

Denver Water
Gross Reservoir Hydroelectric Project
FERC Project No. 2035

**ARTICLE 416 – Recreation Management
Plan**

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Prepared by:



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Glossary

ADA	Americans with Disabilities Act
Addendum	2017 FERC Approved Addendum to Recreation Management Plan
ATV	All-Terrain Vehicle
BCSO	Boulder County Sheriff's Office
BRCC	Boulder Regional Communications Center
Corps	U.S. Army Corp of Engineers
CPW	Colorado Parks and Wildlife
CR	County Road
EA	Environmental Assessment
FERC	Federal Energy Regulatory Commission
FSR	Forest Service Road
GRE Project	Gross Reservoir Expansion Project
kWh	Kilowatt-hour
Order	License Amendment
PFD	Personal Flotation Device
PLS	Pure Live Seed
RAMP	Recreation Adaptive Management Plan
RMP	Recreation Management Plan
SH	State Highway
temp RMP	temporary Recreation Management Plan
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service

1. Introduction

The Board of Water Commissioners for the City and County of Denver (Denver Water) is in the process of obtaining the necessary permissions to expand Gross Dam and Reservoir (the Gross Reservoir Expansion Project or GRE Project). The GRE Project involves raising the dam at Gross Reservoir, located on South Boulder Creek in Boulder County, Colorado, by 131 feet. The reservoir storage capacity will be expanded by 77,000 acre-feet increasing the storage capacity from approximately 42,000 acre-feet to approximately 119,000 acre-feet.

Since Gross Reservoir is within a federal hydropower reserve and is subject to an existing Federal Energy Regulatory Commission (FERC) hydropower license – Gross Reservoir Hydroelectric Project No. 2035 – Denver Water had to amend its existing hydropower license to pursue the GRE Project. The FERC order amending this license (FERC Order) was issued on July 16, 2020 and mandates the creation of several plans to address impacts related to the expansion and operation of Gross Dam and Reservoir by Denver Water.

1.1 Scope and Objectives of Recreation Management Plan

The 2020 FERC Order requires Denver Water to start and complete construction of the raised dam by July 16, 2022, and July 16, 2027, respectively, and to submit a final Recreation Management Plan by July 16, 2021. This revised Recreation Management Plan (RMP) meets the requirements of Article 416 of Denver Water's license for the Gross Reservoir Hydroelectric Project and has been developed in concert with the U.S. Forest Service's (USFS) 4(e) Condition 24 as outlined in the 2016 Settlement Agreement and in the 2020 FERC Order. This RMP addresses changes to several recreation sites that will be required of the GRE Project. This RMP was developed using the following resources:

- The 2002 Recreation Management Plan, approved by FERC in its Order dated May 4, 2004.
- The 2017 Addendum to Recreation Management Plan (Addendum), approved by FERC in its Order dated July 16, 2020.
- Stakeholder comments during the development of the 2002 RMP.
- The 2017 Addendum, and comments from the draft 2016 FERC License Amendment Application.

In consultation with USFS, U.S. Fish & Wildlife Service (USFWS), Colorado Parks and Wildlife (CPW), and Boulder County, the purpose of this RMP is to implement the plan outlined in the 2017 Addendum through the relocation of recreation facilities after the GRE Project is completed. This RMP will also incorporate the specific management measures of USFS 4(e) Condition 24 (which replaces Condition 106 of the prior license). While maintaining specific requirements of the original 2002 RMP, this revised RMP also updates management measures described in the 2002 RMP to be appropriate for managing current and future Gross Reservoir recreation demand, which has increased and evolved significantly since the conception of the 2002 RMP.

Elements of Articles 401 and 405 that pertain to erosion control and rehabilitation measures related to recreation at Gross Reservoir have been incorporated into this revised RMP (see Section 4.4). In addition, an overview of Article 417 – Recreation Monitoring Plan is provided in this RMP (see Section 4.2.1). For a detailed explanation of Denver Water’s erosion control and recreation monitoring efforts, see the full Article 417 – Recreation Monitoring Plan. Specific elements of USFS 4(e) Condition 24 and the revised Article 416 provisions of the 2020 FERC Order are directly related to these additional articles.

This RMP also includes management strategies that will be implemented during construction of the GRE Project (see Section 4.5 Temporary Recreation Management Plan).

1.2 Goals of the Gross Reservoir Recreation Management Plan

The goals of this RMP, as developed by the Denver Water Gross Reservoir RMP Project Team, are to:

1. Provide, operate, and monitor recreation facilities required by Article 416 and USFS 4(e) Condition 24 of the 2020 FERC Order (see Section 4.2).
2. Create enjoyable and manageable recreation experiences that have minimal impact on the surrounding natural landscape and wildlife all while maintaining a strong commitment to ensuring the safety of visitors and employees (for more on safety and law enforcement, see Sections 4.1 & 4.1.1).
3. Maintain an adaptive management approach for the protection of natural resources and to provide a safe recreation experience for visitors as recreation demand continues to evolve over time at Gross Reservoir (Section 4.3).
4. Restore damaged resource areas and improve visual qualities of both the natural and developed landscape within Denver Water property and the newly established FERC boundary (Section 4.4).
5. Ensure the security of critical Gross Dam infrastructure.

1.3 FERC Requirements – 2017 Addendum

When the dam raise is completed, the reservoir storage capacity will be increased from approximately 42,000 acre-feet to approximately 119,000 acre-feet. This inundation will result in the necessary relocation of the following recreation areas and their amenities currently provided at Gross Reservoir:

- Peninsula Recreation Area.
- Dam Recreation Area.
- Haul Road Recreation Area.
- South Boulder Creek Inlet Trail.

As per the 2017 Addendum, the facilities at these four areas will be relocated to points above the newly defined high-water line. The following six areas will be constructed to achieve a complete, one-to-one relocation of all inundated facilities:

- Northern Dam Viewpoint (relocated Peninsula Recreation Area).
- Relocated Dam Recreation Area.
- Relocated Haul Road Recreation Area.

- Relocated South Boulder Creek Inlet Trail.
- Scenic Ridge Trail (new/additional area).
- Upper Viewshed Trail (new/additional area).

The following tables are provided as context for any references made in this Management Plan to recreation areas both pre- and post-GRE Project. For a better understanding of which areas are being inundated and/or relocated, refer to Section 3.3.1. For geographic context of these areas, both pre- and post-GRE Project, see Figure 1 and Figure 2 respectively)

1.3.1 FERC Requirements – 2020 FERC Order Amending License and Extending License Term

Although there will be two newly constructed recreation areas, the number of recreation facilities at Gross Reservoir will remain the same as the current RMP. As required by Article 416 of the 2020 FERC Order:

- A site-specific summary of these newly relocated facilities, as well as existing facilities that will not be inundated or relocated, is provided in Section 3.2.
- A revised recreation-facilities table, listing the name of each recreation site and all facilities existing and/or to be constructed with a single location point (latitude and longitude) for each recreation site, is also provided in Section 3.3.1.

As required by USFS 4(e) Condition 24, this RMP will discuss how Denver Water plans to implement the following required management measures (Sections 4.2, 3.3.4 and 4.4):

- Updated Recreation Use Monitoring.
- Winiger Ridge Dispersed Recreation.
- Human/Bear Interaction Management.
- Fishing Line Recycling Program.

1.3.2 FERC Requirements – 2002 Recreation Management Plan Article 416

This RMP maintains the requirements mandated by FERC as outlined in the 2002 RMP. These requirements include:

1. Implementation Schedule

Once this RMP is approved, the plan will be implemented.

2. Management Measures

Throughout the development of this RMP, specialists spent considerable time in the field exploring design alternatives that maximize resource protection and still provide for an array of recreation activities. Extensive efforts were undertaken to minimize tree loss, erosion, and encroachment upon sensitive wildlife habitats and resource areas.

3. Non-Motorized Car Top Boating

Following the GRE Project, Gross Reservoir will remain accessible for non-motorized car-top boating. Recreation areas that will provide shoreline access for launching U.S. Coast Guard/CPW standard approved, non-motorized watercraft include the North Shore Recreation Area, the Relocated Haul Road Recreation Area, and the Winiger Ridge Recreation Area (see Section 3.2 for site specific descriptions). A complete

description of all rules and regulations associated with non-motorized car-top boating at Gross Reservoir can be found in Section 4.1 of this RMP.

4. Boating Access at South Boulder Creek

Seasonal boating is permitted at the South Boulder Creek Outlet Trailhead. A complete description of this recreation area is provided in Section 3.2 and regulations pertaining to kayakers entering the reservoir from South Boulder Creek above the reservoir are described in Section 4.1.

5. Flow Information

Denver Water will collect information on current conditions (flows) on South Boulder Creek (both above and below the reservoir). This information will be made available to the public on the Gross Reservoir recreation website, the Colorado Division of Water Resources website and the National Weather Service website.

As a result of the increasing recreation demand at Gross Reservoir, some of the management approaches and techniques discussed in the 2002 RMP may be replaced with updated, best management practices where appropriate. Such management practices include, but are not limited to:

- Added adaptive management strategies (Section 4.3).
- Updated recreation rules and regulations (Section 4.1).
- The evolution of site-specific management measures over time and as a result of the GRE Project (Section 3.2).

None of these added or revised management measures conflict with any new or existing FERC requirements and are thus incorporated into this RMP as means for upholding Denver Water's mission: *To expertly manage and supply an essential natural resource to sustain our vibrant community – because water connects us all.*

1.4 Background

In the late 1940s, the City of Denver proposed construction of a reservoir on South Boulder Creek as part of the City's water supply system. A license to construct, operate, and maintain this impoundment – Gross Reservoir – was issued in 1951 from FERC, with an expiration date of 2000. Although the majority of facilities for water storage were built in the 1950s, a proposed hydroelectric generation plant was not constructed at this time.

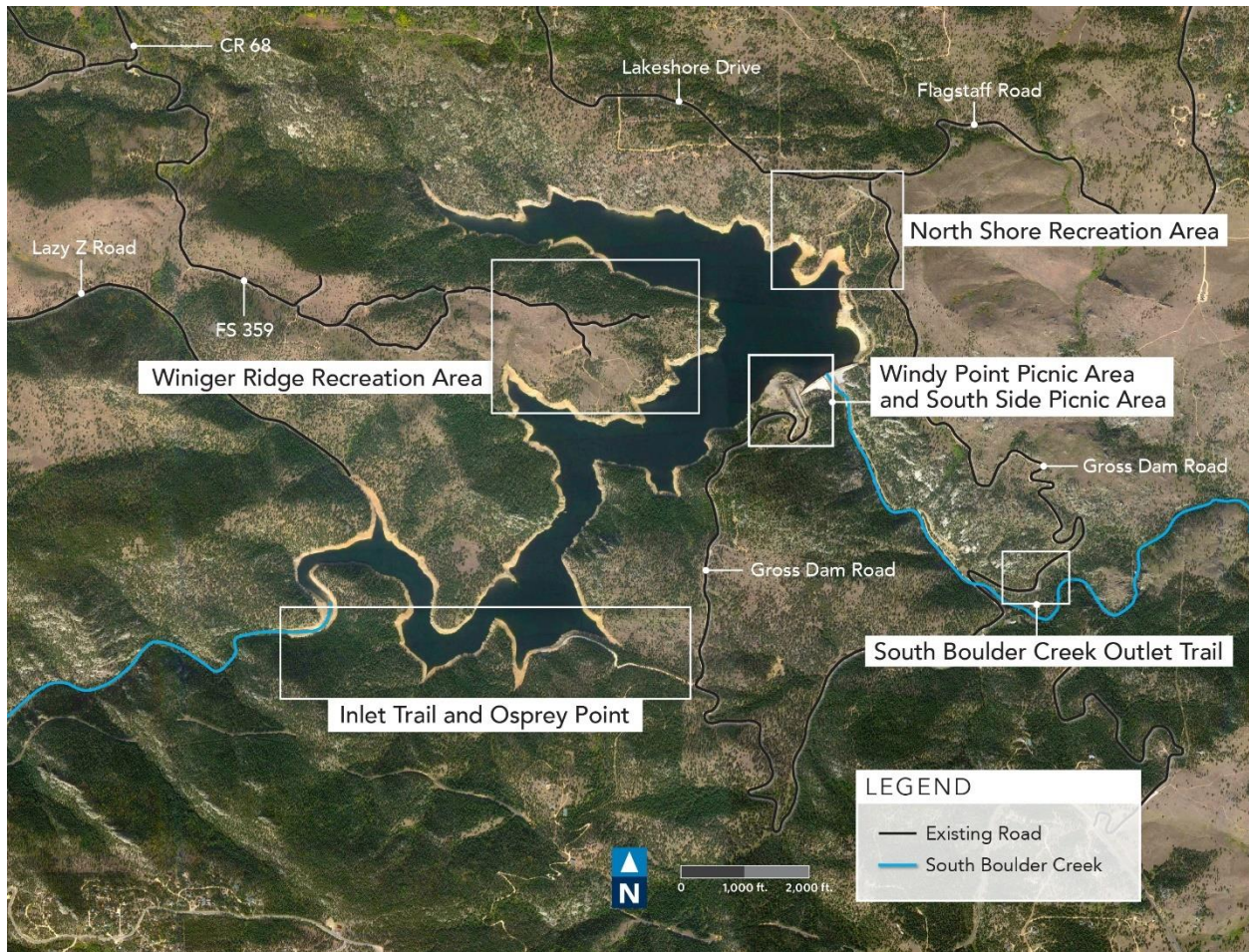
In April of 1998 Denver Water filed an application with FERC for a new license to allow for continued maintenance and operation of the reservoir and to construct new hydroelectric power facilities. Electricity generated from this hydroelectric powerhouse would be connected to Xcel Energy's transmission system and help meet part of future regional power needs thereby conserving fossil fuel resources.

As required by FERC, an applicant-submitted Draft Environmental Assessment for Hydropower License (1999) was prepared by Denver Water. Final recommendations were then prepared in a joint effort by FERC staff and USFS. This assessment included a preliminary recreation plan that outlines appropriate recreational uses, general improvements to recreation facilities at 11 sites, trail development, and reclamation of some disturbed areas.

Following approval of the Environmental Assessment, Denver Water received a 40-year license from FERC to continue to operate Gross Reservoir in March 2001. As stipulated in the license, Denver Water was required to submit a RMP to FERC for their approval. The Environmental Assessment for Hydropower License (2000) was used as a foundation for the plan and provided direction for this recreation management planning effort.

For geographic context of each of the pre-GRE Project recreation areas, refer to Figure 1: Pre-GRE Project Recreation Locations.

