



**COLORADO**  
Division of Water Resources  
Department of Natural Resources

November 28, 2022

Mr. Daniel Tucker, P.E.  
Arkansas Groundwater and Reservoir Association  
205 S. Main St.  
Fowler, CO 81039

**Re: Pueblo East Pit**  
**DRMS File No. M-1986-015**  
**Secs. 34 & 35, Twp. 20S, Rng. 64W, 6th P.M.**  
**Water Division 2, Water District 14**  
**SWSP ID 0408, WDID 1407801**

**Approval Period: June 1, 2022 through December 15, 2022, with possible extension to May 31, 2023, subject to Condition of Approval No. 1**

*Contact Information for Mr. Tucker: 719-826-2597; dan@agraco.net*

Dear Mr. Tucker:

We have reviewed your June 1, 2022 letter requesting the renewal of a substitute water supply plan ("SWSP") in accordance with Section 37-90-137(11), C.R.S., for a sand and gravel pit owned by Arkansas Groundwater & Reservoir Association ("AGRA" or "Applicant"), previously operated by Transit Mix of Pueblo and Castle Aggregates. The mine is permitted with the Division of Reclamation, Mining, and Safety under File No. M-1986-015. The required renewal fee of \$257.00 has been received and given receipt no. 10021840.

## **SWSP OPERATION**

The gravel operation is located east of Pueblo between Highway 50 and the Arkansas River. This pit did not exist, and no ground water was exposed, prior to January 1, 1981. The operation consists of several phases (Phase 1, 2, and 7) as shown in the attached Figure 1. Currently, mining in all phases has been completed, and AGRA is in the process of reclaiming the area. Phase 2 has been lined with an approved slurry wall per January 9, 2012 correspondence from the Division 2 Assistant Engineer (although AGRA has indicated that a 1 acre area possibly has exposed groundwater and is accounted for). Reclamation of the Phase 7 pit will include backfilling the pit to a ground surface elevation at least two feet higher than the groundwater table. The Phase 1 and 2 pits will be converted to reservoir storage for the purpose of storing AGRA's replacement supplies.

Consumptive use of water from the operation under this SWSP includes evaporation from up to 76.0 acres of surface area (65.0 acres in Phase 1, 1.0 acre in Phase 2, and 10.0 acres in Phase 7).

Well permit no. 82461-F corresponds to Phase 1 and limits that portion of the operation to dust control and evaporation from 65.0 acres of exposed water and 282.05 acre-feet annually. Well Permit



No. 85020-F (which replaces Well Permit No. 75997-F) corresponds to Phase 7 and limits that portion of the operation to evaporation from 10.0 acres of exposed water and first fill operations of the pit, totaling 107.01 acre-feet (or the amounts covered under a Water Court approved plan for augmentation or SWSP approved by the State Engineer, whichever is more restrictive).

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 groundwater. According to the renewal request, the long term plan for the site is for storage reservoirs in Phases 1 and 2, (Phase 2 already has an approved slurry wall), and to backfill Phase 7 to a ground surface elevation at least two feet higher than the ground water table. Accordingly, AGRA obtained a bond for \$3,758,100 through DRMS, an amount sufficient to backfill Phase 7.

## DEPLETIONS

As noted above, consumptive use of water from the operation under this SWSP includes evaporation from up to 76.0 acres of surface area (65.0 acres in Phase 1, 1.0 acre in Phase 2, and 10.0 acres in Phase 7). The pits finished filling in early 2021, so no depletions have been calculated for first fill.

The monthly distribution of the values and the lagged effects on the Arkansas River, are detailed in Tables 1-4, which are attached. The lagged depletions were calculated individually for each Phase of the operation based on the characteristics below.

Location	T (gpd/ft)	S	X (ft)	W (ft)
Phase 1	97,100	0.15	1,032	2,647
Phase 2	97,100	0.15	964	2,206
Phase 7	97,100	0.15	420	2,250

T = Transmissivity of the aquifer (gallons per day per foot).

S = Specific yield of the aquifer.

X = Distance between the centroid of the mining area and the Arkansas River (feet).

W = Distance between the Arkansas River and the alluvial boundary (feet).

<sup>2</sup> We note that the W distance value for the Phase 1 and Phase 1 (initial fill) lagging inputs are different due to do the different locations for the point of depletion and the variability of the alluvial boundary in the location of the Pueblo East Pit.

Lagging factors for each of the Phases were calculated using the Glover Method, normalized to the number of months required for 95% of depletions to affect the river, and are provided in the following table.

Month	Phase 1	Phase 2	Phase 7
1	49.15%	54.46%	76.62%
2	34.43%	36.62%	19.16%
3	11.76%	8.92%	4.22%
4	4.65%	-	-
Total	100.00%	100.00%	100.00%

Note: Lagging factors are normalized to the number of months required for at least 95% of depletions to affect the river.

