Alan Goldich
Routt County Planning
Sent via Email

May 1, 2023

RE: Clark Store PUD, PL20210026
Response to Division of Water Resources

Dear Alan,

LRE Water has reviewed the letter dated March 22, 2023, from Megan Sullivan, Water Resource Engineer with the Division of Water Resources ("DWR"). Ms. Sullivan's letter notes that the Colorado Revised Statute (30-28-133(3)(d)) requires that a subdivider submit "Adequate evidence that a water supply that is sufficient in terms of quality, quantity, and dependability will be available to ensure an adequate supply of water for the type of subdivision proposed," and that such evidence has not yet been provided. The purpose of this letter is to address DWR's concern.

PROJECT DESCRIPTION

The Entelco Corporation ("Applicant") owns a 63.34-acre parcel on the west side of County Road 129 in Clark, as shown in ***Figure 1***, attached. The Applicant proposes to subdivide this parcel into two lots. Lot 1 will be 5.0 acres and include the existing structures known as the Clark Store, the Stone House, and the Barn. This lot would also be re-zoned to put a PUD in place, so that the Applicant can make improvements to the Clark Store and the residential units within the Stone House and Barn ("Clark Store PUD"). Lot 2 will be 57.05 acres and remain zoned as Agriculture/Forestry. The remaining 1.29 acres is in the County Road 62 right of way and will be dedicated to the County.

The Clark Store PUD will include (1) the current commercial businesses that operate in the Clark Store: a retail convenience store, liquor store, post office, library, deli, ice cream store, and coffee shop; (2) the two existing dwelling units in the Stone House, and (3) the four existing dwelling units in the Barn. In addition, the Clark Store PUD will (1) allow the Applicant to add an outdoor public gathering space with up to three new structures: a storage shed, a beer/wine service structure, and a food preparation/grill structure, and (2) allow the Applicant to rebuild the existing dwelling units so long as the two units associated with the Stone House do not exceed a total of 2,100 sq. ft. and the four units associated with the Barn do not exceed a total of 3,000 sq. ft. LRE Water quantified the overall water demand for the existing and proposed commercial operation, residential units, and potential irrigation demand.

PROJECTED WATER DEMANDS

The water requirements for the Clark Store PUD will continue to be supplied from the Bush Spring and Pipeline surface diversion system. This water source can reliably support the projected indoor and outdoor water demands for the project. In total, the maximum annual water supply is projected

to be 3.77 AF based on a total indoor demand of 2.65 AF/year for commercial and residential use, and a total outdoor demand of 1.12 AF/year for irrigation. The specific water use parameters that LRE Water relied on to quantify the different demand types are described below and summarized in ***Table 1***, attached. In addition, the monthly demand analysis for the project is summarized in ***Table 2***, attached.

Commercial Demand:

LRE Water quantified the demand for commercial operations associated with the Clark Store in two parts: water use per employee and water use per customer. The water use per employee was assumed to be 15 gpd, and the water use per customer was assumed to be 5 gpd. These daily rates represent the water demand for bathroom and kitchen facilities located within the store, and based on LRE Water's experience these rates are a conservative approximation. Monthly demands were then quantified based on a schedule of the number of employees and customer trips each month. This schedule was initially developed using the historical employment and transactional customer data collected at the existing Clark Store business. The peak month totals were then increased to account for the potential of hiring additional employees and serving additional customers due to the increased popularity generated by planned improvements and additional outdoor facilities. That said, the Applicant does plan to have outdoor rented portable restroom facilities available to the public that would not be connected to the Clark Store water or wastewater system. The increased demand, therefore, provides a conservative quantification of the commercial water requirement.

