WSI Weiland, Inc.
Environmental & Engineering

10/5/2022

Brock Bowles
Environmental protection Specialist
Colorado Division of Mining Reclamation & Safety
1313 Sherman St., Room 215
Denver, Colorado 80202

Re: Goose Haven Reservoir M-2010-071 Response to Adequacy #2
Brock,

I have provided responses to the outstanding items from your Adequacy Review 3 letter dated Oct 26, 2022.

Mr. Zuber Wrote the following comments a) and b);

a) In the adequacy response to Item #4, the applicant states that post-mining stormwater flows from the site will not exceed pre-mining flows. (The Division understands this statement to be relevant to the swale at the northwest corner of the site.) The applicant should provide proof that flow is less than or equal to pre-disturbance flow in the form of a hydrology model or other type of hydrologic analysis.

Response:

We request the DRMS consider the following other type of other hydrologic analysis;

A Hydrologic analysis was previously submitted in the "Goose Haven Hydrology Report" by Merrick April 30, 2009. In that report the offsite contributions to the Cell 2A area were modeled and all of the drainage sub basins upstream of the Cell 2A area were considered. I have attached sheet B-1 from this study for reference. The drainage plan only routes offsite drainage around the proposed reservoir sites sin an extremely low gradient grass lined swale. The 2 new reservoirs Cells 2 & 2A effectively remove a combined area of 70 acres that would have historically contributed to the onsite runoff and drained onto the Boulder County property north of Cell 2A. The pre-mining (or relative historical) stormwater runoff including the reservoir sites was not modeled, based on the idea that the reservoirs will

remove significant runoff acreage from the drainage area. That combined with the knowledge that no increase in impervious ground will occur as the result of this project informed the drainage engineer that that a detailed "historical" runoff model in this case would not be relevant.

b) I find the drop structure, wing wall, and cutoff wall concept and design to be sound. However, it is a somewhat unusual approach. Therefore, the applicant needs to provide a written commitment to repairing any erosion on or addressing sediment loading to adjacent properties. This includes the property north of the site, which is owned by Boulder County. If erosion or sediment problems persist, the applicant will need to redesign the stormwater system, perhaps constructing a detention pond with an embankment and adequate spillways that do not cause damage to the downstream property.

One of the engineering design criteria for the swale and outlet structure, which by the way was conceived in a meeting with Boulder County and City of Boulder personnel, is to prevent erosion and sedimentation. The design presented included detailed hydrologic calculations consistent with current engineering practices. It is felt that the analysis provided is more than adequate to prevent damage to the neighboring property and in lieu of any sound engineering reason by DRMS that the plan as designed is inadequate I request that the DRMS reconsider any requirement to committing to a written statement by the City regarding this perceived issue. It should also be noted that the Office of the State Engineer Dam Safety Division has thoroughly reviewed the drainage plan and has not raised any concerns regarding erosion or sedimentation. City of Lafayette will however, If absolutely necessary, commit to mitigating (in writing) any potential issues that "could affect" Boulder County's land to the north should the DRMS require.

Patrick Lennenberg Wrote the following comments 1-5:

1. There is an approved groundwater monitoring program for the site that was initially approved during the original permitting process and further committed to during AM-1. The groundwater monitoring program needs to be updated to account for the new lined reservoir. The updated program needs to propose new groundwater monitoring locations (up- and down-gradient locations), provide a map of current and proposed monitoring locations, and update the groundwater flow model to demonstrate affects to the hydrologic balance will be minimized pursuant to Rule 3.1.7. An updated model is needed to establish mitigation triggers for the new wells and demonstrate the effectiveness of the installed underdrain along the southern boundary of the lined reservoir. The potentiometric surface map provided in the Applicant's responses, Map C-1, to the Division's second adequacy review is comprised of onsite data and interpolated regional data.

The provided map seems to indicate a north-northeast gradient near the new lined reservoir where there is no onsite data but where there is onsite data the gradient shifts to a more northeast gradient. Updating the groundwater model and installing additional wells at the site would determine the actual groundwater flow across the new portion of the permitted area and the site as a whole.

We were unable to acquire any of the groundwater model files from CTL Thompson from the 2010 study, so a new Groundwater model has been developed and is given in the enclosed GOOSE HAVEN RESERVOIR EXPANSION GROUNDWATER MODELING REPORT. It should be noted that the modeling report does include some additional offsite DWR well data that when combined with the general governing principal that groundwater follows with the contour of the land gives a better regional understanding the groundwater in the area. It is however agreed that additional wells will be beneficial to verify groundwater flow. To that end, the report also includes additional piezometers to verify groundwater elevations surrounding the western portion of the site and a commitment to monitor those wells in a similar fashion as the existing groundwater monitoring program. Mitigation triggers may not be relevant since a perimeter drain has already been constructed and functional. The new wells can however verify the efficacy of the drain system.

Finally, in the Board Order, signed July 21, 2021, for violation MV-2021-008, part of the Board ordered corrective action was to submit a hydrologic evaluation for the site to address the new reservoir. To date a sufficient hydrologic evaluation has not been submitted for review for the site.

The groundwater modeling Report should satisfy the requirement

2. During the pre-operation inspection the Operators representative stated there is another underdrain along the northern boundary of the lined reservoir and ties into the same outfall location as the southern underdrain ties into. Does this drain exist? If so, the underdrain needs to be shown on an updated map and please provide the construction details of the underdrain

   This drain does exist and was constructed to facilitate construction dewatering It is is shown in the detailed cross sections Sheets C-20 through C-28 of the Embankment dam drawings submitted to the SEO dam safety division. This drain as noted on the plans will be plugged and abandoned.

3. During the pre-operation inspection the Operators representative stated the outfall is pumped to discharge to the ditch. Please explain if the representative meant the lined ditch immediately north of the site or the Boulder and Weld County ditch located along Boulder Creek approximately 0.5 miles north of the site. Please provide a map that shows the alignment of the discharge piping.

   A map showing the alignment which discharges to the Lower Boulder Ditch. Before development of the site, this pipe was connected to a series of clay pipe field drains and a small pond in the NE corner of the Cell 2A site.

   By routing flow from the south perimeter drain and the dam toe drain through this pipe, the City will be maintaining the historical hydrologic balance of the area.

4. Please see the Division of Water Resources comment letter regarding the current amendment application, attached to this memo. Please provide a copy of the currently approved SWSP Plan or approved augmentation plan and valid well permit for the site.

   The SWSP approval letter has been enclosed.

5. Please provide an update on the status of the Applicant's permit with Dam Safety and the jurisdictional dam at the site. Please commit to providing a copy of the approval documentation from Dam Safety.

   The embankment dam structure has been approved by the SEO Dam Safety Division. A copy of the approval letter has been enclosed.

Sincerely

Peter Wayland
President

Encl. Sheet B-1 from Goose Haven Reservoir Complex Hydrology Report, Goose Haven Reservoir Groundwater Modeling Report, Figure HS-1A Outlet Drain Pipe, SEO SWSP approval Letter, SEO Dam Approval Letter.