Figure 1: Pre-GRE Project Recreation Locations

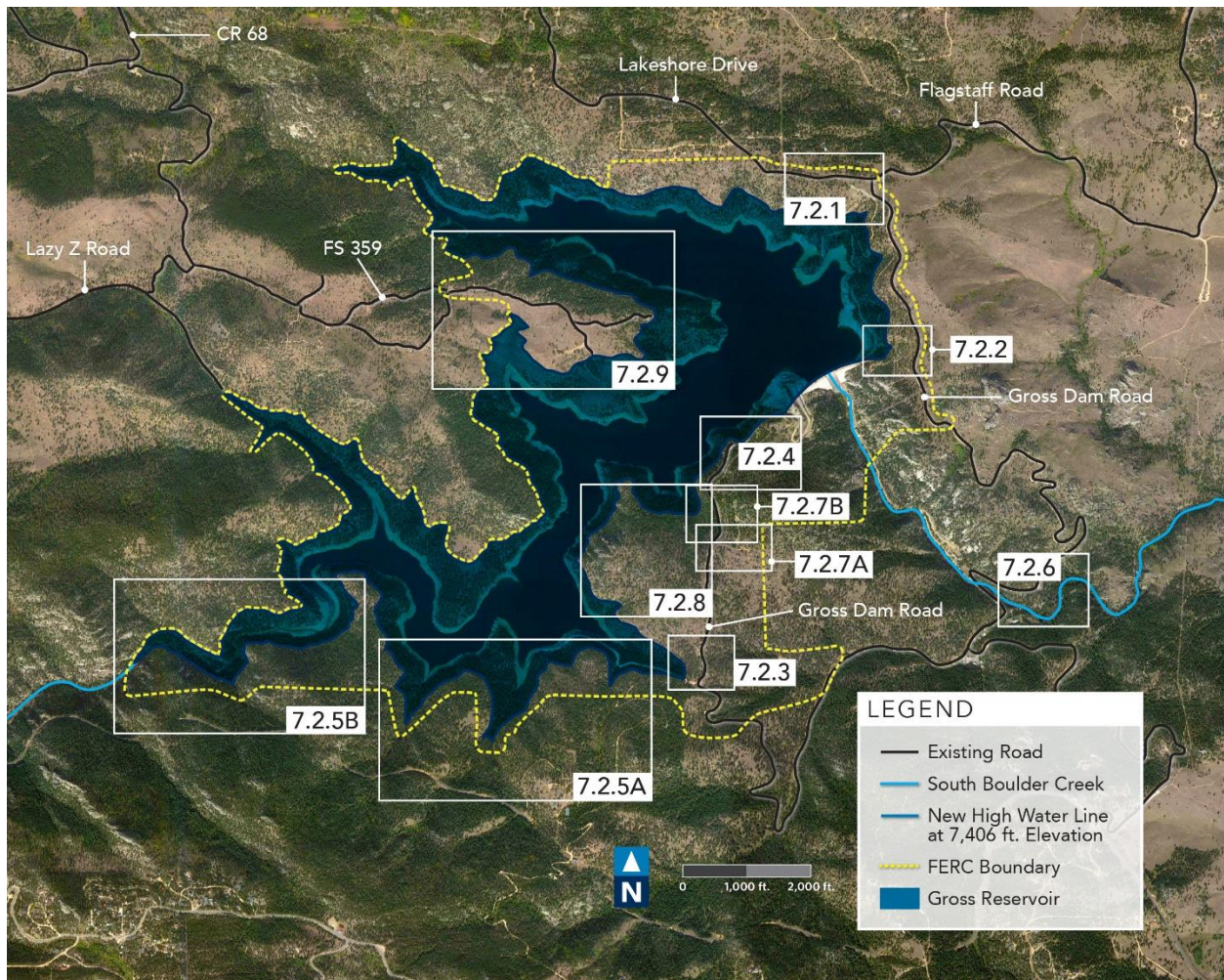


On November 25, 2016, as supplemented on March 24, 2017, the City and County of Denver, Colorado, acting by and through its Board of Water Commissioners (Denver Water) filed an application to amend its license for the Gross Reservoir Hydroelectric Project No. 2035 to raise the hydroelectric project's dam and enlarge the reservoir. Denver Water also proposed to extend the license term by 10 years. Gross Reservoir is located on South Boulder Creek in Boulder County, Colorado and occupies land within the Roosevelt National Forest administered by USFS.

To meet existing and future water needs, Denver Water proposed the Moffat Collection System Project (Moffat Project), a water development project that would include an enlargement of Gross Reservoir. On November 25, 2016, Denver Water filed an application with FERC, seeking to amend the hydroelectric project license to increase the storage capacity of Gross Reservoir by lengthening the dam crest by approximately 900 feet, raising Gross Dam by 131 feet, raising the spillway crest by 126 feet, and heightening the normal maximum reservoir elevation by 124 feet. This would increase the normal maximum elevation of the reservoir from 7,282 to 7,406 feet increasing its normal maximum surface area from 418 to 842 acres and expand its maximum storage volume from 41,811 to 119,000 acre-feet.

For geographic context of each of these post-GRE Project recreation areas, refer to Figure 2: Post-GRE Project Recreation Locations.

Figure 2: Post-GRE Project Recreation Locations



1.5 Plan Development and Methodology

This RMP was constructed drawing from the procedures of both the 2002 RMP and the 2017 Addendum to the Recreation Management Plan while also incorporating relevant elements of Articles 401, 405 and 417, as well as the new requirements outlined in the 2020 FERC Order. Thus, this RMP was developed drawing from the efforts of various past and present hired consultants and specialists. Ultimately, this RMP was organized by a team of Denver Water recreation specialists, environmental scientists and planning professionals (Denver Water RMP Project Team). This team was responsible for reviewing all current and future FERC requirements and creating this updated version of Article 416 with the future recreation setting of Gross Reservoir as a point of focus.

The development of this RMP involved extensive internal coordination between members of the Denver Water RMP Project Team relying on the knowledge, expertise, and observation of Denver Water staff who are familiar with Gross Reservoir and its history.

The 2002 RMP was developed by a project consulting team under the direction of Denver Water. The project consulting team included specialists in the areas of planning, landscape architecture, resource management, law enforcement and safety, marketing and research, ecology and restoration, and economic development.

Throughout the planning process, project consultants met with Denver Water staff, agencies, and the public to identify and discuss project issues, facility opportunities and constraints, public uses, and resource management.

Denver Water and representatives from stakeholder groups were extensively involved throughout the concept design and recommendation development phase. Meetings were held to present preliminary design concepts and management strategies. The plans evolved throughout this process as additional input was incorporated into facility design and management recommendations.

Due to the site-specific nature of trails, campsites, and picnic areas, the locations of existing facilities were agreed upon in the field with staff from Denver Water and USFS. The exact locations of major trail corridors and campsites were flagged and located on topographic maps using global positioning instruments. If any site-specific facilities are needed to be relocated in the future, Denver Water will coordinate with USFS to ensure a mutual understanding of site-specific area.

1.5.1 2017 Addendum to Recreation Management Plan

Through the consultation process for this License Amendment Application for the Gross Reservoir Hydroelectric Project Denver Water has, or will, engage with the following stakeholders: Boulder County Sheriff's Office (BCSO), Mountain View Fire and Coal Creek Canyon Fire Protection District, USFWS, USFS, CPW, and Boulder County to receive comments on the proposed changes to this RMP. The proposed changes to this RMP were identified in the following documents that went to all stakeholders as party to the consultation process:

Initial Consultation Document (2008): Denver Water hired a contractor to study the relocation of recreation facilities to be inundated. Denver Water also proposed to adhere to the types of facilities and level of management desired by the stakeholders for the 2002 RMP. Denver Water’s consultant analyzed relocation of the recreation facilities that would be inundated by the GRE Project and found suitable locations for the same number and types of recreation facilities required under the 2008 RMP. Denver Water included this relocation plan (Gross Reservoir Recreation Relocation Plan – May 2008) in the Initial Consultation Document.

The comments received at this stage of consultation coincided with Denver Water’s proposal to not change facilities or recreation experiences when it relocates facilities that are in the inundation area. Numerous stakeholders asked that there not be an increase in recreation by way of the license amendment. Denver Water agreed that no additional facilities would be included in this addendum. Some stakeholders asked that the area remain a “car-top” boating experience and continue to restrict motorized boating. Denver Water agreed. Stakeholders also expressed an interest in knowing whether there will be closures during construction. Denver Water acknowledged this comment; however, the construction phase of the GRE Project is outside the scope of the 2017 Addendum. Denver Water agreed to provide notices during construction of temporary recreation closures.

Draft Amendment Application (2009): Denver Water included the same recreation relocation plan (Gross Reservoir Recreation Relocation Plan – May 2008) in its Draft License Amendment Application (Draft Application) to FERC.

The comments received on the Draft Application, regarding Denver Water’s proposal to relocate recreation facilities, reiterated the desire to not allow for increased recreation but to maintain the facilities and opportunities that currently exist. Denver Water agrees with these comments and will continue to contract with the local sheriff’s department to patrol the expanded Gross Reservoir. The U.S. Army Corps of Engineers’ (Corps) third-party consultant developing the Environmental Impact Statement for the Moffat Collection System Project, determined that although the water-surface area and additional shoreline will increase, a major increase in visitation is not expected from the dam raise activity. Denver Water will continue to have the area patrolled and agrees to maintain the current number of parking spaces, the seasons and hours of operation, and the same types of recreation opportunities in an effort to maintain current visitor levels in accordance with the 2008 RMP.

Again, stakeholders wanted to know about temporary closures during construction. Denver Water has included a temporary Recreation Management Plan as a portion of this RMP. Denver Water will provide notice of temporary closures during construction but intends to keep recreational facilities open as much as possible without compromising public safety or construction progress.

During this stage of consultation Denver Water heard opposing views from stakeholders about allowing or not allowing motorized boating. Because Denver Water does not want to allow bodily contact with the water and because of the important interest among most stakeholders to have no net increase in recreation and no change in facilities, Denver Water is not proposing to allow

motorized boating, but will instead continue to offer the facilities under the existing RMP that accommodate car-top boating.

Some stakeholders also expressed concern that Forsythe Falls would be inundated. While inundation of the falls could not be avoided, the existing Forsythe trail will remain in place and will provide access to the shoreline of the expanded reservoir.

Throughout the consultation process, and with the exception of the comment about Forsythe Falls, Denver Water did not receive comments specifically about relocation of the existing facilities. Therefore, following the second stage of consultation, Denver Water's contractor developed in more detail the information in the 2017 Addendum to propose specific locations for each relocated recreation facility in light of the comments during the development of the RMP and the comments on this consultation effort.

Additionally, Denver Water had the opportunity to share the addendum with Boulder County and USFS during discussions on 4(e) conditions. These agencies did not have comments specific to the information in the addendum (the proposed location of existing facilities) other than the recognition that USFS conditions regarding sensitive species, cultural resources, and other similar land clearing prescriptions will apply to the construction of relocated facilities on National Forest System lands. In addition, USFS requested clarification on signage at the relocated facilities. Denver Water agrees.

Final Amendment Application (2016) (Supplemented 2017): Based on comments received on the Draft Amendment Application and during the Corps Environmental Impact Statement process, Denver Water updated the Amendment Application and submitted it to FERC in November 2016. The Final Amendment Application summarized consultation with agencies, affected Indian tribes, and members of the public likely to be interested in the proceedings. Comments received from these groups were summarized and responded to and, as applicable, changes were made to the Final Amendment Application.

Previous consultation included USFS, USFWS, Environmental Protection Agency, U.S. Bureau of Indian Affairs, U.S. Bureau of Reclamation, U.S. Bureau of Land Management, Colorado Water Conservation Board, Colorado Department of Public Works, Colorado Division of Water Resources, State Historic Preservation Office, multiple tribal organizations, and more than 150 public interest groups.

FERC Supplemental Environmental Assessment (2018): FERC prepared a supplemental Environmental Assessment (EA) based on staff review of the environmental impacts of the expansion of Gross Dam and Reservoir. Specifically, the EA analyzed the effects of:

- Changes in details of dam raise activities such as the relocation of the on-site quarry.
- Potential replacement of the auxiliary spillway with a saddle dam.
- Inundation and tree clearing to a new maximum reservoir elevation of 7,406 feet.
- Impacts of changes to project operations such as revised ramping rates.
- Modifications to recreation facilities.
- Modifications to the project boundary.

- Environmental mitigation and other mitigation measures proposed by Denver Water.
- Denver Water’s compliance with statutory requirements.

Also include in the evaluation was the effect of 30 4(e) conditions from USFS and the water quality certification issued by the Colorado Department of Public Health and Environment.

Based on information in the supplementary EA, FERC staff’s independent analysis concluded impacts associated with the project, as mitigated by the environmental measures, would not constitute a major federal action significantly affecting the quality of the human environment.

FERC Order (2020): On July 16, 2020 FERC issued an order amending the Gross Dam and Reservoir Hydropower License and extending the license term. Among several conditions of the license was the requirement to prepare this Recreation Management Plan (Article 416 and 4(e) Condition 24).

2. Goals

Objective 1: Facilities Improvements

- a. Provide new and additional signage at all facilities and along all roads and trails to improve wayfinding and interpretive signage to adequately inform visitors of Gross Reservoir rules, regulations, and other pertinent information.
- b. Minimize vehicular intrusion and overflow at all parking lots and along roads.
- c. Provide Americans with Disabilities Act (ADA) accessible facilities and access to the reservoir where feasible.
- d. Provide cost effective and fiscally responsible operations and management of recreation facilities.

Objective 2: Water Recreation (Boating and Fishing)

- a. Effectively communicate and enforce all CPW boating and fishing regulations to the public.
- b. Monitor the safety and compliance of all water-related recreation on and around the reservoir.
- c. Ensure all Denver Water and BCSO recreation staff are properly trained for water related emergencies and rescue situations.

Objective 3: Trails and Campsites Improvements

- a. Develop a sustainable network of trails that link facilities.
- b. Actively monitor all recreational trails and campsites within the FERC boundary/Denver Water property for erosion and high use impact.
- c. Perform routine trail/campsite maintenance as a preventative measure to sustain a healthy natural landscape and recreational experience.
- d. Actively mitigate the negative effects of undesignated trails and campsites.

Objective 4: Data Based Management Decision Making

- a. In concert with Article 417 – Recreation Monitoring Plan, Denver Water seeks to use all recreation monitoring efforts and associated data collection to better inform future recreation management decisions.

3. Gross Reservoir Recreation Setting

3.1 Natural Setting

This section addresses the overall natural and visual features found at Gross Reservoir. Site-specific analysis for each recreation area is provided in Section 3.2.

