STATE OF COLORADO

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

Fwd: Mining in Four Mile Creek Basin, Boulder, Colorado

1 message

Cunningham - DNR, Michael <michaela.cunningham@state.co.us> Fri, Jul 14, 2017 at 7:48 AM
To: Amy Eschberger - DNR <amy.eschberger@state.co.us>

Amy,

I received the below email from the Pine Brook Water District regarding the Gold Hill Mill and Cash and Who Do Mines in Boulder County. Let's discuss after you've had a chance to review the email and attachment.

Michael Cunningham
Environmental Protection Specialist III

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

P 303.866.3567 x8116 | F 303.832.8106
1313 Sherman Street, Room 215, Denver, CO 80203
michaela.cunningham@state.co.us | www.mining.state.co.us

---------- Forwarded message ----------
From: <bob@pinebrookwater.com>
Date: Thu, Jul 13, 2017 at 3:43 PM
Subject: Re: Mining in Four Mile Creek Basin, Boulder, Colorado
To: michael.cunningham@state.co.us

Date: July 13, 2017

To: Colorado Division of Reclamation, Mining, and Safety

Attn: Michael Cunningham

Dear Michael,

There is currently an attempt by Colorado Milling Company, LLC, P. O. Box 99, Moab, UT 84532, to open and operate the Gold Hill Mill and potentially the Cash Mine along with other potential mines. This mill and the mines associated with it are located in the upper reaches of the Four Mile Creek Water shed.

This is important as the Pine Brook Water District diverts water from Four Mile Creek under its senior water rights to the Pine Brook Reservoir to be treated for use as potable water use for a population of about 1,200 people. The water from Four Mile Creek is typically its main source of water, so impacts to its flows and/or water quality is taken very seriously by the District. Obviously if the flows of Four

Mile Creek are adversely impacted it will also have an impact on the water quality as there is less natural dilution.

Impacts to this drainage, impacts to the flows of Four Mile Creek, and/or impacts to the raw water quality of Four Mile Creek can have negative consequences not only to the District but to all the residents who live along this drainage. Reductions or impacts to the flows of Four Mile Creek obviously can have significant impacts on water right holders as Four Mile Creek is tributary to Boulder Creek and is part of the total South Platte Drainage.

Flows of Four Mile Creek since the Four Mile Canyon Fire of 2010 and especially since the floods of 2013, have been amazingly higher than normal, prior to these events Four Mile Creek was known to all but dry up almost every year in late August or early September for about a week to two weeks. The flows before and after those time periods were also quite low and directly impacted the ability of water right users ability to be able to obtain their water. *In 2002 it was essentially dry (less than 25 gpm flows) for 63 days straight! Any impact to the flows of Four Mile Creek could have a significant impact on the ability of the District to obtain their water rights.* Four Mile Creek is the main source of water for the District, so impacts to its flows and/or water quality are taken very seriously by the District. While amounts of water to be taken may seem trivial to others it can be significant to the District. This drainage not only serves as the main source of water to be used for potable water for the District but also for many homes located along Four Mile Creek (estimated to be in excess of 200 homes) most of whom have shallow wells along the creek.

While the District has a fully licensed treatment facility to treat its raw water, we would also note that said design and treatment regime is based on what we consider “normal” raw water quality conditions. Spills from mines, milling operations, or other mine/mill wastes that might contaminate Four Mile Creek would be creating abnormal conditions for the District and add to its costs to treat the water. For the homes located along Four Mile Creek it could be especially disastrous since most of them do not have a treatment system.

The District is not interested in shutting down these operations but is interested in requesting that they be monitored fully to insure that they are operated in a manner that prevents contamination of Four Mile Creek. Attached is an engineering report that the District had commissioned. In summary the report notes that as long as these mine and milling operations are properly permitted and operated within the limits of those permits, and in a safe manner, the mine and milling operations would be of low risk to Four Mile Creek. The report also notes, and the District would request, that some of the waivers of testing that these operations received in the past be re-visited and reviewed for appropriateness. Most of these are in relationship to water testing of water from monitoring wells in the area and/or in the mine. We would again stress that since so many people, in excess of 1,500, depend on the water in Four Mile Creek for their health, safety, and welfare, that it is important to protect the quality of the water. The District would also request that any prior notices of violation be checked to ensure that they have been corrected.

The biggest threat to the District's raw water quality in this water shed is from mines and their operations. The District has no interest in stopping these operations but has a very strong interest in insuring that they are operated in an appropriate manner, in a safe manner, and that they are permitted as required by law.

Sincerely,

Robert de Haas, Manager

Pine Brook Water District

1903 Linden Drive, Boulder, CO 80304

Office 303-443-5394, Cell 303-817-8153

Colo. Mill & Cash Mine Risk Assessment_7Jun2017.pdf
4392K

STATE OF COLORADO

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

Gold Hill Mill and Cash and Who Do Mines

3 messages

Eschberger - DNR, Amy <amy.eschberger@state.co.us> Tue, Jul 18, 2017 at 1:01 PM
To: bob@pinebrookwater.com

Hi Robert,

I'm the new specialist for Boulder County. Michael Cunningham forwarded me your comment on the Gold Hill Mill and Cash and Who Do Mines which are currently in Temporary Cessation (TC). At this time, we have not received a request from the operator to come out of TC, but as your attached report correctly indicated, the operator must either reclaim the site or recommence with operations within 5 years of the 2nd TC term, which would expire in summer of 2018. I believe the operator has recently submitted a plan of operations to BLM, but I don't think it's been finalized yet.

I haven't been to the site yet, but intend to inspect it some time this summer. Being new to Boulder County, I have a lot of research to do to familiarize myself with some of these more complicated permits.

I appreciate your comments and the very informative report prepared by Morrison Geotechnical Solutions. I've added your comments to the public file for Permits M-1994-117 and M-1983-141. However, the attached report was marked "confidential" so I wanted to check with you first before adding that to the public file. Is it intended for our internal review only?

Please send any comments or questions directly to me moving forward.

Thanks,

Amy Eschberger
Environmental Protection Specialist

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

P 303.866.3567 x8129 | F 303.832.8106 | C 303.945.9014
1313 Sherman Street, Room 215, Denver, CO 80203
Amy.Eschberger@state.co.us | http://www.mining.state.co.us

bob@pinebrookwater.com <bob@pinebrookwater.com> Tue, Jul 18, 2017 at 2:04 PM
To: "Eschberger - DNR, Amy" <amy.eschberger@state.co.us>

Amy,

Even though the report is marked confidential you can make it part of the public record. Thanks for letting acknowledging receipt of the report and the importance of it.

Robert de Haas, Manager
Pine Brook Water District
1903 Linden Drive, Boulder,CO 80304
303-443-5394 - Office
303-817-8153 - Cell
303-415-0621 - Fax

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Eschberger - DNR, Amy <amy.eschberger@state.co.us> Tue, Jul 18, 2017 at 2:24 PM
To: bob@pinebrookwater.com

Robert,

I appreciate you getting back with me on this. I will be sure to add the Morrsion G.S. report to the public record for both permits.

Thanks,

Amy Eschberger
Environmental Protection Specialist

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

P 303.866.3567 x8129 | F 303.832.8106 | C 303.945.9014
1313 Sherman Street, Room 215, Denver, CO 80203
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STATE OF COLORADO

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

Fwd: Mining in Four Mile Creek Basin, Boulder, Colorado

Kimberly Morrison <kimberly@morrisongeo.com> Mon, Jul 24, 2017 at 11:11 AM
To: "Eschberger - DNR, Amy" <amy.eschberger@state.co.us>
Cc: Kimberly Morrison <kimberly@morrisongeo.com>

Hi Amy,

Thank you for the call this morning, and for sending the comment (below) from Pine Brook. I'm fine with making my report public record based on the context with which the report was used.

Thank you and regards,

Kim Morrison

KIMBERLY FINKE MORRISON, P.E., R.G. | PRESIDENT

MORRISON SOLUTIONS, INC.

2745 S. ARBUTUS WAY | LAKEWOOD, CO 80228 USA

CELL: +1.303.588.8289 | EMAIL: kimberly@morrisongeo.com

WEBSITE: www.morrisonsolutionsinc.com

From: Eschberger - DNR, Amy [mailto:amy.eschberger@state.co.us]
Sent: Monday, July 24, 2017 9:44 AM
To: Kimberly Morrison <kimberly@morrisongeo.com>

[Quoted text hidden]

[Quoted text hidden]

Morrison Geotechnical Solutions, Inc.
2745 S. Arbutus Way
Lakewood, CO 80228 USA
Tel 303-989-1480

7 June 2017

Pine Brook Water District
Attention: Mr. Robert de Haas, Manager
1903 Linden Dr.
Boulder, CO 80304
bob@pinebrookwater.com

RE: PRELIMINARY REVIEW AND RISK ASSESSMENT
CASH MINE & GOLD HILL MILL, BOULDER COUNTY, COLORADO

Dear Bob:

Morrison Geotechnical Solutions, Inc. (MGS) has prepared this letter to Pine Brook Water District (Pine Brook) to provide results of a preliminary review and risk assessment for the Gold Hill Mill and Cash Mine located in the Four Mile Creek Drainage watershed. This review has been performed in accordance with our proposal dated 22 April 2017 and the contract dated 30 April 2017.

1.0 Introduction

Located in Gold Hill, Colorado, the operator of the Gold Hill Mill and Cash Mine has requested a total of approximately 20 acre-feet of water from Pine Brook over a 42-month period to perform testing of the milling process in advance of re-opening the Cash Mine. Prior to Pine Brook providing the requested water to the mine, Pine Brook has requested that MGS perform a preliminary review and risk assessment of the site operations.

1.1 Scope of the Assessment

MGS has been commissioned by Pine Brook to carry out an independent review and preliminary risk assessment for the Gold Hill Mill and Cash Mine as of May 2017. This review has included the following scope of work:

- Review existing permit documentation for the site available from the Colorado Division of Reclamation and Mine Safety (DRMS) website (e.g., notices of violation, annual reports, water monitoring data) and other readily-available sources (note: over 1,800 documents pertaining to the mines and mill were found on the DRMS website alone); and
- Perform a preliminary risk assessment providing opinion on risk of degradation of water quality to the Four Mile Creek Drainage watershed from mining and milling operations.

1.2 Limitations

This report has been prepared by MGS in accordance with generally accepted standards of practice within the terms of the contract with Pine Brook, and taking into account the resources devoted to it by agreement with the Client. The program is intended to provide a qualitative independent assessment of the risk of groundwater and surface water degradation within the Four Mile Creek Drainage watershed, and is based on the following assumptions:

- The scope is focused on environmental permitting, regulatory compliance and engineering controls to limit groundwater and surface water degradation;
- The scope focuses review on existing environmental permitting data readily available via public sources;
- The information provided in this report is not to be construed as legal advice;
- We disclaim any responsibility to the Client and others in respect to any matters outside this scope of work;
- This report is confidential to the Client, and MGS accepts no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on this report at their own risk; and
- MGS's level of review was dictated by the timing allowed for review and compilation of our report.

2.0 Background

The Gold Hill Mill and Mines (including the Cash Mine) are located in Section 12, Township 1 North, Range 72 West, Boulder County, Colorado. This section provides historic information on the mine and mill, as well as our current understanding of future mining and milling.

2.1 Historic Mine & Mill Development

The Cash Mine was reportedly one of the most productive mines in the historic Gold Hill mining district. Discovered in the 1870s, the mine was in operation until 1919. Except for some surface work on the mine dump in the 1930s, the mine remained inactive through 1945, and was again active between 1946 and 1953. The Cash Mine was reopened in 1958 with underground exploration and development work performed until 1964. A small surface operation took place between 1967 and 1971. As of 1983 when Gold Hill Mining Company (GHMC) pursued re-opening (and permitting) of the Cash Mine, the Cash Mine shaft followed the mineralized vein for an inclined distance of 761 feet with nine levels driven at irregular intervals. The mine plan at the time was to dewater the workings, rehabilitate the mine, and connect the workings with the nearby Who Do Mine. If deeper mineralization was found, the operator

planned to sink the shaft an additional 300 feet with drifts extending for a minimum of 1,000 feet to the northeast on three new levels. On-site milling of the ore was not proposed at the time.

The 1983 mine plan stated that a water purification plant would be installed to enable dewatering of the Cash Mine to proceed below the first level station and the 125-foot level without releasing any acidic mine waters into Cash Gulch. Water quality data presented in the 1983 permit application showed that water in the Cash Mine portal and Cash Gulch exhibited a pH in the range of 3.8 to 4.3, with elevated zinc (up to 37.4 mg/L), copper (up to 0.38 mg/L), and total dissolved solids (TDS) (up to 1,590 mg/L). The 1983 permit application stated that a water treatment plant had been designed to treat this water for discharge, and that a National Pollutant Discharge Elimination System (NPDES) permit would be obtained. It does not appear that a water treatment plant was ever constructed at the site, nor was the site permitted for treated discharge.

In 1985, GHMC filed an Amendment to construct a gravity and flotation concentration mill, the Gold Hill Mill. An aerial photo of the Gold Hill Mill site as of September 2016 is provided as **Figure 1**.

Figure 1. Aerial photo of Gold Hill Mill (Source: GoogleEarth; September 2016).

The mine and mill have active permits with the Colorado Division of Reclamation and Mine Safety (DRMS), which are discussed in more detail in **Section 3.0** . A site map of the permitted mill and nearby mining areas is included as **Map 2-1** in **Attachment 2**.

2.2 Proposed Mine & Mill Activities

The current operator (Colorado Milling Company, LLC) is requesting a total of approximately 20 acre-feet of water from Pine Brook over a 42-month period to perform testing of the milling process in advance of re-opening the Cash Mine. Based on communication with a consultant (Bruce Lytle of Lytle Water Solutions) retained by the operator, we understand that the operator proposes to re-open the Cash Mine and process ore obtained from the mine at the adjacent Gold Hill Mill. The Cash Mine underground workings are flooded and dewatering would be required for the proposed operation. The dewatering water is considered the primary source of water that the operator proposes to use for long-term milling operations.

We understand that the operator proposes to maintain the permitted milling rate of 50 tons per day (tpd) for the life of mining operations. The life of mine is unknown, but believed to be in the range of 15 to 20 years based on modeling performed by the operator's consultant. At the proposed milling rate, augmentation water would be required above and beyond that from dewatering and recycling of water in the tailings. Steady-state conditions are anticipated to be achieved in about five (5) years at an augmentation rate of 1.2 to 1.4 acre-feet[1] per month, with less water needed during the first 5 years. The mill has proposed obtaining this augmentation source from Pine Brook. The operator plans to build a new lined pond to store water supply water, primarily from the initial mine dewatering.

3.0 Environmental Permit Review

Based on our review of the available documentation, the Gold Hill Mill and Cash Mine currently hold the permits and agreements summarized in **Table 1**. It is important to note that additional permits and agreements are likely in place that are not listed, including claims agreements, easements, etc. However, given the limited time available for review by MGS, an exhaustive review was not performed. Key permits and agreements associated with the properties are summarized in the following sections.

Table 1. Permit & Agreement Summary.

Regulatory Agency / Party	Permit	Permit Holder	Issue Date	Expiration
DRMS	Reclamation Permit No. M-1994-117 *(Gold Hill Mill)*	Colorado Milling Company, LLC	7/26/1995	No expiration
DRMS	Reclamation Permit No. M-1983-141 *(Cash and Who Do Mines; Gold Hill Mill included in this permit until 1995)*	Colorado Milling Company, LLC	9/7/1983	No expiration

[1] Analyses performed by Lytle are currently best estimates based on available and assumed parameters. Lytle proposes to perform testing of Cash Mine dewatering during the test mill run to validate their assumptions.

Regulatory Agency / Party	Permit	Permit Holder	Issue Date	Expiration
District Court, Water Division No. 1	Water Right Permit (Case No. 85CW117) *(Left Hand Ditch Company)*	Mark Steen	10/2/1985	No expiration
Boulder County Zoning Division	Use By Right *(Cash Mine)*	Mark Steen	5/25/1983	No expiration
BLM	Notice of Intent (No reference number)	Mark Steen, Gold Hill Mining Company	8/19/1983	Likely expired; approved for disturbance of less than 5 acres of Public Land
BLM	Notice of Intent (BLM COC 51793) *(Cash and Who Do Mines)*	Unknown	Unknown	See **Section 3.2** stating approved Plan required to recommence operations
BLM	Notice of Intent (BLM COC 51792) *(Gold Hill Mill)*	Unknown	Unknown	See **Section 3.2** stating approved Plan required to recommence operations
Environmental Protection Agency (EPA)	Class V Underground Injection Control (UIC) Permit Authorized by Rule (EPA File #CO50000-08061) *(Cash Mine)*	Mount Royale Ventures, LLC	1/7/2008	No expiration
USACE	Permit Exemption Corps File No. 200680106	Cash and Who Do Mines per DRMS Permit No. M-1983-141	2/28/2006	No expiration (unless site impacts drainages)
USACE	Permit Exemption Corps File No. 199580018	Gold Hill Mill Project per DRMS Permit No. M-1994-117	1/6/1995	No expiration (unless site impacts drainages)
Office of the State Engineer (OSE)	Monitoring Well Permits – Various	Various	Various	No expiration

3.1 Colorado Division of Reclamation, Mining and Safety (DRMS)

3.1.1 Background

In 1965, Colorado instituted a voluntary reclamation program. Memoranda of understanding between operators and the state were signed, setting forth site-specific reclamation criteria. The Colorado Open Cut Land Reclamation Act followed four years later. Without funding for administration or enforcement of the program, though, this legislation proved ineffective. The Open Mining Land Reclamation Act of

1973 established a permitting process, requiring limited bonding and more rigid reclamation performance timelines and standards for coal mines and sand and gravel operators, though hard rock mines (such as gold and silver mines) still avoided bonding and were not required to protect the hydrologic balance, establish suitable vegetation, or dispose of toxic materials in a safe manner.

By 1975, all western states except for Arizona had adopted some form of mining and reclamation standards and regulations. With commitment from the Colorado Department of Natural Resources (DNR), the Colorado Mined Land Reclamation Division (MLRD) was created in early 1976 to regulate non-coal mining operations. The Colorado Mined Land Reclamation Act was passed, and the Colorado Mined Land Reclamation Board (Board) was appointed to serve in an administrative and adjudicatory capacity.

The MLRD merged with several other divisions within DNR to create the Division of Minerals and Geology (DMG) in 1992. Within DMG, the Office of Mined Land Reclamation (OMLR) administers rules and regulations through the Coal Program and the Minerals Program. In 1993, DMG amended the Minerals Act to give the Division and Board greater authority in bonding requirements and environmental engineering design and protection, and earlier grandfathered protections were modified to retrofit old permits with the necessary new environmental requirements. No specific changes to the Reclamation permits for the Gold Hill Mill and Cash Mine appear to have occurred because of the 1993 changes to the Minerals Act. Later, the DMG changed its name to the Division of Reclamation, Mining and Safety (DRMS).

3.1.2 Reclamation Permits

Under the Mined Land Reclamation Act, the Board and the Minerals Program issue and enforce mining and reclamation permits for all non-coal mines in Colorado on state, federal, and private lands. The Minerals Program does not grant permission to mine. The Program issues four different types of reclamation permits based on the type of operation and characterization of the material being mined. Reclamation permits issued under the Hardrock Act in the Minerals Program are issued for the life of the operation.

GHMC was granted Reclamation Permit M-1983-141 by the Division on 7 September 1983 for re-opening of the Cash Mine. The Cash Mine was a proposed underground gold and silver mine and a mine dump sorting and upgrading operation with a proposed disturbance area of 2.261 acres (ac). The Cash Mine has operated under Permit M-1983-141 since 1983, and currently has a permitted surface disturbance area of 9.93 ac.

The Gold Hill Mill commenced construction in 1985 via approval of an amendment to the permit. The Gold Hill Mill was later separated from the original permit and made part of a new Reclamation Permit, Permit M-1994-117 (as of 26 July 1995), and has operated under that permit since. The current permitted surface disturbance area for the mill is 8.4 ac. Though both permits remain active, no mining

and milling activities have occurred since late 2008 and both permits are currently in Temporary Cessation (TC) (refer to **Section 3.1.4**).

Referring to Section 34-32-110 of the Mined Land Reclamation Act, both permits are 110 Limited Impact Permits denoting an operation limited in size of acreage that can be disturbed, and for hard rock operations, the tons of material that can be mined on a yearly basis. It also implies that the material being mined and disturbed is not toxic or acid producing. Both permits are currently 110(2) permits that each affect less than ten (10) acres; extract less than 70,000 tons of mineral, overburden or combination thereof per calendar year; and are neither an *in situ* leach mining operation nor a Designated Mining Operation (DMO) (refer to **Section 3.1.5**).

3.1.3 Approved Revisions

Operators may make revisions to their approved permits at any time through the appropriate revision process. A Technical Revision (TR) is a change in the permit or an application for a permit, which has only a minor effect upon the approved or proposed Reclamation Plan. An amendment is a change in the permit or an application for a permit, which increases the acreage of the affected land or which has a significant affect upon the approved or proposed Reclamation Plan.

