COLORADO
Division of Water Resources
Department of Natural Resources
Water Division 2 - Main Office

Memorandum

To: Whom it may concern

CC: Jim and Jo Pustizzi, Ray and Judy Kilmer, John and Mary Kester, Rick and Jennifer Akin, Larry and Barbara Markcum, Donald Westfall Living Trust, U.S. Forest Service, Alan Alias, Friends of Twin Lakes

From: Rachel A. Zancanella, P.E., Division 2 Engineer

Subject: Bartlett Gulch, Twin Lakes Ditch Drainage, and Barn Pond Site Visit Determination
July 9, 2024 Site Visit

Date: August 5, 2024

Background:

On July 9th through 11th, 2024 Division of Water Resources staff completed a field investigation as part of a settlement agreement related to Water Court Case No. 21CW3008 (attached). The purpose of the site visit was multifaceted. However, of note is the claim that the flow in West Bartlett Gulch that goes through the Town of Twin Lakes above Gordon Acres was not the natural channel of Bartlett Gulch and was instead an undecreed ditch. Therefore, as part of the investigation Division of Water Resources staff investigated the claim. At the time of investigation, local property owners Jim and Jo Pustizzi, Ray Kilmer and Alan Alias, who also has a water right downstream of the point of interest had previously shut off flow down the reach that heads towards the Town.

Authority and Jurisdiction:

C.R.S. 37-92-501: "The state engineer and the division engineers shall administer, distribute, and regulate the waters of the state in accordance with the constitution of the state of Colorado, the provisions of this article and other applicable laws, and written instructions and orders of the state engineer, in conformity with such constitution and laws, and no other official, board, commission, department, or agency, except as provided in this article and article 8 of title 25, C.R.S., has jurisdiction and authority with respect to said administration, distribution, and regulation."

C.R.S. 37-92-502(1-2)
1. "The state engineer or the division engineers shall issue to the owners or users of water rights and to the users of waters of the state such orders as are necessary to implement the provisions of section 37-92-501, including, but not limited to, the orders specified in subsections (2) to (7) of this section. If such orders are given orally, they shall be confirmed promptly in writing.
2. Each division engineer shall order the total or partial discontinuance of any diversion in his division to the extent that the water being diverted is not necessary for application to a beneficial use; and he shall also order the total or partial discontinuance of any diversion in his division to the extent that the water being diverted is required by persons entitled to use water under water rights having senior priorities, but no such discontinuance shall be ordered unless the diversion is causing or will cause material injury to such water rights having senior priorities."

Division 2 is an over-appropriated basin with a senior call for water at all times except under very rare circumstances. The opportunity to divert water in the basin without a water right or under what is known as "Free River Conditions" occurs on average, less than once every 30 years.

In administration pursuant to C.R.S. 37-92-501, the Division Engineer is responsible for administering water by seniority of decreed water rights.

Analysis:

The Division of Water Resources, as noted above, is responsible for the administration, distribution and regulation of the waters of the State. As such, when water is diverted out of the natural channel or sometimes even controlled within the natural channel, such as with an in-stream flow right, our role is to ensure that it is done lawfully pursuant to statutes and decrees. This includes diversion into ditches as well as out-of-priority storage in reservoirs. In doing so, our staff look at thousands of diversions annually. With respect to Bartlett Gulch, our staff raised concerns regarding three separate points of diversion starting in 2017. The first two are addressed with Lake County via their blanket plan for Augmentation in Water Court Case No. 98CW173 and the second is also addressed in the aforementioned 21CW3008 case. The split in question at the Pustizzi/Kilmer/Alias lands was the third point of diversion under investigation.

In this investigation multiple lines of evidence may be considered when determining whether a particular flow path is a natural channel or is a man-made diversion. A strong indication of a natural channel however is simply that the natural flow of water follows the slope or grade line or for skiers, the "fall line" in the path of least resistance. More simply, water runs downhill, perpendicular to contour lines (see Figure 1).

