STATE OF COLORADO

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

# SWSP Approval for Three Bells Pit

**Brucker - DNR, Sarah** <sarah.brucker@state.co.us> Tue, Dec 12, 2017 at 1:29 PM
To: Jared Dains <JaredDains@applegategroup.com>
Cc: Michael Hein <michael.hein@state.co.us>, Mark Simpson <mark.simpson@state.co.us>, Amy Eschberger - DNR <amy.eschberger@state.co.us>

Please see attached for the SWSP approval for the Three Bells Pit (M-1979-191). Please note that the SWSP is currently approved through May 1, 2018, but may be extended through December 31, 2018 upon receipt of an updated 2018 Water Balance, showing actual depletions and replacements for January through March 2018 and projected depletions and replacements through December 31, 2018, that demonstrates that all depletions can be adequately replaced in time, location, and amount. If you have any questions, please feel free to contact me at this office. Regards,

**Sarah Brucker, P.E.**
**Water Resources Engineer**

COLORADO
Division of Water Resources
Department of Natural Resources

P 303.866.3581 x 8249
1313 Sherman Street, Suite 821, Denver, CO 80203
sarah.brucker@state.co.us | www.water.state.co.us

**Approval.pdf**
3928K

December 12, 2017

Jared Dains, P.E.
Applegate Group, Inc.
1490 West 121st Avenue, Suite 100
Denver, CO 80234

**Re: Lafarge Middle Poudre Combined Substitute Water Supply Plan (WDID 0302533, Plan ID 3068)**
**Three Bells Pit, DRMS Permit No. M-1979-191 (WDID 0303023)**
**Section 13, T6N, R68W, 6th P.M.**
**Water Division 1, Water District 3, Larimer County**

**Approval Period: January 1, 2018 through May 1, 2018 (December 31, 2018 if extended)**
*Contact Information for Mr. Dains: 303-452-6611; jareddains@applegategroup.com*

Dear Mr. Dains:

We have received your letter dated October 31, 2017, requesting renewal of the above referenced substitute water supply plan to cover depletions caused by gravel mining operations at the Three Bells Pit, operated by Martin Marietta Materials, Inc. ("MMM" or "Applicant"). The required fee of $257 has been submitted (receipt no. 3683358). General information regarding the Three Bells Pit is provided in Table A below. A map showing the location of the Three Bells Pit is attached as Figure 1.

**Table A - Replacement Plan Site**

| Site Name | DRMS Permit No. | WDID | Exposed Surface Area | Well Permit No. | New Permit Required? |
|---|---|---|---|---|---|
| Three Bells Pit | M-1979-191 | 0303023 | 5.5 acres | 64818-F | No |

The Lafarge Middle Poudre Combined Plan previously included a number of other sites that are no longer covered under this SWSP for various reasons.

The Shields Mine (M-2006-064, WDID 0303027) was previously included in the plan but was acquired by the City of Fort Collins in 2014 and is covered under an individual SWSP (WDID 0302700).

The Port of Entry Pit (M-1982-182, WDID 0303026) was removed from the combined plan as of January 1, 2012 and is currently covered under an individual SWSP (WDID 0302533) that previously relied on replacement credits generated through this SWSP. As of 2017, the Port of Entry SWSP relies on replacement sources owned or controlled by the City of Fort Collins and is no longer debited against this combined plan.

The compacted clay liner for the Kyger Pit (M-1999-088, WDID 0303025) was approved by the State Engineer's Office as meeting the design standard for liners on January 24, 2014, and the Kyger Pit is now classified as a lined reservoir in accordance with the 1999 SEO Guidelines. All lagged depletions due to past mining and dewatering operations at the Kyger Pit were replaced by the end of 2015 and the site is no longer required to be covered under a SWSP.

**Depletions**

*Evaporation and Operational Losses*

During this plan period, consumptive use at the Three Bells Pit will be limited to evaporation, and water used for dust control and liner construction.

The Three Bells Pit consists of two primary cells, the "Veldman" parcel to the southeast and the "DiTullio" parcel to the northwest. Mining operations have been completed at both parcels, and all dewatering has ceased. The clay liner for the Veldman parcel was approved by the State Engineer's Office as meeting the design standard for liners in a letter dated March 6, 2015, and is now classified as a lined reservoir in accordance with the 1999 SEO Guidelines (River Bluffs Lake, WDID 0303324). It is anticipated that the remaining area of ground water exposure at the DiTullio parcel, known as Pond 1, will be lined during this plan period.

Net evaporative depletions were calculated using a gross annual evaporation of 39 inches from the exposed water surface, with a credit of 8.78 inches for effective precipitation. The current exposed ground water surface area at the site is estimated to be approximately 5.5 acres. MMM anticipates that the pond will be lined by April of 2018, therefore the surface area was set to zero from May 2018 on. The Applicant shall replace all evaporative depletions from the exposed water surface until such time as the pond is lined and the liner approved by this office. You have assumed an ice covered period to occur during the months of January and February of 2018 and have reduced the computation of evaporation accordingly. However, for the purpose of this SWSP, the Applicant shall replace the net evaporation depletions from the exposed ground water surface area that may occur during the assumed ice covered period (January and February) for any time that the pit is not completely covered by ice. Computation of the net evaporation during any time that the pit is not completely covered by ice shall be determined as the pro-rata amount of the monthly gross evaporation rate distribution amount identified in the State Engineer's *General Guidelines for Substitute Supply Plans for Sand and Gravel Pits,* subtracting the pro-rata amount of the effective precipitation for that period. The net depletion of ground water due to evaporation is projected to total 1.85 acre-feet during this plan period.

You have estimated that 1.84 acre-feet of water will be used for dust control purposes during this plan period. An additional 0.77 acre-feet of water is estimated to be used for the construction of a liner at the site during this plan period. Water used for dust control and liner construction purposes is assumed to be 100% consumed.

The total consumptive use of ground water at the Three Bells Pit (including evaporative and operational losses) is estimated to be 4.46 acre-feet for this plan period, as detailed in the attached Appendix A.

A stream depletion model using the Glover method was used to calculate the lagged depletions to the Cache La Poudre River. The alluvial aquifer model was used with the following aquifer input parameters: transmissivity (T) = 45,000 gallons/day/foot; the distance of centroid of the exposed ground water to the Cache La Poudre River (X) = 1,900 feet; the distance from the parallel impermeable boundary to the Cache La Poudre River (W) = 4,800 feet; and the specific

yield (S) = 0.2. Lagged depletions from past and projected evaporative and operational consumptive use will total 23.31 acre-feet during this plan period.

*Dewatering*

Dewatering at the Veldman parcel ceased at the end of October, 2014, and dewatering at the DiTullo parcel ceased at the end of August 2017. While the site was continuously dewatered, the water returned to the stream system was considered to be adequate to offset the depletions attributable to the dewatering. However, now that dewatering at the site has ceased, the delayed depletions from dewatering must be replaced. Lagged depletions from dewatering will be calculated using the Glover method with the parameters identified above. Dewatering operations at the site have resulted in lagged depletions totaling 213.95 acre-feet during this plan period.

The remaining unlined pond at the site is proposed to be lined; therefore there will be no depletions resulting from the "first fill" of the pit. It may be necessary to evacuate the contents of the pond and keep it dewatered in order to complete construction of the liner. MMM proposes to recharge all dewatering discharge into a series of silt ponds adjacent to Pond 1 or to an undeveloped field directly south of Pond 1. MMM will ensure that the dewatering discharge percolates into the ground without running off to the Poudre River. By operating in this manner, the depletions from dewatering Pond 1 will be offset by the recharge accretions from the adjacent discharge sites, avoiding lagged depletions from the pond dewatering operation. If the discharged water does not infiltrate into the ground within 72 hours, the Applicant will be required to make replacements for evaporation.

*Total Depletions*

The depletions to be replaced under this SWSP are summarized in Table B below. A monthly breakdown of the lagged depletions, including the lagged dewatering depletions, can be found in the attached Table 1.

**Table B – Depletion Summary (all amounts in acre-feet)**

| Site Name | Evaporation Loss | Water Lost in Mined Product | Dust Control | Liner Construction | First Fill | Total | Lagged Depletions | Lagged Dewatering Depletions | Total Lagged Depletions |
|---|---|---|---|---|---|---|---|---|---|
| Three Bells Pit | 1.85 [a] | N/A | 1.84 | 0.77 | N/A | 4.46 | 23.31 | 213.95 | 237.26 |

[a] Assumes Pond 1 is lined and liner approved by the end of April, 2018.

**Replacements**

Replacement water will come from a combination of accretion credits from past recharge of shares of the Box Elder Ditch Company, water stored in River Bluffs Lake, and water stored in Heaton Reservoir.

*BEDC Shares*

Lafarge West, Inc., the former operator of the subject site and SWSP, previously owned and dedicated to this plan 5.0 shares in the Box Elder Ditch Company. The 5.0 Box Elder Ditch Company shares were sold but recharge credits continue to be available for replacement use under this combined plan for water that was delivered to recharge through the 2014 irrigation year. In addition, MMM obtained approval from Steamboat Partners Investments, LLC for the use of their 1.0 Box Elder Ditch Company share in the 2015 and 2016 SWSPs. Accretions from past recharge of these shares will continue to accrue to the stream in 2018.

The Box Elder Ditch is divided into 64 Box Elder Ditch Company ("BEDC") shares. The 5.0 shares previously dedicated to this plan are from the group of 5.5 shares previously owned by Lafarge that were historically associated with the Three Bells Farm. The 1.0 share owned by Steamboat Partners comes from this same group of 5.5 shares. A total of 6.0 BEDC shares were historically utilized for the irrigation of 344.3 acres at the Three Bells Farm. The historical consumptive use credit for the 6.0 BEDC shares used to irrigate the Three Bells property was determined to be 307.0 acre-feet (51.2 acre-feet per share), based on a historical consumptive use analysis submitted with the 2014 SWSP request.