In the peak summer months of June, July, and August the Clark Store is projected to have up to 7 employees. Then, for the remainder of the year, it is expected that half the number of employees will be needed. As it relates to customer trips, it is anticipated that in the peak month of July the Clark Store will serve up to 500 customers daily. Then, following the peak in July, customer trips will begin to decline through the winter before ramping back up in late spring. More specifically, it is anticipated August will be 75% of peak (375 customers), September and October will be 45% of peak (225 customers), and the winter season from November to March will be 35% of peak (175 customers) with the fewest customer trips occurring in April at 25% of peak (125 customers). Then, in May and June customer trips would increase back to the July peak, with May being 35% of peak and June being 75% of peak. In total, the maximum annual indoor commercial demand is projected to be 1.42 AF, as shown in ***Table 2***, attached.

Water Demand Calculation:

- Employees in Peak Month * % of Peak Month * 15 gpd/employee * Days
- (7 people * 100% * 92 days) + (7 people * 50% * 273 days) = 1,600 people per day
- (1,599.5 people per day * 15 gpd/person) = 24,000 gallons = 0.07 AF

- Customer in Peak Month * % of Peak Month * 5 gpd/customer * Days
- (500 people * 31 days) + (375 people * 61 days) + (225 people * 61 days) + (175 people * 182 days) + (125 people * 30 days) = 877,00 people per day
- (877,000 people per day * 5 gpd/person) = 438,500 gallons = 1.35 AF

Residential Demand:

There are six existing residential units included in the Clark Store PUD. Two of the units are located in the Stone House residence, and four of the units are located are in the Barn residence. The Applicant has requested with approval of the proposed Clark Store PUD the ability to increase the size of the Stone House residence from a total of 1,920 sq. ft. to 2,100 sq. ft., and to increase the size of the Barn residence from a total of 1,647 sq. ft. to 3,000 sq. ft. but not increase the number of units in each structure. Based on the proposed square footages, the size of the two Stone House units would be approximately 1,050 sq. ft, and the size of the four Barn units would be approximately 750 sq. ft. At these sizes, LRE Water assigned the number of occupants per unit based on EQR (Equivalent Residential Unit) factors that are commonly used for water supply planning purposes. For the Stone House residence, the number of occupants per unit was set at 2.5 persons, and for the Barn residence, the number of occupants per unit was set at 1.5 persons. Monthly water demands were then quantified based on an average daily usage rate of 100 gpd per person. In total, the maximum annual water demand for residential use is projected to be 1.23 AF, as shown in ***Table 2***, attached.

Water Demand Calculation:

- Occupants * 100 gpd/person * Days
- (2 Stone House Units * 2.5 people) + (4 Barn Units * 1.5 people) = 11 people
- (11 people * 100 gpd/person * 365 days) = 401,500 gallons = 1.23 AF

Irrigation Demand:

Between and surrounding the existing Clark Store, Stone House, and Barn structures there are areas of irrigated lawn, trees, and landscaping. It is LRE Water's understanding from the Applicant that this area receives water both from the Brush Creek Spring and Pipeline diversion system and from tailwater supplies associated with the agricultural irrigation of fields located to the north and west of the property. The Applicant, however, does not control the tailwater supply. As such, the projected water demand for the Clark Store PUD includes the irrigation of up to 30,000 sq. ft. (0.69 acres) using the Brush Creek Spring and Pipeline diversion system. The general location of the irrigated area is shown in ***Figure 2***.

The water demand for irrigating lawns, trees, and gardens within the Clark Store PUD was based on an irrigation water requirement (IWR) of 1.38 ft/year. This average annual rate was derived using the modeling tool that was developed by the Upper Yampa Water Conservancy District ("UYWCD") to evaluate contract applications under its Elk River area-wide augmentation plan decreed in Case No. 15CW3058. More specifically, the following parameters were entered into the model: property elevation, property location (quarter-quarter, section, township, and range), crop type (bluegrass), and irrigation method (sprinkler). With this information, the model pulls from a regional dataset the local temperature and precipitation data, growing season start and end dates, and the elevation adjustment factor. With the site specific data, the model then calculates the monthly IWR for a bluegrass crop grown near Clark, Colorado, based on the Modified Blaney-Criddle methodology (S.C.S. Technical Release 21).