On 30 June 1985, GHMC filed an amendment to Permit M-1983-141 to increase surface disturbance to 7.638 ac with additional mine dumps (Who Do, White Cloud, Wynona), a tailings impoundment, and a gravity and flotation concentration mill. The mill was to be used to exclusively process ore from Gold Hill Venture's properties, and would not accept third-party or custom ore on a toll milling or contract basis. The amendment outlined a water pumping and storage scheme from Left Hand Creek to bulkheaded Time Mine adit to the Wynona Shaft or a drilled well to mill. The Hazel A adit bulkhead was to be used for overflow storage. Amendment 1 (AM-1) was approved on 25 September 1985, with a permit condition for a monitoring plan for the tailings impoundment and water storage reservoir, including two monitoring wells for the tailings impoundment and monitoring of the Hazel A Adit.

In October 2006, DRMS granted approval of Amendment 2 (AM-2). AM-2 included language that requested the ability to emplace tailings (backfill) within the Cash Mine. Approval of AM-2 was conditional, stipulating submittal of a subsequent TR (TR-5) concerning establishment of an enhanced water monitoring program. Due to staff changes at DRMS during the time of submittal of AM-2, many important documents pertaining to AM-2 are reportedly missing from the file (MRV, 2009).

Over the course of operations, seven (7) TR applications to Permit M-1983-141 and nine (9) TR applications to Permit M-1994-117 have been prepared by the various operators. The latest TR applications submitted for each permit (TR-7 to M-1983-141 and TR-9 to M-1994-117) were both approved by the Division on 30 October 2013. A detailed review of each of the TRs was not performed as part of this assessment.

3.1.4 *Temporary Cessation Status*

Provisions in the regulations allow for operators to enter into two five-year periods of Temporary Cessation (TC); however, by the end of the second five-year period, operators must reinitiate operations or begin reclamation. Once an operator has completed a phase of mining, the operator has five years to complete reclamation for that phase.

The Gold Hill Mill is inactive, and no milling has reportedly occurred since the end of 2008. Similarly, the Cash and Who Do Mines have been inoperative since late 2008. The Division approved the Operator's request to place the permits into TC. The current TC period is effective for five years, from 13 June 2013 until 13 June 2018, or until the Operator notifies the Division that active milling operations have resumed.

3.1.5 *Designated Mining Operation (DMO)*

The category of a Designated Mining Operation (DMO) deals with permits issued to operations considered to be of higher environmental risk than a 110 Limited Permit (or a 112 Regular Permit). These facilities generally mine and disturb materials that are toxic or acid-producing, and may include toxic chemicals in on-site processing. Permitting and bonding requirements are more rigorous for a DMO.

A letter from DMG dated 6 January 2000 stated that, while there was a potential for acid mine drainage from the ore stockpiles on the site, there was no evidence at the time that potential existed for "*quantities sufficient to adversely affect any person, property, or the environment*;" further, the letter goes on to state that during the upcoming TC period, monitoring of downgradient wells would continue and that DMG would provide a definitive determination of DMO status based on that data before the site could resume activities. Though no additional documentation on DMO status was found in the available records, the mill is not currently permitted as a DMO. A letter from DMG dated 7 January 2000 provided a determination that the Cash and Who Do Mines were not believed to comply with the definition of a DMO.

3.1.6 *Succession of Operators*

Since the Reclamation Permits were granted, each has undergone numerous Succession of Operator (SO) changes, as summarized in **Table 2** for Permit M-1983-141 and **Table 3** for Permit M-1994-117.

Table 2. Succession of Operators - Permit M-1983-141 (Cash and Who-Do Mines, Formerly Included Gold Hill Mill).

Revision Number	Date	From	To
--	2 October 1985	Gold Hill Mining Co.	Gold Hill Ventures Limited Partnership

Revision Number	Date	From	To
SO-01	21 October 1991	Gold Hill Mining Co.	Joint Operators: Gold Hill Mining Co. and Colino Oro Molino
SO-02	Unknown	Joint Operators: Gold Hill Mining Co. and Colino Oro Molino	Joint: Mi Vida Enterprises Inc. & Colino Oro Molino
SO-03	29 January 1996	Joint: Mi Vida Enterprises Inc. & Colino Oro Molino	Mi Vida Enterprises Inc.
SO-04	26 June 1998	Mi Vida Enterprises Inc.	ITEC Environmental Colorado, Inc.
SO-05	7 March 2005	ITEC Environmental Colorado, Inc.	Mount Royale Ventures, LLC
SO-06	3 August 2010	Mount Royale Ventures, LLC	AGC Resources, LLC
SO-07	2 August 2012	AGC Resources, LLC	Gold Hill Mines, Inc.
SO-08	25 August 2015	Gold Hill Mines, Inc.	Colorado Milling Company, LLC

Table 3. Succession of Operators - Permit M-1994-117 (Gold Hill Mill).

Revision Number	Date	From	To
--			
SO-01	13 March 1998	Note 1	Note 1
SO-02	14 July 1998	Colina Oro Molino Inc.	ITEC Environmental Colorado, Inc.
SO-03	7 March 2005	ITEC Environmental Colorado, Inc.	Mount Royale Ventures, LLC
SO-04	3 August 2010	Mount Royale Ventures, LLC	AGC Resources, LLC
SO-05	2 August 2012	AGC Resources, LLC	Gold Hill Mines, Inc.
SO-06	25 August 2015	Gold Hill Mines, Inc.	Colorado Milling Company, LLC

Note:

1. In 1998, Colina Oro Molino, Inc. (COM) submitted a succession of operator application to change the operator for Permit M-1994-117 to Franklin Consolidated Mining, Inc. However, the Division denied this request on 13 March 1998.

In 1992, Colina Oro Molino, Inc. (COM) initiated discussions with the Division to separate the permit (M-1983-141) so that the mill and mines could be operated separately. At the time, the permit was under joint operators, with GHMC operating the mines and COM operating the mill. Sometime between 1992 and 1996, GHMC became Mi Vida Enterprises, Inc. (record of SO-02 was not found on the Division's website). In 1995, the operators (MVE and COM) submitted applications to the Division to separate the mines from the mill. The current operator for both Reclamation Permits is Colorado Milling Company, LLC.

3.2 Bureau of Land Management (BLM)

A notice was filed with the Bureau of Land Management (BLM) by Mark Steen on behalf of GHMC on 20 July 1983 for re-opening of the Cash Mine. The BLM responded on 19 August 1983 that the proposed operations at the Cash Mine fall within the purview of the Surface Management Regulations at 43 CFR 3809, and, since the proposed operation would disturb less than 5 acres of Public Land, approval of a Notice of Intent was not required.

On 22 December 2011, the BLM issued a letter to the operator under both DRMS permits (AGC Resources, LLC [AGC]) that, due to inactivity and lack of maintenance, the BLM determined that the operator had abandoned the operations. This letter referenced permit number BLM COC 51793 for the Cash and Who Do Mines, and permit number BLM COC 51792 for the Gold Hill Mill. In this letter, the BLM stated that the previous operator, MRV, committed to preparation of a Plan of Operations during a site visit performed in July 2010 to initiate BLM's preparation of an Environmental Assessment (EA). The BLM gave the operator 30 days from the date of the letter to make contact or the BLM would commence the forfeiture process.

Subsequent correspondence indicated that Mark Steen sent a letter to the BLM in January 2012 stating that AGC had absconded and abandoned the project, and, as landowners, the Steen Family corporations were left as the sole parties willing to respond to the BLM's concerns. On 3 April 2013, the BLM issued a letter to Mark Steen of Gold Hill Mines, Inc. (GHM) ordering an immediate, temporary suspension of the Gold Hill Mines operations (i.e., Gold Hill Mill, Cash Mine, etc.). The BLM stated that this suspension would be in effect until the BLM approved of a Plan of Operations for the site. No additional communication on this matter was found in the available documentation. Based on our review, mining and milling of the properties cannot officially commence until the BLM has approved a Plan of Operations in accordance with the National Environmental Policy Act (NEPA) process.

3.3 Colorado Division of Water Resources (DWR)

A letter from Vranesh and Raisch dated 20 September 1985 addresses water supply for the Gold Hill Mill. This letter states that a water court case was filed to change the consumptive use of 20 shares of stock in the Left Hand Ditch Company for use at the mill. The case was filed with the Colorado Water Court, Water Division 1, under case number 85CW117. The change of water right proposed by the applicant (Mark Steen) was approved on 2 October 1985.

In letter dated 22 June 1992, Mark Steen (Gold Hill Ventures) stated that water rights for the Gold Hill Mill were obtained by purchase of 20 shares of stock in the Left Hand Ditch Company, which entitle the mill to a pro-rata share of the available water from Left Hand Creek. Further, this letter states that water will be drawn at a point of diversion located on the south back of the creek at a maximum rate of 50 gallons per minute (gpm). Construction of a permanent pumping station was to be completed prior to commencing mill operations, with water to be pumped 3,900 feet up Akins Gulch in a pipeline that was

(reportedly) installed in 1987 for this purpose. The water line reportedly entered the portal of the Time mine's adit, which passes approximately 45 feet beneath County Road 52, and extends 395 feet in a southeasterly direction. A three-foot-thick concrete bulkhead was constructed in the Time mine, which created water storage capacity for winter milling operations. The operator planned to drill a well from the surface to draw water from the Time mine workings.

COM submitted an application to the Colorado Division of Water Resources (DWR) in April 1992 to install a well, as mentioned above, to extract stored water from the Times mine workings. DWR issued a letter to COM on 10 July 1992 that returned the permit application for disposal, stating that the well, as proposed, would not encounter groundwater. The letter from DWR goes on to say that COM is required to obtain approval of a substitute water plan or plan for augmentation to replace evaporation losses from a holding pond located on the property that depletes inflows to Four Mile Creek.

In 2006, MRV issued a permit application to DWR for installation of a well in a location similar to that rejected in 1992 to beneficially use non-tributary groundwater. On 12 January 2007, the DWR issued a letter requesting additional information stating that the analysis provided failed to demonstrate that the groundwater at that location is non-tributary to the South Platte River. After additional correspondence, the permit application was rejected by DWR on 7 December 2007 as the operator was not able to demonstrate that the source was non-tributary.

According to a letter from Mark Steen (Gold Hill Mines, Inc.) dated 14 February 2013, water from Left Hand Creek is the only legal source of appropriated water for use in the Gold Hill Mill. Based on personal communication with Bruce Lytle on 11 May 2017, we understand the following:

- The water right from Left Hand Ditch Company remains valid;
- No infrastructure for use of this water (i.e., pump station, pipeline) is currently operational; and
- Obtaining water from Left Hand is an undesirable approach for the mill, due in part to the elevation difference between the creek and the mill (i.e., uphill pumping requirements).

We also understand that Lytle Water Solutions is currently preparing a Substantive Water Supply Plan (SWSP) for the proposed mine and mill. A SWSP would only last for one year, but only requires administrative approval and could be renewed for up to 5 years, allowing the operator time to obtain other permits that would be required for long-term operations.

As discussed in **Section 2.2** , the operator proposes to use dewatering water from the Cash Mine as a long-term water source for the mill. However, the Cash Mine is understood to be tributary to Four Mile Creek and subsequently to Boulder Creek and the South Platte. As such, we anticipate that the operator will experience similar difficulty in obtaining a well permit from DWR to beneficially use the dewatering water as it will be difficult to demonstrate that the water is non-tributary.

3.4 Environmental Protection Agency (EPA)

On 7 January 2008, the Environmental Protection Agency's (EPA) Region 8 office issued authorization for "*the emplacement of flotation tailings from the Gold Hill Mill into existing underground workings or openings of the Cash Mine (the Class V well) with or without a non-toxic cementing agent*." The letter stated that this activity was "*authorized by rule*" in accordance with 40 CFR Sections 144.24 and 144.84(a).

A letter from Mark Collins of MRV to the EPA on 6 March 2009 stated that MRV tested a system for pumping mill tailings into the Cash Mine. In August of 2008, MRV excavated and sampled two historic mine openings adjacent to the M-1994-117 permit boundary. They understood that backfilling operations were permitted via DRMS's approval of AM-2 and EPA's issuance of the above authorization. As such, and based on subsequent communication with DRMS, MRV tested the backfilling system by closing the holes using tailings. As noted previously, much of the documentation pertaining to AM-2 was lost by DRMS due to employee transition. In order to resolve the conflict, MRV submitted an application (TR-6) to DRMS to address the issue of underground tailings emplacement. This issue is discussed in more detail in **Section 4.1** .

3.5 Colorado Department of Public Health and Environment (CDPHE)

No active permits with the Colorado Department of Public Health and Environment (CDPHE) were found for the mine or mill. At some point, AGC had obtained a storm water discharge permit (COR040225) for the Cash & Who Do Mines, with notification of termination and reapplication requirements sent by the Water Quality Control Division (WQCD) to Mark Steen (Gold Hill Mines) on 12 November 2013. Current permit status is unknown. Other relevant permitting communication with CDPHE includes:

- A letter from the Hazardous Materials and Waste Management Division (HMWMD) of CDPHE to the Boulder County Health Department on 23 January 1995 regarding potential classification of the Gold Hill Mill as a custom mill requiring a Certificate of Designation (CD) requirement, stating that DMG was attempting to bring the mill under the Reclamation Permit. The mill has not been designated as a custom mill requiring a CD;
- A letter from WQCD to COM on 28 June 1995 noting that DMG identified a discharge from the site into Cash Gulch during a site inspection and that DMG noted that the site could no longer be operated as a zero discharge facility, requiring issuance of a Colorado Discharge Permit System (CDPS) permit;
- A letter from WQCD to COM on 6 November 1995 providing results from a facility inspection performed at the site on 11 October 1995 (CDPS permit COR040073). WQCD noted the following: (i) Storm Water Management Plan (SWMP) not available on site nor provided prior to inspection; (ii) evidence of storm water discharge from the facility (from the silt trap southeast of the mill building); (iii) evidence of non-storm water discharge (tailings pond can drain to the

Hazel A Adit, with evidence of discharge from the Hazel A observed on the day of inspection); (iv) damaged berm at the toe of the tailings impoundment requiring repair; and (v) waste oil drums stored outside with soil staining evident and no Best Management Practices (BMPs) employed to manage risk;

- A letter from WQCD to MRV on 28 July 2009 stating that Mark Steen, owner of the Cash & Who Do Mines, had notified the WQCD of an alleged unpermitted industrial wastewater discharge with groundwater from the mines pumped and released to Gold Run, which then flows into Boulder Creek. The WQCD required MRV to immediately initiate efforts to discontinue alleged discharges and submit a permit application for a CDPS permit (it is possible that the permit that expired in 2013 was issued as a result of this notification); and

- Mark Steen (Gold Hill Mines) submitted an application for a CDPS permit to WQCD on 24 January 2013 for development of the Cash Mine, specifically for discharge of water overflowing the shaft at the 3rd Level. DRMS issued a letter to WQCD on 6 March 2013 stating that they understood CDPHE was not intending to issue a discharge permit because the water that flowed from the 3rd Level Adit did not directly flow into any state waters. DRMS argued that the mine was flanked by Cash Gulch on the west and an unnamed gulch to the east, both of which are ephemeral and flow into Gold Run Gulch, a tributary of Boulder Creek. It was agreed that no further determination on whether or not a discharge permit would be required would be made until both agencies (i.e., WQCD and DRMS) were able to conduct a joint inspection of the site. The March 2013 letter from WQCD was the last record found in the available documentation on this matter.

3.6 U.S. Army Corps of Engineers (USACE)

The U.S. Army Corps of Engineers (USACE) reviewed site information pertaining to Reclamation Permit M-1994-117 in 1995, and Reclamation Permit M-1983-141 in 2006. In both cases, the USACE stated that no Department of the Army (DA) permit was required at the time in accordance with Section 404 of the Clean Water Act.

4.0 Compliance Issues

This section provides an overview of identified compliance issues for the mine and mill since 1983.

4.1 DRMS – Notices of Violation (NOVs)

During the course of operations, DRMS cited numerous notices of violation (NOVs) to the various operators under Reclamation Permit Nos. M-1983-141 and M-1994-117. A document prepared by DMG on 15 September 1997 in preparation for a Board hearing on Permit No. M-1994-117 indicated the following key compliance events had occurred as of that date:

- Process water and/or tailings spill events: a total of 11 documented events from October 1991 to September 1997;
- Tailings pond or Hazel A bulkhead freeboard issues/notations on inspection reports: a total of 13 items between June 1994 and September 1997;
- NOVs: a total of 13 for the period from September 1985 to September 1997;
- Cease & Desist (C&D) Orders: a total of 8 for the period from September 1985 to September 1997; and
- Problems/Possible Violations (PB/PV) on inspection reports: a total of 71 PBs and 14 PVs for the period from November 1991 through September 1997.

Specific details of NOVs found within the available documentation on Permit No. M-1983-141 include:

- 1985 – 26 September – Board issued an NOV for mining without a permit, a C&D Order, and a civil penalty of $2,800 to GHMC after an inspection performed by the Division on September 13th revealed mill construction occurring without a permit (amendment had been filed on June 30th of that year to add the mill, but the amendment was not approved until September 25th). The civil penalty was paid and the C & D lifted on October 2nd.
- 1992 – 27 March – Board issued an NOV (M-92-021) for processing of ore in the Gold Hill Mill from properties not owned by GHV (i.e., properties other than the Cash Mine and adjacent mines), a C&D Order, and a civil penalty of $23,370 to co-operators, GHV and COM. At this time, the mill was being operated by COM with GHV operating the mines. The co-operators each filed separate petitions to the Board for reconsideration of this NOV, which was denied on August 26th.
- 1992 – 29 May – Board issued an NOV (M-92-029) for failing to use the permitted water pumping and utilization scheme and failing to provide the Division with a detailed water pumping/utilization scheme that included a monitoring plan in the form of a TR or Amendment, a C&D Order, and a civil penalty of $12,300 to co-operators, GHV and COM. Sometime during 1992, two other NOVs (M-92-028 for failure to repair rips in tailings pond liner and M-92-030 for failure to contain tailings in the impoundment) were issued to the co-operators, specific details unknown. Civil penalties on all three of these NOVs were paid as of July 29th, and the C&D Orders were lifted on August 19th.
- 1993 – 7 September – An NOV (MV-93-074) was issued for failure to pay annual fees and submit an annual report, details unknown.
- 1994 – 21 September – Board issued an NOV (M-94-042) for mill tailings spilling on the ground from two locations at the mill building and from overtopping the tailings impoundment, a C&D

Order, and a civil penalty of $450 to co-operators, COM and MVE. The Board Order required the operators to submit a new permit application that provided for a safe freeboard level and an engineered design to either modify the existing impoundment or build a new impoundment. An approved permit application was required to be submitted by the co-permittees by December 1st, which was not completed by the designated time.

- 1995 – 25 January – Board issued an NOV (M-95-001) for failing to submit the required permit application for modifications to the tailings impoundment as required (per NOV M-94-042), a C&D Order, and a civil penalty of $4,500 to co-operators, COM and MVE. The Board made minor modifications to this order on February 22nd. The corrective action required by the C&D Order was to obtain an approved permit for the site by June 14th.
    - As this action was not completed in the allotted time, the Board then issued an Order on June 23rd modifying the permit to require that the operator commence reclamation of the milling portion of the permit area by July 28th as the Board believed that the processing portion of the site could not be conducted in compliance with the regulations; however, the Board believed that the mining portion could be completed in compliance with the regulations, making no modifications to the mining areas.
    - COM submitted evidence to the Board during a formal public hearing on July 27th that a separate reclamation permit had been issued by DRMS for the Gold Hill Mill, arguing that issuance of the permit demonstrated that the mill could be operated in compliance with the regulations. The Board then issued an Order on September 1st to COM that vacated the previous Order to commence reclamation of the mill by July 28th.
- 1995 – 1 September – Board issued an NOV (M-95-053) for failing to pay the civil penalty required by NOV M-95-001 by the required date of 15 June 1995 (penalty paid on 7 July 1995) and a civil penalty of $100 to co-operators, COM and MVE. At approximately the same time, another NOV (M-95-054) was issued for failure to obtain a permit for milling by the deadline, details unknown.
- 2011 – 8 December – Board issued an NOV (MV-2011-030) for failure to protect areas outside of the affected land from slides or damages occurring during the mining operation, failure to minimize disturbance to the prevailing hydraulic balance, failure to comply with federal and state water quality laws, and failure to comply with permit conditions and a civil penalty of $9,800 to AGC. The Order imposed the following corrective action: (i) submit all past due Annual Water Monitoring reports within 30 days of the Order; (ii) submit either a discharge permit from CDPHE or written proof that the application for a discharge permit had commenced; and (iii) complete permanent closure of a secondary (unpermitted) escape-way that had been constructed. A letter from DRMS dated 9 January 2012 stated that the above corrective actions had not been completed, initiating another reason to believe that another violation existed.

- 2012 – 28 March – The Board issued an NOV (MV-2012-006) for failure to comply with the corrective actions imposed by a former NOV (MV-2011-030) and failure to pay the civil penalty to AGC. Mr. Steen had submitted a petition to the Board on February 7th for postponement as the landowner, but had no standing at the time to petition the Board on the matter. The Order found AGC in violation of complying with an order, permit or regulation; failing to cure a default under a performance warranty; and that AGC's financial warranty was subject to forfeiture. The Order was amended on April 23rd to provide the following corrective action: (i) submit all past due Annual Water Monitoring reports within 30 days of the Order; (ii) submit either a discharge permit from CDPHE or written proof that the application for a discharge permit had commenced; and (iii) complete permanent closure of a secondary escape-way. The amended Order also imposed a civil penalty of $9,800.