Table 2 from the 2014 SWSP request shows the average ditch diversion for the Box Elder Ditch from 1950 to 2007. Table 3 takes the average ditch diversions for the Box Elder Ditch from 1950 to 1984 and analyzes the historic consumptive use and return flows for the 6.0 BEDC shares. Table 4 breaks this information down further to come up with the monthly historic farm headgate diversions and return flows for the 5.0 BEDC shares previously utilized in this plan. As shown on Table 4, the average annual farm headgate diversion associated with the subject 5.0 BEDC shares is 457.0 acre-feet (91.4 acre-feet per share) with an associated return flow obligation of 201.1 acre-feet (40.2 acre-feet per share). This leaves a net consumptive use credit of 255.9 acre-feet, or 51.2 acre-feet per share.

The BEDC shares were previously diverted into a recharge pit (WDID 0302002) through an existing lateral from the ditch. The recharge pit was constructed on the un-mined portion of the Three Bells Pit site and was excavated to only the upper portion of the gravel deposit so as not to expose additional ground water. The estimated recharge pit size is one (1) acre. For the purposes of calculating recharge credit under this plan, evaporation from open water was assumed for the entire surface area of the recharge pit for the number of days water was diverted into the recharge pit. Based on this approach, the proportion of days with water diverted into the recharge pit to the number of days per month was applied to the monthly gross evaporation rate, resulting in an evaporative consumptive use from the recharge pit of approximately 2.04 acre-feet.

From 2004 through October 2014, a cumulative volume of 4,697 acre-feet associated with the 5.0 Lafarge BEDC shares was recharged. In addition, 189.11 acre-feet associated with the 1.0 Steamboat Partners BEDC share were recharged from November 2014 through November 2015, along with 263.6 acre-feet from April 2016 through October 2016. A recharge model was used to determine the total monthly recharge accretion credits for 2017. The recharge model uses the following parameters: transmissivity (T) = 45,000 gallons/day/foot, the distance of centroid of the recharge pit to the Cache La Poudre River (X) = 1,600 feet, the distance from the parallel impermeable boundary to the Cache La Poudre River (W) = 5,000 feet, and the specific yield (S) = 0.2.

The lagged accretions to the Cache la Poudre River from past deliveries to recharge are estimated to total 35.09 acre-feet for this approval period. The recharge accretions accrue to the Cache la Poudre River downstream of the river diversion for the New Cache system (WDID 0300929).

Return flow obligations associated with the use of the BEDC shares are based on return flow percentages during the irrigation season (May through September) and the non-irrigation season (October through April). Irrigation season return flow factors are applied to monthly farm headgate deliveries and non-irrigation season return flow factors are applied to total annual farm headgate deliveries. Therefore, the return flow obligations associated with the past diversion of the subject BEDC shares into recharge have been replaced under previous SWSPs.

*River Bluffs Lake (Veldman Reservoir)*

River Bluffs Ventures, LLC owns River Bluffs Lake (aka Veldman Reservoir, WDID 0303324), a lined portion of the Three Bells Pit. The compacted clay liner for the site was approved by the State Engineer's Office as meeting the design standard for liners on March 6, 2015, and River Bluffs Lake is now classified as a lined reservoir in accordance with the 1999 SEO Guidelines. There are currently approximately 800 acre-feet of water stored in the reservoir that were previously diverted under free river conditions. River Bluffs Ventures, LLC, provided a letter dated January 23, 2017 stating that they have reserved 180 acre-feet of the water stored in River Bluffs Lake for use as a replacement source for this SWSP. MMM used 50 acre-feet during the 2017 plan period, leaving 130 acre-feet remaining available. You have estimated that the 130 acre-feet of water will be pumped from River Bluffs Lake during the period of April through October 2018.

*Heaton Reservoir*

MMM is the owner of Heaton Reservoir (WDID 0504089), located adjacent to the confluence of Boulder Creek with St. Vrain Creek in the N½ of the NE ¼ of Section 9, T2N, R68W, 6th P.M. The slurry wall liner for the Heaton Reservoir was approved by the State Engineer's Office as having met the design standard for liners in a letter dated April 7, 2003 and it is therefore classified as a lined reservoir in accordance with the 1999 SEO Guidelines. Heaton Reservoir was granted a conditional water storage right for 680 acre-feet in case no. 2001CW193. There are currently approximately 500 acre-feet of fully consumable water stored in the reservoir. You have estimated that 115 acre-feet of replacement water will be pumped from Heaton Reservoir during the periods of January through March, and November through December 2018. Transit loss will be assessed from the point of release at the confluence of Boulder Creek with St. Vrain Creek, down St. Vrain Creek to its confluence with the South Platte River, and finally to the confluence of the South Platte River and the Cache la Poudre River, a distance of approximately 35 miles. When there are no intervening water rights on the Cache la Poudre River, South Platte River, and St. Vrain Creek between the Three Bells Pit and the outlet of Heaton Reservoir calling for water, MMM may use water released from Heaton Reservoir to cover the depletions from this plan. If the water released from Heaton Reservoir is unable to replace the depletions from this plan anytime during the non-irrigation season, MMM must provide water from replacement sources that can be delivered above the calling water right, such as Veldman Reservoir.

A monthly breakdown of projected lagged depletions, replacements, and return flow obligations is shown on the attached Table 2.

*Additional Replacement Sources*

MMM has also requested the ability to use replacement water from recharge or direct use of the 1.0 BEDC share owned by Steamboat Partners Investments, LLC under this SWSP. The dry-up acreage required for the 1.0 Steamboat Partners BEDC share would be 57.4 acres of the 344.3 historically irrigated acres on the Three Bells property. Prior to receiving any credit for the use of this water, MMM will need to provide documentation that they have the right to the use of this water, and the dry-up area attributed to the 1.0 Steamboat Partners BEDC share must be documented in accordance with the attached Administration Protocol *"Dry-Up of Irrigated Land"* to ensure that no other shares historically used on the Three Bells Farm are claiming credit for the same dry-up. The water attributable to the 1.0 Steamboat Partners share will be required to be diverted in priority at the ditch and then measured into the Three Bells recharge site or, if used directly, through an augmentation station approved by the water commissioner. Adequate measuring devices acceptable to the water commissioner must be installed prior to receiving replacement credit for the use of this share. Return flow obligations associated with the use of the

1.0 share must be calculated in accordance with the previously approved return flow factors and replaced under this SWSP.

Supplemental leases will be obtained in the event that the above-described sources are insufficient to replace all depletions from the Three Bells Pit. Such supplemental leases may be obtained from any authorized augmentation source contained in a gravel pit approved pursuant to § 37-90-137(11), C.R.S., that is capable of making replacements at the most upstream calling right impacted by the Three Bells Pit depletions.

The Applicant has requested permission to lease out any of its excess replacement credit to other gravel pit SWSPs approved pursuant to § 37-90-137(11), C.R.S., to the extent that such excess replacement credit exists. The Applicant must provide written notice to the Division Engineer and Water Commissioner at least 30 days in advance of the desired commencement of use of the excess replacement credits, which must include the specific plan in which the credits will be used, the provision in the plan that allows an unnamed source to be added for credit, the annual and monthly amount of excess replacement credit available, the location at which the water will be delivered to the stream, and a copy of a lease agreement between the Applicant and the purchaser of the excess replacement credits if the additional plan is not owned by the Applicant. The Applicant cannot claim credit for the use of the excess replacement credits in any other plan until they have received written approval from the Division Engineer or Water Commissioner. Any use of any such excess replacement credits must continue to be directly related to the mining of sand and gravel.

**Due to the possibility that the current dry conditions may persist and irrigation may begin early this water year, this SWSP will expire on May 1, 2018 unless the Applicant provides an updated 2018 Water Balance showing actual depletions and replacements made through March 31, 2018, which demonstrates that the Applicant has managed their replacement water supplies to ensure that water can be delivered above the calling water right through December 31, 2018.**

**Long Term Augmentation**

In accordance with the letter dated April 30, 2010 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. The April 30, 2010 letter from DRMS requires that you provide information to DRMS to demonstrate you can replace long term injurious stream depletions that result from mining related exposure of ground water. The DRMS letter (attached) identifies four approaches to satisfy this requirement.

The Three Bells Pit is proposed to be reclaimed to Developed Water Storage. In accordance with approach no. 3, the bond for the Three Bells Pit has been increased to $3,294,000 to cover the cost of final reclamation.

**Conditions of Approval**

I hereby approve the proposed substitute water supply plan in accordance with § 37-90-137(11), C.R.S. subject to the following conditions:

1. This plan shall be valid for the period of January 1, 2018 **through May 1, 2018**, unless otherwise revoked or superseded by decree. **This SWSP may be extended through December 31, 2018 if the Applicant provides an updated 2018 Water Balance showing that all depletions have been and can be replaced in time, location, and amount.**

Additional SWSPs are required until there is no longer an effect on stream flow from lagged depletions from mining and dewatering at the Three Bells Pit. Any renewal request must be submitted to this office with the statutory filing fee (currently $257 per pit) **no later than March 1, 2018 (November 1, 2018 if extended)**.

2. Well permit no. 64818-F has been obtained for the current use and exposed ground water surface at the site in accordance with § 37-90-137(2) and (11), C.R.S.
3. The total surface area of ground water exposed at the Three Bells Pit shall not exceed 5.5 acres, which results in an estimated evaporative loss at the Three Bells Pit of 1.85 acre-feet during this plan period.
4. Applicant shall replace the net evaporative depletions from the exposed ground water surface area that may occur during the assumed ice covered period (January and February 2018) for any time that the exposed ground water in the pit is not completely covered by ice.
5. Applicant is required to replace the net evaporative depletions from the exposed ground water surface area until such time as the pond is lined and the liner approved by this office.
6. The amount of water used for dust control and liner construction at the Three Bells Pit shall not exceed 2.61 acre-feet for this plan period.
7. Total consumption at the Three Bells Pit must not exceed these aforementioned amounts unless an amendment is made to this plan.
8. Approval of this plan is for the purposes as stated herein. Any additional uses of this water must first be approved by this office.
9. All pumping for dust control and liner construction purposes shall be measured in a manner acceptable to the division engineer.
10. Replacement water shall be made available to cover all out-of-priority depletions in time, place, and amount and shall be made available under the direction and/or approval of the water commissioner. Notice must be provided and approval made by the water commissioner at least 48 hours prior to the release of replacement water, or as required by the water commissioner. The replacement may be aggregated to maximize beneficial use. The water commissioner and/or division engineer shall determine the rate and timing of an aggregated release.
11. The replacement water, which is the subject of this plan cannot be sold or leased to any other entity, unless excess replacement credits exist and the Applicant has obtained written approval from the Division Engineer or Water Commissioner for the use of such excess replacement credits. As a condition of subsequent renewals of this substitute water supply plan, the replacement water must be appurtenant to this site until a plan for augmentation or liner approval is obtained for the site.
12. The Applicant has proposed to use for replacement, if needed, water available from any other source legally available for augmentation and which can be provided in the amount, at the time, and at the location required to replace out of priority depletions from the subject pits. Additional sources of replacement water in this SWSP may only be used if the Applicant complies with the attached Division One Administration Protocol "*Use of Replacement Sources Not Specifically Identified in an SWSP or Augmentation Plan*".
13. Conveyance loss for delivery of replacement water is subject to assessment and modification as determined by the water commissioner or division engineer.