The monthly IWR values, however, do not account for losses in delivering the water supply to the crop, and therefore, the overall water supply diverted by the Bush Spring and Pipeline for irrigation within the Clark Store PUD needs to account the application efficiency. It is anticipated that the lawns, trees, and gardens will be irrigated using a sprinkler system, which is assumed to have an application efficiency of 85%. The resulting diversion demand is therefore equal to 1.62 ft/year. (1.38 ft. / 90%), and in total, the maximum annual outdoor irrigation demand will be 1.12 AF.

Water Demand Calculation:

- Irrigated Area * (Irrigation Water Requirement / Efficiency)
- (30,000 sq. ft. / 43,560 sq. ft / acre) = 0.69 acres
- (0.69 acres * (1.38 feet / 85%) = 1.12 AF

PHYSICAL WATER AVAILABILITY

As mentioned, the existing potable demand at the Clark Store, Stone House, and Barn is supplied by the Bush Spring and Pipeline diversion system. This potable water supply system consists of a shallow infiltration gallery, spring collection box, concrete storage tank, and treatment facility. The infiltration gallery diverts water supplies from a tributary of the Elk River through a perforated 4 inch diameter pipe that is buried upgradient from the spring collection box. The spring collection box is a 3 foot diameter pipe that is vertically oriented and rises approximately 4 feet above the ground surface. It has a sloped roof that drains rain and snow away from the collection box, and it provides short term storage and overflow. From the collection box, water supplies are delivered to a cast-in-place concrete storage tank that holds approximately 6,100 gallons, and from there, water is treated and delivered to the Clark Store, Stone House, and Barn.

LRE Water was on-site at the Bush Spring and Pipeline diversion system on September 19, 2023, and similar to how a pump test for a groundwater well is conducted, LRE Water quantified the inflow supply from the spring collection box to the concrete storage tank by monitoring how quickly water levels in the storage tank recovered after a period of pumping. The existing pump was

disconnected from the treatment system and connected to a hose, so that water could be pumped and discharged away from the tank. Then, prior to turning the pump on, the distance from the top of the storage tank to the water surface level was measured. This point of reference was used as a baseline to monitor the recovery of storage supplies. The pump was then turned on and operated for 1 ½ hours, and a second depth measurement was taken when the pump was turned off. Based on the difference between the two depth measurements, LRE Water estimated that approximately 193 gallons had been pumped from storage. It took approximately 43 minutes for the water surface level to recover to the referenced starting depth, which equates to an inflow rate of 4.5 gpm (193 gallons / 43 minutes). This measurement was taken in late September and is therefore representative of streamflow levels at or near baseflow conditions. In the Elk River basin, streamflow hydrology is driven by the annual snowpack, wherein flows increase during the spring snowmelt, and typically peak by mid-summer before receding back to baseflow conditions. As a result, the available diversion supply from the Bush Spring and Pipeline is likely more than 4.5 gpm in the spring and summer, when demands for the Clark Store PUD are highest. Moreover, the ability to store up to 6,100 gallons allows the Bush Spring and Pipeline diversion system to meet a peak day demand at a higher rate than the inflow supply. As such, the physically available water supply is sufficient to meet the projected demands for the Clark Store PUD.

LEGAL WATER AVAILABILITY

The Bush Spring and Pipeline was adjudicated in Civil Action 3538 on April 1, 1963, by the Routt County District Court. The decree granted an absolute water right with a priority date of January 1, 1940, to divert up to 0.0111 cfs or approximately 5 gpm from a tributary of the Elk River, as shown in ***Figure 2***. This water right, however, was to be used only for domestic purposes, and therefore cannot be used to supply the commercial businesses within the Clark Store or irrigation within the Clark Store PUD.

