at the request of the Operator on this Financial Warranty the BLM has, pursuant to 43 C.F.R. 3809.1-9, accepted this Financial Warranty in lieu of requiring a separate reclamation bond payable to the United States, then, notwithstanding any other provision of this Financial Warranty, or of law, the Operator hereby agrees that this Financial Warranty shall not be released until the Board is advised in writing by the BLM that the Operator's obligations to the BLM, for which this warranty is executed, have been satisfied and until its release is approved by the Board.

This Financial Warranty may be executed in multiple copies, each of which shall be treated as an original, but together they constitute only one agreement, the validity and interpretation of which shall be governed by the laws of the State of Colorado.

The provisions hereof shall bind and inure to the benefit of the parties hereto and their successors and assigns.

Signed and dated this 16 day of MARCH, 2022.

Grand Island Resources, LLC (SEAL)
Operator

By: [signature]
Authorized Signature

Daniel Takami, President
Title

NOTARIZATION OF OPERATOR'S ACKNOWLEDGEMENT

STATE OF KY)
) ss.
COUNTY OF Jefferson)

The foregoing instrument was acknowledged before me this 16 day of MARCH, 2022, by DANIEL J. TAKAMI as PRESIDENT of GRAND ISLAND RESOURCES LLC.

ELIZABETH A. WESTERFIELD
Notary Public
Commonwealth of Kentucky
Commission Number KYNP23483
My Commission Expires Feb 12, 2025

[signature]
NOTARY PUBLIC

My Commission expires: 2-12-2025

APPROVED:

State of Colorado
Mined Land Reclamation Board
Division of Reclamation, Mining and Safety

By: _____ Date: _____
Division Director

Appendix D-2

D-2 Financial Warranty Check

GRAND ISLAND RESOURCES LLC
12567 WEST CEDAR DRIVE #250
LAKEWOOD, CO 80228

1025
82-595/1070
131

March 21 2022
Date

CHECK ARMOR FRAUD PROTECTION

Pay to the Order of Mined Land Reclamation Board $ 162,841

One hundred sixty-two Thousand eight hundred forty-one Dollars

Photo Safe Deposit® Details on back

CITYWIDE BANKS.

For Financial Warranty mv-2021-017

MP

⑆107005953⑆ 007 085 6⑈ 01025

Appendix D-3

D-3 Civil Penalty Check

GRAND ISLAND RESOURCES LLC
12567 WEST CEDAR DRIVE #250
LAKEWOOD, CO 80228

1073
82-595/1070
131

3/21/2022
Date

CHECK ARMOR FRAUD PROTECTION

Pay to the Order of DIVISION OF MINE RECLAMATION | $5,000 00/100

FIVE THOUSAND 00/100 Dollars

Photo Safe Deposit® Details on back

CITYWIDE BANKS®

For VIOLATION NO. MV-2021-017

Glenn P. Brewer

AUTHORIZED SIGNATURE AUTHORIZED SIGNATURE AUTHORIZED SIGNATURE AUTHORIZED SIGNATURE AUTHORIZED SIGNATURE AUTHORIZED SIGNATURE AUTHORIZED SIGNATURE

MP

⑈107005953⑈ 007 085 6⑈ 01073

Appendix E

E – Progress Report for the First Quarter, 2022 to CDPHE-WQCD Notice of Violation/Cease and Desist Order Number IO-211130-1 dated November 30, 2021 ("Order")

GRAND ISLAND RESOURCES

March 30, 2022

VIA EMAIL: jacob.dyste@state.co.us; kelly.morgan@state.co.us
Mr. Jacob Dyste
Ms. Kelly Morgan
CDPHE-WQCD
Mail Code: WQCD-CWE-B2
4300 Cherry Creek Drive South
Denver, CO 80246-1530

RE: Grand Island Resources Quarterly Update, 1st Quarter 2022
Notice of Violation/Cease and Desist Order No. IO-211130-1

Dear Ms. Morgan and Mr. Dyste:

Pursuant to Paragraph 24 of the Notice of Violation/Cease and Desist Order Number IO-211130-1 dated November 30, 2021 ("Order"), as modified by correspondence with the Division, Grand Island Resources ("GIR") provides the following progress report for the first quarter, 2022:

1. Activities completed in the first quarter of 2022 (January 1-March 30, 2022):

a. GIR submitted the December 2021 DMRs on January 28, 2022. The results showed an exceedance in Potentially Dissolved Lead for the 30-day average limit. Per GIR's CDPS discharge permit, the 30 – day average maximum for Potentially Dissolved Lead in December is 3.8 ug/L. The result for 30-day average came back at 4.0 ug/L. GIR determined this exceedance came from the December 14th sampling of treated water that had been routed through Pond 2, which picked up enough lead to bring the sample to 7 ug/L. To resolve this issue, the system is no longer being routed through Pond 2 and all treated flow is directly discharged through the monitoring station. All samples taken since removing Pond 2 from the treatment system have been in compliance. The sample taken on December 29th came back at 1 ug/L.

b. GIR submitted the January 2022 DMRs on February 28, 2022. During the month of January 2022 there were no exceedances at Outfall 001.

c. GIR conducted WET testing in accordance with EPA and State of Colorado procedures in March 2022. The effluent passed the WET testing requirements for the sampling period.

d. On February 18, 2022, the Mined Land Reclamation Board signed the Board Order in the matter of NOV No. MV-2021-017 ("Board Order").

e. On February 22, 2022, the Division of Reclamation, Mining, and Safety ("DRMS") concluded its investigation of the citizen complaints submitted between November 2021 through

January 2022, regarding potential impacts the mine discharge may have had on surface water and groundwater resources in the vicinity of the mine, particularly to downstream wells. DRMS found no evidence indicating groundwater discharges from the mine led to degradation of surface and groundwater resources. In addition, DRMS reviewed all of the past data from the Cross Gold Mine, including exceedances of discharge standards and found that all discharges were below drinking water standards. DRMS also considered factors such as the distance from the mine to the nearest domestic wells and the quality of water in Coon Track Creek.

f. On March 13, 2022, GIR's consultant, Patrick Delaney of Blackfox Mining provided Mr. Dyste with the first set of February 2022 compliance samples and informed Mr. Dyste that GIR has been unable to submit the facility evaluation identified and outlined in Paragraph 21 of the Order due to Mr. Delaney's work in evaluating and establishing water treatment on site, training GIR staff onsite, and ensuring permit compliance. It is my understanding that Mr. Dyste approved the delay and recognized that GIR has made significant progress towards compliance.

g. On March 10, 2022, GIR and the Division met to discuss this NOV, the contents of the facility evaluation, improvements made on site to date, and other planned activities to keep the facility in compliance and move towards negotiations of a consent order in this matter.

h. On March 14, 2022, Mr. Delaney submitted the second half of February sampling which also showed that GIR had no exceedances and was in compliance with its discharge permit.

2. Activities planned for second quarter of 2022 (April 1-June 30, 2022), subject to change based on time, staffing, and financial constraints:

a. Pursuant to Corrective Action No. 1 of the Board Order, the Technical Revision shall be approved by DRMS by April 28, 2022.

b. The following work will be done to prepare for high Spring runoff and ensure that the site remains in compliance with its permit effluent limits:

i. Management of high concentrated flow via attenuation measures is a component of GIR's water management strategy to remain in compliance with GIR's permits. GIR has identified points of concentrated infiltrated water flows into the Idaho Tunnel. GIR has identified an abandoned crosscut approximately 960 feet into the Idaho Tunnel which may be suitable for peak flow attenuation via a water door. Placement of a water door in the Caribou/Idaho Tunnel allows for planned release of the detained water and provides access to the underground workings as needed. Attenuation of high infiltration water flux would have important benefits to water treatment.

ii. GIR has located various locations in the Cross mine in which the workings intersect fault systems. These highly fractured zones are susceptible to relatively high flow of infiltrated water into the mine which increases weathering of the surrounding rock and mobilizes sediment, thereby resulting in suspended solids laden water outflow requiring treatment prior to environmental release. To partially alleviate those conditions, GIR is planning the construction of catchment areas at the tunnel ribs, which will be collection points for water thereby allowing for improved drainage control into conveyance ditches. Additionally, shotcrete will be used at highly fractured and weathered areas to secure loose material in position and to limit sloughing and sediment generation.

iii. GIR has determined that, in certain locations, open core drill holes become water conveyance conduits as rock fractures and groundwater are intercepted. GIR is identifying these specific locations where core drill holes contribute significant water flows to peak discharge. GIR plans to apply industry and engineering standards to plug these holes possibly with a high compressive strength dry grout packing.

c. Install a new flowmeter at Outfall-001A.

d. Move the existing flowmeter at Outfall-001A to the Caribou Mine source stream for complete monitoring of all flow onsite, both source water and treated.

e. Enhance the mechanical equipment at the existing WTP to maximize throughput capabilities.

f. Install instrumentation to monitor the water level in the Winze. This is the current location of the Cross pump to limit manual checks and ensure proper operations of the Cross pump given that the vicinity of the Winze has been dewatered completely since March 26, 2022.

g. Continue to onboard the new Water Treatment Technician.

h. Weather permitting, dewater for retreatment and clean out Pond 2 from historic treatment practices that settled heavy metal particulate.

i. Establish a long-term sump solution in the Caribou Tunnel.

j. Install mitigation tools in both the Cross and Caribou portals to reduce sediment outflow.

k. Install mitigation tools in the Caribou outflow ponds to retain sediment prior to treatment.

l. Install an operational bypass of the Caribou Mine source stream before Pond 1 to the Cross workings to prevent Pond 1 overtopping.

m. Install increased heat trace and insulation in the Cross Tunnel to ensure no freezing will occur do to batch treatment.

Pursuant to Paragraph 24 of the Order, GIR will submit a progress report for the second quarter-2022 on June 30, 2022. In the meantime, please do not hesitate to contact Patrick Delaney or Sheela Stack if you have any questions or require any further information.

Respectfully,

Daniel Takami
President, Grand Island Resources, LLC

Appendix F

F – Community awareness

Appendix F-1

F-1 DRMS Response to Citizen Complaints - Domestic Water Findings

COLORADO
Division of Reclamation, Mining and Safety
Department of Natural Resources

February 22, 2022

RE: Response to Citizen Complaints; Cross Gold Mine; DRMS File No. M-1977-410

The Division of Reclamation, Mining and Safety (DRMS) received multiple citizen complaints from November 2021 through January 2022 regarding the Cross Gold Mine, File No. M-1977-410. While various concerns were expressed in the complaints, the primary concern (under DRMS jurisdiction) was regarding potential impacts the mine discharge may have had on surface water and groundwater resources in the vicinity of the mine, particularly to downstream wells.

Pursuant to Hard Rock Rule 3.1.6, disturbances to the prevailing hydrologic balance of the affected land and of the surrounding area and to the quantity or quality of water in surface and groundwater systems both during and after the mining operation and during reclamation shall be minimized. Additionally, mine operators are required to be in compliance with applicable federal and Colorado water quality laws and regulations, including statewide standards adopted by the Water Quality Control Commission.

The Cross Gold Mine discharges groundwater through the Cross Mine and the Idaho Tunnel portals. The groundwater is treated to meet aquatic life standards before it is discharged into Coon Track Creek. The discharge of treated wastewater is regulated by the Colorado Department of Public Health and Environment, Water Quality Control Division (WQCD) under CDPS Permit No. CO0032751. In the course of investigating whether or not the discharge of groundwater from the Cross Gold Mine impaired the quality of groundwater in downstream wells, DRMS reviewed the available water quality data associated with the following:

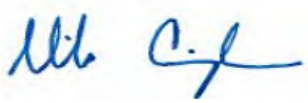
- Domestic well – single sampling event provided with anonymous citizen complaint
- CDPS Permit No. CO0032751 – provided by WQCD
- Coon Track Creek, Middle Boulder Creek, and Barker Reservoir surface water sampling data – provided by the City of Boulder

Upon reviewing the available water quality data for the Cross Gold Mine and the surrounding area, DRMS has found no evidence indicating groundwater discharges from the mine led to degradation of surface and groundwater resources. DRMS reviewed all of the past data from the Cross Gold Mine, including exceedances of discharge standards and found that all discharges were below drinking water standards. DRMS also considered factors such as the distance from the mine to the nearest domestic wells and the quality of water in Coon Track Creek.

