COLORADO
Division of Water Resources
Department of Natural Resources

October 1, 2019

Mr. Paul Bruss
Bishop-Brogden Associates, Inc.
333 West Hampden Ave., Ste 1050
Englewood, CO 80110

RE: Castle Concrete Aggregates (Grisenti Farms) Pit
DRMS File No. M-2001-005
Sec. 13, Twp. 19S, Rng. 69W, 6th P.M.
Water Division 2, Water District 12
SWSP ID 4625, WDID 1207856

Approval Period: February 1, 2019 through January 31, 2021
Contact Phone Number for Mr. Bruss: 303-806-8952

Dear Mr. Bruss:

We have reviewed your April 18, 2019 renewal request for a substitute water supply plan ("SWSP" or "plan"), in accordance with § 37-90-137(11) C.R.S., for a gravel pit to be operated by Castle Concrete Aggregates ("Castle" or "Applicant"), previously operated by Transit Mix Concrete Company. The gravel pit is permitted with the Division of Reclamation, Mining, and Safety ("DRMS") under File No. M-2001-005, and is permitted with the Division of Water Resources under Well Permit No. 79268-F. The required $257 fee for the SWSP renewal request has been received under receipt no. 3691456.

SWSP OPERATION

Castle has a lease agreement with the Grisenti family to mine sand and gravel from about 100 acres of land along the Arkansas River east of Florence. The mining operation is divided into two phases. Phase 1 involved the mining of approximately 35 acres located east of Highway 115 and west of Brush Hollow Creek. Phase 1 has been completed and serves as a water recharge pond for SWSP operations. Mining operations have been completed in Phase 2, and the Applicant is in the process of completing final reclamation of the site. The two ponds will be used for wildlife habitat and aquifer recharge associated with a long-term augmentation plan for the site. The attached Figure 1 shows the project phases.

DEPLETIONS

The depletions from this operation for the 2019 plan year (February 1, 2019 through January 31, 2020) consist of 100.83 acre-feet of net evaporative loss from a maximum of 48.00 acres of exposed

ground water, 3.50 acre-feet pumped for dust suppression, and 185.14 acre-feet of groundwater infiltrating into the Phase 2 pit.

The depletions from this operation for the 2020 plan year (February 1, 2020 through January 31, 2021) consist of 154.29 acre-feet of net evaporative loss from a maximum of 52.0 acres of exposed ground water, 3.5 acre-feet pumped for dust suppression, and 164.51 acre-feet of groundwater infiltrating into the Phase 2 pit..

A monthly breakdown of these amounts for both plan years is shown in Table 1, attached. Total depletions from mining activities are estimated to be 289.47 acre-feet for the 2019 plan year and 322.30 acre-feet for the 2020 plan year

An estimated 350 acre-feet will be required to fill the Phase 2 pit. Initially, all inflows to the Phase 2 pit will occur by groundwater infiltration. In the future, a turnout structure will be constructed to fill the pit directly from the Lester-Attebery Ditch. Using the totalizing flow meter from the dewatering pump, it is estimated that the initial groundwater infiltration rate will be 250-300 gpm.

LAGGED DEPLETIONS

The renewal request has included lagged depletions associated with evaporation, dust control, and the Phase 2 pit first-fill. Evaporative depletions were lagged individually from each pond based on the exposed ground water area, dust control depletions were lagged from the fresh water supply pond, and depletions from first-fill operations were lagged from the centroid of the Phase 2 mining area. For the most conservative estimate, the first-fill was assumed to be a result of groundwater infiltration without any volume from the Lester-Attebery Ditch.

The depletions were lagged through use of IDS-AWAS, which utilized the Glover Method with the following parameters:

Glover Method Input Parameters

Location	T	S	X	W
Phase 1	40,000	0.087	934	1,489
Supply Pond	40,000	0.087	551	1,018
Phase 2	40,000	0.087	541	1,252

T = Transmissivity of aquifer (gallons per day per foot)
S = Specific yield of aquifer
X = Distance between the centroid of the pond or mining area and the Arkansas River (feet)
W = Distance between the Arkansas River and the alluvial boundary (feet)

The cumulative lagged depletions are 279.90 acre-feet for the 2019 plan year and 329.86 acre-feet for the 2020 plan year, and may be found in Table 1, attached.

REPLACEMENTS

The main source of replacement water is based on the 81.4 acres that is now removed from agricultural production by the mining operation out of the total pro rata share of 89.47 acres of

alfalfa and silage corn historically irrigated with Lester-Attebery Ditch water. A ditch wide analysis has been completed and the calculated historical consumptive use for the Grisenti parcel was 220.8 acre-feet per year (2.47 acre-feet per acre). The historical irrigation summary is attached as Table 2. Although 89.4 acres are currently dried up, 8 acres has been removed from the calculations to account for potential future irrigation. The proposed dry-up of 81.4 acres of historically irrigated land provide a historical consumptive use credit of 201.12 acre-feet (221.60 acre-feet credit during April through October and a return flow obligation of 20.48 acre-feet during winter months).

