WSI Weiland, Inc.
Environmental & Engineering

October 31, 2016

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

Re: Response to Goose Haven Reservoir #2; DRMS File No. M-2010-71;
Preliminary Adequacy Review (AM-01)

Michael,

The following numbered responses correspond to your numbered comments in the preliminary Adequacy Review Letter dated July 24, 2015. Additional supporting documents and updated Exhibits have been attached.

1. As required by Rule 1.6.2(d) and 1.6.5(2), please submit proof of publication in a newspaper of general circulation in the locality of the proposed mining operation.

   Proof of publication has been enclosed

2. As required by Rule 1.6.2 (e), please submit proof of the notice to all owners of record of surface and mineral rights of the affected land and the owners of record of all land surface within 200 feet of the boundary of the affected land including all easement holders located on the affected land and within 200 feet of the boundary of the affected land. Proof of notice may be return receipts of a Certified Mailing or by proof of personal service.

   Proof of Certified Mailing has been enclosed

3. The Division received comments from History Colorado and the Colorado Division of Water Resources. The letters are attached for your review. Please address the comments noted in the letters and make any changes to the application as necessary.

   History Colorado references Lower Boulder Ditch and South Platte Supply Canal (one in the same), which is out of the permit area. The Gomez residence is no longer in existence. The DWR comments are covered in the attached Substitute Water Supply Plan /well permit

6.4.1 Exhibit A - Legal Description

No comment.

6.4.2 Exhibit B - No Comment

No comment.

6.4.3 Exhibit C – Pre-mining and Mining Plan Map of Affected Lands

4. A review of the original structure list provided under Exhibit S, shows that there are permanent man-made structures which have not been labeled on Exhibit C-1 Pre-Mine Map. Please provide a revised copy of Exhibit C-1 Pre-Mine Map with all permanent man-made structures labeled; see additional comments under Exhibit S, Item No. 29.

   The original Exhibit S listed several structures owned by the applicant. These have been excluded in the revised Exhibit S

6.4.4 Exhibit D – Mining Plan

5. The materials processing area is currently located within the western half of Reservoir #4. Please specify where the processing area will be located when the remainder of Reservoir #4 is mined out.

   Following sand & gravel extraction from the eastern portion of Reservoir #4, the processing plant will be moved offsite. Material from the western portion of Reservoir #4 (in the area where the materials processing area is currently located) shall be then hauled offsite for processing.

6. The Applicant has indicated that overburden which was stripped from the processing area was stockpiled immediately to the east. Please specify where topsoil from the processing area was stockpiled and specify where the overburden stockpile will be moved to when the east half of Reservoir is mined out.

   Topsoil from the processing area has been stockpiled in the topsoil stockpile area west of Reservoir #2. Overburden from the processing area was stockpiled to the east of the processing area and has since been hauled offsite for structural fill.

7. Exhibit C-1 – Pre-Mine Plan Map shows that Reservoir #4 is located within a 100 year floodplain. However, the floodplain is not identified. Please specify the water course which corresponds to the floodplain and specify the

distance between Reservoir #4 and the water course.

The water course associated with the floodplain is the Bullhead Gulch, which is an ephemeral drainage which is predicted to flow under localized 100 year storm events. The invert of the drainage as mapped by the 1998 Flood Insurance Work Map by Taggart Engineering has been shown in the revised Exhibit C-1. The distance from Reservoir #4 is approximately 1353 ft.

8. The currently approved Mining Plan states that no overburden or topsoil would be stockpiled within the floodplain. However, during the inspection conducted on July 30, 2015 the Division observed stockpiles adjacent to the material processing area which were within the floodplain. Please provide a technical justification for locating stockpiles within the floodplain.

   This stockpile has been removed

9. The currently approved Mining Plan calls for maintaining 3H: **1**V mine slope as the excavation approached the limits of mining. The Operator was unable to obtain structure agreements for all permanent man-made structures within 200 feet of the affected area. In lieu of signed structure agreements, the Operator provided an engineering analysis which demonstrated that the proposed mine slopes are adequately stable and protective of nearby infrastructure. The Operator is proposing to change to the mine plan to allow for maintaining a l H: 1V mine slope. Therefore, the formerly approved engineering analysis is no longer valid. The Operator shall complete the following steps in order to be in compliance with Rule 6.4.19:

   a) Provide a new set of structure agreements to all owners of permanent man-made structures within 200 feet of the affected area.*

   b) If the Operator cannot obtain signed structure agreements for all of the structures, then an updated engineering analysis may be submitted for Division review.

   ***Structure agreements shall be sent by a trackable method, i.e. certified mail. In addition, the individual structure agreements shall be labeled with the certified mail number or other tracking number.**

   Structure agreements have been mailed or hand delivered to all owners of structures within 200ft for which agreements have not been secured. These owners include Excel Energy, CDOT and Northern Colorado Water Conservancy District. Proof of mailing/delivery has been attached. the letter to Excel was hand delivered on site on 11/01/2016 to Barbara Temple of Excel (photo)

6.4.5 Exhibit E - Reclamation Plan

10. The Reclamation Plan did not address proper bonding of the lifts. Once a lift is placed it should be scarified to a depth of two inches to provide good bonding between lifts. Scarification shall be accomplished by disking, raking with a grader, or an approved alternate method. Please specify how the Operator will

ensure the lifts are properly bonded.

Section 6.4.5 Exhibit E – Reclamation Plan, has been updated to include this scarification specification between lifts. Exhibit E, Figure 1-Typical Section has also been updated to include this specification.

11. The Applicant is proposing to install a compacted clay liner on Reservoir #2 and Reservoir #4. Please submit a construction quality assurance plan for the installation of the clay liner.

    A compacted clay liner quality assurance / quality control plan has been enclosed

12. Please commit to providing a final construction report and certification for the pit liner.

    This commitment has been added to the revised Section 6.4.5 Exhibit E – Reclamation Plan

13. To properly regulate the liner installation, the Division must receive a commitment from the Operator stating that the design specifications will not be modified without prior Division approval.

14. *This commitment has been added to the revised Section 6.4.5 Exhibit E – Reclamation Plan*

15. Figure 6.4.5 -1 Typical Section shows that the uppermost portion of the clay liner is exposed. The portions of the clay liner above the normal pool elevation (5,050 ft.) should be covered with overburden or a protective shell. Please commit to covering all portions of the clay liner which are situated above the normal pool elevation and make the necessary changes to Figure

    6.4.5 – 1 Typical section or provide a technical justification for leaving a

    portion of the clay liner uncovered.

    Figure 6.4.5 – 1 Has been revised to protect the clay liner

16. The Applicant has stated that overburden will be mixed with the weathered claystone and moisture conditioned. Please provide specifications for the liner fill mixture including:

    a) Percent fines (should contain at least 20% fines on a dry weight basis).

    b) Percentage of gravel (material retained on a No. 4 sieve should not exceed 10%).

    c) Stones and rocks (no rocks larger than 2 inches should be in the liner material).

    The compacted clay liner shall be composed only be composed of clay / weathered claystone and will not be mixed with overburden. The gradation criteria has been added to the revised Section 6.4.5 Exhibit E – Reclamation Plan

17. Please commit to notifying the Division when the reservoir slopes have been reclaimed to their final grade, but prior to filling the reservoir with water. Upon notification from the Operator, the Division will schedule an inspection to verify the pit slopes have been reclaimed to the approved grade.

    The operator shall notify the Division to schedule an inspection following final slope grading.

6.4.6 Exhibit G – Water Information

18. The Applicant has committed to installing a sub-surface drain around Reservoir #2. The installation of the subsurface drain was based on the findings of a ground water monitoring study conducted by McLaughlin Water Engineers. Please specify if a sub-surface drain will be installed around Reservoir #4. In addition, clarify if the potential impacts to ground water elevations were studied for Reservoir #4. Provide the findings of any ground water study including any modeling results, or provide an explanation as to why the potential impacts to ground water have not been analyzed in regard to lining Reservoir #4.

    A subsurface drain has not been specified around Reservoir #4. This reservoir occurs in the directly in the groundwater gradient shadow of the existing Reservoir #3, which is lined with a compacted clay liner as well.

19. During review of the original 112 Construction Materials Reclamation Permit application, the Operator committed to following a groundwater monitoring and mitigation plan. The groundwater monitoring plan contained specific language regarding the installation of a slurry wall. The Division requests the Operator provide a revised commitment with all references to the construction of a slurry wall replaced by the construction of a clay liner. In addition, the Operator shall affirm the mitigation measures will continue to apply regardless of whether the mitigation triggers are the result of installing a clay liner on Reservoir #2 or Reservoir #4.

    The groundwater monitoring plan has been revised to replace reference to slurry wall with compacted clay liner. This plan has been incorporated into the revised Exhibit G. A commitment statement has been added to the plan

20. In the original application, the Operator identified all wells within 700 feet of the proposed permit boundary (see Exhibit S). Please verify that the list of wells is complete and accurate and ensure that there were no new wells constructed since the original permit was approved. If new wells have been constructed within 700 feet of the permit boundary, then the Operator shall provide a revised list of wells and a map showing the location of the wells in relation to the permit boundary.

    A comprehensive search for wells within 600 ft of the excavation boundary was conducted for the Office of the State Engineer (SEO) for the well permit application. There are no alluvial wells within 600 ft of the proposed excavation and therefore no wells are listed in Exhibit S. Wells listed previously were

onsite wells owned by the applicant. Figure 1 600 ft well spacing has been included which was submitted to the SEO. The SEO concurred with this finding and issued the well permit without agreements from any alluvial well owners.

21. The original Mining Plan stated that Reservoir #2 would be dewatered and pumped into one of the existing on-site reservoirs. The applicant has indicated that water from dewatering operations will be delivered to a settling pond impoundment. Exhibit C-2 Mine Plan Map (Sheet 2) shows there are three sediment ponds located in the materials processing area. Please provide additional detail regarding water management at the site, including how the water is delivered to the sediment ponds and how it is routed through the sediment ponds. In addition, specify if water is discharged from the site and identify the discharge location and the receiving body of water.

    This plan has been modified to discharge to Boulder Creek. There is a sediment pond north west of Cell 4 used to settle sediment prior to routing under the Lower Boulder Ditch to a return flow canal discharging to Boulder Creek. The routing of groundwater is described in the current SWSP, which has been attached.

6.4.8 Exhibit H -Wildlife Information

No comment.

6.4.9 Exhibit I -Soils Information

22. Please commit to ripping or disking the stockpile area west of Reservoir #2 to eliminate compacted conditions prior to seeding.

    Exhibit I has been updated to include disking of the stockpile west of Reservoir #2 prior to seeding.

6.4.10 Exhibit J -Vegetation Information

22. The Operator has submitted a Noxious Weed Management Plan (NWMP). The Operator has stated the NWMP will be implemented following revegetation of the site. Management of noxious weeds and other undesirable species shall be performed throughout the life of the mine. Please provide a commitment to control noxious weeds throughout the life of the mine.

    This statement had been added to Exhibit J

23. During the inspection conducted on July 30, 2015, the Division observed Purple loosestrife. Purple loosestrife is a List A Noxious weed and must be eradicated whenever detected. The Noxious Weed Management Plan (NWMP) did not list Purple loosestrife as a species which would be monitored and controlled. Please revise the NWMP to include Purple loosestrife.

    An addendum to Attachment IV has been enclosed which includes identification and control of purple loosestrife.

24. The Noxious Weed Management Plan (NWMP) did not address post-treatment monitoring. Assessing the effectiveness of weed control methods is critical to the long-term control of noxious weeds, especially for List A Species. Please submit a revised NWMP which addresses post-treatment monitoring.

    A revised Weed management plan is in the process of being developed and will be submitted to the Division by Novemver 4, 2016

6.4.11 Exhibit K - Climate

No comment.

6.4.12 Exhibit L - Reclamation Costs

No comment.

6.4.13 Exhibit M - Other Permits and Licenses

25. Please specify if the Operator will need approval from the Federal Emergency Management Agency for the construction of Reservoir #4, which is located within a 100 year floodplain.

    Since no permanent fill will occur in the floodplain, it is understood that does not need approval from FEMA.

26. Please provide the Division with a copy of the NPDES Permit (#COG501535).

    This permit has been enclosed

27. Please provide the Division with a copy of a valid well permit and Substitute Water Supply Plan.

    These documents have been enclosed

28. Please identify how the Operator will comply with the Division's groundwater policy. The following options are available to the Operator:

    a. Obtain a court approved augmentation plan prior to exposing groundwater. If an existing court approved augmentation plan covers the evaporative depletions, then provide a copy of the augmentation plan for the Division 's records.

    b. Obtain approval from the Division of Water Resources that acknowledges compliance with the Office of the State Engineer's (SEO) requirements pursuant to C.R.S. 37-90- 137(11). Typically, this is accomplished through the dedication of water shares to the SEO.

Augmentation of water rights shall not be required due to the fact that all excavations below the water table shall be lined with a compacted clay liner which shall undergo leak testing and meet leakage criteria set forth by the SEO.

6.4.14 Exhibit N – Source of Legal Right to Enter

No comment.

6.4.15 Exhibit O – Owner(s) of Record of Affected Land (Surface Area) and Owners of Substance to be Mined

No comment.

6.4.16 Exhibit P - Municipalities Within Two Miles

No comment.

6.4.17 Exhibit Q – Proof of Mailing of Notices to Board of County Commissioners and Soil Conservation District

No comment.

6.4.18 Exhibit R – Proof of Filing with County Clerk and Recorder

No comment.

6.4.19 Exhibit S - Permanent Man-made Structures

29. The list of structures provided under Exhibit S appears to be an incomplete list. Please revise the list and include all permanent man-made structures within 200 feet of the affected area.

    It is our contention that Exhibit S is indeed a complete list of Permanent Man Made Structures not owned by the applicant within 200 ft of the affected area. I should be noted that the previous list included several structures owned by the applicant

30. The Applicant has indicated that several agreements have been secured. Please provide copies of the structure agreements which have been obtained.

    Copies of existing agreements have been enclosed.

31. Please see additional comments under Exhibit D, Item No. 9 regarding structure agreements.

    Please see response above to Exhibit D

The List of Enclosures are as follows:

1. Proof of Publication
2. Proof of Certified Mailing to Adjacent Owners
3. Proof of Mailing/Hand Delivery of Structure Agreements
4. SEO SWSP Approval Letter
5. Substitute Water Supply Plan
6. Well Permit #3655374
7. 600ft Well Spacing Map
8. Attachment 6.4.5-1 Construction Quality Control Plan
9. Revised Exhibits C,D,E,F,G,I,J
10. NPDES Permit
11. Structure Agreements

Peter Wayland

Peter Wayland
President

AFFIDAVIT OF PUBLICATION

CAMERA

State of Colorado
County of Boulder

I, the undersigned agent, do solemnly swear that the Camera is a daily newspaper printed, in whole or in part, and published in the City of Boulder, County of Boulder, State of Colorado, and which has general circulation therein and in parts of Boulder and Broomfield counties; that said newspaper has been continuously and uninterruptedly published for a period of more than six months next prior to the first publication of the annexed legal notice of advertisement, that said newspaper has been admitted to the United States mails as second-class matter under the provisions of the Act of March 3, 1879, or any, amendments thereof, and that said newspaper is a daily newspaper duly qualified for publishing legal notices and advertisements within the meaning of the laws of the State of Colorado; that a copy of each number of said newspaper, in which said notice of advertisement was published, was transmitted by mail or carrier to each of the subscribers of said newspaper, according to the accustomed mode of business in this office.

The annexed legal notice or advertisement was published in the regular and entire edition of said daily newspaper once each week, on the same day of each week for the period of **4** consecutive insertions; and that the first publication of said notice was in the issue of said newspaper dated **September 4, 2015** and that the last publication of said notice was in the issue of said newspaper dated **September 25, 2015**.

Agent

Subscribed and sworn to before me this **25th day** of **September, 2015** in the County of Boulder, State of Colorado.

Notary Public

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NOTARY PUBLIC
STATE OF COLORADO
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2500 Public Notice **2500 Public Notice**

PUBLIC NOTICE

The City of Lafayette; 1290 S Public Rd, Lafayette CO 80026, 303-665-5588, has filed an amendment application for a Regular (112) Construction Materials Operation Reclamation Permit with the Colorado Mined Land Reclamation Board under provisions of the Colorado Land Reclamation Act for the Extraction of Construction Materials. The proposed mine is known as Goose Haven Reservoirs Complex Expansion #2 & #4, and is located at or near Sections 15, 22, 21 Township 1N, Range 69W, 6th Prime Meridian.

The date of commencement was, September 2013, and the proposed date of completion is, September 2019. The proposed future use of the land is Developed Water Resource. Additional information and tentative decision date may be obtained from the Division of Reclamation, Mining, and Safety, 1313 Sherman Street, Room 215, Denver, Colorado 80203, (303) 666-3567, or at the Boulder County Clerk and Recorder's office; 1750 33rd St, Boulder, CO 80301, or the above-named applicant.

Comments must be in writing and must be received by the Division of Reclamation, Mining, and Safety by 4:00 p.m. on, **November 23, 2015.**

Please note that under the provisions of C.R.S. 34-32.5-101 et seq. Comments related to noise, truck traffic, hours of operation, visual impacts, effects on property values and other social or economic concerns are issues not subject to this Office's jurisdiction. These subjects, and similar ones, are typically addressed by your local governments, rather than the Division of Reclamation, Mining, and Safety or the Mined Land Reclamation Board.

Published: Daily Camera Sept. 4, 11, 18, 25, 2015 - 5655255

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NATALIE KURYLKO & JASON CONDON
10029 ISABELLE RD
LAFAYETTE, CO 80026

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☐ Addressee

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Total Postage and Fees $	$6.74

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NEW CONSOLIDATED LOWER BOULDER
RESERVOIR & DITCH CO. ATTN: DAN GRANT
PO BOX 1826
LONGMONT, CO 80502

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9590 9403 0398 5163 4166 98

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BOULDER CO SEP 9 2015 USPS 80301

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RESERVOIR & DITCH CO. ATTN: DAN GRANT
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LONGMONT, CO 80502

9590 9403 0398 5163 4165 82

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THOMAS SCHWARTZ
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NCWCD ATTN: JIM STRUBLE
220 WATER AVENUE
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1. THOMAS SCHWARTZ
10641 ISABELLE RD
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9590 9403 0398 5163 4167 04

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A. Signature
X Tom Schwartz ☐ Agent ☐ Addressee

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220 WATER AVENUE
BERTHOUD, CO 80513

9590 9403 0398 5163 4166 50

2. Article Number (Transfer from service label) 7015 0640 0001 5692 2341

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A. Signature
X M Mauser ☐ Agent ☐ Addressee

B. Received by (Printed Name) M Monson C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
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BRIAN MCGUIRE NTC & CO LLP
6053 BRANDYWINE CT
BOULDER, CO 80301

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MARC & CONNIE LENART
9905 ISABELLE RD
LAFAYETTE, CO 80026

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BRIAN MCGUIRE NTC & CO LLP
6053 BRANDYWINE CT
BOULDER, CO 80301

9590 9403 0398 5163 4166 43

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X [signature] ☑ Agent ☐ Addressee

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1. Article Addressed to:

MARC & CONNIE LENART
9905 ISABELLE RD
LAFAYETTE, CO 80026

9590 9403 0398 5163 4166 74

7015 0640 0001 5692 2327

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A. Signature

X [signature] ☐ Agent ☐ Addr

B. Received by *(Printed Name)* Connie Lenart C. Date of De

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FRANKLIN SCHWARTZ
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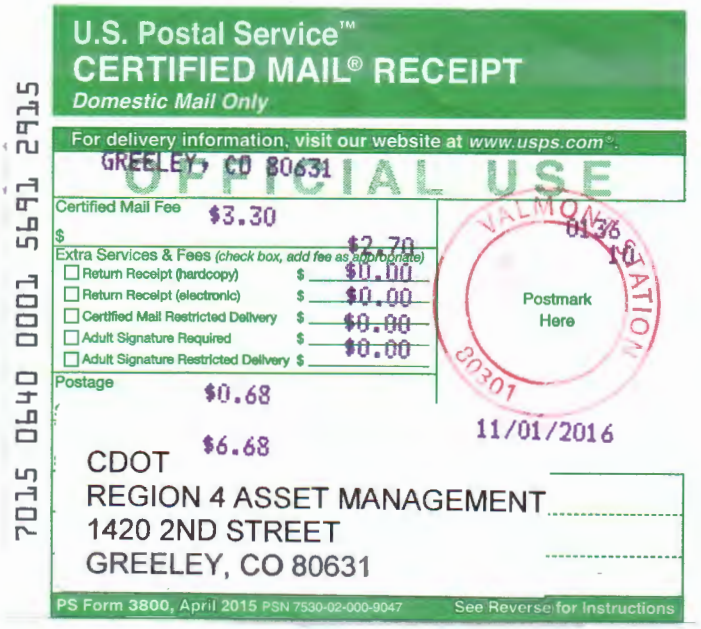

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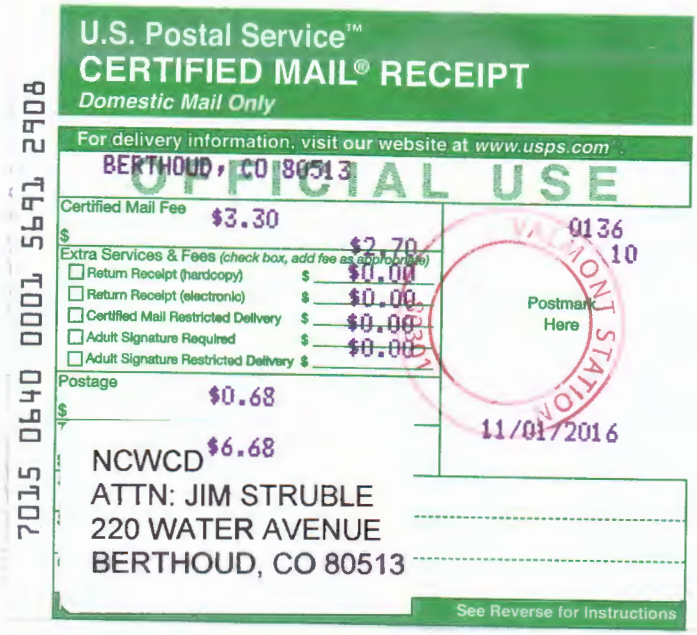

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NCWCD
ATTN: JIM STRUBLE
220 WATER AVENUE
BERTHOUD, CO 80513

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DEPARTMENT OF NATURAL RESOURCES

DIVISION OF WATER RESOURCES

John W. Hickenlooper
Governor

Mike King
Executive Director

Dick Wolfe, P.E.
Director/State Engineer

February 1, 2016

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

Approval Period: January 1, 2015 through December 31, 2016
Contact information for Mr. Wayland: 303-443-9521, pwayland@weilandinc.com

Dear Mr. Wayland:

We have reviewed your letter received August 8, 2014 requesting a substitute water supply plan ("SWSP") in accordance with § 37-90-137(11), C.R.S., to cover 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 3666019B).

Plan 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 Lafayette using fully consumable water from their waste water treatment plant.

Depletions

Evaporation and Mining Operations

Net evaporative depletions are calculated using a gross annual evaporation of 41 inches per year per NOAA Technical Report NWS-33. This is reduced by applying a credit of 9.7 inches for effective precipitation which is 70% of the average annual precipitation based on Longmont 2 ESE (ID#055116) weather station. Groundwater will be exposed within dewatering trenches and the sediment ponds. The Applicant exposed 1.75 acre of groundwater within sediment ponds and dewatering trenches during 2015 and projects that they will expose 1.6 acres of groundwater during 2016. The sediment ponds along with the dewatering trenches resulted in an evaporative loss of 3.73 acre-feet in 2015 and will result in an evaporative loss of 3.92 acre-feet in 2016.