DRMS is committed to ensuring the Cross Gold Mine remains in compliance with all applicable water quality standards and will consider and review any additional water quality data as it becomes available.

If you have any questions, please contact me at (303) 866-3567 ext. 8116.

Sincerely,



Michael A. Cunningham
Senior Environmental Protection Specialist

CC: Daniel Takami, Grand Island Resources, LLC
Amy Eschberger, DRMS

Appendix F-2

F-2 GIR Open letter to every Nederland resident

GRAND ISLAND
RESOURCES

Dear Friends and Neighbors,

As a member of the Boulder County community, Grand Island Resources (GIR) recognizes the impact our mining operations at the Cross and Caribou Mines, located in Nederland, CO, can have on the environment. Like our first and former President of three years, Tom Hendricks, we at GIR are committed to clean water, clean air, and a cleaner earth. As we have transitioned from the untimely death of our beloved friend "Miner Tom" and through COVID-19 supply disruptions, we have addressed and embraced challenges we have faced, devoting time and millions of dollars cleaning up and upgrading our infrastructure and facilities. Major accomplishments include:

Recent replacement of a 50-year-old antiquated, passive water treatment system with a 21st century $150,000 state-of-the-art system featuring post-filtration, polishing media to extract or neutralize dissolved metals. This system meets or exceeds strict state and federal aquatic life standards.

The above standards are more stringent than the EPA's National Primary Drinking Water Regulations and out of eleven exceedances over the past twenty months, which were in parts per billion, all eleven met drinking water standards.

We continue to clean, fix, and repair existing infrastructure and facilities and we will not resume operations until we are certain all applicable safety and environmental standards can be met.

Multiple scientific and engineering studies on effective groundwater discharge treatment have been commissioned and we are actively working towards implementing the best solutions available.

We are moving as quickly as science, engineering, and supply logistics allow to upgrade the rest of our equipment and facilities to protect the citizens of Boulder County and the environment.

GIR currently generates three million dollars a month of economic activity in the Town of Nederland and surrounding areas helping local businesses survive in this unpredictable and trying time.

GIR and its predecessors have a 50-year history of community involvement and charitable outreach.

We continue to employ private capital to clean up existing contaminated mine tailings and to operate our hard rock mines in an environmentally responsible fashion.

GIR is fully engaged with federal, state, and local agencies, including Colorado's Water Quality Control Commission (WQCC), the Division of Reclamation, Mining and Safety (DRMS) and the Colorado Department of Public Health & Environment (CDPHE).

We look forward to continuing and enhancing our existing partnerships with local universities and our work with federal, state, and local government regulators.

GIR adheres to the highest standards of Environmental, Social, and Corporate Governance (ESG) criteria as we strive to make Colorado's mining industry cleaner and more compatible than it has ever been with the environment and the people who live nearby.

We believe that the above initiatives have a positive impact on the local environment and create a more enjoyable place for all of us who live, work, and play in our county and great state.

Daniel Takami, President
Grand Island Resources
4415 Caribou Road, Nederland, CO 80466
info@grandislandresourcesllc.com

Appendix F-3

F-3 GIR Letter for Immediate Release

GRAND ISLAND
RESOURCES

4415 Caribou Rd,
Nederland CO, 80466

FOR IMMEDIATE RELEASE

Grand Island Resources (GIR) has been founded on and dedicated to our mission which is to prove that existing contaminated mining sites and tailings can be remediated and operated while keeping the environment and our water clean and safe, all financed by private capital. We are working hand in hand with federal, state and local agencies, including the Colorado Department of Water Quality Control Division (WQCD), to make all the necessary investments and capital improvements that were not made by previous operators of the Cross and Caribou Mines in the mountains above Nederland, Colorado. We have retained world renowned experts and engineering firms and are working closely with the Division of Reclamation, Mining and Safety (DRMS) and the Colorado Department of Public Health & Environment (CDPHE).

We are currently installing modern, proven water treatment infrastructure to replace the last 50 years of antiquated and obsolete water purification methods and treatments with state-of-the-art systems. GIR regrets that the treatment system could not be installed and placed in operation sooner to prevent violations during our evaluation and revitalization of the Caribou and Cross mines. However, we weren't looking for a short term "fix." Our plan has always been to become long term good neighbors by establishing a 21st century mining operation future generations will appreciate. We are replacing legacy systems with new ones that will meet or exceed current industry standards.

Since early spring of 2021 we have commissioned detailed scientific and engineering studies on how to best treat groundwater discharge from the mines. This summer we pilot tested one water treatment system and have recently transitioned to a far more robust one. Three qualified Colorado water treatment engineering firms are participating with us to design and install a comprehensive treatment system that will ensure full compliance with state and federal water quality standards.

While there have recently been trace amounts of certain contaminants that have exceeded our NPDES permit standards, we are confident the new treatment system will effectively remove them. We are also moving as quickly as science, engineering, and supply logistics allow to upgrade the rest of our equipment and facilities to fully protect the citizens of Boulder County and the environment.

Grand Island Resources is committed to clean water and takes pride in delivering the highest standards of environmental stewardship and is proud of its commitment to all Environmental, Social, and Governance (ESG) principles. We have made and will continue to make substantial investments to demonstrate that the historic Cross and Caribou Mines can be operated in a manner that is environmentally responsible and economically resilient. We believe we will be able to employ these same means and methods to establish a model using private capital which can be used to restore and reclaim abandoned mining sites throughout the United States.

We look forward to working with local universities and our federal, state, and local government regulators, to prove how it is now possible to make Colorado's mining industry cleaner, safer, and more compatible with the Colorado environment and all the people who live in and visit in our great state.

Contact: **Edward R. Byrne, ED BYRNE, PC, counsel for Grand Island Resources**
Phone: (303) 478-8075, e-mail: edbyrne@smartlanduse.com

-30-

Appendix F-4

F-4 GIR Letter sent to Nederland Major, BOT, Town Attorney and Town Administrator

Ed Byrne, P.C.
A Professional Legal Services Corporation
2305 Broadway Street
Boulder, CO 80304 - 4106

January 9, 2022

SENT VIA E-MAIL

Mayor Kris Larsen
Members of the Board of Trustees for the Town of Nederland
Miranda Fisher, Town Administrator
P.O. Box 396
Nederland, CO 80466

Re: Cease and Desist Malicious or Recklessly Untruthful Statements Disparaging or Defaming Grand Island Resources, LLC, Owner and Operator of the Caribou and Cross Mines, and/or Sustainable Metal Solutions, LLC

Dear Mayor Larsen, et al.,

I represent Grand Island Resources, LLC (GIR), the owner and operator of the Caribou and Cross mines, and Sustainable Metal Solutions, LLC (SMS). We have become increasingly concerned by the tone of the rhetoric and the false and misleading statements being made by members of the Board of Trustees of the Town of Nederland. This letter explains why many of the statements appear to have been made with actual malice or reckless disregard for the truth, and are intended to result in the closure of our mines. If successful, this quickly organized and orchestrated campaign, which constitutes actionable corporate disparagement, libel and slander, could result in damages in excess of Five Hundred Million Dollars ($500,000,000.00).

While we reserve all of our legal rights and remedies with respect to past statements, we hereby demand that all elected and administrative representatives of the Town of Nederland cease and desist the making, repeating, republishing and/or sponsorship of false or misleading statements concerning Grand Island Resources, LLC, and/or Sustainable Metal Solutions, LLC, and their officers, employees, subcontractors, consultants, agents and other representatives.

Background and Brief History of Town/Mine Relationship

The Caribou and Cross mines were discovered and began operation in 1869, more than 150 years ago. Over the course of the past century and a half. The Town of Caribou was established in 1870 and it flourished, for better and worse, until it was destroyed in a devastating wildfire in 1905.

More recently, Tom Hendricks reopened the mines in 1970, and he earned a well-deserved reputation for environmentally responsible hard rock mining. GIR is proud to continue his legacy. We have the resources, expertise and commitment to take this tradition of performance to the next level in Boulder County. We've spent the past six years ensuring that his leadership and legacy will be sustainable. In addition to the economic activity in Nederland supported by our workforce payroll of more than $500,000 per month,

most of it spent locally in Nederland, we maintain Caribou Road, we perform safety rescues during all seasons of the year, we've been snow plowing the road all the way down to the Cardinal Mill site this year, and we have continued to allow public recreation on our private land.

Moreover, when other mountain towns were struggling due to the effect of COVID-19 on tourism, Nederland's economy was actually *growing* (sales at the local grocery store increased 40%) as our repair and renovation work ramped up. We believe a majority of people and businesses in the Town fully appreciate all that Tom Hendricks and GIR have a history of doing for the community, but a little more than a month ago a small group of activists, including representatives of the Town, decided to try to destroy us. We will not let that happen.

Idaho Tunnel Collapse and Occasional Aquatic Life Water Quality Standard Violations

GIR has been focused on cleaning up the mine sites, improving antiquated infrastructure across both mines, and repairing and repainting existing structures, while dealing with the Idaho Tunnel collapse that occurred in December of 2019, and the tragic passing of Tom Hendricks on January 6, 2020. A brief summary of those efforts was included in GIR President Daniel Takami's Daily Camera Guest Opinion, which was published on 12/21/2021. See Takami Guest Opinion, attached.

Following the Idaho Tunnel collapse, there have been eleven (11) individual exceedances of our NPDES aquatic life water quality standards - out of twenty (20) NPDES water quality parameters tested twice per month for the past twenty (20) months - 11 out of more than 400 data points. We are working closely with DRMS and CDPHE to complete our implementation, testing and approval of a brand new water treatment system, which features state-of-the-art post-filtration, polishing media and is already delivering excellent results. A more detailed description of this effort may be found in the timeline provided to the Division of Reclamation, Mining and Safety on December 3, 2021. See GIR Supplemental Timeline, attached.

The "Cross violation VS NPDWR drinking water standards table," attached, compares the aquatic life exceedances (that we believe our new treatment system will eliminate) to drinking water quality standards. *In fact, none of the aquatic life standard exceedances measured at our 6" discharge pipe violate the National Primary Drinking Water Regulations (NPDWR).* This is important: *even at our discharge pipe*, there have been NO violations of the NPDWR standards that were enacted to mitigate any risk of water quality-based harm to human beings.

GIR is currently fully engaged with federal, state, and local agencies, including Colorado's Water Quality Control Commission (WQCC), the Division of Reclamation, Mining and Safety (DRMS) and the Colorado Department of Public Health & Environment (CDPHE). Our 6" diameter discharge pipe is located 1.2 miles and 1,000 feet of elevation (plus 360' of well depth) above the closest well (at the abandoned Cardinal Mill site). Water from springs and tributaries dilute the water flowing from our settling pond discharge pipe as Coon Track Creek flows to North Beaver Creek. We are 4.5 miles from the Town of Nederland, in the valley north of the Eldora watershed where the Town's water intake is located.

GIR regrets that their new water treatment system was not installed and operating sooner than November 15, 2021. We have been struggling to prevent the unanticipated aquatic life water quality violations during

our evaluation and initial work at the Caribou and Cross mines. However, we weren't looking for a short term "fix." The long-term answer proved to be elusive. Our plan has always been to establish a 21st century mining operation present and future generations in Boulder County will respect and appreciate. See SMS Slides attachment for a more detailed description. We are moving as quickly as science, engineering, and supply logistics allow to upgrade the rest of our equipment and facilities to fully protect the citizens of Boulder County and the environment. We can clarify that the occasional exceedances which have occurred were not the result of a chemical spill, ore processing water release, or impoundment breach. In fact, the mines are not producing ore - we are cleaning, fixing, and repairing existing infrastructure and facilities. We will not resume operations until we are certain all applicable safety and environmental standards can be met.

GIR has already spent $4.1 million dollars and nearly 20,000 man-hours directly on repairing the Idaho Tunnel, improving its water systems, and preventing the collapse of Caribou Road. Since 2019, GIR has spent a total of $6.2 million dollars and 47,210 man hours on the Idaho Tunnel, general clean-up of the Caribou and Cross mines, repairs to other infrastructure, and other water treatment facility improvements. If GIR wasn't willing to do this, it is unlikely any other company or entity would have stepped up, but we're here for the long haul. In fact, we have working partnerships with Ph.D and masters programs at the Colorado School of Mines, and the Geology, Geophysics and Archeological Departments at the University of Colorado. We are expanding those programs and we've initiated discussions with Colorado State University, as well.