Sixty shares of Twin Lakes Reservoir water will be used to supply the replacement water for the winter months. The Applicant has one-time lease water from the Pueblo Board of Water Works (PBWW) stored in several reservoirs: CWPDA Storage Account in Pueblo Reservoir (259.1 acre-feet), Pueblo West Pit (302.2 acre-feet), and Phase 2 Pit (67.3 acre-feet)

Transit Mix will request an exchange from PBWW of approximately 131.31 acre-feet in the 2019 plan year and 118.03 acre-feet in the 2020 plan year, as shown in the attached Table 4.

Transit Mix will request Twin Lakes release approximately 55.80 acre-feet in the 2019 plan year and 45.87 acre-feet in the 2020 plan year. This water is subject to a 10.3 percent transit loss (0.07% per mile for 147.8 miles) for delivery to the Grisenti site. The proposed replacement schedule for this SWSP's approval period is shown in the attached Table 4.

LONG TERM AUGMENTATION

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. 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 identifies four approaches to satisfy this requirement. Approach nos. 1 and 3 require bonding to ensure the pit can be backfilled or lined. Approach no. 4 requires documentation to identify what water rights or other permanent water source will be dedicated to the SWSP to assure that all permanent depletions from either an unforeseen abandonment of the site by the Applicant or as a result of long term ground water exposure after completion of mining and reclamation will be replaced so as to prevent injury to other water rights.

In accordance with approach nos. 1 and 3, a bond for $115,000 has been obtained through DRMS. It is our understanding that this may be used for backfilling of the sediment pond and water basin, but is not adequate for backfilling of the Phase 2 mining pit. Therefore, in accordance with approach no. 4, you have indicated that the mineral lease between the Applicant and the landowner provides for the Applicant's use of the Lester-Attebery water rights in connection with the mining operation. You have indicated that the Applicant intends to fully utilize the Lester-Attebery Ditch rights as the sole replacement supply for a long-term augmentation plan for the Grisenti Pit. For the purposes of this SWSP, the lease agreement will be accepted for the dedication of the subject water rights; however, if the State Engineer determines that a different dedication process is necessary to assure proper dedication of water rights, additional information may be required prior to future SWSP approvals.

CONDITIONS OF APPROVAL

This SWSP is hereby approved pursuant to § 37-90-137(11), C.R.S., subject to the following conditions:

1. This plan shall be valid for the period of February 1, 2019 through January 31, 2021, unless otherwise revoked or superseded by decree. If this plan will not be made absolute by a water court action by the plan's expiration date, a renewal request must be submitted to this office with the statutory fee of $257 no later than **December 1, 2020**.

2. The total surface area of the ground water exposed after December 31, 1980 shall not exceed 52.00 acres for the period of this SWSP.

3. The annual volume of ground water used for dust control shall not exceed 3.5 acre-feet.

4. The lagged depletions associated with this mining operation must not exceed 279.90 acre-feet during the period February 1, 2019 – January 31, 2020 and 329.86 acre-feet during the period February 1, 2020 – January 31, 2021. Documentation of pond size may be required by the Division Engineer in the form of an aerial photo evaluation or survey by a Professional Land Surveyor during the term of this plan.

5. Total consumption at the Grisenti Farms Pit must not exceed the aforementioned amounts, unless a new SWSP allowing such is approved by this office.

6. Approval of this plan is for the purposes as stated herein. Any additional uses of this water must first be approved by this office in a new SWSP. Any future additional historic consumptive use credit given (e.g., agricultural water transfer) for this site must consider all previous credits given.

7. Releases of water by Pueblo Board of Water Works pursuant to this plan shall be coordinated with the Water Commissioner and the Augmentation Coordinator and shall equal or exceed the depletions to be replaced on a monthly basis.

8. All diversions, including dust suppression, must be measured in a manner acceptable to the Division Engineer and in accordance with the "Amendments to Rules Governing the Measurement of Tributary Ground Water Diversions Located in the Arkansas River Basin".

9. Adequate accounting of depletions and replacements (in acre-feet) must be provided to the Water Commissioner (Dan.Henrichs@state.co.us) and the Division Engineer (Augmentation.Coordinator@state.co.us) on forms and at times acceptable to both of them. The accounting form(s) shall be sufficient to demonstrate that the net effective replacement equaled or exceeded the total depletion on a monthly basis. All replacement water must be concurrent with depletions in quantity, timing and location, except that releases aggregated at the discretion of the Division Engineer may occur in a later month than the depletions. Said accounting must be received by the 10th of the month following the reporting period. The proposed accounting form is provided in the attached Table 4. 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.