Historical phreatophyte consumptive use and effective precipitation were determined to partially offset gross evaporation at the site. The credit from historical phreatophyte consumptive use was calculated to be 19.49 acre-feet per year from 5.6 acres of equivalent 100% canopy cover native vegetation in Phase 1, and 9.45 acre-feet per year from 2.7 acres of 100% canopy cover native vegetation in Phase 7. Effective precipitation was claimed on the remaining 62.7 acres of exposed surface area, and was calculated as 70% of precipitation. Gross evaporation from 76.0 acres of surface area was estimated to be 314.26 acre-feet/year and the resulting net evaporation was estimated to be 237.97 acre-feet/year.

## REPLACEMENT

GCC Rio Grande, Inc. currently has a lease with PBWW that will provide a maximum of 250 acre-feet but nominally 180 acre-feet of fully consumable water annually through June 30, 2027, which is subleased by AGRA. The sublease will expire on **December 31st, 2022** at which time AGRA will seek to renew the sublease agreement to continue the use of this water. The water source is fully consumable water stored in Pueblo Reservoir.

AGRA may have excess credits available under its annual Rule 14 Plan to provide replacement water that is not covered under the aforementioned sublease.

The projected depletions, credits, and releases subject of this SWSP are shown on the attached Table 5.

## CONDITIONS OF APPROVAL

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

1. This SWSP shall be valid June 1, 2022 through December 15, 2022, unless otherwise revoked or superseded by decree. This SWSP may be extended if a lease for replacement water from GCC Rio Grande, Inc., is received by **December 15, 2022**. **If a lease extension is received, this SWSP will be extended until May 31, 2023, or the expiration date of the new lease,**

**whichever is sooner.** If this SWSP will not be made absolute by a water court action by the SWSP expiration date, a renewal request must be submitted to this office and the Division 2 office (please copy Bethany Arnold at [bethany.arnold@state.co.us](mailto:bethany.arnold@state.co.us)) with the statutory fee (currently \$257) no later than **March 1, 2023**. If a renewal request is received after the expiration of this SWSP, it may be considered a request for a new SWSP, in which case the \$1,593 filing fee will apply.

2. Well permit nos. 85020-F and 82461-F were obtained for the current use and exposed pond surface area of the gravel pit in accordance with Section 37-90-137(2) and (11), C.R.S. According to the submittal, the exposed surface area of ground water associated with Phase 2 is a maximum of 1.0 acres. **Therefore, a new well permit must be obtained in accordance with §37-90-137(2), C.R.S., and this SWSP for the groundwater depletions associated with evaporation from the pits at Phase 2.** The provisions of §37-90-137(2), C.R.S., prohibit the issuance of a permit for a well to be located within 600 feet of any existing well, unless the State Engineer finds that circumstances so warrant after a hearing in accordance with the procedural rules in 2CCR402-5. The hearing will be waived if you are able to obtain statements from the owners of all wells within 600 feet, verifying that they have no objection to your use of the proposed well.
3. Total consumption at the Pueblo East Pit shall not exceed the amounts given in the attached tables.
4. The total amount of water surface area at the Pueblo East Pit (combined between Phases 1, 2, and 7) shall not exceed 76.0 acres. Documentation of water surface area may be required by the Division Engineer in the form of an aerial photo evaluation or survey by a Professional Land Surveyor during the plan year or in years covered by subsequent renewals of this plan.
5. Approval of this SWSP is for the purposes and amounts stated herein. Additional uses and/or consumption of the water that is subject to this SWSP will be allowed only if a new SWSP is approved for those additional uses and/or amounts.
6. 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 approval of the Water Commissioner and Division Engineer. The replacement water that is the subject of this plan cannot be sold or leased to any other entity.
7. Conveyance loss for delivery of augmentation water to the Arkansas River is subject to assessment and modification as determined by the Division Engineer.
8. When applicable, the Applicant will submit augmentation replacement requests via the "Arkansas Basin Water Operations Dashboard" (<http://div2waterops.com/AnonymousHome>). To set up an account on the "Arkansas Basin Water Operations Dashboard", email the River and Reservoir Operations Coordinator ([lonnie.spady@state.co.us](mailto:lonnie.spady@state.co.us)) with: user name, user email address, user phone number, and indicate SWSP name (Or SWSP group WDID) or decree number. Once the applicant's request is made through the "Arkansas Basin Water Operations

Dashboard", the Division Engineer's Office will review and either approve or deny the request. This decision will be emailed to applicants through the "Dashboard" to document this transaction.