These are the facts. We thought many, if not most of Nederland's residents were more or less aware of the work ongoing at the mines during the past six years. Then, in mid-November of 2021, we received an e-mail from Mayor Larsen requesting a meeting.

Communication with the Town

On 11/19/2021, I had a one-hour Zoom conference with Mayor Larsen in response to his e-mail. During our congenial conversation, I walked him through a brief description of all that GIR has been doing to clean, fix and repair existing Caribou and Cross mine infrastructure, while dealing with the Idaho Tunnel collapse that occurred in December of 2019 and the tragic passing of Tom Hendricks on January 6, 2020.

I also shared with Mayor Larsen some of the Sustainable Metal Solutions, Inc. (SMS), vision and business model concepts. I explained we had just installed a new $150,000 water treatment system, and I invited him up for a tour of the mine. He said he had had a standing invitation from Tom Hendricks going back to when he was first elected to the Board of Trustees, and he regretted never having taken him up on the offer. The Mayor said he would contact us to set up a tour when he returned from his Thanksgiving trip to Ohio.

Instead, we have come to believe that Mayor Larsen and a couple of other colleagues on the Board joined forces with other local activists to whip up opposition to GIR. See attached Nederland poster. This group is apparently determined to close down our 152-year old Caribou and Cross mines. If he and his group win, it will eliminate a local monthly payroll in excess of half a million dollars, most spent locally by our remarkably diverse workforce (BIPOC, women, LGBQ, veterans, etc.). Although we had offered to

provide him with answers to all his questions, including a personal tour and a future public outreach town meeting, the Mayor chose to pick a fight with us. We are here to promise you that we will not go quietly.

As noted above, the Caribou and Cross mine discharge pipe is 4.5 miles from Nederland and 1.2 miles from the closest well, a 360-foot deep, concrete-encased well at the Cardinal Mill site off of Caribou Road, 1.8 miles west of Nederland's town limits. Nederland's town water intake is southwest of the town limits, in the Eldora watershed. No cross-connection has ever been found between the Eldora watershed groundwater and the Coon Track Creek/North Beaver Creek watershed. Basic hydrologic dispersion and groundwater geologic principles demonstrate that the following outrageous claims being made by this group about water from our discharge pipe are false:

1. that wells in the valley and in Town may not be safe to drink;

2. that food grown in gardens irrigated from North Beaver Creek (into which Coon Track Creek flows) may be unsafe;

3. that dogs drinking from Middle Boulder Creek (into which North Beaver Creek flows) may be hurt; and

4. that the City of Boulder's drinking water (Middle Boulder Creek flows into Barker Reservoir) may not be safe.

On information and belief, other false statements include, without limitation:

1. GIR is a "Chinese funded Canadian shell company;"

2. GIR is "currently mining gold;"

3. GIR's "'mining' is under a 45 year old permit that has had no public review;"

4. GIR's "mining" methods to extract gold are extremely harmful, in direct violation of the Clean Water Act;

5. Citizen complaints are needed to prevent "Klondike Mountain (from looking like) the Climax superfund site outside of Leadville."

Our opponents have not done their research. They are aggressively trying to shut down our operation based on false claims of potential harm and outrageous allegations of corporate malfeasance – claims and allegations they are making either with malice aforethought or with reckless disregard for the truth. Mayor Larsen, members of the Board of Trustees, the Town Administrator and Town staff members must cease and desist the making, repeating, publishing or sponsoring of these and similarly inaccurate and potentially harmful statements.

Our Excellent Reputation Is Critical to the Company's Existing and Prospective Contractual Relationships

SMS and GIR are well-respected in Washington, DC, and at the highest levels of the Biden Administration, including the EPA, the BLM, the Department of Interior, the Army Corps of Engineers, the Department of Justice, Lake County, and the Governor of Colorado for the work we have been doing in Leadville, after being selected by them to assume responsibility for clean-up of the California Gulch Superfund Site. U.S. Bankruptcy Court Case No. 17-21646-MER. We will vigorously defend our reputation and we reserve all our rights and potential remedies against those who are making/publishing false or misleading statements, along with anyone who republishes, restates or sponsors them.

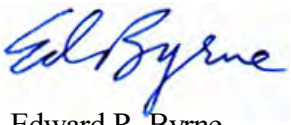
Finally, we recently learned about a January 25, 2022, meeting between the Town of Nederland and the Boulder County Commissioners that has been advertised by the Town of Nederland on social media, including specific invitations sent to many private citizens in the Town. When one of the recipients of an invitation from the Town questioned whether my clients had been invited to participate – or even received notification of the meeting – the Town Administrator, who *chose* not to notify or invite us to the meeting stated, "(t)his is a collaborative meeting between Boulder County and the BOT."

On Friday, January 7, 2022, we sent a letter by e-mail to Boulder County stating our position that we must be allowed to participate as a panelist in the public meeting, or the meeting should be canceled.

The residents of Nederland and the citizens of Boulder County have been ill-served by the misinformation that has already been disseminated – we may not get a second chance to make a first impression, but we deserve and are entitled to a fair and reasonable opportunity to try.

Thank you for your careful consideration of this letter and its attachments.

Sincerely,



Edward R. Byrne

cc: Jennifer Madsen, Town Attorney

Appendix F-5

F-5 Libelous Nederland Poster

WARNING

Boulder County's watershed is being poisoned.

Grand Island Resources LLC is a Chinese funded Canadian shell company that is currently mining gold at the top of Caribou Road. They are mining under a 45 year old permit that has had no public review. They are currently using methods to extract the gold that are extremely harmful and in direct violation of The Clean Water Act.

If you care about Boulder County's water quality, our community's future or your property value, please help us by filing a formal complaint before Klondike mtn looks like the Climax superfund site outside of Leadville.

https://dnrlaserfiche.state.co.us/forms/DRMS_Complaint

SCAN ME

Mine Permit ID

1977-410

Call Boulder County Planning and Permitting!

Call Boulder County Commissioners !

Call Joe Neguse!

Call Jared Polis!

Appendix F-6

F- 6 Letter to the Editor of The Mountain Ear (print version)

Homegrown Journalism

THE MOUNTAIN EAR

Volume 45, Issue 12 | 32 Pages | Thursday, January 13, 2022 | $1.50 | Nederland, Colorado

• ALLENSPARK • BLACK HAWK • CENTRAL CITY • COAL CREEK CANYON • FERNCLIFF • GOLD HILL • JAMESTOWN • NEDERLAND • PINECLIFFE • ROLLINSVILLE • WARD •

"Sea to Summit" exhibit debuts at Nederland Library

PHOTO BY KIRK C. WATKINS

New exhibit at Nederland Community Library
Judy Tuell Fisher will be displaying her artwork at the Nederland Community Library from January through March. The exhibit is titled "From Sea to Summit."
See story page 16.

Music of the Mountains: Where to be and what to see

Grant Livingston

Jamie Lammers
Nederland

Grant Livingston has been playing music since he was 10 years old. He started taking it seriously as a career when he moved to California in 2013, playing with a small band across the north of the state.

When he moved to Colorado in the summer of 2021, he was anxious to get himself involved in the music scene in the state. He started a new electric group to perform in gigs all across Colorado and has also continued playing solo gigs.

Livingston has written songs since middle and high school and primarily performs on the acoustic guitar, but you might occasionally see him performing with a mandolin or a banjo. His influences since moving to California include jam music, bluegrass, and jam grass, and he cites Bob Dylan, Robert Hunter, and Jerry Garcia as songwriting influences.

He considers his playing style very fluid, going from Flatpicking to rhythmic funk to classic folk songwriter chord progressions to a solo acoustic style. He is able to switch between all of these styles of playing depending on the context of the venue and show he is playing.

Being able to share the most authentic version of himself with an audience is one of his favorite parts about being able to perform live. He loves getting in the flow of the music, and that effect is enhanced with the advent of a crowd.

He hopes to bring his new electric band to the Caribou Room sometime later this year and is excited to be a part of the lineup for the Frozen Dead Guy Days festival in March. He wants his music to reach people in a way that allows them to get lost in whatever moment they find themselves in and prioritize the good things that life (and music) can bring.

You can watch Grant Livingston live at Knotted Root Brewery, 250 North Caribou Street in Nederland, on Friday, February 4, 2022, at 6 p.m. You can also catch him live at Howlin' Wind Brewery, 51 A Main Street in Rollinsville, on Saturday, February 5, 2022, at 4 p.m.

Continued on page 3

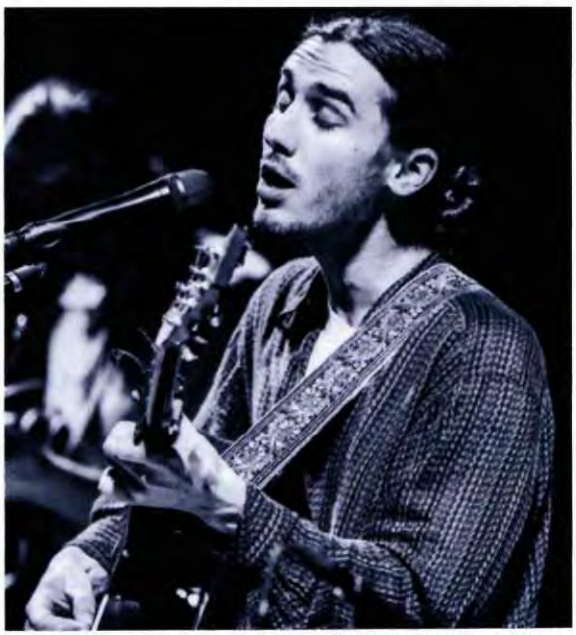


PHOTO COURTESY OF GRANT LIVINGSTON

- QUOTE OF THE WEEK -

"There are basically two types of people. People who accomplish things, and people who claim to have accomplished things. The first group is less crowded" ~ Mark Twain

Appendix F-7

F-7 Letter to the Editor “Mining with Respect for Environment”

LETTER TO THE EDITOR

Encouraging transparency

Dear Editor,

In an effort to provide necessary transparency, encourage public engagement and play fairly while keeping historical Record in our democratic republic, the Town of Nederland, needs to:

1. Pass an Ordinance that once again requires the Town to print in the Paper of Record (the Mountain-ear) all BoT proposed and passed Ordinance language IN FULL, and all Meetings and or Public Hearings.

2. Per usual Record Retention: When Town makes redactions from Public Record, the redactions need to be 'blacked out' and no longer 'whited out' so the Public knows when something is redacted and how much content is redacted.

3. Per Record Retention Rules, restore the old website.

4. Follow the Nederland Municipal Code and Record Retention Rules and have the certified hard copy of the Code and hard copies of all adopted/referenced Codes available for review during Town Hall business hours.

5. Rescind any 'paperless' governance Policies and/or Resolutions currently established.

6. Per Record Retention Rules: provide the un-redacted invoices from the Town Attorney, including and especially those titled "Administrative". Tax payer money should not be spent on unknowns to the tax payer/public.

7. Bring back the 12 month, one page chart, that in real time reflects individual BoT votes yea or no, and create them for the missing years.

8. Provide necessary usable surface space in Town Hall for the public to review Public Record.

9. Provide an ADA compliant bathroom in Town Hall, since Town is forcing normally grandfathered in buildings 40-100+ years old to. Town should be leading by example.

Kathleen Chippi
Nederland

State Legislature directs local school property tax mill increase

Dear Editor,

In December 2021, many Colorado school districts began raising property taxes to fix a decades' old practice that reduced local taxes for education based on what has now been determined to be an incorrect interpretation of the Colorado Constitution.

The legislature passed HB 21-1164, requiring the Colorado Department of Education (CDE) implement a mill levy correction plan for districts. The plan must ensure that districts incrementally correct the mill levy by not increasing more than 1 mill a year beginning in the 2021 tax year.

The Mill Levy Correction impacts 118 out of 178 Colorado school districts. Gilpin County School District RE-1 (GCSD) is one of the 118 school districts that has been directed by the State legislature to raise their local property tax mill levy.

GCSD has been directed to raise the total program mill levy to the level approved by voters at the time the GCSD taxpayers voted to de-TABOR in 1996.

In the 1990s and 2000s, many school districts obtained voter approval to retain and spend revenue above the property tax revenue limitation imposed on the district by the Colorado Taxpayer Bill of Rights (TABOR) provision of the Colorado Constitution. TABOR limits the amount of revenue the state can retain and spend.