10. The Applicant shall perform an inspection and provide verification that the land associated with the changed water right in this SWSP has been removed from irrigation during the term of this SWSP. Verification of dry-up must be in the form of an affidavit signed by an individual with personal knowledge of the dry-up for the entire irrigation season for each parcel of land associated with the change of water right in this SWSP. For 2019, this SWSP renewal request shall serve as written notification to the Water Commissioner and Division Engineer identifying the lands to be dried-up for the **2019** irrigation season. **By November 30, 2019,** the Applicant shall provide an affidavit to the Water Commissioner and Division Engineer that confirms dry-up during the **2019** irrigation season. For 2020, the Applicant shall provide a written notification to the Water Commissioner and Division Engineer **by March 15, 2020** identifying the lands to be dried-up for the **2020** irrigation season. **By November 30, 2020,** the Applicant shall provide an affidavit to the Water Commissioner and Division Engineer that confirms dry-up during the **2020** irrigation season.

    The historical consumptive use attributed to the changed surface water right(s) under this SWSP shall not include ground water contributions. As a result, the historical consumptive use ("HCU") credit calculated for the subject water right to be changed by this SWSP shall be reduced by any ongoing sub-irrigation from ground water. In order to ensure the required dry-up conditions exist during the approval period of this SWSP, and to ensure no sub-irrigation from ground water is occurring, the Applicant shall provide records of monthly monitoring of depth to ground water for all land associated with the change of water right in this SWSP. Information regarding depth to ground water may be provided using existing irrigation wells, existing or new monitoring wells, or piezometers located on the dried-up fields. Applicant may utilize wells or piezometers located within ¼ mile of each field provided that the Applicant can demonstrate the depth to ground water information available off-site is representative of the depth to ground water on the dried-up land. The Applicant shall modify its accounting to reduce the amount of the calculated HCU that may be claimed in this SWSP according to the table below. Measurements taken at the start of each month will determine the necessary reduction in credit to be applied during the following month. The Applicant may use another methodology upon review and prior approval by the State Engineer and Division Engineer. (Construction of monitoring holes/wells, or piezometers requires that permits or notices be obtained as described in Table 1 of the Water Well Construction Rules.)

Depth to Ground Water (Feet)	Percent Reduction in Calculated HCU[1]	
	Native Grass	Alfalfa
1	85%	100%
2	50%	90%
3	30%	75%
4	20%	50%
5	15%	35%
6	10%	20%
7	5%	15%
8	0%	10%

[1] Adapted from *EVAPOTRANSPIRATION AND AGRONOMIC RESPONSES IN FORMERLY IRRIGATED MOUNTAIN MEADOWS, South Park, Colorado*, March 1, 1990; Revised September 1, 1991

11. The approval of this SWSP does not relieve the Applicant and/or the landowner of the requirement to obtain a Water Court decree approving a permanent plan for augmentation or mitigation to ensure the permanent replacement of all depletions, including long-term evaporation losses and lagged depletions after gravel mining operations have ceased. Since reclamation of the mine site will produce a permanent water surface exposing ground water to evaporation, an application for a plan for augmentation must be filed with the Division 2 Water Court, to include, but not be limited to, long-term evaporation losses and lagged depletions. The Applicant has indicated that a plan for augmentation will be developed when additional information has been gathered regarding the method and rate of infiltration.

12. 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. **Any subsequent request for a renewal/additional SWSP for this site must include information regarding the Applicant's plans for filing an application with the water court for a plan for augmentation.**

13. **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 identifies four approaches to satisfy this requirement.**

    In accordance with approach nos. 1 and 3, a bond for $115,000 has been obtained through DRMS. It is our understanding that this may be used for backfilling of the sediment pond and water basin, but is not adequate for backfilling of the Phase 2 mining pit. Therefore, in accordance with approach no. 4, you have indicated that the mineral lease between the Applicant and the landowner provides for the Applicant's use of the Lester-Attebery water rights in connection with the mining operation. You have indicated that the Applicant intends to fully utilize the Lester-Attebery Ditch rights as a replacement supply for a long-term augmentation plan for the Grisenti Pit, in addition to water releases from Twin Lakes Reservoir. For the purposes of this SWSP, the lease agreement will be accepted for the dedication of the subject water rights; however, if the State Engineer determines that a different dedication process is necessary to assure proper dedication of water rights, additional information may be required prior to future SWSP approvals.

14. The replacement water that is the subject of this SWSP cannot be sold, leased or otherwise legally encumbered during the term of this SWSP. As a condition of subsequent renewals of this SWSP, the replacement water must be appurtenant to this site until a plan for augmentation is obtained. All replacement water must be concurrent with depletions in quantity, timing, and location.

15. The State Engineer may revoke this SWSP or add additional restrictions to its operation if at any time the State Engineer determines that injury to other vested water rights has or will occur as a result 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.