Specific details of NOVs found within the available documentation on Permit No. M-1994-117 include:

- 1995 – 20 December – Board issued an NOV (M-95-078) for failure to repair holes in the tailings impoundment liner as directed by the Division by an imposed 11/20/1995 deadline, a C&D Order, and a civil penalty (unknown) to COM. On 21 February 1996, the Board issued an Order indicating that corrective actions as specified in association with NOV M-95-078 had been completed with the NOV abated and the C&D Order lifted; however, this Order specified payment of a civil penalty in the amount of $16,800. The civil penalty was paid on March 28th.

- 1997 – 9 April – Board issued an Order to COM for failure to install and operate a tailings pond evaporation system and land application system by the specified deadline dates and a civil penalty of $8,000 (no C&D Order was issued). Board-specified corrective actions included: (i) submit verification that the spray evaporative system meets the design capacity; (ii) repair screen and filter for the recirculating pump intake; (iii) operator to operate the evaporation and land application systems in accordance with approved direction; and (iv) provide a modification to the Permit within 30 days that included a plan to provide adequate process water storage capacity at the mill. The operator installed and operated the evaporation system and the land application system by May 10th.

- 1997 – 24 September – Board issued an NOV (M-97-027) for failure to perform reclamation as prescribed by the reclamation plan, specifically failure to install and operate a tailings pond evaporation system and land evaporation system by the deadline date, a C&D Order, and a civil penalty of $8,000 to COM.

- 2002 – 16 September – Board issued an NOV (MV-2002-024) for failure to provide an annual report and pay annual fees, a C&D order, and a civil penalty of $225 to ITEC.

- 2002 – 20 December – Board issued an NOV (MV-2002-032) for failure to submit the 2001 annual water monitoring report as required by the permit. Personnel changes during the time

did not allow 2001 monitoring to be completed, but the Board decided a good faith effort was being made by the new personnel at ITEC (Mark Steen) to address the issue, and therefore the minimum civil penalty of $100 was issued.

- 2011 – 8 December – Board issued an NOV (MV-2011-033) for failure to handle acid-forming or toxic-producing material in a manner that would protect the drainage system from pollution and a civil penalty of $9,800 to AGC. The situation requiring mitigation was unpermitted placement of uncemented tailings by the previous operator, MRV, into two historic prospect pits located on the hillside below the mill and in the Cash Mine workings. On 23 April 2012, the Board issued an Order indicating that if a pending permit transfer from AGC to Gold Hill Mines Inc. was approved, Gold Hill Mines Inc. would not be liable for civil penalties imposed on a previous operator.

- 2012 – 28 March – Board issued an NOV (MV-2012-005) to AGC for failure to comply with the conditions of the Order issued in 2011 (i.e., MV-2011-033).

4.2 DWR – Non-Permitted Consumptive Use

On 6 August 2010, James Beck (J.M. Beck & Associates) submitted a letter to DWR on behalf of AGC (who had just completed acquisition of the properties on June 15th from MRV) requesting a variance or authorization for non-permitted consumptive use at the Gold Hill Mill and Cash Mine. The letter addressed a proposed mitigation action in order to: (i) eliminate a non-permitted adit discharge flowing at a nominal rate of 2 to 5 gpm, but observed to be in excess of 25 to 30 gpm during the spring run-off period; and (ii) deplete surplus tailings pond water in exceedance of the allowable freeboard (estimated volume of 400,000 to 500,000 gallons).

During their site presence (sometime between 2005 to late 2008), MRV developed a previously non-existent 3rd Level adit intercepting the Cash Mine workings, which Mr. Beck stated resulted in altering of the site hydrologic characteristics. A 2013 permit application to CDPHE provided the schematic shown in **Figure 2**, which is believed to illustrate the situation that Mr. Beck describes.

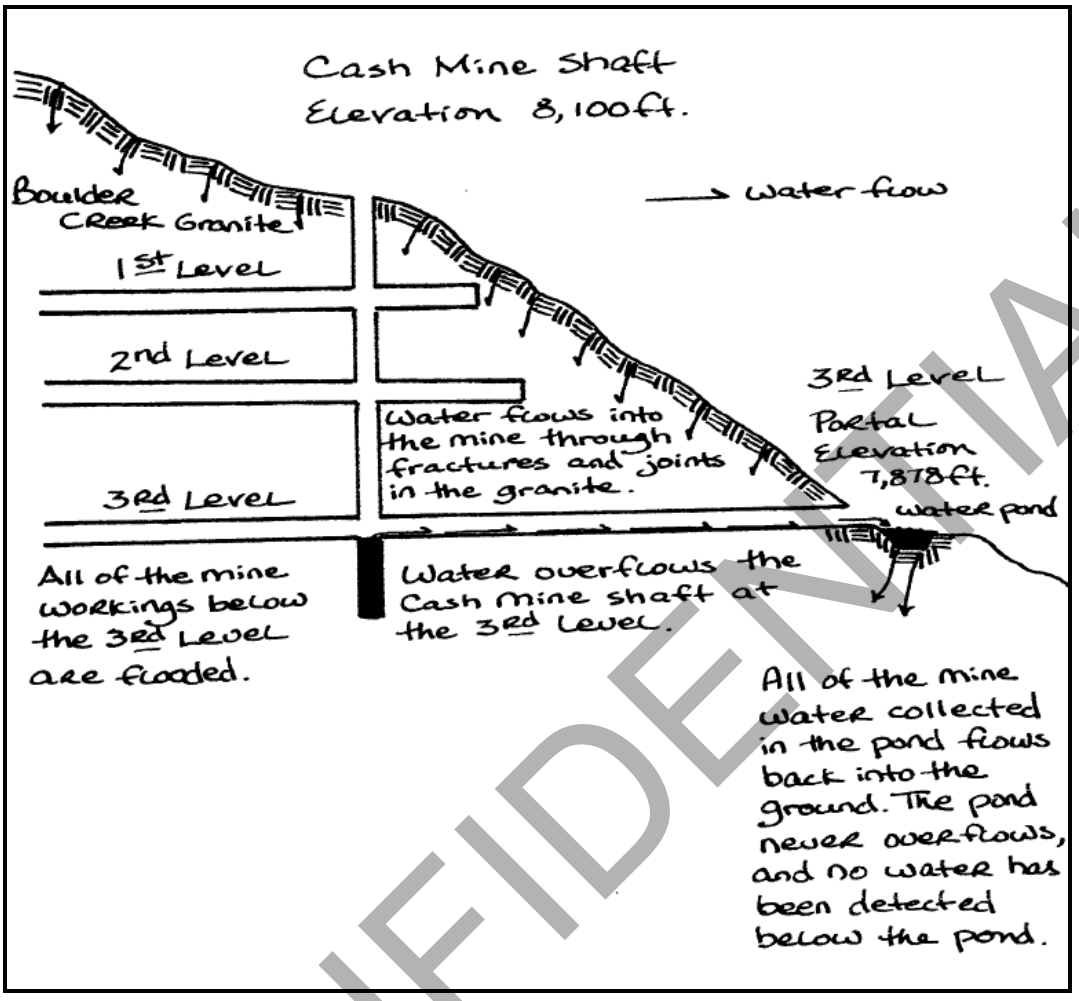

Figure 2. Cash Mine Shaft Schematic (Steen, 2013).

AGC proposed the following mitigation plan: (i) capture adit inflow and establish dewatered conditions in the underground workings via an interim marginal consumptive use with pumping of the non-permitted "Cash Mine well" to the tailings pond; (ii) employ a spray evaporation and land application system to reduce volume of untreated process water contained in the tailings pond; (iii) capture adit discharge water for use as drilling water. Use of the spray evaporation and land application system was approved by DRMS; however, the activity was recognized to result in a consumptive use under the jurisdiction of DWR. No follow-up communication from DWR was found in the available records on this matter.

The DRMS permit for the Gold Hill Mill stipulates that a minimum two feet of freeboard (as measured from the top of the synthetic liner) be maintained during non-operational periods, with one foot of freeboard required during operational periods. In a 6 August 2010 letter from J.M. Beck and Associates to DWR, the available freeboard in the tailings impoundment was measured on 22 July 2010 to be a

mere 4 inches. The letter goes on to state that design calculations indicated that a minimum 1.3 feet of freeboard would be required to accommodate the design basis 100-year, 24-hour precipitation event.

Mr. Beck also mentioned that he had met with DWR during the due diligence effort performed by AGC prior to acquisition of the properties and noted that there were numerous and significant permitting gaps, deficiencies, and/or potential violations associated with the operations, including a number of concerns with respect to regulation of site features that would typically fall under the purview of DWR, and that AGC was programmatically moving forward on several fronts with various agencies to establish a "fully permitted" status for the site. As a note, Mr. Beck is currently a consultant for the operator based on recent communication with him.

5.0 Environmental Monitoring

We understand that the current Reclamation Permits require quarterly monitoring of the following:

- Groundwater sampling of four (4) wells (Well #1 through Well #4) located below the mill tailings impoundment for verifying the integrity of the geomembrane liner. Current testing appears to include only the following parameters: manganese (dissolved), zinc (dissolved), total dissolved solids (TDS), and sulphate;
- Groundwater sampling of well MW1 (location unknown), reportedly installed upgradient of the Cash Mine, and well MW5 (location unknown), reportedly installed downgradient of the Cash Mine. We understand that both of these wells were installed in September 2007. Current testing appears to include only the following parameters: arsenic (dissolved), cadmium (dissolved), manganese (dissolved), zinc (dissolved), TDS and sulphate; and
- Surface water sampling of the Cash Mine Pond from the 3rd Level Adit and Cash Gulch (downstream of the pond). Current testing appears to include only the following parameters: arsenic (dissolved), cadmium (dissolved), manganese (dissolved), zinc (dissolved), TDS and sulphate.

Though the operations are currently in TC, monitoring is continuing on a quarterly basis. The following sections discuss the monitoring program and provide results of a cursory review of available historic monitoring data. Although not required by the permit, the Operator has previously sampled the pond and solids in the tailings impoundment.

5.1 Background

A letter from McCulley, Frick & Gilman, Inc. (MFG) dated 10 November 1998 discusses the surface and groundwater monitoring program for the Gold Hill Mill as of that time. Groundwater samples were being collected quarterly from four monitoring wells (Well #1, Well #2, Well #3 and Well #4). Also, groundwater samples were being taken from the Hazel A Adit and the fresh water tank located inside

the mill building, which was fed by groundwater pumped from the Wynona/Times mine. Surface water samples were also being collected from Left Hand Creek, just downstream of Lick Skillet Road. These monitoring locations are illustrated on **Map 2-2** (**Attachment 2**).

The Division noted in a 26 April 1997 letter to the operator that a review of monitoring data from past events showed that the data was inconsistent in terms of parameters analyzed for and laboratory detection limits employed. At that time, the Division requested that the following parameters be analyzed for: aluminum, arsenic, cadmium, chromium (VI), copper, iron, lead, manganese, mercury, selenium, silver, uranium and zinc.

In October 2013, DRMS approved TR-9 for the Gold Hill Mill (Reclamation Permit M-1994-117), which revised the monitoring plan to:

- Eliminate the following parameters from the sampling suite: aluminum, chromium, cobalt, copper, fluoride, iron, lead, lithium, mercury, nickel, selenium, and vanadium;
- Remove Left Hand Creek water sampling location as the creek is not located within the mill's drainage and has been extensively sampled by the EPA, the WQCD, and the Boulder County Health Department;
- Remove Hazel A Adit water sampling location. The Hazel A was historically used as part of the surface water management system for the mill and tailings impoundment. Decant lines collected excess stormwater runoff within the tailings impoundment and directed the water through a pipeline to the Hazel A Adit. Decant water was recycled back to the mill. Once the new tailings impoundment was constructed, the mine no longer received stormwater runoff;
- Cease collection of samples from the Times/Wynona Mine until such time as the mine is used for water storage (understood to have been permitted for storing water pumped from Left Hand Creek); and
- MW1 (mill well; location unknown) was established as the compliance point for the mill.

In October 2013, DRMS approved TR-7 for the Cash and Who Do Mines (Reclamation Permit M-1983-141), which revised the monitoring plan to eliminate the following parameters from the sampling suite: aluminum, chromium, cobalt, copper, fluoride, iron, lead, lithium, mercury, nickel, selenium and vanadium. Also, the Cash Well monitoring location was eliminated and replaced with the Cash Mine Pond from the 3rd Level Adit.

5.2 Surface Water Quality Data Review

The concentration of pollutants discharged in mine drainage from mines or mills operated to obtain copper-bearing ores, lead-bearing ores, zinc-bearing ores, gold-bearing ores or silver-bearing ores, or any combination of these ore types, from open pit or underground operations other than cyanide mills

or leach process operations is required to meet effluent guidelines established by the EPA (2011). For the type of operation at the Gold Hill Mill and associated mines, the EPA (2011) has established daily maximum and average monthly limits for the following parameters: cadmium, copper, mercury, lead, zinc, pH and total suspended solids (TSS).

WQCD has established basic standards for surface water quality in the State of Colorado, as outlined in Regulation No. 31 (The Basic Standards and Methodologies for Surface Water; 5 CCR 1002-31). Standards are based on class of use of the surface water, and includes a more comprehensive suite of analytes than that discussed above.

A sampling of surface water quality test results obtained from Left Hand Creek, the Cash Mine 3rd Level Pond, and Cash Gulch were compared to the EPA (2011) standards and the Regulation No. 31 (5 CCR 1002-31) surface water quality standards (domestic water supply and agricultural), as presented in **Table 3-1** (**Attachment 3**).

5.2.1 Left Hand Creek

Select samples obtained from Left Hand Creek in 1998, 2005, 2006, 2007 and 2008 were compared to the EPA (2011) effluent criteria and to the Colorado surface water quality standards for both agricultural and domestic water supply usages, showing no exceedances. Left Hand Creek is reportedly not located within the mill's drainage, and was removed from the water quality sampling program in 2013.

5.2.2 Cash Mine 3rd Level Pond

Overflow from the third-level of the Cash Mine discharges to an external pond, as illustrated conceptually in **Figure 2**. Select samples obtained from this pond (i.e., Cash Mine 3rd Level Pond) in 2006, 2007, 2008, and 2016 were compared to the EPA (2011) effluent criteria. The discharge appears to exceed the effluent criteria for zinc, with a maximum dissolved concentration of 2.99 milligrams per liter (mg/L) compared to EPA's monthly average total concentration of 0.75 mg/L (mine drainage). Other parameters appear to meet criteria, though results are typically provided for dissolved concentrations instead of total concentrations. A comparison of the pond water quality to the Colorado surface water quality standards for agricultural uses shows exceedances for the following parameters: manganese (max. 6.7 mg/L); zinc (max. 2.99 mg/L); and nitrate (max. 207 mg/L). The following additional analytes show exceedances when comparing the water quality to the Colorado surface water quality standards for domestic water supply: cadmium (max. 0.0084 mg/L); sulfate (max. 2,000 mg/L); and nitrite (max. 1.74 mg/L). Monitoring of the Cash Mine 3rd Level Pond is on-going, but excludes nitrate and nitrite.

5.2.3 Cash Gulch

Select samples obtained from Cash Gulch in 2015 and 2016 were compared to the EPA (2011) effluent criteria and to the Colorado surface water quality standards for both agricultural and domestic water

supply usages, showing no exceedances. Surface water sampling of Cash Gulch appears to be included as part of the current monitoring program, with on-going sampling being performed.

5.3 Groundwater Quality Data Review

WQCD has established basic standards for groundwater quality in the State of Colorado, as outlined in Regulation No. 41 (The Basic Standards for Ground Water; 5 CCR 1002-41). Standards are based on class of use of the groundwater, and include a comprehensive suite of analytes, many of which have not been tested for in historic sampling at the site. A sampling of groundwater quality test results obtained from Wells #1 through #4, MW1, MW5, the Hazel A Adit, and the Times/Wynona Mine were compared to the Regulation No. 41 (5 CCR 1002-41) groundwater quality standards (domestic water supply and agricultural), as presented in **Table 3-2** (**Attachment 3**).

5.3.1 Wells #1 through #4

Select samples obtained from Wells #1 through #4 in 1998, 2005, 2006, 2007, 2008, 2015 and 2016 were compared to the Colorado groundwater quality standards for both agricultural and domestic water supply usages. Groundwater quality as measured in the wells downgradient of the tailings impoundment (Wells #1 through #4) appears to generally be of good quality, with only two exceedances when compared to the Colorado groundwater quality standards for agricultural uses (i.e., Well #3 had a measured manganese concentration of 0.84 mg/L in 1998 and Well #4 had a measured manganese concentration of 0.223 mg/L in 2016). However, the wells show the following exceedances when compared to the Colorado groundwater quality standards for domestic water supply:

- Well #1 – uranium (max. 0.0325 mg/L);
- Well #2 – uranium (max. 0.0178 mg/L) and sulphate (max. 560 mg/L);
- Well #3 – uranium (max. 0.0184 mg/L), sulphate (max. 380 mg/L), nitrate (max. 14.7 mg/L) and nitrate/nitrite (max. 14.7 mg/L); and
- Well #4 – uranium (max. 0.0361 mg/L).

Monitoring of Wells #1 through #4 is ongoing, but excludes uranium, nitrate, and nitrate/nitrite.

5.3.2 Hazel A Adit

Select samples obtained from the Hazel A Adit in 1998, 2005, 2006, 2007 and 2008 were compared to the Colorado groundwater quality standards for both agricultural and domestic water supply usages. Groundwater quality in the Hazel A Adit appears to generally be of good quality, with no exceedances when compared to the Colorado groundwater quality standards for agricultural uses. However, the following analytes show exceedances when comparing the water quality to the Colorado groundwater quality standards for domestic water supply: manganese (max. 0.12 mg/L); sulphate (max. 630 mg/L);

nitrate (max. 29.5 mg/L) and nitrate/nitrite (max. 29.6 mg/L). Monitoring of the Hazel A Adit ceased in 2013.

5.3.3 Times/Wynona Mine

Select samples obtained from the Times/Wynona Mine in 2005, 2006, 2007 and 2008 were compared to the Colorado groundwater quality standards for both agricultural and domestic water supply usages. A comparison of the water quality to the Colorado groundwater quality standards for agricultural uses shows exceedances for the following parameters: cadmium (max. 0.0255 mg/L); cobalt (max. 0.06 mg/L); iron (max. 11.2 mg/L); manganese (max. 19.2 mg/L); nickel (max. 0.21 mg/L); and zinc (max. 8.15 mg/L). When comparing the water quality to the Colorado groundwater quality standards for domestic water supply, sulphate (max. 1,410 mg/L) is also in exceedance. Monitoring of water obtained from the Times/Wynona Mine ceased in 2013. Note that these samples were obtained from the fresh water tank located inside the mill building, and the mill has been in TC since 2008.

5.3.4 Cash Mine Wells MW1 and MW5

Select samples obtained from the Cash Mine upgradient (MW1) and downgradient (MW5) wells in 2007, 2015 and 2016 were compared to the Colorado groundwater quality standards for both agricultural and domestic water supply usages. A comparison of the water quality to the Colorado groundwater quality standards for agricultural uses shows exceedances for the following parameters:

- MW1 – cobalt (max. 0.05 mg/L – marginal) and manganese (max. 0.342 mg/L); and
- MW5 – cobalt (max. 0.05 mg/L – marginal).

When comparing the water quality to the Colorado groundwater quality standards for domestic water supply, the following parameters are also in exceedance:

- MW1 – iron (max. 0.39 mg/L) and sulphate (max. 975 mg/L); and
- MW5 – arsenic (max. 0.0172 mg/L) and sulphate (max. 360 mg/L).

Monitoring of the Cash Mine upgradient and downgradient wells is ongoing, but excludes cobalt and iron.

5.4 Tailings Analytical Testing

In 2009, two tailings samples from the tailings impoundment were submitted for testing. The results of the analyses are summarized in **Table 4**.

Table 4. Tailings Solids Analytical Testing Results (Gold Hill Mill).

Parameter	Unit	US EPA Allowable Limits	Sample 1 - 6/12/2009	Sample 2 - 6/12/2009
Antimony	µg/L	--	2.6	7.7
Arsenic	µg/L	5000	<4.0	<4.0
Barium	mg/L	100	0.163	0.279
Beryllium	mg/L	--	<0.001	<0.001
Boron	mg/L	--	0.11	0.124
Cadmium	µg/L	1000	<0.2	<0.2
Chromium	mg/L	5	<0.002	<0.002
Copper	mg/L	--	<0.0100	<0.0100
Iron	mg/L	--	<0.100	0.236
Lead	µg/L	5000	<1.0	23.1
Manganese	mg/L	--	0.0904	0.0279
Mercury	µg/L	200	<0.100	<0.100
Mercury	mg/kg	--	0.17	0.583
Molybdenum	mg/L	--	0.0068	0.0136
Nickel	mg/L	--	<0.0020	0.0037
Selenium	µg/L	1000	<1.0	<1.0
Silver	mg/L	5	<0.0080	<0.0080
Strontium	mg/L	--	0.228	0.112
Thallium	µg/L	--	<0.3	0.7
Zinc	mg/L	--	<0.0400	0.0577
Solids (by weight), calculated	%	--	71.9	70.6

Under the EPA, the Resource Conservation and Recovery Act (RCRA) monitors eight different metallic elements, commonly referred to as the "RCRA 8s". Each metal has a designated degree of concentration to determine whether or not the waste type is characteristically hazardous. The table above provides the allowable limits of these elements in waste per EPA. According to these criteria, the existing tailings at the Gold Hill Mill are not classified as hazardous.