GCSD will increase the total program mill levy from 4.075 to 5.075 mills in 2021 to be collected in 2022. A $500,000 residential home owner will see a $35.75 property tax increase for GCSD. The GCSD mill levy correction will increase the total program mill levy over the next three years from 4.075 mills to 6.651 mills. The total program mill levy was 6.651 mills when the voters de-TABORed in 1996.

The mill levy correction will not provide more revenue for GCSD. The mill levy correction will shift the revenue source for school districts back to local property tax and reduce the CDE revenue funding local public schools. This change, increasing local property tax for schools, will reduce the CDE per pupil revenue, also called the State share.

The Black Hawk Educational Enhancement Tax (EET) continues to provide revenue for GCSD. The intergovernmental agreement between the City of Black Hawk and GCSD applies when the mill levy exceeds 8 mills and when the increase is required by state or federal law. The EET has been providing 1.5% tax revenue from food, beverage, and lodging from the City of Black Hawk to GCSD since 2008. Today, the annual revenue exceeds $1 million for students and teachers in the classroom.

With the total program correction of 5.075 mills, voter-approved overrides of 2.754 mills, transportation of .364 mills, and the abatement .001 mills, the GCSD 2021 total mill levy is 8.194 mills, leaving the EET in place and enhancing the opportunities GCSD can offer its students.

David MacKenzie
GCSD Superintendent

Caribou and Cross Mines part of Nederland's history for 152 years

Metal	date from	date to	sample Measurement Cross ug/L	NPDWR levels * ug/L	Notes
lead	6/1/2021	6/30/2021	12	15	Meets Tap water levels
lead	12/1/2020	12/31/2020	4.4	15	Meets Tap water levels
lead	1/1/2021	1/31/2021	10	15	Meets Tap water levels
lead	4/1/2021	4/31/2021	6.2	15	Meets Tap water levels
lead	7/1/2021	7/31/2021	8	15	Meets Tap water levels
cadmium	8/1/2021	8/31/2021	1.5	5	Meets Tap water levels
zinc	8/1/2021	8/31/2021	282	no level violation	Meets Tap water levels
Silver	1/1/2021	1/31/2021	0.4	no level violation	Meets Tap water levels
copper	1/1/2021	1/31/2021	34.5	130	Meets Tap water levels
copper	3/1/2021	3/31/2021	46.75	130	Meets Tap water levels
copper	4/1/2021	4/31/2021	50	130	Meets Tap water levels

* National Primary Drinking Water Regulations (40 CFR)

Dear Editor,

Tom Hendricks had a well-deserved reputation for environmentally responsible hard rock mining. Grand Island Resources (GIR), current owner of the Caribou and Cross mines, is proud to continue his legacy. GIR has been and will continue to be a good neighbor. We have nearly completed the process of evaluating what has caused 11 exceedances of 400 aquatic life standard test parameters since December of 2019, and we have installed a new state-of-the-art water treatment system, which will prevent future violations. We weren't looking for a short term "fix." The long-term answer proved to be elusive.

Our plan has always been to establish a 21st century mining operation present and future generations in Boulder County will respect and appreciate. We are moving as quickly as science, engineering, and supply logistics allow us to upgrade the rest of our equipment and facilities to fully protect the citizens of Boulder County and the environment. We want to clarify at the outset that the occasional exceedances did not result from a chemical spill, ore processing water release, or impoundment breach. In fact, the mines are not producing ore – we are cleaning, fixing, and repairing existing infrastructure and facilities. We will not resume operations until we are certain all applicable safety and environmental standards can be met.

GIR is currently fully engaged with federal, state, and local agencies, including Colorado's Water Quality Control Commission (WQCC), the Division of Reclamation, Mining and Safety (DRMS) and the Colorado Department of Public Health & Environment (CDPHE). We are focused on cleaning up the mine sites, improving antiquated infrastructure across both mines, and repairing and repainting existing structures, while dealing with the Idaho Tunnel collapse that occurred in December of 2019 and the tragic passing of Tom Hendricks on January 6, 2020.

GIR has already spent $4.1 million dollars and nearly 20,000 man-hours directly on repairing the Idaho Tunnel, which collapsed unexpectedly in December of 2019, improving its water systems, and preventing the collapse of Caribou Road. Since 2019, GIR has spent a total of $6.2 million dollars and 47,210 man hours on the Idaho Tunnel, general clean-up of the Caribou and Cross mines, repairs to other infrastructure, and other water treatment facility improvements. If GIR wasn't willing to do this, it is unlikely any other company or entity would have stepped up, but we're here for the long haul. In fact, we have working partnerships with PhD and Masters programs at the Colorado School of Mines, and the Geology, Geophysics and Archeological Departments at the University of Colorado. We are expanding those programs and we've initiated discussions with Colorado State University, as well.

Following the Idaho Tunnel collapse, there have been eleven (11) individual exceedances of our NPDES aquatic life water quality standards – out of twenty (20) NPDES water quality parameters tested twice per month for the past twenty (20) months – 11 out of more than 400 data points. We are working closely with DRMS and CDPHE to complete our implementation, testing and approval of the brand new water treatment system, which features post-filtration, polishing media that are already delivering excellent results.

The Caribou and Cross mine discharge pipe is 1.2 miles from and 1,000' in elevation above the closest well, a 360-foot deep well located on the Cardinal Mill site off of Caribou Road west of Nederland. Nederland's town water intake is southwest of the town limits, in the Eldora watershed. No cross-connection has ever been found between the Eldora watershed groundwater and the Coon Track Creek/North Beaver Creek watershed. Basic hydrologic dispersion and groundwater geologic principles demonstrate that the following claims are false: that our discharge pipe (4.5 miles from Nederland's town limits) could harm wells in the valley and in Town, that food grown in gardens irrigated from North Beaver Creek (into which Coon Track Creek flows) may be unsafe, that dogs may be hurt drinking from Middle Boulder Creek (into which North Beaver Creek flows), or that the City of Boulder's drinking water may have been poisoned (Middle Boulder Creek flows into Barker Reservoir). Here's why:

As noted above, our 6" diameter discharge pipe is located 1.2 miles and 1,000 feet of elevation from the closest well. Water from springs and tributaries dilute the water from our settling ponds as Coon Track Creek flows to North Beaver Creek. We are 4.5 miles from the Town of Nederland, in the valley north of the Eldora watershed where the Town's water intake is located. The attached "Cross violation VS NPDWR drinking water standards" table compares the aquatic life exceedances (that we believe our new treatment system will eliminate) to drinking water quality standards. In fact, none of the aquatic life standard exceedances measured at our 6" discharge pipe violate the National Primary Drinking Water Regulations.

Finally, GIR has the resources, expertise and commitment to take the Caribou and Cross mines' tradition of community-supporting, environmentally responsible performance to the next level in Boulder County. We will continue our support of, and strengthen our partnership with the Town of Nederland. We've spent the past six years ensuring that Tom's leadership and legacy will be sustainable. In addition to the economic activity in Nederland supported by our workforce payroll of more than $500,000 per month, most of it spent locally in Nederland, we maintain Caribou Road (we've been snow plowing the road all the way down to the Cardinal Mill site this year), we perform safety rescues during all seasons of the year, and we have continued to allow public recreation on our private land. We look forward to a healthy, strong and prosperous relationship with the Town of Nederland's residents and businesses, and the citizens of Boulder County for many years to come, and we appreciate your support!

If you have any questions or concerns, please don't hesitate to contact us at info@grandislandresourcesllc.com.

Daniel Takami, President
Grand Island Rsources, LLC
Nederland

Cross and Caribou Mines Carries on the Legacy of 'Mining with Respect for the Environment.'

Many people don't realize the statue in front of the Boulder County Courthouse is Tom Hendricks, the legendary hard rock miner of the historic Cross and Caribou Mines. As the first President of Grand Island Resources, Hendricks placed a sign at the entrance of the Cross Mine that read, "Mining with respect for the environment." We continue forward with his legacy of responsible mining with the utmost respect for Boulder County's land, water, and people.

Recent tests of our new water treatment system indicate we are now in full compliance with the very stringent aquatic life water quality standards. The Division of Reclamation, Mining and Safety (DRMS) has determined Grand Island Resources has made "good faith efforts" to put a new treatment system in place and resolve any issues. We are working closely with the Colorado Department of Public Health and Environment to complete our implementation, testing and approval of the new water treatment system.

In a recent public meeting on 1-25-22, officials from Boulder County acknowledged Grand Island Resources is cooperating with the county and state regulators to provide documents and ensure compliance with all our applicable regulatory requirements.

The Cross and Caribou mines are not in the watershed containing Nederland's drinking water intake. No cross-connection has ever been found between the Eldora watershed groundwater and the Coon Track Creek/North Beaver Creek watershed.

This is supported by the hydrogeologic and geochemical expert who provided sworn testimony before the Mined Land Reclamation Board (MLRB) on 12-15-22, that:

1. A treatment system is in place that will prevent future violations of standards.
2. Contamination of local groundwater from mine surface water discharges is impossible due to local hydrogeology.
3. The violation of discharge standards does not mean that harm has occurred to human health or the environment. No harm has been demonstrated, only technical violations of stringent standards that have a built-in substantial margin of safety.

There has never been a valid reason in the 50-year modern history of the mine for someone in Nederland or Boulder to fear for their health due to mine water management. Instead, discussion of the mine's violations is being driven by individuals who are spreading misinformation and lies about the real and potential harm.

Our critics should have taken the time to learn about us and the state-of-the-art technology we have installed to clean up the mine and to make it safer for all. This is something all of Boulder County can support.

Grand Island Resources worked together with mining legend Tom Hendricks and is taking his initiative to the next level, operating a clean, safe and environmentally conscious hard rock mine in Boulder County. We look forward to working with State regulators, the County, the City of Boulder, the Town of Nederland, its residents, and all of our Boulder County neighbors to complete Tom's mission of "**Mining with respect for the environment**."

Daniel Takami

President of Grand Island Resources, LLC,

Appendix F-8

F-8 Letter to the Editor “Mining with Respect for Environment”
(print version in The Mountain Ear)

LETTER TO THE EDITOR

Nederland Elementary Kindergarten information night

Dear Families,

Do you or someone you know have a child that will be 5 years old by October 1, 2022? If so, they are ready for kindergarten.

Let's meet virtually on Google Meet the evening of February 16, 2022, from 6 p.m. - 7:15 p.m. to learn all about kindergarten at Nederland Elementary School. Meet our wonderful kindergarten team, and get your registration questions answered.

- Meet the principal, Caleb Melamed
- Slide Show presentation from the Kindergarten Team
- Transportation information by Monte Miles
- Registration information from our registrar Sheila Kassera

Please call Sheila Kassera at 720-561-4808 to RSVP. Please help spread the word. Thank you!

Johnnie LeFaiver
Nederland

Special District Board Elections

Dear Editor,

Coming up this year in May, Special District Elections. Why should you care and why am I telling you this?

Special districts form a major part of the local government infrastructure. They collect taxes to perform a service on the taxpayer's behalf. That can be a water district, transportation district, fire protection district, the list is extensive. In Colorado there are more than 2800 special districts that control billions of dollars of taxpayer funds. Some are better run than others. That covers why you should care.

Why am I telling you this? Because I promised that I would as a board director of the Nederland Fire Protection District when I ran for election. Sometimes special districts hide behind the law and post only the statutory notice that hides at the back of the paper in the legal notices section that few people read. When I ran for election approximately 1 in 10 electors that I spoke to knew that there was either an election or an elected board for the fire district or that they might be eligible to be on a board.

Special districts are governed by an elected board of directors, either 5 or 7, who are taxpayers within the district. Special district elections occur every 2 years and stagger the board terms so there should always be board members with context about what is going on. Each director usually serves a 4-year term. This year the election is on May 3rd.

In a fire district the chief runs the department day-to-day and acts as the CEO. The board delegates authority to them to do that. The board, in turn, provides oversight to ensure that the district is being run correctly and has a plan to ensure the longevity of the district. The board should bring with them a variety of skills and backgrounds and a desire for the success of the department. Previous experience in emergency services is not required.