The Applicant used approximately 0.17 acre-feet of groundwater for dust suppression at the site in 2015 and has estimated that 3.75 acre-feet will be used in 2016. A total of 182,436 tons was mined in 2015 and 400,000 tons is anticipated to be mined in 2016. 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 relates to a groundwater loss from mined product of 5.37 acre-feet in 2015 and up to 11.77 acre-feet during 2016.

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 during the SWSP period were 6.97 acre-feet for 2015 and are estimated to be 14.36 acre-feet in 2016.

The depletions to occur in this plan period are summarized below. The attached Table AI.1, AI.2 and AI.3 shows the monthly breakdown of these values for 2016 and attached Table 1 shows the actual operations in 2015.

Table A – Depletion Summary

	Evaporative Loss	*Mined Product Loss*	*Dust Control Loss*	*Total Consumptive Use*	*Lagged Depletions*
2015	3.73	5.37	0.17	9.27	6.97
2016	3.92	11.77	3.75	19.45	14.36
Total	7.65	17.14	3.92	28.72	21.33

Dewatering

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. Dewatering is projected to remain continuous throughout the duration of this SWSP approval period. For 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.

The applicant proposed to dewater the north dewatering trench, which is adjacent to Lower Boulder Ditch, by pumping directly to the Lower Boulder Ditch per an agreement with the ditch company. The Applicant claims that north dewatering trench is filled exclusively by water seeping from the ditch. However, the Applicant has not shown that the Lower Boulder Ditch has a legal right to recapture water that has seeped from the ditch. **Therefore, all water from the north dewatering trench must be returned to Boulder Creek through the same method used for the southern dewatering trench.**

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.

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 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 January 11, 2016 and is attached. 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 substitute water supply plan, 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 January 1, 2015 through December 31, 2016, unless otherwise revoked, modified, or superseded by decree. **A SWSP renewal request must be submitted to this office with the statutory fee (currently $257) by November 1, 2016.**
2. A well permit must be obtained for this pit in accordance with § 37-90-137(2) and (11), C.R.S. Applicant submitted a well permit application (receipt no. 3655374). 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 cancelled.
3. The total surface area of the groundwater exposed at the site during 2016 must not exceed 1.6 acres, resulting in evaporative losses of 3.92 acre-feet.

4. The total amount of water used for dust control at the site during 2016 must not exceed 3.75 acre-feet. All pumping for dust control will be tracked by the operator by keeping a log of 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 lost in aggregate production at the site during 2016 must not exceed 11.77 acre-feet.
6. Total consumption at the site must not exceed the aforementioned amounts unless an amendment is made to this plan.
7. Approval of this plan 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. The water commissioner and/or the division engineer shall determine the rate and timing of an aggregated release.
9. As long as dewatering 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.
10. All diversions shall be measured in a manner acceptable to the division engineer. The Applicant shall install and maintain such measuring devices as required by the division engineer for operation of this SWSP. In addition, the applicant shall maintain daily records of all diversions, replacements, and the amount of water used for each particular purpose. The applicant shall provide a report of these records to the division engineer (Div1Accounting@state.co.us) and the water commissioner (Bob Carlson at Bob.Carlson@state.co.us) on a monthly basis. The accounting must be submitted within 30 calendar days of the end of the month for which the accounting is being made and conform to the Administration Protocol *"Augmentation Plan Accounting, Division One – South Platte River"* (attached).

    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 Applicants 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 plan 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 substitute water supply plan 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. This substitute water supply plan may be revoked or modified at any time should it be determined that injury to other vested water rights has or will occur as a result of this plan. Should this substitute water supply plan 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. In addition, lack of timely accounting may prevent proper administration, which may lead to revocation or modification of this plan.

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 Karlyn Armstrong of this office Michael Hein of our Division office in Greeley at (970) 352-8712.

Sincerely,

Jeff Deatherage, P.E.
Chief of Water Supply

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

Cc: Michael Hein, Assistant Division Engineer, Michael.Hein@state.co.us
810 9th Street, Suite 200, Greeley, CO 80631, (970) 352-8712

Bob Carlson, Water Commissioner District 5, bob.carlson@state.co.us
PO Box 380, Erie, CO 80516

Division of Reclamation, Mining and Safety

JD/jmw/kaa: Goose Haven 2 Expansion Approval (2015).docx

Table 1

2015 GOOSE HAVEN RESERVOIR EXPANSION #2

MONTHLY WATER ACCOUNTING WORKSHEET 2015

Month	(1) Gross Evaporation	(2) Net Unit Evaporation	(3) Pit Size	(4) Dewatering Pump Rate	(5) Exposed Groundwater Area	(6) Net Evaporation	(7) Aggregate Mined	(8) Water in Mined Product	(9) Water Used for Dust Supression		(10) Total Operational Losses	(11) Lagged Effect on Stream	(12) Transit Loss	(13) Total Replacement Requirement
	[ft]	[ft]	[acres]	[pump rate]	[acres]	[acre-ft]	[tons]	[acre-ft]	[gallons]	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]
January	0.10	0.00	*30.00*		*1.30*	0.00	*0*	*0.00*	*0.00*	*0.000*	*0.00*	*0.523*	0.079	*0.602*
February	0.12	0.10	*30.00*		*1.30*	0.13	*0*	*0.00*	*5,000.00*	*0.015*	*0.14*	*0.485*	0.073	*0.557*
March	0.19	0.12	*35.00*		*1.50*	0.19	*11,406*	*0.34*	*5,000.00*	*0.015*	*0.54*	*0.442*	0.066	*0.509*
April	0.31	0.21	*35.00*		*1.50*	0.31	*11,205*	*0.33*	*5,000.00*	*0.015*	*0.66*	*0.418*	0.063	*0.480*
May	0.41	0.27	*45.00*	*292.36*	*1.75*	0.47	*16,938*	*0.50*	*5,000.00*	*0.015*	*0.98*	*0.420*	0.063	*0.482*
June	0.50	0.39	*50.00*	*347.68*	*1.75*	0.69	*34,859*	*1.03*	*5,000.00*	*0.015*	*1.73*	*0.446*	0.067	*0.513*
July	0.51	0.45	*55.00*	*347.70*	*1.50*	0.67	*29,056*	*0.86*	*5,000.00*	*0.015*	*1.54*	*0.510*	0.077	*0.587*
August	0.46	0.39	*60.00*	*430.72*	*1.40*	0.54	*39,185*	*1.15*	*5,000.00*	*0.015*	*1.71*	*0.607*	0.091	*0.698*
September	0.34	0.27	*60.00*	*346.20*	*1.40*	0.38	*11,493*	*0.34*	*5,000.00*	*0.015*	*0.73*	*0.709*	0.106	*0.815*
October	0.24	0.16	*60.00*	*253.60*	*1.40*	0.23	*22,559*	*0.66*	*5,000.00*	*0.015*	*0.91*	*0.784*	0.118	*0.901*
November	0.14	0.10	*60.00*	*233.50*	*1.40*	0.14	*5,735*	*0.17*	*5,000.00*	*0.015*	*0.32*	*0.814*	0.122	*0.936*
December	0.10	0.00	*60.00*	*211.00*	*1.40*	0.00	*0*	*0.00*	*5,000.00*	*0.015*	*0.02*	*0.81*	0.122	*0.935*
TOTALS	3.42	2.45					*182,436*				*9.27*	*6.97*	1.05	*8.01*
MAXIMUMS						273,333			3.75 acre-ft/yr					

Notes: *Actual Monthly Production Amounts are in Italics.*

(1) = (Monthly fraction of evaporation) for elevations below 6500 ft per SEO guidelines X (40 inches per year) Gross free water surface evaporation from NOAA Technical Report NWS 33

(2) = Column (1) - 70% of average precipitation (1948-2000) as recorded at Longmont

(3) = Estimate of Pit Size in Acres

(4) = Total Pumped per Totalizing Flow Meter Readings

(5) = (Estimate of Linear distance of Dewatering Trench X 4ft/ 43,560) + (Estimate of any pond area in acres)

(6) = Column (2) X Column (4)

(7) = Actual Aggregate Mined in Tons

(8) = (Column (6) X 2000lbs/ton X 0.04) / (8.34lbs H_2O per gal. X 325,851 gallons per acre-ft)

(9) = Estimate of water used for dust supression

(10) = Column (5) + Column (7) + Column (8)

(11) = Stream Depletion as Determined by IDS AWAS

(12) =Transit Loss of 15%

(13) = Column (10) + Column (11)

(14) = Monthy Replacement Delivery By the City of Lafayette

Table AI.1 Monthly Net Evaporation 2014-2016

2014

Sediment Ponds *1.00 acres* (Beginning July)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Month	Monthly Fraction of Evaporation	Gross Free Surface Evaporation [in]	Mean Rainfall [in.]	Effective Precipitation [in.]	Monthly Potential Evaporation [in]	Free Water Surface Area [acre]	Net Evaporation [acre-feet]
Jan-14	0.030	41.000	0.400	0.280	0.000	*0.65*	0.000
Feb-14	0.035	41.000	0.380	0.266	1.169	*0.70*	0.068
Mar-14	0.055	41.000	1.100	0.770	1.485	*0.80*	0.099
Apr-14	0.090	41.000	1.700	1.190	2.500	*0.85*	0.177
May-14	0.120	41.000	2.470	1.729	3.191	*0.90*	0.239
Jun-14	0.145	41.000	1.740	1.218	4.727	*1.00*	0.394
Jul-14	0.150	41.000	1.130	0.791	5.359	1.400	0.625
Aug-14	0.135	41.000	1.250	0.875	4.660	1.400	0.544
Sep-14	0.100	41.000	1.240	0.868	3.232	1.400	0.377
Oct-14	0.070	41.000	1.330	0.931	1.939	1.400	0.226
Nov-14	0.040	41.000	0.680	0.476	1.164	1.400	0.136
Dec-14	0.030	41.000	0.460	0.322	0.000	1.400	0.000
totals	1.000		13.880	9.716	29.426		2.885

2015

Sediment Ponds *1.00 acres*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Month	Monthly Fraction of Evaporation	Gross Free Surface Evaporation [in]	Mean Rainfall [in.]	Effective Precipitation [in.]	Monthly Potential Evaporation [in]	Free Water Surface Area [acre]	Net Evaporation [acre-feet]
Jan-15	0.030	41.000	0.400	0.280	0.000	1.400	0.000
Feb-15	0.035	41.000	0.380	0.266	1.169	1.400	0.136
Mar-15	0.055	41.000	1.100	0.770	1.485	1.400	0.173
Apr-15	0.090	41.000	1.700	1.190	2.500	1.400	0.292
May-15	0.120	41.000	2.470	1.729	3.191	1.400	0.372
Jun-15	0.145	41.000	1.740	1.218	4.727	1.400	0.551
Jul-15	0.150	41.000	1.130	0.791	5.359	1.400	0.625
Aug-15	0.135	41.000	1.250	0.875	4.660	1.400	0.544
Sep-15	0.100	41.000	1.240	0.868	3.232	1.400	0.377
Oct-15	0.070	41.000	1.330	0.931	1.939	1.400	0.226
Nov-15	0.040	41.000	0.680	0.476	1.164	1.400	0.136
Dec-15	0.030	41.000	0.460	0.322	0.000	1.400	0.000
totals	1.000		13.880	9.716	29.426		3.433

2016

Sediment Ponds *1.00 acres*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Month	Monthly Fraction of Evaporation	Gross Free Surface Evaporation [in]	Mean Rainfall [in.]	Effective Precipitation [in.]	Monthly Potential Evaporation [in]	Free Water Surface Area [acre]	Net Evaporation [acre-feet]
Jan-15	0.030	41.000	0.400	0.280	0.000	1.600	0.000
Feb-15	0.035	41.000	0.380	0.266	1.169	1.600	0.156
Mar-15	0.055	41.000	1.100	0.770	1.485	1.600	0.198
Apr-15	0.090	41.000	1.700	1.190	2.500	1.600	0.333
May-15	0.120	41.000	2.470	1.729	3.191	1.600	0.425
Jun-15	0.145	41.000	1.740	1.218	4.727	1.600	0.630
Jul-15	0.150	41.000	1.130	0.791	5.359	1.600	0.715
Aug-15	0.135	41.000	1.250	0.875	4.660	1.600	0.621
Sep-15	0.100	41.000	1.240	0.868	3.232	1.600	0.431
Oct-15	0.070	41.000	1.330	0.931	1.939	1.600	0.259
Nov-15	0.040	41.000	0.680	0.476	1.164	1.600	0.155
Dec-15	0.030	41.000	0.460	0.322	0.000	1.600	0.000
totals	1.000		13.880	9.716	29.426		3.923

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 AI.5
(4) = Effective Rainfall = 70% Mean Rainfall
(5) = Columns (1) x (2) - (4)
(6) = Total free water surface area
(7) = Columns ((5)/12) x (6)

Table AI.2. Monthly Water Extracted - Mined Product and Dust Control - ~~2015~~-2016

2015-2016

	(1)	(2)	(3)	(4)	(5)
Month	Monthly Fraction of Annual Extraction	Monthly Gravel Extraction [tons]	Monthly Volume of Water Extracted [acre-feet]	Volume of Water Used for Dust Control [acre-feet]	Total [acre-ft]
Jan	0.00	13,333.3	0.39	0.13	0.52
Feb	0.00	13,333.3	0.39	0.13	0.52
Mar	0.00	33,333.3	0.98	0.31	1.29
Apr	0.00	33,333.3	0.98	0.31	1.29
May	0.00	33,333.3	0.98	0.31	1.29
June	0.13	53,333.3	1.57	0.50	2.07
July	0.13	53,333.3	1.57	0.50	2.07
Aug	0.13	53,333.3	1.57	0.50	2.07
Sept	0.08	33,333.3	0.98	0.31	1.29
Oct	0.08	33,333.3	0.98	0.31	1.29
Nov	0.08	33,333.3	0.98	0.31	1.29
Dec	0.03	13,333.3	0.39	0.13	0.52
totals	**0.683**	**400,000.0**	**11.77**	**3.75**	**15.52**

Notes:

(1) = Monthly fraction of extraction

(2) = Column (1) x400,000 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 2014-2016

2014

Month	(1) Monthly Evaporative Loss [acre-ft]	(2) Monthly Volume of Water Extracted [acre-ft]	(3) Total loss (Unlagged) [acre-ft]	(4) Total loss Net Loss (Lagged) [acre-ft]	(5) Total loss/ Replacement (Lagged) [acre-ft]
Jan-14	*see accounting*		*0.00*	*0.31*	*0.36*
Feb-14	*see accounting*		*0.08*	*0.29*	*0.33*
Mar-14	*see accounting*		*0.16*	*0.26*	*0.30*
Apr-14	*see accounting*		*0.24*	*0.24*	*0.28*
May-14	*see accounting*		*0.30*	*0.23*	*0.27*
Jun-14	*see accounting*		*0.37*	*0.23*	*0.26*
Jul-14	*see accounting*		*0.97*	*0.24*	*0.28*
Aug-14	*see accounting*		*0.98*	*0.28*	*0.32*
Sep-14	*see accounting*		*1.21*	*0.34*	*0.39*
Oct-14	*see accounting*		*1.25*	*0.41*	*0.47*
Nov-14	*see accounting*		*0.14*	*0.49*	*0.56*
Dec-14	*see accounting*		*0.00*	*0.53*	*0.61*
totals	0.00	0.00	5.91	3.850	4.43

2015

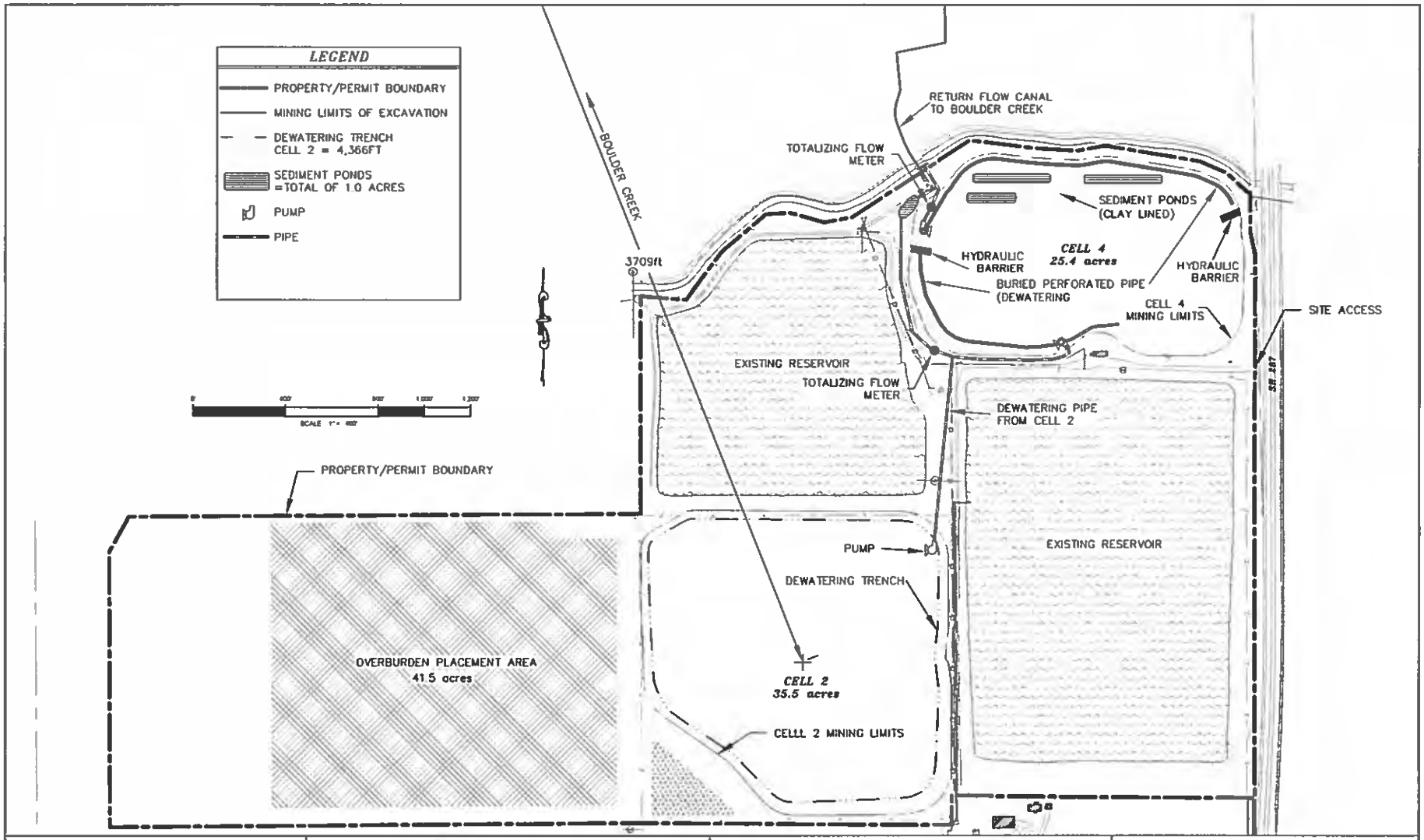
Month	(1) Monthly Evaporative Loss [acre-ft]	(2) Monthly Volume of Water Extracted [acre-ft]	(3) Total loss (Unlagged) [acre-ft]	(4) Total loss Net Loss (Lagged) [acre-ft]	(5) Total loss/ Replacement (Lagged) [acre-ft]
Jan-15	*see accounting*		*0.00*	*0.52*	*0.60*
Feb-15	*see accounting*		*0.14*	*0.48*	*0.56*
Mar-15	*see accounting*		*0.54*	*0.44*	*0.51*
Apr-15	*see accounting*		*0.66*	*0.42*	*0.48*
May-15	*see accounting*		*0.98*	*0.42*	*0.48*
Jun-15	*see accounting*		*1.13*	*0.45*	*0.51*
Jul-15	*see accounting*		*1.54*	*0.51*	*0.59*
Aug-15	*see accounting*		*1.71*	*0.61*	*0.70*
Sep-15	*see accounting*		*0.73*	*0.71*	*0.81*
Oct-15	*see accounting*		*0.91*	*0.78*	*0.90*
Nov-15	*see accounting*		*0.32*	*0.81*	*0.94*
Dec-15	*see accounting*		*0.02*	*0.81*	*0.93*
totals	0.00	0.00	9 27	6 969	8 01

2016

Month	(1) Monthly Evaporative Loss [acre-ft]	(2) Monthly Volume of Water Extracted [acre-ft]	(3) Total loss (Unlagged) [acre-ft]	(4) Total loss Net Loss (Lagged) [acre-ft]	(5) Total loss/ Replacement (Lagged) [acre-ft]
Jan-16	0.00	0.52	0.52	1.00	1.15
Feb-16	0.16	0.52	0.67	0.98	1 13
Mar-16	0.20	1.29	1 49	0.95	1 09
Apr-16	0.33	1.29	1 63	0 94	1 08
May-16	0.43	1.29	1 72	0 97	1 12
Jun-16	0 63	2.07	2 70	1.03	1 19
Jul-16	0.71	2.07	2.78	1.13	1.30
Aug-16	0.62	2.07	2.69	1.26	1.45
Sep-16	0.43	1.29	1 72	1.41	1.62
Oct-16	0.26	1.29	1.55	1.52	1.75
Nov-16	0.16	1.29	1.45	1.57	1.81
Dec-16	0.00	0.52	0.52	1.58	1.82
totals	3.92	15.52	19.45	14.357	16.51

Notes:

(1) = From Table AI.1
(2) = From Table AI.2
(3) = Sum of Column (1) and Column (2)
(4) = Column (3) Lagged with IDS-AWAS Program (Non-Steady State) See AI.4
(5) = Column (4) + 15% of Column (4) for transit loss



REVISIONS		

Welland Inc.
Environmental & Engineering

GOOSE HAVEN RESERVOIR #2 - COMPLEX EXPANSION
TEMPORARY SUBSTITUTE WATER SUPPLY PLAN
LAFAYETTE, CO
ROCK PRODUCTS, LLC

FIGURE 2
SITE PLAN

SCALE	DWG No.	REV
1"=400'	FIGURE 2.DWG	

DRAWN BY	CHECKED BY	DATE	SHEET
CTW	PFW	09/08/15	1 OF 1

City of Lafayette

PUBLIC WORKS

January 11, 2016

Weiland Inc
PO Box 18087,
BOULDER, CO 80308

RE: Goose Haven Reservoir Expansion
SWSP
Augmentation Water for 2016

Dear Peter

In accordance with your email of January 11, 2016 Lafayette is committing to provide augmentation water for the Goose Haven Reservoir The replacement schedule is given in Column (5) of tables AI.5-AI.6 for 2016 calendar year, this table is shown below:

SWSP Replacement Requirement Goose Haven #2 Expansion 2016

Month	(1) Monthly Evaporative Loss [acre-ft]	(2) Monthly Volume of Water Extracted [acre-ft]	(3) Total loss (Unlagged) [acre-ft]	(4) Total loss Net Loss (Lagged) [acre-ft]	(5) Total loss/ Replacement (Lagged) [acre-ft]
Jan-16	0 00	0 52	0 52	1 00	1 15
Feb-16	0 16	0.52	0 67	0 98	1 13
Mar-16	0 20	1.29	1 49	0 95	1 09
Apr-16	0 33	1.29	1 63	0 94	1 08
May-16	0 43	1.29	1 72	0 97	1 12
Jun-16	0 63	2 07	2 70	1 03	1 19
Jul-16	0 71	2 07	2 78	1 13	1 30
Aug-16	0 62	2 07	2 69	1 26	1 45
Sep-16	0 43	1.29	1 72	1 41	1 62
Oct-16	0 26	1.29	1 55	1 52	1 75
Nov-16	0 16	1.29	1 45	1 57	1 81
Dec-16	0 00	0 52	0 52	1 58	1 82
totals	3 92	15 52	19 45	14 357	16 51

Notes:
(1) = From Table AI 1
(2) = From Table AI.2
(3) = Sum of Column (1) and Column (2)
(4) = Column (3) Lagged with IDS-AWAS Program (Non-Steady State) See AI.4
(5) = Column (4) + 15% of Column (4) for transit loss

As described in your report, The City of Lafayette will either provide augmentation through the exchange of our Waste Water Treatment Plant credits or through release from Goose Haven. Attached is a list of water rights owned by the City of Lafayette and their change decree's. Accounting for deliveries will be provided

through our regular water rights accounting, as prepared by TZA Water Engineers. All required information will need to be provided to TZA on a weekly basis..