14. The Applicant shall provide daily accounting (including, but not limited to diversions, depletions, replacement sources, and river calls) on a monthly basis, or more frequent if required by the water commissioner. The accounting must be emailed to the water commissioner, Mark.Simpson@state.co.us, **and** DNR_Div1Accounting@state.co.us within 30 days of the end of the month for which the accounting applies. Accounting and reporting procedures are subject to approval and modification by the division engineer. Accounting forms need to identify the WDID number for each well operating under this SWSP. **NOTE:** Monthly accounting, even during the winter non-irrigation season, is required.
15. The name, address, and phone number of the contact person who will be responsible for the operation and accounting of this plan must be provided on the accounting forms submitted to the division engineer and the water commissioner.
16. Applicant shall follow the applicable protocols as referenced in the attached documents for the operation of this SWSP.
17. If reclamation 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 to include, but not be limited to, long-term evaporation losses and lagged depletions.
18. If a lined pond results after reclamation, replacement of lagged depletions shall continue until there is no longer an effect on stream flow.
19. To assure that depletions from ground water evaporation do not occur in the unforeseen event, or events, that would lead to the abandonment of the Three Bells Pit, a bond in the amount of $3,294,000 has been obtained through the DRMS for lining or backfilling of the pit. Additionally, if the dewatering at the Three Bells Pit is discontinued before the pit is lined, the bond can finance the completion of the lining of the pit or backfilling, thus preventing depletions to the stream system.
20. The State Engineer may revoke this SWSP or add additional restrictions to its operation if at any time the State Engineer determines that injury to other vested water rights has occurred or will occur as a result of the operation of this SWSP. Should this SWSP expire without renewal or be revoked prior to adjudication of a permanent plan for augmentation, all use of ground water must cease immediately.
21. 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 which the senior appropriation receiving the substitute supply has normally been put. 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.
22. 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 pending water court case or any other legal action that may be initiated concerning this 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.

If you have any questions concerning this approval, please contact Michael Hein, Assistant Division Engineer, in Greeley at (970) 352-8712 or Sarah Brucker in Denver at (303) 866-3581.

Sincerely,

for Jeff Deatherage, P.E.
Chief of Water Supply

Attachments: Figure 1 – Overview Map
Appendix A – Mining Site Consumptive Use
Table 1 – Total Lagged Depletions
Tables 2-4, Middle Poudre Combined SWSP 2014 (dated 11/21/2013)
Table 2 – 2018 Water Balance
River Bluffs Ventures letter
DRMS April 30, 2010 letter
Division One Augmentation Protocol *"Augmentation Plan Accounting, Division One – South Platte River"*
Division One Administration Protocol *"Delivering Water Using the Natural Stream"*
Division One Administration Protocol *"Dry-Up of Irrigated Land"*
Division One Administration Protocol "*Recharge*"
Division One Administration Protocol "*Use of Replacement Sources Not Specifically Identified in an SWSP or Augmentation Plan*"

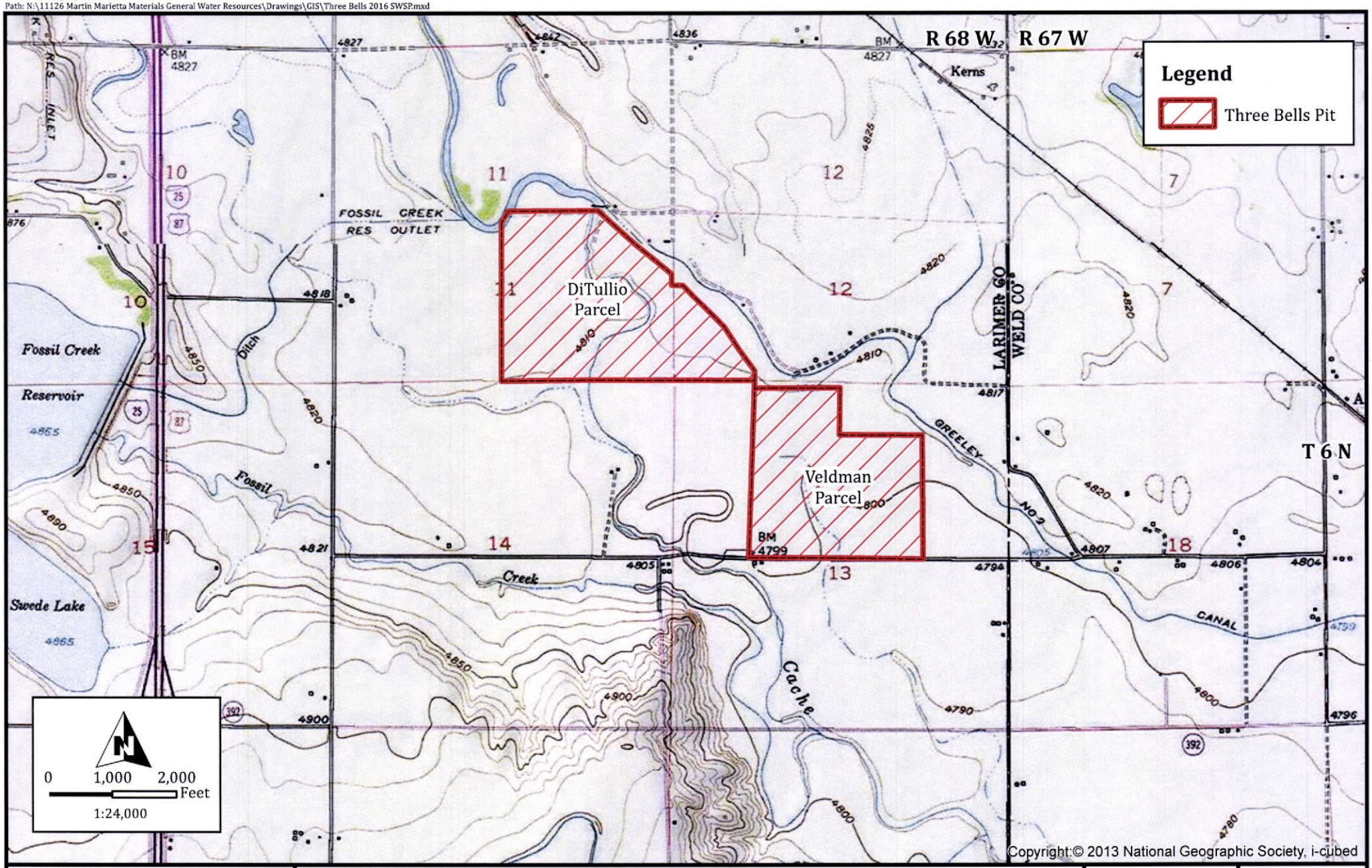
Cc: Michael Hein, Assistant Division Engineer, Division 1, Michael.Hein@state.co.us
810 9th Street, Suite 200, Greeley, CO 80631

Mark Simpson, Water Commissioner, District 3, Mark.Simpson@state.co.us

Amy Eschberger, Division of Reclamation Mining and Safety, Amy.Eschberger@state.co.us

Best Copy Available

Date Saved: 10/31/2017 10:13:07 AM
Path: N:\11126 Martin Marietta Materials General Water Resources\Drawings\GIS\Three Bells 2016 SWSP.mxd





**Applegate Group, Inc.**
Water Resource Advisors for the West
1490 West 121st Ave., Suite 100 Phone: (303) 452-6611
Denver, CO 80234-2728 Fax: (303) 452-2759
www.ApplegateGroup.com e-mail: info@applegategroup.com


# THREE BELLS PIT SWSP

Overview Map

Date: 31 Oct 2017
Job #: 11-126
Drawn By: JMD

Figure: 1
Of: 1

## Appendix A

## Three Bells SWSP- 2018 Renewal

*Red italics denote projections*

Applegate Group, Inc.

*Evaporative Losses*

| Month | Percent of Annual Evaporation (A) | Gross Lake Evaportation (ft) (B) | Precipitation (in) (C) | Effective Precipitation (ft) (D) | Net Lake Evaporation (acre-ft/acre) (E) | Total Lake Evaporation (ac-ft) (F) |
|---|---|---|---|---|---|---|
| *Jan-18* | *3.0%* | *0.10* | *0.34* | *0.02* | *0.00* | *0.00* |
| *Feb-18* | *3.5%* | *0.11* | *0.28* | *0.02* | *0.00* | *0.00* |
| *Mar-18* | *5.5%* | *0.18* | *0.87* | *0.05* | *0.13* | *0.70* |
| *Apr-18* | *9.0%* | *0.29* | *1.45* | *0.08* | *0.21* | *1.14* |
| *May-18* | *12.0%* | *0.39* | *2.37* | *0.14* | *0.25* | *0.00* |
| *Jun-18* | *14.5%* | *0.47* | *1.96* | *0.11* | *0.36* | *0.00* |
| *Jul-18* | *15.0%* | *0.49* | *1.37* | *0.08* | *0.41* | *0.00* |
| *Aug-18* | *13.5%* | *0.44* | *1.10* | *0.06* | *0.37* | *0.00* |
| *Sep-18* | *10.0%* | *0.33* | *0.96* | *0.06* | *0.27* | *0.00* |
| *Oct-18* | *7.0%* | *0.23* | *0.97* | *0.06* | *0.17* | *0.00* |
| *Nov-18* | *4.0%* | *0.13* | *0.52* | *0.03* | *0.10* | *0.00* |
| *Dec-18* | *3.0%* | *0.10* | *0.35* | *0.02* | *0.00* | *0.00* |
| ***Total*** | ***100%*** | ***3.25*** | ***12.54*** | ***0.73*** | ***2.27*** | ***1.85*** |

| End-of-Month Dewatering Meter Reading [gal] | | |
|---|---|---|
| Veldman Parcel | DiTullio Parcel (West) | DiTullio Parcel (East) |
| - | - | - |
| - | - | - |
| - | - | - |
| - | - | - |
| - | - | - |
| - | - | - |
| - | - | - |
| - | - | - |
| - | - | - |
| - | - | - |
| - | - | - |
| - | - | - |
| - | - | - |
| **-** | **-** | **-** |