If you would like to run for election on the board you need to complete a self-nomination form, this can be found on our website under 'Governance' and return to Jim Harrison, DEO Nederland Fire Protection District, PO Box 155, Nederland, CO 80466. You can also drop it off at the fire station. You must return the form by February 25th at 5 p.m. or fill out an affidavit of intent to run as a write-in candidate by February 28th at 5 p.m. to be included on the ballot.

There are 3 seats up for election this year and at this time all of the current incumbents intend to run as candidates. If there are no further candidates, then the election will be canceled by the board at the beginning of March.

The board resolved to make this election a mail-in ballot because of COVID uncertainties and also to ensure access and transparency. All eligible electors of the district will receive a mail ballot should the election proceed.

Whether you decide to be a candidate or vote, please participate in our democracy.

Sincerely,

Iain Irwin-Powell
President, Board of Directors Nederland Fire Protection District.

Carrying on the Legacy of "Mining with Respect for the Environment"

Dear Editor,

Many people don't realize the statue in front of the Boulder County Courthouse is Tom Hendricks, the legendary hard rock miner of the historic Cross and Caribou Mines. As the first President of Grand Island Resources, Hendricks placed a sign at the entrance of the Cross Mine that read, "Mining with respect for the environment." We continue forward with his legacy of responsible mining with the utmost respect for Boulder County's land, water, and people.

Recent tests of our new water treatment system indicate we are now in full compliance with the very stringent aquatic life water quality standards. The Division of Reclamation, Mining and Safety (DRMS) has determined Grand Island Resources has made "good faith efforts" to put a new treatment system in place and resolve any issues. We are working closely with the Colorado Department of Public Health and Environment to complete our implementation, testing and approval of the new water treatment system.

In a recent public meeting on 1-25-22, officials from Boulder County acknowledged Grand Island Resources is cooperating with the county and state regulators to provide documents and ensure compliance with all our applicable regulatory requirements.

The Cross and Caribou mines are not in the watershed containing Nederland's drinking water intake. No cross-connection has ever been found between the Eldora watershed groundwater and the Coon Track Creek/North Beaver Creek watershed.

This is supported by the hydrogeologic and geochemical expert who provided sworn testimony before the Mined Land Reclamation Board (MLRB) on 12-15-22, that:

A treatment system is in place that will prevent future violations of standards.

Contamination of local groundwater from mine surface water discharges is impossible due to local hydrogeology.

The violation of discharge standards does not mean that harm has occurred to human health or the environment. No harm has been demonstrated, only technical violations of stringent standards that have a built-in substantial margin of safety.

There has never been a valid reason in the 50-year modern history of the mine for someone in Nederland or Boulder to fear for their health due to mine water management. Instead, discussion of the mine's violations is being driven by individuals who are spreading misinformation and lies about the real and potential harm.

Our critics should have taken the time to learn about us and the state-of-the-art technology we have installed to clean up the mine and to make it safer for all. This is something all of Boulder County can support.

Grand Island Resources worked together with mining legend Tom Hendricks and is taking his initiative to the next level, operating a clean, safe and environmentally conscious hard rock mine in Boulder County. We look forward to working with State regulators, the County, the City of Boulder, the Town of Nederland, its residents, and all of our Boulder County neighbors to complete Tom's mission of "Mining with respect for the environment."

Daniel Takami
President of Grand Island Resources, LLC,

Letters to the Editor are the opinion of the author and do not reflect the opinion of the newspaper.

Correction. On January 20, 2022, a letter from the City of Boulder regarding Cross and Caribou Mines to the Division of Reclamation and Mining Safety (DRMS) and CDPHE's Water Quality Control Division was included in *The Mountain-Ear* as a letters to the editor, in print and online. *The Mountain-Ear* would like to clarify that the City of Boulder did not submit this letter to *The Mountain-Ear*.

The next Gilpin County GOP Meeting is on Thursday, February 3, 2022, at 7 p.m. at the Professional Building. The building is located at 972 Golden Gate Canyon Rd, Black Hawk, CO 80422.

Gilpin County Democrats meet on the 4th Thursday of each month at 6:30 p.m.via Zoom. All are welcome to attend. Please request an invitation from gilpindemschair@gmail.com.

POSITION OF IMPORTANCE: Gilpin County is soliciting letters of interest to serve on the Gilpin County Planning Commission to review land use and land subdivision issues at monthly meetings, currently held online via Zoom. There is one position available with a term that will end on December 31, 2024, with the option to request appointment to a new three-year term beginning January 2025. All members must reside in Gilpin County; a mileage reimbursement is available, once in-person meetings resume. Letters of interest should be addressed to: Gilpin County Commissioners, PO Box 366, Central City, CO, 80427-0366, or via email to scate@gilpincounty.org. Letters must be received by March 1, 2022. Informal consultations between the current Planning Commission and applicants will be held on March 8, 2022. For more information, please contact Deputy Clerk Sharon Cate at 303-582-5214 x1 or email address above.

Your Property Tax Notice is on its Way!!

Important Dates:
February 28, 2022, 1st half due and
June 15, 2022, 2nd Half due
or April 30 Full Payment due

You may pay online:
(https://paytaxes.us/co_gilpin), by mail, over the phone or in person
(don't forget your mask)

Your tax notice also includes information on signing up for all future Tax Notices to be emailed.

Please contact our office if you have questions 303-582-5222
Gilpin County Treasurer, Mary Lorenz

Appendix F-9

F-9 Guest Opinion to the Boulder Daily Camera

GUEST OPINION – A Quick Fix Was Never the Answer for Nederland Mine Cleanup

published in the Boulder Daily Camera on 12/21/2021:

https://www.dailycamera.com/2021/12/21/guest-opinion-daniel-takami-a-quick-fix-was-never-the-answer-for-nederland-mine-cleanup/

As members of the Boulder County community, Grand Island Resources (GIR) agrees that clean water is a priority. For our Cross and Caribou Mines located in Nederland, CO, we couldn't agree more. We, like you, are committed to clean water, clean air and a cleaner earth. As we've transitioned from the untimely death of our respected leader, Tom Hendricks ("Miner Tom"), and through COVID-19's supply disruptions, the challenges have continued, but we've embraced them, each in turn, devoting all our time and millions of dollars on clean-up and upgrades, not production, during the past two years.

Our most difficult challenge has been applying 21st century technology to meet strict aquatic life standards high in the Coon Track drainage. We've recently had to replace legacy passive water treatment with state-of-the-art post-filtration, polishing media to extract or neutralize dissolved metals to meet and exceed strict state and federal aquatic life standards. These standards are more stringent than the EPA's National Primary Drinking Water Regulations (i.e., 11 exceedances were in parts per billion and 10 of them met drinking water standards). The exceedances did not result from a chemical spill, ore processing water release, or impoundment breach. In fact, the mines are not producing ore – we are cleaning, fixing, and repairing existing infrastructure and facilities. We will not resume operations until we are certain all applicable safety and environmental standards can be met.

We have commissioned detailed scientific and engineering studies on how to best treat groundwater discharge from both mines. We have retained three nationally recognized Colorado water treatment engineering firms who informed our recent installation of a $150,000 water treatment system, replacing 50 years of antiquated water purification systems.

GIR regrets that the treatment system was not installed and operating sooner to prevent the unanticipated violations during our evaluation and initial work at the Caribou and Cross mines. However, we weren't looking for a short term "fix." The long-term answer proved to be elusive. Our plan has always been to be a good neighbor by establishing a 21st century mining operation present and future generations in Boulder County will respect and appreciate. We are moving as quickly as science, engineering, and supply logistics allow to upgrade the rest of our equipment and facilities to fully protect the citizens of Boulder County and the environment.

As a company, GIR is dedicated to our mission: employing private capital to clean up existing contaminated mine tailings and responsibly operate hard rock mines. We have made and will continue to make substantial investments in Boulder County's historic Cross and Caribou Mines to operate them in a manner that is environmentally responsible and economically resilient.

We all live on a small planet. We know that the pollution caused by improper mining here and anywhere else in the world is likely to find its way into the food we eat, the air we breathe, and the water we need to survive.

We are currently fully engaged with federal, state, and local agencies, including Colorado's Water Quality Control Commission (WQCC), the Division of Reclamation, Mining and Safety (DRMS) and the Colorado Department of Public Health & Environment (CDPHE). We are focused on cleaning up the mine sites, improving antiquated infrastructure across both mines, repairing, and repainting existing structures, and finalizing plans for completion of the infrastructure proposed by Mr. Hendricks in the special use review application that was approved by Boulder County in 2008.

GIR looks forward to continuing and enhancing our existing partnerships with local universities and our work with federal, state, and local government regulators. As a company, we practice the highest standards of Environmental, Social, and Corporate Governance (ESG) criteria as we strive to make Colorado's mining industry cleaner and more compatible than it has ever been. GIR believes these initiatives will have a positive impact on the local environment and create a more enjoyable place for all of us who live, work and play in this great state.

Daniel Takami, President,
Grand Island Resources
4415 Caribou Road
Nederland, CO 80466

Appendix F-10

F-10 Save the Colorado Letter to DRMS Response Letter, Dr Miller

27 January 2022

Amy Eschberger
Environmental Protection Specialist
Colorado Division of Reclamation, Mining and Safety

VIA EMAIL: amy.eschberger@state.co.us

Dear Ms. Eschberger:

I am providing this letter on behalf of Grand Island Resources (GIR) in response to the comment letter you received from Save the Colorado (STC) on December 28, 2021 (STC Letter). STC has four issues with approval of the proposed Amendment 2 to the GIR 110(2) Limited Impact Mining Permit: (1) has there been no meaningful public participation in the AM-02 Application Review, (2) the AM-02 Application fails to demonstrate minimization of impacts to water quality, (3) the Cross Mine should be considered a Designated Mining Operation (DMO), and (4) the AM-02 Application fails to demonstrate compliance with HB 19-1113.

Informed review of the STC Letter finds that there is a fundamental misunderstanding of the law and regulations which has led STC to believe the DRMS should deny Amendment 2 and reclassify the mine. We appreciate this opportunity to respond to STC's comments, including educating STC and others on the status of the new water treatment system and addressing any misunderstandings of the law.

1. <u>There Was No Actual or Potential for Harm from The Discharge</u>

I provide hydrogeologic and chemical expert services to GIR, as a former employee, and currently as a consultant. As you may recall, as a retained expert I provided sworn testimony on December 15, 2021 to the Mined Land Reclamation Board (MLRB) that:

1. A treatment system is in place that will prevent future violations of standards.
2. Contamination of local groundwater from mine surface water discharges is impossible due to local hydrogeology.
3. The violation of discharge standards does not mean that harm has occurred to human health or the environment. No harm has been demonstrated, only violations.

Since that testimony, it is my understanding that no State, Federal, County or City agency has disagreed with my opinion or provided any opinions to the contrary. I also don't believe another expert has put forth a contrary oral or written opinion based on science and mathematics. There is no expert opinion that wells have been contaminated downstream from our below-drinking-water-level discharges at the mine.

To date, we have not received a rebuttal expert opinion proving harm or injury. That is because no domestic or drinking water source was actually impacted, nor was there ever the potential for harm. No Colorado drinking water, livestock water, or agricultural irrigation standards for compounds in water were ever exceeded as a result of GIR's surface water discharge. In a mountain valley with a gaining stream, groundwater flows

to surface water, not surface to ground. Surface water contaminating groundwater would be impossible because the water would be flowing uphill. Clearly this wasn't the case. We hope STC understands there has been no harm.

Large margins of safety exist in the discharge permit. The state permit writer ensures that these safety factors exist for limits to individual compounds, like zinc. The toxicity of Cross Mine discharge is also directly tested against sensitive stand-in species. The state requires controlled direct testing of our effluent on the health of newly hatched minnows, trout, and aquatic invertebrates. There has been no harm.

a. *Forcing GIR to Prove a Negative is Unfair and Overly Burdensome*

STC makes several comments to the effect that my testimony indicated that it will take several months, possibly longer, before the design of the final mine-selected treatment system is complete. That is true, however, left unstated by STC, the current system is installed, functioning and is being constantly tested. When fully successful, it will be expanded. What is not mentioned by STC is that I also testified that:

- Proof of concept testing and engineering by highly-qualified consultants to design the system was done using Cross and Caribou mine groundwater discharge.
- DRMS met with the entire water treatment consultation team and had their questions answered by the team prior to system installation.
- The treatment system was in place on December 15 and producing permit-compliant discharge.
- The system is being operated with the knowledge and approval of CDPHE.
- The system will be upgraded in stages, starting this winter, to meet current and future mine water treatment by increasing capacity and redundancy.