9. The Applicant shall provide daily accounting (including, but not limited to diversions, and river calls) on a monthly basis. The accounting must be submitted to the Division Engineer via the online submittal tool. Accounting must be submitted within 10 days after the end of the month for which the accounting applies. Accounting and reporting procedures are subject to approval and modification by the Division Engineer.
10. Dewatering of the Phase 7 pit will produce delayed depletions to the stream system. As long as the Phase 7 pit is continuously dewatered, the water returned to the stream system should be adequate to offset the depletions attributable to the dewatering operation. Once dewatering at the Phase 7 pit ceases, the delayed depletions must be addressed. If dewatering of the Phase 7 pit is discontinued, the pit would fill and cause additional depletions to the stream system due to increased evaporation.
11. The approval of this SWSP does not relieve the Applicant and/or landowner of the requirement to obtain a Water Court decree approving a permanent plan for augmentation or mitigation to ensure the permanent replacement of all depletions, including long-term evaporation losses and lagged depletions after gravel mining operations have ceased. If reclamation of the mine site will produce a permanent water surface exposing groundwater to evaporation, an application for a plan for augmentation must be filed with the Division 2 Water Court at least three (3) years prior to the completion of mining to include, but not be limited to, long-term evaporation losses and lagged depletions. If a lined pond results after reclamation, replacement of lagged depletions shall continue until there is no longer an effect on streamflow. Granting of this plan does not imply approval by this office of any such court application(s).
12. 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 water under this SWSP must cease immediately and the Applicant shall obtain and present to this office an alternate source of replacement water.
13. In accordance with amendments to Section 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 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.
14. 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.

Should you have any questions, please contact Melissa van der Poel of this office or Noah Friesen in the Division 2 office in Pueblo at (719) 542-3368.