Total Exposed Water Surface = 5.5 acres (through April 2018)
Annual Preciptiation = 12.5 inches - Taken from the Windsor Weather Station
Gross Annual Evaporation = 39 inches -Taken from NOAA Technical Report NWS 33

(A) Taken from *General Guidelines for Substitute Water Supply Plans for Sand and Gravel Pits Submitted to The State Engineer*
(B) Gross lake evaporation = (A) *(Gross Annual Evaporation / 12)
(C) Mean monthly precipitation values.
(D) Effective precipitation = 0.7*(C)/12
(E) Net lake evaporation from exposed water surfaces = (B) - (D)
(F) Total lake evaporation from exposed water surfaces = (E) * Total Exposed Water Surface

*Operational Losses*

| Month | Percent of Annual Aggregate Production (A) | Aggregate Production (tons) (B) | Water Retained in Product (ac-ft) (C) | Water Used For Dust Control (ac-ft) (D) | Water Used for Liner Construction (ac-ft) | Operational Consumptive Use (ac-ft) (E) | Evaporative Consumptive Use (ac-ft) (F) | Total Consumptive Use (ac-ft) (G) | Total Lagged Depletions (ac-ft) (H) | Lagged Dewatering Depletions (ac-ft) (I) |
|---|---|---|---|---|---|---|---|---|---|---|
| *Jan-18* | *1.0%* | *0* | *0.00* | *0.46* | *0.00* | *0.46* | *0.00* | *0.46* | *2.99* | *27.61* |
| *Feb-18* | *2.0%* | *0* | *0.00* | *0.46* | *0.00* | *0.46* | *0.00* | *0.46* | *2.66* | *25.09* |
| *Mar-18* | *6.0%* | *0* | *0.00* | *0.46* | *0.00* | *0.46* | *0.70* | *1.16* | *2.45* | *22.93* |
| *Apr-18* | *9.0%* | *0* | *0.00* | *0.46* | *0.77* | *1.23* | *1.14* | *2.37* | *2.45* | *21.02* |
| *May-18* | *13.0%* | *0* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | *2.46* | *19.31* |
| *Jun-18* | *16.0%* | *0* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | *2.07* | *17.75* |
| *Jul-18* | *17.0%* | *0* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | *1.78* | *16.32* |
| *Aug-18* | *15.0%* | *0* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | *1.57* | *15.01* |
| *Sep-18* | *9.0%* | *0* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | *1.41* | *13.80* |
| *Oct-18* | *7.0%* | *0* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | *1.27* | *12.70* |
| *Nov-18* | *4.0%* | *0* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | *1.15* | *11.68* |
| *Dec-18* | *1.0%* | *0* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | *1.04* | *10.74* |
| ***Total*** | ***100%*** | ***0*** | ***0.00*** | ***1.84*** | ***0.77*** | ***2.61*** | ***1.85*** | ***4.46*** | ***23.31*** | ***213.95*** |

Total Material Mined = 0 tons/year
Moisture Content = 4.0%

Notes:
(A) Average monthly production percentages from the sand and gravel mining industry
(B) Aggregate production = (A) * Total Material Mined/Year
(C) Water retained in product calculated as 4% of aggregate production
(D) Water used for dust control
(E) Operational consumptive use = (C) + (D)
(F) Total lake evaporation from exposed water surfaces = Net Lake Evap * Total Exposed Water Surface
(G) Column (E) + Column (F)
(H) Total lagged mining depletions do not reflect steady state conditions and are displayed as "real-time" depletions
(I) Lagged dewatering depletions. Dewatering will be continuous during 2016; therefore all dewatering depletions are assumed to be offset by dewatering discharge to stream

# Table No. 1

Three Bells Pit SWSP 2018

Applegate Group, Inc.

11/20/2017

10-106

## Total Lagged Depletions

*Red italics denote projections*

| Month | Three Bells Pit Lagged Depletions (ac-ft) (A) | Three Bells Pit Lagged Dewatering Depletions (ac-ft) (B) | Total Poudre Lagged Depletions (ac-ft) (C) |
|---|---|---|---|
| *Jan-18* | *2.99* | *27.61* | *30.59* |
| *Feb-18* | *2.66* | *25.09* | *27.74* |
| *Mar-18* | *2.45* | *22.93* | *25.38* |
| *Apr-18* | *2.45* | *21.02* | *23.48* |
| *May-18* | *2.46* | *19.31* | *21.77* |
| *Jun-18* | *2.07* | *17.75* | *19.82* |
| *Jul-18* | *1.78* | *16.32* | *18.10* |
| *Aug-18* | *1.57* | *15.01* | *16.58* |
| *Sep-18* | *1.41* | *13.80* | *15.21* |
| *Oct-18* | *1.27* | *12.70* | *13.97* |
| *Nov-18* | *1.15* | *11.68* | *12.83* |
| *Dec-18* | *1.04* | *10.74* | *11.79* |
| ***Total*** | ***23.31*** | ***213.95*** | ***237.26*** |

NOTES:

(A) Three Bells Pit Lagged Depletions

(B) Three Bells Pit Lagged Dewatering Depletions

(C) Total lagged depletions, (A)+(B)

Applegate Group, Inc.