If there are any questions with regard to this matter please feel free in contacting me.

Respectfully,

Bradley S. Dallam, P.E.
Water Resource Manager

cc: Dave Lindholm
Jon File
Ted Zorich
John Faux
Bruce Kroeker

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

GOOSE HAVEN RESERVOIR #2
COMPLEX EXPANSION (M-2010-071)
TEMPORARY SUBSTITUTE
WATER SUPPLY PLAN

Prepared for:

Rock Products of Colorado, LLC
PO Box 983
Broomfield, CO 80038

Prepared by:

Weiland, Inc.
PO Box 18087
Boulder, CO 80308

December 19, 2012
Revised July, 2014
Revised, September 9 2015

1.0 INTRODUCTION

Rock Products LLC contracted Weiland, Inc. (WI) to complete the well application/temporary substitute water supply plan (SWSP) for the Goose Haven Reservoir #2 Complex Expansion (M-2010-071). The pit will be operated by Rock Products, LLC and owned by the City of Lafayette. A plan was previously submitted and approved in 2013. This plan includes water depletions/replacements associated with the addition of Cell 4

1.1. LEGAL DESCRIPTION AND SITE LOCATION

The legal description of the site is: A parcel of land in Sections 15, 21 and 22, Township 1 N, Range 69 West of the 6th PM. A site index map is given in Figure 1.

1.2. JUSTIFICATION AND NEED

Rock Products, LLC provides sand gravel for construction of roads and development of the infrastructure of Colorado. Their need is to excavate gravel at the property below to keep up with their demand for services. Additionally, there is a need to construct a water storage reservoir to meet the demands of the City of Lafayette's water supply.

1.3. PROJECT DESCRIPTION

The project will be constructed in two Cells. Cell 2 will mine approximately 35.5 acres in the south west. Cell 4 will mine approximately 25.4 acres in the north east (see Figure 2). Conventional dry mining methods shall be employed for the operation which involves construction of dewatering trenches to drain the gravel deposit. The dewatering trenches will be pumped to sediment ponds on the surface and ultimately discharged to Boulder Creek, via the City's return flow canal. For Cell 2, and following stripping of overburden, dewatering trenches will be constructed in the north of the mining cell and will expand to the south as mining progresses. As of July 2014, approximately ½ the total length of trench has been opened in Cell 2. Figure 2 illustrates the maximum extent of dewatering trench construction. Cell 4 dewatering will be achieved by pumping of constructed horizontal perforated pipe and will occur concurrently with Cell 2 and will begin in July 2014, however no mining of aggregate is expected to occur in Cell 4 during 2014-2016 (only stripping of overburden). Following mining, the site will be reclaimed to a water storage reservoir by constructing a low permeability compacted clay liners around the perimeter of the excavations.

2.0 OPERATIONAL WATER BALANCE

2.1. PREDICTED OPERATIONAL DEPLETIONS

2.1.1. Evaporative Losses

The gross surface water evaporation calculation is based on a free water surface evaporation of 40.0 inches year^{-1} (Farnsworth and Peck 1982). Historical climate data shows mean temperature below 32 degrees for Dec-Jan, therefore ice cover for those months prevents evaporation. Currently, approximately ½ the total length of dewatering trench is open in Cell 2. The remaining length of trench is expected to be open by the end of 2015. Overburden (dry) in the west half of Cell 4 has been stripped as of June 2014. For the purpose of allowing placement of the aggregate processing plant in the west half of Cell 4, perforated pipe drains have been constructed along the south and west boundary. Perforated pipe drains were constructed along the north boundary adjacent to the Lower Boulder Ditch. Hydraulic barriers constructed of compacted clay were placed on the ends of the north pipe. The sediment ponds have been clay lined. Table AI.1 summarizes the exposed groundwater site conditions for 2014-2016. Figure 2 shows exposed groundwater conditions by the end of 2016.

2.1.2. Mined Losses and Dust Control Losses

No mining of the sand and gravel material below the water table has occurred prior to July 2014. Water will however be used for dust control before then as shown in Table AI.2. The total annual consumptive use for dust control will be 3.75 acre-ft. The monthly distribution of water that will be used for dust control is given in Tables AI.2 of Appendix I.

For 2014, water lost due to pore water extracted with the mined product and dust control is calculated to be 11.79 acre-ft. In 2014, water lost due to pore water extracted with the mined product and dust control is calculated to be 15.52 acre-ft. The calculations are based on gravel that is 4% water by weight.

2.2. NET WATER DEPLETION

The net water loss per year can be written as:

(Monthly Lagged Evaporative Loss) + (Monthly Volume of Water Extracted) = (Net Stream Depletion / Replacement)

The monthly sums of evaporative losses and water extracted have been lagged utilizing the IDS-AWAS model. The model was run to predict actual monthly stream depletions as they occur (non-steady state).

The monthly water loss or potential injury to the Boulder Creek is given in Appendix I – Tables AI.3 2014 - 2016.

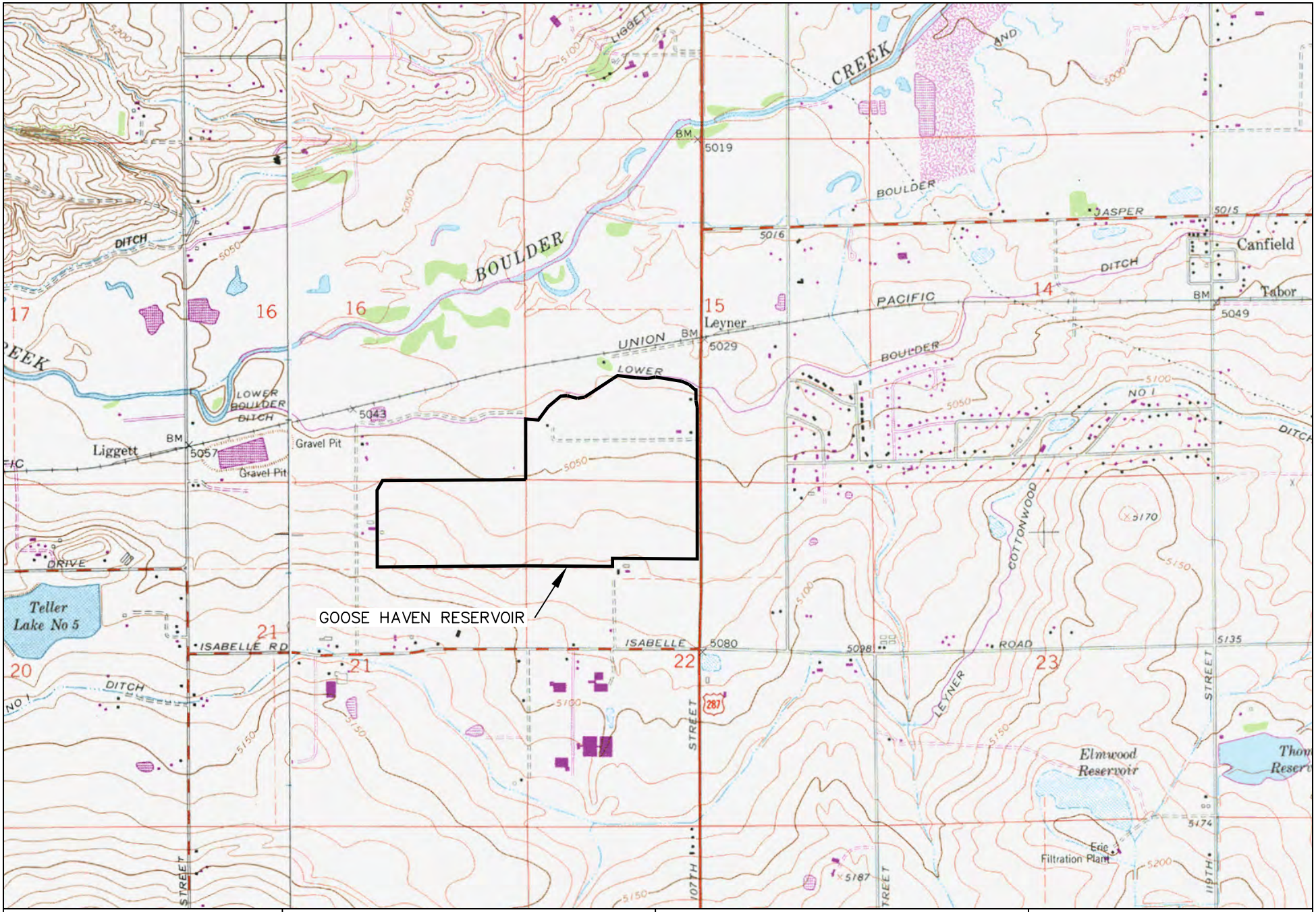
2.3. REPLACEMENT

Replacement water will come from fully consumable water owned by the City of Lafayette. Replacement water deliveries will occur at the City's WWTP located at 0 E County Line Rd, Lafayette. Replacements will be made to Boulder Creek via Coal Creek. There are no intervening water users on Boulder Creek between the point of injury and the confluence of Boulder Creek and Coal Creek. A transit loss of 15% has been assigned to the reach of Coal Creek from the City's WWTP to the confluence of Coal Creek and Boulder Creek.

3.0 REFERENCES

Farnsworth, R. K., Thompson, E. S., and Peck, P.L., 1982 “Evaporation Atlas for the Contiguous 48 United States”. NOAA Technical Report NWS 33, Office of Hydrology National Weather Service, Washington D.C.

Schroeder, D.R., 1987, “Analytical Stream Depletion Model”. Office of the State Engineer Division of Water Resources, State of Colorado.



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 1
SITE LOCATION MAP

SCALE	DWG NO.	REV.
1"=2,000'	SITE LOCATION.DWG	REV

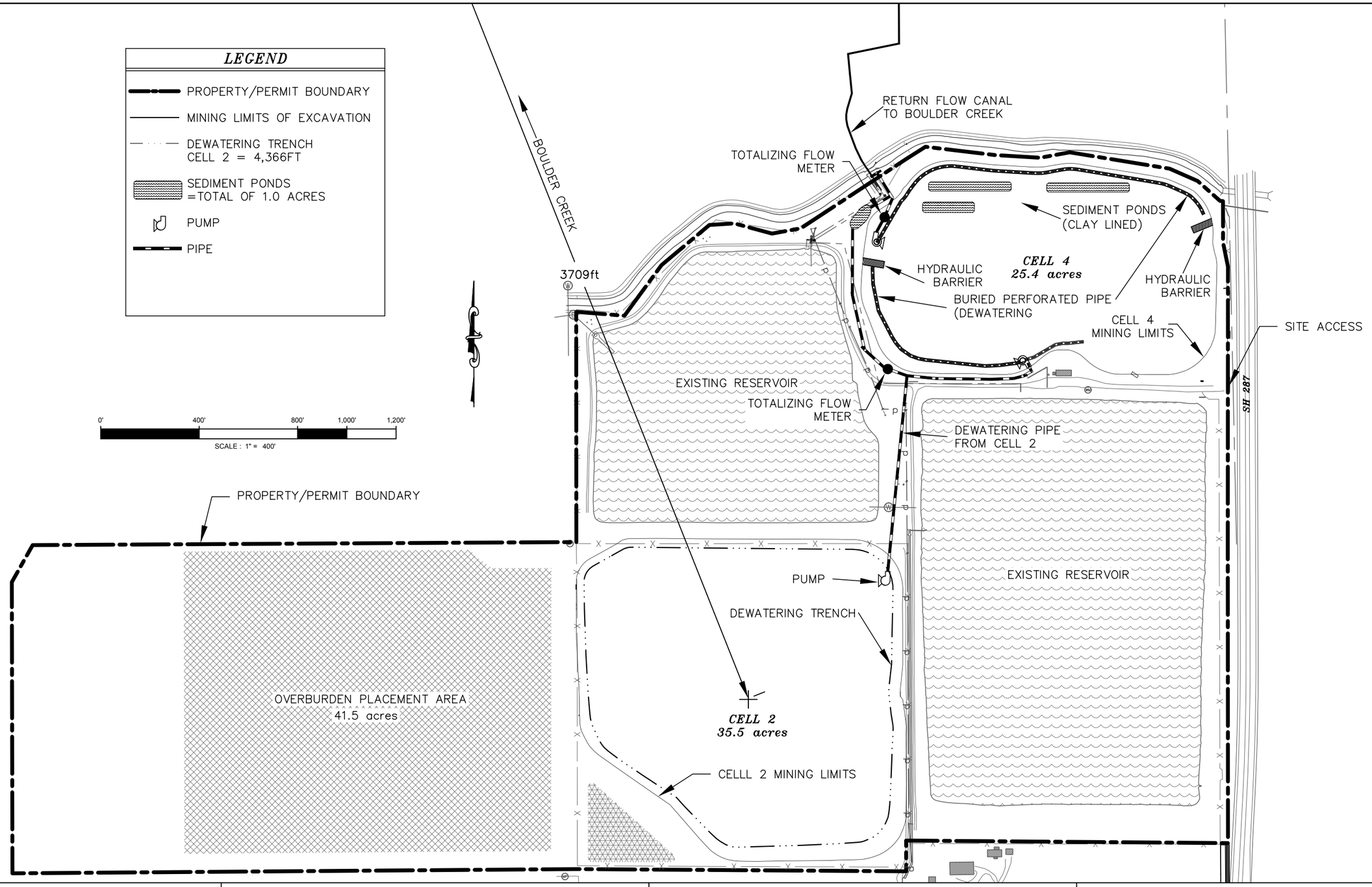
DRAWN BY:	CHECKED BY:	DATE:	SHEET
CTW	PFW	11/15/11	1 OF 1

LEGEND

- PROPERTY/PERMIT BOUNDARY
- MINING LIMITS OF EXCAVATION
- DEWATERING TRENCH CELL 2 = 4,366FT
- SEDIMENT PONDS =TOTAL OF 1.0 ACRES
- PUMP
- PIPE

0' 400' 800' 1,000' 1,200'

SCALE : 1" = 400'



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

SCALE	DWG NO.	REV.
1"=400'	FIGURE 2.DWG	REV

DRAWN BY:	CHECKED BY:	DATE:	SHEET
CTW	PFW	09/08/15	1 OF 1

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

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

GOOSE HAVEN RESERVOIR #2 - COMPLEX EXPANSION

LAFAYETTE, CO

PREPARED FOR: ROCK PRODUCTS

FIGURE 3

LAFAYETTE RETURN FLOW CANAL

SCALE	DWG NO.		REV
1"=100'	DRAW#		REV
DRAWN BY: CTW	CHECKED BY: PFW	DATE: 11/01/12	SHEET: SHEET#

Table AI.1 Monthly Net Evaporation 2014-2016

2014

Sediment Ponds *1.00 acres* (Beginning July)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Month	Monthly Fraction of Evaporation	Gross Free Surface Evaporation [in]	Mean Rainfall [in.]	Effective Precipitation [in.]	Monthly Potential Evaporation [in]	Free Water Surface Area [acre]	Net Evaporation [acre-feet]
Jan-14	0.030	41.000	0.400	0.280	0.000	*0.65*	0.000
Feb-14	0.035	41.000	0.380	0.266	1.169	*0.70*	0.068
Mar-14	0.055	41.000	1.100	0.770	1.485	*0.80*	0.099
Apr-14	0.090	41.000	1.700	1.190	2.500	*0.85*	0.177
May-14	0.120	41.000	2.470	1.729	3.191	*0.90*	0.239
Jun-14	0.145	41.000	1.740	1.218	4.727	*1.00*	0.394
Jul-14	0.150	41.000	1.130	0.791	5.359	1.400	0.625
Aug-14	0.135	41.000	1.250	0.875	4.660	1.400	0.544
Sep-14	0.100	41.000	1.240	0.868	3.232	1.400	0.377
Oct-14	0.070	41.000	1.330	0.931	1.939	1.400	0.226
Nov-14	0.040	41.000	0.680	0.476	1.164	1.400	0.136
Dec-14	0.030	41.000	0.460	0.322	0.000	1.400	0.000
totals	1.000		13.880	9.716	29.426		**2.885**

2015

Sediment Ponds *1.00 acres*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Month	Monthly Fraction of Evaporation	Gross Free Surface Evaporation [in]	Mean Rainfall [in.]	Effective Precipitation [in.]	Monthly Potential Evaporation [in]	Free Water Surface Area [acre]	Net Evaporation [acre-feet]
Jan-15	0.030	41.000	0.400	0.280	0.000	1.400	0.000
Feb-15	0.035	41.000	0.380	0.266	1.169	1.400	0.136
Mar-15	0.055	41.000	1.100	0.770	1.485	1.400	0.173
Apr-15	0.090	41.000	1.700	1.190	2.500	1.400	0.292
May-15	0.120	41.000	2.470	1.729	3.191	1.400	0.372
Jun-15	0.145	41.000	1.740	1.218	4.727	1.400	0.551
Jul-15	0.150	41.000	1.130	0.791	5.359	1.400	0.625
Aug-15	0.135	41.000	1.250	0.875	4.660	1.400	0.544
Sep-15	0.100	41.000	1.240	0.868	3.232	1.400	0.377
Oct-15	0.070	41.000	1.330	0.931	1.939	1.400	0.226
Nov-15	0.040	41.000	0.680	0.476	1.164	1.400	0.136
Dec-15	0.030	41.000	0.460	0.322	0.000	1.400	0.000
totals	1.000		13.880	9.716	29.426		**3.433**

2016

Sediment Ponds *1.00 acres*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Month	Monthly Fraction of Evaporation	Gross Free Surface Evaporation [in]	Mean Rainfall [in.]	Effective Precipitation [in.]	Monthly Potential Evaporation [in]	Free Water Surface Area [acre]	Net Evaporation [acre-feet]
Jan-15	0.030	41.000	0.400	0.280	0.000	1.600	0.000
Feb-15	0.035	41.000	0.380	0.266	1.169	1.600	0.156
Mar-15	0.055	41.000	1.100	0.770	1.485	1.600	0.198
Apr-15	0.090	41.000	1.700	1.190	2.500	1.600	0.333
May-15	0.120	41.000	2.470	1.729	3.191	1.600	0.425
Jun-15	0.145	41.000	1.740	1.218	4.727	1.600	0.630
Jul-15	0.150	41.000	1.130	0.791	5.359	1.600	0.715
Aug-15	0.135	41.000	1.250	0.875	4.660	1.600	0.621
Sep-15	0.100	41.000	1.240	0.868	3.232	1.600	0.431
Oct-15	0.070	41.000	1.330	0.931	1.939	1.600	0.259
Nov-15	0.040	41.000	0.680	0.476	1.164	1.600	0.155
Dec-15	0.030	41.000	0.460	0.322	0.000	1.600	0.000
totals	1.000		13.880	9.716	29.426		**3.923**

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 AI.5
(4) = Effective Rainfall = 70% Mean Rainfall
(5) = Columns (1) x (2) - (4)
(6) = Total free water surface area
(7) = Columns ((5)/12) x (6)

Table AI.2. Monthly Water Extracted - Mined Product and Dust Control - 2015-2016

2015-2016

	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Month	Monthly Fraction of Annual Extraction	Monthly Gravel Extraction [tons]	Monthly Volume of Water Extracted [acre-feet]	Volume of Water Used for Dust Control [acre-feet]	Total [acre-ft]
Jan	0.00	13,333.3	0.39	0.13	0.52
Feb	0.00	13,333.3	0.39	0.13	0.52
Mar	0.00	33,333.3	0.98	0.31	1.29
Apr	0.00	33,333.3	0.98	0.31	1.29
May	0.00	33,333.3	0.98	0.31	1.29
June	0.13	53,333.3	1.57	0.50	2.07
July	0.13	53,333.3	1.57	0.50	2.07
Aug	0.13	53,333.3	1.57	0.50	2.07
Sept	0.08	33,333.3	0.98	0.31	1.29
Oct	0.08	33,333.3	0.98	0.31	1.29
Nov	0.08	33,333.3	0.98	0.31	1.29
Dec	0.03	13,333.3	0.39	0.13	0.52
totals	**0.683**	**400,000.0**	**11.77**	**3.75**	**15.52**

Notes:

(1) = Monthly fraction of extraction

(2) = Column (1) x400,000 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 2014-2016

2014

Month	(1) Monthly Evaporative Loss [acre-ft]	(2) Monthly Volume of Water Extracted [acre-ft]	(3) Total loss (Unlagged) [acre-ft]	(4) Total loss Net Loss (Lagged) [acre-ft]	(5) Total loss/ Replacement (Lagged) [acre-ft]
Jan-14	*see accounting*		*0.00*	*0.31*	*0.36*
Feb-14	*see accounting*		*0.08*	*0.29*	*0.33*
Mar-14	*see accounting*		*0.16*	*0.26*	*0.30*
Apr-14	*see accounting*		*0.24*	*0.24*	*0.28*
May-14	*see accounting*		*0.30*	*0.23*	*0.27*
Jun-14	*see accounting*		*0.57*	*0.23*	*0.26*
Jul-14	*see accounting*		*0.97*	*0.24*	*0.28*
Aug-14	*see accounting*		*0.98*	*0.28*	*0.32*
Sep-14	*see accounting*		*1.21*	*0.34*	*0.39*
Oct-14	*see accounting*		*1.25*	*0.41*	*0.47*
Nov-14	*see accounting*		*0.14*	*0.49*	*0.56*
Dec-14	*see accounting*		*0.00*	*0.53*	*0.61*
totals	0.00	0.00	5.91	3.850	4.43

2015

Month	(1) Monthly Evaporative Loss [acre-ft]	(2) Monthly Volume of Water Extracted [acre-ft]	(3) Total loss (Unlagged) [acre-ft]	(4) Total loss Net Loss (Lagged) [acre-ft]	(5) Total loss/ Replacement (Lagged) [acre-ft]
Jan-15	*see accounting*		*0.00*	*0.52*	*0.60*
Feb-15	*see accounting*		*0.14*	*0.48*	*0.56*
Mar-15	*see accounting*		*0.54*	*0.44*	*0.51*
Apr-15	*see accounting*		*0.66*	*0.42*	*0.48*
May-15	*see accounting*		*0.98*	*0.42*	*0.48*
Jun-15	*see accounting*		*1.73*	*0.45*	*0.51*
Jul-15	*see accounting*		*1.54*	*0.51*	*0.59*
Aug-15	*see accounting*		*1.71*	*0.61*	*0.70*
Sep-15	*see accounting*		*0.73*	*0.71*	*0.81*
Oct-15	*see accounting*		*0.91*	*0.78*	*0.90*
Nov-15	*see accounting*		*0.32*	*0.81*	*0.94*
Dec-15	*see accounting*		*0.02*	*0.81*	*0.93*
totals	0.00	0.00	9.27	6.969	8.01

2016

Month	(1) Monthly Evaporative Loss [acre-ft]	(2) Monthly Volume of Water Extracted [acre-ft]	(3) Total loss (Unlagged) [acre-ft]	(4) Total loss Net Loss (Lagged) [acre-ft]	(5) Total loss/ Replacement (Lagged) [acre-ft]
Jan-16	0.00	0.52	0.52	1.00	1.15
Feb-16	0.16	0.52	0.67	0.98	1.13
Mar-16	0.20	1.29	1.49	0.95	1.09
Apr-16	0.33	1.29	1.63	0.94	1.08
May-16	0.43	1.29	1.72	0.97	1.12
Jun-16	0.63	2.07	2.70	1.03	1.19
Jul-16	0.71	2.07	2.78	1.13	1.30
Aug-16	0.62	2.07	2.69	1.26	1.45
Sep-16	0.43	1.29	1.72	1.41	1.62
Oct-16	0.26	1.29	1.55	1.52	1.75
Nov-16	0.16	1.29	1.45	1.57	1.81
Dec-16	0.00	0.52	0.52	1.58	1.82
totals	3.92	15.52	19.45	14.357	16.51