The Applicant is in the process of filing an application with the Division 6 Water Court for a new, conditional water right at the Bush Spring and Pipeline to be used for domestic, commercial, and irrigation purposes. This water right will have a junior 2024 priority date and will be subject to downstream river administration on the Elk and Yampa Rivers. On the Elk River, administration has historically been controlled by the Colorado Water Conservation Board's ("CWCB") instream flow water right in the reach from Rock Creek to the Yampa River, as shown in ***Figure 3***. This water right is decreed for 65 cfs year-round with a priority date of September 23, 1977, and in dry years calls have typically been placed from mid-August to early-October. On the Yampa River, administration is controlled at the Lily Park Ditch No. 1 Pump Station by calling priorities decreed to the pump station or bypass priorities decreed to more junior water rights. In general, these priorities have ranged from 1950 to 1963. The first year of administration occurred in 2018, when a call was placed for a 22 day period in September. Since then, there was a 10 day call from late-August to early-September in 2020, and a 4 day call from late-July to early-August in 2021.

The Applicant's new Bush Creek Spring and Pipeline water right would be out-of-priority during periods of administration on the Elk and Yampa River, and as such, would have to either curtail diverting water supplies for commercial and irrigation uses, or develop a plan for augmentation that would prevent injury to senior calling water rights by replacing out-of-priority depletions. The Applicant is pursuing the option to develop a plan for augmentation, so that the water supply that is physically available at the Bush Spring and Pipeline will also be legally available and provide the Clark Store PUD with a reliable source of supply.

PLAN FOR AUGMENTATION

The UYWCD operates two area-wide augmentation plans: the Yampa River Augmentation Plan that was decreed in Case No. 06CW49, and Elk River Augmentation Plan that was decreed in Case No. 15CW3058. These area-wide augmentation plans allow water users that are located within defined areas of Yampa and Elk River basins to contract with the UYWCD for augmentation replacement supplies. In these defined areas, it was determined that out-of-priority diversions from potential contractees could be fully replaced by the UYWCD. These area-wide augmentation plans allow water users within the defined area to obtain a legal water supply without having to individually file a Water Court application.

The Clark Store PUD is located within the defined area of the Elk River Augmentation Plan, as shown in ***Figure 4***, and the Applicant is in the process of obtaining a contract with the UYWCD. Once the Applicant has a contract, the Bush Spring and Pipeline diversion system will be able to divert water supplies for commercial and irrigation uses without having to curtail when either the Elk or Yampa River is under administration.

Should you have any questions, please do not hesitate to contact me.