# Table No. 2

Middle Poudre Combined SWSP 2014

11/21/2013

**Box Elder Ditch Diversions**

10-106

All diversions in acre-feet

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1950 | 0.0 | 0.0 | 0.0 | 0.0 | 902.5 | 1751.4 | 2092.6 | 1000.7 | 654.6 | 0.0 | 0.0 | 0.0 | 6401.8 |
| 1951 | 0.0 | 0.0 | 0.0 | 0.0 | 1144.5 | 1759.4 | 2221.5 | 626.8 | 1053.2 | 0.0 | 0.0 | 0.0 | 6805.4 |
| 1952 | 0.0 | 0.0 | 0.0 | 0.0 | 729.9 | 2423.8 | 1519.4 | 2110.4 | 1465.8 | 136.9 | 0.0 | 0.0 | 8386.2 |
| 1953 | 0.0 | 0.0 | 0.0 | 0.0 | 1569.0 | 2376.2 | 2388.1 | 1809.0 | 769.6 | 0.0 | 0.0 | 0.0 | 8911.9 |
| 1954 | 0.0 | 0.0 | 0.0 | 95.2 | 2570.6 | 2114.4 | 2217.6 | 825.1 | 597.0 | 382.8 | 0.0 | 0.0 | 8802.8 |
| 1955 | 0.0 | 0.0 | 0.0 | 140.8 | 2029.1 | 944.2 | 2171.9 | 1281.3 | 599.0 | 0.0 | 0.0 | 0.0 | 7166.4 |
| 1956 | 0.0 | 0.0 | 0.0 | 0.0 | 743.8 | 1779.2 | 2402.0 | 1071.1 | 376.9 | 1033.4 | 0.0 | 0.0 | 7406.4 |
| 1957 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1073.1 | 2332.6 | 1709.8 | 831.1 | 0.0 | 0.0 | 0.0 | 5946.5 |
| 1958 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1152.4 | 2031.1 | 1723.7 | 809.3 | 45.6 | 0.0 | 0.0 | 5762.1 |
| 1959 | 0.0 | 0.0 | 0.0 | 0.0 | 390.8 | 2332.6 | 2294.9 | 2054.9 | 489.9 | 0.0 | 0.0 | 0.0 | 7563.1 |
| 1960 | 0.0 | 0.0 | 0.0 | 226.1 | 1051.3 | 1697.9 | 2283.0 | 1559.0 | 664.5 | 73.4 | 0.0 | 0.0 | 7555.2 |
| 1961 | 0.0 | 0.0 | 0.0 | 0.0 | 172.6 | 805.3 | 1884.3 | 1440.0 | 489.9 | 0.0 | 0.0 | 0.0 | 4792.2 |
| 1962 | 0.0 | 0.0 | 0.0 | 333.2 | 1691.9 | 1235.7 | 2005.3 | 1814.9 | 662.5 | 0.0 | 0.0 | 0.0 | 7743.6 |
| 1963 | 0.0 | 0.0 | 0.0 | 317.4 | 2469.5 | 979.9 | 2271.1 | 610.9 | 557.4 | 0.0 | 0.0 | 0.0 | 7206.1 |
| 1964 | 0.0 | 0.0 | 0.0 | 0.0 | 1953.8 | 1180.2 | 2689.6 | 1168.3 | 634.7 | 714.1 | 0.0 | 0.0 | 8340.6 |
| 1965 | 0.0 | 0.0 | 0.0 | 0.0 | 1451.9 | 244.0 | 1356.7 | 1610.6 | 632.7 | 0.0 | 0.0 | 0.0 | 5295.9 |
| 1966 | 0.0 | 0.0 | 0.0 | 162.7 | 1570.9 | 1112.7 | 2292.9 | 569.3 | 240.0 | 196.4 | 0.0 | 0.0 | 6144.9 |
| 1967 | 0.0 | 0.0 | 0.0 | 0.0 | 491.9 | 71.4 | 1031.4 | 1658.2 | 559.4 | 406.6 | 0.0 | 0.0 | 4218.9 |
| 1968 | 0.0 | 0.0 | 0.0 | 0.0 | 1063.2 | 1211.9 | 2457.6 | 1327.0 | 888.6 | 452.2 | 17.9 | 0.0 | 7418.3 |
| 1969 | 0.0 | 0.0 | 0.0 | 7.9 | 787.5 | 688.3 | 2249.3 | 1426.1 | 339.2 | 0.0 | 0.0 | 0.0 | 5498.3 |
| 1970 | 0.0 | 0.0 | 0.0 | 0.0 | 686.3 | 646.6 | 1662.2 | 1741.5 | 370.9 | 0.0 | 0.0 | 0.0 | 5107.5 |
| 1971 | 0.0 | 0.0 | 0.0 | 0.0 | 164.6 | 1989.5 | 2175.9 | 1549.1 | 372.9 | 0.0 | 0.0 | 0.0 | 6252.0 |
| 1972 | 0.0 | 0.0 | 0.0 | 75.4 | 1338.9 | 1049.3 | 2128.3 | 1275.4 | 158.7 | 210.3 | 0.0 | 0.0 | 6236.1 |
| 1973 | 0.0 | 0.0 | 0.0 | 0.0 | 271.7 | 1759.4 | 2132.3 | 1761.4 | 783.5 | 65.5 | 0.0 | 0.0 | 6773.7 |
| 1974 | 0.0 | 0.0 | 0.0 | 0.0 | 1747.5 | 1380.5 | 2269.1 | 1721.7 | 660.5 | 121.0 | 0.0 | 0.0 | 7900.3 |
| 1975 | 0.0 | 0.0 | 0.0 | 0.0 | 910.4 | 741.8 | 2503.2 | 1666.1 | 569.3 | 214.2 | 0.0 | 0.0 | 6605.1 |
| 1976 | 0.0 | 0.0 | 0.0 | 0.0 | 737.9 | 2060.9 | 2703.5 | 2126.3 | 716.0 | 33.7 | 0.0 | 0.0 | 8378.3 |
| 1977 | 0.0 | 0.0 | 0.0 | 0.0 | 1535.2 | 2532.9 | 1188.3 | 1192.1 | 752.3 | 412.6 | 0.0 | 0.0 | 7613.5 |
| 1978 | 0.0 | 0.0 | 0.0 | 77.6 | 256.3 | 1163.7 | 2488.5 | 2174.9 | 839.0 | 0.0 | 0.0 | 0.0 | 7000.0 |
| 1979 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2222.9 | 1116.9 | 54.0 | 0.0 | 0.0 | 0.0 | 3393.8 |
| 1980 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1444.8 | 1692.9 | 1481.7 | 536.1 | 0.0 | 0.0 | 0.0 | 5155.5 |
| 1981 | 0.0 | 0.0 | 0.0 | 11.9 | 654.0 | 1402.3 | 2276.1 | 1042.9 | 214.0 | 0.0 | 0.0 | 0.0 | 5601.2 |
| 1982 | 0.0 | 0.0 | 0.0 | 115.6 | 622.8 | 279.5 | 1802.8 | 1586.8 | 220.0 | 0.0 | 0.0 | 0.0 | 4627.5 |
| 1983 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1798.6 | 1960.9 | 182.3 | 0.0 | 0.0 | 0.0 | 3941.8 |
| 1984 | 0.0 | 0.0 | 0.0 | 0.0 | 180.9 | 1549.9 | 1953.6 | 1874.2 | 772.4 | 74.8 | 0.0 | 0.0 | 6405.7 |
| 1985 | 0.0 | 0.0 | 0.0 | 0.0 | 806.5 | 1794.3 | 1907.1 | 1776.6 | 313.1 | 0.0 | 0.0 | 0.0 | 6597.6 |
| 1986 | 0.0 | 0.0 | 0.0 | 0.0 | 933.8 | 1490.0 | 2171.4 | 1232.0 | 617.9 | 120.5 | 0.0 | 0.0 | 6565.6 |
| 1987 | 0.0 | 0.0 | 0.0 | 73.6 | 465.9 | 1142.3 | 2009.1 | 1349.0 | 274.0 | 68.6 | 0.0 | 0.0 | 5382.4 |
| 1988 | 0.0 | 0.0 | 0.0 | 0.0 | 479.8 | 1533.6 | 1902.6 | 1369.6 | 525.5 | 74.8 | 0.0 | 0.0 | 5885.9 |
| 1989 | 0.0 | 0.0 | 0.0 | 75.5 | 783.5 | 666.3 | 1930.9 | 998.7 | 315.2 | 0.0 | 0.0 | 0.0 | 4770.0 |
| 1990 | 0.0 | 0.0 | 0.0 | 0.0 | 268.0 | 1100.1 | 1262.1 | 926.8 | 389.8 | 0.0 | 0.0 | 0.0 | 3946.7 |
| 1991 | 0.0 | 0.0 | 0.0 | 0.0 | 321.9 | 1007.0 | 1860.7 | 1267.1 | 348.7 | 0.0 | 0.0 | 0.0 | 4805.4 |
| 1992 | 0.0 | 0.0 | 0.0 | 0.0 | 837.2 | 1021.9 | 936.4 | 1264.6 | 363.4 | 372.5 | 0.0 | 0.0 | 4796.0 |
| 1993 | 0.0 | 0.0 | 0.0 | 0.0 | 729.9 | 988.8 | 1628.1 | 1766.3 | 191.0 | 47.9 | 0.0 | 0.0 | 5352.0 |
| 1994 | 0.0 | 0.0 | 0.0 | 330.3 | 546.3 | 1316.3 | 1694.3 | 1119.3 | 661.1 | 0.0 | 0.0 | 0.0 | 5667.5 |
| 1995 | 0.0 | 0.0 | 0.0 | 281.5 | 117.0 | 368.5 | 1217.3 | 2240.4 | 956.6 | 191.6 | 0.0 | 0.0 | 5372.9 |
| 1996 | 0.0 | 0.0 | 0.0 | 237.0 | 1436.1 | 896.9 | 2091.8 | 1240.5 | 843.8 | 478.0 | 0.0 | 0.0 | 7224.1 |
| 1996 | 0.0 | 0.0 | 0.0 | 174.9 | 1334.1 | 665.1 | 1994.4 | 320.9 | 457.6 | 389.3 | 0.0 | 0.0 | 5336.3 |
| 1998 | 0.0 | 0.0 | 0.0 | 0.0 | 858.5 | 1119.5 | 2088.2 | 1800.0 | 886.2 | 0.0 | 0.0 | 0.0 | 6752.4 |
| 1999 | 0.0 | 0.0 | 0.0 | 92.4 | 0.0 | 186.5 | 2036.3 | 1755.0 | 977.9 | 88.4 | 0.0 | 0.0 | 5136.4 |
| 2000 | 0.0 | 0.0 | 0.0 | 483.8 | 1022.7 | 1728.2 | 1933.1 | 1251.6 | 1171.1 | 306.7 | 0.0 | 0.0 | 7897.1 |
| 2001 | 0.0 | 0.0 | 0.0 | 159.1 | 447.3 | 1311.7 | 1815.7 | 1727.4 | 797.4 | 542.9 | 0.0 | 0.0 | 6801.5 |
| 2002 | 0.0 | 0.0 | 0.0 | 181.3 | 1398.8 | 1207.2 | 1369.0 | 414.9 | 552.3 | 608.5 | 292.0 | 0.0 | 6024.0 |
| 2003 | 0.0 | 0.0 | 0.0 | 188.8 | 484.1 | 894.2 | 1949.6 | 1595.1 | 742.4 | 734.1 | 295.5 | 0.0 | 6883.9 |
| 2004 | 0.0 | 0.0 | 0.0 | 698.2 | 790.4 | 844.6 | 1834.1 | 1489.4 | 708.1 | 468.3 | 97.6 | 0.0 | 6930.8 |
| 2005 | 0.0 | 0.0 | 0.0 | 166.1 | 960.9 | 584.7 | 2299.3 | 1455.1 | 647.4 | 391.1 | 241.8 | 0.0 | 6746.4 |
| 2006 | 0.0 | 0.0 | 0.0 | 420.5 | 1066.3 | 1948.8 | 1767.7 | 848.2 | 819.6 | 474.3 | 136.8 | 0.0 | 7482.2 |
| 2007 | 0.0 | 0.0 | 0.0 | 77.0 | 1212.5 | 1429.5 | 2118.4 | 1571.9 | 875.5 | 357.7 | 0.0 | 0.0 | 7642.5 |
| Avg. | 0.0 | 0.0 | 0.0 | 89.7 | 848.1 | 1210.0 | 1982.9 | 1421.5 | 602.6 | 177.4 | 18.6 | 0.0 | 6351.0 |
| Avg for 5 Shares | 0.0 | 0.0 | 0.0 | 7.0 | 66.3 | 94.5 | 154.9 | 111.1 | 47.1 | 13.9 | 1.5 | 0.0 | 496.2 |
| Max . | 0.0 | 0.0 | 0.0 | 698.2 | 2570.6 | 2532.9 | 2703.5 | 2240.4 | 1465.8 | 1033.4 | 295.5 | 0.0 | 8911.9 |
| Max for 5 Shares | 0.0 | 0.0 | 0.0 | 54.5 | 200.8 | 197.9 | 211.2 | 175.0 | 114.5 | 80.7 | 23.1 | 0.0 | 696.2 |

**Table No. 3**
Martin Marietta Materials, Inc.
Middle Poudre Combined SWSP

*Prepared By:* Applegate Group, Inc.
*Date Revised:* 11/21/2013
*AG Job#:* 10-106