Notes:

(1) = From Table AI.1
(2) = From Table AI.2
(3) = Sum of Column (1) and Column (2)
(4) = Column (3) Lagged with IDS-AWAS Program (Non-Steady State) See AI.4
(5) = Column (4) + 15% of Column (4) for transit loss

Boundary = Alluvial Aquifer
Distance to Boundary = 4,400ft
Transmissivity = 44,883 gal/day/ft (K=600ft/day, b=10ft)
Specific Yield=0.2
Distance to Well=3,709 ft

2013-2014

Time (mo.)	Dep. Rate(CFS)	Vol. of Dep. (acre-feet)	Vol. of Dep. This Step (acre-feet)	
1	*0.00*	*0.00*	*0.00*	
2	*0.00*	*0.00*	*0.00*	
3	*0.00*	*0.00*	*0.00*	
4	*0.00*	*0.01*	*0.00*	
5	*0.00*	*0.01*	*0.01*	
6	*0.00*	*0.04*	*0.03*	
7	*0.00*	*0.11*	*0.07*	
8	*0.00*	*0.26*	*0.14*	
9	*0.00*	*0.47*	*0.21*	
10	*0.00*	*0.74*	*0.27*	
11	*0.01*	*1.06*	*0.31*	
12	*0.01*	*1.38*	*0.32*	
13	*0.01*	*1.69*	*0.31*	
14	*0.00*	*1.98*	*0.29*	
15	*0.00*	*2.24*	*0.26*	
16	*0.00*	*2.49*	*0.24*	
17	*0.00*	*2.72*	*0.23*	
18	*0.00*	*2.95*	*0.23*	
19	*0.00*	*3.19*	*0.24*	
20	*0.01*	*3.47*	*0.28*	
21	*0.01*	*3.80*	*0.34*	
22	*0.01*	*4.21*	*0.41*	
23	*0.01*	*4.70*	*0.49*	
24	*0.01*	*5.23*	*0.53*	Actual from Accounting

2015

25	0.01	5.75	0.52	
26	0.01	6.24	0.48	
27	0.01	6.68	0.44	
28	0.01	7.10	0.42	
29	0.01	7.52	0.42	
30	0.01	7.96	0.45	
31	0.01	8.47	0.51	
32	0.01	9.08	0.61	Actual from Accounting
33	0.01	9.79	0.71	
34	0.01	10.60	0.81	
35	0.02	11.50	0.90	
36	0.02	12.47	0.97	

Time (mo.)	Dep. Rate(CFS)	Vol. of Dep. (acre-feet)	Vol. of Dep. This Step (acre-feet)
2016			
37	0.02	13.47	1.00
38	0.02	14.45	0.98
39	0.02	15.39	0.95
40	0.02	16.33	0.94
41	0.02	17.31	0.97
42	0.02	18.34	1.03
43	0.02	19.47	1.13
44	0.02	20.73	1.26
45	0.02	22.15	1.41
46	0.03	23.67	1.52
47	0.03	25.24	1.57
48	0.03	26.82	1.58

Table AI.5. Period of Record General Climate Summary - Temperature and Precipitation

Weather Station: :(055116) LONGMONT 2 ESE

Period of Record: From Year 1948 to Year 2000

Month	Mean Temperature [F]	Mean Rainfall [in]
January	26.9	0.40
February	31.7	0.38
March	37.9	1.10
April	47.0	1.70
May	57.0	2.47
June	66.3	1.74
July	72.0	1.13
August	70.0	1.25
September	61.1	1.24
October	49.9	1.33
November	36.9	0.68
December	29.9	0.46
		13.88

Source: Western Regional Climate Center

Table updated on Jun 4, 2001
For monthly and annual means, thresholds, and sums:
Months with 5 or more missing days are not considered
Years with 1 or more missing months are not considered
Seasons are climatological not calendar seasons

2015 GOOSE HAVEN RESERVOIR EXPANSION #2

MONTHLY WATER ACCOUNTING WORKSHEET 2015

Month	(1) Gross Evaporation	(2) Net Unit Evaporation	(3) Pit Size	(4) Dewatering Pump Rate	(5) Exposed Groundwater Area	(6) Net Evaporation	(7) Aggregate Mined	(8) Water in Mined Product	(9) Water Used for Dust Supression		(10) Total Operational Losses	(11) Lagged Effect on Stream	(12) Transit Loss	(13) Total Replacement Requirement	(14) Actual Replacement Delivery	(15) Net Effect on Stream
	[ft]	[ft]	[acres]	[pump rate]	[acres]	[acre-ft]	[tons]	[acre-ft]	[gallons]	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]	[acre-ft]
January	0.10	0.00	*30.00*		*1.30*	0.00	*0*	*0.00*	*0.00*	*0.000*	*0.00*	*0.523*	0.079	*0.602*	*1.110*	0.508
February	0.12	0.10	*30.00*		*1.30*	0.13	*0*	*0.00*	*5,000.00*	*0.015*	*0.14*	*0.485*	0.073	*0.557*	*1.092*	0.535
March	0.19	0.12	*35.00*		*1.50*	0.19	*11,406*	*0.34*	*5,000.00*	*0.015*	*0.54*	*0.442*	0.066	*0.509*	*1.04*	0.529
April	0.31	0.21	*35.00*		*1.50*	0.31	*11,205*	*0.33*	*5,000.00*	*0.015*	*0.66*	*0.418*	0.063	*0.480*	*1.03*	0.552
May	0.41	0.27	*45.00*	*292.36*	*1.75*	0.47	*16,938*	*0.50*	*5,000.00*	*0.015*	*0.98*	*0.420*	0.063	*0.482*	*1.08*	0.593
June	0.50	0.39	*50.00*	*347.68*	*1.75*	0.69	*34,859*	*1.03*	*5,000.00*	*0.015*	*1.73*	*0.446*	0.067	*0.513*	*1.14*	0.631
July	0.51	0.45	*55.00*		*1.50*	0.67	*29,056*	*0.86*	*5,000.00*	*0.015*	*1.54*	*0.510*	0.077	*0.587*	*1.23*	0.646
August	0.46	0.39	*60.00*		*1.40*	0.54	*39,185*	*1.15*	*5,000.00*	*0.015*	*1.71*	*0.607*	0.091	*0.698*	*1.37*	0.675
September	0.34	0.27														
October	0.24	0.16														
November	0.14	0.10														
December	0.10	0.00														
TOTALS	3.42	2.45					*142,649*				*7.30*	*3.85*	0.58	*4.43*	*9.098*	*4.670*
MAXIMUMS							273,333							8.32 acre-ft/yr		

Notes: *Actual Monthly Production Amounts are in Italics.*

(1) = (Monthly fraction of evaporation) for elevations below 6500 ft per SEO guidelines X (40 inches per year) Gross free water surface evaporation from NOAA Technical Report NWS 33

(2) = Column (1) - 70% of average precipitation (1948-2000) as recorded at Longmont

(3) = Estimate of Pit Size in Acres

(4) =Pump Rate as Calculated by Totalizing Flow Meter Readings

(5) = (Estimate of Linear distance of Dewatering Trench X 4ft/ 43,560) + (Estimate of any pond area in acres)

(6) = Column (2) X Column (4)

(7) = Actual Aggregate Mined in Tons

(8) = {Column (6) X 2000lbs/ton X 0.04} / {8.34lbs H_2O per gal. X 325,851 gallons per acre-ft}

(9) = Estimate of water used for dust supression

(10) = Column (5) + Column (7) + Column (8)

(11) = Stream Depletion as Determined by IDS AWAS

(12) =Transit Loss of 15%

(13) = Column (10) + Column (11)

(14) = Monthy Replacement Delivery By the City of Lafayette

(15) = Column(13) - Column (12). Positive value indicates accretion

Form No.
GWS-25

OFFICE OF THE STATE ENGINEER
COLORADO DIVISION OF WATER RESOURCES

818 Centennial Bldg., 1313 Sherman St., Denver, Colorado 80203
(303) 866-3581

AUTH

WELL PERMIT NUMBER 79766 -F -
DIV. 1 WD 6 DES. BASIN MD

APPLICANT

ROCK PRODUCTS OF COLORADO LLC
C/O WEILAND INC
PO BOX 18087
BOULDER, CO 80308-

(303) 443-9521

APPROVED WELL LOCATION
WELD COUNTY
1/4 SW 1/4 Section 15
Township 1 N Range 68 W Sixth P.M.

DISTANCES FROM SECTION LINES
Ft. from Section Line
Ft. from Section Line

UTM COORDINATES (Meters,Zone:13,NAD83)
Easting: Northing:

PERMIT TO EXPOSE WATER IN A PIT

ISSUANCE OF THIS PERMIT DOES NOT CONFER A WATER RIGHT

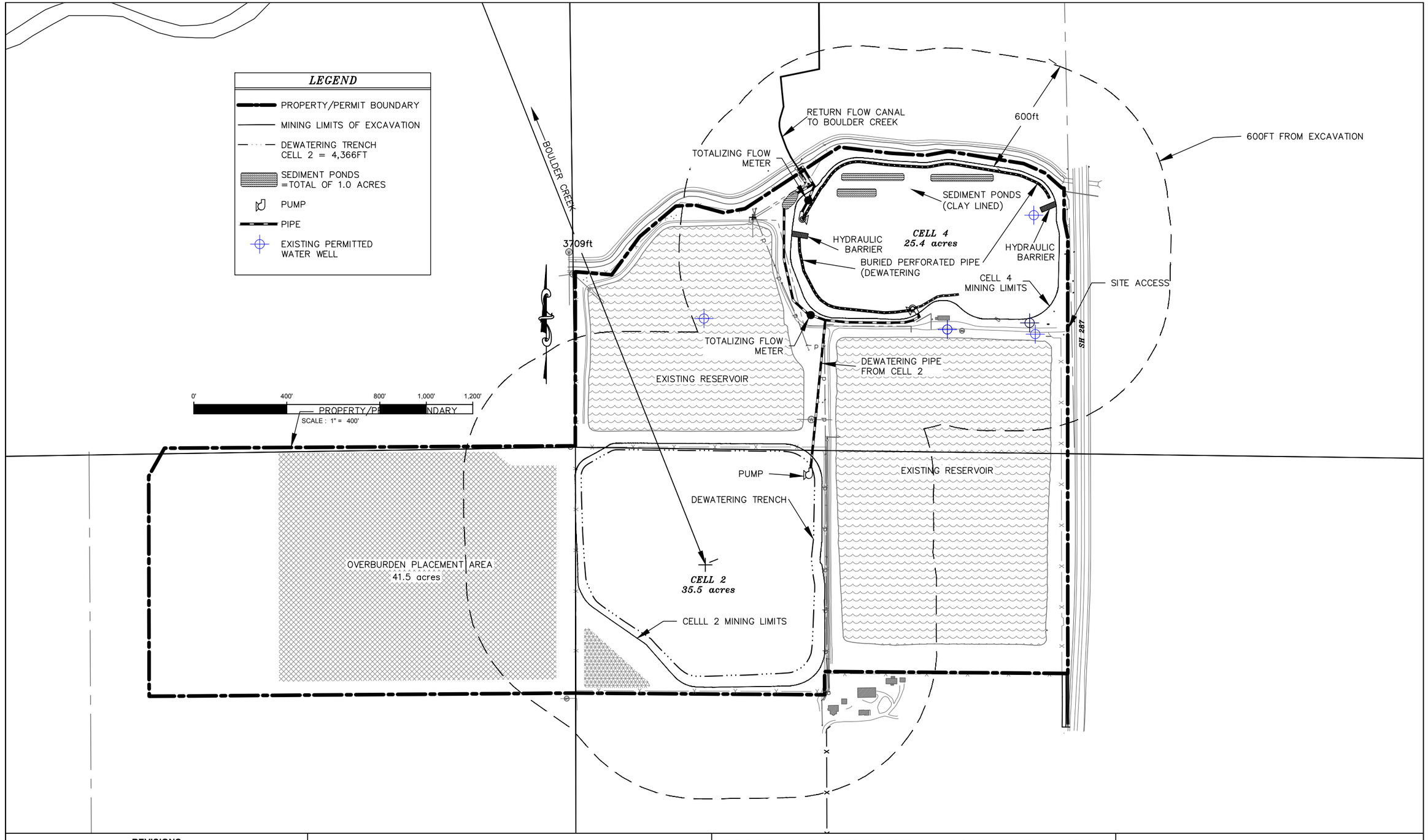
CONDITIONS OF APPROVAL

1) This well shall be used in such a way as to cause no material injury to existing water rights. The issuance of this permit does not assure the applicant that no injury will occur to another vested water right or preclude another owner of a vested water right from seeking relief in a civil court action.
2) The construction of this well shall be in compliance with the Water Well Construction Rules 2 CCR 402-2, unless approval of a variance has been granted by the State Board of Examiners of Water Well Construction and Pump Installation Contractors in accordance with Rule 18.
3) Approved pursuant to CRS 37-90-137 (2) and (11) for the construction and operation of a well (gravel pit pond) in accordance with the temporary substitute water supply plan approved by the State Engineer on February 1, 2016, for the Goose Haven Pit Expansion, Division of Reclamation, Mining & Safety Permit Number M-2010-71. The well (pond) shall not be operated unless it is included in a substitute water supply plan approved by the State Engineer or a plan for augmentation approved by the Water Court. The water supply plan for this pit is currently valid through December 31, 2016 and if it is not extended or if a court decree is not entered for a plan for augmentation, diversion of ground water from this well must cease immediately.
4) The average annual amount of ground water to be appropriated shall not exceed 20.0 acre-feet with the total surface area of the proposed ground water pond limited to 2.0 acres, or the amounts covered under a water court approved plan for augmentation or substitute water supply plan approved by the State Engineer, whichever is less. No additional water surface area shall be exposed unless a permit therefore is approved.
5) The use of ground water, in addition to evaporation loss, is limited to water used for dust control and water lost with the mined product. No other use of water is allowed unless a permit therefor is approved.
6) The owner shall mark the well (pond) in a conspicuous place with well permit number(s) and court case number(s) as appropriate. The owner shall take necessary means and precautions to preserve these markings.
7) A totalizing flow meter or other measuring method acceptable to the Division Engineer must be installed so as to measure any pumping from this gravel pit pond(s) or trenches and must be maintained in good working order. Permanent records of all diversions from the gravel pit pond(s) or trenches, tonnage of mined product, and the surface area of ground water exposure shall be maintained by the well owner (recorded at least monthly) and submitted to the Division Engineer in accordance with the terms and conditions of the substitute water supply plan or augmentation plan.
8) Pursuant to Policy 2014-1 of the State Board of Examiners of Water Well Construction and Pump Installation Contractors (Board), the minimum construction standards in Rule 10 of the Water Well Construction Rules shall be waived for gravel pit ground water ponds, except compliance with Rule 10.1 and its subsections 10.1.2, 10.1.4, 10.1.6 and Rule 10.2 and its subsection 10.2.1 is required. The owner of the gravel pit shall take necessary means and precautions to prevent contaminants from entering the gravel pit ground water pond.
9) Pursuant to Policy 2014-1 of the Board, the disinfection standards of Rule 15 of the Water Well Construction Rules shall be waived and the water well construction report requirement of Rule 17 shall be waived, except compliance with Rules 17.1.4, 17.3 and 17.4 is required. The site plan and cross section drawings required by Rule 17.1.4 shall also include the date ground water was initially exposed in the gravel pit.
10) The boundaries of the gravel pit ponds shall be more than 600 feet from any existing well constructed in the same source, that is not owned by the applicant.
11) This well is subject to administration by the Division Engineer in accordance with applicable decrees, statutes, rules, and regulations.

APPROVED
KAA

Dick Wolfe by Kaelyn Armstrong
State Engineer By

Receipt No. 3655374 DATE ISSUED 04-04-2016 EXPIRATION DATE N/A



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

WELL PERMIT APPLICATION

LAFAYETTE, CO

PREPARED FOR: ROCK PRODUCTS, LLC

FIGURE 1
600 FT WELL SPACING

SCALE	DWG NO.	REV.
1"=500'	FIGURE 2.DWG	REV

DRAWN BY:	CHECKED BY:	DATE:	SHEET
CTW	PFW	03/11/16	1 OF 1

ATTACHMENT 6.4.5-1

GOOSE HAVEN RESERVOIR COMPLEX EXPANSION #2, #4
COMPACTED CLAY LINER
CONSTRUCTION QUALITY ASSURANCE PLAN

Prepared For:
The City of Lafayette
&
Rock Product of Colorado LLC

Prepared By:
Weiland, Inc.
P.O. Box 18087
Boulder, CO 80308

October 2016

TABLE OF CONTENTS

1.0 INTRODUCTION

This Construction Quality Assurance Plan (CQAP) has been prepared for the City of Lafayette (City) and their contractor Rock Products of Colorado LLC (RP) by Weiland, Inc. (WI) as part of a Reclamation Plan for the Goose Haven Reservoir Complex Expansion #2, #4 project in Lafayette, Colorado. The purpose of this is CQAP to provide the Quality Assurance (QA) requirements for Quality Control (QC) checks for construction of Compacted Clay Liner (Liner) subsurface embankments to be constructed around the perimeter of Reservoirs #2, and #4. The requirements in this plan are to assure that the construction is incompliance with the design specifications as described in Section 6.4.5 Exhibit E- Reclamation Plan (Liner Design) of the Colorado Division of Reclamation Mining & Safety (DRMS) regular 112 permit for the site (Permit # M2010-071).

The CQAP will also provide documentation recommended by the Colorado Office of the State Engineer (SEO) as outlined in the *Guide to Specification Preparation for Slurry Walls and Clay Liners as a Component of a Colorado Mined Land Reclamation Permit*.

This document addresses, by reference of the Liner Design, the observations, test methods, test frequencies, and documentation necessary to adhere to the construction-level specifications and design details in all phases of construction. Protocol for reporting test results that certify compliance with the Liner Design, correcting construction deficiencies, and documentation of such corrections are also provided in this CQAP.

2.0 REFERENCES

The publications listed below form a part of this Plan to the extent referenced. The publications are referred to in the text by the basic designation only. Use the latest revision unless otherwise noted:

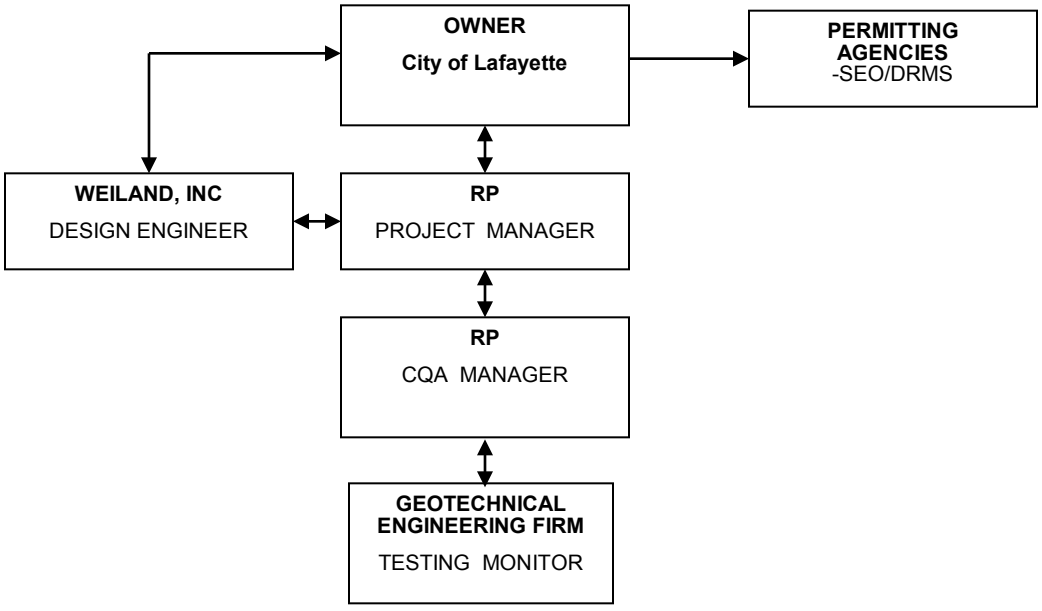
American Society for Testing and Materials (ASTM):

ASTM D422	Standard Test Method for Particle Size Analysis of Soil
ASTM D698	Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort
ASTM D2487	Standard Classification of Soils for Engineering Purposes
ASTM D2922	Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods
ASTM D3017	Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods

Colorado Department of Natural Resources, Division of Minerals and Geology. 2000. *Guide to Specification Preparation for Slurry Walls and Clay Liners as a Component of a Colorado Mined Land Reclamation Permit*. Denver, Colorado. September.

3.0 CONSTRUCTION QUALITY ASSURANCE (CQA) ORGANIZATION

The CQA organization shall consist of a Project Manager (PM) and CQA Manager representing the Operator (RP), the Engineer (Weiland, Inc.), and a Testing Monitor from a reputable third-party geotechnical engineering firm. The flowchart below presents the project organization, lines of communication, and structure of CQA inspection activities.



3.1. OWNER – PROJECT MANAGER AND CQA MANAGER

The City's contractor – Rock Products of Colorado LLC (RP) is responsible for the design and construction of the Clay Liner. This responsibility includes complying with the Liner Design requirements, the submission of CQA documentation and verification to the DRMS that the Liner was constructed in accordance with the approved Liner Design and Drawings. RP will appoint a Project Manager and a CQA Manager for the Clay Liner construction, as described below.

- RP Project Manager will administer the CQAP described herein.

- RP Project Manager is responsible for coordinating schedules, meetings, and field activities. This responsibility includes communications to other members of the CQA organization, permitting agencies, material suppliers, and subcontractors.
- The CQA Manager will report directly the RP Project Manager. The CQA Manager will have daily direct contact with Construction personnel. The CQA Manager has the authority to halt any phase of construction because of quality related concerns with respect to either materials or their installation.

The CQA Manager has the overall responsibility for CQA. The CQA Manager is responsible for reviewing the CQAP as well as the Liner Design specifications and Drawings for the work so that the CQAP can be implemented without contradictions or discrepancies. Other CQA Manager responsibilities ensuring that testing laboratories are conforming to CQA requirements and procedures, ensuring that sample chain-of-custody procedures are followed, confirming that test data are accurately reported and that test data are maintained for later reporting, and preparation of periodic reports. The CQA Manager will verify that communication of all QA/QC issues are conveyed to and acted upon by the PM. The CQA Manager will oversee the Testing Monitors and may perform duties associated with a Testing Monitor. The most important duty of the CQA manager is overall responsibility for confirming that the facility was constructed in accord with DRMS's approved Liner Design Specifications and Drawings.

Key responsibilities of the CQA Manager, include:

- Confirm that Testing Monitor's testing equipment, personnel and procedures do not change during the project or that any such changes do not result in a deterioration of the test monitoring process.
- Provide the PM with weekly reports on the field testing/monitoring results.
- Report to the PM results of all observations and tests as the Work progresses and interact with the Construction Crew to provide assistance in modifying construction methods to comply with the Liner design.

- Verify that all deficient areas have been reworked and re-tested to meet the Liner Design Specifications.
- Maintain a file of all field reports, meeting notes, weekly reports, submittals, etc.
- In conjunction with the Engineer, prepare a final CQA Report. The purpose of the CQA Report is to provide a permanent record of the construction to the Owner and DRMS such that the liner was constructed in accordance with the Liner Design Specifications and Drawings.