16. In accordance with amendments to C.R.S. § 25-8-202(7) and "Senate Bill 89-181 Rules and Regulations" adopted on February 4, 1992, the state engineer shall determine whether or not 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 SWSP. 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 Kate Fuller of this office, or Dan Henrichs in the Division 2 office in Pueblo at (719) 269-2800.

Sincerely,

Jeff Deatherage, P.E.
Chief of Water Supply

Attachments: Tables 1-4
Figure 1

ec: Bill Tyner, Division 2 Engineer
Rachel Zancanella, Assistant Division 2 Engineer
Brian Sutton, Lead Water Commissioner
John Van Oort, River Operations Coordinator
Dan Henrichs, District 12 Water Commissioner
Water Information Team Members
Division of Reclamation, Mining and Safety

JD/kff/Transit Mix Grisenti 2019 SWSP.docx

Figure 1
Castle Concrete Aggregates - Grisenti Pit
General Location Map

Date: 4/11/2019 | Job No. 9107.08

Legend

Streams / Ditches
- Stream/River - Perennial
- Stream/River - Intermittent
- Canal/Ditch

- Permit Boundary (Approx.)
- PLSS Section
- PLSS Township Boundary

Aerial Photo Date: 6/1/2018 Google Earth
Data Source: CDSS, CDOT, BLM, USGS

N W E S

0 150 300 600
Feet

Colorado
Main Map

Best Copy Available

Figure 2
Castle Concrete Aggregates - Grisenti Pit
2018 Dry-Up Map

Date: 4/11/2019 | Job No. 9107.08

Table 1
Castle Concrete Aggregates - Grisenti Pit
Projected Depletions from Mining Operations (2019-2020)

	Production			Exposed Water Surface						First-Fill of Phase 2 (Unlagged)	**Total Unlagged Depletion from Mining Operation**	**Total Lagged Depletion from Mining Operation**
Month	Mined Material (x 1000 tons) [1]	Water Consumed (ac-ft) [2]	Dust Control (ac-ft) [3]	Gross Evaporation (ft) [4]	Total Precipitation (ft) [5]	Effective Precipitation (ft) [6]	Net Evaporation (ft) [7]	Exposed Groundwater Area (acres) [8]	Net Evaporation Volume (ac-ft) [9]	(ac-ft) [10]	(ac-ft) [11]	(ac-ft) [12]
Feb-19	0.00	0.00	0.27	0.13	0.04	0.03	0.10	28.50	2.98	0.00	3.25	3.00
Mar-19	0.00	0.00	0.30	0.21	0.08	0.06	0.15	30.00	4.62	0.00	4.91	4.23
Apr-19	0.00	0.00	0.29	0.34	0.11	0.08	0.26	30.00	7.81	0.00	8.10	6.75
May-19	0.00	0.00	0.30	0.45	0.13	0.09	0.36	30.00	10.83	0.00	11.12	9.78
Jun-19	0.00	0.00	0.29	0.55	0.10	0.07	0.49	30.00	14.57	0.00	14.86	13.24
Jul-19	0.00	0.00	0.30	0.57	0.15	0.11	0.46	30.00	13.88	0.00	14.18	14.29
Aug-19	0.00	0.00	0.30	0.51	0.16	0.11	0.40	30.00	11.87	0.00	12.17	13.00
Sep-19	0.00	0.00	0.29	0.38	0.09	0.06	0.32	37.00	11.80	37.11	49.20	40.21
Oct-19	0.00	0.00	0.30	0.26	0.07	0.05	0.21	44.00	9.29	38.34	47.94	48.82
Nov-19	0.00	0.00	0.29	0.15	0.06	0.04	0.11	46.00	5.01	37.11	42.40	44.39
Dec-19	0.00	0.00	0.30	0.11	0.04	0.03	0.08	47.00	3.95	36.98	41.23	41.77
Jan-20	0.00	0.00	0.30	0.11	0.03	0.02	0.09	48.00	4.20	35.61	40.10	40.41
19-20 Total	0.00	0.00	3.50	3.78	1.06	0.74	3.03	-	100.83	185.14	289.47	279.90
Feb-20	0.00	0.00	0.28	0.13	0.04	0.03	0.10	49.00	5.13	33.31	38.72	38.99
Mar-20	0.00	0.00	0.30	0.21	0.08	0.06	0.15	50.00	7.69	30.13	38.12	38.03
Apr-20	0.00	0.00	0.29	0.34	0.11	0.08	0.26	50.00	13.02	23.86	37.16	36.88
May-20	0.00	0.00	0.30	0.45	0.13	0.09	0.36	50.00	18.04	16.43	34.77	34.81
Jun-20	0.00	0.00	0.29	0.55	0.10	0.07	0.49	51.00	24.78	11.93	36.99	35.75
Jul-20	0.00	0.00	0.30	0.57	0.15	0.11	0.46	51.00	23.60	9.59	33.49	34.32
Aug-20	0.00	0.00	0.30	0.51	0.16	0.11	0.40	51.00	20.18	8.22	28.70	30.23
Sep-20	0.00	0.00	0.29	0.38	0.09	0.06	0.32	51.00	16.27	6.63	23.18	25.00
Oct-20	0.00	0.00	0.30	0.26	0.07	0.05	0.21	52.00	10.98	6.85	18.13	19.98
Nov-20	0.00	0.00	0.29	0.15	0.06	0.04	0.11	52.00	5.66	6.63	12.57	14.57
Dec-20	0.00	0.00	0.30	0.11	0.04	0.03	0.08	52.00	4.37	5.48	10.15	11.01
Jan-21	0.00	0.00	0.30	0.11	0.03	0.02	0.09	52.00	4.55	5.48	10.33	10.30
20-21 Total	0.00	0.00	3.50	3.78	1.06	0.74	3.03	-	154.29	164.51	322.30	329.86