Periodic sampling of the supernatant solution from the tailings impoundment has also occurred, though not required by permit. **Table 5** summarizes the results of analytical testing performed in 1998 and 2016.

Table 5. Tailings Pond Analytical Testing Results (Gold Hill Mill).

Parameter	Unit	Sample - 6/30/1998	Sample - 9/20/2016
Aluminum, Dissolved	mg/L	<0.05	NT
Arsenic, Dissolved	mg/L	0.005	0.0011
Cadmium, Dissolved	mg/L	<0.0003	<0.0002
Chromium, Dissolved	mg/L	<0.005	NT
Copper, Dissolved	mg/L	<0.02	NT
Iron, Dissolved	mg/L	0.31	NT
Lead, Dissolved	mg/L	0.003	NT
Manganese, Dissolved	mg/L	0.33	0.1
Mercury, Dissolved	mg/L	<0.0001	NT
Selenium, Dissolved	mg/L	<0.005	NT
Silver, Dissolved	mg/L	<0.0002	NT
Uranium, Dissolved	mg/L	0.006	NT
Uranium, Calculated	pCi/L	4	NT
Zinc, Dissolved	mg/L	<0.02	<0.02
TDS (180°C)	mg/L	NT	2330
Sulfate	mg/L	NT	1620

With measurable concentrations of arsenic, iron, lead, manganese and uranium in the tailings pool, it seems incongruent that monitoring of wells downstream of the tailings impoundment (i.e., Well #1 through Well #4) currently only analyze for one of these parameters (i.e., manganese).

6.0 Preliminary Risk Assessment

Based on our limited review of available documentation, and without the benefit of a site visit, we were unable to complete a comprehensive risk assessment for the Gold Hill Mill and Cash Mine. However, we have identified the following risks for site operations (existing and future):

- ***Permitting Risk:*** Operation of the mine and/or mill without the proper permits and authorizations;
- ***Tailings Impoundment Risks:***
  - Seepage from the lined tailings impoundment into groundwater;
  - Failure of the existing tailings dam due to embankment instability; and
  - Loss of freeboard (due to process water or waste management issues or after a large storm event) leading to overtopping failure of the tailings impoundment;

- ***Contaminated Discharge Risk:*** Unacceptable mine discharge via leakage or bulkhead failure, or contaminated surface water discharge.

Each of these risks is discussed in the following sections, with risk level assessed based on likelihood of occurrence and impact of the risk to degradation of water quality in the Four Mile Creek Drainage watershed using the matrix illustrated in **Figure 3**.

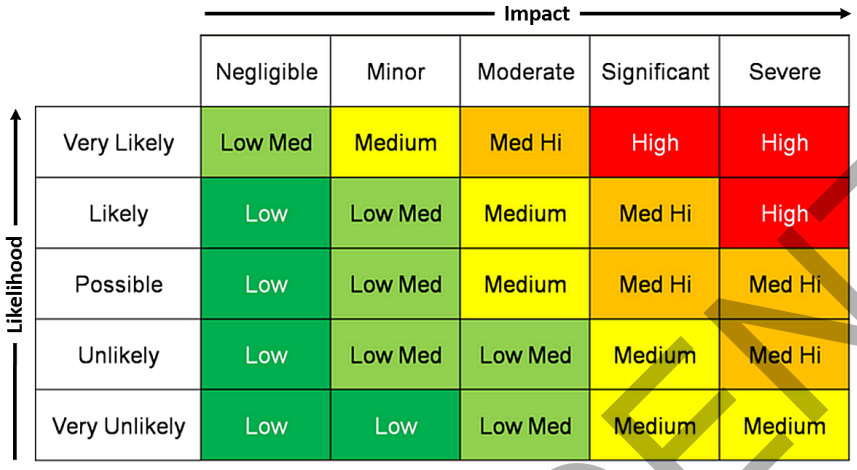

Figure 3. Risk Matrix Based on Likelihood and Impact.

6.1 Permitting Risk

Based on our review, the following additional permits and/or permit modifications may be required to recommence full operations of the Gold Hill Mill and Cash Mine as proposed by the current operator:

- A Technical Revision or Amendment to the existing Reclamation Permit for the Gold Hill Mill for construction of a new tailings impoundment and potentially additional infrastructure (e.g., water storage reservoir). No application appears to have been submitted to the Division to-date, approval of which is anticipated to take up to a year;

- Approval of a Plan of Operations by the BLM. We are unaware of the operator having submitted a Plan of Operations to the BLM to commence the NEPA process. Depending on whether an Environmental Assessment (EA) or Environmental Impact Statement (EIS) is required, the timeframe for completion of this permitting effort is anticipated to take anywhere from 3 to 7 years (on average) to complete;

- The operator will require a long-term water source for future operations of the mine and mill. Though the operator has existing water rights for use of water from Left Hand Creek, we understand that use of this source is undesirable (e.g., from a pumping standpoint), and the operator is requesting augmentation water from Pine Brook. Also, the operator proposes to use dewatering water from the Cash Mine as a long-term water source for the mill. However, the

Cash Mine is tributary to Four Mile Creek and subsequently to Boulder Creek, and, as discussed in **Section 3.3** , we anticipate that the operator will experience difficulty in obtaining a well permit from DWR as it will be difficult to demonstrate that the water is non-tributary;

- For past operations, the operator disposed of excess process water using approved pond sprinkler systems and land application systems. For future operations, it is possible that the operator will be required to obtain a CDPS wastewater discharge permit from CDPHE's WQCD to dispose of excess wastewater. This may also apply to discharge from the existing Cash Mine to the 3rd Level Pond;
- As in the past, the site will require a CDPS storm water discharge permit from CDPHE's WQCD for discharge of storm water, as well as an update to the Storm Water Management Plan (SWMP) for future site operations; and
- Though it does not appear to have been required in the past, the site may require an air permit from CDPHE's Air Quality Control Division (AQCD) for future operations.

Though permitting of the mine and mill may be viewed as a significant risk for the operator, this risk is generally viewed to have limited effect on water quality in the Four Mile Creek Drainage watershed. However, on-going site monitoring, site safety, and proper closure/reclamation for a permitted operation with an active operator is significantly improved over that of an abandoned operation. As such, it may be in Pine Brook's best interest for the site to be properly permitted, operated, and reclaimed. Based on a likelihood of permitting risks of "Likely" combined with an impact of "Minor" to degradation of water quality in the Four Mile Creek Drainage watershed, this risk is considered Low to Medium.

6.2 Tailings Impoundment Risk

The Gold Hill Mill has an existing tailings impoundment that was originally constructed shortly after approval was granted by DRMS in September 1985. An expansion to the facility was completed in 1995, as illustrated in **Figure 4**, which resulted in a total tailings pond capacity of approximately 11,500 cubic yards with two feet of freeboard.

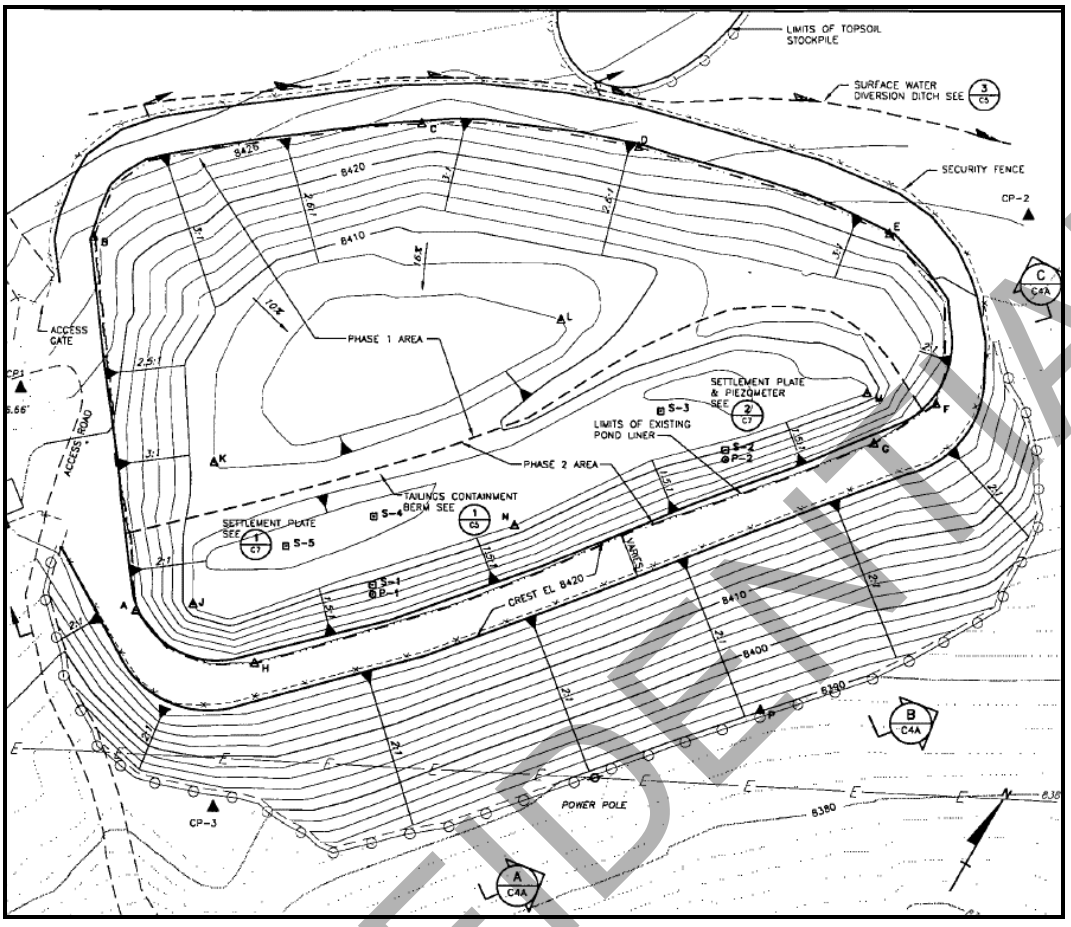

Figure 4. Tailings Impoundment Expansion As-Built, Plan (MFG, 1995).

Based on our understanding of the existing tailings impoundment, we have identified the following three high-level risks: (i) seepage from the tailings impoundment into groundwater; (ii) embankment failure due to instability; and (iii) embankment failure due to overtopping. Each of these is discussed in the following sections.

6.2.1 Tailings Seepage

Though the pre-existing tailings impoundment employed a liner (30-mil polyethylene liner), the expansion construction involved placement of a new and improved liner system above the pre-existing facility. The composite liner system is comprised of a 60-mil high density polyethylene (HDPE) geomembrane overlying a geosynthetic clay liner (GCL), which is anticipated to exhibit acceptable performance.

As discussed in **Section 5.0** , the ongoing monitoring program for the site includes monitoring of four wells installed downstream of the tailings impoundment. Groundwater quality as measured in these downgradient wells appears to generally be of good quality, only exceeding for manganese when

compared to the Colorado groundwater quality standards for agricultural uses. However, when compared to the Colorado groundwater quality standards for domestic water supply, the wells show exceedances with respect to uranium, nitrate, and nitrate/nitrite, parameters that are not currently part of the required monitoring program. Also, analytical testing of the tailings supernatant pool showed measurable concentrations of arsenic, iron, lead, manganese and uranium, while the current groundwater monitoring program only analyzes for one of these parameters (i.e., manganese).

The existing tailings impoundment is filled to near capacity with tailings, with a limited pool. Upon closure, the impoundment is anticipated to be drained (via evaporation) and covered to limit future infiltration. These measures will further reduce the seepage risk from the existing tailings impoundment.

Based on our understanding of the current status of the existing tailings impoundment and the results of monitoring data, we consider the likelihood of contaminated seepage from the tailings impoundment to be "Possible" with an impact of "Moderate" to degradation of water quality in the Four Mile Creek Drainage watershed, resulting in a Medium risk.

6.2.2 Embankment Failure Due to Instability

A cross-section through the tailings impoundment, as illustrated in **Figure 5**, shows that the embankment raise was constructed as a modified centerline raise with a portion of the embankment constructed on pre-existing tailings. The as-built design drawings show that a biaxial geogrid was placed on the pre-existing tailings to improve the foundation prior to placement of the overlying raise fill. The embankment was constructed with a downstream slope of 2H:1V (horizontal:vertical) and an upstream slope of 1.5H:1V.

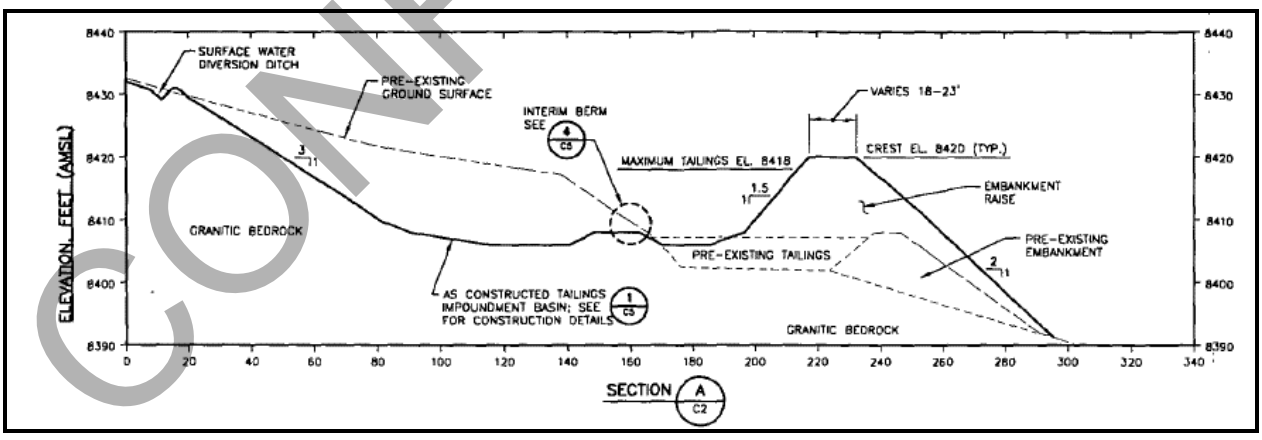

Figure 5. Tailings Impoundment Expansion As-Built, Cross-Section A (MFG, 1995).

The downstream slope of the embankment is considered relatively steep if constructed of soil materials (i.e., not rock fill). Also, construction of the embankment over pre-existing and potentially soft tailings may be viewed as a foundation stability risk, which was mitigated via placement of geogrid. However,

the embankment is only about 30 feet high and appears to be structurally stable over 20 years after the raise construction was completed, with the impoundment filled to near capacity. Based on these observations, we consider embankment failure due to instability to be "Unlikely." However, if a failure of the embankment were to occur, the impact on water quality in the Four Mile Creek Drainage watershed would be "Significant," resulting in a Medium risk.

6.2.3 Embankment Failure Due to Overtopping

The tailings impoundment was constructed without an emergency spillway to prevent overtopping failure. The facility appears to have been designed such that upstream surface water is diverted around the facility, with inflows only from direct precipitation and mill operations (tailings plus process water). Though mining and milling operations at the site have reportedly not been performed since late 2008 (refer to **Section 3.1.4**), aerial photography of the tailings impoundment obtained from Google Earth shows that the facility has been filled to near capacity (refer to **Figure 6**). A letter from Mark Steen to DRMS on 7 April 2009 stated that "*the Gold Hill Mill's tailings pond is filled to capacity, and a new pond will have to be permitted and constructed before production resumes at the Cash Mine*."

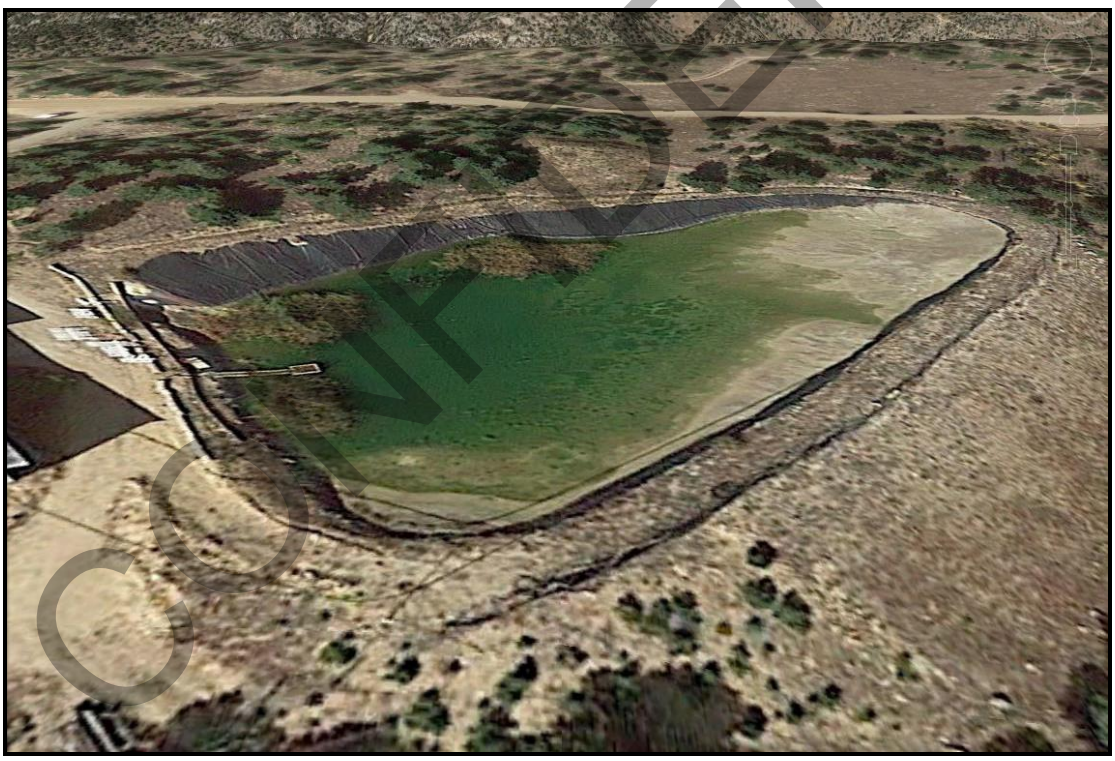

Figure 6. Aerial view of the existing tailings impoundment (Google Earth, October 2015).

We understand that the operator plans to build a new lined pond to store water supply water as part of the future operations; however, we are unaware of plans to construct a new tailings impoundment, and understand that the proposed mill testing program would use the existing tailings impoundment. A

letter from the operator (MVE) to the Division dated 2 September 1997 stated that in the event of failure of the tailings impoundment, "*thousands of tons of mill tailings and hundreds of thousands of gallons of waste water would be deposited in the Cash Gulch drainage, which empties into Gold Run and Four Mile Creek*."

Based on these observations, we consider embankment failure due to overtopping to be "Possible." If a failure of the embankment were to occur, the impact on water quality in the Four Mile Creek Drainage watershed would be "Significant," resulting in a Medium to High risk.

6.3 Contaminated Discharge Risk

We understand that the site has at least one bulkhead[2], the Hazel A, and that the 3rd Level of the Cash Mine exits the ground surface to an existing pond. Also, the site has storm water discharges and has previously operated a land application system to eliminate excess waste water.

6.3.1 Hazel A Bulkhead

We understand that the Hazel A mine workings were operated as a water reservoir available for decanting excess water from the tailings impoundment (MVE, 1997). The Hazel A mine was to be operated such that the mine workings remain in a state of readiness to receive any sudden storm water that would otherwise overflow the tailings dam.

In 1996, the Division had performed an inspection of the Hazel A Adit and found that the existing wooden bulkhead was leaking. During a September 1997 inspection, the Division observed that construction of a concrete cinder block wall had commenced to a height of 3.5 feet in front of the existing bulkhead to alleviate the leakage. The Division required that the operator cease construction and submit design plans for approval prior to reinitiating construction of the bulkhead, which is believed to have been completed.

As of January 1996, the height of the Hazel A bulkhead was measured at five feet and one inch (5'-1"), with an estimated water storage capacity of 48,000 gallons (Fox, 1996). The Hazel A adit is susceptible to recharge from groundwater, with a letter from the Division dated 18 March 1996 estimating an average groundwater inflow rate of 1.7 gpm.

Based on a review of data through 2008, groundwater quality in the Hazel A Adit appeared to generally be of good quality, with no exceedances when compared to the Colorado groundwater quality standards for agricultural uses. However, monitoring of the Hazel A Adit ceased in 2013. With the operation having been on TC since 2008, the current volume of water stored behind the Hazel A bulkhead is unknown.

[2] As discussed in previous sections, the Times/Wynona Mine may also have a bulkhead. Other historic mines in the area may also have bulkheads. As technical information on these bulkheads has not been reviewed, MGS is unable to comment on the risk of failure of these features.