3.2. DESIGN ENGINEER

The Design Engineer's primary responsibility is to design an earthen liner that fulfills the performance requirements of RP, DRMS and SEO, complies with accepted design practices for impermeable liners, and meets or exceeds the minimum requirements of the Colorado SEO and DRMS. If unexpected conditions are encountered during construction, the Design Engineer may be involved with changes to some aspect of the design during the construction phase of the project. If significant design changes are required, the DRMS shall be notified and design changes shall be approved by DRMS prior to the continuation of the project. The design Engineer will also perform field surveys and stakeouts to ensure the project is being constructed as designed

3.3. GEOTECHNICAL ENGINEER – TESTING MONITOR

The Testing Monitor will perform the required testing activities activities associated with construction of the Liner Design specifications and complete field reports that will document the testing results. The Testing Monitors will report directly to the CQA and are responsible for informing the CQA if materials are within tolerance with respect to Optimum Moisture Content and Density as defined by Proctor Analysis for the respective borrow material.

4.0 TESTING SCHEDULE

The testing requirements and frequencies outlined below are prepared to demonstrate the placed and constructed material is in accordance with the Liner Design and Drawings.

4.1. FIELD TESTING

The following tests shall be performed on the Liner as applicable:

Property	Test Method	Frequency
Grain Size	ASTM D422	1 test per 10,000 cubic yards or any change in material
Moisture-Density Curve	ASTM D698	1 test per 10,000 cubic yards or any change in material
In-place density	ASTM D2922	1 test per 10,000 cubic yards
In-place moisture	ASTM D3017	1 test per 10,000 cubic yards
Classification	ASTM D2487	1 test per 10,000 cubic yards or any change in material

The following tests shall be performed on the backfill zone as applicable:

Property	Test Method	Frequency
Grain Size	ASTM D422	1 test per any change in material
Classification	ASTM D2487	1 test per any change in material
In-place density	ASTM D2922	1 test during initial method test
In-place moisture	ASTM D3017	1 test during initial method test

4.2. POST- CONSTRUCTION TESTING

Once the earthen liner construction is complete post construction testing may be conducted by the Engineer for submittal to the Colorado SEO in accordance with the "State Engineer Guidelines for Lining Criteria for Gravel Pits", August 1999, Section 3.1. The purpose of this testing is to assure that the liner meets the performance standards of the Colorado SEO. If the liner meets the performance standards, the DRMS can release the portion of the bond that covers the installation.

5.0 PROJECT MEETINGS

To successfully complete the Work, it will be necessary for the PM, CQA Manager, and Engineer to have formal, structured communications on a regular basis. This section of the CQAP provides a minimum basis for general project meetings. The following meetings can be held during the progress of the Work as deemed necessary and as described below:

5.1. PRE-CONSTRUCTION MEETING

A pre-construction meeting will be held prior to the start of major construction items. As determined by PM, the CQA Manager, and Engineer will attend the meeting to establish lines of communication, review construction plans, review the CQAP, and discuss other issues associated with construction. This meeting should take place at least one week prior to the start of major construction items.

The objectives of the pre-construction meeting are to:

- Introduce individuals involved in the project and the review their responsibilities
- Review lines of authority and communication
- Discuss the established protocol for observations and tests
- Discuss the established protocol for handling construction deficiencies, rework and re-testing to meet project Specifications
- Review methods for documenting and distributing field monitoring data and other documents
- Discuss the schedule and sequencing of work
- Make a list of action items requiring resolution and assign responsibility
- Conduct a site walk to verify that the Liner Design and Specifications are understood

5.2. PROGRESS MEETINGS

Progress meetings can be held by RP at the discretion of the City, PM, and/or the Engineer at the work site at an agreed-upon date and time.

The objectives of each progress meeting are to:

- Review the activities and accomplishments completed since the last meeting
- Review the work location activities and construction monitoring requirements for upcoming work
- Discuss any potential construction problems

A representative of the CQA Manager will take meeting minutes at each progress meeting.

5.3. PROBLEM OR WORK DEFICIENCY MEETINGS

Special meetings will be held when a problem or deficiency has occurred or may possibly occur. As determined by PM, attendance at these special meeting is mandatory for PM, CQA Manager and Engineer. The purpose of the meeting is to define and resolve the problem or recurring work deficiency in the following manner:

- Define and discuss the problem or deficiency
- Review alternative solutions
- Implement a plan to resolve the problem or deficiency

The CQA Manager will document each special meeting.

6.0 SUBMITTALS AND REPORTING

The CQA Manager in conjunction with the Engineer is responsible for submitting the following reports and forms to PM. The following forms and reports are attached in Appendix I through III of this CQAP. The schedules for submission of the following reports are included in the respective report sections.

6.1. PRODUCTION REPORT/ QUALITY CONTROL REPORT

The CQA monitor shall provide a weekly report to RP regarding earthwork activities. Detailed field notes shall be taken documenting the soil type, particle and clod size, loose lift thickness, moisture conditioning process, equipment used, number of passes, compacted lift thickness, bonding of lifts, and dry density with relative in-place moisture content. The field notes shall be included on a Production Report/Contractor Quality Control Report. A Production Report/Contractor Quality Control Report template has been included in Appendix I of this document. The Product Report/Quality Control Reports shall be submitted to RP at the end of the week that work occurred.

6.2. TESTING PLAN AND LOG

As tests are performed, the Testing Monitor shall record on the Testing Plan (or similar log) and Log the date the test was conducted, the date the results were forwarded to PM, remarks and acknowledgement that an accredited or PM approved testing laboratory was used. A Testing Plan and Log template has been included in Appendix II of this document. The Testing Plan and Log shall be submitted to PM at the end of each week during the construction period.

REWORK ITEM LIST

The CQA Manager shall maintain a list of work that does not comply with the Liner Design and Drawings, identifying what items need to be reworked, the date the item was originally discovered, and the date the item was corrected. There is no requirement to report a rework item that is corrected the same day it is discovered. A Rework Item List template has been included in Appendix III of this document. The Rework Item List shall be submitted at the end of each month during the construction period.

6.3. AS-BUILT DRAWINGS

The Engineer is required develop and review the as-built Drawings to ensure that as-built Drawings are kept current on a monthly basis and marked to show deviations that have been made from the original Design Drawings. Upon completion of the work, the Engineer shall furnish a certificate attesting to the accuracy of the as-built Drawings prior to submission to PM.

6.4. CONSTRUCTION CERTIFICATION REPORT

Upon completion of the work, the Engineer shall furnish a certificate to PM attesting that “the work has been completed, inspected tested and is in compliance with the Liner Design.

APPENDIX I

EXAMPLE PRODUCTION REPORT/QUALITY CONTROL REPORT

Production Report/ Quality Control Report

Date: _____
Report No. _____
Page 1 of _____
Attachment: Y / N
sketch _____
comments _____

M T W Th F S Su

Project Information **Title:** .....
Location: .....
.....

Job Site Conditions Wind: N E S W Temperature: high low Cloud Cover Precipitation

am	_____	_____	_____	_____
pm	_____	_____	_____	_____
Humidity	_____	_____		

Schedule and Drawings
Work **IS** / **IS NOT** on schedule per the revised schedule of _____
As-built drawings **ARE** / **ARE NOT** up to date

Work Item	**Comment and Location Section** *(describe all work or deviations from work plan in detail below or attach additional comment sheet as needed)*	**Conforms**	
		Y	**N**

CONSTRUCTION EQUIPMENT USED	TASK	NO. OF PASSES/DESCRIPTION OF OPERATION

EARTHWORK DESCRIPTION	SOIL TYPE	PARTICLE SIZE	CLOD SIZE	LOOSE LIFT THICKNESS	COMPACTED LIFT THICKNESS	BONDING NOTES	DRY DENSITY	IN-PLACE MOISTURE

Quality Control Materials and Testing

Submittals available for review:_____

Installed materials meet contract specifications?

_____

_____

_____

Samples/tests by Contractor	Samples/tests by QCA Monitor

QCA Monitor information

Time on-site:_____ Time departed:_____

Project Number:_____ Contract #:_____

Title: _____

QCA Monitor: _____ Company: _____

Phone: _____ Fax: _____

I certify this report to be complete and accurate based upon my observations, knowledge, and review of contract requirements and state/federal environmental requirements. Contract specifications and drawings HAVE/HAVE NOT been reviewed. Any discrepancies from plans or specifications HAVE/HAVE NOT been noted to the office in charge of construction.

_____ / _____

(signature) (date)

Distribution: QCA Manager
Contract File
Field File

APPENDIX II

EXAMPLE TESTING PLAN AND LOG

TESTING PLAN AND LOG

FORT LUPTON LINER CONSTRUCTION

DATE	TEST	Conducted by	DESCRIPTION	RESULTS	CONFORMS (y/n)

APPENDIX III

EXAMPLE REWORK ITEM LIST

REWORK ITEMS LIST

FORT LUPTON LINER CONSTRUCTION

DATE	ITEM DESCRIPTION	INITIAL CONDITION	PROPOSED CHANGE DESCRIPTION	FINAL CONDITION	APPROVED BY

6.4.5 Exhibit E - Reclamation Plan

(a) Description of the Type of Reclamation

The site will be reclaimed to developed water resource and will construct two additional water storage reservoirs Reservoir #2 and Reservoir #4, which correspond to Cells 2 and 4 respectively. Reservoir #2 shall have a normal pool water surface area of approximately 32 acres and Reservoir #4 will have a normal pool water surface area of approximately 24 acres. Both reservoirs will be constructed with a compacted clay liner around the perimeter of the mining highwall as shown in Figure 6.4.5 – 1 Typical Section, and Exhibit F, Sheets 1-4. No slurry wall will be constructed as indicated in the previous permit application.

Reclamation Earthwork/Compacted Clay Liner Construction

A summary table of reclamation earthwork volumes, areas and lengths is given as Table 6.4.5-1.

Table 6.4.5-1. Reclamation Earthwork Summary

CELL 2	30-45ft deep					
ITEM	**VOLUMES**		**LENGTH**		**AREAS**	
Total Embankment	163,040.00	yd^3				
Clay Liner	90,507.25	yd^3				
Slope fill	76,550.00	yd^3				
Keyway Volume	4017.25	yd^3				
Keyway Length			4338.63	ft		
Pit Floor Area					150,390.76	yd^2
Pit Floor Area					31.13	ac
Pit Floor Depth of Excavation			1.81	ft		
Topsoil / Revegetation Replacement Area					34,061.02	yd^2

Topsoil / Revegetation Replacement Area					7.05	ac
Topsoil Replacement Depth			1	ft		
Topsoil Replacement Volume	11,352.54	yd^3				
CELL 4	25-30ft deep					
ITEM	**VOLUMES**		**LENGTH**		**AREAS**	
Total Embankment	117,205.00	yd^3				
Clay Liner	66,240.00	yd^3				
Slope fill	50,965.00	yd^3				
Keyway Volume		yd^3				
Keyway Length			3903.28	ft		
Pit Floor Area					112,577.51	yd^2
Pit Floor Area					23.30	ac
Pit Floor Depth of Excavation			1.77	ft		
Topsoil / Revegetation Replacement Area					21,053.98	yd^2
Topsoil / Revegetation Replacement Area					4.36	ac

Topsoil Replacement Depth			1	ft		
Topsoil Replacement Volume	7,017.29	yd^3				

Reservoir #2 shall be reclaimed first. Following mining of Cell 2, reclamation will begin by constructing a the subsurface drain as specified in engineering documents in the existing permit. Following installation of the drain, preparation of the borrow material on the excavation floor will be performed by disking the weathered claystone in preparation for moisture conditioning. Geotechnical investigations conducted by CTL Thompson indicate the weathered claystone is a suitable borrow material with plasticity indices near or above 20 (see Table 6.4.5-2). The liner borrow material shall also meet the following criteria;

a) Percent fines (should contain at least 20% fines on a dry weight basis).

b) Percentage of gravel (material retained on a No. 4 sieve should not exceed 10%).

c) Stones and rocks (no rocks larger than 2 inches should be in the liner material).

A drain pipe will then be installed at the toe of the mining highwall and into the weathered shale with a filter pack which will be in hydraulic communication with the gravel layer to facilitate dewatering during liner construction. The Keyway surrounding the perimeter of the excavation and offset approximately 6ft from the toe of slope will then be excavated as specified in Figure 6.4.5 – 1 Typical Section. Once the borrow material is within the moisture specification (0 to +3% of optimum moisture content), the compacted clay liner will then be constructed by making passes with Miskin Scrapers towed by JD 9520's in 8" lifts. This type of scraper will provide significant compaction energy to bring each lift to 95% standard proctor maximum dry density. *Following placement, each lift shall be scarified to a depth approximately 2" to ensure adequate bonding between lifts. Scarification shall be achieved with disking equipment*. Once the compacted clay liner is completed to the approximate geometry/specifications given in Figure 6.4.5 – 1 Typical Section, the slope will be backfilled to 3H:1V with overburden stored to the west of Reservoir #2. This controlled backfill shall be placed in 8" lifts to 95% standard proctor maximum dry density at 0 to +3% optimum moisture content. Following backfilling of the slopes, a protective shell shall be constructed from the ground surface above to 10ft below the normal pool elevation. The specifications for the protective shell are given in Figure 6.4.5 – 1 Typical Section. Following Mining of Cell 4, reclamation / construction of Reservoir #4 will occur in the same fashion as Reservoir #2.

Table 6.4.5-2. Weathered Claystone Geotechnical Data

BORING	CELL	DEPTH	MOISTURE CONTENT	DRY DENSITY	LIQUID LIMIT	PLASTICITY INDEX	PASSING #200 SIEVE	PERME - ABILITY
		[ft]	[%]	[PCF]			[%]	[cm/sec]
TH-2	4	24	12.6	124	39	22		
TH-3	4	24	9	120	36	19	94	
TH-5	4	24	13.6	121	44	25	91	
TH-5	4	29	12.7	123	39	22	93	$6X10^{-8}$
TH-9	4	24	11.9	121	41	23	77	
TH-11	2	19	10	119	33	18	91	
TH-11	2	29	9.3	107	35	20	94	
TH-14	2	49	12.4	ND	38	24	64	
TH-16	2	29	9.6	130	40	28	98	
TH-19	2	31-34	20.3	ND	36	21	58.9	

Compacted Clay Liner Quality Assurance/Quality Control Plan

Please see Attachment 6.4.5 – 1

Following construction of the compacted clay liner final construction report and certification for the pit liner shall be completed and submitted to the Division.

The operator shall commit to no modifications to the design specifications without prior Division approval.

(b) Post Mining Land Use Comparison

The site is currently used as a developed water resource facility and is consistent with the Town of Lafayette's master plan. Other land uses surrounding the site include rural residential and agricultural and Boulder County Conservation easements. The Goose Haven reservoir site is compatible with those land uses.

(c) Description of How the Reclamation Plan will Meet the Requirements of Section 3.1

Completion of the reclamation plan described herein shall meet the requirements of Section 3.1

(d) Topsoil Segregation

Topsoil shall be segregated as shown in Exhibit C-2.

(e) Reclamation Sequence and Timetable

An estimate of the sequence and periods of time for each reclamation activity is given in Table 6.4.5-1.

Table 6.4.5-1. Reclamation Sequence Summary

Mining Cell / Size	Reclamation Activity	Approximate Time Period
Cell 2 / 35 acres	Construct Compacted Clay Liner and Construct Appurtenant Pipeworks	Following Mining of Cell 2
Cell 2 / 35 acres	Perform Topsoiling / Revegetation	Following Construction of Compacted Clay Liner
Cell 4 / 26 acres	Construct Compacted Clay Liner and Construct Appurtenant Pipeworks	Following Mining of Cell 4
Cell 4 / 26 acres	Perform Topsoiling / Revegetation	Following Construction of Compacted Clay Liner

(f) Descriptions and Specification of Reclamation activities

(i) Final Grading

Final slopes will be graded to 3H:1V

(ii-v) Seeding, Fertilization, Revegetation, Topsoiling

Topsoil Replacement / Revegetation

Topsoil will be replaced to an approximate depth of 1 ft for the areas shown in as topsoil/revegetation areas in Exhibit F Sheets 1-2. The overburden stockpile to the west of Cell 2 will continue to supply fill material after the reservoirs are reclaimed, therefore only revegetation will occur in that area. Once the fill has been removed from the site, the underlying topsoil will be reseeded again.

Seeding and Fertilizing

The proposed seeding areas are shown on Exhibit F – Reclamation Plan Map. The recommended seeding method is by drill and seeding rates assume this method. The species composition of the seed mixture recommended for reclamation is shown in Table E-3 below.

Table E-3. Recommended Seed Mixture

Species (Variety)	***Rate – pure live seed (PLS) lbs/ac***	***Native/ Introduced***	***W/C Season***

Thickspike wheatgrass (Critana)	8.0 to 10.0	Native	Cool
Sideoats grama (Vaughn)	5.0 to 7.0	Native	Warm
Switchgrass (Nebraska-28)	4.0 to 6.0	Native	Warm
Alfalfa (Nomad)	3.0 to 5.0	Introduced	NA
TOTAL	20.0 to 28.0		

Based on this seed mixture, an application rate of approximately 20.0 to 28.0 lbs PLS/ac will be used. Topsoil should be disked prior to seeding. It is recommended that fertilizer be utilized for reclamation. A standard application of fertilizer will be used and applied at a rate of 250 lbs/ac as shown in Table E-4.

Table E-4. Fertilizer Application

Fertilizer	***Standard rate lbs/acre***
Diammonium phosphate (18-46-0) (46-53% available P_2O_5 with 18-21% N)	250

Fertilizer will not be used near the edge of the reservoir, since the possibility of nitrate contamination in the pond water exists. The total disturbed area to be seeded is approximately 53acres. The total area to be fertilized is approximately 53 acres. Seeding and fertilizing will be completed after the overburden and topsoil is replaced, smoothed to conform to the existing topography and disked. Optimal periods of seeding are in the fall (after November 1st) or in the spring from late March up to April 30th. Mulching will not be completed as the quality soils and availability of water should facilitate the rapid establishment of perennial grasses.

Alternative Reclamation Plan

There is no alternative reclamation plan.

6.4.7 Exhibit G - Water Information

(1) The operation will affect groundwater systems, however through execution of the temporary substitute water supply plan, there will not be a net change to tributary groundwater flow to Boulder Creek.

(2) (a) Surface water structures are shown in Exhibit C1, Pre-Mining Plan Map

(b) The sand and gravel deposit to be mined is an alluvial aquifer tributary to Boulder Creek.

(c) Water from dewatering operations is routed to sediment pond to allow for settling of suspended sediment. A stormwater management plan has been prepared for the site which identifies BMP's to prevent pollution to surface waters due to stormwater runoff.

(3) Under full operation, the project will consume approximately 20 acre-ft / year due to evaporative loss of exposed groundwater in dewatering trenches, water lost within the mined product and water consumed for dust control.

(4) The replacement source for all depletions to Boulder Creek is fully consumable water rights owned by the City of Lafayette.

(5) The applicant has applied for and received a NPDES Stormwater Discharge Permit. The permit number is COG501535

The groundwater Monitoring and Mitigation plan has been revised as follows;

Step 1 - Establish Monitoring Well Grid and Baseline Ground Water Elevations

CTL Thompson, Inc. had supervised the installation of 7 piezometers (4 up gradient and 3 down gradient from the proposed mining operations) within the City of Lafayette property surrounding the proposed mining operations. Piezometers 1 through 3 have been in service for several years and piezometers 4 through 7 were installed on July 1,9 and 16, 2009. The piezometers are at the locations shown on Exhibit F. Water level measurements were made at the time of drilling and several days after drilling. Since that time the City of Lafayette has continued monitoring of the piezometers. The measurements are attached as an appendix. From these measurements, we have established the following seasonal baseline ground water elevations;

	Winter Baseline December 31	Spring Baseline March 31	Summer Baseline June 30	Fall Baseline September 31
Piezometer	Water Elevation	Water Elevation	Water Elevation	Water Elevation
1	5037.9	5036.4	5039.3	5038.8
2	5036.2	5035.9	5036.7	5036.3
3	5030.4	5030.3	5033.7	5031.7
4	5062.6	5062.6	5064.8	5064.1
5	5060.7	5060.7	5061.9	5061.3
6	5044.2	5043.3	5045.9	5045.8
7	5039.1	5039.0	5041.5	5041.4

Ground water elevations will continue to be measured at the established piezometers quarterly starting at the time of permit approval from the DRMS. This will further confirm seasonal water surface elevations for the site prior to mining. In addition, just prior to beginning Compacted Clay and drain installation, an additional measurement at each well will be completed. Measurements will be provided to the RMS as part of an annual report.

Step 2 - Monitoring

Following compacted Clay Liner and drain installation and through mining, piezometers will continue to be measured quarterly with measurements provided to the DRMS as part of the annual report.

Step 3 - Mitigation Triggers

A ground water modeling study was prepared for the proposed operation to include estimated effects as a result of Groundwater Barrier and drain installation. The anticipated effects modeled at the locations of the proposed piezometers are as follow:

Piezometer	Predicted Change in Water Elevation (Feet)
1	0
2	-0.5
3	0
4	0
5	0
6	3.0
7	0

As can be seen the highest anticipated change occurs in piezometer 6 in the south east corner of the proposed mining operation and most near the Swartz residence. Despite this change, the ground water surface is anticipated to stay well below (approximately 11 feet) the basement floor elevation of the home following drain and Compacted Clay Liner construction.

If a change in groundwater elevation greater than two feet beyond the seasonal baseline plus the anticipated (modeled) change in ground water elevations occurs, then an intermediate second measurement will be taken 45 days after the initial reading. If the reading is still outside the mitigation trigger and an impact is imminent (i.e. a flooded basement or field), mitigation will be performed.

Step 4 - Mitigation Alternatives

Mitigations to a raised or lowered water table will be completed by the City under the following conditions.

1. Monitoring data demonstrates that a change in ground water surface elevation has occurred beyond that anticipated through Compacted Clay Liner and drain installation and as a result of seasonal variation.
2. The change in ground water elevation has caused an impact to adjacent water supply, an impact is imminent, or has caused an impact to basement or field as a result of high groundwater elevation.

Lowering of water table

If mitigation from a lowered water table is required, one of the two following actions will be completed by the City.

1. Alternative 1 - The City will provide the well owner with water, until the water level returns to normal.
2. Alternative 2 - The City will drill the affected party's well deeper to restore well production to pre project conditions.

Raising of Water Table

If mitigation to lower the water table is required, one of the two following actions will be completed by the City.

1. Alternative 1 - A well and pump will be installed and operated to locally reduce the water elevations in the aquifer.
2. Alternative 2 - An additional subsurface drain may be installed to reduce the water surface elevations in the vicinity of the impacted structure or field.

Commitment

Operator shall commit to the mitigation measures above regardless of whether the mitigation triggers are the result of installing a clay liner on Reservoir #2 or Reservoir #4

6.4.9 Exhibit I – Soils Information

No change to the existing Exhibit I, except for of the addition of the following statement:

The operator will commit to ripping or disking the stockpile area west of Reservoir #2 to eliminate compacted conditions prior to seeding

6.4.10 Exhibit J – Vegetation

There is no change to the existing Exhibit J, except for the addition of the following statement;

The operator will commit to controlling noxious weeds throughout the life of the mine.