LOWER BOULDER DITCH

LOWER BOULDER DITCH

LOWER BOULDER DITCH

RESERVOIR NO. 4
(PROPOSED FUTURE)

RESERVOIR NO. 1
(EXISTING)

RESERVOIR NO.3
(EXISTING)

RESERVOIR NO. 2
(UNDER CONSTRUCTION)

RESERVOIR NO. 2A
(PROPOSED)

SWALE #4
WIDTH = 10 FT
SLOPE = 0.68%
SIDE SLOPES = 8:1

GOOSEHAVEN RESERVOIR COMPLEX PROPERTY BOUNDARY

SWALE #3
TRAPEZOIDAL CHANNEL
WIDTH = 5 FT
SLOPE = 25% TO 7%
SIDE SLOPES = 3:1 & 4:1

SWALE #2
TRAPEZOIDAL CHANNEL
WIDTH = 9 FT
SLOPE = 0.2%
SIDE SLOPES = 3:1

SWALE #1
TRAPEZOIDAL CHANNEL
WIDTH = 5 FT
SLOPE = 0.24% TO 3%
SIDE SLOPES = 3:1

FILL AREA

STA. 32+32

STA. 48+50

STA. 46+13

STA. 22+97

STA. 21+00

STA. 0+00

STA. 0+00

STA. 0+00

A
42.0 AC
2

B
40.5 AC
2

C
28.4 AC
2

D
13.1 AC
2

E
10.5 AC
2

Avocet Ln

Isabelle Rd

ISABELLE ROAD

US HIGHWAY 287

287

BULLHEAD GULCH TRIBUTARY OFFSITE

NORTH
300' 0 150' 300' 600'
1" = 300' HOR.

LEGEND

- RESERVOIR BOUNDARY
- SUB-BASIN BOUNDARY
- A / 61.5 AC / 2 — BASIN ID W/ AREA (ACRES) AND % IMPERVIOUS
- CHANNEL (FLOW ARROWS)
- 1 — BASIN DESIGN POINT
- 5075 — EXISTING CONTOUR INTERVAL
- PROPERTY BOUNDARY

Number	Revision Description	By	Date

CITY OF LAFAYETTE, CO.
BOULDER, COUNTY

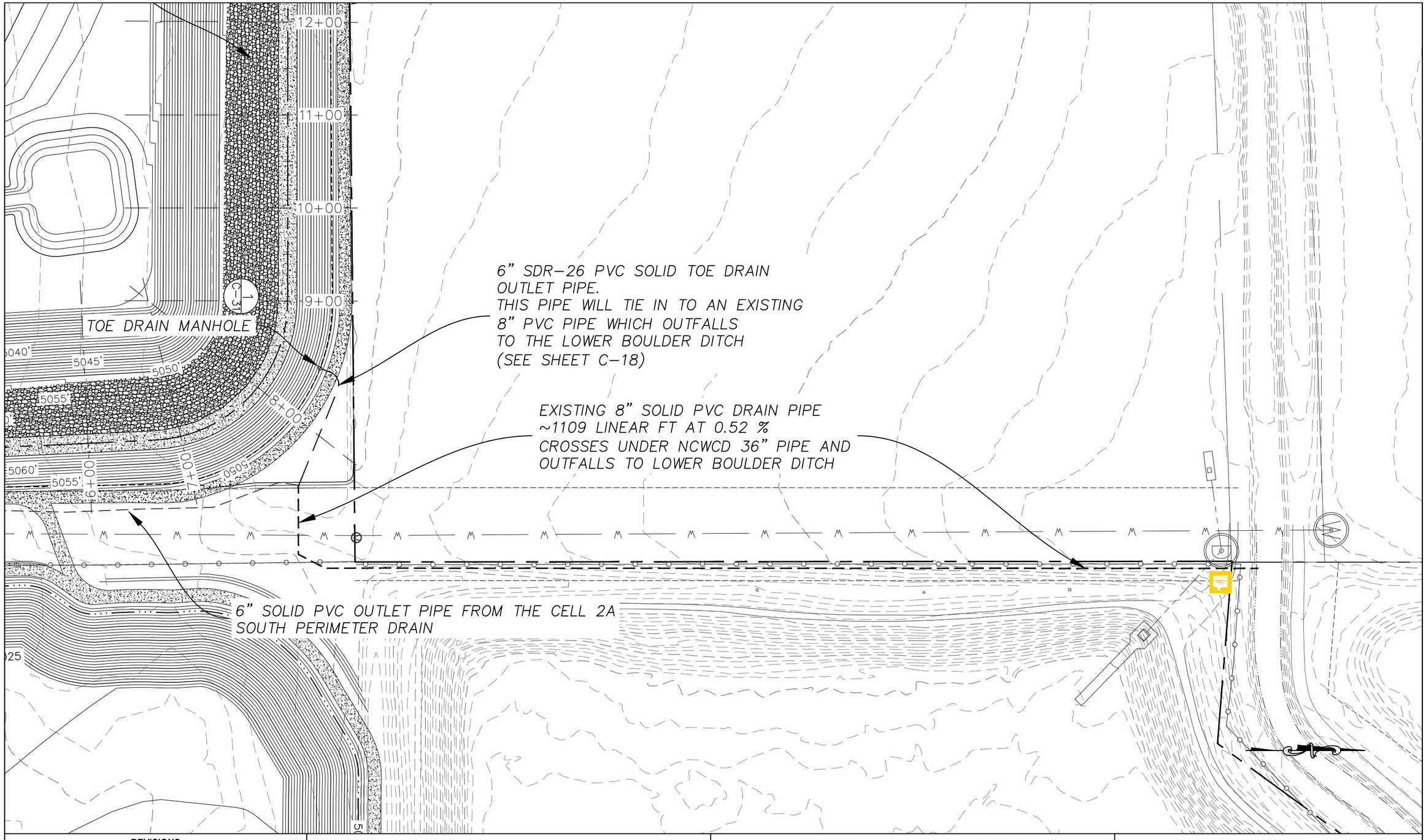
GOOSEHAVEN RESERVOR COMPLEX
DRAINAGE BASIN

MERRICK
2480 W. 26th Ave
Suite 82-2B
Denver, CO 80211
T303.964.3333
F303.964.3355

DESIGN: BEC
DETAIL: MJG
CHECK: BEC
DATE: FEB, 2019

PROJECT NUMBER
XXX

Drawing Number:
B-1



REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

Weiland, Inc.
Environmental & Engineering
PO BOX 18087
BOULDER, CO. 80308
ph 303-443-9521
fax 303-443-9536

GOOSE HAVE RESERVOIR
COMPLEX EXPANSION
LAFAYETTE, CO.

PREPARED FOR:
ROCK PRODUCTS OF COLORADO LLC

FIGURE HS-1A
OUTLET DRAIN PIPE

SCALE	DWG NO.	REV.
1"=100'	OUTLET.DWG	REV

DRAWN BY:	CHECKED BY:	DATE:	SHEET
CTW	PFW	01/05/23	1 OF 1

COLORADO
Division of Water Resources
Department of Natural Resources

September 30, 2022

Peter Wayland
Weiland, Inc
P.O. Box 18087
Boulder, CO 80308

Re: Goose Haven # 2 Expansion Substitute Water Supply Plan (WDID 0602537)
Goose Haven # 2 Expansion Pit, DRMS Permit No. M-2010-071 (WDID 0603019)
Sections 15, 21, 22, T1N, R69W, 6th P.M.
Water Division 1, Water District 6, Boulder County
SWSP ID: 5385

Approval Period: May 25, 2021 through December 31, 2022
Contact information for Mr. Wayland: 303-443-9521, pwayland@weilandinc.com

Dear Mr. Wayland:

We have reviewed your letters received May 25, 2021 and August 31, 2022 requesting a substitute water supply plan ("SWSP") in accordance with § 37-90-137(11), C.R.S., to replace depletions caused by mining operations at the Goose Haven Reservoir #2 Complex Expansion Pit operated by Rock Products of Colorado, LLC ("RPC" or "Applicant") along Boulder Creek. This plan was first approved on January 9, 2013; this application is for the renewal of the plan and the required fee of $257 for the SWSP has been submitted (receipt number 10012325).