3.1.1 *Weather and Climate*

The weather at Gross Reservoir can be volatile. The reservoir's elevation at 7,282 feet of elevation near the Continental Divide leaves it exposed to rapid weather changes throughout the year. In the summer, its proximity to the Indian Peaks to the west affords little warning of approaching convection-driven thunderstorms. In the fall, winter, and early spring the area is subject to very strong, gusty, downslope winds as air masses from the west push over the Continental Divide and descend, warming and gathering speed (Chinook winds).

Summertime monsoons often bring short, mid-afternoon thunder or hailstorms accompanied with high winds. It's not uncommon to have high-gusting northwest winds during the summer. Chinook winds strike between November and March, with gusts exceeding 100 mph. In general, the northern and western aspects adjacent to the reservoir are prone to higher winds.

Summer temperatures are generally mild. Days above 95 degrees are rare and humidity is typically low. Winter temperatures are usually quite cold. The skies are clear about 115 days out of the year and partly cloudy another 130 days. Annual precipitation averages between 20 and 25 inches. Over half of the precipitation falls during the months of April and May. January and February are the driest months. Warm, sunny winter days generally melt snow quickly although snow can linger in some areas throughout the winter.

3.1.2 *Water*

Gross Reservoir is, first and foremost, a drinking water storage facility for Denver Water. The reservoir's primary source of water is South Boulder Creek, which includes water diverted from the western slope via the Moffat Tunnel from areas near Winter Park and Fraser, Colorado. Flows within the local watershed are supplemented with water diverted beneath the Continental Divide. Roughly 60,000 acre-feet of water from the west slope flows through the Moffat Tunnel, then down South Boulder Creek and into the reservoir each year. The South Boulder Creek watershed accounts for 45% of the flow into Gross Reservoir (MEPP 2000). In addition to these water sources, several smaller drainages flow into Gross Reservoir including Winiger Creek and Forsythe Creek. Most of the runoff in these drainages is derived from seasonal snowmelt.

Upon completion of the GRE Project, Gross Reservoir will store approximately 119,000 acre-feet of water. The surface area of the reservoir will cover 842 acres, creating approximately 13 miles of shoreline.

The depth of the reservoir results in cool water temperatures throughout the year. Summer water temperatures only reach 64 degrees Fahrenheit (18 C) on the surface. Cold water immersion is a concern as prolonged exposure to water under 60 degrees greatly increases the need for a rapid rescue response.

Gross Reservoir usually freezes over by January each year. During the mid to late winter months ice fishing occurs at several locations on the reservoir as ice conditions allow. This activity has its risks due to the unpredictability of ice conditions.

The water levels at Gross Reservoir fluctuate greatly depending upon the time of year, maintenance activities, and water consumption. Rarely does the reservoir maintain a consistent level for any length of time. Water levels can fluctuate as much as 100 feet throughout the year. Typically, the lowest water elevation occurs in early May prior to spring run-off. By mid-June the reservoir usually reaches its capacity. Denver Water attempts to keep the reservoir as full as possible through June, July, and August. However, by July or August customer use increases and natural stream flows decrease, so water level begin to drop. During the winter there is typically less fluctuation in water level as demand decreases and becomes more consistent.

Operations at Gross Reservoir include hydropower generation, which equates to approximately 13 Million kWh per year. Water supply operations will not change to accommodate power generation. The turbine and the generator will likely operate from April through September as dictated by reservoir releases to meet municipal water supply needs.

3.1.3 Erosion

Most soils around Gross Reservoir have high erosion hazard. This hazard is primarily due to steepness of slopes. While soils are relatively stable at present, removal of their protective cover of vegetation can leave them very susceptible to erosion. In general, erosion along and above the reservoir shoreline can be described as slight with a few areas of moderate to severe. This erosion exists where human activity, over decades, has removed the protective vegetation cover along social trails. Where unimproved automobile access roads reach the shoreline, erosional damage is often serious. From these trail and road areas, erosion has moved thousands of tons of material into the reservoir. The bulk of sediment reaching the reservoir, originates outside the immediate area affected by trails and road and is delivered by South Boulder Creek and other natural drainages.

Erosion damage in the study area extends from the surface downward into the subsoil in many places and in some places all subsoil is gone and solid granitic bedrock is exposed. The bulk of the latter severe damage is located along the North Shore area where dispersed heavy foot traffic has allowed the most extensive destabilization. After the topsoil layer (generally 4 to 8 inches thick) is removed, the subsoil (mostly 10 to 20 inches thick) offers little resistance to erosion. This lack of resistance is because most of this soil is gravelly, loamy sand which means that it has few fine particles to cement the larger particles together.

3.1.4 Vegetation

The vegetation at Gross Reservoir is typical of the Lower Montane life zone. In this life zone, ponderosa pine and Douglas fir comprise the dominant species in usually open woodland conditions. On warm, south-facing slopes, ponderosa pine predominates while Douglas fir forest predominates on the cooler north facing slopes. Aspen groves are common in wetter areas where past disturbance or fire has occurred. Other plant community types found near the reservoir include small wetland or riparian areas and mountain grassland.

The conifer forests found near the reservoir range from thick stands of young trees occurring primarily on north-facing slopes to more open canopies of large trees on south and west facing slopes. In most areas, the forest is encroaching into the few remaining meadows. Forest stands include individual trees of varying age but are skewed toward the relatively young categories. The high density of trees has resulted in competition between trees and frequent stressed health is apparent. Aspen forests are found in wetter areas along ravines and drainages. These too are slowly being replaced by conifer forest. Due to prior deforestation, few, if any, old growth forests remain.

The suppression of natural fire cycles has resulted in a build-up of fuels in the forest. This fire hazard was demonstrated in September 2000 when the Walker Ranch Fire burned over 1,100 acres of Boulder County Open Space land on the eastern edge of the site. This fire was believed to have been caused by an unattended campfire. The fire burned for several days under hot, dry conditions. In addition to the fire hazard, suppression has also resulted in moderate to severe insect infestations.

The wetlands found within the FERC study area are located primarily along South Boulder Creek, Winiger Ridge, and Forsythe Canyon. These wetlands tend to be very narrow but offer habitats conducive to supporting a variety of plant and animal communities not found in the forested uplands. Some of the plants found in these areas include: narrowleaf cottonwood, thinleaf alder, western river birch, Bebb willow, mountain willow, twinberry, chokecherry, and red-osier dogwood.

Several species of invasive weeds are found near the reservoir. Most common are cheatgrass (downy brome) and alyssum. Less common weeds found in isolated populations include diffuse knapweed, musk thistle, and Canada thistle. Overall, at present, weed infestations are not a serious problem, meaning that management to prevent serious infestations has strong potential to be effective.

3.1.5 Fish and Wildlife

Gross Reservoir and the surrounding area are host to a wide variety of fish and wildlife, both resident and migratory. Like many foothill areas along Colorado's Front Range, habitat alteration has resulted from increased human activity. New roads, residential development, and increased recreation have begun to shift animal communities from their historic ranges. The areas around Gross Reservoir provide essential habitat and serve as seasonal migration routes for a number of animal species. Significant alterations to these habitats can have lasting impacts on animal populations.

There are many species found within the Gross Reservoir area including: mule deer, elk, black bear, fox, and beaver; large predators including mountain lions, coyotes, and bobcats; dozens of small mammal species; and a host of birds including cavity nesting birds and raptors.

The west side of the reservoir including Winiger Ridge is considered winter range for elk, although these animals can be found in the area throughout the year. Estimates put the Winiger Ridge winter elk population at more than 270 animals. To ensure the protection of this herd, USFS closes this area to motorized vehicles from December to May.

Forsythe Canyon and Winiger Ridge are part of the wild turkey's overall range. Cavity nesting birds, including the northern flicker and hairy woodpecker, can also be found. Raptors in the area include golden eagles, Cooper's Hawk, goshawk, prairie falcons, red-tailed hawks, American kestrels, and great horned owls. However, no nests have been observed.

Studies by CPW show rainbow trout is the predominant fish species found in Gross Reservoir. Other, less populous species include lake trout, tiger muskie, longnose sucker, and white sucker. CPW stocks the reservoir with rainbow trout to maintain the population because there is minimal natural reproduction. Assessment of rainbow trout habitat potential for Gross Reservoir rated low to medium, supporting about 15 rainbow trout per acre. Low trout productivity is due to water depth, cool reservoir temperatures, and fluctuating reservoir water levels (Gross Reservoir EA 1998). The white sucker and longnose sucker populations are not maintained by stocking but reproduce naturally in the reservoir.

3.1.6 Rare and Sensitive Species

Numerous analyses of rare and sensitive plant and wildlife species, including focused field surveys (performed in 2010), were conducted as part of the Draft and Final Environmental Impact Statement process for the GRE Project. Consultation with the USFWS is required under Section 7 of the Endangered Species Act prior to authorization of any Federal action that may affect endangered or threatened species or critical habitat. The USFWS issued three Biological Opinions for the GRE Project with terms that cover the GRE Project's effects and mitigation to reduce those effects (as applicable). These Biological Opinions are comprehensive and cover Denver Water's entire Collection System for existing and future conditions following implementation of the GRE Project. The USFWS found no adverse effects that would jeopardize the existence of a threatened or endangered species would occur as the result of the GRE Project.

Other special status wildlife species with the potential to occur at Gross Reservoir include seven species of migratory birds that are protected under the Migratory Bird Treaty Act. These species include northern goshawk, flammulated owl, bald eagle, American tree-toed woodpecker, olive-sided flycatcher, American peregrine falcon, and black swift. Disturbance to nesting migratory birds from the GRE Project would be avoided or minimized by using procedures following USFS and CPW guidelines.

The GRE Project would not affect any USFS Region 2 sensitive species but would affect several plant species of local concern in the Arapaho-Roosevelt National Forest. For these plant species, inundation would destroy a large portion of the known populations in the Gross

Reservoir area. To mitigate for these anticipated impacts, a Special Status Plants Relocation Plan (Condition 22 of the FERC Order) will be prepared for USFS review prior to ground disturbance activities from the GRE Project. This plan will cover various measures to transplant, relocate, and collect seed from the following USFS species of local concern: wild sarsaparilla, Dewey sedge, Sprengel's sedge, enchantress's nightshade, tall blue lettuce, Maryland sanicle, false melic.

3.1.7 Visual Resources Overview

The reservoir's unique location offers a variety of scenes and visual experiences. The landscape aesthetics are characterized by clear water, rocky shorelines, and steeply sloped forested hillsides set against high mountain peaks in the distance, all of which give Gross Reservoir a unique "sense of place". These scenes and visual experiences are dramatically altered according to the weather, season of the year, and time of day. Denver Water is preparing an Addendum to the Article 414 – Visual Resources Protection Plan, which will incorporate terms of USFS 4(e) Condition 23 in the 2020 FERC Order.

The public access roads, trails, and individual sites around the reservoir offer a variety of viewpoints and visual experiences. The reservoir itself can be viewed in the foreground, middle ground or background depending upon one's location. In addition to the open expanses of water found near the dam and peninsula areas, there are at least a half-dozen coves located along the reservoir's shoreline. Each of these locations offers a unique blend of water, shoreline, vegetation, and topography. Endless variations in depth of view and spatial character abound.

3.2 Recreation Areas: Conditions and Characteristics (Post-GRE Project)

The following site-specific summaries discuss in detail the facility characteristics of all Gross Reservoir recreation areas (post-GRE Project). This section also offers condition assessments of existing recreation areas that will not be impacted or changed because of the GRE Project, such as the North Shore Recreation Area. Current visitation trends and in-field observation by Denver Water employees offers some insight into future conditions for newly constructed recreation areas.

It should be noted that, because construction of all "new" recreation areas described below has yet to commence, the design and location of these areas may be subject to change during the GRE Project. This may also mean that allocation of the described facilities for each of the newly proposed areas is also subject to change. However, conceptual design maintains the number of total facilities, to be constructed reservoir-wide, will remain the same. This is per Denver Water's agreement to maintain a one-to-one ratio of inundated facility replacement/relocation.

The following types of facilities are of primary focus in the site descriptions provided in the next section. Refer to each associated figure for visual representation:

- Number of parking spaces.
- Number of picnic sites – individual and group picnic shelters (Figure 7.1.3 & 7.1.4).
- Number of restrooms – double vault or single vault (Figure 7.1.1 & 7.1.2).
- Trails – natural surface and crusher fine (Figure 7.1.5 & 7.1.6).

- Fishing and hand boat launch access points.

The site characteristics described below, along with their associated design figures, were approved by FERC in 2017 after Denver Water submitted the Addendum to Recreation Management Plan.

3.2.1 North Shore Recreation Area (EXISTING)

Site Characteristics (Figure 7.2.1)

The North Shore Recreation Area serves as Gross Reservoir’s most popular recreation destination, currently sustaining 33% of reservoir visitation (see Section 3.3.4). It is often visitors’ first chance to view well over half the surface area of the reservoir and distant views of the Continental Divide. The North Shore is Gross Reservoir’s one-stop-shop for visitors looking to appreciate Colorado’s most precious commodity – water. The following amenities are available for visitors looking to accommodate their outdoor experience:

- **Parking:** The North Shore parking lot provides a total of 40 parking spaces, including two accessible spaces per the ADA. All parking spaces are delineated with parking bumpers and respective ADA signage.
- **Picnic Sites:** The area includes 15 individual picnic sites and two group picnic sites. Nearly all picnic sites also provide a lockable pedestal grill. Eight small-group picnic sites and the two group sites are located within the immediate area of the North Shore parking lot, while seven of the small-group sites are located along the Ridgeline Trail, extending about a quarter mile west of the parking lot.
- **Restrooms:** Located at the western most end of the North Shore parking lot is a double vault toilet restroom facility. There is also a single vault toilet restroom facility located at the end of the Ridgeline Trail accommodating the additional picnic sites.
- **Trails:** Primary access to the shoreline is provided via the Boat House Trail (0.25-miles). A gated facilities access road also provides access to the water’s edge and the northern dam abutment for Denver Water personnel. This road, while permanently closed to public vehicle traffic, is a less strenuous alternative to the Boat House Trail and available for visitors walking to the shore. The Ridgeline Trail (0.3-miles) leads West from the North Shore parking lot along the ridgeline and connects to the Loop Trail (0.25-miles) that traverses down to the reservoir. Denver Water plans to establish a roughly 0.25-mile portion of trail along the shoreline that will connect the Boat House Trail and Loop Trail along the new high-water line.
- **Fishing Access and Hand Boat Launch:** All trails within the North Shore Recreation Area provide access to the water’s edge where visitors are permitted to fish and launch approved, hand-launched watercraft.