LEGEND

EXISTING	PROPOSED
PROPERTY/PERMIT BOUNDARY AND AFFECTED AREA BOUNDARY	MINING LIMITS OF EXCAVATION
SURROUNDING PARCEL BOUNDARY	
W — UNDERGROUND WATER PIPELINE	
E — UNDERGROUND ELECTRIC	
OH E — OVERHEAD POWER LINE	
T — T — UNDERGROUND TEL LINE	
CANAL	
CHAIN LINK FENCE	
UTILITY POLE	
ELEVATION CONTOUR LINE (5FT)	
ELEVATION CONTOUR LINE (1FT)	
GRAVEL ROAD	
BUILDING	
RESERVOIR	
100 YR FLOODPLAIN	

EASEMENT:
NEW CONSOLIDATED LOWER BOULDER RESERVOIR & DITCH COMPANY
P.O. BOX 1120
FREDERICK, CO 80530

TIEFEL DOUGLAS A
PO BOX 17130
BOULDER CO, 80308

1 SOUTH PLATTE SUPPLY CANAL & LOWER BOULDER DITCH

EXCEL UTILITY POLE 3m

COUNTY OF BOULDER
P O BOX 471
BOULDER CO
80306

TIEFEL FAMILY LLC THE
PO BOX 17130
BOULDER CO, 80308

COUNTY OF BOULDER
P O BOX 471
BOULDER CO
80306

1353 ft

EXCEL UTILITY POLE 3l

CELL 4
~26 ACRES

EXCEL UTILITY POLE 3k

5 LEFT HAND WATER DISTRICT PIPELINE

NCWCD ACCESS MH
STATION 1234+00

EXCEL UTILITY POLE 3j

7 COLORADO DEPARTMENT OF TRNASPORTATION
REGION 4 ACCESS MANAGEMENT UNIT
1420 2ND STREET
GREELEY, CO 80631

EXCEL UTILITY POLE 3i

6 CENTURYLINK UNDERGROUND TELEPHONE LINE

EXCEL UTILITY POLE 3h

SITE BENCHMARK
GEOSERV CONTROL POINT
ELEV.: =5,052.62

SH 287

COUNTY OF BOULDER
P O BOX 471
BOULDER CO
80306

DRAINAGE

GULCH

BULLHEAD

NTC & CO LLP FBO
BRIAN M MCGUIRE IRA
6053 BRANDYWINE CT
BOULDER CO
80301

COUNTY OF BOULDER
P O BOX 471
BOULDER CO
80306

16 15
21 22

3a EXCEL UTILITY POLE

2 NORTHERN COLORADO WATER CONSERVANCY DISTRICT
36" PIPELINE

TOE OF SLOPE SETBACK MIN. OF 72FT FROM UTILITY POLES

3b EXCEL UTILITY POLE

CLAPP MARK R
9907 ISABELLE RD
LAFAYETTE CO
80026

NORTHERN COLORADO WATER CONSERVANCY DISTRICT
80FT EASEMENT

CELL 2
~35 ACRES

TOE OF SLOPE SETBACK MIN. OF 72FT FROM UTILITY POLES

3c EXCEL UTILITY POLE

EXISTING CLAY LINER RESERVOIR #1

TOE OF SLOPE SETBACK MIN. OF 72FT FROM UTILITY POLES

3d EXCEL UTILITY POLE

LENART MARC & CONNIE
9905 ISABELLE RD
LAFAYETTE CO
80026-9103

TOE OF SLOPE SETBACK MIN. OF 72FT FROM UTILITY POLES

3e EXCEL ENERGY UTILITY POLE

3f EXCEL ENERGY UTILITY POLE

EXCEL UTILITY POLE 3g

SCHWARTZ HOUSE 4

SCHWARTZ FRANKLIN D
REVOCABLE TRUST ET AL
10503 ISABELLE RD BOULDER

SCHWARTZ THOMAS D
10641 ISABELLE RD
LAFAYETTE CO, 80026

KURYLKO NATALIE & JASON A CONDON
10029 ISABELL RD
LAFAYETTE CO, 80026-9103

SISK NANCY B
PO BOX 233
LAFAYETTE CO, 80026-0233

CITY OF LAFAYETTE
1290 S PUBLIC RD
LAFAYETTE CO
80026

REVISIONS

REV	DESCRIPTION	DATE	APPROVED

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

GOOSE HAVEN RESERVOIR COMPLEX EXPANSION #2,#4
REGUALR 112 MINING PERMIT

LAFAYETTE, CO

PREPARED FOR: ROCK PRODUCTS

EXHIBIT C - PRE-MINE PLAN MAP

SCALE	DWG NO.	REV.
1"=200'	EXHIBIT C PRE-MINE PLAN MAP A-1.DWG	REV

DRAWN BY:	CHECKED BY:	DATE:	SHEET
CTW	PFW	10/31/16	SHEET 1 of 1

LEGEND

EXISTING	PROPOSED
PROPERTY/PERMIT AFFECTED AREA BOUNDARY	MINING LIMITS OF EXCAVATION
W UNDERGROUND WATER PIPELINE	MINING HIGHWALL
E UNDERGROUND ELECTRIC	DEWATERING TRENCH
OH E OVERHEAD POWER LINE	OVERBURDEN STOCKPILE AREA
t t UNDERGROUND TEL LINE	TOPSOIL STOCKPILE AREA
SURFACE WATER	CONVEYOR
CHAIN LINK FENCE	SALEABLE MATERIAL STOCKPILE
UTILITY POLE	DEWATERING PIPES/DRAINS
GRAVEL ROAD	HAUL ROADS (SUBJECT TO CHANGE)
BUILDING	
RESERVOIR	

TOPSOIL STOCKPILE AREA
~9.5 acres

OVERBURDEN STOCKPILE AREA
~32.0 acres

1:1 HIGHWALL SLOPE

DEWATERING TRENCH

HAUL ROAD

80ft NCWCD EASEMENT

DIRECTION OF MINING

DIRECTION OF MINING

CELL 2
~35 ACRES

TOE OF SLOPE SETBACK MIN. OF 72FT FROM UTILITY POLES

TOE OF SLOPE SETBACK MIN. OF 72FT FROM UTILITY POLES

TOE OF SLOPE SETBACK MIN. OF 72FT FROM UTILITY POLES

TOE OF SLOPE SETBACK MIN. OF 72FT FROM UTILITY POLES

2 NCWCD 36" PIPELINE

BENCH AT 5,050

3:1 HIGHWALL SLOPE

SLOPE DRAIN TO BE INSTALLED PER CTL 2010 GROUNDWATER RESPONSE STUDY

EXISTING CLAY LINER RESERVOIR #1

PIT RUN CANAL

3a EXCEL UTILITY POLE

3b EXCEL UTILITY POLE

3c EXCEL UTILITY POLE

3d EXCEL UTILITY POLE

3e EXCEL ENERGY UTILITY POLE

3f EXCEL ENERGY UTILITY POLE

EXCEL UTILITY POLE 3g

SCHWARTZ HOUSE 4

0' 100' 200' 250' 300'

SCALE: 1" = 100'

REVISIONS

REV	DESCRIPTION	DATE	APPROVED

Weiland, Inc.
Environmental & Engineering

PO BOX 18087
BOULDER, CO 80308
ph 303-443-9521

GOOSE HAVEN RESERVOIR COMPLEX EXPANSION #2,#4
REGUALR 112 MINING PERMIT

LAFAYETTE, CO

PREPARED FOR:

ROCK PRODUCTS

EXHIBIT D - MINE PLAN MAP
SHEET 1

SCALE	DWG NO.	REV.
1"=100'	EXHIBIT D MINE PLAN MAP SHEETS 1-2 A-1.DWG	REV

DRAWN BY:	CHECKED BY:	DATE:	SHEET
CTW	PFW	10/31/16	SHEET 1 of 2

LEGEND

EXISTING	PROPOSED
PROPERTY/PERMIT AFFECTED AREA BOUNDARY	MINING LIMITS OF EXCAVATION
UNDERGROUND WATER PIPELINE	MINING HIGHWALL
UNDERGROUND ELECTRIC	DEWATERING TRENCH
OVERHEAD POWER LINE	OVERBURDEN STOCKPILE AREA
UNDERGROUND TEL LINE	TOPSOIL STOCKPILE AREA
SURFACE WATER	CONVEYOR
CHAIN LINK FENCE	SALEABLE MATERIAL STOCKPILE
UTILITY POLE	DEWATERING PIPES/DRAINS
GRAVEL ROAD	HAUL ROADS (SUBJECT TO CHANGE)
BUILDING	
RESERVOIR	

1 SOUTH PLATTE SUPPLY CANAL & LOWER BOULDER DITCH

SEDIMENT POND

SEDIMENT POND

SEDIMENT POND

DEWATERING PIPE (BURIED)

LIMITS OF EXCAVATION

1:1 HIGHWALL SLOPE

EXCEL UTILITY POLE 3m

EXCEL UTILITY POLE 3l

EXCEL UTILITY POLE 3k

EXCEL UTILITY POLE 3j

EXCEL UTILITY POLE 3i

EXCEL UTILITY POLE 3h

CELL 4
~26 ACRES

MATERIAL PROCESSING
PLANT (LAYOUT APPROXIMATE)

HAUL ROAD

SCALE HOUSE

SCALE

5 LEFT HAND WATER DISTRICT PIPELINE

7 COLORADO DEPARTMENT OF TRNASPORTATION
REGION 4 ACCESS MANAGEMENT UNIT
1420 2ND STREET
GREELEY, CO 80631

6 CENTURYLINK UNDERGROUND TELEPHONE LINE

SH 287

SITE ACCESS

Site Benchmark
GEOSURV Control Point
Elev=5052.62

PIT RUN CONVEYOR

1:1 HIGHWALL SLOPE

DEWATERING TRENCH

3a EXCEL UTILITY POLE

REVISIONS

REV	DESCRIPTION	DATE	APPROVED

Weiland, Inc.
Environmental & Engineering

PO BOX 18087
BOULDER, CO 80308
ph 303-443-9521

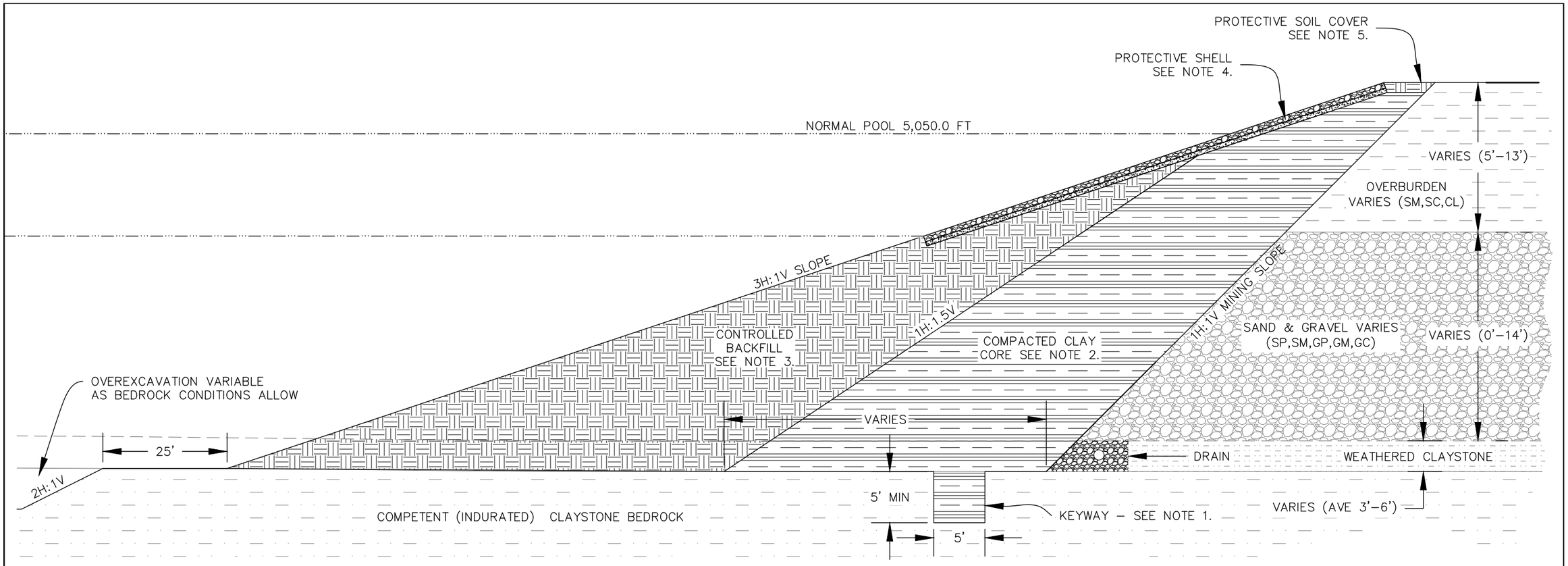
GOOSE HAVEN RESERVOIR COMPLEX EXPANSION #2,#4
REGUALR 112 MINING PERMIT
LAFAYETTE, CO

PREPARED FOR:
ROCK PRODUCTS

EXHIBIT D - MINE PLAN MAP
SHEET 2

SCALE	DWG NO.	REV.
1"=100'	EXHIBIT D MINE PLAN MAP SHEETS 1-2 A-1.DWG	REV

DRAWN BY:	CHECKED BY:	DATE:	SHEET
CTW	PFW	10/31/16	SHEET 2 of 2



NOTES:

1. KEYWAY SIDE SLOPES SHALL BE VERTICAL OR A MINIMUM OF 0.5H:1V. KEYWAY WIDTH SHALL BE A MINIMUM OF 5 FT. KEYWAY DEPTH SHALL BE A MINIMUM OF 5FT OR TO REFUSAL BY JD 400. THE KEYWAY SHALL BE FILLED WITH COMPACTED CLAY MATERIAL IN MAX 8" LIFTS TO 95% STANDARD PROCTOR DRY DENSITY AT 0 TO +3% OF THE OPTIMUM MOISTURE CONTENT.

2. THE COMPACTED CLAY CORE SHALL BE CONSTRUCTED OF PROCESSED AND MOISTURE CONDITIONED WEATHERED CLAYSTONE MATERIAL BORROWED FROM THE PIT FLOOR. THE MATERIAL SHALL BE PLACED IN 8" LIFTS TO 95% STANDARD PROCTOR DRY DENSITY AT 0 TO +3% OF THE OPTIMUM MOISTURE CONTENT. FOLLOWING PLACEMENT, EACH LIFT SHALL BE DISKED TO A DEPTH OF 2" TO ENSURE BONDING BETWEEN LIFTS.
3. CONTROLLED BACKFILL SHALL BE COMPOSED OF OVERBURDEN MATERIAL AND PLACED IN 8" LIFTS TO 95% STANDARD PROCTOR DRY DENSITY AT 0 TO +3% OF THE OPTIMUM MOISTURE CONTENT.

NOTES CONTINUED:

4. THE PROTECTIVE SHELL SHALL BE PLACED ON THE SLOPE TO BETWEEN GROUND SURFACE AND 10FT BELOW (5,053FT–5,040FT). PROTECTIVE SHELL SHALL BE CONSTRUCTED OF PROCESSED ONSITE ROCK WITH D50=3.5" AND 100% COARSER THAN 0.75". THE SHELL SHALL BE PLACED TO A THICKNESS OF 7" AND BEDDED INTO 6" OF TYPE I GRANULAR BEDDING.

5. PROTECTIVE SOIL COVER SHALL BE PLACED TO A DEPTH OF 6"=8" ABOVE COMPACTED CLAY LINER ON HORIZONTAL EXPOSURES FOLLOWED BY REVEGETATION.

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

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

GOOSE HAVEN RESERVOIR COMPLEX
EXPANSION #2, #4 REGULAR 112 PERMIT
LAFAYETTE, CO

PREPARED FOR: ROCK PRODUCTS, LLC

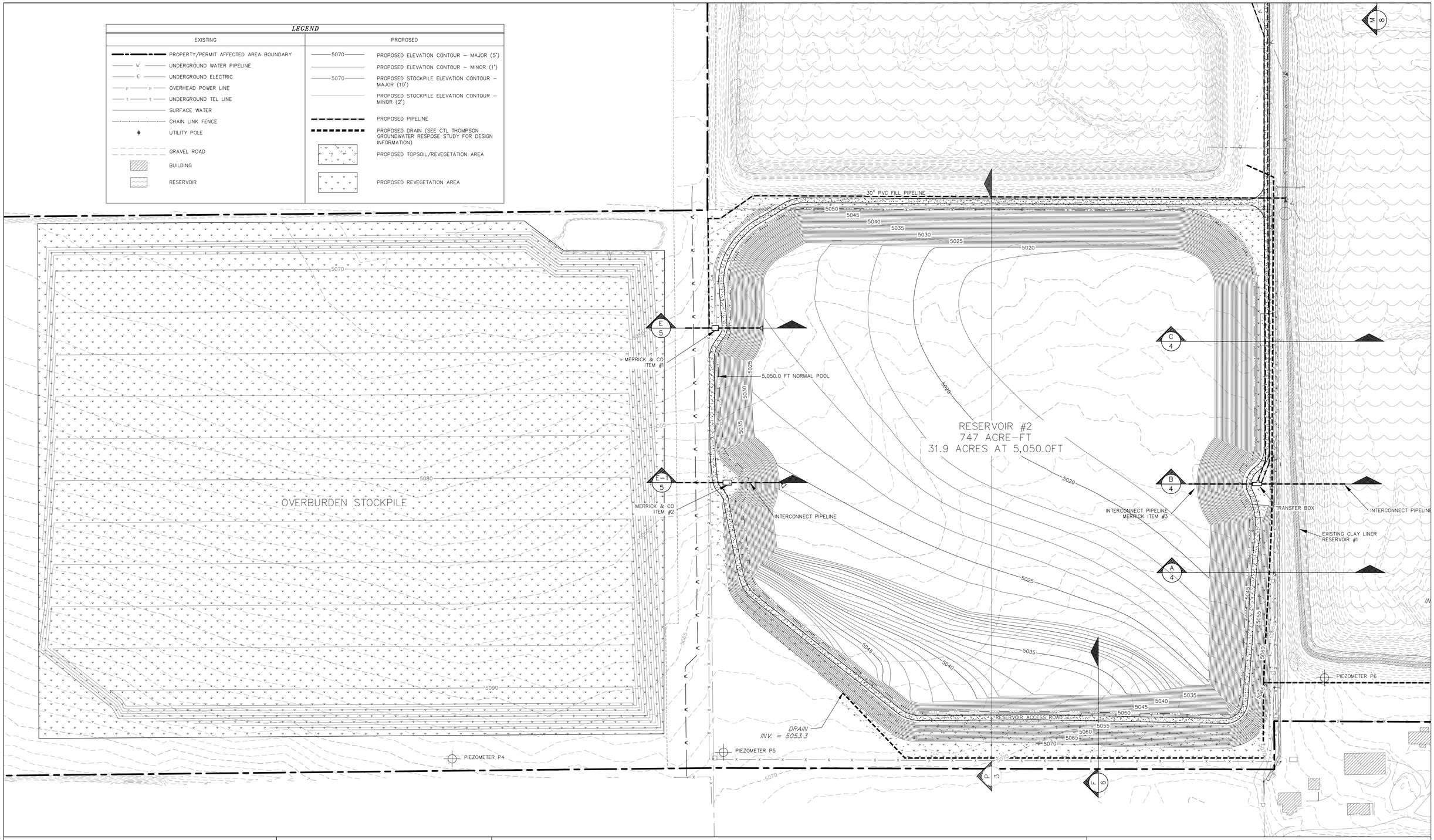
EXHIBIT E - FIGURE 1
TYPICAL SECTION

SCALE	DWG NO.	REV.
NTS	TYPICAL SECTION A-1.DWG	REV

DRAWN BY:	CHECKED BY:	DATE:	SHEET
CTW	PFW	10/31/16	1 OF 1

LEGEND

EXISTING	PROPOSED
PROPERTY/PERMIT AFFECTED AREA BOUNDARY	5070 PROPOSED ELEVATION CONTOUR – MAJOR (5')
W UNDERGROUND WATER PIPELINE	PROPOSED ELEVATION CONTOUR – MINOR (1')
E UNDERGROUND ELECTRIC	5070 PROPOSED STOCKPILE ELEVATION CONTOUR – MAJOR (10')
p p OVERHEAD POWER LINE	PROPOSED STOCKPILE ELEVATION CONTOUR – MINOR (2')
t t UNDERGROUND TEL LINE	PROPOSED PIPELINE
SURFACE WATER	PROPOSED DRAIN (SEE CTL THOMPSON GROUNDWATER RESPOSE STUDY FOR DESIGN INFORMATION)
CHAIN LINK FENCE	PROPOSED TOPSOIL/REVEGETATION AREA
UTILITY POLE	PROPOSED REVEGETATION AREA
GRAVEL ROAD	
BUILDING	
RESERVOIR	



REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

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

GOOSE HAVEN RESERVOIR COMPLEX EXPANSION #2, #4
REGUALR 112 MINING PERMIT

LAFAYETTE, CO

PREPARED FOR: ROCK PRODUCTS

EXHIBIT F

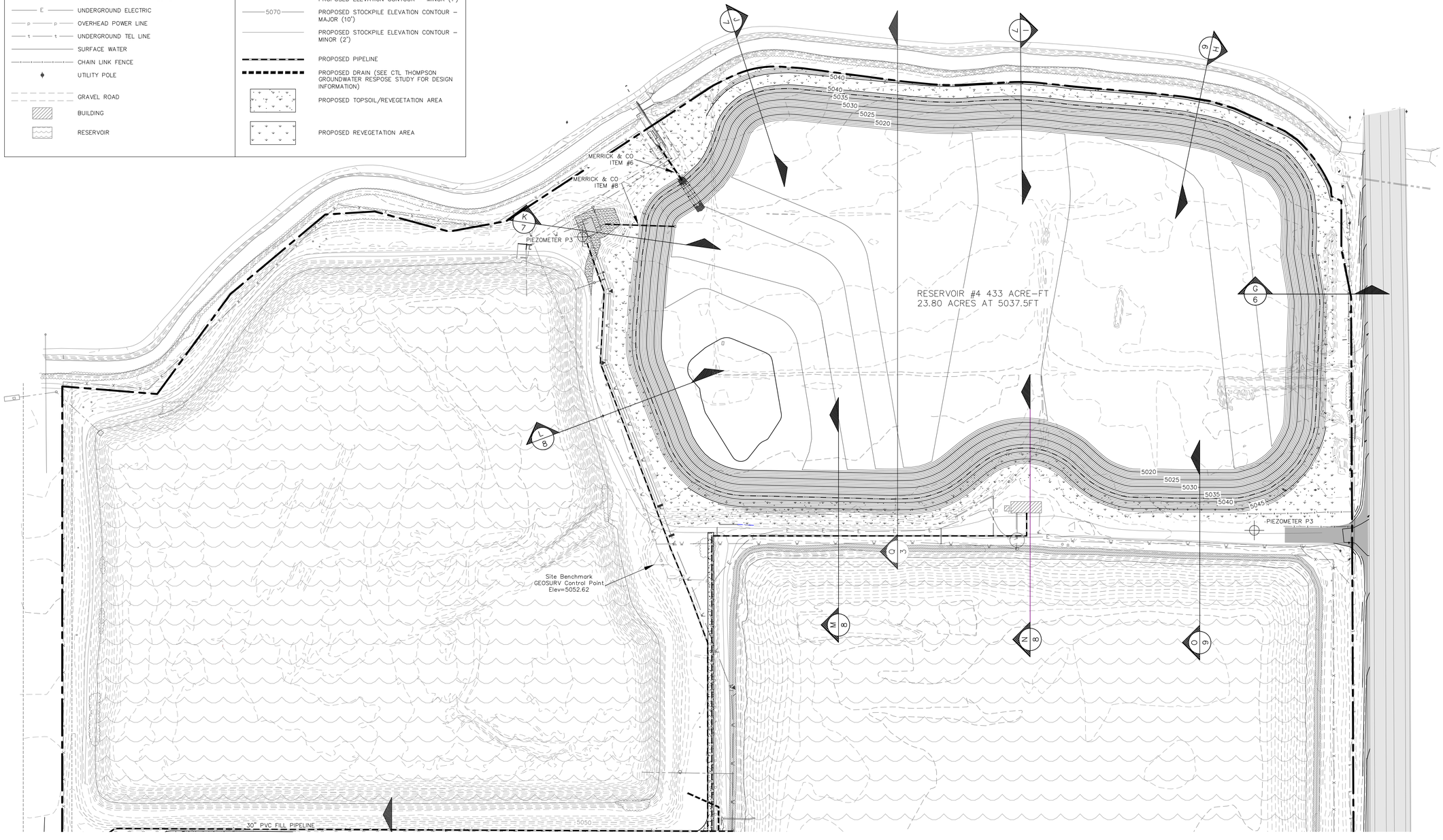
SHEET 1

SCALE	DWG NO.	REV.
1"=100'	SHEETS 1-2 PLAN	REV

DRAWN BY:	CHECKED BY:	DATE:	SHEET
CTW	PFW	10/31/16	SHEET 1 of 9

LEGEND

EXISTING		PROPOSED	
PROPERTY/PERMIT AFFECTED AREA BOUNDARY		5070	PROPOSED ELEVATION CONTOUR – MAJOR (5')
W	UNDERGROUND WATER PIPELINE		PROPOSED ELEVATION CONTOUR – MINOR (1')
E	UNDERGROUND ELECTRIC	5070	PROPOSED STOCKPILE ELEVATION CONTOUR – MAJOR (10')
p p	OVERHEAD POWER LINE		PROPOSED STOCKPILE ELEVATION CONTOUR – MINOR (2')
t t	UNDERGROUND TEL LINE		PROPOSED PIPELINE
	SURFACE WATER		PROPOSED DRAIN (SEE CTL THOMPSON GROUNDWATER RESPOSE STUDY FOR DESIGN INFORMATION)
	CHAIN LINK FENCE		PROPOSED TOPSOIL/REVEGETATION AREA
	UTILITY POLE		PROPOSED REVEGETATION AREA
	GRAVEL ROAD		
	BUILDING		
	RESERVOIR		



REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

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

GOOSE HAVEN RESERVOIR COMPLEX EXPANSION #2, #4
REGUALR 112 MINING PERMIT

LAFAYETTE, CO

PREPARED FOR: ROCK PRODUCTS

EXHIBIT F
SHEET 2

SCALE	DWG NO.		REV.
1"=100'	SHEETS 1-2 PLAN.DWG		REV
DRAWN BY: CTW	CHECKED BY: PFW	DATE: 10/31/16	SHEET: SHEET 2 of 9

Colorado Department of Public Health and Environment

CERTIFICATION TO DISCHARGE
UNDER
CDPS GENERAL PERMIT COG500000
DISCHARGES ASSOCIATED WITH SAND & GRAVEL MINING AND PROCESSING
(and other Nonmetallic Minerals except fuel)
Certification Number: **COG501535**

This Certification to Discharge specifically authorizes:

Rock Products of Coloado, LLC
to discharge from the facility identified as

Goose Haven Reservoir #2

to:

Facility Located at:	3993 N 107th, Boulder County, Lafayette, CO 80026
Facility Location	Latitude 40.0428, Longitude -105.1102
Discharge Number 001-A External Outfall	Latitude 40.0478 N Latitude 105.1079 W, after treatment and prior to entering the Lower Boulder Ditch

All discharges must comply with the lawful requirements of federal agencies municipalities, counties, drainage districts and other local agencies regarding any discharges to storm drain systems, conveyances, or other water courses under their jurisdiction.