SWSP Operation

This SWSP covers depletions caused by gravel mining operations at the Goose Haven Reservoir #2 Expansion Pit which is located in Sections 15, 21 and 22 in Township 1 North, Range 69 West of the 6th P.M. Depletions to occur during this approval period include evaporative losses from exposed groundwater and operational losses including water lost in mined product and dust control. Replacement water will be supplied by the City of Lafayette using fully consumable water from their waste water treatment plant. The extraction of sand and gravel was completed in March 2022, and Cells 2, 4 and 2A are being prepared to be lined.

Depletions

Evaporation and Mining Operations

The Applicant proposed to replace evaporation from exposed ground water at the site based upon evaporation atlases in NOAA Technical Report NWS 33 and the SEO monthly distribution factors for sites below 6,500 feet. Gross annual evaporation at the gravel pit location is estimated to be 41 inches per year. Net evaporation is defined as gross evaporation less the consumptive use of water by vegetation that naturally occurred at the site prior to construction of the pit. The

historical consumptive use was assumed to be equal to the effective precipitation, based on the Longmont 2 ESE (ID#055116) weather station.

Currently, approximately 3.61 acres are exposed in Cell 2A (shown on attached Figure 2 as areas 1-12), and 3.61 acres are exposed in Cell 2 (shown on attached Figure 2 as areas 13-16). In addition, 2.24 acres are exposed in Cell 4 (shown on attached Figure 2 as areas 17-23). The net evaporation from the estimated exposed water surface is 9.07 acre-feet for Cell 2, 9.07 acre-feet for Cell 2A, and 5.63 acre-feet for Cell 4, for 2021 and 2022, as shown in Table AI.1, column 7.

Computation of evaporation under this SWSP was reduced during the ice covered period. You have assumed the ice covered period will occur during the months of December and January based on average monthly temperatures less than 32°F taken from the Longmont 2 ESE, NOAA weather station (record 1960-2004). However, for the purpose of this SWSP, the Applicant shall replace the net evaporation depletions from the exposed groundwater surface area that may occur during the assumed ice covered period (the months of December and January) for any time that the pit is not completely covered by ice.

Computation of the net evaporation during any time that the pit is not completely covered by ice shall be determined as the pro-rata amount of the monthly gross evaporation rate distribution amount identified in the State Engineer's *General Guidelines for Substitute Supply Plans for Sand and Gravel Pits,* subtracting the pro-rata amount of the effective precipitation for that period.

The Applicant estimated approximately 3.75 acre-feet/year of groundwater for dust suppression at the site. A total of 206,000 tons were estimated to be mined for 2021 and 11,760 tons in 2022. The mined material will be in a dewatered state and washed and therefore, pursuant to paragraph 13 of the *General Guidelines for Substitute Water Supply Plans for Sand and Gravel Pit* (April 2, 2011), a 4% moisture content by weight is charged as a groundwater diversion. This results in a groundwater consumption from mined product of 6.06 acre-feet for 2021 and 0.35 acre-feet for 2022.

The Alluvial Water Accounting System ("AWAS") model was used with the alluvial aquifer boundary condition option to lag depletions to Boulder Creek. The following parameters were used in the model: transmissivity (T) = 44,883 gallons per day per foot, distance (X) from the centroid of the surface of the exposed ground water to the river = 3,709 feet, distance (W) from the aquifer boundary through the exposed ground water to the river channel = 4,400 feet, and specific yield (SY) = 0.2. The location of the stream depletion is assumed to be perpendicular to the river. The lagged depletions due to evaporation and mining operations are 30.27 acre-feet/year.

The depletions to occur in this plan period are summarized on attached Table AI.1, AI.2 and AI.3.

Dewatering

Dewatering of Cells 2, 4 and 2A will continue throughout the construction of a compacted clay liner in Cells 2 & 4 and a clay liner and dam embankment in Cell 2A. Dewatering will occur through two hydraulically separated trenches. Water in the southern dewatering trench system will be discharged into sediment ponds and ultimately discharged into Boulder Creek via Lafayette's return flow canal from the Boulder and Weld County Ditch Headgate. The return flow canal is a concrete

lined canal that discharges to Boulder Creek into the initial reach of the Boulder & Weld County Ditch downstream of the diversion structure, but upstream of the ditch headgate and overflow canal back to Boulder Creek. The discharge of dewatering water must be measured into and from the Boulder and Weld County Ditch to ensure it makes it back to Boulder Creek. Dewatering is projected to occur continuously throughout the duration of this SWSP approval period. For the dewatering analysis, it is assumed that the sediment ponds do not allow infiltration and that the dewatered water is returned to Boulder Creek the same month the dewatering occurs.

As long as dewatering in the trench systems remains continuous, the net accretions should be sufficient to replace the lagged depletions. At least three years prior to the planned cessation of dewatering, the operator must submit a dewatering analysis that shows how post pumping depletions will be replaced. As this analysis requires knowledge of the total volume dewatered, all dewatering activities must be metered with a totalizing flow meter that is recorded and reported on the submitted monthly accounting. **Any renewal request must demonstrate that the dewatering is occurring continuously at a constant rate or must account for all lagged depletions and return flows from dewatering.**

Replacements

Replacement water for depletions under this SWSP will come from fully consumable water owned by Lafayette to be delivered to Boulder Creek from Lafayette's waste water treatment plant ("WWTP", WDID 0602300) or through release from Lafayette's Goose Haven Reservoir Complex (WDID 0603998). This WWTP discharges to Coal Creek, a tributary to Boulder Creek. Intervening water rights between the site and the Coal Creek confluence are the Boulder & Weld County Ditch (WDID 0600515), Howell Ditch (WDID 0600536), and the Wittemyer Ponds (WDIDs 0606006 through 0606010). Should one of these rights place a call, the Applicant must insure that water is released directly from Lafayette's Goose Haven Reservoir Complex. A transit loss of 15% has been assigned to the reach of Coal Creek from Lafayette's WWTP to the confluence of Coal Creek and Boulder Creek. A letter from Lafayette confirming that as the owner they will be making replacements on behalf of RCP was provided to our office on September 20, 2022 and is attached to this letter. Table A1.3 provides the required replacement schedule for these deliveries.

Long-Term Augmentation

Final reclamation at the site will consist of lined storage reservoirs for Lafayette's use as a part of the Goose Haven Reservoir Complex. In accordance with the letter dated April 30, 2010 (copy attached) from the Colorado Division of Reclamation, Mining, and Safety ("DRMS"), all sand and gravel mining operators must comply with the requirements of the Colorado Reclamation Act and the Mineral Rules and Regulations for the protection of water resources. As the DRMS permit holder and land owner is the City of Lafayette, a bond to cover the cost of backfilling or lining the pit is not required as Lafayette is a governmental agency. As the final reclamation plan is a lined reservoir, an augmentation plan is not required to be filed in court.