*Historic Consumptive Use and Return Flows for 5.5 Box Elder Ditch Share used at Three Bells Property*

| Month | Average Headgate Diversion (ac-ft) (A) | Prorata Diversion For 6.0 Shares (ac-ft) (B) | Diversions Available at Farm Headgate (ac-ft) (C) | Water Available for Crop Consumption (ac-ft) (D) | Potential Irrigation Requirement (ac-ft) (E) | Calculated CU Credit (ac-ft) (F) | Total Return Flows (ac-ft) (G) | 20% Surface Return Flows (ac-ft) (H) | 80% Subsurface Return Flows (ac-ft) (I) | Lagged Subsurface Return Flows (ac-ft) (J) | Historic Accretions & Depletions 6.0 Shares (ac-ft) (K) | Historic Accretions & Depletions 5.5 Share (ac-ft) (L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 9.53 | -9.53 | -8.74 |
| Feb | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8.29 | -8.29 | -7.60 |
| Mar | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.33 | -7.33 | -6.72 |
| Apr | 44.30 | 4.15 | 3.74 | 2.24 | 5.00 | 2.24 | 1.50 | 0.30 | 1.20 | 6.70 | -3.26 | -2.99 |
| May | 907.30 | 85.06 | 76.55 | 45.93 | 34.00 | 34.00 | 42.55 | 8.51 | 34.04 | 10.72 | 57.32 | 52.54 |
| Jun | 1283.80 | 120.36 | 108.32 | 64.99 | 123.00 | 64.99 | 43.33 | 8.67 | 34.66 | 18.58 | 81.07 | 74.31 |
| Jul | 2091.20 | 196.05 | 176.45 | 105.87 | 140.00 | 105.87 | 70.58 | 14.12 | 56.46 | 25.12 | 137.21 | 125.77 |
| Aug | 1470.60 | 137.87 | 124.08 | 74.45 | 66.00 | 66.00 | 58.08 | 11.62 | 46.47 | 31.24 | 81.23 | 74.46 |
| Sep | 571.40 | 53.57 | 48.21 | 28.93 | 30.00 | 28.93 | 19.28 | 3.86 | 15.43 | 28.50 | 15.86 | 14.53 |
| Oct | 130.70 | 12.25 | 11.03 | 6.62 | 5.00 | 5.00 | 6.03 | 1.21 | 4.82 | 20.68 | -10.86 | -9.96 |
| Nov | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 14.95 | -14.95 | -13.71 |
| Dec | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 11.42 | -11.42 | -10.47 |
| **Total** | **6499.3** | **609.3** | **548.4** | **329.0** | **404.0** | **307.0** | **241.3** | **48.3** | **193.1** | **193.1** | **307.0** | **281.4** |

(A) Average Headgate Diversions for Box Elder Ditch (1950 to 1984)
(B) Prorata Diversion for 6.0 Box Elder Shares (64 total shares in ditch)
(C) Available at Farm Headgate = (B) Prorata Diversions for 6.0 shares * 90% (10% Ditch Losses)
(D) Water Available for Crop Consumption = (C) Farm Headgate Delivery * 60% Field Efficiency
(E) Potential irrigation requirement and crop demand from CSU SP CU Model Modified Blaney-Criddle Model Run (Appendix F)
(F) Calculated CU credit for 6.0 Box Elder Ditch shares, whichever is less, (D) or (E)
(G) Return Flows at Farm, (C)-(F)
(H) Surface return flows, (G) Total return flows * 0.2
(I) Subsurface return flows, (G) Total return flows * 0.8
(J) Lagged subsurface return flows at river; from lagging model where X = 1,500 ft, W = 4,800 ft, T = 50,000 gpd/ft, and S = 0.2
(K) Historic accretions and depletions for 6.0 Box Elder Shares used at Three Bells Property
(L) Historic accretions and depletions for 5.5 Box Elder Share owned by Lafarge from Three Bells

**Table No. 4**
Martin Marietta Materials, Inc.
Middle Poudre Combined SWSP

*Prepared By:* Applegate Group, Inc.
*Date Revised:* 11/21/2013
*AG Job #:* 10-106

*Historic Farm Headgate Diversions and Return Flows for 5.0 Box Elder Ditch Shares*

| | 5.0 Shares from Three Bells Farm | | | | | |
|---|---|---|---|---|---|---|
| Month | Farm Headgate Diversions (ac-ft) (A) | Surface Return Flows (ac-ft) (B) | Lagged Subsurface Return Flows (ac-ft) (C) | Total Return Flows (ac-ft) (D) | Net Depletions (ac-ft) (E) | RF Obligation Percentages (ac-ft) (F) |
| Jan | 0.00 | 0.00 | 7.94 | 7.94 | -7.94 | 1.7% |
| Feb | 0.00 | 0.00 | 6.91 | 6.91 | -6.91 | 1.5% |
| Mar | 0.00 | 0.00 | 6.11 | 6.11 | -6.11 | 1.3% |
| Apr | 3.11 | 0.25 | 5.58 | 5.83 | -2.72 | 1.3% |
| May | 63.79 | 7.09 | 8.94 | 16.03 | 47.77 | 25.1% |
| Jun | 90.27 | 7.22 | 15.49 | 22.71 | 67.56 | 25.2% |
| Jul | 147.04 | 11.76 | 20.93 | 32.70 | 114.34 | 22.2% |
| Aug | 103.40 | 9.68 | 26.03 | 35.71 | 67.69 | 34.5% |
| Sep | 40.18 | 3.21 | 23.75 | 26.96 | 13.21 | 67.1% |
| Oct | 9.19 | 1.00 | 17.24 | 18.24 | -9.05 | 4.0% |
| Nov | 0.00 | 0.00 | 12.46 | 12.46 | -12.46 | 2.7% |
| Dec | 0.00 | 0.00 | 9.52 | 9.52 | -9.52 | 2.1% |
| **Total** | **457.0** | **40.2** | **160.9** | **201.1** | **255.9** | - |

(A) From Table No. 3 Column (C), pro-rated to 5.0 share
(B) From Table No. 3 Column (H), pro-rated to 5.0 share
(C) From Table No. 3 Column (J), pro-rated to 5.0 share
(D) = (B) + (C)
(E) = (A) - (D)
(F) For May through September, equal to the monthly return flows divided by the monthly farm headgate diversions.
For October through April, equal to the monthly return flows divided by the total annual farmheadgate diversions

## Table No. 2

Three Bells Pit SWSP 2018

Distance from Heaton Reservoir to Poudre River Confluence = 35 miles
Transit Loss Rate = 0.50% per mile

Applegate Group, Inc.

11/20/2017
10-106

### 2018 Water Balance

*Red italics denote projections*

2017 FHD = 0.00 ac-ft

| Month | Total Combined Lagged Depletions (ac-ft) (A) | Farm Headgate Delivery for Recharge of Box Elder Shares (ac-ft) (B) | Evap at Recharge Pit for Box Elder shares (ac-ft) (C) | Net Recharge (ac-ft) (D) | Lagged Recharge Credit of Box Elder Shares (ac-ft) (E) | Return Flow Factor (ac-ft) (F) | Return Flow Obligation (ac-ft) (G) | Net Impact to the Poudre River (ac-ft) (H) | % of Month Under Call Conditions (I) | Initial Net Impact to the Poudre River (ac-ft) (J) | Additional Replacements: Veldman Reservoir Release (ac-ft) (I) | Additional Replacements: Heaton Reservoir Release (ac-ft) (K) | Additional Replacements: Heaton Reservoir Transit Loss (ac-ft) (L) | Net Impact to the Poudre River (ac-ft) (M) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Jan-18* | *30.59* | *0.00* | *0.00* | *0.00* | *4.58* | *1.7%* | *0.00* | *-26.01* | *100%* | *-26.01* | | *32.0* | *5.60* | *0.39* |
| *Feb-18* | *27.74* | *0.00* | *0.00* | *0.00* | *4.18* | *1.5%* | *0.00* | *-23.56* | *100%* | *-23.56* | | *29.0* | *5.08* | *0.37* |
| *Mar-18* | *25.38* | *0.00* | *0.00* | *0.00* | *3.82* | *1.3%* | *0.00* | *-21.56* | *100%* | *-21.56* | | *27.0* | *4.73* | *0.72* |
| *Apr-18* | *23.48* | *0.00* | *0.00* | *0.00* | *3.49* | *1.3%* | *0.00* | *-19.99* | *100%* | *-19.99* | *26.5* | | *0.00* | *6.51* |
| *May-18* | *21.77* | *0.00* | *0.00* | *0.00* | *3.19* | *25.1%* | *0.00* | *-18.58* | *100%* | *-18.58* | *23.5* | | *0.00* | *4.92* |
| *Jun-18* | *19.82* | *0.00* | *0.00* | *0.00* | *2.92* | *25.2%* | *0.00* | *-16.90* | *100%* | *-16.90* | *19.5* | | *0.00* | *2.60* |
| *Jul-18* | *18.10* | *0.00* | *0.00* | *0.00* | *2.66* | *22.2%* | *0.00* | *-15.43* | *100%* | *-15.43* | *17.0* | | *0.00* | *1.57* |
| *Aug-18* | *16.58* | *0.00* | *0.00* | *0.00* | *2.43* | *34.5%* | *0.00* | *-14.15* | *100%* | *-14.15* | *16.0* | | *0.00* | *1.85* |
| *Sep-18* | *15.21* | *0.00* | *0.00* | *0.00* | *2.22* | *67.1%* | *0.00* | *-12.99* | *100%* | *-12.99* | *14.5* | | *0.00* | *1.51* |
| *Oct-18* | *13.97* | *0.00* | *0.00* | *0.00* | *2.03* | *4.0%* | *0.00* | *-11.94* | *100%* | *-11.94* | *13.0* | | *0.00* | *1.06* |
| *Nov-18* | *12.83* | *0.00* | *0.00* | *0.00* | *1.86* | *2.7%* | *0.00* | *-10.97* | *100%* | *-10.97* | | *14.0* | *2.45* | *0.58* |
| *Dec-18* | *11.79* | *0.00* | *0.00* | *0.00* | *1.70* | *2.1%* | *0.00* | *-10.09* | *100%* | *-10.09* | | *13.0* | *2.28* | *0.64* |
| ***Total*** | ***237.26*** | ***0.00*** | ***0.00*** | ***0.00*** | ***35.09*** | | ***0.00*** | ***-202.17*** | ***-*** | ***-202.17*** | ***130.0*** | ***115.0*** | ***20.1*** | ***22.71*** |

NOTES:
(A) Total lagged depletions from Table No. 1 Column (G)
(B) Projected and actual diversions into recharge in 2012 for 5 Box Elder Ditch Company shares
(C) Estimated evaporation losses from the recharge site assuming 1.0 acre pond at gross evaporation rate
(D) = (B) - (C)
(E) Lagged recharge from recharge model
(R) Return flow factors from Table No. 4 Column (F)
(G) May through September: Columns (B) * (F). October through April: Column (F) * Total farm headgate delivery from previous irrigation season
(H) Columns (E) - (A) - (G) (positive values indicate a net accretion)
(I) Percentage of month under call conditions
(J) Column (H) * Column (I)
(K) Release from Vedlman Reservoir
(L) Release from Heaton Reservoir
(M) Transit loss on Heaton Reservoir release
(N) = (J) + (K) + (L) - (M)

January 23, 2017

Mr. James Sharn
Martin Mariett Materials, Inc.
10170 Church Ranch Way
Westminister, CO 80021

**RE: Reservation of Water Stored in River Bluffs Lake (aka Veldman Pit) for the Three Bells SWSP**

Dear James:

River Bluffs Ventures, LLC (RBV) owns River Bluffs Lake (aka Veldman Pit) which currently has approximately 800 acre feet of free river water in storage. To our knowledge the water is available for augmentation use. River Bluffs has reserved up to 180 acre feet of the water in storage (or such other sources the RBV owns or controls legally and physically suitable) for use as a replacement supply in Martin Marietta Materials, Inc.'s (MMM) 2017 and/or 2018 Three Bells Substitute Water Supply Plans. MMM shall be responsible for physically making the release of the water to the river at the times needed in the Three Bells Substitute Water Supply Plan(s).