Based on our limited understanding of the situation, we have assigned failure of the Hazel A bulkhead a likelihood of "Possible." If a failure of the bulkhead were to occur, the water volume may be relatively high, though the water quality is anticipated to be relatively good. As such, we have assigned an impact of "Moderate," resulting in a Medium risk.

6.3.2 *Cash Mine 3rd Level Pond*

Overflow from the third-level of the Cash Mine discharges to an external pond. A comparison of the pond water quality to the Colorado surface water quality standards for agricultural uses shows exceedances for manganese, zinc and nitrate. When comparing the water quality to the Colorado surface water quality standards for domestic water supply, cadmium, sulfate and nitrite also exhibit exceedances. Monitoring of the Cash Mine 3rd Level Pond is on-going, but excludes nitrate and nitrite.

The rate or quality of discharge from the Cash Mine is not anticipated to exhibit any significant changes under the current condition. Future proposed operations would include dewatering of the Cash Mine, which would decrease the rate of discharge, at least temporarily. However, potential impacts to water quality under the proposed plan cannot be assessed.

Based on our understanding of this discharge, we have assigned a likelihood of future discharge occurring as "Very Likely." However, the impact is anticipated to be "Negligible," resulting in a Low to Medium risk.

6.3.3 *Land Application System*

During the course of operations, a land application system had been approved by the Division to remove excess waste water. A letter from the Division to the operator dated 26 April 1997 stated that the "*spray evaporation system* [also approved for use on the tailings impoundment] *is the primary water elimination system at the Gold Hill Mill, and that the land application system is to be used only if needed to maintain adequate freeboard in the Hazel-A adit and the tailings pond*." The spray evaporation system was estimated to be able to dispose of between 5 and 10.7 gpm of water (DMG, 1996). We do not know where the land application system was installed, nor the volume of waste water eliminated via the land application system. As such, we are unable to assess the likelihood or impact of risks associated with past or future use of the land application system.

6.3.4 *Storm Water Discharge*

The site has had previously operated under a storm water discharge permit(s) and has had a Storm Water Management Plan (SWMP) (Dufford & Brown, 1995). We understand that surface water is diverted around the tailings impoundment via channels and berms to limit the volume of inflow to the facility after a storm event. Though the current status of the permit and SWMP is unknown, the likelihood of storm water discharge from the site is considered "Very Likely," while the impact on water

quality in the Four Mile Creek Drainage watershed is considered "Negligible," resulting in a Low to Medium risk.

7.0 Closing

MGS appreciates the opportunity to support Pine Brook with this review. If you have any questions or comments regarding the contents of this report, please contact me via phone at 303.588.8289, or via e-mail at kimberly@morrisongeo.com.

Respectfully submitted,

Morrison Geotechnical Solutions, Inc.

Kimberly Morrison, P.E., R.G.
President, Principal Geotechnical Engineer

Attachments:

Attachment 1 – Primary References Cited
Attachment 2 – Site Maps
Attachment 3 – Water Quality Data Review

Attachment 1
Primary References Cited

Over 1800 documents were available for MGS's review from public sources. The following documents were key to our review:

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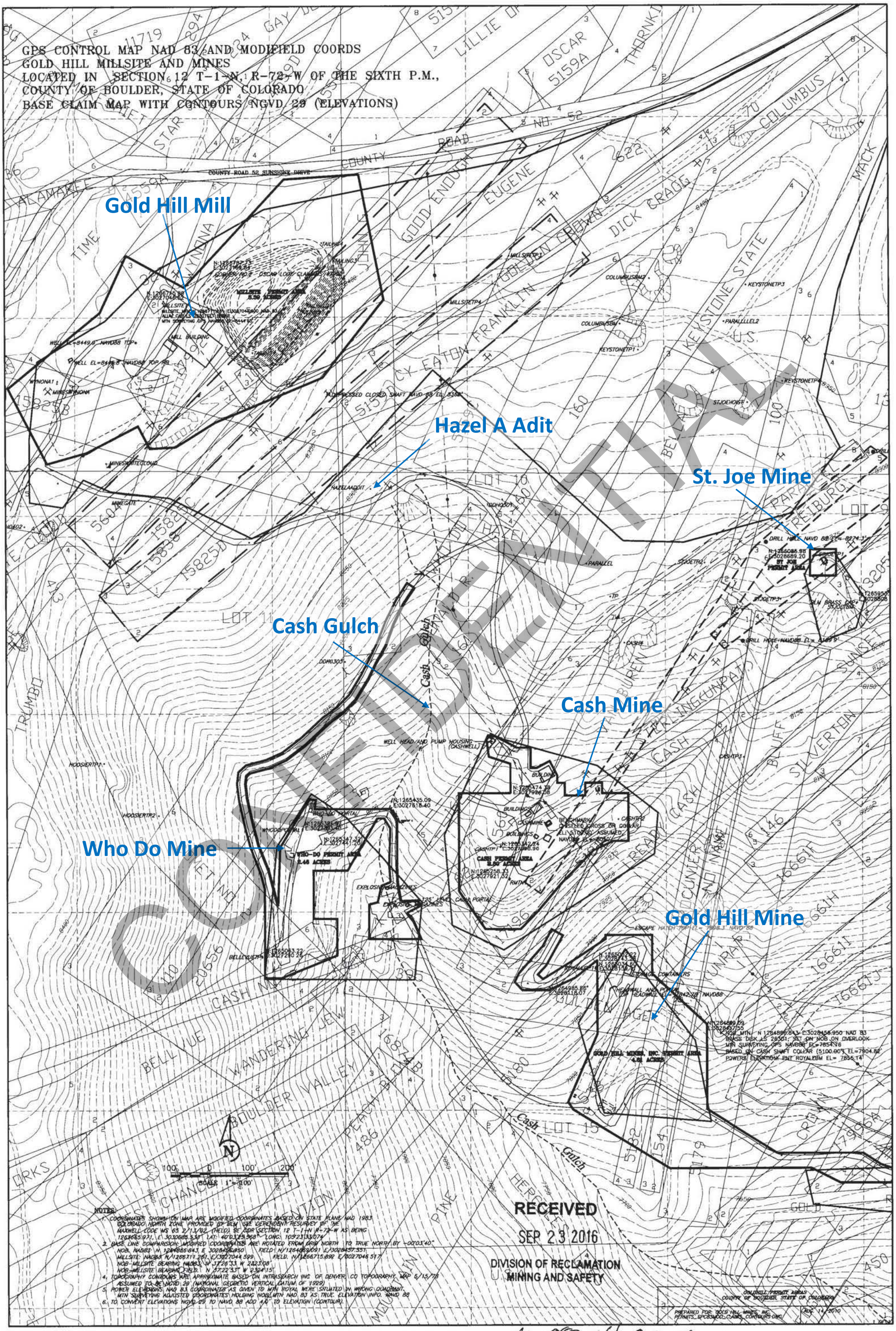
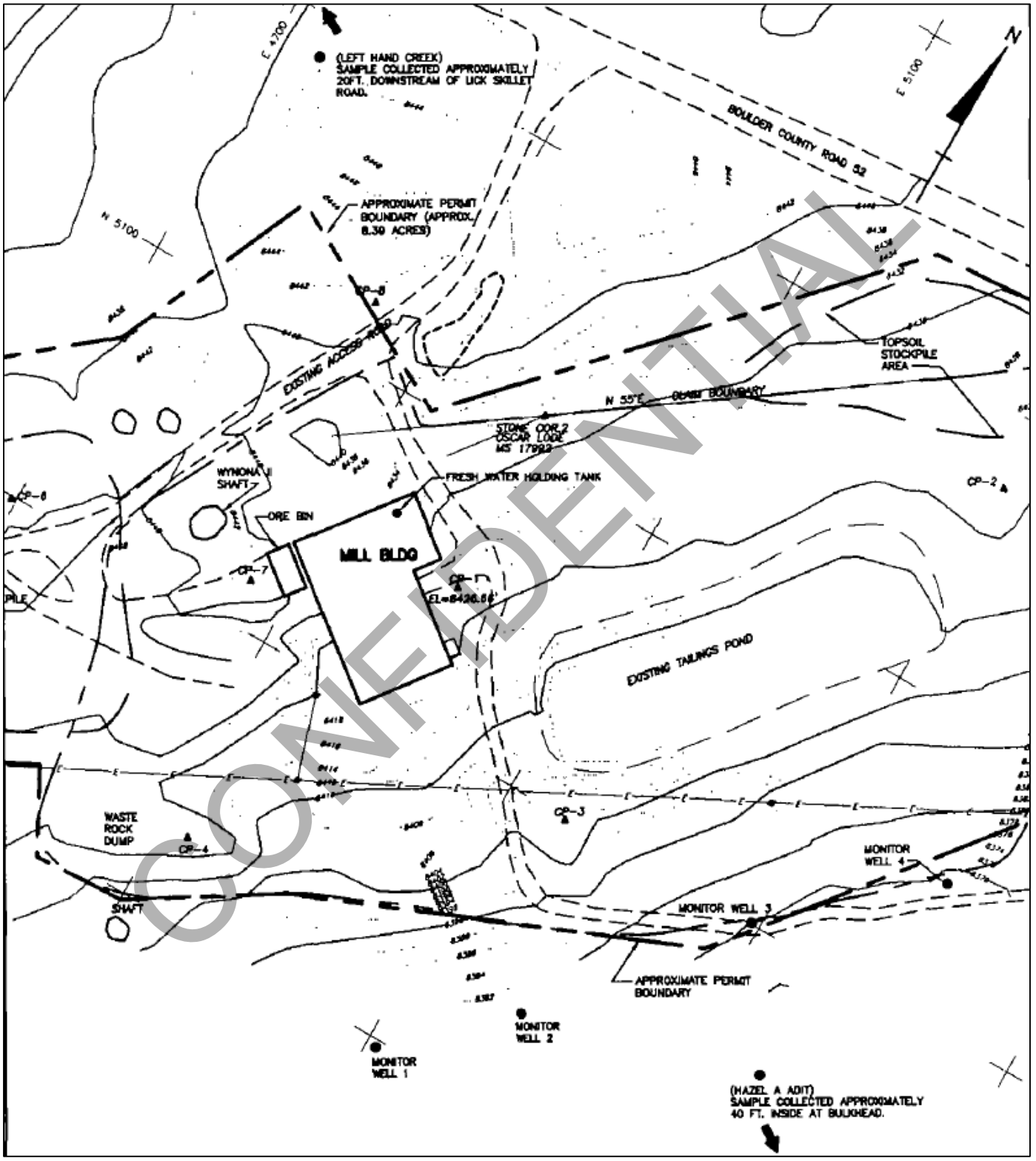
Attachment 2
Site Maps



M-1983-141 8.5x14 map

Map 2-1. Site Map (2016 Annual Report).



Map 2-2. Surface and Groundwater Monitoring Locations (MFG, 1998).

Attachment 3
Water Quality Data Review

Table 3-1
Gold Hill Mine Cash Mine
- Surface Water Quality Data -

Parameter	Unit	O Surface Water Standards (Regulation 3		EPA Effluent Limits - Ore Mining*		Left Hand Creek									Max. Value
		Dom. Water Supply	Agricultural	Monthly Avg.	Daily Max.	6/30/1998	12/13/2005	3/30/2006	6/26/2006	9/28/2006	3/30/2007	6/27/2007	9/12/2007	9/15/2008	
Aluminum, Dissolved	mg/L	--	--	--	--	0.06	NT	NT	NT	NT	NT	NT	<0.03	<0.03	**0.06**
Arsenic, Dissolved	mg/L	--	--	--	--	<0.001	NT	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**ND**
Arsenic, Total	mg/L	0.00002 - 0.01 (30-day)	0.1 (30-day)	--	--	NT	<0.001	NT	NT	NT	NT	NT	NT	NT	**ND**
Beryllium, Dissolved	mg/L	0.004 (30-day)	0.1 (30-day)	--	--	NT	NT	NT	NT	NT	NT	NT	<0.002	<0.002	**ND**
Boron, Dissolved	mg/L		0.75 (30-day)	--	--	NT	NT	NT	NT	NT	NT	NT	<0.01	<0.01	**ND**
Cadmium, Dissolved	mg/L	0.005 (1-day)	0.1 (30-day)	--	--	<0.0003	NT	0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	**0.0001**
Cadmium, Total	mg/L	--	--	0.05	0.1	NT	<0.0003	NT	NT	NT	NT	NT	NT	NT	**ND**
Chromium, Dissolved	mg/L	0.05 (1-day)	0.1 (30-day)	--	--	<0.005	NT	NT	NT	NT	<0.01	<0.0001	<0.01	<0.01	**ND**
Cobalt, Dissolved	mg/L	--	--	--	--	NT	NT	NT	NT	NT	NT	NT	<0.01	<0.01	**ND**
Copper, Dissolved	mg/L	1 (30-day)	0.2	--	--	<0.02	NT	0.0012	0.002	0.0063	0.0047	0.009	0.0074	0.0018	**0.009**
Copper, Total	mg/L	--	--	0.15	0.3	NT	0.01	NT	NT	NT	NT	NT	NT	NT	**0.01**
Iron, Dissolved	mg/L	0.3 (30-day)		--	--	0.07	NT	<0.02	0.04	0.06	0.05	0.04	0.03	0.09	**0.09**
Iron, Total	mg/L	--	--	--	--	NT	0.12	NT	NT	NT	NT	NT	NT	NT	**0.12**
Lead, Dissolved	mg/L	0.05 (1-day)	0.1 (30-day)	--	--	<0.001	NT	0.0001	<0.0001	0.0001	0.0001	0.0002	0.0005	<0.0001	**0.0005**
Lead, Total	mg/L	--	--	0.3	0.6	NT	<0.001	NT	NT	NT	NT	NT	NT	NT	**ND**
Lithium, Dissolved	mg/L	--	--	--	--	NT	NT	NT	NT	NT	NT	NT	<0.02	<0.02	**ND**
Magnesium, Dissolved	mg/L	--	--	--	--	NT	NT	NT	NT	NT	4.3	1.4	NT	NT	**4.3**
Manganese, Dissolved	mg/L	0.05 (30-day)	0.2 (30-day)	--	--	<0.02	NT	0.009	<0.005	0.007	0.005	<0.005	0.005	<0.005	**0.009**
Mercury, Dissolved	mg/L	0.002 (1-day)	--	--	--	<0.0001	NT	NT	NT	NT	NT	NT	<0.0002	<0.0002	**ND**
Mercury, Total	mg/L	--	--	0	0	NT	<0.0001	NT	NT	NT	NT	NT	NT	NT	**ND**
Nickel, Dissolved	mg/L	0.1 (30-day)	0.2 (30-day)	--	--	NT	NT	NT	NT	NT	<0.01	<0.01	<0.01	<0.01	**ND**
Selenium, Dissolved	mg/L	0.05 (30-day)	0.02 (30-day)	--	--	<0.005	NT	NT	NT	NT	NT	NT	<0.0001	<0.0001	**ND**
Silver, Dissolved	mg/L	0.1 (1-day)	--	--	--	0.0005	NT	<0.00005	<0.00005	0.00009	<0.00005	<0.00005	NT	NT	**0.0005**
Silver, Total	mg/L	--	--	--	--	NT	<0.0002	NT	NT	NT	NT	NT	NT	NT	**ND**
Uranium, Dissolved	mg/L	0.0168 - 0.03 (30-day)	--	--	--	<0.002	NT	NT	NT	NT	NT	NT	NT	NT	**ND**
Uranium, Calculated	pCi/L	--	--	--	--	<1	NT	NT	NT	NT	NT	NT	NT	NT	**ND**
Vanadium, Dissolved	mg/L	--	--	--	--	NT	NT	NT	NT	NT	NT	NT	<0.005	<0.005	**ND**
Zinc, Dissolved	mg/L	5 (3-day)	2 (30-day)	--	--	0.03	NT	0.037	0.12	0.045	0.043	0.027	0.039	0.016	**0.12**
Zinc, Total	mg/L	--	--	0.5 (mill) - 0.75 (drainage)	1 (mill) - 1.5 (drainage)	NT	0.05	NT	NT	NT	NT	NT	NT	NT	**0.05**
pH	s.u.	5.0-9.0	--	6.0 - 9.0	6.0 - 9.0	NT	7.48	7.5	NT	NT	NT	7.6	NT	NT	**7.6**
TDS (180^{o}C)	mg/L	--	--	--	--	NT	86	90	NT	NT	NT	40	40	50	**90**
Sulfate as SO4	mg/L	250 (30-day)	--	--	--	NT	27	20	<10	<10	20	<10	<10	30	**30**
Conductivity	umhos/cr	--	--	--	--	NT	NT	156	NT	NT	NT	54	NT	NT	**156**
Nitrate as N, Dissolved	mg/L	10 (1-day)	100	--	--	NT	NT	NT	NT	NT	0.24	<0.02	0.05	0.06	**0.24**
Nitrate/Nitrite as N, Dissolved	mg/L	--	--	--	--	NT	NT	NT	NT	NT	0.24	<0.02	0.05	0.06	**0.24**
Nitrite as N, Dissolved	mg/L	1.0 (1-day)	10 (1-day)	--	--	NT	NT	NT	NT	NT	<0.01	<0.01	<0.01	<0.01	**ND**
Fluoride	mg/L	2.0 (1-day)	--	--	--	NT	NT	NT	NT	NT	NT	NT	<0.1	<0.1	**ND**
TSS	mg/L	--	--	20	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	**NT**

NOTES:

* EPA (2011) - Guidance for ore mining operations for "copper, lead, zinc, gold, and silver ores." EPA parameters based on "total" metals (not dissolved); however, where total metals was not tested, the limit is designated by the "dissolved" value (typically not conservative).

Table 3-1
Gold Hill Mine Cash Mine
- Surface Water Quality Data -

Parameter	Unit	O Surface Water Standards (Regulation 3		EPA Effluent Limits - Ore Mining*		CASH MINE 3RD LEVEL POND									Max. Value
		Dom. Water Supply	Agricultural	Monthly Avg.	Daily Max.	9/28/2006	12/29/2006	6/27/2007	9/12/2007	11/19/2007	9/15/2008	3/29/2016	6/23/2016	9/20/2016	
Aluminum, Dissolved	mg/L	--	--	--	--	NT	NT	NT	<0.03	0.06	0.07	NT	NT	NT	**0.07**
Arsenic, Dissolved	mg/L	--	--	--	--	0.0032	0.0008	0.002	0.002	0.001	0.002	0.0006	0.0007	0.0006	**0.0032**
Arsenic, Total	mg/L	0.00002 - 0.01 (30-day)	0.1 (30-day)	--	--	NT	NT	NT	NT	NT	NT	NT	NT	NT	**NT**
Beryllium, Dissolved	mg/L	0.004 (30-day)	0.1 (30-day)	--	--	NT	NT	NT	<0.002	<0.004	<0.004	NT	NT	NT	**ND**
Boron, Dissolved	mg/L		0.75 (30-day)	--	--	NT	NT	NT	0.17	0.3	0.4	NT	NT	NT	**0.4**
Cadmium, Dissolved	mg/L	0.005 (1-day)	0.1 (30-day)	--	--	0.001	0.0004	0.0002	0.0003	<0.0002	0.0005	0.0084	0.0001	0.0067	0.0084
Cadmium, Total	mg/L	--	--	0.05	0.1	NT	NT	NT	NT	NT	NT	NT	NT	NT	**NT**
Chromium, Dissolved	mg/L	0.05 (1-day)	0.1 (30-day)	--	--	NT	NT	0.0003	<0.01	<0.02	<0.02	NT	NT	NT	**0.0003**
Cobalt, Dissolved	mg/L	--	--	--	--	NT	NT	NT	<0.01	<0.02	<0.02	NT	NT	NT	**ND**
Copper, Dissolved	mg/L	1 (30-day)	0.2	--	--	0.0024	0.0039	0.0016	0.003	0.008	0.004	NT	NT	NT	**0.008**
Copper, Total	mg/L	--	--	0.15	0.3	NT	NT	NT	NT	NT	NT	NT	NT	NT	**NT**
Iron, Dissolved	mg/L	0.3 (30-day)		--	--	10.1	<0.02	<0.04	<0.02	<0.04	0.04	NT	NT	NT	**10.1**
Iron, Total	mg/L	--	--	--	--	NT	NT	NT	NT	NT	NT	NT	NT	NT	**NT**
Lead, Dissolved	mg/L	0.05 (1-day)	0.1 (30-day)	--	--	<0.0001	<0.0001	<0.0001	0.0005	0.0005	0.0004	NT	NT	NT	**0.0005**
Lead, Total	mg/L	--	--	0.3	0.6	NT	NT	NT	NT	NT	NT	NT	NT	NT	**NT**
Lithium, Dissolved	mg/L	--	--	--	--	NT	NT	NT	0.03	<0.04	0.07	NT	NT	NT	**0.07**
Magnesium, Dissolved	mg/L	--	--	--	--	NT	NT	102	NT	NT	NT	NT	NT	NT	**102**
Manganese, Dissolved	mg/L	0.05 (30-day)	0.2 (30-day)	--	--	5.51	6.7	1.99	0.313	0.28	0.36	2.21	0.023	2.28	6.7
Mercury, Dissolved	mg/L	0.002 (1-day)	--	--	--	NT	NT	NT	<0.0002	<0.0002	<0.0002	NT	NT	NT	**ND**
Mercury, Total	mg/L	--	--	0	0	NT	NT	NT	NT	NT	NT	NT	NT	NT	**NT**
Nickel, Dissolved	mg/L	0.1 (30-day)	0.2 (30-day)	--	--	NT	NT	0.02	0.01	0.03	<0.02	NT	NT	NT	**0.03**
Selenium, Dissolved	mg/L	0.05 (30-day)	0.02 (30-day)	--	--	NT	NT	NT	<0.0002	0.0004	0.0006	NT	NT	NT	**0.0006**
Silver, Dissolved	mg/L	0.1 (1-day)	--	--	--	0.00005	<0.00005	<0.00005	NT	NT	NT	NT	NT	NT	**0.00005**
Silver, Total	mg/L	--	--	--	--	NT	NT	NT	NT	NT	NT	NT	NT	NT	**NT**
Uranium, Dissolved	mg/L	0.0168 - 0.03 (30-day)	--	--	--	NT	NT	NT	NT	NT	NT	NT	NT	NT	**NT**
Uranium, Calculated	pCi/L	--	--	--	--	NT	NT	NT	NT	NT	NT	NT	NT	NT	**NT**
Vanadium, Dissolved	mg/L	--	--	--	--	NT	NT	NT	<0.005	<0.01	<0.01	NT	NT	NT	**ND**
Zinc, Dissolved	mg/L	5 (3-day)	2 (30-day)	--	--	0.382	0.174	0.018	0.03	<0.004	0.054	2.99	0.02	2.42	2.99
Zinc, Total	mg/L	--	--	0.5 (mill) - 0.75 (drainage)	1 (mill) - 1.5 (drainage)	NT	NT	NT	NT	NT	NT	NT	NT	NT	**NT**
pH	s.u.	5.0-9.0	--	6.0 - 9.0	6.0 - 9.0	NT	NT	7.9	NT	NT	NT	NT	NT	NT	**7.9**
TDS (180°C)	mg/L	--	--	--	--	NT	NT	2490	2650	3090	3740	946	1750	886	**3740**
Sulfate as SO4	mg/L	250 (30-day)	--	--	--	1650	1720	1500	1700	1900	2000	538	50	512	2000
Conductivity	mhos/cr	--	--	--	--	NT	NT	2900	NT	NT	NT	NT	NT	NT	**2900**
Nitrate as N, Dissolved	mg/L	10 (1-day)	100	--	--	NT	NT	33	50.7	113	207	NT	NT	NT	207
Nitrate/Nitrite as N, Dissolved	mg/L	--	--	--	--	NT	NT	33.6	51.4	114	209	NT	NT	NT	**209**
Nitrite as N, Dissolved	mg/L	1.0 (1-day)	10 (1-day)	--	--	NT	NT	0.57	0.68	0.67	1.74	NT	NT	NT	1.74
Fluoride	mg/L	2.0 (1-day)	--	--	--	NT	NT	NT	1.5	1.5	2.1	NT	NT	NT	**2.1**
TSS	mg/L	--	--	20	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	**NT**