Conditions of Approval

I hereby approve this SWSP, in accordance with Section 37-90-137(11), C.R.S., subject to the following conditions:

1. This SWSP shall be valid for the period of May 25, 2021 through December 31, 2022, unless otherwise revoked, or superseded by decree. **A SWSP renewal request must be submitted to this office with the statutory fee (currently $257) by November 1, 2022.** If a renewal request is received after the expiration date of this plan, it may be considered a request for a new SWSP and the $1593 filing fee will apply.
2. A well permit must be obtained for this pit in accordance with § 37-90-137(2) and (11), C.R.S., since the current well permit no. 79766-F issued for the site is only for 2 acres of groundwater exposed and 20 acre-feet of depletions. The provisions of § 37-90-137(2), C.R.S., prohibit the issuance of a permit for a well to be located within 600 feet of any existing well, unless the State Engineer finds that circumstances so warrant after a hearing held in accordance with the procedural rules in 2 CCR 402-5. This hearing may be waived if you are able to obtain statements from the owners of all wells within 600 feet, verifying that they have no objection to your use of the proposed well. Should a new well permit be denied for reasons of 600 foot spacing, or any other legitimate reason, approval of this substitute water supply plan will be canceled.
3. The total surface area of the groundwater exposed at the site during the period of this SWSP must not exceed 3.61 acres in Cell 2A, 3.61 acres in Cell 2, and 2.24 acres in Cell 4, resulting in evaporative loss of 9.07 acre-feet for Cell 2A, 9.07 acre-feet for Cell 2, and 5.63 acre-feet for Cell 4.
4. The total amount of water used for dust control at the site during the period of this SWSP must not exceed 3.75 acre-feet. All pumping for dust control will be tracked by the operator by keeping a log of the number of fills the water truck makes. This shall be included on submitted accounting. A totalizing flow meter may be required on dust control operations at the discretion of the water commissioner or division engineer.
5. The total amount of water consumed in aggregate production at the site during the period of this SWSP must not exceed 6.06 acre-feet for 2021 and 0.35 acre-feet for 2022.
6. Total consumption at the site must not exceed the aforementioned amounts unless an amendment is made to this SWSP.
7. Approval of this SWSP is for the purposes as stated herein. Any additional uses of this water must first be approved by this office.
8. All releases of replacement water must be sufficient to cover all out-of-priority depletions in time, place, and amount and must be made under the direction and/or the approval of the water commissioner. The release of replacement water may be aggregated to maximize beneficial use, subject to approval by the division engineer or water commissioner. The water commissioner and/or the division engineer shall determine the rate and timing of an aggregated release.

9. As long as dewatering occurs continuously, the net accretions should be sufficient to replace the lagged depletions. At least three years prior to the planned cessation of dewatering, the operator must submit a dewatering analysis that shows how post pumping depletions will be replaced. As this analysis requires knowledge of the total volume dewatered, **dewatering operations must be measured by totalizing flow meters that can accurately show the monthly volume of dewatered water that is pumped and returns to the stream. The total amount pumped monthly for dewatering purposes and the lagged depletions from dewatering must be reported on the submitted monthly accounting. Should it be determined by the water commissioner or division engineer that dewatering water is being diverted for any purpose by the operator and accounting is not adequate to show that 100 percent of the dewatering water is returned back to the Boulder Creek, the Applicant will need to account for any lagged dewatering depletions at the site. Any renewal request must demonstrate that the dewatering is occurring continuously at a constant rate or must account for all lagged depletions and return flows from dewatering.**

10. The Applicant shall provide daily accounting (including, but not limited to diversions, depletions, replacement sources, and river calls) on a monthly basis. The accounting must be uploaded to the CDSS Online Reporting Tool within 30 days of the end of the month for which the accounting applies (https://dwr.state.co.us/Tools/reporting). Instructions for using the tool are available on the Division of Water Resources website on the "Services" → "Data & Information" page under the heading of "Online Data Submittal". Accounting and reporting procedures are subject to approval and modification by the division engineer. Accounting forms need to identify the WDID number for each structure operating under this SWSP. **NOTE:** Monthly accounting, even during the winter non-irrigation season, is required.

    In addition, the applicant shall verify that the City of Lafayette (WDID 0602503) includes in their monthly accounting, a report on the reusable water released to provide replacement for this SWSP. It is the Applicant's responsibility to ensure Lafayette releases the leased water in the correct time, place, and amount.

11. The name, address, and phone number of a contact person who will be responsible for the operation and accounting of this SWSP must be provided on the accounting forms to the division engineer and water commissioner.

12. Conveyance loss for delivery of augmentation water is subject to assessment and modification as determined by the division engineer or water commissioner.

13. The approval of this SWSP does not relieve the Applicant and/or the landowner of the requirement to obtain a Water Court decree approving a permanent plan for augmentation or mitigation to ensure the permanent replacement of all depletions, including long-term evaporation losses and lagged depletions after gravel mining operations have ceased. If reclamation of the mine site will produce a permanent water surface exposing groundwater to evaporation, an application for a plan for augmentation must be filed with the Division 1 Water Court prior to the completion of mining, to include, but not be limited to, long-term evaporation losses and lagged depletions. If a lined pond results after reclamation, replacement of lagged depletions from mining and dewatering shall continue until there is no longer an effect on stream flow.

14. In accordance with the letter dated April 30, 2010 (copy attached) from the Colorado Division of Reclamation, Mining, and Safety ("DRMS"), all sand and gravel mining operators must comply with the requirements of the Colorado Reclamation Act and the Mineral Rules and Regulations for the protection of water resources. As the DRMS permit holder and land owner is the City of Lafayette, a bond to cover the cost of backfilling or lining the pit is not required as Lafayette is a governmental agency. As the final reclamation plan is a lined reservoir, an augmentation plan is not required to be filed in court.
15. The State Engineer may revoke this SWSP or add additional restrictions to its operation if at any time the State Engineer determines that injury to other vested water rights has occurred or will occur as a result of the operation of this SWSP. Should this SWSP expire without renewal or be revoked prior to adjudication of a permanent plan for augmentation, all excavation of product from below the water table, and all other use of water at the pit, must cease immediately.
16. In accordance with amendments to §25-8-202(7), C.R.S., and Senate Bill 89-181 Rules and Regulations adopted on February 4, 1992, the State Engineer shall determine whether the substitute supply is of a quality to meet requirements of use to senior appropriators. As such, water quality data or analysis may be requested at any time to determine if the water quality is appropriate for downstream water users.
17. The decision of the state engineer shall have no precedential or evidentiary force, shall not create any presumptions, shift the burden of proof, or serve as a defense in any water court case or any other legal action that may be initiated concerning the substitute water supply plan. This decision shall not bind the state engineer to act in a similar manner in any other applications involving other plans or in any proposed renewal of this plan, and shall not imply concurrence with any findings of fact or conclusions of law contained herein, or with the engineering methodologies used by the Applicant.