Sincerely,

LRE WATER

Ashley Moffatt, P.E.
Water Resource Engineer, VP of Western Operations

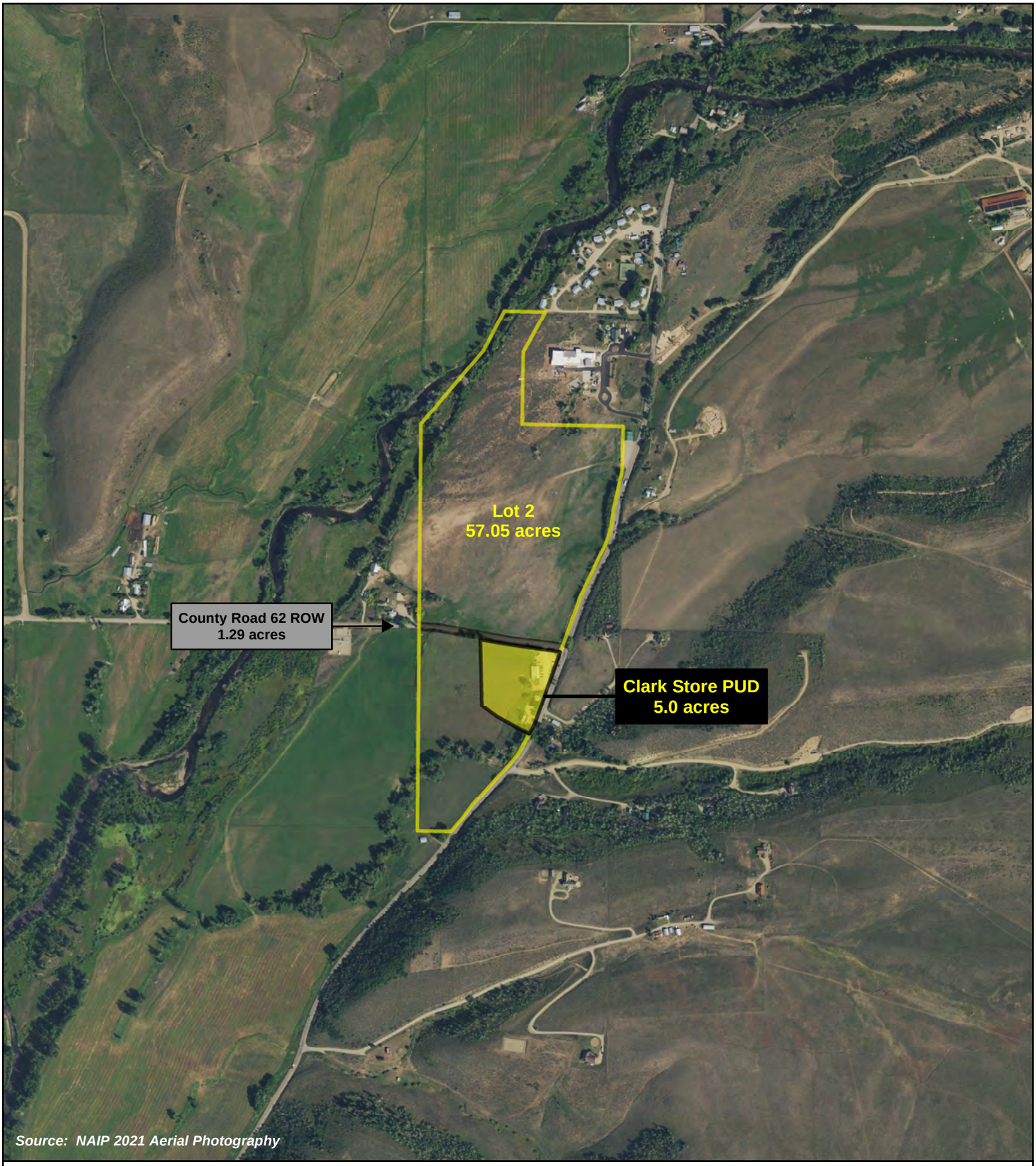

Figure 1
Clark Store PUD Property

LRE WATER

Feet
0 500 1,000 2,000

Date: 2024-04-29
File: 21676-1.0
Drawn: ANM
Approved: ANM

Figure 2
Irrigated Area

LRE WATER

Feet
0 100 200 400

Date: 2024-04-29
File: 21676-1.0
Drawn: ANM
Approved: ANM

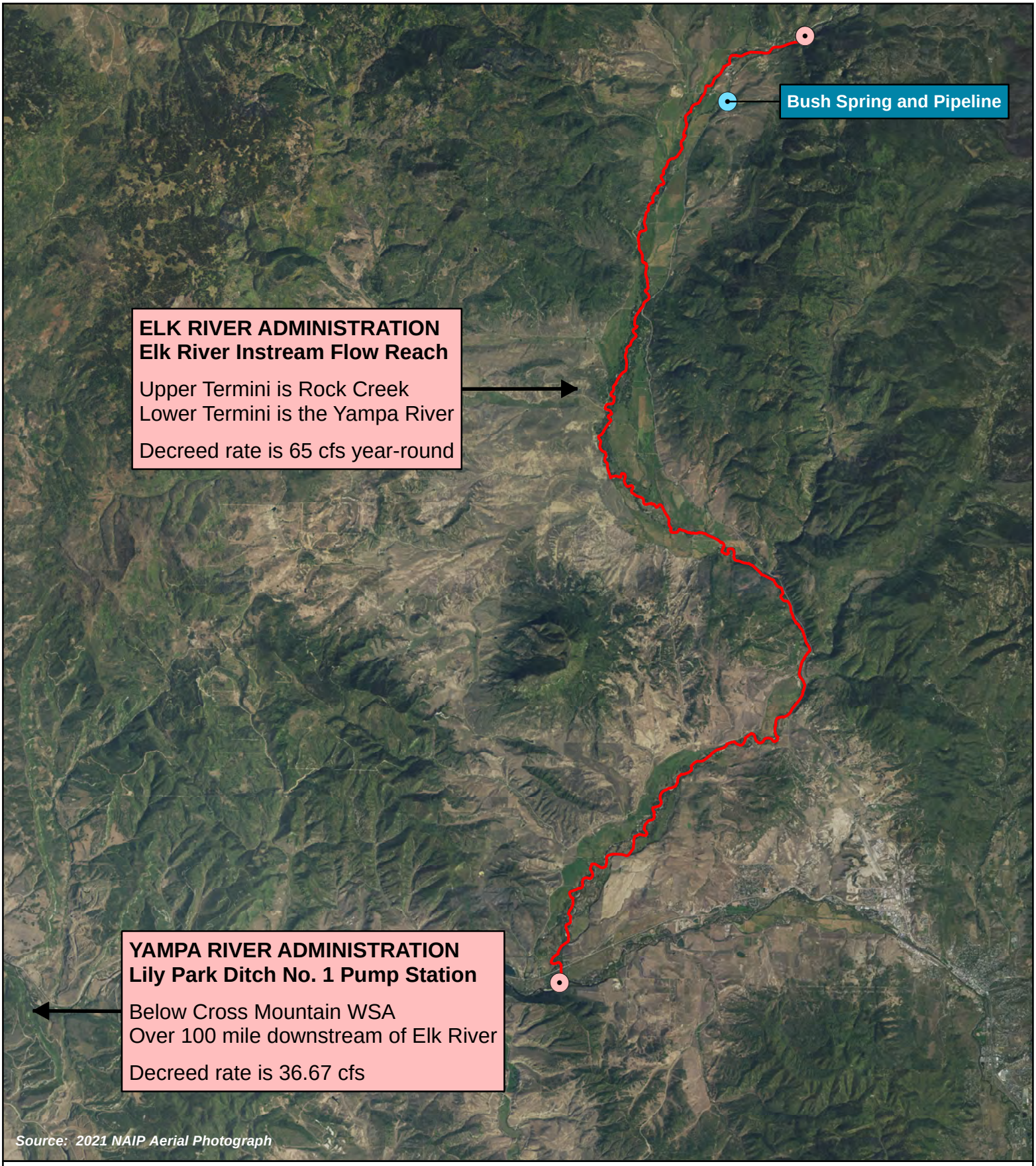

Figure 3
River Administration

LRE WATER

Miles
0 2 4 8

Date: 2024-04-29
File: 21676-1.0
Drawn: ANM
Approved: ANM

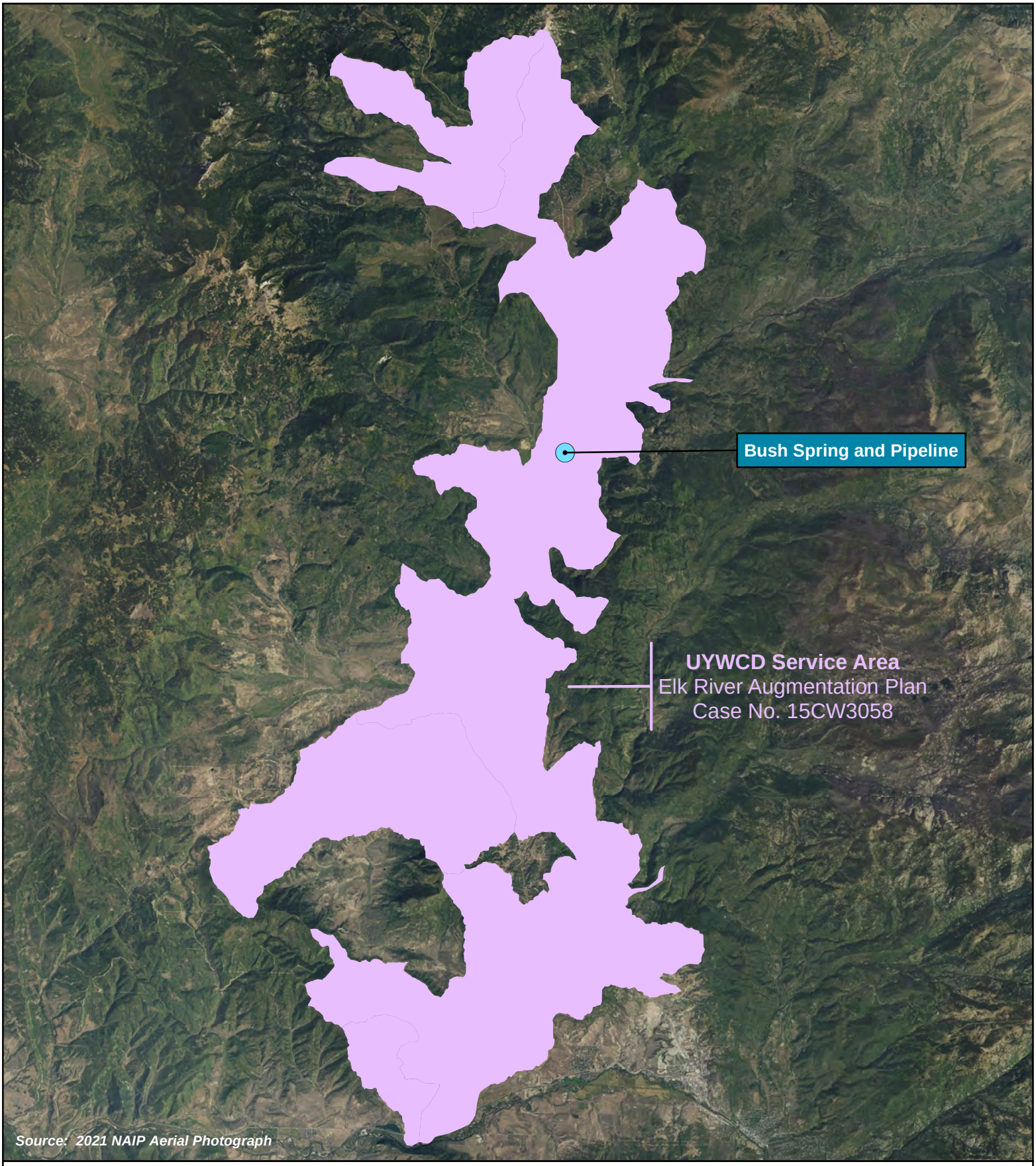