Notes:
[1] Active mining has completed at the Grisenti Pit. Therefore, no production is expected during SWSP period.
[2] Based upon 4 percent water loss by weight.
[3] Dust control projections based upon historical maximum annual dust control uses, distributed uniformly through the year. Actual monthly dust control amounts may vary.
[4] Based upon NOAA Evaporation Atlas (45.4 inches per year), distributed monthly based upon State's SB-120 guidelines.
[5] Based upon average monthly precipitation data from the NOAA Climate Data (Canon City, 1950 - 2003).
[6] Effective Precipitation equals 70 percent of total precipitation, based upon the State's SB-120 guidelines, [5] * 0.70.
[7] Net Evaporation equals Gross Evaporation less Effective Precipitation, [4] - [6].
[8] The maximum exposed water surface area that may occur during the plan period is 55 acres. Projected amounts based on estimated timing and infiltration rates for the first-fill operatic
[9] Equals [7] * [8].
[10] Total Unlagged Depletion from Mining Operation equals [2] + [3] + [9] + [10]. Amount conservatively assumes first-fill occurs by ground water infiltration only.
[11] Total Lagged Depletions from Mining Operation are lagged using URF factors for each mining area, developed in IDS-AWAS employing the glover method. The IDS-AWAS inputs are provided in the 2019 SWSP renewal request.

Table 2
Castle Concrete Aggregates - Grisenti Pit
Historical Irrigation Summary

												Full 89.4 Acres		81.4 Acres Pro Rata	
Month	Historical Diversions (ac-ft) [1]	Ditch Loss (ac-ft) [1a]	Farm Delivery (ac-ft) [1b]	Surface Runoff (ac-ft) [2]	Consumptive Irrigation Requirement (ft) [3]	Consumptive Irrigation Requirement (ac-ft) [4]	Consumptive Use (CU) per StateCU (ac-ft) [5]	To Groundwater (ac-ft) [6]	Glover Lagging Factors (%) [7]	Lagged Groundwater Return Flow (ac-ft) [8]	Total Return Flow (ac-ft) [9]	Historical Stream Depletion (ac-ft) [10]	Historical Stream Accretion (ac-ft) [11]	Historical Stream Depletion (ac-ft) [12]	Historical Stream Accretion (ac-ft) [13]
Feb									0.01	2.82	2.82		2.82		2.57
Mar									0.01	2.72	2.72		2.72		2.47
Apr	43.45	4.35	39.11	7.82	0.14	12.52	9.65	21.64	0.07	16.00	23.83	15.28		13.91	
May	126.33	12.63	113.70	22.74	0.34	30.40	29.42	61.54	0.19	46.96	69.70	44.00		40.06	
Jun	127.98	12.80	115.18	23.04	0.58	51.85	50.73	41.41	0.19	45.88	68.92	46.26		42.12	
Jul	128.35	12.83	115.51	23.10	0.67	59.90	56.34	36.07	0.16	40.05	63.15	52.36		47.67	
Aug	97.86	9.79	88.07	17.61	0.55	49.17	43.66	26.80	0.14	34.18	51.80	36.27		33.03	
Sep	65.15	6.52	58.64	11.73	0.33	29.50	25.98	20.93	0.08	19.91	31.64	27.00		24.58	
Oct	55.34	5.53	49.81	9.96	0.07	6.26	5.11	34.74	0.07	17.64	27.60	22.21		20.22	
Nov									0.03	8.35	8.35		8.35		7.61
Dec									0.02	4.86	4.86		4.86		4.43
Jan									0.02	3.73	3.73		3.73		3.40
Total	644.47	64.45	580.02	116.00	2.68	239.59	220.88	243.13	1.00	243.13	359.14	243.38	22.49	221.60	20.48

Notes:

[1] Based upon analysis of Lester-Attebery Ditch daily diversions between 1950 - 2006, pro-rated based upon percent ownership of each of the three water rights totaling 9.1 cfs.