Should you have any questions, please contact Ioana Comaniciu of this office Michael Hein of our Division office in Greeley at (970) 352-8712.

Sincerely,

Jeff Deatherage, P.E.
Water Supply Chief

Attachments: Tables AI.1, AI.2, AI.3, Figure 2
City of Lafayette Lease Letter
April 30, 2010 DRMS letter

Ec: Michael Hein, Assistant Division Engineer, Michael.Hein@state.co.us
Jason Smith, Tributary Operation Coordinator, jason.smith2@state.co.us
Division of Reclamation, Mining and Safety

JD/jmw/idc: Goose Haven 2 Expansion Approval (2021-22).docx

Table AI.1 Monthly Net Evaporation 2020

Cell 2 - 2022

Areas 13-16 *3.61 acres*

Month	(1) Monthly Fraction of Evaporation	(2) Gross Free Surface Evaporation [in.]	(3) Mean Rainfall [in.]	(4) Effective Precipitation [in.]	(5) Monthly Potential Evaporation [in.]	(6) Free Water Surface Area [acre]	(7) Net Evaporation [acre-ft.]
January	0.03	41.00	0.43	0.30	0.00	3.61	0.00
February	0.04	41.00	0.44	0.31	1.13	3.61	0.34
March	0.06	41.00	0.89	0.62	1.63	3.61	0.49
April	0.09	41.00	1.89	1.32	2.37	3.61	0.71
May	0.12	41.00	2.27	1.59	3.33	3.61	1.00
June	0.15	41.00	1.35	0.95	5.00	3.61	1.50
July	0.15	41.00	1.12	0.78	5.37	3.61	1.61
August	0.14	41.00	1.03	0.72	4.81	3.61	1.45
September	0.10	41.00	1.36	0.95	3.15	3.61	0.95
October	0.07	41.00	1.06	0.74	2.13	3.61	0.64
November	0.04	41.00	0.59	0.41	1.23	3.61	0.37
December	0.03	41.00	0.40	0.28	0.00	3.61	0.00
totals	1.00		12.83	8.98	30.14		9.07

Cell 2A 2022

Areas 1-12 *3.61 acres*

Month	(1) Monthly Fraction of Evaporation	(2) Gross Free Surface Evaporation [in.]	(3) Mean Rainfall [in.]	(4) Effective Precipitation [in.]	(5) Monthly Potential Evaporation [in.]	(6) Free Water Surface Area [acre]	(7) Net Evaporation [acre-ft.]
January	0.03	41.00	0.43	0.30	0.00	3.61	0.00
February	0.04	41.00	0.44	0.31	1.13	3.61	0.34
March	0.06	41.00	0.89	0.62	1.63	3.61	0.49
April	0.09	41.00	1.89	1.32	2.37	3.61	0.71
May	0.12	41.00	2.27	1.59	3.33	3.61	1.00
June	0.15	41.00	1.35	0.95	5.00	3.61	1.50
July	0.15	41.00	1.12	0.78	5.37	3.61	1.61
August	0.14	41.00	1.03	0.72	4.81	3.61	1.45
September	0.10	41.00	1.36	0.95	3.15	3.61	0.95
October	0.07	41.00	1.06	0.74	2.13	3.61	0.64
November	0.04	41.00	0.59	0.41	1.23	3.61	0.37
December	0.03	41.00	0.40	0.28	0.00	3.61	0.00
totals	1.00		12.83	8.98	30.14		9.07

Cell 4 - 2022

Areas 17-23 *2.24 acres*

Month	(1) Monthly Fraction of Evaporation	(2) Gross Free Surface Evaporation [in.]	(3) Mean Rainfall [in.]	(4) Effective Precipitation [in.]	(5) Monthly Potential Evaporation [in.]	(6) Free Water Surface Area [acre]	(7) Net Evaporation [acre-ft.]
January	0.03	41.00	0.43	0.30	0.00	2.24	0.00
February	0.04	41.00	0.44	0.31	1.13	2.24	0.21
March	0.06	41.00	0.89	0.62	1.63	2.24	0.30
April	0.09	41.00	1.89	1.32	2.37	2.24	0.44
May	0.12	41.00	2.27	1.59	3.33	2.24	0.62
June	0.15	41.00	1.35	0.95	5.00	2.24	0.93
July	0.15	41.00	1.12	0.78	5.37	2.24	1.00
August	0.14	41.00	1.03	0.72	4.81	2.24	0.90
September	0.10	41.00	1.36	0.95	3.15	2.24	0.59
October	0.07	41.00	1.06	0.74	2.13	2.24	0.40
November	0.04	41.00	0.59	0.41	1.23	2.24	0.23
December	0.03	41.00	0.40	0.28	0.00	2.24	0.00
			12.83	8.98	30.14		5.63

Notes:

(1) = Monthly fraction of evaporation for elevations below 6500 ft from Guidelines for Substitute Water Supply Plans.
(2) = Gross free water surface evaporation from NOAA Technical Report NWS 33
(3) = Mean Rainfall - See Table AI.5
(4) = Effective Rainfall = 70% Mean Rainfall
(5) = Column (1) * Column (2) - Column (4)
(6) = Total predicted free water surface area
(7) = (Column (5)/12)* Column (6)

Table AI.2. Monthly Water Extracted - Mined Product and Dust Control

	(1)	(2)	(3)	(4)	(5)
Month	Monthly Fraction of Annual Extraction	Monthly Gravel Extraction	Monthly Volume of Water Extracted	Volume of Water Used for Dust Control	Total
	[1]	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]
May-21	0.12	25,000	0.74	0.31	1.05
Jun-21	0.12	25,000	0.74	0.50	1.24
Jul-21	0.06	13,000	0.38	0.50	0.88
Aug-21	0.12	25,000	0.74	0.50	1.24
Sep-21	0.10	20,000	0.59	0.31	0.90
Oct-21	0.11	22,000	0.65	0.31	0.96
Nov-21	0.07	15,000	0.44	0.31	0.75
Dec-21	0.05	10,000	0.29	0.13	0.42
Jan-22	0.05	10,000	0.29	0.13	0.42
Feb-22	0.04	8,000	0.24	0.13	0.36
Mar-22	0.08	17,000	0.50	0.31	0.81
Apr-22	0.08	16,000	0.47	0.31	0.78
totals	**1.000**	**206,000**	**6.06**	**3.75**	**9.81**

Notes:

(1) = Monthly fraction of extraction

(2) = Column (1) x206,000 tons

(3) =Column (2) x (2000 lbs/ton) x (0.04) x (1/62.4 ft^3/lbs) x (1/43,560 acre-ft/ft^3)

(4) = Monthly distribution of groundwater to be used for dust control

(5) = Totals

Table AI.2. Monthly Water Extracted - Mined Product and Dust Control

	(1)	(2)	(3)	(4)	(5)
Month	Monthly Fraction of Annual Extraction	Monthly Gravel Extraction	Monthly Volume of Water Extracted	Volume of Water Used for Dust Control	Total
	[1]	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]
January	0.44	5,233	0.15	0.13	0.28
February	0.56	6,527	0.19	0.13	0.32
March	0.00	0	0.00	0.31	0.31
April	0.00	0	0.00	0.31	0.31
May	0.00	0	0.00	0.31	0.31
June	0.00	0	0.00	0.50	0.50
July	0.00	0	0.00	0.50	0.50
August	0.00	0	0.00	0.50	0.50
September	0.00	0	0.00	0.31	0.31
October	0.00	0	0.00	0.31	0.31
November	0.00	0	0.00	0.31	0.31
December	0.00	0	0.00	0.13	0.13
totals	**0.000**	**11,760**	**0.35**	**3.75**	**4.10**