Sincerely,

Dino DiTullio, Manager
River Bluffs Ventures, LLC

# STATE OF COLORADO

**DIVISION OF RECLAMATION, MINING AND SAFETY**
Department of Natural Resources

1313 Sherman St., Room 215
Denver, Colorado 80203
Phone: (303) 866-3567
FAX: (303) 832-8106

COLORADO DIVISION OF RECLAMATION MINING & SAFETY



April 30, 2010

Lafarge West, Inc.
10170 Church Ranch Way, Ste. 200
Westminister, CO 800210000

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:

| | | | |
|---|---|---|---|
| M2006064 | Shields at Fossil Creek Mine | M1983031 | Stromquist Pit |
| M1994002 | Andrews S & G #5 (Burlington Pit) | M1974072 | Chantala Pit |
| M2006018 | North Bank Resources | M1985218 | Rich Pit |
| M2006073 | Sundance Sand and Gravel Resource | M1985206 | Boone-Martin Pit |
| M2009082 | Parsons Mine | M1995022 | Andrews #2 |
| M1977081 | Greeley West Pit | M1990144 | Boone-Fillmore Pit |
| M2003091 | Duckworth Pit | M1997087 | Hartman Pit |
| M2000113 | Mamm Creek Sand & Gravel | M2001094 | Shaw Pit |
| M2001090 | River Valley Resource | M2002009 | Beeman Pit #1 |
| M2000016 | Riverbend Operation | M1981307 | Fountain Pit |
| M1979134 | Powers Pit | M1977439 | Home Office Mine |
| M1977036 | Greeley 35th Ave Pit | M1979191 | Three Bells Pit |
| M2000034 | Reichert Pit | M1982182 | Port of Entry Pit |
| M2001051 | North Taft Hill Expansion Site | M2002081 | Overland Ponds |
| M1974015 | Lyons Pit | M1981088 | McCoy Pit |
| M1974004 | Specification Aggregates Quarry | M1982034 | Miller Pit |
| M1987176 | Hamm Pit | M1996082 | Blair Mesa Pit |
| M1988042 | Cottonwood Pit | M1980136 | Chambers Pit |
| M1990112 | State Pit | M1977098 | Sievers Pit |
| M1979002 | North Delta Pit | M1983013 | Latham - Burkett Pit |
| M1979159 | Brose Pit | M1979097 | East Rigden Pit |
| M1998014 | Gypsum Ranch Pit | M1991035 | Bluestone Pit |
| M1999088 | Kyger Pit | M1986159 | Courtner Pit |
| M1998075 | Andrews #3 (Mock Pit) | | |

| | |
|---|---|
| M1974070 | Nelson Pit |
| M2000002 | Tanabe Pit |
| M1994045 | Bluestone Pit |
| M1986079 | M & G Pit |

# ADMINISTRATION PROTOCOL
## Augmentation Plan Accounting
## Division One – South Platte River

This protocol establishes the accounting and reporting process required to enable the division engineer's office to confirm that depletions from all out-of-priority diversions are being replaced so as to prevent injury to vested water rights. The accounting must comport with established "cradle to grave" accounting standards, which allow an audit of the information to track exactly how the data is manipulated as it is translated from raw input data to the resultant impact on the river. While this protocol is subordinate to any decreed language addressing specific accounting requirements, it generally addresses the minimum requirements of such accounting.

The accounting must use the standard convention where a depletion is "negative" and an accretion or other replacement source is "positive". The sum of the impacts will then result in either a "negative" or "positive" impact on the stream.

Wells in plans that have a negative stream impact must provide additional replacement water, curtail pumping or both until the impact is no longer negative. Plans with a negative stream impact that fail to curtail pumping will be ordered to stop pumping until such time as the projected impact of the wells is no longer negative.

1. Accounting must be submitted electronically to the water commissioner (call 970-352-8712 to obtain email address) and division engineer at Div1Accounting@state.co.us within 30 days of the end of the month for which the accounting is being submitted.
2. The accounting must provide the **contact information** including name and address for:
    a. the owner(s) of each well
    b. the person responsible for submitting the accounting
    c. the plan administrator and/or the plan attorney.
3. All **input data** must be in one location, such as an "Input" worksheet, etc. The accounting must show all pumping. Input data includes the information listed below.
    a. The required input data for each **well** is:
        i. the monthly meter reading for wells that use a **presumptive depletion factor** (PDF) to determine the associated consumptive use (CU); or
        ii. the monthly CU in acre-feet (AF) for wells that have a decree or approved SWSP that allows the wells to use a **water balance methodology** to determine the CU of the well. The analysis used to determine the CU must be included with the accounting.
        iii. Wells that are decreed as an **alternate point of diversion** (APOD) to a surface water right must report pumping on a daily basis if any of the diversion during the month is claimed as being "in priority". (See *Administration Protocol – APOD Wells* for more details.)

iv. The well meter serial readings for each meter shall be included if there is more than one meter on a well.

b. Each **recharge site** must comply with the *Administration Protocol - Recharge* and must report the:

i. daily volume in AF diverted into the site;

ii. monthly volume in AF released from the site;

iii. monthly net evaporative loss in AF;

iv. volume of water in AF remaining at the end of the month.

c. The accounting must identify each source of **fully consumable replacement water** actually delivered to the location impacted by the depletions. To demonstrate the water was actually delivered to the required location will require the following information:

i. the originating source of the water, date released and volume of water released;

ii. transportation losses to point of diversion or use, if any, using stream loss factors approved by the water commissioner;

iii. the volume of water actually delivered on a daily basis past any surface water diversion that was sweeping the river as corroborated by the water commissioner.

(See *Administration Protocol – Delivery of Water* for more details on delivering water.)

d. For each source of **replacement water that has been "changed"** for use as a source of augmentation, such as changed reservoir shares, ditch bypass credits or credits from dry-up, etc., the following input information must be reported:

i. the basis and volume of the return flow obligation;

ii. the location the changed water was historically used; this will be the location used to determine the timing of the return flow impact on the river.

4. The accounting must include a monthly **projection** of the plan's operation at least through March 31 of the next calendar year.

5. The accounting must include all input and output files associated with **modeling the delayed impact** of diversions. The output from the modeling must report to a summary table that shows, by month, the ongoing depletions associated with pumping, return flow obligations, etc. and accretions from recharge operations.

6. A **net impact** summary must show the out-of-priority depletions, accretions from each recharge site, volume of replacement water actually delivered to the location of the depletions and the resultant net impact on **a daily basis**. If necessary, the net impact must be done by river reach.

   While **modeling** may use a **monthly step function** to determine the depletions from pumping and accretions from recharge, the monthly result must then be **divided by the number of days in the month** in order to **simulate a daily impact**, as water rights are administered on a daily and not monthly basis.

Replacement water must be provided such that the **daily net impact** (using the simulated daily numbers from the modeling) **is not negative**. If a well is out-of-priority for 15 days during a month, replacement must be made only for the 15 days the well is out-of-priority. The replacement must be made, however, on a daily basis as opposed to, for instance, making an aggregated release equal to the volume of the out-of-priority depletions. Likewise, the simulated daily accretion will only count toward replacing the depletion on the days the well is out-of-priority. The accretions that report to the river when the well is in priority cannot be used to replace the out-of-priority depletions.

The **accretions that impact the river when the well is in priority** are not considered "excess" unless the cumulative net impact of the well is not negative for the entire irrigation year to date. (The irrigation year for this purpose is April 1 thru the following March 31.) Until such time as the cumulative net impact is not negative, the accretions must simply be released to the river and cannot be leased to other plans or recaptured. Plans that show a positive cumulative net impact are still required to make replacements on a daily basis; the cumulative analysis only effects whether or not accretions reporting to the river when the well is in priority are considered "excess" and are, therefore, able to be recaptured.

7. The basis for determining that the depletions are **out-of-priority** must be clearly established and all steps in the calculation included in the accounting. The analysis may be done, unless otherwise limited by decree, for each well or groups of wells, provided the most junior water right associated with the group of wells is used as the reference water right for the group's out-of-priority status.

8. Accounting must include **actual information** for the irrigation year through the month for which the accounting is being submitted **AND projections** of the plan operation through March 31 of the next calendar year.

9. The following **naming convention** must be used for all files submitted pursuant to item 1:

   "Plan**WDID**_YYMMDD"

   where: PlanWDID is the WDID assigned by the division engineer's office
   YYMMDD corresponds to the date the accounting is submitted.

   As an example, the assigned WDID for the former GASP plan was 0103333. If accounting using Excel® was submitted for that plan on May 15, 2004, the file name would be:

   "0103333_040515.xls"

   The name of the file must be in the subject line of the email.

10. All accounting must be reported using the **WDID** for the structure, at a minimum. Other information such as well name, permit number, etc. may also be included as desired. <u>All wells must be decreed by the water court, permitted by the state engineer or included in a decreed plan for augmentation</u>. Unregistered and undecreed wells cannot, in the opinion of the division engineer, be effectively administered because of the need to know the location, allowable diversion rate and use of the well - information that is only available from the decree or permitting process.

11. If a well is covered in multiple SWSP's or augmentation plans, the monthly meter readings must be the same in the accounting for each plan covering the subject well. The accounting for every plan covering the well shall state the proportionate pumping amount covered by each plan to assure all out-of-priority depletions are replaced.