Permit Limitations and Monitoring Requirements apply to 001A as outlined in the Permit Part I.B and Part I.C

Parameter	Units	Discharge Limitations Maximum Concentrations			Rationale	Monitoring Frequency	Sample Type
		30-Day Average	7-Day Average	Daily Max.			
APPLICABLE TO ALL DISCHARGES AS LISTED IN GENERAL PERMIT							
pH, (Minimum-Maximum) 00400	s.u.	NA	NA	6.5-9.0	Water Quality Standards	2 Days/Month	Grab
Total Suspended Solids, 00530	mg/l	30	45	NA	State Effluent Regulations	2 Days/Month	Grab
Oil and Grease Visual 84066		NA	NA	Report	State Effluent Regulations	2 Days/Month	Visual [3]
Oil and Grease, 03582	mg/l	NA	NA	10 [3]	State Effluent Regulations	Contingent [4]	Grab
Flow, 50050	MGD	Report	NA	Report	Discharge Evaluation	Instantaneous [2] or Continuous	Recorder/ In-situ [2]
SITE SPECIFIC PARAMETERS							
Arsenic (Total recoverable) , 00978	ug/l	Report	NA	Report	Water Quality Standards	Monthly	Grab
Cadmium (potentially dissolved), 01313	ug/l	Report	NA	Report	Water Quality Standards	Monthly	Grab

[2] – If power is not available, flow may be measured on an instantaneous basis 2 days / month
[3] – If a visual sheen is noticed, a grab sample must be taken and analyzed for oil and grease
4- This sampling requirement is contingent upon a visual sheen being present

Certification is issued 02/24/2012 **Effective 03/01/2012** **Certification Expires: 6/30/2013**
This certification under the permit requires that specific actions be performed at designated times. The certification holder is legally obligated to comply with all terms and conditions of the permit.

Signed,

Andrew Neuhart
Assessment Based Permits Unit Manager
Water Quality Control Division

RESERVOIR CONSTRUCTION AND MINING AGREEMENT AND AGREEMENT CONCERNING EASEMENT BOUNDARY

1. **PARTIES.** The parties to this Reservoir Construction and Mining Agreement and Agreement Concerning Easement Boundary ("Agreement") are the **Northern Colorado Water Conservancy District**, a Colorado water conservancy district formed and operating pursuant to Title 37, Article 45, of the Colorado Revised Statutes ("Northern Water"), the **New Consolidated Lower Boulder Reservoir & Ditch Company**, a Colorado mutual ditch company ("Lower Boulder") the **City of Lafayette**, a Colorado home-rule municipal corporation ("City") and **Rock Products of Colorado LLC** a Colorado limited liability company ("Contractor"). Northern Water, Lower Boulder, City and Contractor are hereinafter jointly referred to as "the Parties."

2. **RECITALS.**

2.1. The City owns and plans to develop certain real property located in the southwest quarter of Section 15, Township 1 North, Range 69 West of the 6th P.M. in Weld County, Colorado, known as the Goose Haven Property.

2.2. Northern Water owns the South Platte Supply Canal ("Supply Canal"), a part of the Colorado-Big Thompson project. Northern Water uses the Supply Canal to deliver water to its allottees and other water users. A portion of the Supply Canal runs adjacent to the northern boundary of the Goose Haven Property.

2.3. Lower Boulder owns the Lower Boulder Ditch which co-exists within the same easement and structure as exists for the Supply Canal. Lower Boulder uses the Lower Boulder Ditch to deliver water to its shareholders and other water users. The Lower Boulder Ditch and the Supply Canal and the associated easements for the operation and maintenance of the Lower Boulder Ditch and the Supply Canal are hereinafter referred to as the "Canal."

2.4. City and Contractor desire to mine a gravel pit to be known as Goose Haven #4 (the "Gravel Pit") pursuant to a permit granted by the State of Colorado. After mining is completed, the Contractor and City intend to seal the pit so as to prevent the inflow of ground water and use the pit as a water storage reservoir.

2.5. Until the Gravel Pit is sealed, it will intercept ground water. Because of elevation of the ground water table in this area, the mining of the Gravel Pit may cause additional seepage from the Canal.

2.6. In order to protect Northern Water and Lower Boulder from increased seepage from the Canal, Contractor and City agree to pump water from the Gravel Pit or deliver other sources into the Canal as set forth below.

NOW, THEREFORE, the Parties agree to the following:

3. DELIVERY OF WATER INTO THE DITCH.

3.1. As replacement for seepage from the Canal, during periods that the Canal is transporting water (the "Operating Season"), Contractor and City agree to discharge all of the water collected from a dewatering system to be installed along the extent of the northern boundary of the Gravel Pit into the Canal, up to a limit of a rate of 100 gallons per minute (gpm). Delivery shall be made on a continuous basis (24 hours per day, 7 days per week) during the Operating Season except as provided below. The collected dewatering water shall be conveyed from the Gravel Pit in a pipe and discharged directly into the Canal at the concrete drop structure located approximately 1,550 feet west of US Highway 287 as measured along the Canal centerline. The discharge shall be into the rip rap lined portion of the Ditch just west of the check and headgate used to deliver water north from the Canal and located so as not to cause damage or erosion to the Canal or to interfere with operations of Lower Boulder or Northern Water. Said dewatering system shall have a valve that can be closed to prevent delivery into the Canal at such times as Lower Boulder and Northern Water do not desire to receive the dewatering discharge. If for whatever reason, the Contractor or the City cannot deliver water from the Gravel Pit into the Canal, the City shall deliver 100 gpm to the ditch from other sources available to them and acceptable to Lower Boulder and Northern Water.

3.2. **Cessation of Deliveries.** The Lower Boulder superintendent may request the Contractor and the City not deliver water into the Canal at times when the water is not needed, such as during periods of precipitation and/or when the Canal is running at or near capacity. At such times the Contractor or City shall cause the delivery of water to the Canal to be discontinued as quickly as possible. In an emergency situation, the Lower Boulder superintendent may cause the delivery to be discontinued and give notice of such discontinuance as soon as possible.

3.3. **Measurement of Deliveries.** Contractor and City shall install a flow meter to measure the discharge into the Canal.

3.4. **Approval of Plans.** Contractor and City, prior to installation of the above described dewatering system structures, shall provide Northern Water and Lower Boulder with written plans and/or drawings for the dewatering system structures describing or showing the location of all components. Northern Water and Lower Boulder shall review and approve or comment on the plans and/or drawings. The Parties agree to work together to obtain an approved set of plans and/or drawings so that installation of the structures may occur.

3.5. **Approvals/Permits.** The City and Contractor are responsible for all approvals and permits necessary for the installation and operation of the dewatering system structures, including those necessary from Boulder County, the State of Colorado and the United States.

3.6. **Term of Delivery.** Delivery shall continue during each Operating Season of the Canal until and unless the Contractor and the City obtain a written acceptance by the State Engineer and/or the Division Engineer ("Engineers") for Water Division No. 1 acknowledging that the Gravel Pit is sealed to prevent inflow of groundwater.

4. **DELIVERY OF QUIT CLAIM DEED TO NORTHERN WATER AND DITCH COMPANY.** In order to resolve any differences between the Parties and to establish the boundary of the easement and real property interests owned by Northern Water and Lower Boulder, as soon as is practicable after the execution of this Agreement by all parties, so as to allow the preparation of a legal description, the City shall deliver to Northern Water and Lower Boulder a quit claim deed establishing the boundary of the south side of the easement for the Canal to be the fence constructed at the edge of the maintenance road for the Canal. The City shall retain an easement to allow access to the Goose Haven Reservoir Complex over the maintenance road by light duty maintenance vehicles; and retain an easement for the maintenance to the boundary fence, which is acknowledged to be the property of the City. The form of quit claim deed to be executed is attached as **EXHIBIT 1**.

5. **CONSENT TO MINING WITHIN TWO HUNDRED FEET.** Northern Water and Lower Boulder shall, upon execution of this Agreement by Contractor and City, execute those documents requested by the State of Colorado to allow the mining of the Gravel Pit.

6. **OPERATIONAL CONTACTS.** For purposes of coordinating the delivery of water into the Canal, the Parties designate the following contacts. The parties can change these contacts with notice to the other Parties pursuant to paragraph 11 below.

Lower Boulder: Jeff Gould, Superintendent Cell: 720-202-1906 E-mail: jraygould87@gmail.com	
City: Brad Dallam, Assistant City Engineer Phone: 303-665-5588 ext. 3326 Cell: 303-885-0616 E-mail: bradd@cityoflafayette.com	**Contractor:** Jon P. File, Manager Cell: 303-570-9798 E-mail:jon.file@comcast.net

7. **AGREEMENT TO COMPENSATE FOR DAMAGES AND INCLUDE NORTHERN WATER AND LOWER BOULDER AS NAMED INSUREDS.** To the extent legally obligated to do so, the City and Contractor agree to provide compensation to Northern Water and Lower Boulder for any damage to real or personal property owned or operated by Northern Water or Lower Boulder caused by construction, operation, maintenance or repair of the Gravel Pit. Further, Contractor will obtain and maintain a general liability insurance policy that will include Northern Water and Lower Boulder as named insureds. The liability policy will have minimum limits of one million dollars per person and one million dollars per occurrence. The Contractor shall provide Northern Water and Lower Boulder a copy of said policy before it commences work within two hundred (200) feet of the Canal and provide Northern Water and Lower Boulder evidence that the policy has been maintained on an annual basis on the anniversary date of this agreement.

8. **MAINTENANCE.** The City and the Contractor agree to maintain the dewatering system structures constructed pursuant to this agreement.

9. **REIMBURSEMENT.** City and Contractor agree to reimburse Lower Boulder for its reasonable legal and engineering costs incurred by Lower Boulder in this matter in an amount not to exceed $8,000.00.

10. **TERM OF AGREEMENT.** This agreement shall terminate upon the written acceptance by the State Engineer and/or the Division Engineer ("Engineers") for Water Division No. 1 acknowledging that the Gravel Pit is sealed to prevent inflow of groundwater.

11. **NOTICES.** Any notice required or permitted by this Agreement shall be in writing. Notice shall be deemed to have been sufficiently given for all purposes when: sent by certified or registered mail, postage and fees prepaid,

addressed to the party at the address listed below; or when hand-delivered to the party at the address listed below.

LOWER BOULDER:
New Consolidated Lower Boulder Reservoir and Ditch Company
Attn: Dan Grant
P.O. Box 1826
Longmont, CO 80502
(303) 888-1125

LOWER BOULDER COPY TO:
Lyons Gaddis Kahn Hall Jeffers Dworak & Grant, PC
Attn: Jeffrey J. Kahn
515 Kimbark Street
P.O. Box 978
Longmont, CO 80502-0978
(303) 776-9900

NORTHERN WATER:
Northern Water
Attn: Don Carlson
220 Water Avenue
Berthoud, CO 80513
800-369-7246

NORTHERN WATER COPY TO:
Peggy Montano
Trout, Raley, Montano, Witwer & Freeman P.C.
1120 Lincoln Street, Suite 1600
Denver, CO 80203
(303) 861-1963

CONTRACTOR:
Rock Products of Colorado LLC
Attn: Jon P. File, Manager
P.O. Box 983
Broomfield CO 80038
(303)570-9798

CITY:
Brad Dallam
1290 S. Public Rd.
Lafayette, Colorado 80026
(303) 665-5588 ext. 3326

12. **WAIVER.** The waiver by any party to this Agreement to a breach of any term or provision of this Agreement shall not operate as or be construed as a waiver of any subsequent breach by any party.

13. **EXHIBITS.** All exhibits referred to in this Agreement are, by reference, incorporated in this Agreement for all purposes.

14. **ATTORNEYS' FEES AND COSTS.** If any judicial proceeding may hereafter be brought to enforce any of the provisions hereof, including an action for specific performance and/or damages, the prevailing Party shall be entitled to recover the costs of such proceedings, including reasonable attorney fees and reasonable expert witness fees.

15. **SEVERABILITY.** In the event any clause, sentence or any portion of the terms, conditions, covenants and provisions of this Agreement are deemed illegal, null or void for any reason, or are held by any court of competent

jurisdiction to be so, the remaining portions of this Agreement shall remain in full force and effect.

16. **CAPTIONS FOR CONVENIENCE.** All headings and captions used herein are for convenience only and are of no meaning in the interpretation or effect of this Agreement.

17. **MODIFICATION.** This Agreement may be amended, modified or altered only by a written amendment executed by all of the Parties to the agreement.

18. **NO MULTI-YEAR FISCAL OBLIGATION.** Nothing herein shall constitute a multiple fiscal year obligation pursuant to Colorado Constitution Article X, Section 20. Notwithstanding any other provision of this Agreement, the City's obligations under this Agreement are subject to annual appropriation by the City Council of the City of LAFAYETTE. Any failure of a City Council annually to appropriate adequate monies to finance the City's obligations under this Agreement shall terminate this Agreement at such time as such then-existing appropriations are to be depleted. Notice shall be given promptly to the other parties of any failure to appropriate such adequate monies.

Dated:_____

The New Consolidated Lower Boulder Reservoir and Ditch Company
a Colorado ~~mutual ditch~~ company

By: _____
Eric Doering, President

ATTEST:

_____
Dan Grant, Secretary

Rock Products of Colorado LLC
a Colorado limited liability Company

By: _____
Jon File, Manager

STATE OF COLORADO)
) **ss.**
COUNTY OF Weld)

Acknowledged before me this 16 day of July, 2014, by Jon File as Manager for Rock Products LLC.

Witness my hand and official seal.

My commission expires: 02-06-16.

JENNIFER A DONOFRIO NOTARY PUBLIC STATE OF COLORADO My Commission Expires 02-06-2016

_____
Notary Public

City of Lafayette, Colorado
a Colorado home-rule municipal corporation

By: Mayor
Name: Christine Berg
Position: Mayor

STATE OF COLORADO)
) ss.
COUNTY OF Boulder)

Acknowledged before me this 4th day of September, 2014, by Christine Berg as Mayor.

Witness my hand and official seal.

My commission expires: 10/20/2015.

Susan Baker
Notary Public

Northern Colorado Water Conservancy District
a Colorado water conservancy district

By: Alan D. Bergman
Name: ALAN D. BERRYMAN
Position: Asst. Gen Mgr.

STATE OF COLORADO)
) ss.
COUNTY OF Larimer)

Acknowledged before me this 14th day of July, 2014, by Alan D. Bergman as Assistant General Manager

Witness my hand and official seal.

My commission expires: 3/23/2018

JIM L. STRUBLE NOTARY PUBLIC STATE OF COLORADO

Notary Public

QUIT CLAIM DEED

The CITY OF LAFAYETTE, a Colorado home rule municipal corporation, whose address is 1290 South Public Road, Lafayette, CO, 80026, County of Boulder, State of Colorado ("Grantor"), for the sum of Ten Dollars and No/100 ($10.00) in hand paid and other good and valuable consideration, hereby sells and quitclaims to NORTHERN COLORADO CONSERVANCY DISTRICT, a Colorado water conservancy district formed and operating pursuant to Title 37, Article 45, of the Colorado Revised Statutes, and the NEW CONSOLIDATED LOWER BOULDER RESERVOIR & DITCH COMPANY, a Colorado mutual ditch company (collectively, "Grantee"), the right, title, interest, claim and demand, which Grantor has in and to the following real property, in the County of Boulder, State of Colorado; to-wit:

> The area between the "Northerly Lot Line of Outlot X-A" and the "Chain Link Fence," as described in Exhibit A attached hereto (referred to hereinbelow as the "Property").

Specifically reserving unto itself (1) an easement over and across the Property for the purpose of maintaining a fence on Grantor's property immediately south of the Property; and (2) an easement over and across the existing maintenance road on the Property for the purpose of accessing, by light duty maintenance trucks and vehicles, Grantor's property immediately south of the Property, known as the Goose Haven Reservoir Complex.

Signed this 4th day of September 2014.

Christine Berg, Mayor

ATTEST:

Susan Koster, CMC, City Clerk

CITY OF LAFAYETTE HOME RULE APRIL 1, 1958 BOULDER COUNTY, COLORADO

STATE OF COLORADO)
) ss.
COUNTY OF BOULDER)

The foregoing instrument was acknowledged before me this 4th day of September, 2014 by Christine Berg, Mayor, and Susan Koster, City Clerk, for the City of Lafayette.

My commission expires: 10/20/2015

WITNESS my hand and official seal.

Notary Public

SUSAN BARKER NOTARY PUBLIC STATE OF COLORADO

EXHIBIT 1

Exhibit A

Description and Depiction of Cross Access Easement

Easement Description

A portion of that parcel known as Outlot X-A conveyed to the City of Lafayette, a Colorado Municipal Corporation, filed October 1, 2009 at Reception No. 03033443, in the northeast quarter of the southwest quarter of Section 15, Township 1 North, Range 69 West of the Sixth Principal Meridian, City of Lafayette, Boulder County, Colorado, described as follows:

Note:

1. The Basis of Bearings is along the southerly line of the NE 1/4 of the SW 1/4 of Section 15, T1N, R69W 6th P.M., as monumented with a 3.25" aluminum cap, PLS 22579, at the west and an aluminum cap, PLS 23529, at the east with an assumed bearing of S 89°53'03" E.

Commencing at the southwest corner of the northeast quarter of the southwest quarter of Section 15, a 3.25" aluminum cap PLS 22579; Thence N 00°05'03" W, along the westerly line of that parcel known as Outlot X-A, a distance of 251.86 feet to a pin and cap, PLS 22097, being the northwest corner of Outlot X-A and the POINT OF BEGINNING.

Thence along the northerly line of said Outlot X-A, as monumented with a pin and cap, PLS 22097, the following eight (8) courses:

1. Thence N 57°26'10" E a distance of 94.14 feet;
2. Thence S 83°23'50" E a distance of 283.60 feet;
3. Thence S 86°45'50" E a distance of 184.90 feet;
4. Thence N 79°21'10" E a distance of 121.70 feet;
5. Thence S 80°53'50" E a distance of 411.30 feet;
6. Thence S 66°27'50" E a distance of 124.80 feet;
7. Thence S 48°33'50" E a distance of 121.40 feet;
8. Thence S 84°17'50" E a distance of 12.19 feet to the westerly right of way line of U.S. Highway 287;

Thence S 00°23'01" E, along said westerly right of way line, a distance of 71.45 feet to the intersection of said westerly right of way line with a City of Lafayette chain link fence;

Thence along said chain link fence, more or less, the following twenty (20) courses:

1. Thence N 64°11'25" W a distance of 22.63 feet;
2. Thence N 03°39'37" W a distance of 16.94 feet to a point of curvature;
3. Thence along a curve to the left a distance of 121.90 feet, said curve having a radius of 295.07 feet, a delta angle of 23°40'15" and a chord distance of 121.04 feet which bears N 34°55'25" W;
4. Thence N 55°15'49" W a distance of 30.83 feet;
5. Thence N 65°43'02" W a distance of 113.36 feet to a point of curvature ;
6. Thence along a curve to the left a distance of 52.41 feet, said curve having a radius of 200.00 feet, a delta angle of 15°00'55" and a chord distance of 52.26 feet which bears N 73°13'29" W;
7. Thence N 80°43'57" W a distance of 55.06 feet;
8. Thence N 83°41'28" W a distance of 59.90 feet;
9. Thence N 85°03'34" W a distance of 80.92 feet;
10. Thence N 85°03'12" W a distance of 78.49 feet;
11. Thence N 84°03'21" W a distance of 77.27 feet to a point of curvature ;
12. Thence along a curve to the left a distance of 63.67 feet, said curve having a radius of 400.00 feet, a delta angle of 09°07'13" and a chord distance of 63.60 feet which bears N 88°36'58" W;
13. Thence S 86°49'26" W a distance of 90.92 feet to a point of curvature ;

(Continued on Sheet 2 of 3)

Easement Description
(Continued from Sheet 1 of 3)

14. Thence along a curve to the right a distance of 77.29 feet, said curve having a radius of 500.00 feet, a delta angle of 08°51'25" and a chord distance of 77.21 feet which bears N 88°44'52" W;
15. Thence N 84°19'09" W a distance of 48.83 feet;
16. Thence N 82°30'53" W a distance of 208.78 feet;
17. Thence N 85°50'27" W a distance of 43.34 feet to a point of curvature;
18. Thence along a curve to the left a distance of 99.04 feet, said curve having a radius of 200.00 feet, a delta angle of 28°22'26" and a chord distance of 98.03 feet which bears S 79°58'20" W;
19. Thence S 65°47'07" W a distance of 17.97 feet;
20. Thence S 63°23'49" W a distance of 30.32 feet to the POINT OF BEGINNING.