Notes:

(1) = Monthly fraction of extraction

(2) = Column (1) x206,000 tons

(3) =Column (2) x (2000 lbs/ton) x (0.04) x (1/62.4 ft^3/lbs) x (1/43,560 acre-ft/ft^3)

(4) = Monthly distribution of groundwater to be used for dust control

(5) = Totals

Table AI.3. Total Net Water Loss / Replacement Requirement

Month	(1) Monthly Evaporative Loss Cell 2	(2) Monthly Evaporative Loss Cell 4	(3) Monthly Evaporative Loss Cell 2A	(4) Monthly Volume of Mined & Dust Water	(5) Total Unlagged Depletions	(6) Total Lagged Depletions	(7) Total Lagged Depletions+ 25% Contingency + 15% Transit Loss
	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]
May-21	1.00	0.62	0.96	1.05	3.63	1.70	2.39
Jun-21	1.50	0.93	1.42	1.24	5.10	1.86	2.61
Jul-21	1.61	1.00	1.61	0.88	5.11	2.13	2.98
Aug-21	1.45	0.90	1.40	1.24	4.98	2.52	3.52
Sep-21	0.95	0.59	0.97	0.90	3.41	2.90	4.06
Oct-21	0.64	0.40	0.58	0.96	2.58	3.20	4.48
Nov-21	0.37	0.23	0.35	0.75	1.70	3.34	4.68
Dec-21	0.00	0.00	0.00	0.42	0.42	3.34	4.68
Jan-22	0.00	0.00	0.00	0.42	0.42	1.92	2.69
Feb-22	0.34	0.21	0.35	0.36	1.26	1.79	2.51
Mar-22	0.49	0.30	0.45	0.81	2.06	1.67	2.34
Apr-22	0.71	0.44	0.75	0.78	2.69	1.64	2.29
totals	**9.07**	**5.63**	**8.85**	**9.81**	**33.36**	**28.02**	**39.23**

(1) = Column (7) from Cell 2 AI.1
(2) = Column (7) from Cell 4 AI.1
(3) = Column (7) from Cell 5 AI.1
(4) = Column (5) from AI.2
(5) = Sum of Columns (1-4)
(6) = Column (5) Lagged in Real Time with IDS AWAS (See AI.4)
(2020 lagged depletions based on accounting)
(7) =Column (6) + 25% Contingency for Uncertainty + 15% Transit Loss
for Deliveries to Boulder Creek Via Coal Creek = Column (6) + (Column (6) * 0.40)

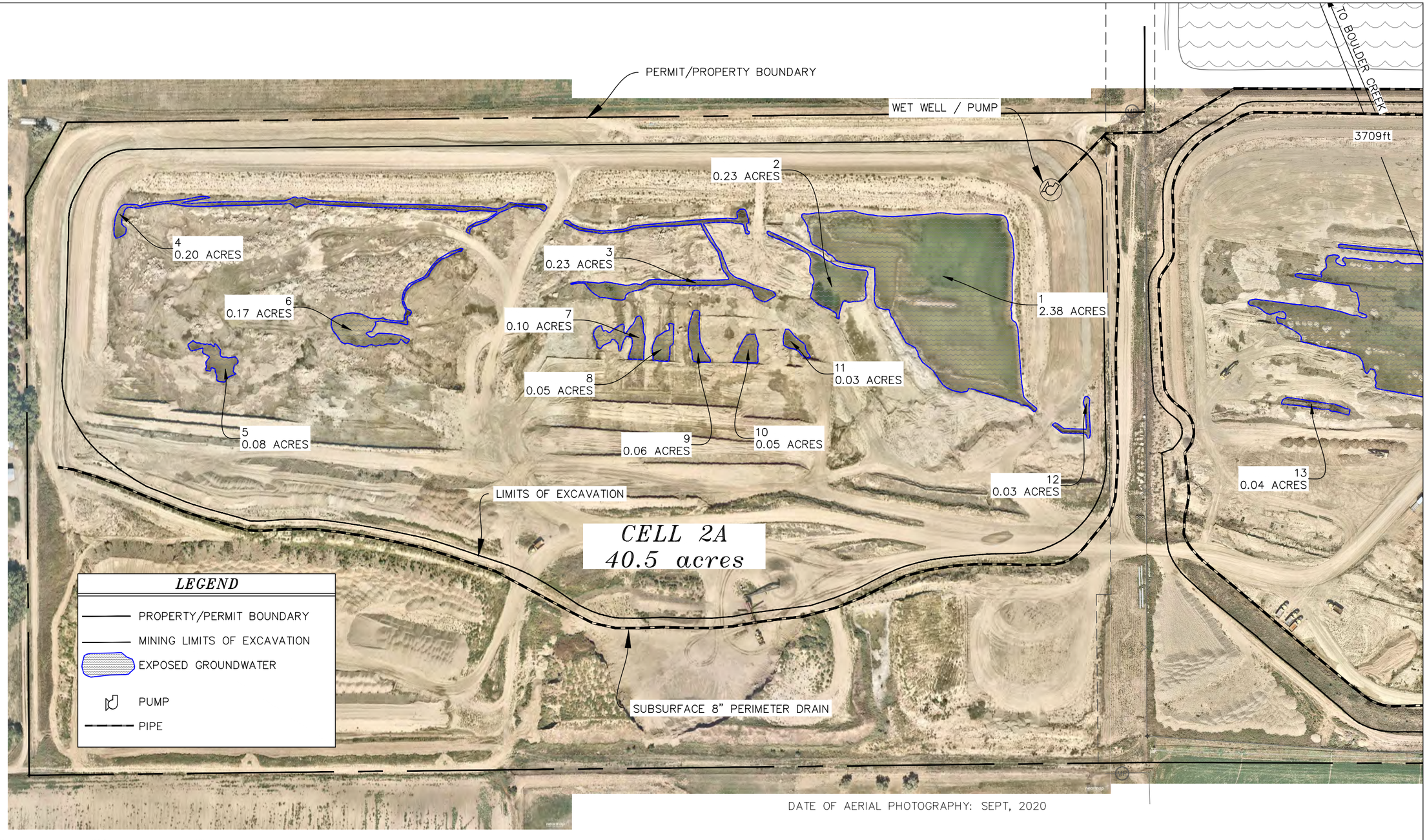
Table AI.3. Total Net Water Loss / Replacement Requirement