Site Conditions

The North Shore Recreation Area is expected to see similar use patterns following the GRE Project. Based on historic use patterns, Denver Water expects the North Shore will continue to

be the most popular recreation area for visitors to Gross Reservoir. The North Shore Recreation Area has sustained impacts associated with overcrowding, including, but not limited to:

- Parking lot overflow and illegal parking along Gross Dam Road, Flagstaff Road, and Lakeshore Drive.
- Trail and shoreline erosion.
- Impacts to recreation facilities.
- Development of undesignated social trails leading from the parking lot to the water's edge.
- Littering and illegal dumping.
- Congested shorelines and trail corridors.

Denver Water will continue to actively monitor such impact following the completion of the GRE Project. As necessary, adaptive management strategies, and mitigation measures discussed in Sections 4.3 & 4.4 may be implemented.

3.2.2 Northern Dam Viewpoint (NEW)

Site Characteristics (Figure 7.2.2)

The Northern Dam Viewpoint Recreation Area will offer scenic views overlooking Gross Reservoir to the northeast of the dam, trail access to the shoreline, and amenities to promote social gatherings post-GRE Project. This area will be easily accessed from Boulder using Flagstaff Road or Golden by way of Gross Dam Road.

- **Parking:** Parking spaces for eight cars, including two ADA spaces, will be provided at the Northern Dam Viewpoint. All parking spaces will be delineated with parking bumpers and respective ADA signage.
- **Picnic Sites:** The Northern Dam Viewpoint will include four individual picnic sites which consist of a crusher-fine base, table, and lockable charcoal grill. The picnic sites sit within widely spaced Ponderosa Pine tree plantings to provide shade and mitigate fire risk. This area will also contain two group picnic sites, one with a shelter cover and one without, each with two picnic tables, and a lockable charcoal grill.
- **Restrooms:** A double vault toilet restroom facility will be placed adjacent to the Northern Dam Viewpoint parking lot.
- **Fishing Access and Hand Boat Launch:** The trail to the Northern Dam Viewpoint will continue down to the reservoir shoreline where it will serve as a fishing and hand-launch boating access point. This 0.1-mile natural surface trail will be maintained to route visitors from the parking area to the shoreline.

Site Conditions

While this is a new location, it will be placed close to a similar visitation location, thus conditions will be similar to that location. Visitation to the Northern Dam Viewpoint is expected to increase following the GRE Project. Traditionally, the site was used for a quick stop to view the reservoir where parking overflow occurred regularly. With the implementation of new amenities and

shoreline access, higher visitation to the area is anticipated. Recreation staff at Gross Reservoir recognize the potential for site impacts at the Northern Dam Viewpoint to include:

- Parking overflow and illegal parking along Gross Dam Road.
- Trail and shoreline erosion.
- Litter.
- Potential for afterhours use due to proximity to Gross Dam Road.
- Potential for trespassing into restricted areas around the dam and hydropower facilities due to proximity and historic trends.
- Increased water patrol presence with the addition of hand boat launch access from the site.

Denver Water will continue to actively monitor such impact following the completion of the GRE Project. As necessary, adaptive management strategies and mitigation measures discussed in Sections 4.3 & 4.4 may be implemented.

3.2.3 Haul Road Recreation Area (NEW)

Site Characteristics (Figure 7.2.3)

The Haul Road Recreation Area will be Gross Reservoir's most accessible location for hand launching boats and shoreline fishing. The area will also offer amenities to promote waterfront social gatherings. Access to the South Boulder Creek Inlet Trail and Upper Viewshed Trail is provided from the Haul Road Recreation Area parking lot.

- **Parking:** A parking area and 50-foot radius boat drop off turnaround will be placed to the north of the new saddle dam and 28 parking spaces, including two ADA-accessible spaces, will be provided. Each parking space will be designated with a parking bumper and associated ADA signage.
- **Picnic Sites:** A total of 13 individual picnic sites will be developed northwest of the saddle dam spillway along the shoreline. Each of the sites will have a picnic table and lockable pedestal grill on a crusher-fine base. All facilities will be linked with a crusher-fine trail network. Two group picnic sites will be located north of the saddle dam spillway near the parking area. Each site will contain a shelter, two picnic tables, and a lockable pedestal grill.
- **Restrooms:** One double vault restroom facility will be located adjacent to the parking area.
- **Trails:** The Haul Road Recreation Area parking lot will serve as the primary access point for the South Boulder Creek Inlet Trail. The parking lot also provides access to the Upper Viewshed Trail, which can connect visitors to the Scenic Ridge Trail.
- **Fishing Access and Hand Boat Launch:** Gross Reservoir's main hand boat launch area will be located along the western edge of the turnaround north of the saddle dam at the high-water elevation. Low-water boat access will be along existing bank slopes. During construction of the new Haul Road Recreation Area, a detailed design plan will be developed establishing how ADA access will be provided from the parking area to the

water's edge. Fishing access points will be situated along the reservoir's edge throughout the area via a short walk to the shoreline from the parking lot.

Site Conditions

The Haul Road Recreation Area will be replacing the Osprey Point boat launch, Gross Reservoir's second most visited recreation area, which currently sustains 27% of yearly visitation (Section 3.3.4). Recreation staff anticipates the following management challenges for the new Haul Road Recreation Area:

- Parking overflow and illegal parking along southern Gross Dam Road and the Dam Access Road.
- Congested boat launch and boat drop off/ turn around areas.
- Heavy trail and shoreline erosion.
- Increased patrol presence to maintain emergency access to the area and along Gross Dam Road and Dam Access Road.
- Displacement of boaters to other recreation areas that may not allow for/provide hand boat launch access (e.g., Dam Recreation Area).
- Overcrowding and congestion may push visitors to attempt launching their watercraft in less suitable (steep and rocky) areas along the shoreline in an attempt to avoid congested areas at the main boat launch.

Following the completion of the GRE Project, impacts to natural resources, facility conditions, and public safety will be closely monitored to mitigate these impacts.

The current Osprey Point boat launch was originally intended to support 20 parking spots. However, as recreation demand has increased, the 20-spot capacity is regularly exceeded. Because of this, accommodations have been made to safely allow for additional parking. Adaptive management strategies such as enforcing strict capacity limitations, allowing for an overflow staging area, additional parking, or a reservation system may be implemented at the new Haul Road Recreation Area (see Section 4.3).

3.2.4 Dam Recreation Area (NEW)

Site Characteristics (Figure 7.2.4)

The new Dam Recreation Area will provide visitors with an up-close view of Gross Dam and allow for easy access to the water's edge. This area will benefit visitors looking for a shoreline picnic or fishing access. Planning and construction of the new trail located on National Forest System land will adhere to USFS Handbook 2309.18, Chapter 20. Due to the close proximity to the dam, however, boaters will be discouraged from launching watercraft from this site.

- **Parking:** Parking spaces for eight cars, including two ADA spaces will be provided at the Northern Dam Viewpoint. All parking spaces will be delineated with parking bumpers and respective ADA signage.

- **Picnic Sites:** Two individual picnic sites will be located at the Dam Recreation Area positioned between the shoreline and parking lot. Each of the sites will have a picnic table and lockable pedestal grill on a crusher-fine base.
- **Restrooms:** One single vault restroom facility will be located adjacent to the parking lot.
- **Trails:** A 0.1-mile natural surface trail will connect the Dam Recreation Area parking lot to the point of the Scenic Ridge Trail, providing access to Scenic Ridge Trail picnic sites and a scenic viewpoint.
- **Fishing Access:** A short walk from the parking lot to the water's edge will provide quick access to shoreline fishing.

Site Conditions

The Dam Recreation Area will provide supplemental parking on the south side of the reservoir replacing the existing Windy Point Picnic Area and South Side Picnic Area. Given historical trends and the limited number of parking spaces (eight spaces) proposed to accommodate the new Dam Recreation Area, compared to the current parking capacity at the Windy Point and South Side Picnic areas (38 spaces – some of which are being relocated to other recreation areas; see Section 3.3.1), recreation staff anticipates the following management challenges for the Dam Recreation Area:

- Parking overflow and vehicular intrusion along Dam Access Road.
- Regular patrol presence to maintain emergency access to the area and Dam Access Road.
- Regular patrol presence to prevent visitors from launching their watercraft from the Dam Recreation Area.
- Potential for trespassing into restricted areas around the dam and hydropower facilities.

Denver Water will continue to actively monitor such impact following the completion of the GRE Project. As necessary, adaptive management strategies and mitigation measures discussed in Sections 4.3 & 4.4 may be implemented.

3.2.5 South Boulder Creek Inlet Trail (NEW)

Site Characteristics (Figure 7.2.5 A & B)

The new South Boulder Creek Inlet Trail will begin at the Haul Road Recreation Area and traverse primarily along the reservoir's southern shoreline to Gross Reservoir's South Boulder Creek Inlet. The trail will be approximately 2.6 miles long.

- **Parking:** Parking for the South Boulder Creek Inlet is located at the Haul Road Recreation Area parking lot (28 spaces).
- **Restrooms:** The Haul Road Recreation Area restroom facility will serve recreators looking to hike the South Boulder Creek Inlet Trail.
- **Fishing Access and Hand Boat Launch:** Multiple designated trail spurs leading from the Inlet Trail to the reservoir's edge will provide for reservoir fishing access along the

way to the inlet. Visitors will be permitted to carry their watercraft along the Inlet Trail should they so choose; although, this is not expected to occur often.

The new South Boulder Creek Inlet Trail alignment was developed in coordination with USFS. Planning and construction of the new trail located on National Forest System land will adhere to USFS Handbook 2309.18, Chapter 20. In addition, Denver Water will obtain and adhere to the Trail Management Objective from USFS that outlines specific management intent of the trail, which will maintain similar recreational opportunities currently provided by the existing South Boulder Creek Inlet Trail (hiking and fishing).

During the design phase of the trail, Denver Water determined that a segment of the Inlet Trail will have to traverse through a portion of National Forest System lands to maintain a safe and sustainable trail alignment. This will result in the addition of approximately two acres of National Forest System lands within the FERC boundary. Prior to any trail-related construction activities, Denver Water will coordinate with USFS on final trail design, alignment, and construction schedule.

Site Conditions

The existing South Boulder Creek Inlet Trail maintains low to moderate use. Recreation staff expects this trend to continue with the implementation of the new South Boulder Creek Inlet Trail. Through examining current use trends associated with the existing Inlet Trail, recreation staff anticipates management challenges for the new trail including, but not limited to:

- Trail erosion in areas with steep grades.
- New, undesignated social trails for shoreline access.
- Increases in litter including human and pet waste.
- Illegal Camping.

Denver Water will continue to actively monitor these impacts following the completion of the GRE Project. As necessary, adaptive management strategies and mitigation measures discussed in Sections 4.3 & 4.4 may be implemented.

3.2.6 South Boulder Creek Outlet (EXISTING)

Site Characteristics (Figure 7.2.6)

The South Boulder Creek Outlet is a popular access point for fishermen, day-hikers, and kayakers. The existing 0.2-mile trail directs visitors down moderate switchbacks to the bottom of the canyon below the dam. The river can be hiked eastward for several miles through Boulder County Parks and Open Space property and Eldorado Canyon State Park year-round. Because of the intermediate hike required to access the river, few amenities are provided once visitors leave the parking lot.

- **Parking:** Fourteen parking spaces exist at the South Boulder Creek Outlet. No ADA parking is provided given the nature and difficulty of the trail accessing the creek.

- **Fishing Access and Hand Boat Launch:** Visitors are permitted to fish and launch kayaks where the trail intersects the creek and downstream from there. Everything upstream from that juncture is restricted due to proximity to Gross Dam infrastructure.

Site Conditions

Impacts along the South Boulder Creek Outlet trail are minimal as the area caters mostly to fly-fishermen and sees only 5% of total visitation at Gross Reservoir (Section 3.3.4). When outlet flows are conducive to fishing or kayaking, recreation staff has experienced the following management challenges:

- Trail erosion in areas of steep grade and the creation of social trails.
- Parking overflow and vehicular intrusion along Gross Dam Road.
- Trespassing into restricted portions of the South Boulder Creek that are near dam infrastructure.
- Trespassing into private caretaker residences along the river.

Denver Water will continue to actively monitor such impact following the completion of the GRE Project. As necessary, adaptive management strategies and mitigation measures discussed in Sections 4.3 & 4.4 may be implemented.

3.2.7 Scenic Ridge Trail (NEW)

Site Characteristics (Figure 7.2.7 A & B)

The Scenic Ridge Trail and amenities will be developed along a ridge overlooking the reservoir from the southwest side. This approximately half-mile long trail will follow along an existing, abandoned roadway bench that was used during the original construction of the dam. Planning and construction of the new trail located on National Forest System land will adhere to USFS Handbook 2309.18, Chapter 20. The relatively flat existing grades will enable the trail to be ADA-accessible.

- **Parking:** A parking area will be located at the southern end of the trail. This parking area is sited off the Dam Access Road, midway between its intersection with the Haul Road and the Dam Recreation Area. Fourteen parking spaces, including two ADA-accessible spaces will be available here. This parking area will accommodate Scenic Ridge Trail users, as well as those who wish to hike or picnic on the Upper Viewshed Trail across the Dam Access Road.
- **Picnic Sites:** A total of 16 individual picnic sites will be located along the Scenic Ridge Trail, as well as in an area to the east of the parking area. Along the Scenic Ridge Trail, eight individual picnic sites will be interspersed within the trees adjoining the trail. The remaining eight individual picnic sites will be situated to the east of the parking area on an existing knoll and secondary trail. Each of the sites will have a picnic table and lockable pedestal grill on a crusher-fine base. All facilities will be linked with a crusher-fine trail network. A total of three group picnic shelters are sited along the Scenic Ridge Trail, two at the southern end of the trail adjacent to the parking area, and a third group picnic shelter at the northern end of the trail near the scenic overlook.

- **Restrooms:** Two single vault restroom facilities will be located on the Scenic Ridge Trail. One on the east of the parking area and the other at the northern end of the Scenic Ridge Trail, adjacent to the scenic overlook.
- **Trails:** The Scenic Ridge Trail traverses approximately 0.5 miles. The northern extent of the trail terminates at a scenic overlook that will be located just northeast of the Dam Recreation Area. This overlook will include interpretive signage and will also provide an excellent vantage point from which to get a closer look at the remnants of historic concrete structures and other infrastructure used to construct the original dam.