[1a] Ditch Loss equals 10% of diversions, [1] * 0.1.

[1b] Farm Delivery equals diversions minus ditch loss, [1] - [1a].

[2] Surface Runoff equal to 20 percent of farm delivery; [1b] * 0.2.

[3] Based upon Modified Blaney-Criddle analysis with an elevation adjustment for the Grisenti crop mix of primarily alfalfa, and climate records from the Canon City weather station from 1950 - 2006, as computed in StateCU.

[4] Historical irrigation on Grisenti farm averaged 89.4 acres between 1950 and 2006, based upon aerial photo delineation and consistent with information provided by Mr. Grisenti.

[5] CU results from StateCU analysis.

[6] Equals [1b] - [2] - [5].

[7] Lagging factors based upon a steady-state Glover analysis using the following parameters: D (weighted) = 700 feet, T = 40,000 gpd/ft, and s= 0.087.

[8] Lagged Groundwater Return Flow equals annual amount To Groundwater distributed monthly using the Glover Factors, [6 Total] x [7 Monthly].

[9] Total Return Flow equals Surface Runoff + Lagged GW Return Flow, [2] + [8].

[10] Historical Stream Depletion equals Historical Diversion less Total Return Flow, [1b] - [9]; if positive, else zero.

[11] Historical Stream Accretion equals Total Return Flow less Historical Diversion , [9] - [1b]; if positive, else zero.

[12] Based upon Phase I and Phase II mining removing all 89.4 acres of irrigated acreage less up to 8 acres of land potentially irrigated by Grisentis on BLM land. [10] * 81.4/89.4.

[13] Based upon Phase I and Phase II mining removing all 89.4 acres of irrigated acreage less up to 8 acres of land potentially irrigated by Grisentis on BLM land. [11] * 81.4/89.4.

Table 3
Castle Concrete Aggregates - Grisenti Pit
Replacement Sources (2019-2020)
(all values in acre-feet)

Month	Total Lagged Mining Depletion [1]	HCU Credit & Return Flow Obligation [2]	Projected Lagged HCU Credits Delivered to the River [3]	Remaining Replacement Requirements [4]	Excess Credits [5]	Reservoir Delivery Requirements [6]
Feb-19	3.00	-2.57	0.00	5.57		5.57
Mar-19	4.23	-2.47	0.00	6.70		6.70
Apr-19	6.75	13.91	7.83	0.00	1.08	0.00
May-19	9.78	40.06	27.88	0.00	18.10	0.00
Jun-19	13.24	42.12	39.81	0.00	26.57	0.00
Jul-19	14.29	47.67	45.14	0.00	30.84	0.00
Aug-19	13.00	33.03	39.13	0.00	26.13	0.00
Sep-19	40.21	24.58	29.06	11.15		11.15
Oct-19	48.82	20.22	22.58	26.24		26.24
Nov-19	44.39	-7.61	9.07	42.93		42.93
Dec-19	41.77	-4.43	1.09	45.10		45.10
Jan-20	40.41	-3.40	0.00	43.81		43.81
19-20 Total	279.90	201.12	221.60	181.50	102.72	181.50
Feb-20	38.99	-2.57	0.00	41.56		41.56
Mar-20	38.03	-2.47	0.00	40.51		40.51
Apr-20	36.88	13.91	7.83	29.04		29.04
May-20	34.81	40.06	27.88	6.92		6.92
Jun-20	35.75	42.12	39.81	0.00	4.06	0.00
Jul-20	34.32	47.67	45.14	0.00	10.82	0.00
Aug-20	30.23	33.03	39.13	0.00	8.89	0.00
Sep-20	25.00	24.58	29.06	0.00	4.06	0.00
Oct-20	19.98	20.22	22.58	0.00	2.60	0.00
Nov-20	14.57	-7.61	9.07	13.10		13.10
Dec-20	11.01	-4.43	1.09	14.34		14.34
Jan-21	10.30	-3.40	0.00	13.70		13.70
20-21 Total	329.86	201.12	221.60	159.18	30.43	159.18

Notes:
[1] Total lagged mining depletions from Table 1, column [11].
[2] HCU credits from Table 2, columns [12] and [13]. Negative values represent return flow obligation.
[3] HCU credits are diverted through the Lester-Attebury Ditch to the Phase 1 pond where the water is recharged back to the river. Lagged HCU credits delivered to the River were projected based on lagging factors described in the 2019 SWSP.
[4] Remaining replacement requirements equal to maximum of ([1] - [2] - [3]) and zero if [2] is negative, and calculated as maximum of ([1] - [3]) and zero if [2] is positive.
[5] Excess credits equal [3] - [1] if the difference is positive and [2] is positive else, equal to [3] - [2] - [1] if the difference is positive and [2] is negative, else zero.
[6] Reservoir release may be occur from Twin Lakes or from Pueblo Reservoir via administrative exchange. Twin Lakes releases will be assessed 10.3% transit loss based upon a loss of 0.07% per mile over 147.8 miles.