Sincerely,

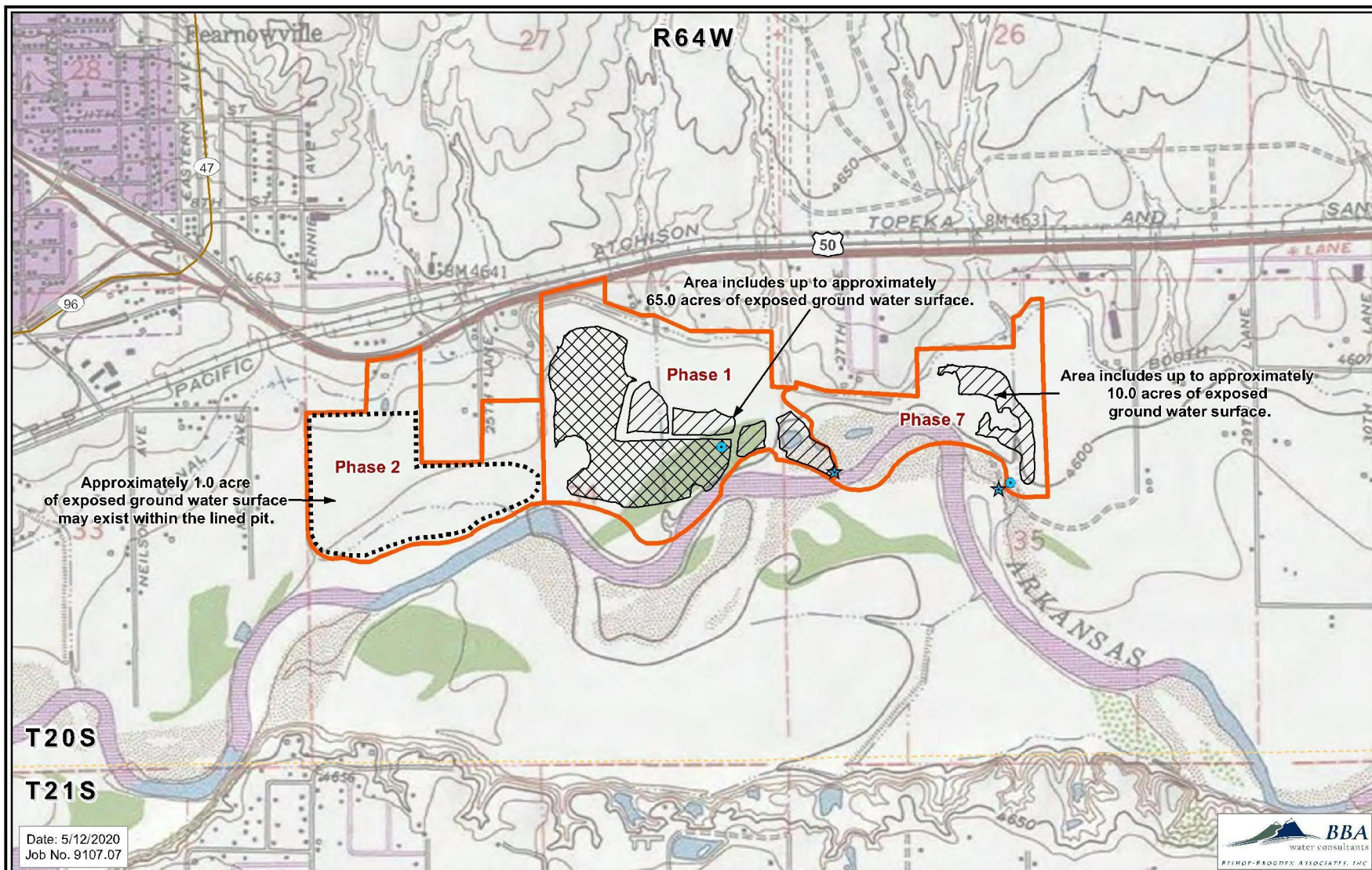


Jeff Deatherage, P.E.  
Water Supply Chief

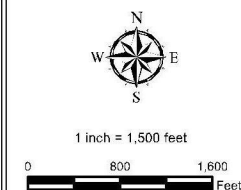
Attachments:        Figure 1  
                             Tables 1-5

ec:                    Division 2 SWSP Staff  
                             Steve Stratman, WD 14/15 Water Commissioner  
                             Division of Reclamation, Mining, and Safety





**Figure 1**  
**Transit Mix Pueblo East Pit**  
**Phase 1, 2, and 7**  
**General Location Map**



**Overview Map**



**Table 1**  
**Arkansas Groundwater and Reservoir Association - Pueblo East Pit Phase 1**  
**Projected Depletion Analysis (June 2022 - May 2023)**

Month	Surface Area of Exposed Groundwater (ac) [1]	Gross Evaporation Rate (ft) [2]	Total Gross Evaporation (ac-ft) [3]	Natural Vegetation Credit					Net Pond Evaporative Depletions (ac-ft) [9]	Total Net Unlagged Depletion (ac-ft) [10]
				Effective Precipitation Rate (ft) [4]	Effective Precipitation Credit (ac-ft) [5]	Phreatophyte CU (ft) [6]	Phreatophyte Reduction Credit (ac-ft) [7]	Total Vegetation Credit (ac-ft) [8]		
6/1/2022	65.0	0.60	39.00	0.08	4.75	0.60	3.36	8.11	30.89	30.89
7/1/2022	65.0	0.63	40.95	0.11	6.53	0.63	3.53	10.06	30.89	30.89
8/1/2022	65.0	0.56	36.40	0.12	7.13	0.56	3.14	10.26	26.14	26.14
9/1/2022	65.0	0.42	27.30	0.05	2.97	0.42	2.35	5.32	21.98	21.98
10/1/2022	65.0	0.29	18.85	0.04	2.38	0.29	1.62	4.00	14.85	14.85
11/1/2022	65.0	0.17	11.05	0.03	1.78	0.04	0.22	2.01	9.04	9.04
12/1/2022	65.0	0.12	7.80	0.02	1.19	0.00	0.00	1.19	6.61	6.61
1/1/2023	65.0	0.12	7.80	0.02	1.19	0.00	0.00	1.19	6.61	6.61
2/1/2023	65.0	0.12	7.48	0.02	1.19	0.00	0.00	1.19	6.29	6.29
3/1/2023	65.0	0.23	14.95	0.05	2.97	0.06	0.34	3.31	11.64	11.64
4/1/2023	65.0	0.38	24.70	0.07	4.16	0.38	2.13	6.29	18.41	18.41
5/1/2023	65.0	0.50	32.50	0.08	4.75	0.50	2.80	7.55	24.95	24.95
6/1/2022	65.0	0.60	39.00	0.08	4.75	0.60	3.36	8.11	30.89	30.89
7/1/2022	65.0	0.63	40.95	0.11	6.53	0.63	3.53	10.06	30.89	30.89
8/1/2022	65.0	0.56	36.40	0.12	7.13	0.56	3.14	10.26	26.14	26.14
9/1/2022	65.0	0.42	27.30	0.05	2.97	0.42	2.35	5.32	21.98	21.98
10/1/2022	65.0	0.29	18.85	0.04	2.38	0.29	1.62	4.00	14.85	14.85
11/1/2022	65.0	0.17	11.05	0.03	1.78	0.04	0.22	2.01	9.04	9.04
12/1/2022	65.0	0.12	7.80	0.02	1.19	0.00	0.00	1.19	6.61	6.61
1/1/2023	65.0	0.12	7.80	0.02	1.19	0.00	0.00	1.19	6.61	6.61
2/1/2023	65.0	0.12	7.48	0.02	1.19	0.00	0.00	1.19	6.29	6.29
3/1/2023	65.0	0.23	14.95	0.05	2.97	0.06	0.34	3.31	11.64	11.64
4/1/2023	65.0	0.38	24.70	0.07	4.16	0.38	2.13	6.29	18.41	18.41
5/1/2023	65.0	0.50	32.50	0.08	4.75	0.50	2.80	7.55	24.95	24.95
2022-2023 Total	-	4.14	268.78	0.69	40.99	3.48	19.49	60.47	208.30	208.30
2023-2024 Total	-	4.14	268.78	0.69	40.99	3.48	19.49	60.47	208.30	208.30