Figure 1. Example of a stream shown on topographic maps crossing the topographic lines, running perpendicular to the contour lines.

Ditches on the other hand are often constructed in such a way as to carry water away from the channel and commonly curve with, or run parallel to, contour lines for certain segments in order to deliver water to the desired destination (see examples in Figure 2).

Figure 2. Examples of ditches running parallel to the grade.

Another physical consideration includes channel cross-sections. Streams are natural and their cross-section is consistent with their stage within the fluvial geomorphology. For example, streams are often fast and channelized in areas of steep slopes and flatten and braid in areas of flat slopes. Ditch cross sections are often indicative of the tool used to construct them, from shovels and ditch diggers to backhoes. This often results in a uniform cross-section shape that is trapezoidal, triangular or square in some cases.

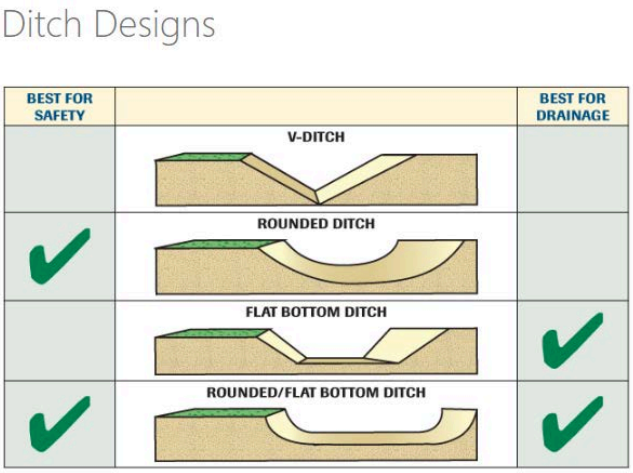


Figure 3. Example ditch cross-sections
Image Credit: Transportation Engineering Agency SDDCTEA

When the flow in a ditch segment that is not perpendicular to contour lines exceeds the ditch capacity, the water will over top and cut new channels that are perpendicular to contour lines (see Figure 4). In contrast, when a natural stream is dammed, water will flow around the obstruction and back into the natural channel downstream.

Figure 4. Example of Ditch Bank Breach

Also, ditches will sometimes have laterals off of them that divert the water again in different directions along the contours.

Finally, a records review was conducted to evaluate if any water rights have been claimed in the area or if map and filling statements were filed, indicating ditches intended to be constructed but either were never finalized or have since been abandoned.

The drainage on Figure 5 labeled “Twin Lakes Ditch” was inspected from the split off of West Bartlett Gulch labeled “West Fork Split” in a southerly direction to the Barn Pond (see enlarged area in Figure 6). The numbered points/areas in Figure 6 correspond to a pictorial log of observations of the physical attributes of the channel as it runs through the Town of Twin Lakes. These areas are described in further detail below.