Site Conditions

Historically, Gross Reservoir has not provided recreational opportunities in the area that will become the Scenic Ridge Trail. Because of this, it is difficult to predict future management challenges associated with the area. However, due to its close proximity to the new Haul Road and Dam Recreation Areas, some inferences can be made. Based on these inferences and the fact that much of the area is situated on National Forest System land, the following management challenges can be expected:

- Parking overflow and vehicular intrusion along Dam Access Road--the Scenic Ridge Parking Area serves as the nearest available parking area for visitors who may be seeking access to either the Dam Recreation Area or the Haul Road Recreation Area. Visitors looking to access these adjacent areas may attempt to use the Scenic Ridge Trail parking lot at times when other parking lots are full. Because of this, parking overflow can be expected.
- Illegal camping: because earlier portions of the trail and associated picnic areas are situated on National Forest System land, visitors may falsely be led to believe that dispersed camping is permitted in the area.
- Recreational shooting/hunting: historically, this segment of National Forest System land has been used by recreational shooters and hunters. Increased patrol may be required in the area to ensure all recreational shooters and hunters are at a safe distance and orientation away from Scenic Ridge Trail amenities.
- The development of social trails from visitors looking to summit the adjacent peak.
- Difficulty servicing amenities: many of the amenities provided along the Scenic Ridge Trail are located at its termination point. This includes several picnic tables and a single vault restroom facility. Recreation staff will be required to drive their service vehicles along the trail itself to service this area, putting visitor safety at risk when visitation in the area is high.
- Potential for trespassing into restricted areas around the dam and hydropower facilities, given the proximity of the dam to the Scenic Ridge Trail's termination point.

Denver Water will continue to actively monitor such impacts following the completion of the GRE Project. As necessary, adaptive management strategies and mitigation measures discussed in Sections 4.3 & 4.4 may be implemented.

3.2.8 Upper Viewshed Trail (NEW)

Site Characteristics (Figure 7.2.8)

The Upper Viewshed Trail will be constructed on the west side of the Dam Access Road and will traverse the hillside across from the Scenic Ridge Trail parking area. The trail will provide for spectacular views of the southern wing of the reservoir and the opportunity for secluded picnicking experiences. Planning and construction of the new trail located on National Forest System land will adhere to USFS Handbook 2309.18, Chapter 20.

- **Parking:** The Scenic Ridge Trail parking lot will provide for the most direct access to the Upper Viewshed Trail (eight spaces). Alternatively, visitors will also be able to access the Upper Viewshed Trail from the Haul Road Recreation Area and the Dam Recreation Area via various trail excursions.
- **Picnic Sites:** A total of five individual picnic sites will be dispersed along the Upper Viewshed Trail's outer most trail spur. Each of the sites will have a picnic table and lockable pedestal grill on a crusher-fine base.
- **Restrooms:** The Scenic Ridge Trail restroom facility will serve as the primary restroom facility for visitors recreators looking to hike the South Boulder Creek Inlet Trail
- **Trails:** The approximately 0.7-mile loop climbs to the crest of the hill and continues down the other side to a point with spectacular views of the reservoir. Trail connections to two parking areas feed into the Upper Viewshed loop trail. An approximately 0.5-mile-long spur connects the loop to the Relocated Haul Road parking area, while an approximately 0.2-mile-long spur leads down to a point directly across the Dam Access Road from the parking area at the Scenic Ridge Trail.
- **Fishing Access:** Fishing access will be located at the terminus of the Upper Viewshed Trail.

Site Conditions

Visitor use on the Upper Viewshed Trail is expected to be high as the trail connects parking areas and offers excellent reservoir views. As with most trails around Gross Reservoir, we expect to encounter the following impacts:

- Trail erosion and widening due to heavy use.
- Increased litter in the area.
- Development of undesignated social trails leading down to the water's edge and cutting switchbacks.
- Illegal camping: because nearly the entire trail and associated picnic areas are situated on National Forest System land, visitors may be falsely led to believe that dispersed camping is permitted in the area.
- Recreational shooting/hunting: historically, this segment of National Forest System land has been used by recreational shooters and hunters. Increased patrol may be required in the area to ensure all recreational shooters and hunters are at a safe distance/orientation away from Scenic Ridge Trail amenities.

- Visitors seeking to access the Upper Viewshed Trail will likely put additional pressure on surrounding area parking lots.
- Additional challenges for enforcement and safety monitoring due to the secluded nature of the trail.

Denver Water will continue to actively monitor such impact following the completion of the GRE Project. As necessary, adaptive management strategies and mitigation measures discussed in Sections 4.3 & 4.4 may be implemented.

3.2.9 Winiger Ridge Access and Recreation Area (EXISTING)

Site Characteristics (Figure 7.2.9)

The Winiger Ridge Access and Recreation Area's main attraction is dispersed camping. Visitors are especially attracted to campsites near the reservoir's edge. Winiger Ridge is accessible via USFS Road (FSR) 359 which begins at the Forsythe Canyon Trailhead. This road is only accessible by vehicle during summer months and is closed at USFS discretion. Winiger Ridge Recreation Area appeals to those seeking a semi-primitive recreation experience with few amenities. The bulk of the ridge, housing campsites #1-14, is primarily managed by USFS while the remaining campsites #15-26 will continue to be managed primarily by Denver Water. However, general patrol and emergency response along the entire ridge is performed by Denver Water and BCSO rangers. General maintenance along the entire ridge is typically shared between Denver Water and USFS. It should be noted that the GRE Project will be inundating existing sites #27-31. At the direction of USFS, these inundated sites will not be relocated as these were deemed temporary in nature.

- **Parking:** At the termination point of FSR 359 lies the Winiger Ridge parking lot, providing a total of 27 parking spaces. There is no ADA parking in this area as there are no ADA-accessible campsites provided.
- **Campsites:** A total of 12 campsites (#15-26) are situated within the FERC boundary, all containing a picnic table and steel fire ring mounted into the ground. Each campsite is delineated by a numbered carsonite posts. Visitors are permitted to camp only within these designated areas.
- **Restrooms:** There are currently no restroom facilities in the area, except for one single vault restroom facility located at the Forsythe Canyon Trailhead. This facility is managed by USFS. Sight signage encourages visitors to pack out waste for resource protection.
- **Trails:** The Forsythe Canyon Trail is the nearest hiking trail serving visitors along Winiger Ridge. The trail begins at the Forsythe Canyon Trailhead and guides hikers down to the reservoir's edge (1.5 miles). This trail will be partially inundated following the completion of the GRE Project. The trail draws its popularity from the spring runoff waterfalls that can be seen along the lower segment of the trail as it meets Gross Reservoir. Following the completion of the GRE Project, these waterfall areas will be inundated. The remaining trail alignment will stay in place and remain open to the public, providing access to the northeastern shoreline of Gross Reservoir. The trail is managed and maintained by USFS; however, because it provides public access to Gross

Reservoir and brings visitors within the FERC Project boundary, the trail is also monitored and patrolled by Denver Water Recreation Staff.

- **Fishing Access and Hand Boat Launch:** The old 4x4 road and ensuing social trails provide access to the water's edge at multiple points whereby visitors are permitted to fish from and launch approved car-top boating vessels.

Site Conditions

The Winiger Ridge Recreation Area accounts for 11% of the total visitation at Gross Reservoir (Pre-GRE – currently accounting for only sites 15-31 within the FERC boundary; see Section 3.3.4). Although visitation is relatively low compared to other east side recreation areas, impacts to this area have been observed to be significant. Following the completion of the GRE Project, sites #27-31 will be inundated by the new high-water line, leaving only 12 campsites (#15-26) within the FERC Project boundary. The following management challenges represent what has been observed historically and what is to be expected following the completion of the GRE Project:

- Increased area erosion: a product of campers straying outside of designated areas creating undesignated/illegal campsites. This poses for increased fire danger as it is typical for these sights to also contain illegal hand-made fire rings. The inundation of five campsites (#27-31) is expected to exacerbate the further development of undesignated/illegal campsites.
- Increased visitation has led to an increase in litter including human waste without the presence of restroom facilities or trashcan receptacles. This is expected to continue during the construction and following the completion of the GRE Project.
- Increased visitation to the area has led to the need for increased patrol presence and concern for boater safety due to accessibility challenges associated with patrolling Winiger Ridge. Commuting to and patrolling Winiger Ridge is a timely endeavor for recreation and enforcement personnel who may already be tied up with east-side recreation area patrol.
- Creation of undesignated social trails throughout camping areas.
- Human-wildlife conflict is a growing concern as visitation to Winiger Ridge increases.
- Historically, the ridge has received little to no nighttime patrol presence. It is common for area locals to report illegal campfires or other disturbances that go on during Gross Reservoir after-hours when enforcement personnel are not on site.
- Confusion as to if visitors are on Denver Water or National Forest System lands. While Denver Water and USFS have been coordinating to ensure campsites have a similar appearance and enforcement is consistent, there may still be confusion on land ownership.

Denver Water will continue to actively monitor such impact following the completion of the GRE Project. As necessary, adaptive management strategies and mitigation measures discussed in Sections 4.3 & 4.4 may be implemented. Also see Section 4.2.2 for a look into future USFS and Denver Water plans for addressing many of these issues.

3.3 Overview of Recreation Use & Infrastructure

This section provides a general understanding of the recreation opportunities and trends currently observed at Gross Reservoir in the context of its available amenities (pre-GRE Project), as well as how the Reservoir is currently accessible to recreators. In addition, this section provides an overview of future recreation amenities following completion of the GRE Project and associated future visitation expectations.

Due to the historic inconsistency of visitation data collection, inferences made in this section with regard to visitation data and trends are only within the context of data collected through the years 2019 and 2020.

A continued commitment to data collection and the accuracy thereof has been established by Denver Water as a result of historic data discrepancies. By the end of 2021, Denver Water will have updated all its visitor counting technology and methodology to further increase the accuracy and reliability of visitation data collection. For a complete description of Denver Water's visitation data collection efforts, see Article 417 – Recreation Monitoring Plan.

As required by FERC, a post-GRE Project revised recreation amenities table listing the name of each recreation site along with its associated amenities is also provided in this section.

3.3.1 *Comprehensive Recreation Facilities Table*

This Post-Expansion Recreation Facilities table encompasses recreation sites that will be constructed during the GRE Project (Northern Dam Viewpoint, Dam Recreation Area, Scenic Ridge Trail, Upper Viewshed Trail, Haul Road Recreation Area), as well as current recreation sites that will not be inundated following the GRE Project and will remain open to the public (North Shore Recreation Area, South Boulder Creek Outlet, and Winiger Ridge Recreation Area). All the sites listed will be managed and patrolled by Denver Water recreation staff and Boulder County Sheriff Rangers during the boating season.

Table 1: Post-GRE Project Recreation Facilities

Site	Parking Spaces	Vault Toilets (double = two-vault facility; single = one-vault facility)	Group Picnic Sites (two picnic tables each)	Individual Picnic Sites (or individual campsites for Winiger Ridge)	Pedestal Grills (or fire rings for Winiger Ridge)	Allows for Boat Launch Access (Yes/No)	Provides Fishing Access (Yes/No)
North Shore Recreation Area (39.95583, -105.35642)	40	3 (double + single)	3	16	14	Y	Y
Northern Dam Viewpoint (39.949892, -105.353544)	8	2 (double)	2	4	4	Y	Y
Dam Recreation Area (39.945106, -105.363085)	8	2 (double)	1	2	2	N	Y
Scenic Ridge Trail (39.940584, -105.364554)	14	2 (single + single)	3	16	16	N	N
Upper Viewshed Trail (39.941270, -105.368901)	0	0	0	5	5	N	Y
Haul Road Recreation Area and South Boulder Creek Inlet Trail (39.935961, -105.365343)	28	2 (double)	2	13	13	Y	Y
South Boulder Creek Outlet Trail (39.93912, -105.34648)	14	0	0	0	0	Y	Y
Winiger Ridge Recreation Area (39.949152, -105.372083)	30	0	0	12	12	Y	Y

The following table represents which pre-GRE Project recreation facilities are being relocated amongst the new, post-GRE Project recreation areas:

Table 2: Existing Facilities to be Relocated

EXISTING FACILITIES

RELOCATED FACILITIES

Peninsula Recreation Area

	Northern Dam Viewpoint	Relocated Haul Road Rec. Area	Relocated Dam Rec. Area	Scenic Ridge Trail	Upper Viewshed Trail
Parking (0)					
Individual Picnic Sites (10)	4	1			5
Group Picnic Sites (2)	2				
Restrooms (1)	1				
Hand Boat Launch (1)	1				
Fishing Access (3)	1	2			

EXISTING FACILITIES

RELOCATED FACILITIES

Dam Recreation Area

	Northern Dam Viewpoint	Relocated Haul Road Rec. Area	Relocated Dam Rec. Area	Scenic Ridge Trail	Upper Viewshed Trail
Parking (38)	8	8	8	14	
Individual Picnic Sites (20)		2	2	16	
Group Picnic Sites (3)				3	
Restrooms (2)			1	1	
Overlook (1)				1	
Fishing Access (1)			1		

EXISTING FACILITIES

RELOCATED FACILITIES

Haul Road Recreation Area

	Northern Dam Viewpoint	Relocated Haul Road Rec. Area	Relocated Dam Rec. Area	Scenic Ridge Trail	Upper Viewshed Trail
Parking (20)		20			
Individual Picnic Sites (10)		10			
Group Picnic Sites (2)		2			
Restrooms (2)		1		1	
Boat Access (1)		1			
Fishing Access (0)					

The following table discusses the post-GRE Project status of all currently established Gross Reservoir trails. This table does not include details on newly established trails such as the Scenic Ridge Trail. For a full representation of all post-GRE Project Gross Reservoir trails, refer to Section 3.2.

Table 3: Gross Reservoir Trails Reference

Current Gross Reservoir Hiking Trails	Status of Trail Post-GRE Project
Boat House Trail (North Shore Recreation Area)	Partially inundated by reservoir expansion. Remaining trail will stay in place.
Ridgeline Trail (North Shore Recreation Area)	Unaffected by reservoir expansion. Existing trail will stay in place.
Loop Trail (North Shore Recreation Area)	Partially inundated by reservoir expansion. Remaining trail will stay in place
Rocky Point Trail (North Shore Recreation Area)	Trail will be fully inundated by reservoir expansion. Will not be reconstructed following GRE. Trail mileage lost will be replaced by new recreation areas – Scenic Ridge Trail and Upper Viewshed Trail
South Boulder Creek Inlet Trail (Haul Road Recreation Area)	Trail will be fully inundated by reservoir expansion. New trail alignment will be constructed following GRE Project.
South Boulder Creek Outlet Trail (South Boulder Creek Outlet)	Unaffected by reservoir expansion. Existing trail will stay in place.
Forsythe Canyon Trail (Winiger Ridge Access and Recreation Area)	Partially inundated by reservoir expansion. Remaining trail will stay in place

3.3.2 Access and Circulation

Gross Reservoir is located 6 miles southwest of the City of Boulder. The reservoir is accessed by one of three gravel roads and one USFS roads: Gross Dam Road, Dam Access Road, Haul Road, and FSR 359. These access roads are reached from three primary roads: County Road (CR) 68 (Flagstaff Road, paved), Magnolia Road (unpaved), and State Highway (SH) 72 (Coal Creek Canyon, paved). County Road 68 connects the City of Boulder from the termination of Flagstaff Road along the north side of the reservoir to Magnolia Road on the west side of the reservoir. Magnolia Road is accessed from SH 119 to the north and southwest (Boulder Canyon or Peak to Peak Scenic Byway respectively) or CR 97 from SH 72 and serves the western portion of CR 68, 68J, and FSR 359. State Highway 72 connects to the south end of Gross Dam Road at Coal Creek.