**Table 2**  
**Arkansas Groundwater and Reservoir Association - Pueblo East Pit Phase 2**  
**Projected Depletion Analysis (June 2022 - May 2023)**

Month	Surface Area of Exposed Groundwater (ac) [1]	Gross Evaporation Rate (ft) [2]	Total Gross Evaporation (ac-ft) [3]	Natural Vegetation Credit					Net Pond Evaporative Depletions (ac-ft) [9]	Total Net Unlagged Depletion (ac-ft) [10]
				Effective Precipitation Rate (ft) [4]	Effective Precipitation Credit (ac-ft) [5]	Phreatophyte e CU (ft) [6]	Phreatophyte Reduction Credit (ac-ft) [7]	Total Vegetation Credit (ac-ft) [8]		
6/1/2022	1.0	0.60	0.60	0.08	0.08	-	0.00	0.08	0.52	0.52
7/1/2022	1.0	0.63	0.63	0.11	0.11	-	0.00	0.11	0.52	0.52
8/1/2022	1.0	0.56	0.56	0.12	0.12	-	0.00	0.12	0.44	0.44
9/1/2022	1.0	0.42	0.42	0.05	0.05	-	0.00	0.05	0.37	0.37
10/1/2022	1.0	0.29	0.29	0.04	0.04	-	0.00	0.04	0.25	0.25
11/1/2022	1.0	0.17	0.17	0.03	0.03	-	0.00	0.03	0.14	0.14
12/1/2022	1.0	0.12	0.12	0.02	0.02	-	0.00	0.02	0.10	0.10
1/1/2023	1.0	0.12	0.12	0.02	0.02	-	0.00	0.02	0.10	0.10
2/1/2023	1.0	0.12	0.12	0.02	0.02	-	0.00	0.02	0.10	0.10
3/1/2023	1.0	0.23	0.23	0.05	0.05	-	0.00	0.05	0.18	0.18
4/1/2023	1.0	0.38	0.38	0.07	0.07	-	0.00	0.07	0.31	0.31
5/1/2023	1.0	0.50	0.50	0.08	0.08	-	0.00	0.08	0.42	0.42
6/1/2022	1.0	0.60	0.60	0.08	0.08	-	0.00	0.08	0.52	0.52
7/1/2022	1.0	0.63	0.63	0.11	0.11	-	0.00	0.11	0.52	0.52
8/1/2022	1.0	0.56	0.56	0.12	0.12	-	0.00	0.12	0.44	0.44
9/1/2022	1.0	0.42	0.42	0.05	0.05	-	0.00	0.05	0.37	0.37
10/1/2022	1.0	0.29	0.29	0.04	0.04	-	0.00	0.04	0.25	0.25
11/1/2022	1.0	0.17	0.17	0.03	0.03	-	0.00	0.03	0.14	0.14
12/1/2022	1.0	0.12	0.12	0.02	0.02	-	0.00	0.02	0.10	0.10
1/1/2023	1.0	0.12	0.12	0.02	0.02	-	0.00	0.02	0.10	0.10
2/1/2023	1.0	0.12	0.12	0.02	0.02	-	0.00	0.02	0.10	0.10
3/1/2023	1.0	0.23	0.23	0.05	0.05	-	0.00	0.05	0.18	0.18
4/1/2023	1.0	0.38	0.38	0.07	0.07	-	0.00	0.07	0.31	0.31
5/1/2023	1.0	0.50	0.50	0.08	0.08	-	0.00	0.08	0.42	0.42
2022-2023 Total	-	4.14	4.14	0.69	0.69	0.00	0.00	0.69	3.45	3.45
2023-2024 Total	-	4.14	4.14	0.69	0.69	0.00	0.00	0.69	3.45	3.45

**Table 3**  
**Arkansas Groundwater and Reservoir Association - Pueblo East Pit Phase 7**  
**Projected Depletion Analysis (June 2022 - May 2023)**