Figure 5

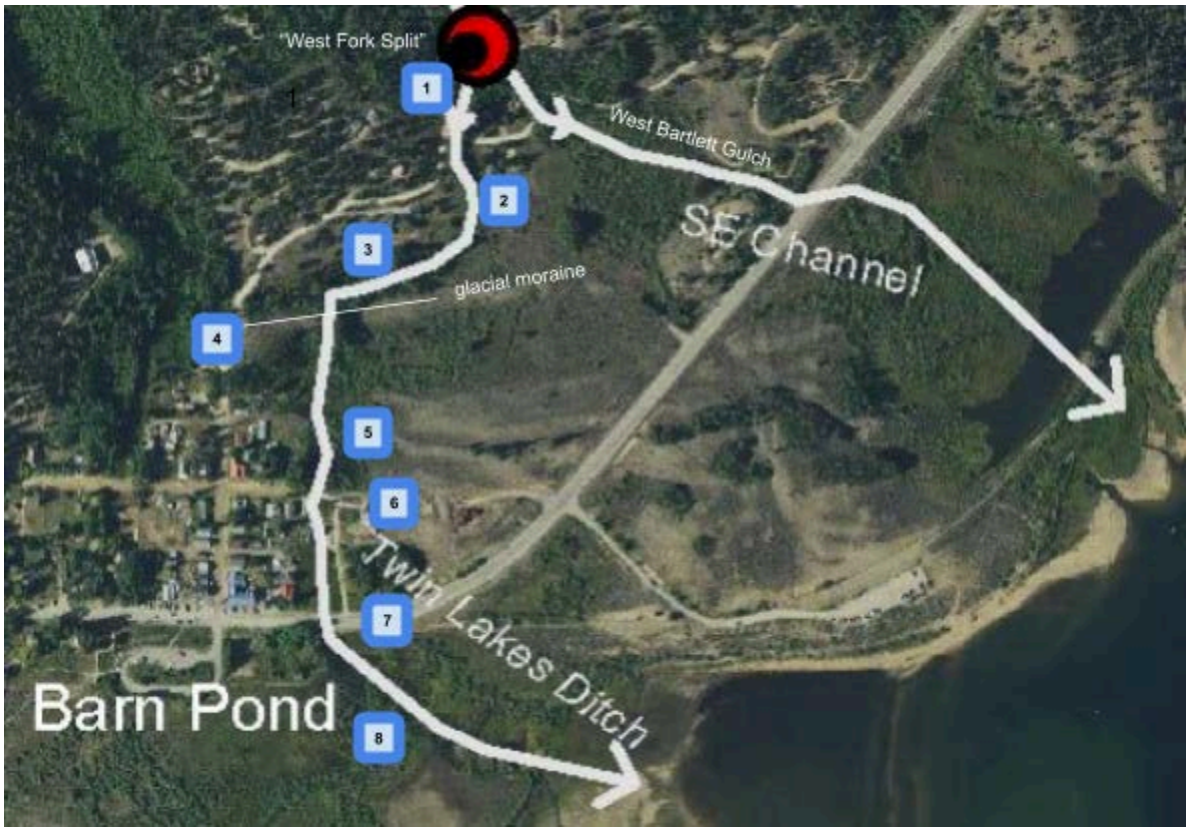


Figure 6

At Point 1 (West Fork Split) "Twin Lakes Ditch" took off from the point of diversion and immediately followed a U shaped path that runs parallel to the contours whereas West Bartlett Gulch continues straight in a manner that runs perpendicular to the contours.

Figure 7

Figure 8

Figure 9. Area 1 U shaped ditch just down ditch of the “West Fork Split”

Area 2 After the channel diverges from West Bartlet Gulch, it flows parallel to the contours towards Dayton Gulch.

Figure 10. Area 2 photo taken at the apex of the curve (Point 2) facing down gradient, channel flowing left to right parallel to the grade.

Area 2 Also in Area 2, water appears to have breached the channel and follows a route back towards the east perpendicular to the contour and ultimately flows to the east before changing direction again and rejoining the flow near Marcum's pond after turning into a separate drainage.

Figure 11. Area 2 photo taken of breach in the channel and aerial view of breached channel.

Area 3: The channel parallels the “glacial moraine”, a geologic formation that acts like a giant berm and runs east to west upgradient from the Town. Through this area, the grade of the channel is very flat and is blocked at multiple points by small beaver dams creating an obstructed path causing water to back up, infiltrate and evaporate along the route.

Figure 12. Area 3 photos taken of beaver dams in channel.

In between points 3 and 4 on Figure 6, the channel takes an almost 90 degree turn to the south through a hand cut section in the “glacial moraine” and enters a natural drainage located in between Dayton Gulch to the West and West Bartlett Gulch to the East. Inside the cut section of the berm are old, hand cut timbers buried within the embankment which resembles construction methods of dams from the early 1900’s.

Figure 13. Area 3 photos of excavated cut through “glacial moraine”.