Figure 4
UYWCD Elk River Augmentation Plan Boundary

LRE WATER

Miles
0 2 4 8

Date: 2024-04-29
File: 21676-1.0
Drawn: ANM
Approved: ANM

Table 1
Summary of Water Use Parameters

Indoor Water Demand Calculator

Water Use:	**100**	gpd/person

Duplex	**2.5**	**persons**	2	Stone House
SFR, Size	> 1,000	sq. ft.		2 Units at 1,050 sq. ft. per Unit
Apartment	**1.5**	**persons**	4	Barn
SFR, Size	< 1,000	sq. ft.		4 Units at 750 sq. ft. per Unit

Notes
Number of Persons * Water Demand * Day in the Month = Gallon per Month

Commercial Use

Water Demand (gpd)	
Employees	**15**
Customers	**5**

Peak Season Numbers	
Employees	**7**
Customers	**500**

	Employees		Customers	
	gallons	% Peak	gallons	% Peak
Jan	1,628	50%	27,125	35%
Feb	1,470	50%	24,500	35%
Mar	1,628	50%	27,125	35%
Apr	1,575	50%	18,750	25%
May	1,628	50%	27,125	35%
Jun	3,150	100%	56,250	75%
Jul	3,255	100%	77,500	100%
Aug	3,255	100%	58,125	75%
Sep	1,575	50%	33,750	45%
Oct	1,628	50%	34,875	45%
Nov	1,575	50%	26,250	35%
Dec	1,628	50%	27,125	35%

Notes
Peak Season Number * Water Demand * Percent of Peak * Days in the Month = Gallons per Month