2022

Month	(1) Monthly Evaporative Loss Cell 2	(2) Monthly Evaporative Loss Cell 4	(3) Monthly Evaporative Loss Cell 2A	(4) Monthly Volume of Mined & Dust Water	(5) Total Unlagged Depletions	(6) Total Lagged Depletions	(7) Total Lagged Depletions+ 25% Contingency + 15% Transit Loss
	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]
January	0.00	0.00	0.00	0.28	0.28	2.84	3.98
February	0.34	0.21	0.34	0.32	1.21	2.61	3.66
March	0.49	0.30	0.49	0.31	1.60	2.39	3.35
April	0.71	0.44	0.71	0.31	2.18	2.23	3.13
May	1.00	0.62	1.00	0.31	2.94	2.15	3.02
June	1.50	0.93	1.50	0.50	4.44	2.15	3.02
July	1.61	1.00	1.61	0.50	4.73	2.26	3.16
August	1.45	0.90	1.45	0.50	4.30	2.46	3.44
September	0.95	0.59	0.95	0.31	2.79	2.68	3.76
October	0.64	0.40	0.64	0.31	1.99	2.84	3.97
November	0.37	0.23	0.37	0.31	1.28	2.86	4.01
December	0.00	0.00	0.00	0.13	0.13	2.78	3.90
totals	**9.07**	**5.63**	**9.07**	**4.10**	**27.86**	**30.27**	**42.38**

Notes:

(1) = Column (7) from Cell 2 AI.1
(2) = Column (7) from Cell 4 AI.1
(3) = Column (7) from Cell 2A AI.1
(4) = Column (5) from AI.2
(5) = Sum of Columns (1-4)
(6) = Column (5) Lagged in Real Time with IDS AWAS (See AI.4)
(2021 lagged depletions based on accounting)
(7) =Column (6) + 25% Contingency for Uncertainty + 15% Transit Loss
for Deliveries to Boulder Creek Via Coal Creek = (Column (6) + (Column (6) * 0.40)



REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

Weiland, Inc.
Environmental & Engineering
PO BOX 18087
BOULDER, CO. 80308
ph 303-443-9521

GOOSE HAVEN RESERVOIR #2 - COMPLEX EXPANSION

TEMPORARY SUBSTITUTE WATER SUPPLY PLAN

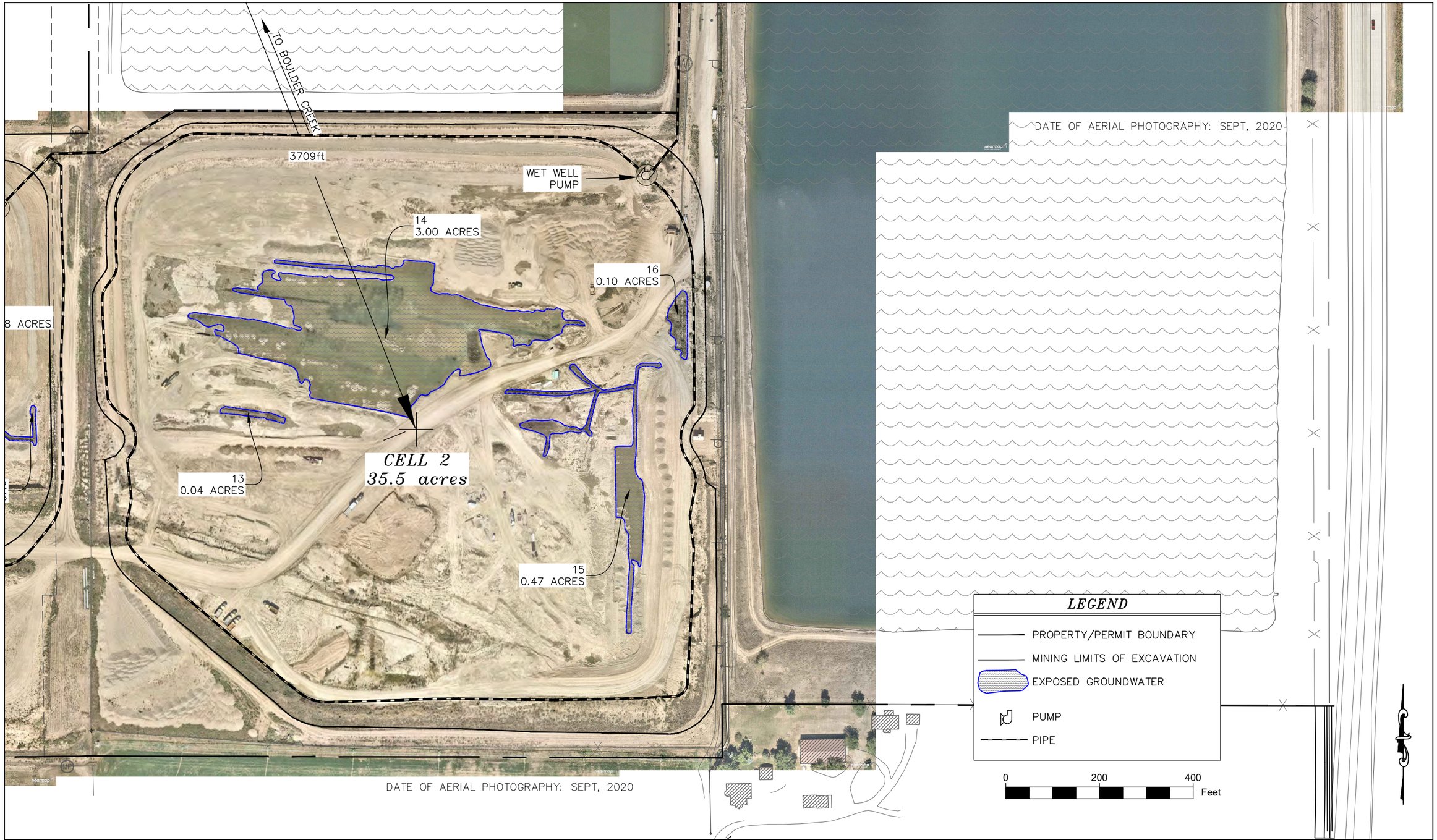
LAFAYETTE, CO

PREPARED FOR: ROCK PRODUCTS, LLC

FIGURE 2
SITE PLAN SHEET-1

SCALE	DWG NO.	REV.
1"=200'	FIGURE 2.DWG	REV

DRAWN BY:	CHECKED BY:	DATE:	SHEET
CTW	PFW	04/15/2021	1 OF 3



REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

Weiland, Inc.
Environmental & Engineering
PO BOX 18087
BOULDER, CO. 80308
ph 303-443-9521

GOOSE HAVEN RESERVOIR #2 - COMPLEX EXPANSION

TEMPORARY SUBSTITUTE WATER SUPPLY PLAN

LAFAYETTE, CO

PREPARED FOR: ROCK PRODUCTS, LLC

FIGURE 2
SITE PLAN SHEET-2

SCALE	DWG NO.	REV.
1"=200'	FIGURE 2.DWG	REV

DRAWN BY:	CHECKED BY:	DATE:	SHEET
CTW	PFW	04/15/2021	2 OF 3

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

Weiland, Inc.
Environmental & Engineering
PO BOX 18087
BOULDER, CO. 80308
ph 303-443-9521

GOOSE HAVEN RESERVOIR #2 - COMPLEX EXPANSION

TEMPORARY SUBSTITUTE WATER SUPPLY PLAN

LAFAYETTE, CO

PREPARED FOR: ROCK PRODUCTS, LLC

FIGURE 2
SITE PLAN SHEET-3

SCALE	DWG NO.	REV.
1"=200'	FIGURE 2.DWG	REV

DRAWN BY:	CHECKED BY:	DATE:	SHEET
CTW	PFW	04/15/2021	3 OF 3

City of Lafayette

PUBLIC WORKS

September 20, 2022

Ioana Comaniciu, P.E.
Water Resources Engineer
1313 Sherman St., Suite 818
Denver, CO 80203

RE: Temporary Substitute Water Supply Plan for Goose Haven Reservoir Complex Expansion – Mining Permit M-2010-07

Dear Ms. Comaniciu,

The City of Lafayette, as the owner of the Goose Haven Reservoir Complex Expansion, does hereby commit to continue to provide replacement water for the Temporary Substitute Water Supply Plan operated by Rock Products of Colorado, LLC for the Mining Permit M-2010-07.