Area 4: Cross sectional view of the west end of the "glacial moraine" on County Road 26 and aerial view of glacial moraine.

Figure 14. Area 3 "glacial moraine".

In between Area 4 and Area 5 on the channel, we observed a diversion structure which took off to the West in a small lateral, crossed under 5th Street and ultimately terminated into Dayton Gulch.

Figure 15. Path of lateral and diversion structure off the channel.

Area 5 Marcum's Beaver Ponds including fire hydrant diversion structure.

Figure 16. Marcum Beaver Ponds.

Area 6 Clogged culvert down ditch of Marcum's Beaver Ponds on the north side of Lang Road

Figure 17. View looking upstream towards Marcum Beaver Ponds.

Area 7 & 8 Barn Pond and dam, including “beaver deceiver” which was plugged by a log at the time of the inspection.

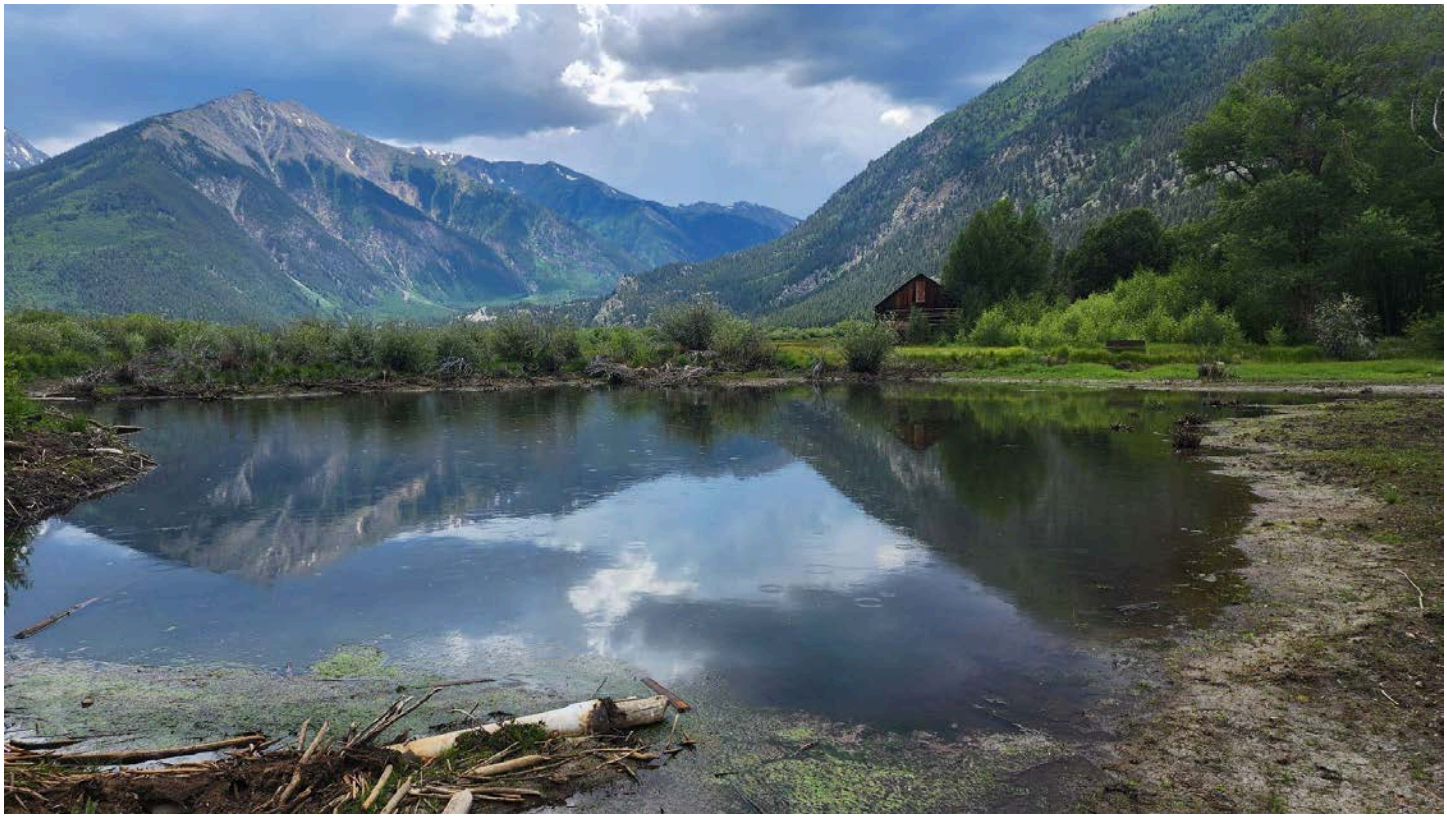


Figure 18. View of “Barn Pond”.

The downstream face of the “Barn Pond” dam consisted of tires stacked in a pyramid formation filled with native grasses similar to flower pots as well as scrap metal including bed springs, sheet metal and vehicle parts. These additions indicate the pond was constructed by man and enhanced by beavers.

Figure 19. Photos of scrap buried in the downstream embankment of the Barn Pond.

Figure 20 is the September 1891 plat map of the Town of Twin Lakes. Though difficult to observe when photographed behind glass, the text on the map in the highlighted area is legible in person on the original map housed in the School House - It states "Water Supply Ditch". The mapped Water Supply Ditch generally follows the current path of Twin Lakes Ditch: down 4th Street and then east down Lake Avenue. During our field visit, it was represented that Mr. Marcum's beaver dam pond had been in existence since the 1900's. We assume this statement was based on it being located in the same area as the "reservoir" (between Pine Street and Aspen Avenue). It should be noted that it was not common practice to note "beaver dams" on plat maps in this era nor have we ever seen them noted on map and filing statements, probably due to their transient nature. However, it was common to note ditches and reservoirs. Finally, the windmill on Marcum's property (Figure 21) is also a hand dug well with hand laid stones common of wells that pre-date the 1950's. It is located in close proximity to the "water supply ditch". It may have been constructed as part of the proposed town water supply system as either a primary or secondary source.