Table 4
Castle Concrete Aggregates - Grisenti Gravel Pits
SWSP Accounting Form & Projected Operations

	Depletions												Historical	Unlagged Ditch	Lagged	Exch. of Water	Replacement Requirements		Replacement
	Production		Dust Control			Exposed Ground Water Area													
Month	Mined Material (tons) [1]	Water Consumed (ac-ft) [2]	Meter Reading (gallons)	Water Use (ac-ft) [3]	Net Evaporation (ft) [4]	Phase 1 (acres) [5]	Fresh Water Pond (acres) [6]	Phase 2 (acres) [7]	Total Exposed GW Area (acres) [8]	Net Evaporation Volume (ac-ft) [9]	First-Fill of Phase 2 Ground Water Infiltration (ac-ft) [10]	Total Unlagged Mining Depletion (ac-ft) [11]	Total Lagged Mining Depletion (ac-ft) [12]	Irrigation Credit (+)/ Debit (-) (ac-ft) [13]	Deliveries to Phase 1 Pond (ac-ft) [14]	Historical Irrigation Credit To River (ac-ft) [15]	from Pueblo Reservoir (ac-ft) [16]	Remaining Replacement Requirement (ac-ft) [17]	Twin Lakes Release Requirement (ac-ft) [18]	Balance Credit (+)/ Debit (-) (ac-ft) [19]
Feb-19	0	0.00	*3,690,689*	0.27	0.10	22.50	1.00	5.00	28.50	2.98	0.00	3.25	3.00	-2.57	0.00	0.00	0.00	5.57	6.04	0.00
Mar-19	0	0.00	*3,787,551*	0.30	0.15	24.00	1.00	5.00	30.00	4.62	0.00	4.91	4.23	-2.47	0.00	0.00	0.00	6.70	7.47	0.00
Apr-19	0	0.00	*3,881,289*	0.29	0.26	24.00	1.00	5.00	30.00	7.81	0.00	8.10	6.75	13.91	13.91	7.83	0.00	0.0	0.0	1.08
May-19	0	0.00	*3,978,152*	0.30	0.36	24.00	1.00	5.00	30.00	10.83	0.00	11.12	9.78	40.06	40.06	27.88	0.00	0.0	0.0	18.10
Jun-19	0	0.00	*4,071,890*	0.29	0.49	24.00	1.00	5.00	30.00	14.57	0.00	14.86	13.24	42.12	42.12	39.81	0.00	0.0	0.0	26.57
Jul-19	0	0.00	*4,168,752*	0.30	0.46	24.00	1.00	5.00	30.00	13.88	0.00	14.18	14.29	47.67	47.67	45.14	0.00	0.0	0.0	30.84
Aug-19	0	0.00	*4,265,615*	0.30	0.40	24.00	1.00	5.00	30.00	11.87	0.00	12.17	13.00	33.03	33.03	39.13	0.00	0.0	0.0	26.13
Sep-19	0	0.00	*4,359,353*	0.29	0.32	24.00	1.00	12.00	37.00	11.80	37.11	49.20	40.21	24.58	24.58	29.06	11.15	0.0	0.0	0.00
Oct-19	0	0.00	*4,456,215*	0.30	0.21	24.00	1.00	19.00	44.00	9.29	38.34	47.94	48.82	20.22	20.22	22.58	26.24	0.00	0.00	0.00
Nov-19	0	0.00	*4,549,953*	0.29	0.11	24.00	1.00	21.00	46.00	5.01	37.11	42.40	44.39	-7.61	0.00	9.07	42.93	0.0	0.0	0.00
Dec-19	0	0.00	*4,646,816*	0.30	0.08	24.00	1.00	22.00	47.00	3.95	36.98	41.23	41.77	-4.43	0.00	1.09	7.18	37.92	42.28	0.00
Jan-20	0	0.00	*4,743,679*	0.30	0.09	24.00	1.00	23.00	48.00	4.20	35.61	40.10	40.41	-3.40	0.00	0.00	43.81	0.0	0.0	0.00
Feb-20	0	0.00	*4,834,044*	0.28	0.10	24.00	1.00	24.00	49.00	5.13	33.31	38.72	38.99	-2.57	0.00	0.00	41.56	0.0	0.0	0.00
Mar-20	0	0.00	*4,930,642*	0.30	0.15	24.00	1.00	25.00	50.00	7.69	30.13	38.12	38.03	-2.47	0.00	0.00	40.51	0.0	0.0	0.00
Apr-20	0	0.00	*5,024,124*	0.29	0.26	24.00	1.00	25.00	50.00	13.02	23.86	37.16	36.88	13.91	13.91	7.83	29.04	0.0	0.0	0.00
May-20	0	0.00	*5,120,722*	0.30	0.36	24.00	1.00	25.00	50.00	18.04	16.43	34.77	34.81	40.06	40.06	27.88	6.92	0.0	0.0	0.00
Jun-20	0	0.00	*5,214,204*	0.29	0.49	24.00	1.00	26.00	51.00	24.78	11.93	36.99	35.75	42.12	42.12	39.81	0.00	0.0	0.0	4.06
Jul-20	0	0.00	*5,310,802*	0.30	0.46	24.00	1.00	26.00	51.00	23.60	9.59	33.49	34.32	47.67	47.67	45.14	0.00	0.0	0.0	10.82
Aug-20	0	0.00	*5,407,400*	0.30	0.40	24.00	1.00	26.00	51.00	20.18	8.22	28.70	30.23	33.03	33.03	39.13	0.00	0.0	0.0	8.89
Sep-20	0	0.00	*5,500,881*	0.29	0.32	24.00	1.00	26.00	51.00	16.27	6.63	23.18	25.00	24.58	24.58	29.06	0.00	0.0	0.0	4.06
Oct-20	0	0.00	*5,597,479*	0.30	0.21	24.00	1.00	27.00	52.00	10.98	6.85	18.13	19.98	20.22	20.22	22.58	0.00	0.0	0.0	2.60
Nov-20	0	0.00	*5,690,961*	0.29	0.11	24.00	1.00	27.00	52.00	5.66	6.63	12.57	14.57	-7.61	0.00	9.07	0.00	13.10	14.61	0.00
Dec-20	0	0.00	*5,787,559*	0.30	0.08	24.00	1.00	27.00	52.00	4.37	5.48	10.15	11.01	-4.43	0.00	1.09	0.00	14.34	15.99	0.00
Jan-21	0	0.00	*5,884,157*	0.30	0.09	24.00	1.00	27.00	52.00	4.55	5.48	10.33	10.30	-3.40	0.00	0.00	0.00	13.70	15.27	0.00
Feb-19 - Jan-20	0	0.00	-	3.50	-	-	-	-	-	100.83	185.14	289.47	279.90	201.12	221.60	221.60	131.31	50.20	55.80	102.73
Feb-20 - Jan-21	0	0.00	-	3.50	-	-	-	-	-	154.29	164.51	322.30	329.86	201.12	221.60	221.60	118.03	41.14	45.87	30.43