Outdoor Water Demand Calculator

Crop Type:	**Bluegrass**	lawn, landscaping, garden
Irrigated Area:	**30,000.0**	square feet
	0.69	acres
Efficiency:	**85.0%**	sprinkler

	IWR Bluegrass (feet)
Jan	0.00
Feb	0.00
Mar	0.00
Apr	0.10
May	0.36
Jun	0.41
Jul	0.33
Aug	0.18
Sep	0.00
Oct	0.00
Nov	0.00
Dec	0.00
	1.38

Notes
(Total Acres of Irrigation * Monthly Irrigation Water Requirement) / Efficiency = Acre-Feet per Month

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Table 2
Projected Monthly Water Demands for the Clark Store PUD

	Indoor Domestic Demand						
	Stone House Units			Barn Units			Total
	Occupancy (people)	Water Use (gal/person)	**Total (AF)**	Occupancy (people)	Water Use (gal/person)	**Total (AF)**	**Demand (AF)**
Jan	5.0	3,100	0.05	6.0	3,100	0.06	**0.10**
Feb	5.0	2,800	0.04	6.0	2,800	0.05	**0.09**
Mar	5.0	3,100	0.05	6.0	3,100	0.06	**0.10**
Apr	5.0	3,000	0.05	6.0	3,000	0.06	**0.10**
May	5.0	3,100	0.05	6.0	3,100	0.06	**0.10**
Jun	5.0	3,000	0.05	6.0	3,000	0.06	**0.10**
Jul	5.0	3,100	0.05	6.0	3,100	0.06	**0.10**
Aug	5.0	3,100	0.05	6.0	3,100	0.06	**0.10**
Sep	5.0	3,000	0.05	6.0	3,000	0.06	**0.10**
Oct	5.0	3,100	0.05	6.0	3,100	0.06	**0.10**
Nov	5.0	3,000	0.05	6.0	3,000	0.06	**0.10**
Dec	5.0	3,100	0.05	6.0	3,100	0.06	**0.10**
Total		36,500	**0.56**		36,500	**0.67**	**1.23**

	Commercial Demand				
	Employees		Customers		Total
	Water Use (gallons)	**Total (AF)**	Water Use (gallons)	**Total (AF)**	**Demand (AF)**
Jan	1,628	0.00	27,125	0.08	**0.09**
Feb	1,470	0.00	24,500	0.08	**0.08**
Mar	1,628	0.00	27,125	0.08	**0.09**
Apr	1,575	0.00	18,750	0.06	**0.06**
May	1,628	0.00	27,125	0.08	**0.09**
Jun	3,150	0.01	56,250	0.17	**0.18**
Jul	3,255	0.01	77,500	0.24	**0.25**
Aug	3,255	0.01	58,125	0.18	**0.19**
Sep	1,575	0.00	33,750	0.10	**0.11**
Oct	1,628	0.00	34,875	0.11	**0.11**
Nov	1,575	0.00	26,250	0.08	**0.09**
Dec	1,628	0.00	27,125	0.08	**0.09**
Total	23,993	**0.07**	438,500	**1.35**	**1.42**

	Outdoor Irrigation Demand			
	Lawn & Turf			Total
	Area (acres)	IWR (feet)	**Total (AF)**	**Demand (AF)**
Jan	0.69	0.00	0.00	**0.00**
Feb	0.69	0.00	0.00	**0.00**
Mar	0.69	0.00	0.00	**0.00**
Apr	0.69	0.10	0.08	**0.08**
May	0.69	0.36	0.29	**0.29**
Jun	0.69	0.41	0.33	**0.33**
Jul	0.69	0.33	0.27	**0.27**
Aug	0.69	0.18	0.15	**0.15**
Sep	0.69	0.00	0.00	**0.00**
Oct	0.69	0.00	0.00	**0.00**
Nov	0.69	0.00	0.00	**0.00**
Dec	0.69	0.00	0.00	**0.00**
Total		1.38	**1.12**	**1.12**

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