NOTES:

* EPA (2011) - Guidance for ore mining operations for "copper, lead, zinc, gold, and silver ores." EPA parameters based on "total" me

Table 3-1
Gold Hill Mine Cash Mine
- Surface Water Quality Data -

Parameter	Unit	CO Surface Water Standards (Regulation 3)		EPA Effluent Limits - Ore Mining*		CASH GULCH				Max. Value
		Dom. Water Supply	Agricultural	Monthly Avg.	Daily Max.	12/29/2015	3/29/2016	6/23/2016	9/20/2016	
Aluminum, Dissolved	mg/L	--	--	--	--	NT	NT	NT	NT	**NT**
Arsenic, Dissolved	mg/L	--	--	--	--	ND	<0.0002	0.0002	0.0002	**0.0002**
Arsenic, Total	mg/L	0.00002 - 0.01 (30-day)	0.1 (30-day)	--	--	NT	NT	NT	NT	**NT**
Beryllium, Dissolved	mg/L	0.004 (30-day)	0.1 (30-day)	--	--	NT	NT	NT	NT	**NT**
Boron, Dissolved	mg/L		0.75 (30-day)	--	--	NT	NT	NT	NT	**NT**
Cadmium, Dissolved	mg/L	0.005 (1-day)	0.1 (30-day)	--	--	0.0014	0.0013	0.0009	0.0007	**0.0014**
Cadmium, Total	mg/L	--	--	0.05	0.1	NT	NT	NT	NT	**NT**
Chromium, Dissolved	mg/L	0.05 (1-day)	0.1 (30-day)	--	--	NT	NT	NT	NT	**NT**
Cobalt, Dissolved	mg/L	--	--	--	--	NT	NT	NT	NT	**NT**
Copper, Dissolved	mg/L	1 (30-day)	0.2	--	--	NT	NT	NT	NT	**NT**
Copper, Total	mg/L	--	--	0.15	0.3	NT	NT	NT	NT	**NT**
Iron, Dissolved	mg/L	0.3 (30-day)		--	--	NT	NT	NT	NT	**NT**
Iron, Total	mg/L	--	--	--	--	NT	NT	NT	NT	**NT**
Lead, Dissolved	mg/L	0.05 (1-day)	0.1 (30-day)	--	--	NT	NT	NT	NT	**NT**
Lead, Total	mg/L	--	--	0.3	0.6	NT	NT	NT	NT	**NT**
Lithium, Dissolved	mg/L	--	--	--	--	NT	NT	NT	NT	**NT**
Magnesium, Dissolved	mg/L	--	--	--	--	NT	NT	NT	NT	**NT**
Manganese, Dissolved	mg/L	0.05 (30-day)	0.2 (30-day)	--	--	0.021	<0.005	0.016	0.048	**0.048**
Mercury, Dissolved	mg/L	0.002 (1-day)	--	--	--	NT	NT	NT	NT	**NT**
Mercury, Total	mg/L	--	--	0	0	NT	NT	NT	NT	**NT**
Nickel, Dissolved	mg/L	0.1 (30-day)	0.2 (30-day)	--	--	NT	NT	NT	NT	**NT**
Selenium, Dissolved	mg/L	0.05 (30-day)	0.02 (30-day)	--	--	NT	NT	NT	NT	**NT**
Silver, Dissolved	mg/L	0.1 (1-day)	--	--	--	NT	NT	NT	NT	**NT**
Silver, Total	mg/L	--	--	--	--	NT	NT	NT	NT	**NT**
Uranium, Dissolved	mg/L	0.0168 - 0.03 (30-day)	--	--	--	NT	NT	NT	NT	**NT**
Uranium, Calculated	pCi/L	--	--	--	--	NT	NT	NT	NT	**NT**
Vanadium, Dissolved	mg/L	--	--	--	--	NT	NT	NT	NT	**NT**
Zinc, Dissolved	mg/L	5 (3-day)	2 (30-day)	--	--	0.33	0.39	0.24	0.19	**0.39**
Zinc, Total	mg/L	--	--	0.5 (mill) - 0.75 (drainage)	1 (mill) - 1.5 (drainage)	NT	NT	NT	NT	**NT**
pH	s.u.	5.0-9.0	--	6.0 - 9.0	6.0 - 9.0	NT	NT	NT	NT	**NT**
TDS (180°C)	mg/L	--	--	--	--	422	392	254	256	**422**
Sulfate as SO4	mg/L	250 (30-day)	--	--	--	219	232	138	133	**232**
Conductivity	umhos/cm	--	--	--	--	NT	NT	NT	NT	**NT**
Nitrate as N, Dissolved	mg/L	10 (1-day)	100	--	--	NT	NT	NT	NT	**NT**
Nitrate/Nitrite as N, Dissolved	mg/L	--	--	--	--	NT	NT	NT	NT	**NT**
Nitrite as N, Dissolved	mg/L	1.0 (1-day)	10 (1-day)	--	--	NT	NT	NT	NT	**NT**
Fluoride	mg/L	2.0 (1-day)	--	--	--	NT	NT	NT	NT	**NT**
TSS	mg/L	--	--	20	30	NT	NT	NT	NT	**NT**

NOTES:

* EPA (2011) - Guidance for ore mining operations for "copper, lead, zinc, gold, and silver ores." EPA parameters based on "total" me

Table 3-2
Gold Hill Mine Cash Mine
- Groundwater Quality Data -

Parameter	Unit	Colorado Groundwater Standards (Regulation 41)		Well #1										Max.
		Domestic Water Supply	Agricultural	6/30/1998	12/12/2005	3/30/2006	9/6/2006	11/19/2007	9/15/2008	12/29/2015	3/29/2016	6/23/2016	9/20/2016	Value
Aluminum, Dissolved	mg/L	--	5	0.06	NT	NT	<0.03	<0.03	<0.03	NT	NT	NT	NT	**0.06**
Aluminum, Total	mg/L	--	--	NT	NT	NT	0.15	NT	NT	NT	NT	NT	NT	**0.15**
Antimony, Dissolved	mg/L	0.006	--	NT	NT	NT	0.0004	NT	NT	NT	NT	NT	NT	**0.0004**
Antimony, Total	mg/L	--	--	NT	NT	NT	0.0005	NT	NT	NT	NT	NT	NT	**0.0005**
Arsenic, Dissolved	mg/L	0.01	0.1	0.002	NT	<0.0005	<0.0005	0.0005	<0.0005	NT	NT	NT	NT	**0.002**
Arsenic, Total	mg/L	--	--	NT	0.002	NT	<0.0005	NT	NT	NT	NT	NT	NT	**0.002**
Barium, Dissolved	mg/L	2	--	NT	NT	NT	0.04	NT	NT	NT	NT	NT	NT	**0.04**
Barium, Total	mg/L	--	--	NT	NT	NT	0.043	NT	NT	NT	NT	NT	NT	**0.043**
Beryllium, Dissolved	mg/L	0.004	0.1	NT	NT	NT	<0.002	<0.002	<0.002	NT	NT	NT	NT	**ND**
Beryllium, Total	mg/L	--	--	NT	NT	NT	<0.002	NT	NT	NT	NT	NT	NT	**ND**
Boron, Dissolved	mg/L	--	0.75	NT	NT	NT	NT	0.01	0.01	NT	NT	NT	NT	**0.01**
Cadmium, Dissolved	mg/L	0.005	0.01	0.0015	NT	0.0003	0.0002	0.0001	0.0001	NT	NT	NT	NT	**0.0015**
Cadmium, Total	mg/L	--	--	NT	0.0006	NT	0.0002	NT	NT	NT	NT	NT	NT	**0.0006**
Calcium, Dissolved	mg/L	--	--	NT	NT	NT	161	NT	NT	NT	NT	NT	NT	**161**
Calcium, Total	mg/L	--	--	NT	NT	NT	172	NT	NT	NT	NT	NT	NT	**172**
Chromium, Dissolved	mg/L	0.1	0.1	<0.005	NT	NT	<0.01	<0.01	<0.01	NT	NT	NT	NT	**ND**
Chromium, Total	mg/L	--	--	NT	NT	NT	<0.01	NT	NT	NT	NT	NT	NT	**ND**
Cobalt, Dissolved	mg/L	--	0.05	NT	NT	NT	NT	<0.01	<0.01	NT	NT	NT	NT	**ND**
Copper, Dissolved	mg/L	1	0.2	<0.02	NT	<0.0005	0.0047	0.0035	0.0025	NT	NT	NT	NT	**0.0047**
Copper, Total	mg/L	--	--	NT	<0.01	NT	0.007	NT	NT	NT	NT	NT	NT	**0.007**
Iron, Dissolved	mg/L	0.3	5	<0.2	NT	0.05	<0.02	<0.02	<0.02	NT	NT	NT	NT	**0.05**
Iron, Total	mg/L	--	--	NT	0.39	NT	0.27	NT	NT	NT	NT	NT	NT	**0.39**
Lead, Dissolved	mg/L	0.05	0.1	<0.001	NT	<0.0001	0.0001	0.0001	0.0001	NT	NT	NT	NT	**0.0001**
Lead, Total	mg/L	--	--	NT	0.001	NT	0.0035	NT	NT	NT	NT	NT	NT	**0.0035**
Lithium, Dissolved	mg/L	--	2.5	NT	NT	NT	NT	<0.02	<0.02	NT	NT	NT	NT	**ND**
Magnesium, Dissolved	mg/L	--	--	NT	NT	NT	36.4	NT	NT	NT	NT	NT	NT	**36.4**
Magnesium, Total	mg/L	--	--	NT	NT	NT	38.5	NT	NT	NT	NT	NT	NT	**38.5**
Manganese, Dissolved	mg/L	0.05	0.2	<0.02	NT	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**ND**
Manganese, Total	mg/L	--	--	NT	NT	NT	0.03	NT	NT	NT	NT	NT	NT	**0.03**
Mercury, Dissolved	mg/L	0.002	0.01	<0.0001	NT	NT	<0.0002	<0.0002	<0.0002	NT	NT	NT	NT	**ND**
Mercury, Total	mg/L	--	--	NT	<0.0001	NT	<0.0002	NT	NT	NT	NT	NT	NT	**ND**
Molybdenum, Dissolved	mg/L	0.21	--	NT	NT	NT	<0.01	NT	NT	NT	NT	NT	NT	**ND**
Molybdenum, Total	mg/L	--	--	NT	NT	NT	<0.01	NT	NT	NT	NT	NT	NT	**ND**
Nickel, Dissolved	mg/L	0.1	0.2	NT	NT	NT	<0.01	<0.01	<0.01	NT	NT	NT	NT	**ND**
Nickel, Total	mg/L	--	--	NT	NT	NT	<0.01	NT	NT	NT	NT	NT	NT	**ND**
Selenium, Dissolved	mg/L	0.05	0.02	<0.005	NT	NT	0.0002	0.0002	0.0003	NT	NT	NT	NT	**0.0003**
Selenium, Total	mg/L	--	--	NT	NT	NT	0.0002	NT	NT	NT	NT	NT	NT	**0.0002**
Silver, Dissolved	mg/L	0.05		0.0003	NT	<0.00005	<0.00005	NT	NT	NT	NT	NT	NT	**0.0003**
Silver, Total	mg/L	--	--	NT	<0.0002	NT	<0.00005	NT	NT	NT	NT	NT	NT	**ND**
Sodium, Dissolved	mg/L	--	--	NT	NT	NT	8.6	NT	NT	NT	NT	NT	NT	**8.6**
Sodium, Total	mg/L	--	--	NT	NT	NT	8.8	NT	NT	NT	NT	NT	NT	**8.8**
Thallium, Dissolved	mg/L	0.002	--	NT	NT	NT	<0.0001	NT	NT	NT	NT	NT	NT	**ND**
Thallium, Total	mg/L	--	--	NT	NT	NT	<0.0001	NT	NT	NT	NT	NT	NT	**ND**
Tin, Dissolved	mg/L	--	--	NT	NT	NT	<0.1	NT	NT	NT	NT	NT	NT	**ND**
Tin, Total	mg/L	--	--	NT	NT	NT	<0.1	NT	NT	NT	NT	NT	NT	**ND**
Uranium, Dissolved	mg/L	0.0168 to 0.03	--	<0.002	NT	NT	0.0325	NT	NT	NT	NT	NT	NT	0.0325
Uranium, Total	mg/L	--	--	NT	NT	NT	0.0317	NT	NT	NT	NT	NT	NT	**0.0317**
Uranium, Calculated	pCi/L	--	--	<1	NT	NT	NT	NT	NT	NT	NT	NT	NT	**ND**
Vanadium, Dissolved	mg/L	--	0.1	NT	NT	NT	NT	<0.005	<0.005	NT	NT	NT	NT	**ND**
Zinc, Dissolved	mg/L	5	2	0.31	NT	0.013	0.013	0.003	0.007	0.04	0.02	0.04	0.02	**0.31**
Zinc, Total	mg/L	--	--	NT	0.06	NT	0.012	NT	NT	NT	NT	NT	NT	**0.06**
pH	s.u.	6.5 - 8.5	6.5 - 8.5	NT	7.57	7.8	NT	NT	NT	NT	NT	NT	NT	**7.8**
TDS (180°C)	mg/L	--	--	NT	714	720	730	780	790	522	328	362	370	**790**
TSS (105°C)	mg/L	--	--	NT	NT	NT	<5	NT	NT	NT	NT	NT	NT	**ND**
Sulfate as SO4	mg/L	250	--	NT	323	340	380	400	440	261	164	184	192	**440**
Conductivity	µmhos/cm	--	--	NT	NT	992	NT	NT	NT	NT	NT	NT	NT	**992**
Nitrate as N, Dissolved	mg/L	10	--	NT	NT	NT	0.42	0.63	0.65	NT	NT	NT	NT	**0.65**
Nitrate/Nitrite as N, Dissolved	mg/L	10	100	NT	NT	NT	0.42	0.63	0.65	NT	NT	NT	NT	**0.65**
Nitrite as N, Dissolved	mg/L	1	10	NT	NT	NT	<0.01	<0.01	<0.01	NT	NT	NT	NT	**ND**
Fluoride	mg/L	4	2	NT	NT	NT	NT	<0.1	0.1	NT	NT	NT	NT	**0.1**

Notes:
NT = Not Tested
ND = Not Detected (i.e., parameter was analyzed for, but was not detected above the MDL)
MDL = Method Detection Limit