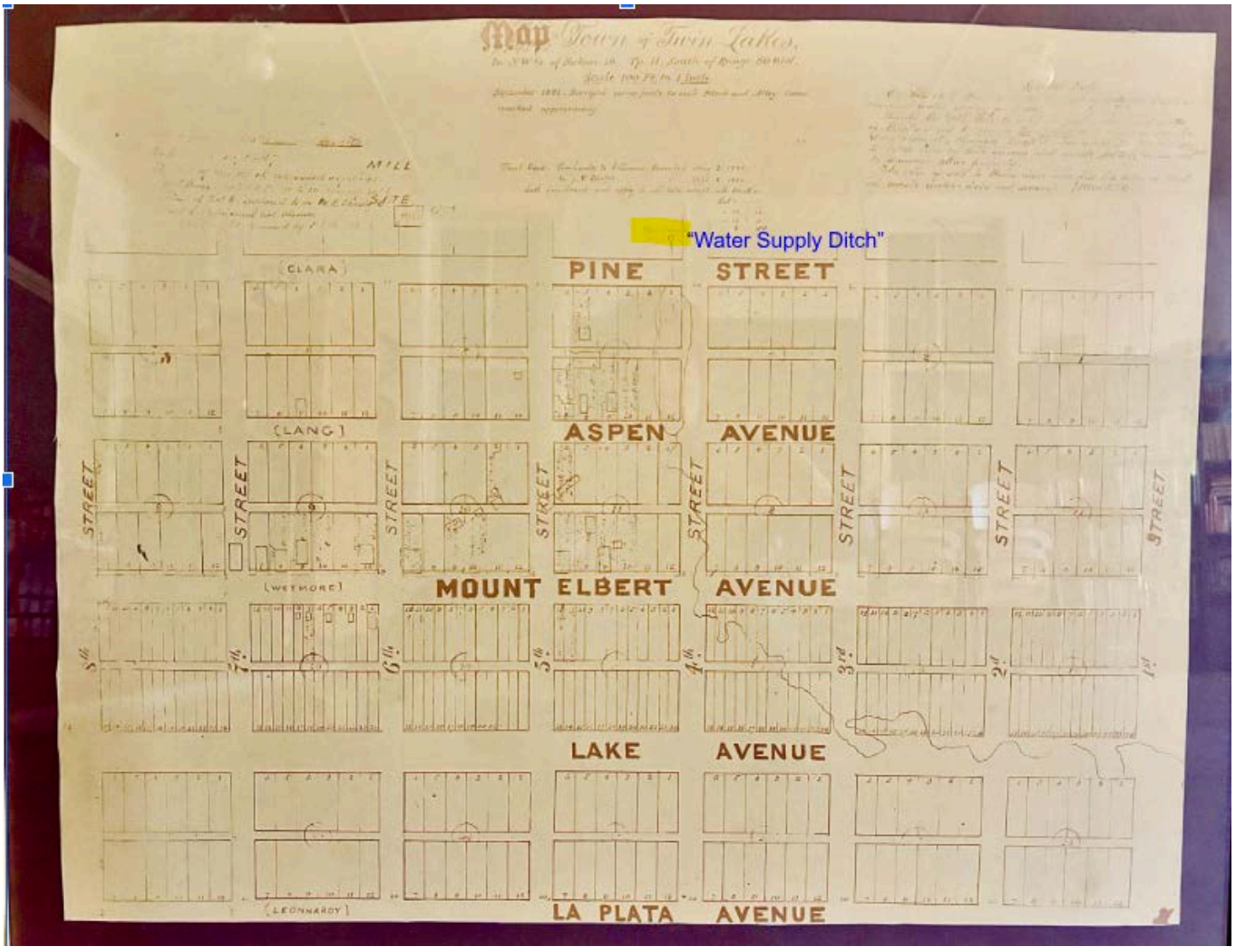