The gravel roads that provide access to Gross Reservoir are approximately 25 feet wide, steep, and winding. The roads are characterized by sharp curves and short sight distances. There are several areas where steep drop-offs occur alongside the road. Currently, there are no guardrails along any of these access roads. Although Gross Reservoir caretakers maintain the roads as

often as once per month (weather permitting), road damage in the form of washboards, exposed bed rock, and potholes is present throughout the year.

There are several gravel parking lots serving the recreation areas around the reservoir. These parking areas range in size providing anywhere from eight to 40 designated parking spaces. The limited number of designated parking spaces leads to haphazard and inefficient parking in some areas. The boundaries of most parking areas are defined by manmade or natural barriers including signage, parking blocks, fences, rocks, vegetation, and topography. There are several locations where vehicles have damaged unprotected landscape areas adjacent to parking lots when overcrowding occurs.

Following the completion of the GRE Project, multiple trails, both ADA-compliant crusher fine and non-ADA-compliant natural surfacing, will provide multiple reservoir access points and serve to connect multiple recreation areas. Most of Gross Reservoir's public trail mileage will be accessible on the south side of reservoir. For detailed trail alignment descriptions see Section 3.2.

3.3.3 Gross Reservoir Sign Plan

Upon the completion of the GRE Project, Denver Water plans to have updated regulatory, interpretive, and directional signage strategically redesigned and installed for the entire reservoir and associated recreation areas and trails. These signs may include wayfinding signs as needed. During construction, a location-based signage plan and inventory will be developed by Denver Water in consultation with GRE Project contractors and USFS. The sign plan will outline exact locations of all public facing signs, as well as installation materials used for each sign. The sign inventory will be developed as a means for tracking conditions and repair needs of each individual sign, which will be used by Denver Water Recreation staff for future maintenance and installation efforts.

Because much of the area within the FERC boundary is shared managerially with USFS, Denver Water is committed to a coordinated sign design and installation concept that promotes a more uniform recreation experience. This concept will be especially pertinent to the Winiger Ridge Recreation Area.

Future signage needs will be prioritized as new recreation trends and enforcement limitations are identified over time.

3.3.4 Visitation Trends, Totals and Future Expectations

The following visitation analyses are derived from visitation data collected in the years 2019 and 2020. Visitation data was collected for the following pre-GRE Project recreation areas, which cumulatively represent visitation totals for the reservoir as a whole (refer to Figure 1: Pre-GRE Project Recreation Locations for a layout of current recreation facilities and geographic context):

- North Shore Recreation Area (includes counts for Peninsula Recreation Area also known as the Boat House Picnic Area).
- Haul Road Recreation Area (includes counts for Inlet Trail, Osprey Point, and Miramonte Picnic Area).

- Dam Recreation Area (includes counts for Windy Point Picnic Area and South Side Picnic Area).
- South Boulder Creek Outlet Trail.
- Winiger Ridge Recreation Area (campsites #15-31).
- Forsythe Canyon Trail.

It should be noted that the COVID-19 pandemic likely played a role in the increased levels of visitation observed in 2020. It is difficult to determine the degree to which the pandemic skewed visitor totals higher and how visitation levels might again change during 2021, during construction of the GRE Project, or following its completion. The projected 5-year construction phase of the GRE Project is also expected to have some level of impact on future recreation demand for Gross Reservoir, the nature of which is also unknown. Although the pandemic's likely influence on 2020 visitor totals somewhat reduces the reliability of the data for that metric, recreation staff believes trends observed in visitation spread across recreation areas, days of the week, and time of day will remain relatively consistent and can be used to predict future trends.

3.3.4.1 2020 Visitation Statistics

During 2020, total visitation for Gross Reservoir reached an estimated 275,600 people, while 2019 total visitation numbers were an estimated 157,600 people, a roughly 75% increase year-over-year. Again, the COVID-19 pandemic likely drove a significant portion of this drastic increase in visitation in 2020, although the exact extent is unknown. Nevertheless, Gross Reservoir's popularity among Colorado's outdoor recreators is growing, and Denver Water expects visitor totals to trend higher than observed in 2019.

The following figures represent visitation spread and peak visitation analyzes across Gross Reservoir's current (pre-GRE Project) recreation areas (note the areas denoted with an asterisk are locations whose counts are vehicle counts adjusted by a people-per-vehicle coefficient. This methodology is described in Article 417).:

Figure 3: 2020 Visitation Spread per Recreation Area

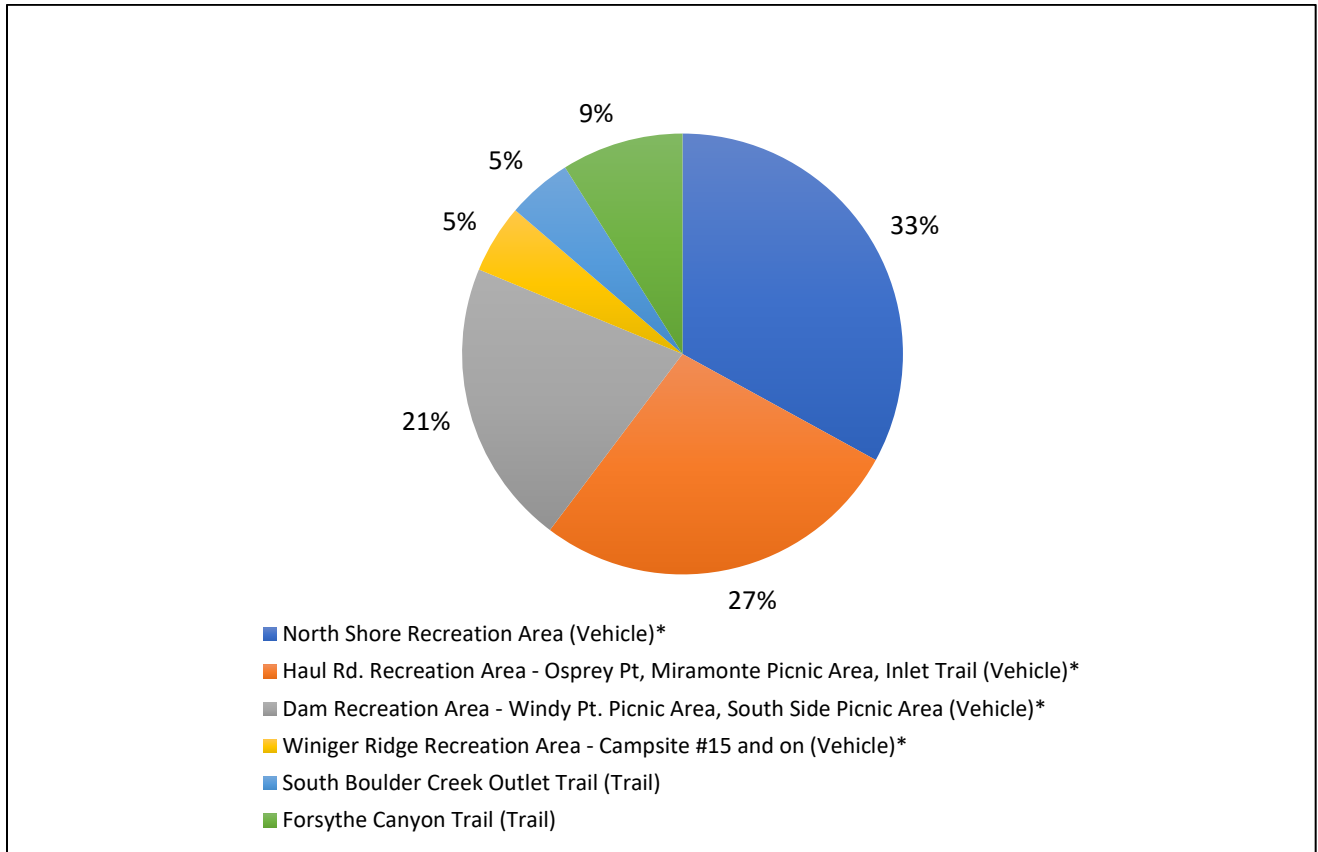


Figure 4: 2020 Visitation Spread per Day of Week (Across all Recreation Areas)

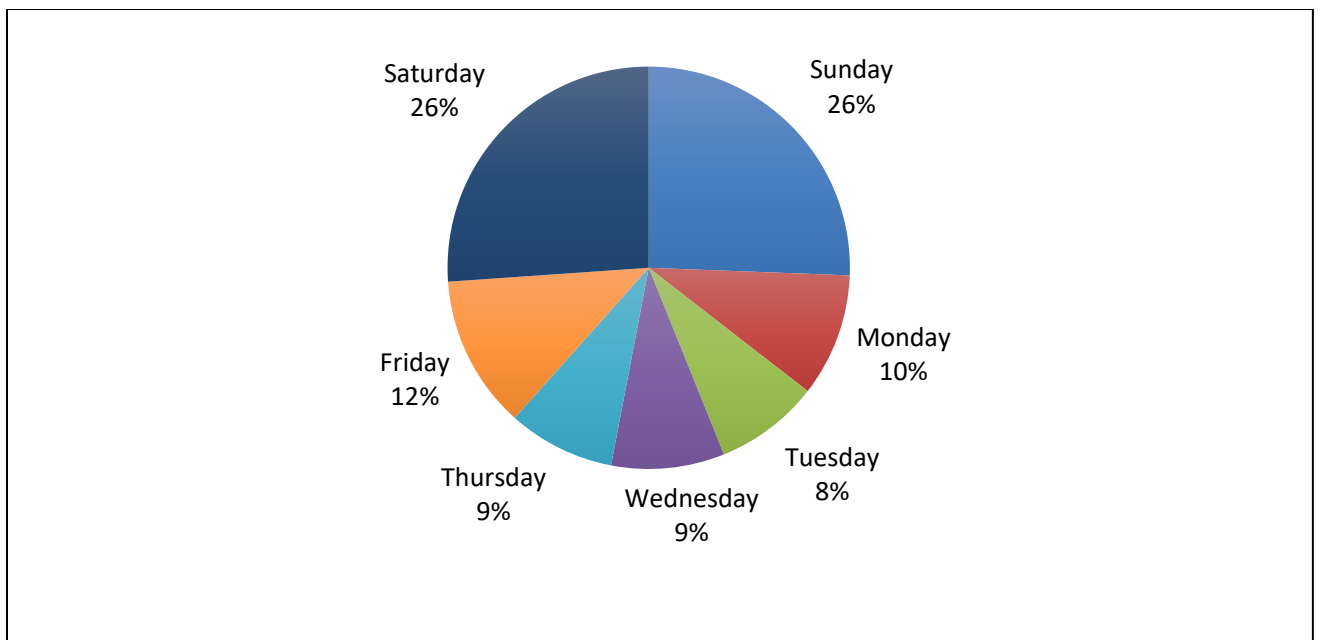


Figure 5: 2020 Hourly Visitation Spread Per Recreation Area (WEEKDAYS)

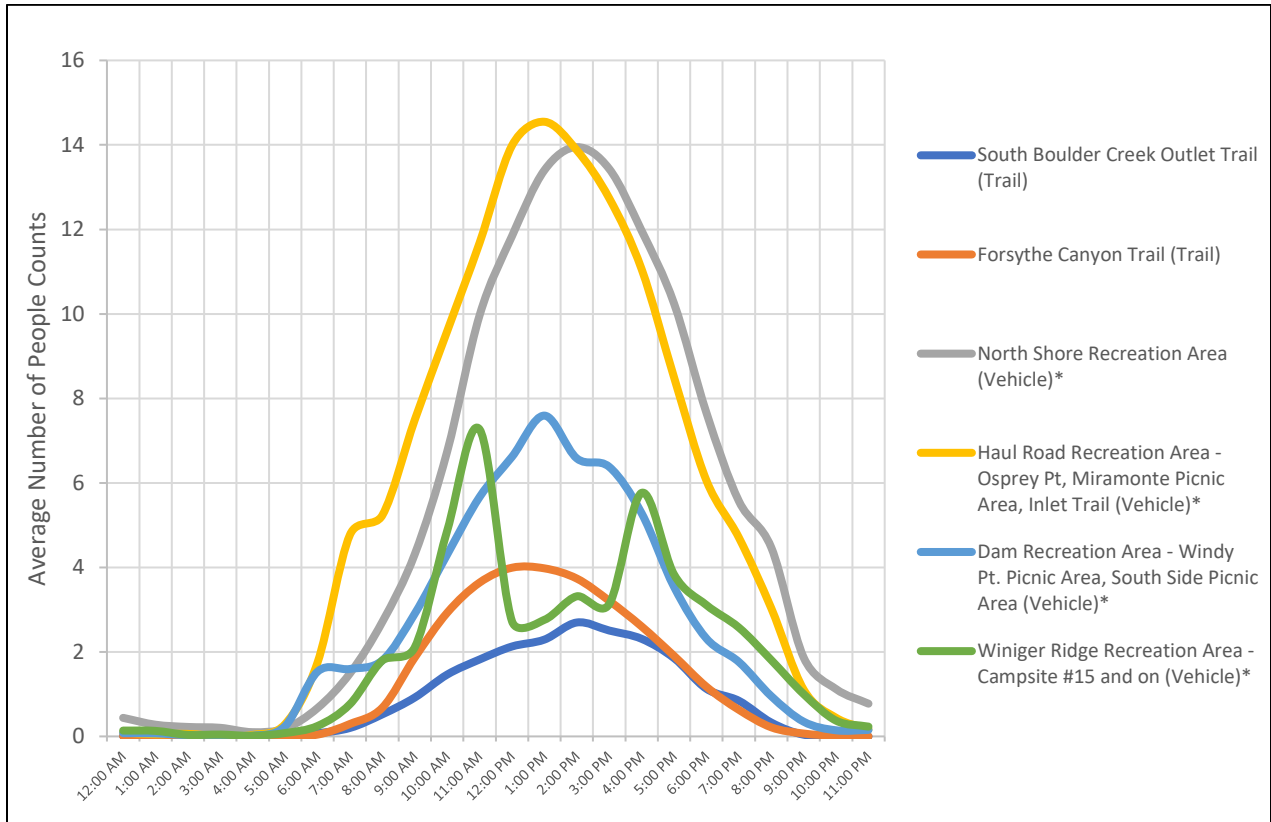
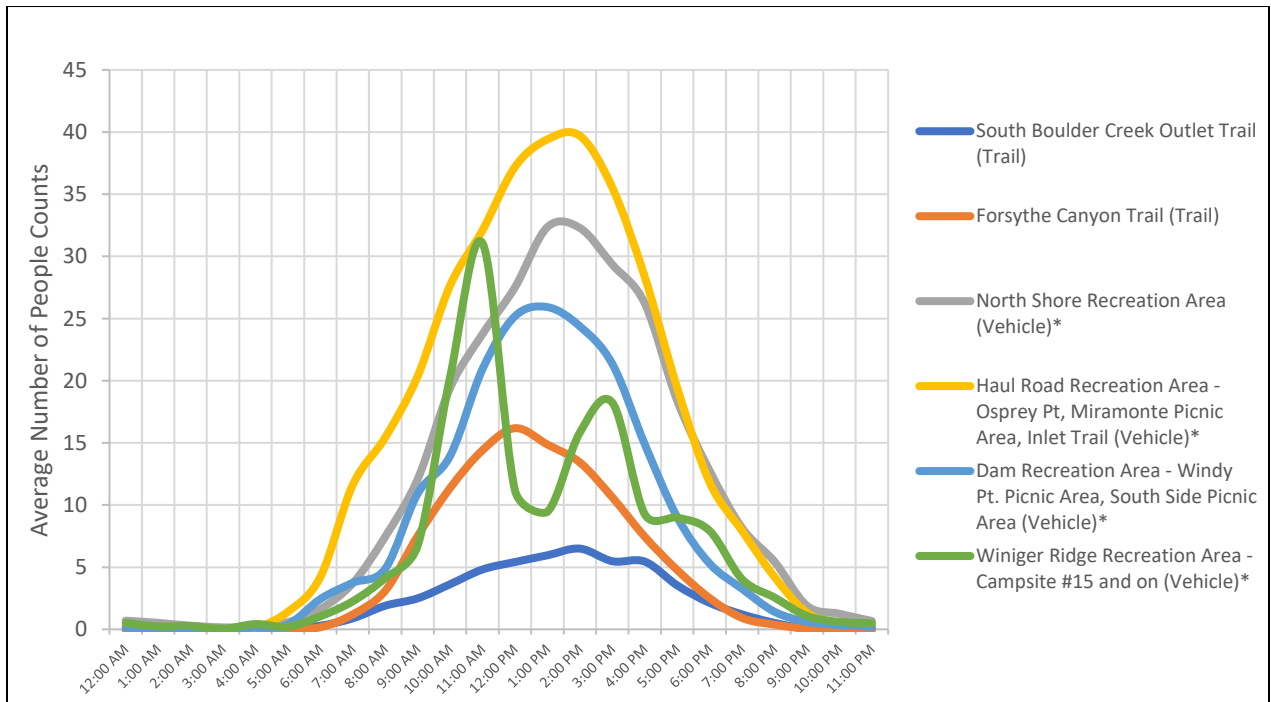