Month	Surface Area of Exposed Groundwater (ac) [1]	Gross Evaporation Rate (ft) [2]	Total Gross Evaporation (ac-ft) [3]	Natural Vegetation Credit					Net Pond Evaporative Depletions (ac-ft) [9]	Total Net Unlagged Depletion (ac-ft) [10]
				Effective Precipitation Rate (ft) [4]	Effective Precipitation Credit (ac-ft) [5]	Phreatophyte CU (ft) [6]	Phreatophyte Reduction Credit (ac-ft) [7]	Total Natural Vegetation Credit (ac-ft) [8]		
6/1/2022	10.0	0.60	6.00	0.08	0.58	0.60	1.62	2.20	3.80	3.80
7/1/2022	10.0	0.63	6.30	0.11	0.80	0.63	1.70	2.50	3.80	3.80
8/1/2022	10.0	0.56	5.60	0.12	0.88	0.56	1.51	2.39	3.21	3.21
9/1/2022	10.0	0.42	4.20	0.05	0.37	0.42	1.13	1.50	2.70	2.70
10/1/2022	10.0	0.29	2.90	0.04	0.29	0.29	0.78	1.08	1.83	1.83
11/1/2022	10.0	0.17	1.70	0.03	0.22	0.04	0.11	0.33	1.37	1.37
12/1/2022	10.0	0.12	1.20	0.02	0.15	0.00	0.00	0.15	1.05	1.05
1/1/2023	10.0	0.12	1.20	0.02	0.15	0.00	0.00	0.15	1.05	1.05
2/1/2023	10.0	0.12	1.15	0.02	0.15	0.00	0.00	0.15	1.00	1.00
3/1/2023	10.0	0.23	2.30	0.05	0.37	0.06	0.16	0.53	1.77	1.77
4/1/2023	10.0	0.38	3.80	0.07	0.51	0.38	1.03	1.54	2.26	2.26
5/1/2023	10.0	0.50	5.00	0.08	0.58	0.50	1.35	1.93	3.07	3.07
6/1/2022	10.0	0.60	6.00	0.08	0.58	0.60	1.62	2.20	3.80	3.80
7/1/2022	10.0	0.63	6.30	0.11	0.80	0.63	1.70	2.50	3.80	3.80
8/1/2022	10.0	0.56	5.60	0.12	0.88	0.56	1.51	2.39	3.21	3.21
9/1/2022	10.0	0.42	4.20	0.05	0.37	0.42	1.13	1.50	2.70	2.70
10/1/2022	10.0	0.29	2.90	0.04	0.29	0.29	0.78	1.08	1.83	1.83
11/1/2022	10.0	0.17	1.70	0.03	0.22	0.04	0.11	0.33	1.37	1.37
12/1/2022	10.0	0.12	1.20	0.02	0.15	0.00	0.00	0.15	1.05	1.05
1/1/2023	10.0	0.12	1.20	0.02	0.15	0.00	0.00	0.15	1.05	1.05
2/1/2023	10.0	0.12	1.15	0.02	0.15	0.00	0.00	0.15	1.00	1.00
3/1/2023	10.0	0.23	2.30	0.05	0.37	0.06	0.16	0.53	1.77	1.77
4/1/2023	10.0	0.38	3.80	0.07	0.51	0.38	1.03	1.54	2.26	2.26
5/1/2023	10.0	0.50	5.00	0.08	0.58	0.50	1.35	1.93	3.07	3.07
2022-2023 Total	-	4.14	41.4	0.69	5.04	3.48	9.40	14.43	26.92	26.92
2023-2024 Total	-	4.14	41.4	0.69	5.04	3.48	9.40	14.43	26.92	26.92

**Table 4**  
**Arkansas Groundwater and Reservoir Association - Pueblo East Pit Summary**  
**Projected Depletion Analysis (June 2022 - May 2023)**