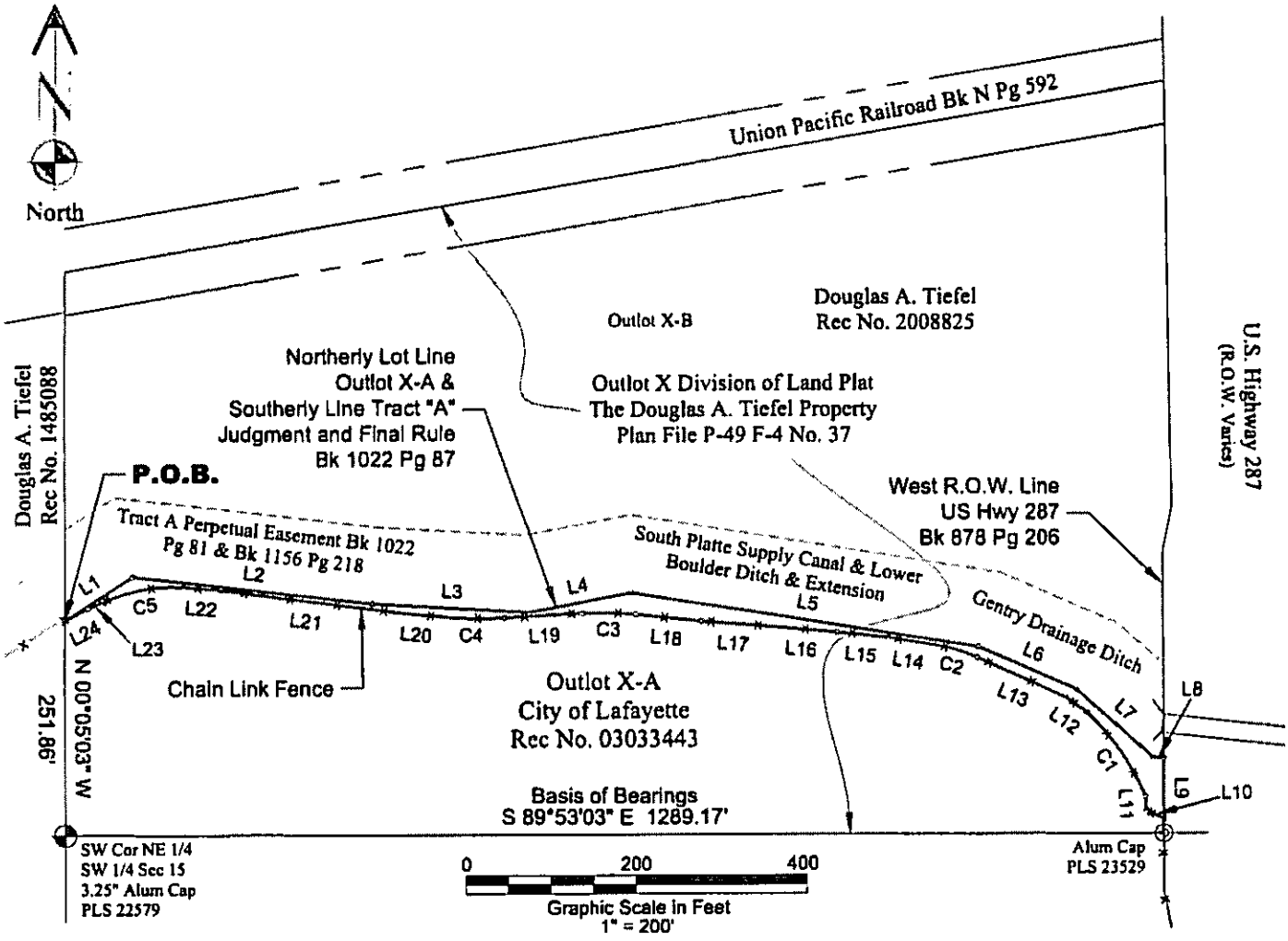
Containing 0.370 acres more or less.

Prepared by EJ Grabowski

For and on behalf of GEOSURV Inc.

520 Stacy Ct. Ste B, Lafayette, CO 80026

DWG: G:\GEOSURV\2001\01008\Drawing\2007 Work\Outlot X-A Fence to Prop.dwg USER: JTV
DATE: May 18, 2011 1:41pm XREFS: IMAGES:



CURVE	ARC LENGTH	RADIUS	DELTA ANGLE	CHORD LENGTH	CHORD BEARING
C1	121.90'	295.07'	23°40'15"	121.04'	N 34°55'25" W
C2	52.41'	200.00'	15°00'55"	52.26'	N 73°13'29" W
C3	63.67'	400.00'	09°07'13"	63.60'	N 88°36'58" W
C4	77.29'	500.00'	08°51'25"	77.21'	N 88°44'52" W
C5	99.04'	200.00'	28°22'26"	98.03'	S 79°58'20" W

LINE	BEARING	DISTANCE
L1	N 57°26'10" E	94.14'
L2	S 83°23'50" E	283.60'
L3	S 86°45'50" E	184.90'
L4	N 79°21'10" E	121.70'
L5	S 80°53'50" E	411.30'
L6	S 66°27'50" E	124.80'
L7	S 48°33'50" E	121.40'
L8	S 84°17'50" E	12.19'
L9	S 00°23'01" E	71.45'
L10	N 64°11'25" W	22.63'
L11	N 03°39'37" W	16.94'
L12	N 55°15'49" W	30.83'

LINE	BEARING	DISTANCE
L13	N 65°43'02" W	113.36'
L14	N 80°43'57" W	55.06'
L15	N 83°41'28" W	59.90'
L16	N 85°03'34" W	80.92'
L17	N 85°03'12" W	78.49'
L18	N 84°03'21" W	77.27'
L19	S 86°49'26" W	90.92'
L20	N 84°19'09" W	48.83'
L21	N 82°30'53" W	208.78'
L22	N 85°50'27" W	43.34'
L23	S 65°47'07" W	17.97'
L24	S 63°23'49" W	30.32'

DWG: G:\GEOSURV\2001\01008\Drawing\2007 Work\Outlot X-A Fence to Prop.dwg USER: EJG
DATE: Jul 08, 2014 7:22pm XREFS: IMAGES:

October 03, 2011

Division of Reclamation Mining and Safety
Attn: Mr. Michael Cunningham
1313 Sherman St., Rm 215
Denver, CO 80203

RE: Compensation agreements for structures within 200 ft. of the affected area

Dear Mr. Cunningham:

We request the DRMS find Application No. M 2010- 07, Goose Haven Reservoir #2 approved. This request is based on our belief that all adequacy issues and application approval requirements have been met by the Applicant, the City of Lafayette. It is our understanding the only remaining item needed by the DRMS to approve the Application is structure owner's compensation agreements.

With this letter, we have enclosed compensation agreements with five owners of structures within 200 ft. of the proposed affected area. We currently have compensation agreements with the following public and private persons:

- City of Lafayette
- Qwest
- Frank D. & Kathleen P. Schwartz
- Left Hand Water District
- Tom Schwartz

We sent draft agreements to all structure owners within 200 ft. of the proposed affected land. To date, we have made significant attempts to reach agreements with the remaining structure owners. We have not been able to reach agreements with the remaining structure owners and desire to move the project forward. Therefore, The City of Lafayette requests it be allowed to use an alternative provision demonstrating structures within 200 ft. of the affected land will not be negatively impacted by the proposed mining and reclamation operations. C.R.S. 34-32.5-115(4) (e). This demonstration was made part of the original submitted Application package under the geotechnical exhibit. The structures we wish to apply this provision to are owned by the following:

- Northern Colorado Water Conservation District
- Xcel
- Lower Boulder Ditch Co
- Nancy B. Sisk

- Douglas A. Tiefel

Please note the proof of mailings do not show the draft compensation agreement being mailed to Mr. Tom Schwartz. However, we have included an executed compensation agreement between the City of Lafayette and Mr. Schwartz which we believe should be adequate to meet the requirements of the Act and Regulations.

Please let either Aaron Asquith of McLaughlin Water Engineers, Ltd. or me know if there are any other items needing resolution in order to move the Application forward to approval

Encl: (compensation agreements (5), proof of certified mailings (9)

Respectfully,

H. Bruce Humphries
Consultant

cc: Mr. Aaron Asquith
McLaughlin Water Engineers, Ltd.
2420 Alcott Street
Denver, CO 80211

Public Works
Taking Care of Business.....Everyday!

City of Lafayette

1290 S. Public Road • Lafayette, Colorado 80026 • (303) 665-5588 Fax (303) 665-2153

June 1, 2011

City of Lafayette,
Attn: Brad Dallam
1290 S. Public Rd.,
Lafayette, CO 80026

Re: Compensation agreement between the City of Lafayette and owner of a structure within 200 feet of the proposed mining area.

Dear Mr. Dallam:

The City of Lafayette is proposing to construct a water storage reservoir adjacent to structures we believe you own. Enclosed is a compensation agreement intended to indemnify you in the unlikely event the mining operation, intended to result in a City storage reservoir, damages your structure(s).

Please sign the enclosed indemnification agreement and return in the enclosed, self addressed and stamped envelope. The city will provide you a signed and notarized agreement. We will return a copy to you for your files.

We thank you for your help in this matter.

Sincerely,
City of Lafayette

Brad Dallam, P.E.
Assistant City Engineer

Enclosures

City of Lafayette Agreement to Compensate Mining Related Damages

The State of Colorado, Division of Reclamation Mining and Safety requires an operator of a mining operation to provide an agreement between the Mine Operator (Permittee) and the Owner of any significant, valuable, permanent man-made structure which lies within 200 feet of any area affected by the mine operation. Alternatively, the Operator may stay 200 feet away from such structures or provide an engineering evaluation which demonstrates the operation will not affect the significant, valuable, permanent man-made structure.

City of Lafayette, 1290 S. Public Rd., Lafayette, CO 80026 owns the following man-made structure as defined by Rule 1.1(48) of the Mined Land Reclamation Board's Rules and Regulations:

Structures

1. Facility Perimeter Fence
2. Various culverts, gates, interconnects, flow lines, etc.
3. Water well on the west side of the property
4. Water well on the east side of the property
5. Reservoir outlet pump station
6. Vacant houses (2)
7. Facility water line
8. Two monitoring well (Goose Haven #3)
9. Abandoned extension of ditch along NW and NE sides of Goose Haven #3
10. Monitoring well NE of Goose Haven #1
11. Access road around Goose Haven Reservoirs
12. Water diversion pump station
13. Outlet ditch to Boulder Creek
14. Old culvert to drain the north side to Lower Boulder Ditch
15. Monitoring well upper west side of Goose Haven #1
16. Vault NW corner of Goose Haven #1

17. Inlet pipeline to Goose Haven #1

18. Barn on the NW corner of the new property

19. Access road on the N and S sides of the property, Leyner-Cottonwood Lateral

20. Irrigation ditch on both sides of the new property

CERTIFICATION

The undersigned, BRADLEY S. DALLAM (print name), Asst City Engineer (print title), City of Lafayette does hereby certify that, to the extent authorized by law, Lafayette will indemnify **City of Lafayette** for any costs incurred resulting from damage to the above listed structure located on or within 200 feet of the proposed affected area described within Exhibit A, of the Construction Materials Mining Permit Application, ***Goose Haven Reservoir #2 - Complex Expansion*** resulting from the proposed mining or reclamation activities.

City of Lafayette:

Name: BRADLEY S. DALLAM Title: Asst City Engr

STATE OF COLORADO)
)ss
Boulder County)

The fore going was acknowledged before me this 23 day of September, 2011 by (Name) Bradley S. Dallam, as (Title) Asst. City Engineer, of the City of Lafayette.

My commission expires: 10/20/2011.

SUSAN BARKER NOTARY PUBLIC STATE OF COLORADO

Notary Public

ACCEPTED BY: (Print Name) Douglas M. Short Title: Public Works Dir., for **City of Lafayette.**

Signature: Douglas M Short, Date: 9/23, 2011.

Public Works
Taking Care of Business.....Everyday!

City of Lafayette

1290 S. Public Road • Lafayette, Colorado 80026 • (303) 665-5588 Fax (303) 665-2153

June 1, 2011

Qwest
Attn: Ms. Peggy Abeyta
5325 Zuni St. Suite 728
Denver, Colorado 80211

Re: Compensation agreement between the City of Lafayette and owner of a structure within 200 feet of the proposed mining area.

Dear Ms. Abeyta:

The City of Lafayette is proposing to construct a water storage reservoir adjacent to structures we believe you own. Enclosed is a compensation agreement intended to indemnify you in the unlikely event the mining operation, intended to result in a City storage reservoir, damages your structure(s).

Please sign the enclosed indemnification agreement and return in the enclosed, self addressed and stamped envelope. The city will provide you a signed and notarized agreement. We will return a copy to you for your files.

We thank you for your help in this matter.

Sincerely,
City of Lafayette

Brad Dallam, P.E.
Assistant City Engineer

Enclosures

Public Works
Taking Care of Business.....Everyday!

City of Lafayette

1290 S. Public Road • Lafayette, Colorado 80026 • (303) 665-5588 Fax (303) 665-2153

City of Lafayette Agreement to Compensate Mining Related Damages

The State of Colorado, Division of Reclamation Mining and Safety requires an operator of a mining operation to provide an agreement between the Mine Operator (Permittee) and the Owner of any significant, valuable, permanent man-made structure which lies within 200 feet of any area affected by the mine operation. Alternatively, the Operator may stay 200 feet away from such structures or provide an engineering evaluation which demonstrates the operation will not affect the significant, valuable, permanent man-made structure.

In conducting its mining operation, the City of Lafayette will make every effort to prevent damage to your structure. This agreement is intended to ensure you are compensated in the unlikely event mining related damage to the following significant, valuable, permanent structure located within 200 feet of the area affected by the proposed mining operations occurs.

Qwest, 5325 Zuni St. Suite 728 Denver, Colorado 80211 owns the following man-made structures as defined by Rule 1.1(48) of the Mined Land Reclamation Board's Rules and Regulations:

Structure

1. Buried phone cable

CERTIFICATION

The undersigned, Frank Phillips **(print name),** Mayor **(print title), City of Lafayette does hereby certify that, to the extent authorized by law, Lafayette will indemnify Qwest for any costs incurred resulting from damage to the above listed structure located on or within 200 feet of the proposed affected area described within Exhibit A, of the Construction Materials Mining Permit Application, *Goose Haven Reservoir #2 - Complex Expansion* resulting from the proposed mining or reclamation activities.**

City of Lafayette:

Frank Phillips

Name: Frank Phillips **, Title:** Mayor

STATE OF COLORADO)
)ss
Boulder County)

SUSAN BARKER NOTARY PUBLIC COLORADO

The fore going was acknowledged before me this 6 **day of** Sept **, 2011 by (Name)** Frank Phillips **, as(Title)** Mayor **, of the City of Lafayette.**

My commission expires: 12/22/2011 **.**

Susan Barker
Notary Public

ACCEPTED BY: (Print Name) PEGGY L. ABEYTA **Title:** MANAGER **, for Qwest.**

Signature: Peggy L. Abeyta **, Date:** July 11 **, 2011.**

Public Works
Taking Care of Business.....Everyday!

City of Lafayette

1290 S. Public Road • Lafayette, Colorado 80026 • (303) 665-5588 Fax (303) 665-2153

June 1, 2011

Frank D. & Kathleen P. Schwartz
10503 Isabelle Rd.
Lafayette, CO 80026

Re: Compensation agreement between the City of Lafayette and owner of a structure within 200 feet of the proposed mining area.

Dear Sir or Madam:

The City of Lafayette is proposing to construct a water storage reservoir adjacent to structures we believe you own. Enclosed is a compensation agreement intended to indemnify you in the unlikely event the mining operation, intended to result in a City storage reservoir, damages your structure(s).

Please sign the enclosed indemnification agreement and return in the enclosed, self addressed and stamped envelope. The city will provide you a signed and notarized agreement. We will return a copy to you for your files.

We thank you for your help in this matter.

Sincerely,
City of Lafayette

Brad Dallam, P.E.
Assistant City Engineer

Enclosures

Public Works
Taking Care of Business.....Everyday!

City of Lafayette

1290 S. Public Road • Lafayette, Colorado 80026 • (303) 665-5588 Fax (303) 665-2153

City of Lafayette Agreement to Compensate Mining Related Damages

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In conducting its mining operation, the City of Lafayette will make every effort to prevent damage to your structure. This agreement is intended to ensure you are compensated in the unlikely event mining related damage to the following significant, valuable, permanent structure located within 200 feet of the area affected by the proposed mining operations occurs.

Frank D. & Kathleen P. Schwartz, 10503 Isabelle Rd., Lafayette, CO 80026 owns the following man-made structures as defined by Rule 1.1(48) of the Mined Land Reclamation Board's Rules and Regulations:

Structure

1. Existing Leyner-Cottonwood Lateral Ditch (Lined and unlined)
2. Occupied home and outbuildings
3. Ditch on the south side of the new property, Leyner-Cottonwood Lateral (co-owned with the City of Lafayette)

CERTIFICATION

The undersigned, Frank Phillips (print name), Mayor (print title), City of Lafayette does hereby certify that, to the extend authorized by law, Lafayette will indemnify **Frank D. & Kathleen P. Schwartz** for any costs incurred resulting from damage to the above listed structure located on or within 200 feet of the proposed affected area described within Exhibit A, of the Construction Materials Mining Permit Application, ***Goose Haven Reservoir #2 - Complex Expansion*** resulting from the proposed mining or reclamation activities.

City of Lafayette:

Frank Phillips

Name: Frank Phillips, Title: Mayor

STATE OF COLORADO)
)ss
Boulder County)

SUSAN BARKER NOTARY PUBLIC STATE OF COLORADO

The fore going was acknowledged before me this 6 day of Sept., 2011 by (Name) Frank Phillips, as(Title) Mayor, of the City of Lafayette.

My commission expires: 10/20/2011.

Susan Barker
Notary Public

ACCEPTED BY: (Print Name) Frank D. Schwartz Kathleen P. Schwartz Title: Owners, for **Frank D. & Kathleen P. Schwartz.**

Signature: Frank Schwartz, Date: 6-20-, 2011.

Kathleen P. Schwartz 6/20/2011

10503 Isabelle
Lafayette, CO 80026

Public Works
Taking Care of Business.....Everyday!

City of Lafayette

1290 S. Public Road • Lafayette, Colorado 80026 • (303) 665-5588 Fax (303) 665-2153

June 1, 2011

Left Hand Water District
6390 6800 Nimbus Rd.
Longmont, CO 80303

Re: Compensation agreement between the City of Lafayette and owner of a structure within 200 feet of the proposed mining area.

Dear Sir or Madam:

The City of Lafayette is proposing to construct a water storage reservoir adjacent to structures we believe you own. Enclosed is a compensation agreement intended to indemnify you in the unlikely event the mining operation, intended to result in a City storage reservoir, damages your structure(s).

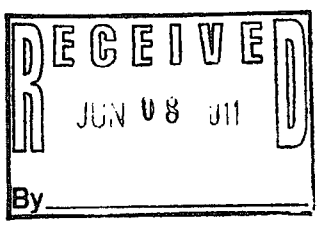
Please sign the enclosed indemnification agreement and return in the enclosed, self addressed and stamped envelope. The city will provide you a signed and notarized agreement. We will return a copy to you for your files.

We thank you for your help in this matter.

Sincerely,
City of Lafayette

Brad Dallam, P.E.
Assistant City Engineer

Enclosures



Public Works
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City of Lafayette

1290 S. Public Road • Lafayette, Colorado 80026 • (303) 665-5588 Fax (303) 665-2153

City of Lafayette Agreement to Compensate Mining Related Damages

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In conducting its mining operation, the City of Lafayette will make every effort to prevent damage to your structure. This agreement is intended to ensure you are compensated in the unlikely event mining related damage to the following significant, valuable, permanent structure located within 200 feet of the area affected by the proposed mining operations occurs.

Left Hand Water District, 6390 6800 Nimbus Rd., Longmont, CO 80303 owns the following man-made structure as defined by Rule 1.1(48) of the Mined Land Reclamation Board's Rules and Regulations:

Structure

1. Left Hand underground water line

CERTIFICATION

The undersigned, Frank Phillips (print name), Mayor (print title), City of Lafayette does hereby certify that, to the extend authorized by law, Lafayette will indemnify **Left Hand Water District** for any costs incurred resulting from damage to the above listed structure located on or within 200 feet of the proposed affected area described within Exhibit A, of the Construction Materials Mining Permit Application, ***Goose Haven Reservoir #2 - Complex Expansion*** resulting from the proposed mining or reclamation activities.

City of Lafayette:

Frank Phillips

Name: Frank Phillips, Title: Mayor

SUSAN BARKER NOTARY PUBLIC STATE OF COLORADO

STATE OF COLORADO)
)ss
Boulder County)

The fore going was acknowledged before me this 6 day of Sept, 2011 by (Name) Frank Phillips, as(Title) Mayor, of the City of Lafayette.

My commission expires: 10/20/2011.

Susan Barker
Notary Public

ACCEPTED BY: (Print Name) Christopher Smith Title: Eng. Manager, for the **Left Hand Water District.**

Signature: _____, Date: June 16, 2011.

Public Works
Taking Care of Business.....Everyday!

City of Lafayette

1290 S. Public Road • Lafayette, Colorado 80026 • (303) 665-5588 Fax (303) 665-2153

June 27, 2011

Tom Schwartz
~~10903~~ Isabelle Rd. 10641
Lafayette, CO 80026

Re: Compensation agreement between the City of Lafayette and owner of a structure within 200 feet of the proposed mining area.

Dear Sir:

The City of Lafayette is proposing to construct a water storage reservoir adjacent to structures we believe you own. Enclosed is a compensation agreement intended to indemnify you in the unlikely event the mining operation, intended to result in a City storage reservoir, damages your structure(s).

Please sign the enclosed indemnification agreement and return in the enclosed, self addressed and stamped envelope. The city will provide you a signed and notarized agreement. We will return a copy to you for your files.

We thank you for your help in this matter.

Sincerely,
City of Lafayette

Brad Dallam, P.E.
Assistant City Engineer

Enclosures

Public Works
Taking Care of Business.....Everyday!

City of Lafayette

1290 S. Public Road • Lafayette, Colorado 80026 • (303) 665-5588 Fax (303) 665-2153

City of Lafayette Agreement to Compensate Mining Related Damages

The State of Colorado, Division of Reclamation Mining and Safety requires an operator of a mining operation to provide an agreement between the Mine Operator (Permittee) and the Owner of any significant, valuable, permanent man-made structure which lies within 200 feet of any area affected by the mine operation. Alternatively, the Operator may stay 200 feet away from such structures or provide an engineering evaluation which demonstrates the operation will not affect the significant, valuable, permanent man-made structure.

In conducting its mining operation, the City of Lafayette will make every effort to prevent damage to your structure. This agreement is intended to ensure you are compensated in the unlikely event mining related damage to the following significant, valuable, permanent structure located within 200 feet of the area affected by the proposed mining operations occurs.

Tom Schwartz, ~~10503~~ 10641 Isabelle Rd., Lafayette, CO 80026 owns the following man-made structure as defined by Rule 1.1(48) of the Mined Land Reclamation Board's Rules and Regulations:

Structure

1. Outbuilding

CERTIFICATION

The undersigned, Frank Phillips (print name), Mayor (print title), City of Lafayette does hereby certify that, to the extend authorized by law, Lafayette will indemnify **Tom Schwartz** for any costs incurred resulting from damage to the above listed structure located on or within 200 feet of the proposed affected area described within Exhibit A, of the Construction Materials Mining Permit Application, ***Goose Haven Reservoir #2 - Complex Expansion*** resulting from the proposed mining or reclamation activities.

City of Lafayette:

Frank Phillips

Name: Frank Phillips, Title: Mayor

STATE OF COLORADO)
)ss
Boulder County)

SUSAN BARKER NOTARY PUBLIC STATE OF COLORADO

The fore going was acknowledged before me this 6 day of Sept, 2011 by (Name) Frank Phillips, as(Title) Mayor, of the City of Lafayette.

My commission expires: 10/20/2011.

Susan Barker
Notary Public

ACCEPTED BY: (Print Name) Tom Schwartz Title: owner, for **Tom Schwartz.**

Signature: Tom Schwartz, Date: July 1, 2011.