Figure 6: 2020 Hourly Visitation Spread Per Recreation Area (WEEKENDS)



3.3.4.2 Future Implications

It is difficult to anticipate future visitation levels and trends in the wake of the GRE Project's commencement. However, the above visitation analyses offer some basic insights:

1. Saturdays and Sundays sustain more than 50% of Gross Reservoir visitation. This trend can be expected to continue both through the projected 5-year construction phase of the GRE Project, as well as following its completion. The public's availability to get out and recreate is not dependent on the nature of Gross Reservoir facilities. While some of Gross Reservoir's Recreation Areas will be closed to the public during the construction phase of the GRE Project, resulting in lower overall visitation levels, weekday versus weekend visitation spread is unlikely to change. Similarly, after many Gross Reservoir recreation areas are altered or added following the completion of the GRE Project, recreation staff should expect to see a similar weekend to weekday visitation ratio.
2. Along the same line of reasoning, peak weekend and weekday hours are likely to remain the same.
3. Cumulatively, all pre-GRE Project, south side recreation areas represent nearly 50% of current Gross Reservoir yearly visitation. This is an important statistic to consider with regard to the construction phase of the GRE Project. During construction, all south side recreation areas will be closed to the public for the duration of the construction phase, while all north side recreation areas will remain open (see Section 4.5 – Temporary Recreation Plan for details and refer to Section 7.2 – Gross Reservoir Map Figures for geographic context). Consequently, all south side visitation will be displaced to the remaining north side recreation areas. The Temporary Recreation Plan in Section 4.5 describes in detail how Denver Water plans to compensate for this displacement of visitors and to allow for a safe and enjoyable recreation experience during construction of the GRE Project.
4. The Haul Road and Dam Recreation Areas are currently Gross Reservoir's most popular destinations for visitors (Haul Road sustaining 27% of total reservoir visitation; the Dam Recreation Area sustaining 21%). These recreation areas are included among the areas to be redesigned and reconstructed following the completion of the GRE Project. Given the extent of these area's associated visitation levels in 2020, close monitoring of these areas post-GRE Project will be crucial for determining their ability to meet future recreation demand.

Visitation monitoring will be essential in determining whether recreation facilities are adequate in sustaining recreation demand. Deployment of automated visitor counters is a common and reliable method for collecting visitation data in outdoor recreation settings. It is a methodology that has seen a variety of technological advancements as the practice has evolved over time. Denver Water remains committed to improving the data collection methodology at Gross Reservoir wherever possible to increase the accuracy and reliability of data collected. Recreation staff relies heavily on visitation data collection and resource condition monitoring to evaluate the need for future adaptive management strategies or for expanded recreation infrastructure. These potential adaptive management strategies, among others, are discussed in further detail in Section 4.3. Following the completion of the GRE Project, if recreation demand is observed to have an adverse impact on resource conditions, facility conditions, or

enforcement capacities, Denver Water will work with FERC and other agencies to implement adaptive management solutions.

4. Recreation Management Strategies

This section describes recreation management strategies Denver Water plans to implement both during the construction phase of the GRE Project, as well as following completion. This section also addresses USFS 4(e) Condition 24 requirements as mandated by FERC.

4.1 Gross Reservoir Rules, Regulations, and Enforcement

Rules and regulations have been developed at Gross Reservoir to ensure visitor safety, resource protection, and provide an enjoyable experience for all visitors and staff. Many of these regulations are in line with state fishing and boating laws while others are in place to protect water quality and alleviate traffic congestion. An “education first” philosophy is used to enforce the applicable rules and regulations. For example, educating visitors instead of issuing citations for less serious infractions like body contact with the water or pet-related violations. This approach goes a long way in building goodwill between Denver Water staff, rangers, and the public. However, safety of visitors and staff is always a priority, so violations that cause or may cause undue danger to a visitor or staff member, or anything that can prevent adequate response during an emergency, is taken more seriously. Writing tickets or infractions for violations can be a time-consuming process and will ultimately be determined by the ranger/law enforcement officer at the time of violation. These rules and regulations are in addition to, and do not supersede, any otherwise applicable county, state, and federal laws.

- **General rules and regulations:**
 - o Public use permitted only from sunrise to sunset, except at the Winiger Ridge Campground.
 - o No body contact with water is permitted.
 - o No trespassing as posted.
 - o Parking is permitted only in designated parking lots and defined spaces. Roadside parking is prohibited.
 - o Overnight parking is not permitted, except at the Winiger Ridge Campground.
 - o Overnight camping on Denver Water property is prohibited, except at the Winiger Ridge Campground.
 - o Parking is not available for trailers, campers, RVs, or buses anywhere around the reservoir.
 - o Pedestrian use allowed only on Gross Reservoir area trails. No bicycles or motorized vehicles are permitted unless the area is specifically designated and posted to permit the operation of such vehicle in an area.
 - o Pets and domestic animals must be kept on leash or lead and under human physical control.
 - o Pet waste shall be removed immediately.
 - o Pets are not permitted to enter the water.
 - o Fireworks are prohibited.

- o Firearms are prohibited on Denver Water property.
- o Smoking is prohibited on Denver Water property.
- o Launching or landing of any drones, manned or unmanned aircraft, or any other aircraft is prohibited on Denver Water property.
- o The following are prohibited: glass bottles or containers; depositing litter or waste in any place other than a waste receptacle; disposal of household waste, hazardous materials, or waste from outside the reservoir site.
- o It is illegal to feed, hunt, trap, kill, or release/relocate animals/wildlife on Denver Water property.
- **Boating Rules and Regulations:**
 - o Watercraft are allowed on the reservoir from the Friday before Memorial Day through September 30.
 - o In accordance with applicable CPW laws, there must be one wearable (type I, II, III, or V), U.S. Coast Guard approved, personal flotation device (PFD) for each person age 13 and older aboard a watercraft or vessel.
 - o Each person age 12 and under must be wearing a U.S. Coast Guard approved PFD while aboard a watercraft or vessel.
 - o All watercrafts are subject to U.S. Coast Guard and CPW safety standards and will be subject to inspection.
 - o It is unlawful to operate watercraft under the influence of alcohol or drugs.
 - o Only non-motorized, car-top boats less than 18 feet in length are permitted on the reservoir.
 - o Electric trolling motors are prohibited.
 - o Trailer hitched boats, motorized boats, sailboats, belly boats, single chambered flotation devices, inflatable mattresses, and inner tubes are prohibited.
- **Winiger Ridge Camping Regulations:**
 - o Camping is subject to all USFS rules, regulations, and closures.
 - o Camping is permitted only in sites designated by a number, fire ring, and picnic table.
 - o Camping is limited to a 14 consecutive day period in the campground and a maximum of 28 days in a 60-day period.
 - o Fires are permitted only in provided rings and grills at designated sites.
 - o Fires are subject to county and/or state bans.
- **Fishing Regulations:**
 - o Fishing is subject to all state regulations enforced by CPW.
 - o Snagging kokanee is permitted October 1 through December 1 only.
 - o Ice fishing is permitted at recreationists' own risk. Only portable ice fishing shelters are permitted and must be removed from the surface when not in use.
- **Special Events:**
 - o Any event, regardless of size or nature that involves photography/videography, advertisement or media that occurs on Denver Water property must be approved by Denver Water, through the Public Affairs Department, with a minimum notice of 10 business days. If approved, an agreed upon Letter of Authorization will need to be signed along with a nominal fee.

- o Denver Water recreation staff and/or the Public Affairs division must be made aware of any special event regardless of size and nature a minimum of 30 days prior to the event taking place.
- o Equipment set-up for events (chairs, alters, tables, booths, etc.) is prohibited.
- o All events are to be hosted within the confines of Gross Reservoir recreation facilities and amenities (established picnic areas and shelters, trails, scenic overlooks etc.).

4.1.1 Article 418, Condition 29 – Safety and Law Enforcement Plan

In accordance with Article 418 and Condition 29, Denver Water has developed a Safety and Law Enforcement Plan to ensure there is adequate law enforcement, fire prevention and response, and emergency medical provisions for visitor safety and critical dam infrastructure security. This section summarizes key safety and law enforcement strategies currently implemented at Gross Reservoir. For a full description of Denver Water’s safety and law enforcement efforts, please reference the Safety and Law Enforcement Plan.

In accordance with Article 418 and Condition 29 of the 2020 FERC Order, after all GRE Project components are implemented, as determined necessary by USFS and subject to prior USFS review and approval, Denver Water will file with FERC, an updated Public Safety and Law Enforcement Plan. Upon FERC approval, Denver Water will implement the updated plan.

4.1.1.1 Safety and Law Enforcement Personnel

Denver Water has hired an on-site, full-time Recreation Ranger to oversee law enforcement and public education at Gross Reservoir. Responsibilities of the Recreation Ranger as they pertain to promoting safety and law enforcement include, but are not limited to:

- Developing and overseeing patrol program. Assisting in hiring, training, and setting patrol objectives.
- Developing and implementing recreational patrol objectives, procedures, and schedules.
- Conducting land and boat patrols as conditions warrant to ensure compliance with established rules and regulations.
- Developing and implementing educational programs to inform visitors, the media, and the public about recreation management objectives including regulations, area closures, and resource protection.
- Serving as liaison and coordinating safety, fire, and enforcement programs with local law enforcement, fire, and rescue agencies to ensure recreational use is safe and orderly and emergency response procedures are well defined.
- Coordinating with Denver Water’s Recreation, Planning, GIS, and Environmental Planning sections to ensure the collection of accurate visitation data pertaining to safety and compliance and that this data is used and analyzed when making facility improvements to further promote safety and compliance at the reservoir.

In addition to hiring the Recreation Ranger, Denver Water hires three (seasonally contracted) BCSO Rangers during the height of the recreation season (May through October). The primary responsibilities of the seasonal rangers include, but are not limited to:

- Assisting the Recreation Ranger in the implementation of patrol operations and educational programs to ensure compliance with established rules and regulations.
- Responding to emergency situations and serving as an additional liaison to local law enforcement, fire, and rescue agencies.
- When warranted, issuing citations for violations of posted rules and regulations.
- Participating in the collection of visitation data pertaining to safety and law enforcement.
- Assisting in facility improvement initiatives seeking to promote safety and compliance.

Denver Water also hires one seasonal Recreation Intern annually during the height of the recreation season who, under the direction of the Recreation Ranger:

- Assists in maintaining the safety and compliance of the public by participating in patrol operations, emergency response procedures, and education outreach.
- Engages with the public for educational and enforcement purposes of safety and compliance.
- Reports violations of posted rules and regulations and alerts seasonal BCSO Rangers and the Recreation Ranger of non-compliance and emergency situations.
- Participates in the collection of visitation data pertaining to safety and law enforcement.
- Assists in facility improvement initiatives seeking to promote safety and compliance.

Due to the recent heightened volume of summer visitation at Gross Reservoir, particularly on weekends and holidays, Denver Water coordinates with BCSO for the additional presence of a BCSO Deputy at the reservoir to assist with daily safety and law enforcement operations. During these high-demand periods, Denver Water also uses volunteer employees who assist on-site staff with traffic control and public education efforts. Denver Water plans to use both strategies when recreation demands are high at the reservoir.

Finally, Gross Reservoir is serviced by three resident caretakers who are committed to assisting enforcement personnel with patrol operations and public education to the extent that such assistance does not impede on their primary responsibility of maintaining and operating Gross Dam hydropower facilities. It is not uncommon for the caretakers to be the primary point of contact in the event of an emergency or in instances of non-compliance occurring in the absence of on-duty law enforcement personnel, especially after hours or during the off season (November through March). During the off season, the only patrol personnel present at Gross Reservoir is the Recreation Ranger on select days of the week. The caretakers are thus adequately trained and equipped to respond to such situations as they arise. However, given future expectation with regard to increased recreation demand, as well as increased incident reporting at the reservoir, opportunities for enhanced law enforcement presence, communication, and response time is being discussed among agency stakeholders. These enhanced provisions will be described in the updated Public Safety and Law Enforcement Plan.