Month	Surface Area of Exposed Groundwater (ac) [1]	Gross Evaporation Rate (ft) [2]	Total Gross Evaporation (ac-ft) [3]	Natural Vegetation Credit					Net Pond Evaporative Depletions (ac-ft) [9]	Total Net Unlagged Depletion (ac-ft) [10]
				Effective Precipitation Rate (ft) [4]	Effective Precipitation Credit (ac-ft) [5]	Phreatophyte CU Distribution [6]	Phreatophyte Reduction Credit (ac-ft) [7]	Total Vegetation Credit (ac-ft) [8]		
6/1/2022	76.0	0.60	45.6	0.08	5.4	17.2%	5.0	10.5	35.12	35.12
7/1/2022	76.0	0.63	47.9	0.11	7.4	18.1%	5.2	12.8	35.09	35.09
8/1/2022	76.0	0.56	42.6	0.12	8.1	16.1%	4.6	12.9	29.67	29.67
9/1/2022	76.0	0.42	31.9	0.05	3.4	12.1%	3.5	6.92	25.00	25.00
10/1/2022	76.0	0.29	22.0	0.04	2.7	8.3%	2.4	5.16	16.89	16.89
11/1/2022	76.0	0.17	12.9	0.03	2.0	1.1%	0.3	2.39	10.53	10.53
12/1/2022	76.0	0.12	9.1	0.02	1.4	0.0%	0.0	1.37	7.75	7.75
1/1/2023	76.0	0.12	9.1	0.02	1.4	0.0%	0.0	1.37	7.75	7.75
2/1/2023	76.0	0.12	8.7	0.02	1.4	0.0%	0.0	1.37	7.37	7.37
3/1/2023	76.0	0.23	17.5	0.05	3.4	1.7%	0.5	3.93	13.55	13.55
4/1/2023	76.0	0.38	28.9	0.07	4.7	10.9%	3.2	7.96	20.92	20.92
5/1/2023	76.0	0.50	38.0	0.08	5.4	14.4%	4.2	9.65	28.35	28.35
6/1/2022	76.0	0.60	45.6	0.08	5.4	17.2%	5.0	10.48	35.12	35.12
7/1/2022	76.0	0.63	47.9	0.11	7.4	18.1%	5.2	12.79	35.09	35.09
8/1/2022	76.0	0.56	42.6	0.12	8.1	16.1%	4.6	12.89	29.67	29.67
9/1/2022	76.0	0.42	31.9	0.05	3.4	12.1%	3.5	6.92	25.00	25.00
10/1/2022	76.0	0.29	22.0	0.04	2.7	8.3%	2.4	5.16	16.89	16.89
11/1/2022	76.0	0.17	12.9	0.03	2.0	1.1%	0.3	2.39	10.53	10.53
12/1/2022	76.0	0.12	9.1	0.02	1.4	0.0%	0.0	1.37	7.75	7.75
1/1/2023	76.0	0.12	9.1	0.02	1.4	0.0%	0.0	1.37	7.75	7.75
2/1/2023	76.0	0.12	8.7	0.02	1.4	0.0%	0.0	1.37	7.37	7.37
3/1/2023	76.0	0.23	17.5	0.05	3.4	1.7%	0.5	3.93	13.55	13.55
4/1/2023	76.0	0.38	28.9	0.07	4.7	10.9%	3.2	7.96	20.92	20.92
5/1/2023	76.0	0.50	38.0	0.08	5.4	14.4%	4.2	9.65	28.35	28.35
2022-2023 Total	-	4.14	314.26	0.69	46.71	100%	28.88	76.29	237.97	237.97
2023-2024 Total	-	4.14	314.26	0.69	46.71	100%	28.88	76.29	237.97	237.97

**Table 5**  
**Arkansas Groundwater and Reservoir Association - Pueblo East Pit**  
**Projected Depletions, Releases and Credits (June 2022 - May 2023)**  
(all values are in acre-feet)

Month	Net Unlagged Depletion [1]	Projected Lagged Depletion [2]	Replacement by Delivery Under GCC/PBWW Sublease [3]	Replacement under AGRA Rule 14 [4]	Net Effect to the River [5]
6/1/2022	35.2	30.0	25.7	4.26	0.0
7/1/2022	35.2	33.3	25.7	7.56	0.0
8/1/2022	29.8	31.5	25.7	5.82	0.0
9/1/2022	25.0	27.6	25.7	1.92	0.0
10/1/2022	16.9	21.4	25.7	0.00	0.0
11/1/2022	10.6	14.8	25.7	0.00	0.0
12/1/2022	7.8	10.3	25.7	0.00	0.0
1/1/2023	7.8	8.3	15.0	0.00	0.0
2/1/2023	7.4	8.9	15.0	0.00	0.0
3/1/2023	13.6	11.3	15.0	0.00	0.0
4/1/2023	21.0	16.4	15.0	1.44	0.0
5/1/2023	28.4	23.1	15.0	8.15	0.0
6/1/2022	35.2	30.0	15.0	14.97	0.0
7/1/2022	35.2	33.3	15.0	18.27	0.0
8/1/2022	29.8	31.5	15.0	16.53	0.0
9/1/2022	25.0	27.6	15.0	12.64	0.0
10/1/2022	16.9	21.4	15.0	6.37	0.0
11/1/2022	10.6	14.8	15.0	0.00	0.0
12/1/2022	7.8	10.3	15.0	0.00	0.0
1/1/2023	7.8	8.3	15.0	0.00	0.0
2/1/2023	7.4	8.9	15.0	0.00	0.0
3/1/2023	13.6	11.3	15.0	0.00	0.0
4/1/2023	21.0	16.4	15.0	1.44	0.0
5/1/2023	28.4	23.1	15.0	8.15	0.0
2022-2023 Total	238.66	237.09	255.00	29.15	0.00
2023-2024 Total	238.66	237.09	180.00	78.38	0.00