Table 3-2
Gold Hill Mine Cash Mine
- Groundwater Quality Data -

Parameter	Unit	Colorado Groundwater Standards (Regulation 41)		Well #2										Max.
		Domestic Water Supply	Agricultural	6/30/1998	12/12/2005	3/30/2006	6/26/2006	9/6/2006	11/19/2007	9/15/2008	12/29/2015	3/29/2016	6/23/2016	9/20/2016	Value
Aluminum, Dissolved	mg/L	--	5	<0.05	NT	NT	NT	<0.03	<0.03	<0.03	NT	NT	NT	NT	ND
Aluminum, Total	mg/L	--	--	NT	NT	NT	NT	1.4	NT	NT	NT	NT	NT	NT	**1.4**
Antimony, Dissolved	mg/L	0.006	--	NT	NT	NT	NT	<0.002	NT	NT	NT	NT	NT	NT	ND
Antimony, Total	mg/L	--	--	NT	NT	NT	NT	<0.002	NT	NT	NT	NT	NT	NT	ND
Arsenic, Dissolved	mg/L	0.01	0.1	<0.001	NT	<0.0005	<0.0005	<0.003	<0.0005	<0.0005	NT	NT	NT	NT	ND
Arsenic, Total	mg/L	--	--	NT	0.001	NT	NT	<0.003	NT	NT	NT	NT	NT	NT	**0.001**
Barium, Dissolved	mg/L	2	--	NT	NT	NT	NT	0.053	NT	NT	NT	NT	NT	NT	**0.053**
Barium, Total	mg/L	--	--	NT	NT	NT	NT	0.066	NT	NT	NT	NT	NT	NT	**0.066**
Beryllium, Dissolved	mg/L	0.004	0.1	NT	NT	NT	NT	<0.002	<0.002	<0.002	NT	NT	NT	NT	ND
Beryllium, Total	mg/L	--	--	NT	NT	NT	NT	<0.002	NT	NT	NT	NT	NT	NT	ND
Boron, Dissolved	mg/L	--	0.75	NT	NT	NT	NT	NT	0.02	0.02	NT	NT	NT	NT	**0.02**
Cadmium, Dissolved	mg/L	0.005	0.01	0.0008	NT	0.001	0.0011	0.0013	0.0013	0.0012	NT	NT	NT	NT	**0.0013**
Cadmium, Total	mg/L	--	--	NT	0.0022	NT	NT	0.0013	NT	NT	NT	NT	NT	NT	**0.0022**
Calcium, Dissolved	mg/L	--	--	NT	NT	NT	NT	133	NT	NT	NT	NT	NT	NT	**133**
Calcium, Total	mg/L	--	--	NT	NT	NT	NT	143	NT	NT	NT	NT	NT	NT	**143**
Chromium, Dissolved	mg/L	0.1	0.1	<0.005	NT	NT	NT	<0.01	<0.01	<0.01	NT	NT	NT	NT	ND
Chromium, Total	mg/L	--	--	NT	NT	NT	NT	0.01	NT	NT	NT	NT	NT	NT	**0.01**
Cobalt, Dissolved	mg/L	--	0.05	NT	NT	NT	NT	NT	<0.01	<0.01	NT	NT	NT	NT	ND
Copper, Dissolved	mg/L	1	0.2	<0.02	NT	0.0344	0.0606	0.054	0.0255	0.0185	NT	NT	NT	NT	**0.0606**
Copper, Total	mg/L	--	--	NT	0.05	NT	NT	0.195	NT	NT	NT	NT	NT	NT	**0.195**
Iron, Dissolved	mg/L	0.3	5	<0.02	NT	0.03	<0.02	<0.02	<0.02	<0.02	NT	NT	NT	NT	**0.03**
Iron, Total	mg/L	--	--	NT	0.27	NT	NT	2.79	NT	NT	NT	NT	NT	NT	**2.79**
Lead, Dissolved	mg/L	0.05	0.1	<0.001	NT	<0.0001	0.0008	0.0009	0.0002	0.0001	NT	NT	NT	NT	**0.0009**
Lead, Total	mg/L	--	--	NT	<0.0001	NT	NT	0.029	NT	NT	NT	NT	NT	NT	**0.029**
Lithium, Dissolved	mg/L	--	2.5	NT	NT	NT	NT	NT	<0.02	<0.02	NT	NT	NT	NT	ND
Magnesium, Dissolved	mg/L	--	--	NT	NT	NT	NT	38.4	NT	NT	NT	NT	NT	NT	**38.4**
Magnesium, Total	mg/L	--	--	NT	NT	NT	NT	41.5	NT	NT	NT	NT	NT	NT	**41.5**
Manganese, Dissolved	mg/L	0.05	0.2	<0.02	NT	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	ND
Manganese, Total	mg/L	--	--	NT	NT	NT	NT	0.099	NT	NT	NT	NT	NT	NT	**0.099**
Mercury, Dissolved	mg/L	0.002	0.01	<0.0001	NT	NT	NT	<0.0002	<0.0002	<0.0002	NT	NT	NT	NT	ND
Mercury, Total	mg/L	--	--	NT	NT	NT	NT	<0.0002	NT	NT	NT	NT	NT	NT	ND
Molybdenum, Dissolved	mg/L	0.21	--	NT	NT	NT	NT	<0.01	NT	NT	NT	NT	NT	NT	ND
Molybdenum, Total	mg/L	--	--	NT	NT	NT	NT	<0.01	NT	NT	NT	NT	NT	NT	ND
Nickel, Dissolved	mg/L	0.1	0.2	NT	NT	NT	NT	0.06	0.04	0.04	NT	NT	NT	NT	**0.06**
Nickel, Total	mg/L	--	--	NT	NT	NT	NT	0.06	NT	NT	NT	NT	NT	NT	**0.06**
Selenium, Dissolved	mg/L	0.05	0.02	<0.005	NT	NT	NT	0.0001	0.0001	0.0002	NT	NT	NT	NT	**0.0002**
Selenium, Total	mg/L	--	--	NT	NT	NT	NT	<0.0005	NT	NT	NT	NT	NT	NT	ND
Silver, Dissolved	mg/L	0.05		<0.0002	NT	<0.00005	<0.00005	<0.0003	NT	NT	NT	NT	NT	NT	ND
Silver, Total	mg/L	--	--	NT	<0.0002	NT	NT	0.0003	NT	NT	NT	NT	NT	NT	**0.0003**
Sodium, Dissolved	mg/L	--	--	NT	NT	NT	NT	17.8	NT	NT	NT	NT	NT	NT	**17.8**
Sodium, Total	mg/L	--	--	NT	NT	NT	NT	18.8	NT	NT	NT	NT	NT	NT	**18.8**
Thallium, Dissolved	mg/L	0.002	--	NT	NT	NT	NT	<0.0005	NT	NT	NT	NT	NT	NT	ND
Thallium, Total	mg/L	--	--	NT	NT	NT	NT	<0.0005	NT	NT	NT	NT	NT	NT	ND
Tin, Dissolved	mg/L	--	--	NT	NT	NT	NT	<0.1	NT	NT	NT	NT	NT	NT	ND
Tin, Total	mg/L	--	--	NT	NT	NT	NT	<0.1	NT	NT	NT	NT	NT	NT	ND
Uranium, Dissolved	mg/L	0.0168 to 0.03	--	<0.002	NT	NT	NT	0.0178	NT	NT	NT	NT	NT	NT	0.0178
Uranium, Total	mg/L	--	--	NT	NT	NT	NT	0.0178	NT	NT	NT	NT	NT	NT	**0.0178**
Uranium, Calculated	pCi/L	--	--	<1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND
Vanadium, Dissolved	mg/L	--	0.1	NT	NT	NT	NT	NT	<0.005	<0.005	NT	NT	NT	NT	ND
Zinc, Dissolved	mg/L	5	2	0.21	NT	0.701	1.48	1.27	0.699	0.559	0.24	0.15	0.16	0.21	**1.48**
Zinc, Total	mg/L	--	--	NT	1.23	NT	NT	1.33	NT	NT	NT	NT	NT	NT	**1.33**
pH	s.u.	6.5 - 8.5	6.5 - 8.5	NT	7.19	7.6	NT	NT	NT	NT	NT	NT	NT	NT	**7.60**
TDS (180°C)	mg/L	--	--	NT	710	630	NT	710	750	910	848	448	460	496	**910.0**
TSS (105°C)	mg/L	--	--	NT	NT	NT	NT	8	NT	NT	NT	NT	NT	NT	**8**
Sulfate as SO4	mg/L	250	--	NT	388	300	310	360	440	560	383	236	254	289	560
Conductivity	µmhos/cm	--	--	NT	NT	958	NT	NT	NT	NT	NT	NT	NT	NT	**958**
Nitrate as N, Dissolved	mg/L	10	--	NT	NT	NT	NT	1.96	3.79	5.9	NT	NT	NT	NT	**5.9**
Nitrate/Nitrite as N, Dissolved	mg/L	10	100	NT	NT	NT	NT	1.98	3.79	5.9	NT	NT	NT	NT	**5.9**
Nitrite as N, Dissolved	mg/L	1	10	NT	NT	NT	NT	<0.01	<0.01	<0.01	NT	NT	NT	NT	ND
Fluoride	mg/L	4	2	NT	NT	NT	NT	NT	0.1	0.2	NT	NT	NT	NT	**0.2**

Notes:
NT = Not Tested
ND = Not Detected (i.e., parameter was analyzed for, but was not detected above the MDL)
MDL = Method Detection Limit

Table 3-2
Gold Hill Mine Cash Mine
- Groundwater Quality Data -

Parameter	Unit	Colorado Groundwater Standards (Regulation 41)		Well #3										Max. Value
		Domestic Water Supply	Agricultural	6/30/1998	12/12/2005	3/30/2006	6/26/2006	9/6/2006	11/19/2007	9/15/2008	12/29/2015	3/29/2016	6/23/2016	9/20/2016	
Aluminum, Dissolved	mg/L	--	5	<0.05	NT	NT	NT	<0.03	<0.03	<0.03	NT	NT	NT	NT	ND
Aluminum, Total	mg/L	--	--	NT	NT	NT	NT	0.12	NT	NT	NT	NT	NT	NT	**0.12**
Antimony, Dissolved	mg/L	0.006	--	NT	NT	NT	NT	<0.0004	NT	NT	NT	NT	NT	NT	ND
Antimony, Total	mg/L	--	--	NT	NT	NT	NT	<0.0004	NT	NT	NT	NT	NT	NT	ND
Arsenic, Dissolved	mg/L	0.01	0.1	<0.001	NT	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	NT	NT	NT	NT	ND
Arsenic, Total	mg/L	--	--	NT	0.002	NT	NT	<0.0005	NT	NT	NT	NT	NT	NT	**0.002**
Barium, Dissolved	mg/L	2	--	NT	NT	NT	NT	0.04	NT	NT	NT	NT	NT	NT	**0.04**
Barium, Total	mg/L	--	--	NT	NT	NT	NT	0.055	NT	NT	NT	NT	NT	NT	**0.055**
Beryllium, Dissolved	mg/L	0.004	0.1	NT	NT	NT	NT	<0.002	<0.002	<0.002	NT	NT	NT	NT	ND
Beryllium, Total	mg/L	--	--	NT	NT	NT	NT	<0.002	NT	NT	NT	NT	NT	NT	ND
Boron, Dissolved	mg/L	--	0.75	NT	NT	NT	NT	NT	0.03	0.02	NT	NT	NT	NT	**0.03**
Cadmium, Dissolved	mg/L	0.005	0.01	<0.0003	NT	0.0007	0.0002	<0.0001	<0.0001	0.0005	NT	NT	NT	NT	**0.0007**
Cadmium, Total	mg/L	--	--	NT	0.0005	NT	NT	0.0002	NT	NT	NT	NT	NT	NT	**0.0005**
Calcium, Dissolved	mg/L	--	--	NT	NT	NT	NT	139	NT	NT	NT	NT	NT	NT	**139**
Calcium, Total	mg/L	--	--	NT	NT	NT	NT	150	NT	NT	NT	NT	NT	NT	**150**
Chromium, Dissolved	mg/L	0.1	0.1	<0.005	NT	NT	NT	<0.01	<0.01	<0.01	NT	NT	NT	NT	ND
Chromium, Total	mg/L	--	--	NT	NT	NT	NT	<0.01	NT	NT	NT	NT	NT	NT	ND
Cobalt, Dissolved	mg/L	--	0.05	NT	NT	NT	NT	NT	<0.01	<0.01	NT	NT	NT	NT	ND
Copper, Dissolved	mg/L	1	0.2	<0.02	NT	<0.0005	0.0007	0.0012	0.0016	0.0019	NT	NT	NT	NT	**0.0019**
Copper, Total	mg/L	--	--	NT	<0.01	NT	NT	0.0081	NT	NT	NT	NT	NT	NT	**0.0081**
Iron, Dissolved	mg/L	0.3	5	0.08	NT	0.19	<0.02	<0.02	0.08	0.06	NT	NT	NT	NT	**0.19**
Iron, Total	mg/L	--	--	NT	8.15	NT	NT	11.9	NT	NT	NT	NT	NT	NT	**11.9**
Lead, Dissolved	mg/L	0.05	0.1	<0.001	NT	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	NT	NT	NT	NT	**0.0002**
Lead, Total	mg/L	--	--	NT	0.001	NT	NT	0.0018	NT	NT	NT	NT	NT	NT	**0.0018**
Lithium, Dissolved	mg/L	--	2.5	NT	NT	NT	NT	NT	<0.02	<0.02	NT	NT	NT	NT	ND
Magnesium, Dissolved	mg/L	--	--	NT	NT	NT	NT	24.2	NT	NT	NT	NT	NT	NT	**24.2**
Magnesium, Total	mg/L	--	--	NT	NT	NT	NT	26.2	NT	NT	NT	NT	NT	NT	**26.2**
Manganese, Dissolved	mg/L	0.05	0.2	0.84	NT	<0.005	<0.005	0.016	<0.005	0.032	<0.005	0.007	<0.005	<0.005	0.84
Manganese, Total	mg/L	--	--	NT	NT	NT	NT	0.055	NT	NT	NT	NT	NT	NT	**0.055**
Mercury, Dissolved	mg/L	0.002	0.01	<0.0001	NT	NT	NT	<0.0002	<0.0002	<0.0002	NT	NT	NT	NT	ND
Mercury, Total	mg/L	--	--	NT	<0.0001	NT	NT	<0.0002	NT	NT	NT	NT	NT	NT	ND
Molybdenum, Dissolved	mg/L	0.21	--	NT	NT	NT	NT	<0.01	NT	NT	NT	NT	NT	NT	ND
Molybdenum, Total	mg/L	--	--	NT	NT	NT	NT	<0.01	NT	NT	NT	NT	NT	NT	ND
Nickel, Dissolved	mg/L	0.1	0.2	NT	NT	NT	NT	<0.01	<0.01	<0.01	NT	NT	NT	NT	ND
Nickel, Total	mg/L	--	--	NT	NT	NT	NT	<0.01	NT	NT	NT	NT	NT	NT	ND
Selenium, Dissolved	mg/L	0.05	0.02	<0.005	NT	NT	NT	0.0002	0.0002	0.0001	NT	NT	NT	NT	**0.0002**
Selenium, Total	mg/L	--	--	NT	NT	NT	NT	0.0002	NT	NT	NT	NT	NT	NT	**0.0002**
Silver, Dissolved	mg/L	0.05		<0.0002	NT	<0.00005	<0.00005	<0.00005	NT	NT	NT	NT	NT	NT	ND
Silver, Total	mg/L	--	--	NT	<0.0002	NT	NT	<0.00005	NT	NT	NT	NT	NT	NT	ND
Sodium, Dissolved	mg/L	--	--	NT	NT	NT	NT	22	NT	NT	NT	NT	NT	NT	**22**
Sodium, Total	mg/L	--	--	NT	NT	NT	NT	23.5	NT	NT	NT	NT	NT	NT	**23.5**
Thallium, Dissolved	mg/L	0.002	--	NT	NT	NT	NT	<0.0001	NT	NT	NT	NT	NT	NT	ND
Thallium, Total	mg/L	--	--	NT	NT	NT	NT	<0.0001	NT	NT	NT	NT	NT	NT	ND
Tin, Dissolved	mg/L	--	--	NT	NT	NT	NT	<0.1	NT	NT	NT	NT	NT	NT	ND
Tin, Total	mg/L	--	--	NT	NT	NT	NT	<0.1	NT	NT	NT	NT	NT	NT	ND
Uranium, Dissolved	mg/L	0.0168 to 0.03	--	<0.002	NT	NT	NT	0.0184	NT	NT	NT	NT	NT	NT	0.0184
Uranium, Total	mg/L	--	--	NT	NT	NT	NT	0.0179	NT	NT	NT	NT	NT	NT	**0.0179**
Uranium, Calculated	pCi/L	--	--	<0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND
Vanadium, Dissolved	mg/L	--	0.1	NT	NT	NT	NT	NT	<0.005	<0.005	NT	NT	NT	NT	ND
Zinc, Dissolved	mg/L	5	2	<0.02	NT	0.011	0.003	0.006	0.027	0.148	<0.01	<0.01	0.01	<0.01	**0.148**
Zinc, Total	mg/L	--	--	NT	0.02	NT	NT	0.024	NT	NT	NT	NT	NT	NT	**0.024**
pH	s.u.	6.5 - 8.5	6.5 - 8.5	NT	7.24	7.6	NT	NT	NT	NT	NT	NT	NT	NT	**7.60**
TDS (180°C)	mg/L	--	--	NT	508	450	NT	620	400	740	432	446	464	416	**740**
TSS (105°C)	mg/L	--	--	NT	NT	NT	NT	16	NT	NT	NT	NT	NT	NT	**16**
Sulfate as SO4	mg/L	250	--	NT	181	160	170	240	170	380	183	158	164	158	380
Conductivity	µmhos/cm	--	--	NT	NT	699	NT	NT	NT	NT	NT	NT	NT	NT	**699**
Nitrate as N, Dissolved	mg/L	10	--	NT	NT	NT	NT	3.38	2.29	14.7	NT	NT	NT	NT	14.7
Nitrate/Nitrite as N, Dissolved	mg/L	10	100	NT	NT	NT	NT	3.38	2.29	14.7	NT	NT	NT	NT	14.7
Nitrite as N, Dissolved	mg/L	1	10	NT	NT	NT	NT	<0.01	<0.01	<0.01	NT	NT	NT	NT	ND
Fluoride	mg/L	4	2	NT	NT	NT	NT	NT	<0.1	<0.1	NT	NT	NT	NT	ND

Notes:
NT = Not Tested
ND = Not Detected (i.e., parameter was analyzed for, but was not detected above the MDL)
MDL = Method Detection Limit

Table 3-2
Gold Hill Mine Cash Mine
- Groundwater Quality Data -

Parameter	Unit	Colorado Groundwater Standards (Regulation 41)		Well #4											Max.
		Domestic Water Supply	Agricultural	6/30/1998	12/12/2005	3/30/2006	6/26/2006	9/6/2006	11/19/2007	9/15/2008	12/29/2015	3/29/2016	6/23/2016	9/20/2016	Value
Aluminum, Dissolved	mg/L	--	5	<0.05	NT	NT	NT	<0.03	<0.03	<0.03	NT	NT	NT	NT	ND
Aluminum, Total	mg/L	--	--	NT	NT	NT	NT	0.04	NT	NT	NT	NT	NT	NT	**0.04**
Antimony, Dissolved	mg/L	0.006	--	NT	NT	NT	NT	<0.0004	NT	NT	NT	NT	NT	NT	ND
Antimony, Total	mg/L	--	--	NT	NT	NT	NT	<0.0004	NT	NT	NT	NT	NT	NT	ND
Arsenic, Dissolved	mg/L	0.01	0.1	<0.001	NT	<0.0005	<0.0005	<0.0005	0.0007	0.0007	NT	NT	NT	NT	**0.0007**
Arsenic, Total	mg/L	--	--	NT	<0.001	NT	NT	<0.0005	NT	NT	NT	NT	NT	NT	ND
Barium, Dissolved	mg/L	2	--	NT	NT	NT	NT	0.028	NT	NT	NT	NT	NT	NT	**0.028**
Barium, Total	mg/L	--	--	NT	NT	NT	NT	0.032	NT	NT	NT	NT	NT	NT	**0.032**
Beryllium, Dissolved	mg/L	0.004	0.1	NT	NT	NT	NT	<0.002	<0.002	<0.002	NT	NT	NT	NT	ND
Beryllium, Total	mg/L	--	--	NT	NT	NT	NT	<0.002	NT	NT	NT	NT	NT	NT	ND
Boron, Dissolved	mg/L	--	0.75	NT	NT	NT	NT	NT	0.03	0.01	NT	NT	NT	NT	**0.03**
Cadmium, Dissolved	mg/L	0.005	0.01	<0.0003	NT	0.0002	0.0005	<0.0001	<0.0001	<0.0001	NT	NT	NT	NT	**0.0005**
Cadmium, Total	mg/L	--	--	NT	<0.0003	NT	NT	<0.0001	NT	NT	NT	NT	NT	NT	ND
Calcium, Dissolved	mg/L	--	--	NT	NT	NT	NT	91.4	NT	NT	NT	NT	NT	NT	**91.4**
Calcium, Total	mg/L	--	--	NT	NT	NT	NT	98.5	NT	NT	NT	NT	NT	NT	**98.5**
Chromium, Dissolved	mg/L	0.1	0.1	<0.005	NT	NT	NT	<0.01	<0.01	<0.01	NT	NT	NT	NT	ND
Chromium, Total	mg/L	--	--	NT	NT	NT	NT	<0.01	NT	NT	NT	NT	NT	NT	ND
Cobalt, Dissolved	mg/L	--	0.05	NT	NT	NT	NT	NT	<0.01	<0.01	NT	NT	NT	NT	ND
Copper, Dissolved	mg/L	1	0.2	<0.02	NT	<0.0005	<0.0005	<0.0005	0.0014	0.0005	NT	NT	NT	NT	**0.0014**
Copper, Total	mg/L	--	--	NT	<0.01	NT	NT	0.0055	NT	NT	NT	NT	NT	NT	**0.0055**
Iron, Dissolved	mg/L	0.3	5	<0.02	NT	0.1	<0.02	0.03	0.03	<0.02	NT	NT	NT	NT	**0.10**
Iron, Total	mg/L	--	--	NT	0.66	NT	NT	0.81	NT	NT	NT	NT	NT	NT	**0.81**
Lead, Dissolved	mg/L	0.05	0.1	<0.001	NT	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	NT	NT	NT	NT	**0.0001**
Lead, Total	mg/L	--	--	NT	0.002	NT	NT	0.0007	NT	NT	NT	NT	NT	NT	**0.002**
Lithium, Dissolved	mg/L	--	2.5	NT	NT	NT	NT	NT	<0.02	<0.02	NT	NT	NT	NT	ND
Magnesium, Dissolved	mg/L	--	--	NT	NT	NT	NT	19.3	NT	NT	NT	NT	NT	NT	**19.3**
Magnesium, Total	mg/L	--	--	NT	NT	NT	NT	20.7	NT	NT	NT	NT	NT	NT	**20.7**
Manganese, Dissolved	mg/L	0.05	0.2	<0.02	NT	<0.005	<0.005	0.01	<0.005	0.006	<0.005	0.223	0.009	<0.005	0.223
Manganese, Total	mg/L	--	--	NT	NT	NT	NT	0.035	NT	NT	NT	NT	NT	NT	**0.035**
Mercury, Dissolved	mg/L	0.002	0.01	<0.0001	NT	NT	NT	<0.0002	<0.0002	<0.0002	NT	NT	NT	NT	ND
Mercury, Total	mg/L	--	--	NT	<0.0001	NT	NT	<0.0002	NT	NT	NT	NT	NT	NT	ND
Molybdenum, Dissolved	mg/L	0.21	--	NT	NT	NT	NT	<0.01	NT	NT	NT	NT	NT	NT	ND
Molybdenum, Total	mg/L	--	--	NT	NT	NT	NT	<0.01	NT	NT	NT	NT	NT	NT	ND
Nickel, Dissolved	mg/L	0.1	0.2	NT	NT	NT	NT	<0.01	<0.01	<0.01	NT	NT	NT	NT	ND
Nickel, Total	mg/L	--	--	NT	NT	NT	NT	<0.01	NT	NT	NT	NT	NT	NT	ND
Selenium, Dissolved	mg/L	0.05	0.02	<0.005	NT	NT	NT	0.0002	0.0003	0.0003	NT	NT	NT	NT	**0.0003**
Selenium, Total	mg/L	--	--	NT	NT	NT	NT	0.0002	NT	NT	NT	NT	NT	NT	**0.0002**
Silver, Dissolved	mg/L	0.05		<0.0002	NT	<0.00005	<0.00005	<0.00005	NT	NT	NT	NT	NT	NT	ND
Silver, Total	mg/L	--	--	NT	<0.0002	NT	NT	<0.00005	NT	NT	NT	NT	NT	NT	ND
Sodium, Dissolved	mg/L	--	--	NT	NT	NT	NT	12	NT	NT	NT	NT	NT	NT	**12.0**
Sodium, Total	mg/L	--	--	NT	NT	NT	NT	12.7	NT	NT	NT	NT	NT	NT	**12.7**
Thallium, Dissolved	mg/L	0.002	--	NT	NT	NT	NT	<0.0001	NT	NT	NT	NT	NT	NT	ND
Thallium, Total	mg/L	--	--	NT	NT	NT	NT	<0.0001	NT	NT	NT	NT	NT	NT	ND
Tin, Dissolved	mg/L	--	--	NT	NT	NT	NT	<0.1	NT	NT	NT	NT	NT	NT	ND
Tin, Total	mg/L	--	--	NT	NT	NT	NT	<0.1	NT	NT	NT	NT	NT	NT	ND
Uranium, Dissolved	mg/L	0.0168 to 0.03	--	0.009	NT	NT	NT	0.0361	NT	NT	NT	NT	NT	NT	0.0361
Uranium, Total	mg/L	--	--	NT	NT	NT	NT	0.0341	NT	NT	NT	NT	NT	NT	**0.0341**
Uranium, Calculated	pCi/L	--	--	6	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	**6.00**
Vanadium, Dissolved	mg/L	--	0.1	NT	NT	NT	NT	NT	<0.005	<0.005	NT	NT	NT	NT	ND
Zinc, Dissolved	mg/L	5	2	<0.02	NT	0.008	0.004	0.003	0.005	0.005	<0.01	<0.01	<0.01	<0.01	**0.008**
Zinc, Total	mg/L	--	--	NT	<0.01	NT	NT	0.007	NT	NT	NT	NT	NT	NT	**0.007**
pH	s.u.	6.5 - 8.5	6.5 - 8.5	NT	7.38	7.6	NT	NT	NT	NT	NT	NT	NT	NT	**7.6**
TDS (180°C)	mg/L	--	--	NT	350	370	NT	420	380	390	438	450	256	282	**450**
TSS (105°C)	mg/L	--	--	NT	NT	NT	NT	<5	NT	NT	NT	NT	NT	NT	ND
Sulfate as SO4	mg/L	250	--	NT	126	130	170	170	150	160	108	157	72.6	91.9	**170**
Conductivity	µmhos/cm	--	--	NT	NT	619	NT	NT	NT	NT	NT	NT	NT	NT	**619**
Nitrate as N, Dissolved	mg/L	10	--	NT	NT	NT	NT	0.59	0.43	0.31	NT	NT	NT	NT	**0.59**
Nitrate/Nitrite as N, Dissolved	mg/L	10	100	NT	NT	NT	NT	0.59	0.44	0.31	NT	NT	NT	NT	**0.59**
Nitrite as N, Dissolved	mg/L	1	10	NT	NT	NT	NT	<0.01	0.01	<0.01	NT	NT	NT	NT	**0.01**
Fluoride	mg/L	4	2	NT	NT	NT	NT	NT	<0.1	0.1	NT	NT	NT	NT	**0.10**