Sincerely,

Melanie Asquith

Melanie Asquith, P.E.
Principal Utility Engineer and Water Resources Manager

cc: Peter Wayland – Weiland, Inc.

April 30, 2010

Permittee Address

RE: Mining Operations with Exposed Ground water

To Whom It May Concern:

The Division of Reclamation Mining and Safety is responsible for ensuring that Sand and Gravel mining operators comply with the requirements of the Colorado Land Reclamation Act for the Extraction of Construction Materials (Act) and the Mineral Rules and Regulations of the Colorado Mined Land Reclamation Board for the Extraction of Construction Materials (Rules). Among these requirements are provisions for the protection of water resources. The Act requires that reclamation plans must ensure minimization of disturbances to the prevailing hydrologic balance, including disturbances to the quantity of water in the area affected by mining and in the surrounding areas. § 34-32.5-116(4)(h). Rule 3.1.6(1)(a) requires compliance with Colorado water laws and regulations governing injury to existing water rights both during and after mining. Permits must specify how the permittee will comply with applicable Colorado water laws and regulations governing injury to existing water right rights. Rule 6.3.3(j); Rule 6.4.5(2)(c). After an extensive review, the Division determined that several operators may not have appropriate permit conditions to address certain reclamation liabilities arising from impacts to water resources.

In September 2009 the Division of Water Resources (DWR) updated its Guidelines for Sand and Gravel Pits. These guidelines provide guidance on achieving compliance with state law regarding replacement of depletions from sand and gravel mining, thus the guidelines provide a benchmark for the protection of hydrologic balance required under the Act and Rules. As noted in the Guidelines, sand and gravel operations which expose groundwater without complying with state law create a reclamation liability by impacting available groundwater.

State law requires that any person exposing ground water must obtain a well permit from the SEO pursuant to § 37-90-137(11). Because exposed groundwater results in out-of-priority water depletions, operations which expose ground water must also eventually obtain a water-court approved augmentation plan. Currently, several operators do not have either an augmentation plan or bonding to provide an alternative method to mitigate injurious stream depletions that result from mining-related exposure of ground water. The Division has a statutory duty to ensure that lands affected by mining are reclaimed in a manner that complies with state law and to ensure that operators have sufficient bonding to achieve reclamation. In order to assist operators in achieving compliance with these requirements, the Division proposes that, by April 30, 2011, operators should contact the Division and agree upon a plan for achieving compliance.

The Division has identified four approaches for operators:

1. File a financial warranty that will ensure backfilling of the pit to cover the exposed ground water to a depth of two feet above the static ground water level or,

2. Obtain a court approved augmentation plan prior to exposing ground water or,

3. File a financial warranty to cover the cost of installing a clay liner or slurry wall that meets the Division of Water Resources requirements for preventing ground water exposure or,

4. Obtain approval from the Division of Water Resources that acknowledges compliance with the SEO's requirements pursuant to § 37-90-137(11).

The Division will work with operators on an individual basis as they move to implement one of these plans. It is likely that options 1 and 3 will require the submittal of a technical revision or an amendment to the existing permit depending on the nature of the current mining and reclamation plan and the proposed changes. Increased financial warranties, as a result of these modifications, may be posted in a phased manner not to exceed three years. Amendments or revisions currently under review will be required to be approved by April 30, 2011 and may use the phased financial warranty approach described above. New applications going forward or presently under review by the Division will be required to meet the requirements of one of the options 1-4 at the time of application approval. Failure of affected operators to initiate contact with the Division and gain compliance as described above could result in an enforcement action being issued by the Division.

If you have any questions, please contact Tony Waldron at 303-866-3567, extension 8150.

cc: Permit Id Site Name

COLORADO
Division of Water Resources
Department of Natural Resources
Dam Safety Branch

September 29, 2022

Mr. Russell Berends, P.E.
Brierley & Associates
2000 S Colorado Blvd, Ste A-400
Denver, CO 80222
Via email: rberends@brierleyassociates.com

When replying, please refer to:
GOOSE HAVEN CELL 2A DAM, DAMID 060340
Water Division 1, Water District 6
Construction File No. C-2114

SUBJECT: Approval of Plans and Specifications and Waiver of Rule 7.9.3

Dear Mr. Berends,

Thank you for submitting plans and specifications for the proposed dam construction project for Goose Haven Cell 2A Dam for approval by the Office of the State Engineer. Goose Haven Cell 2A Dam is located in Boulder County, Colorado. This project involves construction of a dam and appurtenant structures around an existing gravel pit. The submittal included a request to waive the requirements of Rule 7.9.3. We have completed our review of the design and construction documents and have found them to be acceptable for construction. We are transmitting digital copies of the construction drawings and specifications with approval signatures, as digitally signed PDF files. Our acceptance and approval of these documents are effective as of the date of this letter. This approval includes an official waiver of Rule 7.9.3 for this project. Permits from other Local, State and Federal agencies may be required prior to the start of construction of this project, considered beyond the scope of our review and approval.

The construction of this project must be performed under the purview of a professional engineer registered in the State of Colorado. We direct your attention to Rule 8 (copy enclosed) of the Rules and Regulations concerning construction observations, coordination, and documentation activities required for this Low Hazard Dam. Please keep Mr. Jeremy Franz at (970) 231-6990 informed of the construction status so he may also meet our obligations under Rule 8.

Please retain the provided digitally approved plan sheets for your records and reference and for archiving after construction. Those will need to be maintained and provided for distribution and paper document production. At the end of construction we will need a PDF file of the approved plans, with the approval signatures as well as a new signature on the as-constructed certification. We will accept digital PDF documents meeting all requirements of Rule 8 at that stage of the process for final acceptance. Final acceptance of the construction will be contingent upon our receipt and acceptance of the “As-Constructed” drawings, as well as the other requirements of Rule 8 of the Rules and Regulations.

We look forward to working with Brierley, Rock Products and the City of Lafayette on the successful completion of this dam construction project. Please do not hesitate to call me at (719) 258-0859 if you have any questions concerning this matter or any other dam safety related issues.

Sincerely,

John E. Hunyadi, P.E.
Chief, Dam Safety Branch

Enc: Copy of Rule 8 of the "Rules and Regulations for Dam Safety and Dam Construction"

ec: Corey Deangelis, Division Engineer, Water Division 1
Jason Smith, WD 6 Water Commissioner
Jeremy Franz, Design Review Engineer
Jim Kirch, Dam Safety Engineer
Anna Crockford, Brierley & Associates - acrockford@brierleyassociates.com
Jon File, Rock Products – jon.file@comcast.net
Melanie Asquith, City of Lafayette – Melanie.Asquith@lafayetteco.gov