Furthermore,

- DRMS testified that the final configuration of the treatment system is to be presented to DRMS as a Technical Revision, not in Amendment 2.
- DRMS conducted an inspection of the installed treatment system on January 11, 2022.
- DRMS was requested to present a progress report to the MLRB on GIR's water treatment progress on January 19, 2022, with a quarterly report from the mine and DRMS to be presented to the Board in March 2022. The progress report was received at a Board hearing.

In response to this verifiable progress to eliminate discharge violations, STC makes such unsupported suppositions as:

> "…there is no conceivable way the applicant can provide the necessary water quality treatment and mitigation information to enable full Division review before the current decision deadline of January 8, 2022"

> "…the entire water quality treatment facility will have to be substantially, if not wholly, overhauled over the next 6 months and beyond. Given this reality, there is no conceivable way for the applicant to meet its statutory and regulatory burdens at the current time."

The reality is that water treatment was in place and meeting standards, approval of changes had been decoupled from Amendment 2 by DRMS and CDPHE, and a procedure for close-interval DRMS oversight and reporting to the Board had already been implemented, thirteen days before STC was writing "… there is no conceivable way…". It's almost if STC missed half of the meeting, projecting to the future progress that was already made by GIR, DRMS, and the MLRB. Most of what STC found "inconceivable", had already been done.

CDPHE Water Quality Control Division (WQCD) is the primary enforcement agency for the mine wastewater treatment system. CDPHE has not linked approval of the water treatment modifications to their review of Amendment 2. I personally communicated with GIR and CDPHE about installation of two separate pilot treatment systems at the mine this year. The second pilot was converted to the current treatment system.

Technical information and drawings of the pilot plants was requested by the state and provided by GIR in a timely manner. CDPHE WQCD stated that our permit is performance based (does it achieve standards), rather than technology based (use an approved method only), so the treatment technology was to be determined by the mine, and permitted by CDPHE based on performance. As Colorado's health and environment agency, if CDPHE WQCD separates approval of Amendment 2 from approval of the water treatment system, it is my opinion that the public is indeed protected by review and regulation.

b. *STC's Expert Opinions*

"On behalf of local residents concerned and directly adversely affected by the ongoing water quality problems at the Cross Gold Mine…" is the opening of the STC letter. I have provided expert public testimony that not a single person or well has been directly adversely affected by GIR's discharge violations, or the water that has been released by the mine. I am unaware of any expert opinion contrary to mine. So right now, as in the past, the only adverse effect on humans from discharge violations, is fear.

GIR would appreciate more information on STC. Which local residents does Save the Colorado represent? Why are they exacerbating fear in individuals? If they have been telling anybody that GIR has caused actual harm rather than there is an alleged violation of water quality standards, GIR would like to know who the person or persons are, so that we can talk to them and set the record straight - reassure them that the mine water discharges have always remained below drinking water compliant levels. We plan to temper the fear with facts.

I have worked with attorneys for decades on groundwater toxic torts, both for defendants and plaintiffs. In my experience, most attorneys are not testifying experts in the earth sciences. It is typically outside an attorney's core skills, so courts and attorneys seek hydrogeologic experts to assist. GIR would appreciate getting the

contact information for STC's hydrogeologic expert to have a constructive discussion between experts.

In order for there to have been harm to groundwater wells from our surface water discharge, water would have to flow backwards. Its common knowledge to hydrologists, geologists and engineers in Colorado that mountain groundwater discharges to mountain streams, not the other way around. That's why there is more water in a stream downslope/downstream than at the headwaters. That's just one of the reasons why there has been no harm to groundwater as a result of discharge violations. GIR would appreciate knowing who STC represents that "…is directly and adversely affected…" by the mine's discharge.

According to the May 24, 2021 form 990ez tax filing with the IRS, Save the Colorado spent $202,451 on "Professional fees and other payments to independent contractors" in 2019 and ended the year with significant cash on hand. Many of Save the Colorado's apparently willful misstatements of fact regarding harm or the law could have been easily avoided by employing a knowledgeable expert. STC has the time, resources, and prior experience to employ experts. Again, GIR would like to have a discussion with STC's expert as soon as possible.

2. <u>There Has Been Opportunity for Meaningful Public Review</u>

STC claims that the public has been denied an adequate opportunity to review and comment on Amendment 2 and links water treatment modifications to the amendment. To do this STC must ignore the fact that the public has been given every required opportunity, and more, to comment on plans and process. Because of the iterative process with DRMS there have been 3 public notices in the past 12 months, one for each iteration of the amendment. Each iteration has also caused DRMS to ask for full review of the amendment by every Colorado Public Agency that the MLRB Board deems appropriate, including the Colorado Department of Public Health and Environment (CDPHE).

GIR is pleased to be able to respond here. It is very concerning to GIR that instead of STC's experts' providing GIR with actual evidence of harm and instead of engaging in fruitful discussions of STC's concerns and trying to understand the mine's operations and new treatment system, STC is proceeding with assumptions of the mine's violations which is being driven by uninformed individuals who are spreading such misinformation about the real and potential harm.

a. *Stopping Amendment 2 Actually Harms the Public and Environment; Delay Is Not Beneficial*

STC makes arguments that delay in the Amendment 2 approval will result only in positive outcomes. This isn't true. Amendment 2 is treated as an abstraction by STC, as if there was no reason for its creation. It's important to understand that Amendment 2 started as a 0.33-acre addition to the permitted disturbance boundary. This expansion was required because a tunnel collapse extended outside the existing 110(2) Amendment 1 permit boundary from 2011. The need to revise the permit was immediate and unexpected.

The reclamation plan for the existing permit did not meet modern standards. The cash bonding for reclamation wouldn't have been sufficient to complete a fraction of the necessary work. Property boundary surveys revealed construction existed outside permit limits. All of these updates to boundaries, bonding, and reclamation needed to be included in Amendment 2. DRMS is, by law and regulation, permitted to propose a bond increase at any time. Technical Amendments are a routine part of the permit process.

Amendment 2 greatly improves the reclamation plan coverage and quality over that approved under Amendment 1. On acceptance, the reclamation bond will increase substantially, but only with an approved amendment, because the bonding is based on costs contained in the amendment and any re-evaluation by DRMS of the overall existing bond. There are numerous proposed construction activities to support stormwater quality that need to happen this year, that are to be approved as part of this permit revision. Without Amendment 2 approval, these activities will have to be re-proposed as Technical Revisions to the existing permit, bonding will not increase, and site environmental construction may be delayed to 2023. This does not benefit the public.

GIR believes the public would want these controls and bonds in place quickly, as well as the proposed Amendment 2 restoration activity, that improves on previous plans, bound and accomplished quickly. DRMS and GIR have completed three review and revision cycles of Amendment 2 at substantial cost to both. The technical challenges and improvements were substantial. A delay and resubmission cycle is an unwarranted do-over of a process DRMS indicates is near complete.

None of the STC identified application technical deficiencies have basis in fact. Many of the items STC states are in planning, or don't exist, have actually been completed prior to the December 15th MLRB hearing. "Missing" documents and plans are not missing at all and DRMS has set the schedule and mechanism for their delivery.

b. ***There are no Missing Laboratory Reports***

In discussing the November 23, 2021 revision of Amendment 2 STC suggests that the mine's data on acid-base accounting:

> "…should be expressly requested by the Division in its review of AM-02 and made part of the publicly available application materials to enable Division and public scrutiny…"

STC implies that GIR is withholding critical data. Nothing could be farther from the truth. The acid-base accounting, leach tests, and correspondence between the mine and DRMS ensuring that tests were conducted to DRMS satisfaction, have been part of the public record since 1995. Complete, rescanned original reports from Core Laboratories acid-base accounting and humidity cell leaching were provided electronically to DRMS with the November 23, 2021 submission, at the request of DRMS. All of the information STC says is missing, has been part of the public record for 37 years. Data isn't missing. STC either didn't look, or simply missed the scores of documents that prove acid-base accounting for Cross Mine ore has been done. We would be happy to provide these

records if STC cannot located them on your database. There is no acid mine drainage in this part of the Grand Island District due to the mineralogy.

c. *The Law does not Support the Restart of the Public Process*

The STC Letter states that "…the Division should exercise its authority under Hardrock Rule 1.6.6, which provides for re-initiation of public process where substantial changes to an application have been made," and under this regulation STC calls for "…a re-start of the application approval clock."

As you and STC likely know, this regulation is entitled "Conditions that Require a New Notice to the Public" and speaks to correcting errors in legal section newspaper ads. Rule 1.6.6 provides for corrections to notices, not 'do-overs' or restarting of the application process. The text is clear:

> "1.6.6 Conditions that Require New Notice to the Public
>
> If a notice is in error or a change to the application is so substantial, as determined by the Office, that it affects any of the terms contained in the notice that was published in the newspaper or mailed to the owners of the affected and adjacent lands, or the change is an amendment to the application, the Applicant shall be required to publish and mail a new notice of the application. In the event that the Applicant is required to issue a new notice, all applicable deadlines shall begin to run anew."

This rule addresses a mismatch between the content of a notice and the content of the change that the notice pertains to. If a notice is inaccurate, it must be redistributed; that's common sense. For example, the notice would have to be republished if it indicated an incorrect location. Any schedule for notices restarts on redistribution of the new notice. Restarting the notice clock makes sense too. The rule states that a mismatch is addressed by publishing a corrected notice and restarting the clock on public notices "…all applicable deadlines shall begin to run anew." I do not believe any other interpretation is possible.

Rule 1.6. contains various notice deadlines, the deadlines referred to in Rule 1.6.6. As an example, a 110 ISL mine needs to publish a notice once a week for four (4) weeks. Rule 1.6.6 states that 4-week process would restart with a mismatch, not that the 110 ISL application be resubmitted if there was a mismatch.

DRMS has asked GIR to address water treatment changes as part of a Technical Revision, which is open to future public comment, rather than in Amendment 2. Accordingly, Amendment 2, and all three public notices of the proposed amendment, do not refer to changes in water treatment. If one did, and the other didn't, that would be a mismatch. That hasn't happened, and timely and accurate publication of notices by GIR is clear in the public record.

GIR has provided public notice in accordance with all requirements of Rule 1.6 as it applies to 110(2) permits. GIR has not had to republish or remail any notice due to

mismatch errors described in Rule 1.6.6.[1] STC's claims appear to stem from unfounded interpretation of the regulations. STC's radical new interpretation of Rule 1.6.6 defies plain English understanding.

3. The AM-02 Application Clearly Demonstrates There Will Be No Harm or Continuing Violations of Water Quality

The STC Letter attempts to convince you and the public that there has been actual harm when this is not the case. There have only been notices of violations, which GIR's predecessor and GIR took seriously and addressed. Harm and violations are not the same. Violations are issued so that actions are taken to prevent harm in a timely manner; the safety factors drawn into the permit virtually guarantee this.

Approval of Amendment 2 would cement a modern reclamation plan prepared by top Colorado-based consultants into action and law. Bonding will increase by approximately $350,000 over the existing bond. Environmental monitoring and protection plans for surface water and groundwater, built around the Amendment 2 activities, will be reviewed by the state and implemented this construction season. The water quality concerns put forward by STC, although unwarranted, are best addressed by approval rather than delay.

a. *Evidence of Pollution*

The STC statement that the mine does not have a record of water quality impacts before January 1, 2019 should give anyone pause. The mine had water quality impacts from tunnel discharge when Tom Hendricks came on site in the early 70's. This was before there were rules requiring treatment. He then constructed treatment systems because there were discharges above the newly enacted Clean Water Act standards. He experimented with alternate treatments in the 1990's because of sporadic violations, despite his best efforts. All of this history is found in the mine's public record. The passive, lime-based system was generally effective during periods of low level mine activity.

More importantly, competent basic research of the publicly available water quality data would (should) have stopped STC from making any claims regarding an absence of history on water quality problems before 2019.