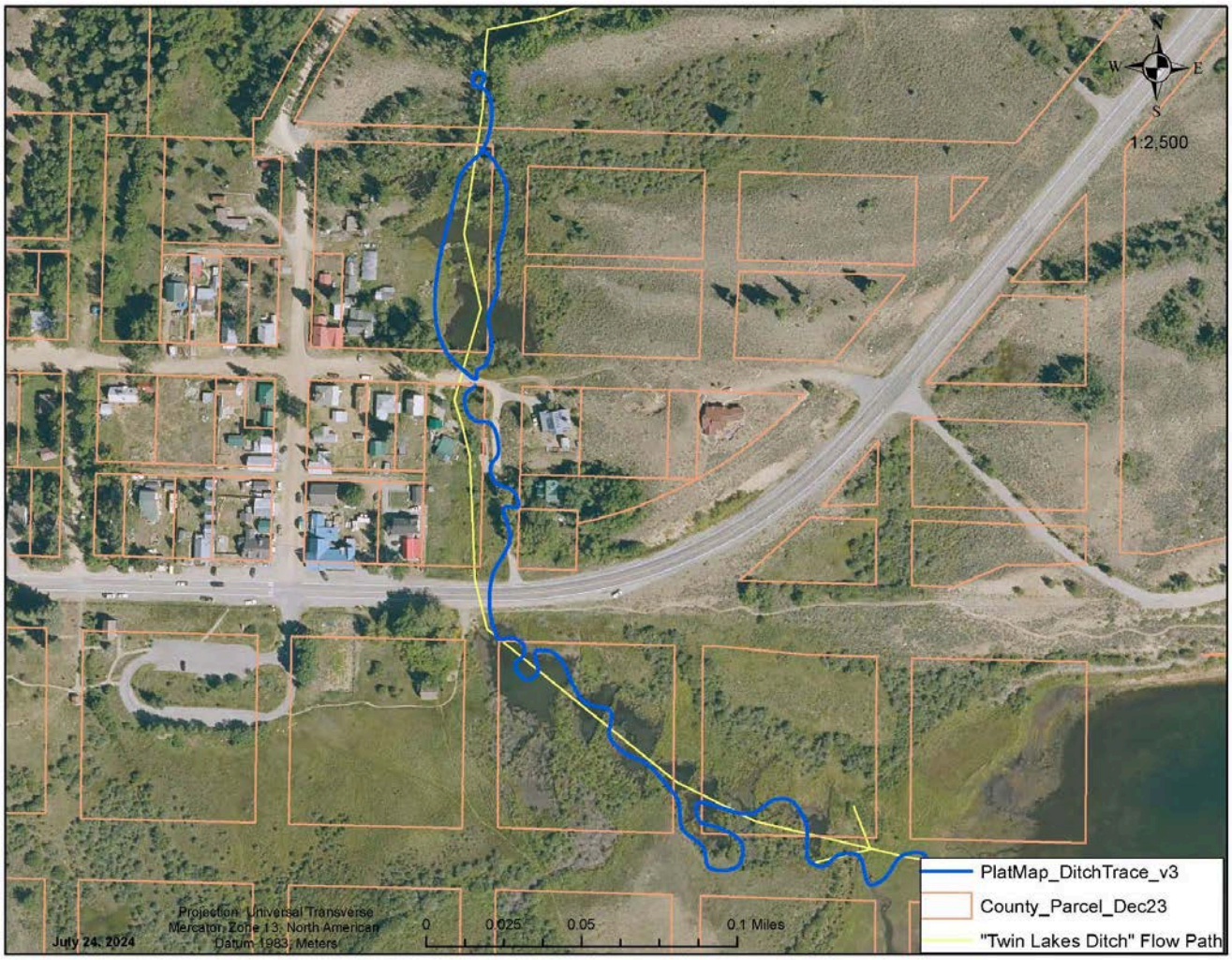