Notes:
[1] No production is expected during the SWSP period. Equal to 0.
[2] Based upon 4 percent water loss by weight, [1] * 0.04 * 0.0007357 * 1000.
[3] Water use based upon end-of-month meter readings reported by Castle Concrete Aggregates. January 2019 end-of-month meter reading is 3,603,200 gallons.
[4] Net Evaporation calculated as described in the 2019 SWSP renewal request.
[5], [6], [7] Individual exposed ground water areas measured area by Castle Concrete Aggregates. Projected surface area in Phase 2 based on expected volume of fill during month.
[8] Total exposed ground water are equals [5] + [6] + [7].
[9] Equals [4] * [8].
[10] Unlagged ground water infiltration into Phase 2 pit resulting from cessation of dewatering and first-fill operations at the pit. Value conservatively assumes no direct delivery of water to Phase 2 via Lester-Attebery Ditch.
[11] Total Unlagged mining depletions equal [2] + [3] + [9] + [10].
[12] Total Lagged Mining Depletions are lagged using URF factors for each mining area, developed in IDS-AWAS employing the glover method. IDS-AWAS inputs are specified in the 2019 SWSP renewal request.
[13] Based on Historical Irrigation Credits/Debits from BBA analysis in 2010 SWSP request, continued in 2019 SWSP.
[14] Actual replacement deliveries to the Phase 1 recharge pond measured through a 2-foot rectangular weir by a continuous recorder.
[15] Historical irrigation credits delivered from Lester-Attebury Ditch to the Phase 1 pond are lagged using URFs for Phase 1, developed in IDS-AWAS employing the glover method. IDS-AWAS inputs are specified in the 2019 SWSP renewal request.
[16] Replacement water delivered to Arkansas River out of Pueblo Reservoir, Pueblo West Pit reservoir or Pueblo East Pit Phase 2 reservoir via administrative exchange. Source of water is 2018 one-time lease water from PBWW.
[17] If [12] is negative, equals maximum of [12] - [13] - [15] - [16] and zero, else if [12] is positive, equal to maximum of [12] - [15] - [16] and zero.
[18] Twin Lakes Release Requirement includes a 10.3% transit loss based upon a loss of 0.07% per mile and a distance of 147.8 miles. Equal to [17] / (1-0.103).
[19] Equal to [15] + [16] + [17] - [12] - minimum of [13] and zero.