12. The following additional accounting is required for sources of replacement water used for more than one plan. The water right owner of the replacement water is responsible for accounting for the total replacement amount and how much each plan is using of that total amount. The accounting for portions of the replacement water by other users must match the accounting of the water right owner. The amount of replacement water used by the water right owner and other users together shall not exceed the total replacement amount available.

    (See *Administration Protocol – Use Of Unnamed Sources For Replacement* for additional requirements concerning required notice and approval of sources of replacement not specifically described in a SWSP or augmentation plan*)*

# ADMINISTRATION PROTOCOL
# Delivering Water Using the Natural Stream
# Division One–South Platte River

This document outlines the actions water users must take in order for the Division of Water Resources to deliver water by means of the natural stream. This protocol is subordinate to any contradicting decreed language addressing specific water rights.

## Access

The language of section 37-84-113, C.R.S., *implicitly acknowledges that a natural stream may be used as a conduit.*[1]

## Notification

The water user must notify the water commissioner **at least 48 hours and not more than 7 days prior to the release of water** being delivered via a natural stream system unless the water commissioner specifically approves a different notice requirement in advance of the release. Advance notice is necessary in order to provide the water commissioner the time required to confirm that the delivery can be made under the current stream conditions.

## Measurement Structures

In accordance with §37-84-113, C.R.S., water users seeking to use the natural stream to deliver water

> *"shall construct suitable and proper measuring flumes or weirs, equipped with self-registering devices if required by the state engineer, for the proper and accurate determination of the amount and flow of water turned into, carried through, and diverted out of said natural stream."* (underline emphasis added)

In short, water users are responsible for the construction of all measurement structures required to administer their water. This may include measurement structures required, in the opinion of the water commissioner or division engineer, to deliver their water past intervening water rights that are drying or "sweeping" the river.

**If the water commissioner is unable to corroborate that water was delivered past a structure that was sweeping the river, none of the water released will be available for diversion or replacement credit below the sweeping structure.**

## Transit Loss

The volume of water available for diversion or replacement credit is the volume released to the stream less transit loss. The transit loss will:

- comply with any specific court decree covering the delivery;
- be based on current conditions and shall be determined by the water commissioner or division engineer;
- be the same for all water users in the same reach of the river or stream at the time of the delivery.

[1] Trail's End Ranch, LLC v. CO DWR, 91 P.3d 1058 (Colo. 2004).

# ADMINISTRATION PROTOCOL
## Dry-Up of Irrigated Land
## Division One – South Platte River

As required by either a decreed change of water rights or a substitute water supply plan, a source of irrigation water may be either permanently or temporarily removed from a parcel of land in order to make the historical consumptive use portion of that water supply available for other uses, typically augmentation. This protocol addresses the documentation required to administer the effective "dry-up". To the extent that one or more of the following directives are in direct contradiction with a decree of the court, the terms of the decree must be followed.

**Permanent Dry-up Covenant**

1. Must be decreed by the court.
2. Must be filed with clerk and recorder's office for the county wherein the land is located.
3. Must email a GIS shapefile to Div1Accounting@state.co.us that includes case number, WDID, and total acreage permanently dried-up, along with any accompanying metadata. The shapefile must be in NAD83 datum, UTM projection, Zone 13North.
4. Must address the issue of noxious weeds as required by §37-92-305(4.5)(a), C.R.S. and/or other county or local ordinances. (DWR is not authorized to administer the issue of noxious weeds; this statement is, therefore, simply informational).

**Temporary Dry-up Agreement**

1. May be made for a term that is not less than one irrigation season.
2. Unless otherwise stated in the approved SWSP, a written notification, reporting land of intended dry-up, must be submitted prior to April 1 of each irrigation season to the division engineer, water commissioner and Div1Accounting@state.co.us. Along with the written notification, a GIS shapefile reflecting the land of intended dry-up must be submitted. The shapefile must be emailed to Div1Accounting@state.co.us. The shapefile shall include case number, WDID, and acreage of dry-up, along with any accompanying metadata. The shapefile must be in NAD83 datum, UTM projection, Zone 13North.
3. Unless otherwise stated in the approved SWSP, a written affidavit, affirming land actually dried up, must be submitted prior to October 31 of each irrigation season to the division engineer, water commissioner and Div1Accounting@state.co.us. Along with the written affidavit, a GIS shapefile, reflecting the dried up acreage proclaimed in the affidavit, must be submitted. If the submitted affidavit indicates that the intended and actual dry-up acreages are identical, then no GIS shapefile is required. The shapefile must be emailed to Div1Accounting@state.co.us. The shapefile shall include case number, WDID, and acreage of dry-up, along with any accompanying metadata. The shapefile must be in NAD83 datum, UTM projection, Zone 13North.
4. Once written notice has been made to the division engineer and/or water commissioner, the dry-up requirement is irrevocable during the current irrigation season regardless of whether or not the water associated with the historical consumptive use is actually used.

# ADMINISTRATION PROTOCOL
# Recharge
# Division One – South Platte River

The purpose of a "recharge structure" as referenced in this document is to introduce water to the river alluvium that will result in accretions to a live stream. For the purposes of this document, a recharge structure does not include a well that is used to artificially recharge a Denver Basin bedrock aquifer. With that qualification, a recharge structure is defined as:

- A section of ditch, the losses from which can be reasonably modeled as a single source of water.
- A pond or group of ponds that receive water from the same delivery location and can be reasonably modeled as a single source of water.

1. A written notification for each recharge structure must be provided to the water commissioner and division engineer. **The Division of Water Resources will not acknowledge any recharge activity conducted without the knowledge of the water commissioner.** The notification must include:
    a. a map showing the location of the structure and the court case number of the plan for augmentation authorized to use the structure;
    b. a map showing the location of the diversion point and the court case number for the decree authorizing the diversion, if any;
    c. a map showing the location of and all information for the metering location;
    d. the maximum water surface area of the structure;
    e. for ditch structures, if the ditch is divided into more than one recharge reach, an explanation of how the volume diverted will be allocated to the various sections.
2. Upon receiving written notification or decree by the water court, the division engineer will assign the structure a WDID number. The WDID number is the identification number that will be used for the administration of the structure and must be included in all correspondence and accounting reports. **(For structures that were included in a decreed plan for augmentation but were not physically constructed at the time of the decree, a written notification of the intent to construct the structure must be provided.)**
3. Any structure that intercepts groundwater must be permitted as a well and included in a plan for augmentation or substitute water supply plan approved by the state engineer. The division engineer strongly recommends avoiding recharge structures that intercept groundwater, in order to simplify the accounting process.
4. The flow into **EVERY** recharge structure **MUST** be metered and equipped with a continuous flow recorder unless the water commissioner in conjunction with the division engineer determines adequate records may be kept without such equipment. If the recharge structure is designed to discharge water via a surface outlet, such discharge must also be metered and equipped with a continuous flow recorder. The water commissioner **MUST** approve the use of the recharge structure **BEFORE** any credit will be given for water placed into recharge.

5. All recharge ponds must have a staff gauge installed such that the gauge registers the lowest water level in the pond. The staff gauge must be readable from a readily accessible location adjacent to the pond.
6. All recharge areas must be maintained in such a way as to minimize consumptive use of the water by vegetation. **No recharge area may be used for the planting of crops during the same irrigation year that it is used as a recharge site without prior approval from the water commissioner or division engineer.**
7. The amount of water recharged to the alluvial aquifer is determined by measuring the amount of water delivered to the recharge structure and subtracting:
    a. the amount of water discharged from the recharge structure,
    b. the amount of water lost to evaporation (see item 8, below),
    c. the amount of water lost to consumptive use due to vegetation located within the recharge structure, and
    d. the amount of water retained in the recharge structure that has not yet percolated into the ground.
8. Net evaporative losses from the recharge structure must be subtracted from the volume of water delivered to the pond. Evaporative losses must be taken every day the pond has a visible water level. If the pond does not have a stage-surface area curve approved by the water commissioner, the maximum surface area of the pond must be used to determine the evaporative losses. Monthly loss factors prorated for the number of days the pond had a visible water level may be used as may real time evaporation data from NOAA or a local weather station. If the pond is not inspected on a routine basis through the month, no prorating of monthly factors will be allowed.
9. The amount of accretions from the recharge structure will be credited only in accordance with a decreed plan of augmentation or substitute water supply plan approved by the State Engineer.
10. All water delivered for recharge must be fully consumable:
    a. changed reservoir rights or the CU portion of changed senior ditch rights;
    b. transbasin water that has been imported into the South Platte River basin;
    c. nontributary water;
    d. excess (unused) accretions from the previous recharge of fully consumable water;
    e. water diverted in priority after "notice" of intent to fully consume the water;
    f. water diverted under free river.
11. Water may be delivered to recharge only if the net impact of the associated plan for augmentation is not negative. Water must first be delivered or exchanged to offset negative impacts of the plan for augmentation before it may be diverted for recharge.
12. Accounting must be performed on a daily basis with reports submitted at least monthly and within 30 days of the end of the month for which the accounting is being made. The volume of water diverted into recharge must be provided to the water commissioner weekly when requested by the water commissioner.

# ADMINISTRATION PROTOCOL
## *Use Of Replacement Sources Not Specifically Identified In An SWSP Or Augmentation Plan*
## Division One – South Platte River

This protocol addresses the minimum standards required for use of a source of replacement water not specifically described in an SWSP or augmentation plan.

- Request to the Division Engineer and Water Commissioner must be in writing and must include:
    - the augmentation plan or SWSP provision in the purchasers plan that allows an unnamed source to be added to the plan for credit
    - the decree provision or SWSP provision in the sellers plan that allows water to be sold for use in the purchasers plan
    - the annual and monthly amount of water available from the water right to be used for replacement
    - the location at which the water will be delivered to the stream
    - a lease agreement between the seller and purchaser of the replacement water
- Applicant shall have written approval from the Division Engineer or Water Commissioner before an unnamed source is added to an augmentation plan or SWSP.
- Applicant must comply with the Augmentation Plan Accounting Protocol and, if appropriate, the Delivery of Water Protocol.

This protocol is subordinate to any decreed language addressing specific situations.