Figure 20

Figure 21. Windmill Well

Figure 22 and Figure 23 are the Town of Twin Lakes Plat map overlaid on an aerial photo with the Water Supply Ditch digitized in blue. In our observations, it is not uncommon to find beaver dams built on top of existing and abandoned man made structures, such as the reservoir shown on the plat map.

Figure 22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PlatMap_DitchTrace_v3
County_Parcel_Dec23
"Twin Lakes Ditch" Flow Path
Projection: Universal Transverse Mercator, Zone 13, North American Datum 1983, Meters
July 24, 2024
0
0.025
0.05
0.1 Miles

Figure 23

The following section reviews available aerial photography of the area from 1955-2023 of Marcum's Beaver Ponds down to the Barn Pond. The Barn Pond was a wet area in the 1955 and earlier photos, but a visible pond did not appear until between the years 1990 to 1999.


Image Year: 1990
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COLORADO
Division of Water Resources
Department of Natural Resources
Projection: Universal Transverse Mercator, Zone 13, North American Datum 1983, Meters
July 24, 2024
0 0.03 0.06 0.12 Miles
BarnPond
"Twin Lakes Ditch" Flow Path


Image Year: 1999
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W
E
S
1:3,000
COLORADO
Division of Water Resources
Department of Natural Resources
Projection: Universal Transverse Mercator, Zone 13, North American Datum 1983, Meters
July 24, 2024
0 0.03 0.06 0.12 Miles
BarnPond
"Twin Lakes Ditch" Flow Path