4. The Cross Mine Should Not Be Classified as A Designated Mining Operation.

By misstatement of law and a misunderstanding of the mine, STC tries to argue that DMO Permit standards apply to a 110(2) Permit Amendment 2 process. The STC Letter tries to work outside the 110(2) processes by broadly distributing distortions of law and fact. STC is misstating law, distorting the public record, and causing public fear where

[1] GIR did have to mail additional comments to landowners who were missed in the first application iteration. That is because we added the Caribou 300 Level and Potosi shaft disturbance areas. There were additional landowners affected by those additions. DRMS approved notifying only the property owners affected by these additions, not requiring a public notification in the paper or otherwise.

there is demonstrably no harm. Their claims do not change a 110(2) mine to a DMO or 110d mine.

Mines and the public operate under the same set of rules and regulations that the people of the state, through their representatives, have chosen. These rules provide a level, transparent, and fair method for mines to seek permits and objectors to have their voices heard. GIR has submitted an Amendment 2 application to its 110(2) Permit, DRMS is reviewing the application using 110(2) standards, thus the 110(2) permitting process is the applicable law.

a. *Save the Colorado Misunderstands DMO Permit Requirements*

STC asserts many times that the relevant permit process for the Cross Mine is a DMO because of presence of toxic substances and violations of water quality standards. They force the Cross Mine into a DMO designation by wordsmithing the regulations without mentioning that the operations proposed in the 110(2) Amendment 2 are categorically excluded as subject to DMO rules or DMO classification. The exclusion for the Cross Mine is found in the Hardrock Rules. Rule 1.1 (14)(e) states:

> "The various types of DMOs are identified in Section 34-32-112.5, C.R.S. 1984, as amended. Except as to uranium mining operations**, designated mining operations exclude operations that do not use toxic or acidic chemicals in processing for purposes of extractive metallurgy and will not cause acid mine drainage**. Any designated mining operation, including uranium designated mining operations, may seek exemptions from this status pursuant to Rule 7." (emphasis added)

The Cross Mine is excluded from consideration as a DMO by rule, because there is no extractive metallurgy conducted at the Cross Mine under the 110(2) Amendment 2 application. That means there are no toxic chemicals that would designate the Cross Mine as a DMO now, or under an approved Amendment 2. There is no acid mine drainage anywhere on the entire property, and the mine is not generating any, as confirmed by acid/base and humidity cell testing.

The Mined Land Reclamation Act is also clear on this point. If the Cross Mine was a DMO for other reasons, such as area, the Act as implemented at CRS § 34-32-112.5.(2) allows the mine to apply for exemption from classification as a DMO if it is not using or storing acid- or toxic-producing materials. A complete exemption from DMO rules is possible. The Act states:

> "If an operator demonstrates to the board at the time of applying for a permit or at a subsequent hearing **that toxic or acidic chemicals are not stored or used on-site and that acid- or toxic-producing materials will not be used, stored, or disturbed in quantities sufficient to adversely affect any person, any property, or the environment, the board shall exempt such operations whether conducted pursuant to section 34-32-110 or otherwise.** The board may promulgate rules governing the conduct of mining operations which are exempted pursuant to this subsection (2)." (emphasis added)

Note the focus of the Act on adverse effect, vs. the mere presence of a single molecule of a toxic substance. Rule-making and legislation have long recognized that "the dose makes the poison" and numeric levels are set accordingly. That is why the statute states "toxic-forming", and the Hardrock Rule states at 1.1(14)(f)1. that mines that are not acid producing, and do not use designated toxic chemicals, are again not subject to DMO rules.

> "Metal mining operations, permitted under Section 34-32-110, C.R.S. 1984, as amended, **which do not use or store designated chemicals, shall be excepted from the requirements applicable to Designated Mining Operations, unless they have a potential to produce acid or toxic mine drainage in quantities sufficient to adversely affect any person, property or the environment**. It shall be the burden of the Operator or Applicant to demonstrate to the satisfaction of the Office that such potential does not exist." (emphasis added)

The Rule states "…in quantities sufficient to adversely affect any person, property or the environment." STC writes that the mere "…presence of toxic materials trigger DMO consideration." This is inaccurate for so many reasons.

For example, the entire state of Colorado is classified Zone 1, the highest classification, for radon gas risk because of the common occurrence of uranium in Colorado soil. No expert would testify that uranium is not a toxic element. But no expert would state that every mine in Colorado is a DMO because there is a toxic element merely 'present' in the soil. Adverse effects matter. If Save the Colorado's claims were true, the entire Colorado Mineral belt would be implicated by the presence of ubiquitous minerals present at thousands of locations. There have been no adverse effects from the mine's discharges, other than fear produced by fanning the flames of public misinformation.

STC's argument is not credible, and the details of their failure are found in the regulations that they omit. The answer to the question of 'is the Cross Mine is a DMO?' is found in the exemptions and exclusions cited above. It is my expert opinion that a reasonable person's review of the Amendment 2 Application and the DRMS public record would find no indication of any currently proposed extractive metallurgy at the Cross Mine. Similarly, a reasonable person would find extensive third-party analytical reports and correspondence between the mine and DRMS regarding acid-generation and leach testing conducted on representative composite samples of Cross Mine ore in the public record. The Amendment 2 record contains the complete Core Laboratories that was resubmitted to DRMS at their request.

It is my expert opinion that the Core Laboratory data package demonstrates that the ore is not acid-generating and does not leach trace metals above acceptable values. Because the host crystalline rocks contain less potentially acid generating material than ore, it can be inferred that waste rock is similarly non-acid non-toxic generating. The Cross Mine has none of the acid generation or toxic leaching characteristics that would classify the Cross Mine as a DMO.

5. The AM-02 Application Should Not Be Delayed While GIR and DRMS Are Discussing End Dates

STC introduces recent amendments and revisions to Hardrock Rules that address long term water treatment "end dates." The rule also contains several processes to seek an exemption to determining an end date for water treatment. STCs argument is that the there is no end date exemption for the Cross Mine because:

1. The 110(2) Cross Mine does not have a required Environmental Protection Plan (EPP).
2. There is no prior record that water quality impacts existed before January 1, 2019.

Review of HB 19-1113 and CRS § 34-32-116(7) reveals a conflict between the Act as enabled and other portions of the Act and Hardrock Rules. A Catch-22. A 110(2) mine needs an EPP to get an exemption, but EPP's, by definition, are only for DMO's. Non-acid-generating non-metallurgical 110(2) operations like the Cross Mine are categorically exempted from DMO rules and application requirements. The Act and Rules define EPP's as plans created by and for DMO's only.

The Act specifies that exemption from the "end date" requires:

> *"An environmental protection plan and reclamation plan adequate to ensure compliance with applicable water quality standards."*

The Act EPP above is a reduced standard from the requirements found in the Rule definitions for DMO EPP's, that state:

> *""Environmental Protection Plan" means a plan submitted by a Designated Mining Operation for approval as part of the Operator's or Applicant's permit for such operation for* ***the protection of human health, property or the environment*** *in conformance with the duties of Operators as prescribed by the Act and these Rules." (emphasis added)*

An EPP meeting "…applicable water quality standards" would plan for a very small subset of the risk that an EPP that covers "…the protection of human health, property or the environment…" plans for. Possibly there is no Catch-22. Functionally, this rule describes two different EPPs. Using a plain-language interpretation of the "end-date" rule, it appears that a comprehensive EPP is required for DMO's and that an EPP and Reclamation plan that addresses only "…applicable water quality standards." is required for everyone else. We seek clarification from DRMS.

There are no time restrictions found in the Act or CRS on submission of an appropriate EPP to DRMS for approval. The mine anticipates submitting the water quality protective EPP in a Technical Revision to the amended permit, after the Amendment 2 process is complete. This is the same manner as DRMS has requested that the mine submit the currently completed Groundwater Monitoring Plan and Stormwater Management Plan, the in-progress engineering design of hydraulic plugs for closure, and any plans for modification of the existing filtration and polishing treatment. These documents will be submitted as Technical Revisions, after Amendment 2 is complete, in compliance with

Hardrock Rules, DRMS policy, and the schedule set by DRMS. All Technical Revisions are open for public comment.

The Save The Colorado claim that the Amendment 2 process is dead in its tracks because of HB 19-1113 is just another of STC's claims supported by selective quotation, poor research, and fanciful interpretation of the regulations. There are no restrictions on GIR creating an appropriate EPP and submitting it to the state for consideration of an end date exemption, a fact unmentioned by STC. The water quality history records prior to 2019 exist. They are extensive, and widely available for public review.

It appears that STC claims that Amendment 2 can't proceed without an end date are not real. GIR is not prohibited from applying for an exemption, and the law appears to be crafted to let mines like the Cross continue operating without an end date for discharge. GIR will seek DRMS guidance on applying for an exemption to an end date, and what a non-DMO EPP should look like. GIR will comply with all evolving regulations.

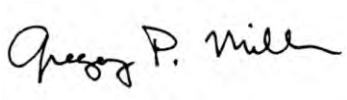
6. Conclusion

The STC Letter begins with the blatant misstatement that there are direct adverse effects to local residents. STC's allegations are based on a clear misunderstanding of the law. STC falsely claims there are records intentionally hidden from public review. All of this has led STC to arrive at the wrong conclusion that a mine that is categorically exempt from the Designated Mining Operation Rule, is a DMO.

Based on review of the public record regarding Cross Mine permitting, and my personal, academic, and professional experience, it is my opinion to a reasonable degree of scientific certainty that there has been no harm to human health or the environment from the 2020-2021 GIR discharge permit violations.

The STC Letter is not an accurate representation of fact, as I describe in great detail above. The STC Letter uses misinformation and misinterpretation of the laws and regulations in an attempt to convince DRMS and the public that Save the Colorado is not only an authority on mine permit classification, but that DRMS has mis-classified the Cross Mine for decades. Based on the above, we hope, like GIR did, you also determine that the STC Letter is based on false assumptions and is not persuasive. Thank you for your time and consideration. If you or STC have any questions, or require any further information, please do not hesitate to contact me or Daniel Takami.

Sincerely,



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Appendix F-11

F-11 GIR DRMS Supplemental Timeline Letter to DRMS

GRAND ISLAND
RESOURCES

P.O. Box 3395
Nederland, CO 80466
December 3, 2021

Supplemental Timeline

Past History

By 1975, Hendricks Mining Co. (HMC) had begun the process of treating trace dissolved metals from the Cross Mine dewatering discharge. Analytical tests performed on the groundwater in the Cross and Caribou mines indicates that this water does not constitute acid mine drainage (AMD). A combination of lime treatment of Cross Mine effluent and dilution with Caribou Mine (Idaho Tunnel) water kept effluent discharges compliant with discharge standards of that time. The ores at the mine were subjected to, and passed, humidity cell and acid/base testing. The mine has maintained a CDPHE discharge permit for decades.

When compliance numerical standards were enhanced, HMC piloted additional treatment technologies such as adsorptive media, with limited success, as occasional water quality standard exceedances occurred throughout each year. The mine today has very strict discharge standards to protect aquatic life, and, being high in the drainage, is given little or no dilution credit. It is now clear that the standard practices of settling micro-sediments in settling ponds combined with lime addition to remove dissolved metals is inadequate, particularly during periods of increased activity at the mines, combined with groundwater recharge during spring as recently observed. The main factor assisting HMC in compliance was the blending of Caribou Mine water and Cross Mine water to meet the standards as the Caribou Mine groundwater met standards without any treatment. As long as the Cross Mine groundwater had adequate dilution from the Caribou Mine groundwater HMC and later Calais were able to meet compliance including during periods of mining activity at the Cross Mine.

In the late 1990's the Caribou Mine, (which was not in operation at the time) started to collapse. This became an issue for the affecting groundwater drainage as an 8-inch HDPE pipe was draining the water through the Idaho Tunnel into Pond 2 where it was mixed with the Cross groundwater and later discharged.

2019 – Spring

The operator Mr. Thomas Hendricks was noticing in his quarterly and year-over-year comparisons that the volume of groundwater discharging out of the Caribou Mine was diminishing. He then contracted a mine servicing company, Harrison Western Construction, to reopen the Idaho tunnel

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Nederland, CO 80466
December 3, 2021

Supplemental Timeline

and repair it so that the groundwater discharge problem could be addressed and for proper maintenance to be performed. Mr Hendricks did share concern in an e-mail correspondence to DRMS in mid-2019.

Caribou tunnel entrance in 2019 after Harrison Western Construction dug out the entrance

Caribou tunnel immediately after opening in 2019

2019 – August to November

In August 2019 Harrison Western Construction began their work and brought up supplies and engineering resources required for opening up the Idaho tunnel. Early excavation work plus removal of the snowshed and digging back of the portal went well during these months.