Notes:
NT = Not Tested
ND = Not Detected (i.e., parameter was analyzed for, but was not detected above the MDL)
MDL = Method Detection Limit

Table 3-2
Gold Hill Mine Cash Mine
- Groundwater Quality Data -

Parameter	Unit	Colorado Groundwater Standards (Regulation 41)		Hazel A Adit								Max. Value
		Domestic Water Supply	Agricultural	6/30/1998	12/13/2005	3/30/2006	6/26/2006	9/28/2006	6/27/2007	9/12/2007	9/15/2008	
Aluminum, Dissolved	mg/L	--	5	<0.05	NT	NT	NT	NT	NT	<0.03	<0.03	ND
Aluminum, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	NT	NT	NT
Antimony, Dissolved	mg/L	0.006	--	NT	NT	NT	NT	NT	NT	NT	NT	NT
Antimony, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	NT	NT	NT
Arsenic, Dissolved	mg/L	0.01	0.1	<0.001	NT	0.0005	<0.0005	0.0009	<0.0005	<0.0005	0.0006	0.0009
Arsenic, Total	mg/L	--	--	NT	<0.001	NT	NT	NT	NT	NT	NT	ND
Barium, Dissolved	mg/L	2	--	NT	NT	NT	NT	NT	NT	NT	NT	NT
Barium, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	NT	NT	NT
Beryllium, Dissolved	mg/L	0.004	0.1	NT	NT	NT	NT	NT	NT	<0.002	<0.002	ND
Beryllium, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	NT	NT	NT
Boron, Dissolved	mg/L	--	0.75	NT	NT	NT	NT	NT	NT	0.02	0.03	0.03
Cadmium, Dissolved	mg/L	0.005	0.01	0.0018	NT	0.0002	0.0003	0.0004	0.0002	0.0006	0.0004	0.0018
Cadmium, Total	mg/L	--	--	NT	0.0005	NT	NT	NT	NT	NT	NT	0.0005
Calcium, Dissolved	mg/L	--	--	NT	NT	NT	NT	NT	NT	NT	NT	NT
Calcium, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	NT	NT	NT
Chromium, Dissolved	mg/L	0.1	0.1	<0.005	NT	NT	NT	NT	0.0003	<0.01	<0.01	0.0003
Chromium, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	NT	NT	NT
Cobalt, Dissolved	mg/L	--	0.05	NT	NT	NT	NT	NT	NT	<0.01	0.01	0.01
Copper, Dissolved	mg/L	1	0.2	<0.02	NT	<0.0005	0.0007	0.0024	0.0159	0.0021	0.0027	0.0159
Copper, Total	mg/L	--	--	NT	<0.01	NT	NT	NT	NT	NT	NT	ND
Iron, Dissolved	mg/L	0.3	5	<0.02	NT	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	0.04
Iron, Total	mg/L	--	--	NT	0.1	NT	NT	NT	NT	NT	NT	0.10
Lead, Dissolved	mg/L	0.05	0.1	<0.001	NT	<0.0001	0.0005	<0.0001	<0.0001	<0.0001	<0.0001	0.0005
Lead, Total	mg/L	--	--	NT	<0.0001	NT	NT	NT	NT	NT	NT	ND
Lithium, Dissolved	mg/L	--	2.5	NT	NT	NT	NT	NT	NT	<0.02	<0.02	ND
Magnesium, Dissolved	mg/L	--	--	NT	NT	NT	NT	NT	28.5	NT	NT	28.5
Magnesium, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	NT	NT	NT
Manganese, Dissolved	mg/L	0.05	0.2	<0.02	NT	<0.005	0.12	<0.005	0.007	0.01	<0.005	0.12
Manganese, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	NT	NT	NT
Mercury, Dissolved	mg/L	0.002	0.01	<0.0001	NT	NT	NT	NT	NT	<0.0002	<0.0002	ND
Mercury, Total	mg/L	--	--	NT	<0.0001	NT	NT	NT	NT	NT	NT	ND
Molybdenum, Dissolved	mg/L	0.21	--	NT	NT	NT	NT	NT	NT	NT	NT	NT
Molybdenum, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	NT	NT	NT
Nickel, Dissolved	mg/L	0.1	0.2	NT	NT	NT	NT	NT	<0.01	0.01	<0.01	0.01
Nickel, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	NT	NT	NT
Selenium, Dissolved	mg/L	0.05	0.02	<0.005	NT	NT	NT	NT	NT	0.0002	0.0002	0.0002
Selenium, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	NT	NT	NT
Silver, Dissolved	mg/L	0.05		<0.0002	NT	<0.00005	<0.00005	<0.00005	<0.00005	NT	NT	ND
Silver, Total	mg/L	--	--	NT	<0.0002	NT	NT	NT	NT	NT	NT	ND
Sodium, Dissolved	mg/L	--	--	NT	NT	NT	NT	NT	NT	NT	NT	NT
Sodium, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	NT	NT	NT
Thallium, Dissolved	mg/L	0.002	--	NT	NT	NT	NT	NT	NT	NT	NT	NT
Thallium, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	NT	NT	NT
Tin, Dissolved	mg/L	--	--	NT	NT	NT	NT	NT	NT	NT	NT	NT
Tin, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	NT	NT	NT
Uranium, Dissolved	mg/L	0.0168 to 0.03	--	0.006	NT	NT	NT	NT	NT	NT	NT	0.006
Uranium, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	NT	NT	NT
Uranium, Calculated	pCi/L	--	--	4	NT	NT	NT	NT	NT	NT	NT	4
Vanadium, Dissolved	mg/L	--	0.1	NT	NT	NT	NT	NT	NT	<0.005	<0.005	ND
Zinc, Dissolved	mg/L	5	2	0.06	NT	0.02	0.041	0.047	0.044	0.099	0.066	0.099
Zinc, Total	mg/L	--	--	NT	0.06	NT	NT	NT	NT	NT	NT	0.06
pH	s.u.	6.5 - 8.5	6.5 - 8.5	NT	7.48	8	NT	NT	7.9	NT	NT	8.0
TDS (180°C)	mg/L	--	--	NT	712	710	NT	NT	560	910	1170	1170
TSS (105°C)	mg/L	--	--	NT	NT	NT	NT	NT	NT	NT	NT	NT
Sulfate as SO4	mg/L	250	--	NT	308	360	480	450	270	530	630	630
Conductivity	µmhos/cm	--	--	NT	NT	989	NT	NT	815	NT	NT	989
Nitrate as N, Dissolved	mg/L	10	--	NT	NT	NT	NT	NT	2.42	2.7	29.5	29.5
Nitrate/Nitrite as N, Dissolved	mg/L	10	100	NT	NT	NT	NT	NT	2.42	2.7	29.6	29.6
Nitrite as N, Dissolved	mg/L	1	10	NT	NT	NT	NT	NT	<0.01	<0.01	0.1	0.1
Fluoride	mg/L	4	2	NT	NT	NT	NT	NT	NT	0.1	<0.1	0.1

Notes:
NT = Not Tested
ND = Not Detected (i.e., parameter was analyzed for, but was not detected above the MDL)
MDL = Method Detection Limit

Table 3-2
Gold Hill Mine Cash Mine
- Groundwater Quality Data -

Parameter	Unit	Colorado Groundwater Standards (Regulation 41)		Wynona/Time						Max.
		Domestic Water Supply	Agricultural	12/12/2005	3/30/2006	6/26/2006	9/12/2007	11/19/2007	9/15/2008	Value
Aluminum, Dissolved	mg/L	--	5	NT	NT	NT	<0.03	<0.06	0.05	**0.05**
Aluminum, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	**NT**
Antimony, Dissolved	mg/L	0.006	--	NT	NT	NT	NT	NT	NT	**NT**
Antimony, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	**NT**
Arsenic, Dissolved	mg/L	0.01	0.1	NT	<0.0005	<0.0005	0.001	0.002	<0.0005	**0.002**
Arsenic, Total	mg/L	--	--	0.003	NT	NT	NT	NT	NT	**0.003**
Barium, Dissolved	mg/L	2	--	NT	NT	NT	NT	NT	NT	**NT**
Barium, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	**NT**
Beryllium, Dissolved	mg/L	0.004	0.1	NT	NT	NT	<0.002	<0.004	<0.002	**ND**
Beryllium, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	**NT**
Boron, Dissolved	mg/L	--	0.75	NT	NT	NT	NT	<0.02	0.01	**0.01**
Cadmium, Dissolved	mg/L	0.005	0.01	NT	<0.0001	0.0001	0.0194	0.0255	0.0077	0.0255
Cadmium, Total	mg/L	--	--	0.0013	NT	NT	NT	NT	NT	**0.0013**
Calcium, Dissolved	mg/L	--	--	NT	NT	NT	NT	NT	NT	**NT**
Calcium, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	**NT**
Chromium, Dissolved	mg/L	0.1	0.1	NT	NT	NT	<0.01	<0.02	<0.01	**ND**
Chromium, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	**NT**
Cobalt, Dissolved	mg/L	--	0.05	NT	NT	NT	0.05	0.06	0.02	0.06
Copper, Dissolved	mg/L	1	0.2	NT	<0.0005	<0.0005	0.0057	0.011	0.0024	**0.011**
Copper, Total	mg/L	--	--	0.02	NT	NT	NT	NT	NT	**0.02**
Iron, Dissolved	mg/L	0.3	5	NT	10.3	11.2	1.25	2.2	0.97	11.2
Iron, Total	mg/L	--	--	24	NT	NT	NT	NT	NT	**24**
Lead, Dissolved	mg/L	0.05	0.1	NT	0.003	<0.0001	0.0017	0.0109	<0.0001	**0.0109**
Lead, Total	mg/L	--	--	<0.0001	NT	NT	NT	NT	NT	**ND**
Lithium, Dissolved	mg/L	--	2.5	NT	NT	NT	<0.02	<0.04	<0.02	**ND**
Magnesium, Dissolved	mg/L	--	--	NT	NT	NT	NT	NT	NT	**NT**
Magnesium, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	**NT**
Manganese, Dissolved	mg/L	0.05	0.2	NT	11.5	9.28	15.6	19.2	10.5	19.2
Manganese, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	**NT**
Mercury, Dissolved	mg/L	0.002	0.01	NT	NT	NT	<0.0002	<0.0002	<0.0002	**ND**
Mercury, Total	mg/L	--	--	<0.0001	NT	NT	NT	NT	NT	**ND**
Molybdenum, Dissolved	mg/L	0.21	--	NT	NT	NT	NT	NT	NT	**NT**
Molybdenum, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	**NT**
Nickel, Dissolved	mg/L	0.1	0.2	NT	NT	NT	0.18	0.21	0.1	0.21
Nickel, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	**NT**
Selenium, Dissolved	mg/L	0.05	0.02	NT	NT	NT	<0.0001	<0.0002	0.0001	**0.0001**
Selenium, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	**NT**
Silver, Dissolved	mg/L	0.05		NT	<0.00005	<0.00005	NT	NT	NT	**ND**
Silver, Total	mg/L	--	--	0.0007	NT	NT	NT	NT	NT	**0.0007**
Sodium, Dissolved	mg/L	--	--	NT	NT	NT	NT	NT	NT	**NT**
Sodium, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	**NT**
Thallium, Dissolved	mg/L	0.002	--	NT	NT	NT	NT	NT	NT	**NT**
Thallium, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	**NT**
Tin, Dissolved	mg/L	--	--	NT	NT	NT	NT	NT	NT	**NT**
Tin, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	**NT**
Uranium, Dissolved	mg/L	0.0168 to 0.03	--	NT	NT	NT	NT	NT	NT	**NT**
Uranium, Total	mg/L	--	--	NT	NT	NT	NT	NT	NT	**NT**
Uranium, Calculated	pCi/L	--	--	NT	NT	NT	NT	NT	NT	**NT**
Vanadium, Dissolved	mg/L	--	0.1	NT	NT	NT	<0.005	<0.01	<0.005	**ND**
Zinc, Dissolved	mg/L	5	2	NT	0.18	0.197	5.02	8.15	2.13	8.15
Zinc, Total	mg/L	--	--	0.36	NT	NT	NT	NT	NT	**0.36**
pH	s.u.	6.5 - 8.5	6.5 - 8.5	6.35	7.1	NT	NT	NT	NT	**7.1**
TDS (180°C)	mg/L	--	--	1550	1550	NT	1900	2100	1670	**2100**
TSS (105°C)	mg/L	--	--	NT	NT	NT	NT	NT	NT	**NT**
Sulfate as SO4	mg/L	250	--	981	950	910	1290	1410	1090	1410
Conductivity	µmhos/cm	--	--	NT	1780	NT	NT	NT	NT	**1780**
Nitrate as N, Dissolved	mg/L	10	--	NT	NT	NT	2.16	4.33	0.13	**4.33**
Nitrate/Nitrite as N, Dissolved	mg/L	10	100	NT	NT	NT	2.19	4.34	0.13	**4.34**
Nitrite as N, Dissolved	mg/L	1	10	NT	NT	NT	0.03	0.01	<0.01	**0.03**
Fluoride	mg/L	4	2	NT	NT	NT	0.6	0.6	0.5	**0.6**

Notes:
NT = Not Tested
ND = Not Detected (i.e., parameter was analyzed for, but was not detected above the MDL)
MDL = Method Detection Limit

Table 3-2
Gold Hill Mine Cash Mine
- Groundwater Quality Data -

Parameter	Unit	Colorado Groundwater Standards (Regulation 41)		MW1					Max.	MW5					Max.
		Domestic Water Supply	Agricultural	11/19/2007	12/29/2015	3/29/2016	6/23/2016	9/20/2016	Value	11/19/2007	12/29/2015	3/29/2016	6/23/2016	9/20/2016	Value
Aluminum, Dissolved	mg/L	--	5	0.21	NT	NT	NT	NT	**0.21**	0.15	NT	NT	NT	NT	**0.15**
Aluminum, Total	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Antimony, Dissolved	mg/L	0.006	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Antimony, Total	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Arsenic, Dissolved	mg/L	0.01	0.1	0.001	0.0005	<0.0002	0.0005	0.0007	**0.001**	0.0172	0.0048	0.0052	0.0041	0.0036	0.0172
Arsenic, Total	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Barium, Dissolved	mg/L	2	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Barium, Total	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Beryllium, Dissolved	mg/L	0.004	0.1	0.01	NT	NT	NT	NT	**0.01**	0.01	NT	NT	NT	NT	**0.01**
Beryllium, Total	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Boron, Dissolved	mg/L	--	0.75	0.01	NT	NT	NT	NT	**NT**	0.01	NT	NT	NT	NT	**0.01**
Cadmium, Dissolved	mg/L	0.005	0.01	0.0017	0.0001	<0.0001	0.0001	0.0001	**0.0017**	0.0003	0.0002	0.0004	0.0004	0.0003	**0.0004**
Cadmium, Total	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Calcium, Dissolved	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Calcium, Total	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Chromium, Dissolved	mg/L	0.1	0.1	0.05	NT	NT	NT	NT	**0.05**	0.05	NT	NT	NT	NT	**0.05**
Chromium, Total	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Cobalt, Dissolved	mg/L	--	0.05	0.05	NT	NT	NT	NT	0.05	0.05	NT	NT	NT	NT	0.05
Copper, Dissolved	mg/L	1	0.2	0.0059	NT	NT	NT	NT	**0.0059**	0.0028	NT	NT	NT	NT	**0.0028**
Copper, Total	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Iron, Dissolved	mg/L	0.3	5	0.39	NT	NT	NT	NT	0.39	0.1	NT	NT	NT	NT	**0.1**
Iron, Total	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Lead, Dissolved	mg/L	0.05	0.1	0.0005	NT	NT	NT	NT	**0.0005**	0.0002	NT	NT	NT	NT	**0.0002**
Lead, Total	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Lithium, Dissolved	mg/L	--	2.5	0.1	NT	NT	NT	NT	**0.1**	0.1	NT	NT	NT	NT	**0.1**
Magnesium, Dissolved	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Magnesium, Total	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Manganese, Dissolved	mg/L	0.05	0.2	0.009	0.271	0.342	0.317	0.215	0.342	0.178	0.035	0.037	0.013	0.019	0.178
Manganese, Total	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Mercury, Dissolved	mg/L	0.002	0.01	0.001	NT	NT	NT	NT	**0.001**	0.001	NT	NT	NT	NT	**0.001**
Mercury, Total	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Molybdenum, Dissolved	mg/L	0.21	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Molybdenum, Total	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Nickel, Dissolved	mg/L	0.1	0.2	0.02	NT	NT	NT	NT	**0.02**	0.05	NT	NT	NT	NT	**0.05**
Nickel, Total	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Selenium, Dissolved	mg/L	0.05	0.02	0.0003	NT	NT	NT	NT	**0.0003**	0.0003	NT	NT	NT	NT	**0.0003**
Selenium, Total	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Silver, Dissolved	mg/L	0.05		NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Silver, Total	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Sodium, Dissolved	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Sodium, Total	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Thallium, Dissolved	mg/L	0.002	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Thallium, Total	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Tin, Dissolved	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Tin, Total	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Uranium, Dissolved	mg/L	0.0168 to 0.03	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Uranium, Total	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Uranium, Calculated	pCi/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Vanadium, Dissolved	mg/L	--	0.1	0.025	NT	NT	NT	NT	**0.025**	0.025	NT	NT	NT	NT	**0.025**
Zinc, Dissolved	mg/L	5	2	0.453	<0.01	<0.01	0.02	0.07	**0.453**	0.003	<0.01	0.02	0.01	<0.01	**0.02**
Zinc, Total	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
pH	s.u.	6.5 - 8.5	6.5 - 8.5	7.14	NT	NT	NT	NT	**7.14**	7.13	NT	NT	NT	NT	**7.13**
TDS (180°C)	mg/L	--	--	NT	1710	1530	1570	1530	**1710**	NT	824	634	652	640	**824**
TSS (105°C)	mg/L	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Sulfate as SO4	mg/L	250	--	730	698	950	975	954	975	360	313	318	334	323	360
Conductivity	µmhos/cm	--	--	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Nitrate as N, Dissolved	mg/L	10	--	2.3	NT	NT	NT	NT	**2.3**	0.09	NT	NT	NT	NT	**0.09**
Nitrate/Nitrite as N, Dissolved	mg/L	10	100	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Nitrite as N, Dissolved	mg/L	1	10	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT	NT	**NT**
Fluoride	mg/L	4	2	NT	NT	NT	NT	NT	**NT**	0.6	NT	NT	NT	NT	**0.6**

Notes:

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