Table 1 Notes

- [1] Phase 1 maximum anticipated exposed ground water surface area is 65. 0 acres.
- [2] Gross Evaporation Rate equals 4.17 feet per year, based upon NOAA Evaporation Atlas. Monthly distribution based upon SB-120 Guidelines.
- [3] Gross Evaporation equals [1] x [2].
- [4] Effective Precipitation Rate equals 70% of total precipitation, based upon NOAA Pueblo Memorial Airport weather station.
- [5] Effective Precipitation Credit equals [ 4] x ([1] - 5.6), based upon 5.6 acres of phreatophyte area in Phase 1.
- [6] Average monthly potential consumptive use in Blaney-Criddle analyses for Phase 1 based on a depth to ground water of 6 feet. Values limited on monthly basis to gross evaporation in [2].
- [7] Phreatophyte Reduction Credit equals [6] x 5.6 ac, based upon 5.6 acres of 100% canopy cover.
- [8] Total natural vegetation credit equals [5] + [7].
- [9] Net pond evaporation equals [3] - [8].
- [10] Phase 1 net unlagged depletion equals the sum of net pond evaporation, [9].

Table 2 Notes

- [1] Phase 2 maximum anticipated exposed ground water surface area is 1.0 acre.
- [2] Gross Evaporation Rate equals 4.17 feet per year, based upon NOAA Evaporation Atlas. Monthly distribution based upon SB- 120 Guidelines.
- [3] Gross Evaporation equals [1] x [2].
- [4] Effective Precipitation Rate equals 70% of total precipitation, based upon NOAA Pueblo Memorial Airport weather station.
- [5] Effective Precipitation Credit equals [4] x [1].
- [6] Phreatophyte Reduction Credit is not claimed in Phase 2.
- [7] Phreatophyte Reduction Credit is not claimed in Phase 2.
- [8] Total natural vegetation credit equals [5] + [7].
- [9] Net pond evaporation equals [3] - [8].
- [10] Phase 2 net unlagged depletion equals net pond evaporation [9].

Table 3 Notes

- [1] Phase 7 maximum anticipated exposed ground water surface area is 10.0 acres after completion of the first-fill of the pit.
- [2] Gross Evaporation Rate equals 4.17 feet per year, based upon NOAA Evaporation Atlas. Monthly distribution based upon SB- 120 Guidelines.
- [3] Gross Evaporation equals [1] x [2].
- [4] Effective Precipitation Rate equals 70% of total precipitation, based upon NOAA Pueblo Memorial Airport weather station.
- [5] Effective Precipitation Credit equals [4] x ([1] - 2.7), based upon 2.7 acres of phreatophyte area in Phase 1.
- [6] Average monthly potential consumptive use in Blaney-Criddle analyses for Phase 7 based on a depth to ground water of 4 feet. Values limited on monthly basis to gross evaporation in [2].
- [7] Phreatophyte Reduction Credit equals [6] x 2.7 ac, based upon 2.7 acres of 100% canopy cover.
- [8] Total natural vegetation credit equals [ 5] + [ 7].
- [9] Net pond evaporation equals [ 3] - [ 8].
- [10] Phase 7 Net Unlagged depletion equals net pond evaporation [9].



Table 4 Notes

- [1] The maximum exposed ground water surface at the Pueblo East Pit under this SWSP is limited to 76.0 acres in Phases 1, 2 and 7.
- [2] Gross Evaporation Rate equals 4.17 feet per year, based upon NOAA Evaporation Atlas. Monthly distribution based upon SB-120 Guidelines.
- [3] Gross Evaporation equals [1] x [2].
- [4] Effective Precipitation Rate equals 70% of total precipitation, based upon NOAA Pueblo Memorial Airport weather station.
- [5] Effective Precipitation Credit equals sum of column [5] in Tables 1-3.
- [6] Phreatophyte CU distribution equal to monthly phreatophyte reduction credit divided by the total annual phreatophyte reduction credit.
- [7] Phreatophyte Reduction Credit equals the sum of column [7] in Tables 1-3.
- [8] Total natural vegetation credit equals [5] + [7].
- [9] Net pond evaporative depletion equals [3] - [8].
- [10] Total net unlagged depletion equals net pond evaporation plus water loss with aggregate removal and dust control [9].

Table 5 Notes

- [1] Net unlagged depletion from evaporation in Phases 1,2, and 7, equal to the sum of Col [13] in Table 1-3.
- [2] Projected lagged depletion, calculated using methodology described in the 2020 SWSP.
- [3] Replacement requirement met by storage delivery under 10-year PBWW lease (limited to 120 ac-ft/year from Oct - Sep). Subject to transit loss, as determined by the DWR. Actual delivery may vary from projected releases shown in this table.
- [4] Replacement requirement met by delivery of replacement water from AGRA Rule 14 operations. May be subject to transit loss, as determined by the DWR. Actual delivery may vary from projected releases shown in this table.
- [5] Net effect to the river is a balance of projected lagged depletions and replacement sources, equal to [2] subtracted from the sum of [3], [4].