GRAND ISLAND
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Nederland, CO 80466
December 3, 2021

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2019 – December

The excavation and portal work were advancing slowly through the frozen ground in mid-December when the contractor installed a series of heaters. Harrison Western Construction then began to heat a large section of unsupported ground. The management of the property, which at this time was Grand Island Resources LLC (GIR) was not notified of this change in process. Overnight the ground became unstable, and a large collapse occurred (detailed in Technical Revision # 5). This event limited the water supply from the Caribou.

2020 – January

While Grand Island Resources was working on an engineering plan, Mr. Thomas Hendricks, the Company President, passed away on January 6, 2020. With his passing an enormous amount of information and institutional knowledge that he had amassed over 48 years in mine operations and blending of the Cross and Caribou waters was also lost. At this time Harrison Western Construction was fired for failing to follow and implement proper procedures, and for poor communication. At this point over $634,000 had been spent on the rehab of the Idaho tunnel and repairing several piping systems for water discharge. 12,557-man hours had been spent to date in the repair and rehabilitation of the portal and the water system.

2020 – Spring

By spring, the Cross water, could not meet standards by lime treatment alone, and without the benefit of dilution and access to Caribou water, resulted in discharge standards violations. DRMS and CDPHE quickly became involved in the process by GIR.

While continued engineering efforts took place, a secondary effect of the December 2019 ground collapse was identified and actions were immediately implemented to protect the Caribou Road, which travels over the Idaho Tunnel, 90 feet from the portal. A total of 385 cubic-yards of high strength concrete, foam concrete, 6-inch hardened rock, and gravel of variant size was placed into the hillside voids. An additional twelve 20 foot long 1-1/2” all thread bolts and anchors were placed into the hillside and mated with the high strength concrete. Sixteen 15-foot soil nails were added to the hillside to provide additional support and stability (as stated in Technical Revision # 7).

GRAND ISLAND RESOURCES

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December 3, 2021

Supplemental Timeline

Caribou tunnel after the cave-in in summer of 2020 with the Company waiting for the ground to freeze to allow for mining teams to enter the mine to reinforce the walls in order to open the mine for access to Caribou water

2020 – Summer

The rock throughout the Idaho Tunnel, particularly around the Idaho Mine section, is soft and has segments decomposed by meteoric waters. This became evident when any activity undertaken would immediately result in suspended solids being present in the waters leaving the portal. As a response the Caribou settling ponds 3A, 3B, and 3C were revitalized and improved so that more residence time could be given in dropping out potential sediments (as stated in Technical Revision # 8).

Original pond 3C before improvement program was implemented at the Caribou

New pond 3C after improvement program was implemented at the Caribou

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Supplemental Timeline

New pond 3A with water control shed on the left, looking down on pond 3B and 3C at the Caribou

Water Settling Pond 3B looking down at pond 3C at the Caribou

Water Settling Pond 3C at the Caribou

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Supplemental Timeline

Water settling pond 3C at the Caribou

Water settling pond 2 at the Cross

2020/2021 – Winter

With the hillside stabilized GIR was able to continue reopening the Idaho tunnel. Upon entrance and post removal of the standing water, the old timber sets were removed, and steel sets were installed. The mining staff began cleaning away debris continued adding support to the Idaho tunnel. Additional staff members were hired, including in-house engineering as well as the addition of skilled mining staff.

The cleanup efforts continued into the Spring of 2021 with the removal of the dirt and muck and collapsed mining structure material. This activity interfered with the natural flow of the Caribou water merging into settling Ponds 3A, 3B and 3C, and Pond 1 and Pond 2. This concern had been communicated to DRMS by Mr. Tom Hendricks in mid-2019.

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Supplemental Timeline

The collapsed Idaho tunnel entrance being excavated and cleaned up

In 2020, a total of $1,391,000 was spent on the Idaho tunnel and water system, including 15,176 man-hours.

2021 – Spring

As work progressed slowly on the Idaho tunnel, the Country rock found in the Idaho mine section of the tunnel was weak in many sections and partially decomposed. This created a problem as any activity moving through the tunnel would immediately stir up sediments in the water as it approached the portal. To solve the problems of suspended solids, work began in rehabilitating and improving our pond settling system 3A, 3B and 3C (as stated in Technical Revision # 8). With work moving forward at the Cross mine and the Caribou Mine even after the improvements in the settling ponds, discharge water quality standards were difficult to maintain. At this point the Grand Island Resources permitting team began evaluating additional treatment options to address water quality issues, and permit requirements and limitations.

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Supplemental Timeline

Active water quality measuring taking place inside Caribou Mine during 2021

2021 – Summer

By the middle part of summer, the Idaho tunnel was open, and one could walk from one end of the tunnel to the end. The widening and ground support systems were not put in place yet, but groundwater that had recovered above the tunnel level was discharged properly and all the caved areas in mine tunnel had been cleared. The above activity along with exploration drilling at the Cross Mine stressed the current water system.

New Caribou tunnel entrance completed in June, 2021

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Supplemental Timeline

2021 – Fall

The process of widening the tunnel required to allow it to be serviced by modern equipment as well as installing permanent ground supports showed an increase in the amount of sediment within the Caribou. Additional sumps underground at the Caribou where designed and implemented to remove as much settlement as possible prior to discharge at the portal. The additional sumps showed some improvement but were not effective in meeting water quality compliance standards. At this point the GIR permitting team brought in a treatment system from, Opel Systems, which tested the water and guaranteed the removal of all problematic metals and contaminants. After only two months, the system provided by Opel Systems proved to be ineffective. Further filtration testing indicated that filtration of micro-sediments from the Caribou discharge appeared to achieve compliance. Trace metals in the Cross discharges were also in compliance with the exception of dissolved zinc and cadmium. This early filtration testing allowed the permitting team to identify the Environmental Site Solutions treatment unit for removing most of our non-compliant metals via 5 micron filtration. Additional improvements in the water systems were done in order to allow for a treatment trailer to be entered into the system.

Improved underground drifts at the Caribou completed in October 2021

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Supplemental Timeline

Opel Systems: removed and replaced with Environmetal Site Solutions Spring through Fall 2021

Environmental Site Solutions water treatment system currently in place and operating, Dec 2021

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Supplemental Timeline

2021 – Winter (current)

The Grand Island Resources team was able to identify a polishing media, post filtration that would handle the dissolved metals remaining in the discharge water. MetSorb polishing media was then sourced from Graver Water Systems. The material and equipment arrived on the property in November and is currently going through its commissioning phase. As of November 2021, Grand Island Resources had invested a total of $4.1 million in improving the Idaho tunnel and its water systems, including 19,477-man hours. This brings the total investment in the Idaho tunnel and water systems improvements since 2019 to $6.2 million- and 47,210-man hours.

GIR is confident that improvements in tunnel design with increased drainage ditches and elevated tunnel roads with layers of different sized gravel will minimize disturbance of the water as it flows into the drainage ditches. The new filtration system on site combined with the MetSorb® polishing media will further improve water release meeting water quality standards. A complete hydrological study of the Caribou and the surrounding area will allow GIR to better understand water flows and positions in this fracture flow environment. It will also help identify additional processes and systems that can safeguard the water as it flows through the underground workings and systems.

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Supplemental Timeline

Caribou tunnel entrance prepared for winter operations, December 2021

Improved mine section at Cross Mine December 2021

In summary, Grand Island Resources has, over the last two years, diligently advanced continued improvements to groundwater effluent treatment to meet regulatory compliance as part of our corporate commitment to sustainable mining and environmental stewardship. GIR has been working within the scope of the treatment mechanism authorized and have investigated treatment options that would not require the addition of water treatment chemicals. GIR will continue to invest human and financial resources to achieve water discharge standard on continued basis.

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Supplemental Timeline

Below, as reference, we provide details of the Service of Notice of Violation / Cease and Desist Order, Number: IO-211105-1

Failure to Comply with Permit Effluent Limitations

9. Pursuant to Part I.A.1. and I.A.2. of the Permit, Grand Island Resources' effluent at Outfall 001A shall not exceed, among others not subject to this action, the effluent discharge limitations specified in the table below:

GRAND ISLAND RESOURCES - CROSS & CARIBOU MINES EFFLUENT DISCHARGE LIMITATIONS FOR OUTFALL 001A					
Parameter		Limitation		Sampling	
		30-day Avg.	Daily Max	Frequency	Type
Lead, potentially dissolved (ug/L), January		3.8	85	2 Days/Month	Grab
Lead, potentially dissolved (ug/L), April		3.6	94	2 Days/Month	Grab
Lead, potentially dissolved (ug/L), June		5.4	140	2 Days/Month	Grab
Lead, potentially dissolved (ug/L), July		4.6	118	2 Days/Month	Grab
Lead, potentially dissolved (ug/L), December		3.8	85	2 Days/Month	Grab
Copper, potentially dissolved (ug/L), January		13	18	2 Days/Month	Grab
Copper, potentially dissolved (ug/L), March		13	19	2 Days/Month	Grab
Copper, potentially dissolved (ug/L), April		13	20	2 Days/Month	Grab
Silver, potentially dissolved (ug/L), January		0.12	2.9	2 Days/Month	Grab
Whole Effluent Toxicity ("WET"), Chronic (%), January - March	7-Day chronic ***Ceriodaphnia dubia***	--	NOEC or IC25 ≥ IWC (73%)	Quarterly	3 Composites / Test
	7-Day chronic ***Pimephales promelas***	--	NOEC or IC25 ≥ IWC (73%)		

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Supplemental Timeline

11. Grand Island Resources' DMRs include, among other information and data, the following effluent data, which exceeded the effluent limitations outlined in Part I.A.2. of the Permit:

GRAND ISLAND RESOURCES - CROSS & CARIBOU MINES EFFLUENT SELF-MONITORING DATA		
DISCHARGE MONITORING REPORTING PERIOD	**SAMPLE MEASUREMENTS FOR OUTFALL 001A**	
Lead, PD (ug/L), June	**30-DAY AVG. LIMIT = 5.4**	**DAILY MAXIMUM = 140**
6/1/2021 - 6/30/2021	**12.0**	--
Lead, PD (ug/L), December	**30-DAY AVG. LIMIT = 3.8**	**DAILY MAXIMUM = 85**
12/1/2020 - 12/31/2020	**4.4**	--
Lead, PD (ug/L), January	**30-DAY AVG. LIMIT = 3.8**	**DAILY MAXIMUM = 85**
1/1/2021 - 1/31/2021	10.0	--
Lead, PD (ug/L), April	**30-DAY AVG. LIMIT = 3.6**	**DAILY MAXIMUM = 94**
4/1/2021 - 4/31/2021	6.2	--
Lead, PD (ug/L), July	**30-DAY AVG. LIMIT = 4.6**	**DAILY MAXIMUM = 118**
7/1/2021 - 7/31/2021	8.0	--
Cadmium, PD (ug/L), August	**30-DAY AVG. LIMIT = 0.82**	**DAILY MAXIMUM = 3.2**
8/1/2021 - 8/31/2021	1.5	--
Zinc, PD (ug/L), August	**30-DAY AVG. LIMIT = 241**	**DAILY MAXIMUM = 263**
8/1/2021 - 8/31/2021	--	282
Silver, PD (ug/L), January	**30-DAY AVG. LIMIT = 0.12**	**DAILY MAXIMUM = 2.9**
1/1/2021 - 1/31/2021	**0.4**	--
Copper, PD (ug/L), January	**30-DAY AVG. LIMIT = 13**	**DAILY MAXIMUM = 18**
1/1/2021 - 1/31/2021	**34.5**	**37.0**
Copper, PD (ug/L), March	**30-DAY AVG. LIMIT = 13**	**DAILY MAXIMUM = 19**
3/1/2021 - 3/31/2021	**46.75**	**85.0**
Copper, PD (ug/L), April	**30-DAY AVG. LIMIT = 13**	**DAILY MAXIMUM = 20**
4/1/2021 - 4/30/2021	--	**50.0**
WET, Chronic (%), *Ceriodaphnia dubia*	**30-DAY AVG. LIMIT = NA**	**DAILY MAXIMUM = NOEC or IC25 ≥ IWC (73%)**
1/1/2021 - 3/31/2021	--	NOEC = 37.0 IC25 = 39.3

Respectfully Submitted