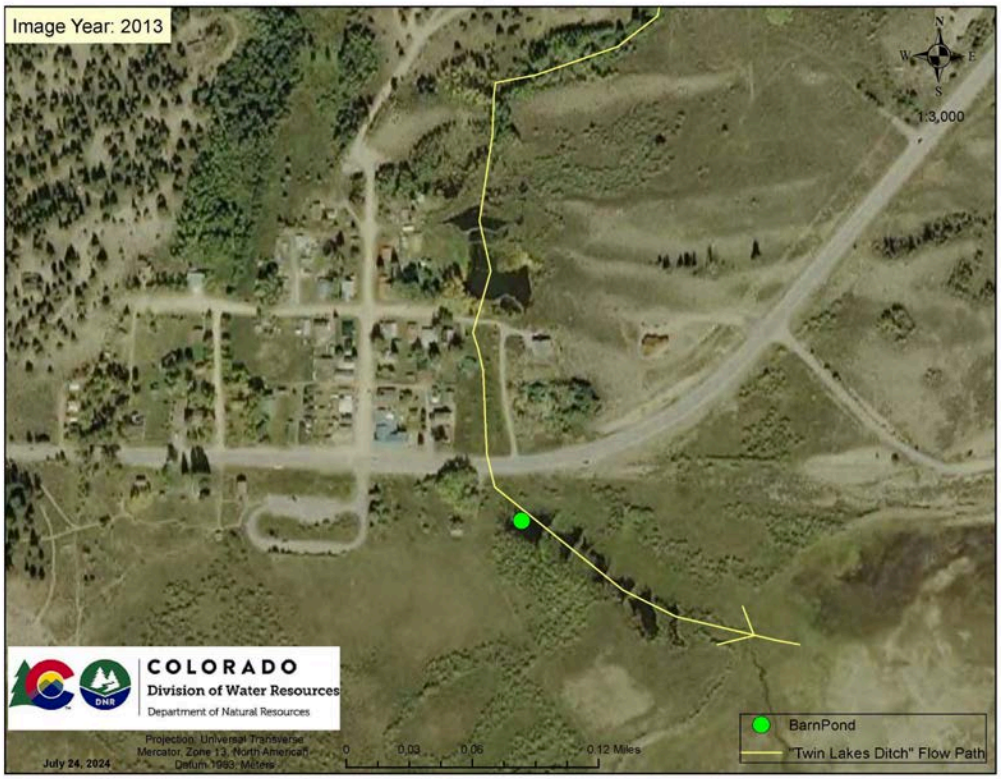
Image Year: 2013
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1:3,000
COLORADO
Division of Water Resources
Department of Natural Resources
Projection: Universal Transverse Mercator, Zone 13, North American Datum 1983, Meters
July 24, 2024
0
0.03
0.06
0.12 Miles
BarnPond
"Twin Lakes Ditch" Flow Path


Image Year: 2023
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W
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1:3,000
COLORADO
Division of Water Resources
Department of Natural Resources
Projection: Universal Transverse Mercator, Zone 13, North American Datum 1983, Meters
July 24, 2024
0
0.03
0.06
0.12 Miles
BarnPond
"Twin Lakes Ditch" Flow Path

Determination:

Based on the physical conditions of the channel noted above, and a review of the available records, the channel has multiple markers of a man-made ditch. Therefore, it is my determination that the “Twin Lakes Ditch” that conveys flow to the west from the “West Fork Split” is not the natural channel of West Bartlett Gulch and is a man-made ditch.

It is the Division Engineer’s responsibility to shepherd the waters of the state per decrees. The decree in case no. 98CW173 requires that Derry Ditch augmentation water to Twin Lakes is to be conveyed down West Bartlett Gulch. Natural flow also needs to remain in the natural channel, West Bartlett Gulch, without diversion, unless and until a lawful means of diversion for the “Twin Lakes Ditch” is established. At which point new, physical work would need to be done to install proper diversion and measurement structures.

Recommendations:

No action is required at this time.

With respect to the water supply for the “Barn Pond”, if interested parties wish to organize and pursue a water right and plan for augmentation for the “Barn Pond”, please select a representative and contact our office for further information. Please include the land owners of the Barn Pond, the U.S. Forest Service in the process.