4.1.1.2 Law Enforcement Jurisdiction

Jurisdictional authority at Gross Reservoir and surrounding land is shared by Denver Water, BCSO, and USFS. Since Denver Water is not a department of the city or county of Denver, Denver Water has no law enforcement authority over the reservoir. Law enforcement

jurisdiction and responsibilities at Gross Reservoir are primarily shared by BCSO and USFS. Under existing cooperative agreements such as the newly identified Gross Reservoir Recreation Area that delineates BCSO enforcement boundaries, BCSO has sole jurisdiction on property (land and water) owned and managed by Denver Water and has joint jurisdiction on USFS land. Additionally, BCSO has jurisdictional authority on major crime scenes regardless of land ownership.

USFS Law Enforcement Officers enforce federal regulations, as well as state wildlife statutes. CPW has authority over all wildlife in the state and enforces state wildlife and fishing regulations on both Denver Water and USFS property. USFS's and CPW's physical presence at Gross Reservoir is limited, sporadic, and concentrated at popular fishing areas and along Winger Ridge.

4.1.1.3 Noncompliance Issues

Law enforcement problems at Gross Reservoir are typical of those in comparable park-like settings. Some of the most common instances of noncompliance include, but are not limited to:

- Body contact with the water, particularly cliff jumpers at Rocky Point (also known as Jump Rock) and other cliff areas along the shoreline.
- Boaters who do not possess a U.S. Coast Guard approved, wearable lifejacket.
- Use of prohibited watercraft on the reservoir, such as innertubes and inflatable mattresses.
- After hours visitation to the reservoir.
- Illegal parking/intrusion onto Gross Dam Road, Flagstaff Road, and the Lakeshore neighborhood community, often blocking/impeding emergency access points.
- Illegal parking of trailers, campers, RVs, and buses.
- Vandalism/damage to Denver Water infrastructure.
- Damage to natural resources due to overcrowding such as social trail and illegal campsite development.
- Litter.
- Illegal camping along Winger Ridge.
- Illegal campfires.
- Off-leash dogs.
- Trespassing onto restricted areas of Denver Water property.

These issues of noncompliance are not insurmountable and are not unusual for a recreation site in fairly close proximity to a major metropolitan area. Addressing these issues will require data collection, planning, multi-agency coordination, and a commitment of resources by Denver Water. Population growth along the Front Range and a corresponding increase in recreation demand will likely continue to increase visitation at Gross Reservoir. Added publicity of Gross Reservoir as a result of the GRE Project is also expected to increase visitation. See Section 4.3 for potential recreation management strategies that may be implemented in an effort to mitigate the effects of growing recreation demand and associated noncompliance issues.

4.1.1.4 Emergency Response Measures and Communications

There are two emergency telephones strategically located at Gross Reservoir currently – one positioned outside the main headquarters building located at 3817 Gross Dam Road, and one located at the northwest end of the North Shore parking lot. Additional emergency phone locations are being considered for other areas around the reservoir following the completion of the GRE Project.

Denver Water will evaluate the construction of a new ranger station and boat house facility that will be situated in closer proximity to the reservoir and key recreation areas for improved emergency response time and patrol planning efficiency.

Following the completion of the GRE Project, Denver Water will work with the appropriate agencies and organizations to identify potential new ambulance and helicopter staging areas at key access points around the reservoir. These sites will serve as primary evacuation points for victims of serious injury, as well as emergency access points in the event of a wildland forest fire.

Denver Water will designate, sign, and enforce “No Parking” areas in front of all emergency gates and access points and along all roads where parking could impede fire and emergency vehicle access (see Section 3.3.3).

Denver Water will maintain and enhance internal and interagency communications by:

- Providing the Recreation Ranger and onsite caretakers with radios compatible with Boulder Regional Communications Center (BRCC) law enforcement, fire and medical operations, and Boulder County Dispatch channels.
- Working with BCSO, USFS, and BRCC to test radio transmission and locate and address terrain-related dead spots.
- Assuring direct communication capabilities with Denver Water recreation staff and Caretakers by dedicated radio channels.
- Providing the Recreation Ranger and caretakers with training in BRCC radio procedures and protocols.

4.1.1.5 Equipment and Resources

The primary mechanism for land patrol operations and emergency response is via official “Denver Water” and “Boulder County Ranger” marked pickup trucks. When necessary, Denver Water and BCSO ATVs are used for commuting through more rugged terrain or along CR 68J, which provides the quickest access to Winiger Ridge.

Denver Water owns and maintains a ranger patrol boat (17-foot whaler) that is the primary mechanism used for water patrol and emergency response. Coal Creek Canyon Fire Protection District stages an inflatable rescue boat at Gross Reservoir as an additional resource for emergency situations. Denver Water caretakers also possess and maintain a flat-bottom, aluminum, maintenance boat, that may also be used for patrol and rescue operations.

All equipment used by Denver Water and BCSO staff for safety and law enforcement purposes is maintained and serviced by Denver Water. The Recreation Ranger is responsible for monitoring the working conditions of all equipment needed for day-to-day patrol purposes or emergency response situations.

4.2 USFS Condition 24

USFS 4(e) Condition 24 requires implementation of the addendum to the project’s approved Recreation Management Plan (Section 3.2), as well as managing activities to minimize bear/human interactions, monitoring recreation use, conducting a pre-construction inventory of all social trails and roads at Winiger Ridge Access and Recreation Area (and developing a Recreation Adaptive Management Plan for Winiger Ridge if necessary), and providing a fishing line recycling program or other measures to reduce impacts to the five relocated fishing access points described in the addendum (Section 3.2). This section describes Denver Water’s management approach to each of these items.

4.2.1 Recreation Monitoring

The data collection and monitoring practices described in Article 417 and Condition 24 will be compiled annually once the Recreation Monitoring Plan is accepted by FERC. Both FERC and USFS will receive reports from Denver Water. Table 4 shows the anticipated schedule for those report deliveries.

Table 4: Anticipated Schedule of Recreation Use Monitoring Reports

FERC	USFS	Report Name	Due Date
	Condition 24	Recreation Use Monitoring Reports	For the first 3 years after the expanded reservoir is full: Every year by February 28.
	Condition 24	Recreation Use Monitoring Reports	After the first 3 years following the filled expanded reservoir: Every 3 years by February 28.
Article 417		Recreation Use Monitoring Reports	For the first 12 years after completion of construction: Every 3 years
Article 417		Recreation Use Monitoring Reports	After the first 12 years following completion of construction: Every 6 years

Per Condition 24, for the first three years after the expanded Gross Reservoir is full, Denver Water will submit annual recreation use monitoring data spreadsheets to USFS by February 28. At the end of the first three years, Denver Water will submit a more comprehensive Recreation Use Monitoring Report to USFS analyzing the data from the previous three years. The Recreation Use Monitoring Report will provide:

- Summary of annual monitoring conducted by year.
- Summary of the annual data collected.
- Tabulation and summary of the data and monitoring practices required in the approved Recreation Monitoring Plan.

In addition, per Article 417, a Recreation Use Monitoring Report will be submitted to FERC every third year for 12 years after construction of the GRE Project is complete. After 12 years, these reports will be submitted every six years.

In addition, for National Forest System land in the Winiger Ridge area (within the FERC Project Boundary) the recreation use monitoring report will include the items specified or required by USFS. These reporting requirements include, but are not limited to, Frissell condition class of dispersed campsites, reported social use conflicts, and observed environmental damage caused by dispersed recreation. This information will be used to determine patterns in dispersed recreation use after reservoir inundation and to evaluate the need for additional recreation mitigation measures.

The USFS monitoring requirements described above can be changed upon mutual agreement of USFS and Denver Water. If USFS and Denver Water agree to change the monitoring requirements, Denver Water will submit an update to the requirements with FERC.

Costs for recreation use monitoring conducted by USFS in the Winiger Ridge area outside the FERC Project Boundary are included in the Collection Agreement under Condition 30.

4.2.2 *Winiger Ridge Dispersed Recreation*

Beginning on the effective date of the amended license (July 16, 2020), Denver Water will conduct a pre-construction inventory of all social trails and roads at Winiger Ridge (within the FERC Project Boundary) as specified or approved by USFS. Within three years of Gross Reservoir being expanded and full, USFS will determine if further recreation management is required by Denver Water for the Forest Plan direction. This USFS determination will recur at a minimum of every three years.

If USFS determines further mitigation is necessary (due to GRE Project-related effects) to meet Forest Plan direction, based on pre-construction inventory results, the new inundation level of the expanded Gross Reservoir, and the ongoing recreation monitoring, Denver Water will develop a Recreation Adaptive Management Plan (RAMP) for Winiger Ridge. The RAMP will be developed in consultation with, and receiving approval from, USFS. On receipt of USFS approval, Denver Water will file the RAMP with FERC. Upon FERC approval, Denver Water will begin to implement the RAMP.

The RAMP will include, but not be limited to, the following unless otherwise agreed to by USFS:

- Measures for addressing social, environmental, safety, and/or sanitation concerns that may arise from the proliferation and/or expansion of dispersed campsites at Winiger Ridge and surrounding area. These measures could include triggers for adding bathrooms, trash receptacles, or other temporary or long-term mitigation measures as determined necessary by USFS.
- Plans for converting obsolete roads to trails.
- Plans for formalizing social trails, including social trails for fishing.
- Measures for minimizing creation of new social trails.

4.2.3 Human/Bear Interaction Management

Beginning on the effective date of the amended license (July 16, 2020), Denver Water will manage activities to minimize the potential for bear/human interactions as needed within the FERC Project Boundary on National Forest System land. If unwanted bear/human interactions are reported, Denver Water will consult with USFS and CPW and implement appropriate mitigation measures. These measures are subject to USFS approval. Potential measures could include, but are not limited to:

- Improved trash management.
- Signage to inform staff and visitors on bear activity and proper behavior to reduce potential for attracting/interacting with bears.

4.2.4 Fishing Line Recycling Program

As an adaptive management strategy, if discarded fishing line becomes commonly found at the five relocated fishing access points described in the Recreation Plan Addendum, the Forest Service and Licensee will confer about whether to implement a fishing line recycling program or other measures to reduce impacts to the sites.

4.3 Adaptive Management

Denver Water remains committed to formulating creative, data driven management approaches toward mitigating the impact overcrowding has on Gross Reservoir's natural resources, recreation facilities, and overall safety and security of visitors and staff. This section identifies potential management strategies that may be considered for future implementation if such impact continues to be observed following the completion of the GRE Project.

As specified in the 2020 FERC Order, construction of all new Gross Reservoir recreation facilities will adhere to a one-to-one relocation ratio of existing recreation infrastructure. Given the continued increase in visitation and its observed impact, it is clear that a limited number of recreation amenities (parking spaces, picnic tables, boat launch access points etc.) does not result in limiting the number of visitors seeking to experience Gross Reservoir. In many cases, insufficient infrastructure and capacity limitations have been a contributing factor of recreation-related impact observed by Denver Water Recreation personnel and law enforcement.

In light of this challenge, the following management practices may be considered by Denver Water in consultation with FERC, local law enforcement/emergency responders, USFS, and local community stakeholders as potential mitigation measures:

1. **Increased parking capacity:** In certain areas where overcrowding has been most prevalent, Denver Water may propose a future amendment to the FERC license for the construction of additional parking capacity in certain areas (e.g., Haul Road Recreation Area, North Shore Recreation Area, South Boulder Creek Outlet Trail). Additional capacity measures may include, but not be limited to the following options:
 - a. Expanding existing parking lot capacities where feasible and where impacts on natural resources is minimal.

- b. Construction of a strategically placed, overflow parking area(s) to be used in times of need. This may involve the use of a shuttle service to transport visitors from an overflow parking area to their recreation area of interest.
 - c. A staging area approach where an area, either roadside or in the form of an additional parking lot, is available to stage visitors safely with their vehicles while they are asked to wait for parking to become available. This strategy was implemented in 2020 when parking was at capacity for the Osprey Point boat launch. Recreation staff were able to safely stage visitors along a portion of the Dam Access Road while monitoring parking availability allowing visitors to enter the boat launch area as other visitors would leave. While effective, this strategy was extremely resource/personnel heavy.
- 2. **Strict capacity limitations:** This approach would likely require additional seasonal BCSO rangers or additional Denver Water recreation staff responsible for monitoring/managing traffic flow and enforcing strict capacity limitations at all parking facilities/reservoir access points. This strategy was implemented in 2020 where additional Denver Water and BCSO personnel were recruited on site during busy weekend hours to monitor parking lot facilities, actively preventing overflow parking situations from developing. While effective, this strategy is also extremely resource/personnel heavy.
- 3. **Reservation system:** Requiring visitors to obtain a form of day pass/permit to visit the reservoir. This management strategy involves issuing reservations to prevent overcrowding. Examples include:
 - a. **Reservoir-wide reservation system:** reservations are required for all visitors, which may involve construction of check point entry/exit booths staffed by Denver Water personnel in times of need. There are two access points by which the public can access Gross Reservoir facilities: Gross Dam Road via Flagstaff Road and Gross Dam Road via SH 72. Visitors would obtain reservations online prior to visiting the reservoir or may purchase one on arrival if parking is available. If entry points are not managed in such a way, then strict enforcement would need to take place.
 - b. **Site-specific reservation:** May only require permitting for visitors seeking to park at Gross Reservoir's busiest facilities (e.g., Haul Road Recreation Area or North Shore Recreation Area). This may also require additional staffing and infrastructure at specific "reservation only" locations.
 - c. **Boater's permit:** Visitors seeking access to the water for non-motorized boating are required to obtain a boater's permit that must be displayed on watercraft at all times. During busy summer months, water recreation is Gross Reservoir's main attraction.
 - d. **Campsite reservations:** Applied to campers accessing the Winiger Ridge Recreation Area. Reservations would be required per individual campsite. Such a system might be co-managed by Denver Water and USFS. It is possible this sort of system may be developed as part of the Winiger Ridge Adaptive Management Plan (see Section 4.2.2)

4. **Improved Infrastructure Design:** There are many infrastructure improvements that can be made to mitigate various forms of recreation related impact. The following examples are among some of the improvements that have been made in the past or have been considered for future mitigation efforts:
- a. **Modified parking lot design:** All Gross Reservoir’s existing and future parking lot facilities are designed so there is only one entry/exit point. In many cases, this has led to increased parking lot congestion and, in rare cases, parking lots have become inaccessible due to illegal parking. A solution to this may be to construct separate entry and exit points at high-use facilities to improve the flow of traffic within parking lots and reduce the potential for the lots to become overwhelmed by illegal parking.
 - b. **Modified road design:** Portions of Gross Dam Road and the Dam Access Road contain wide shoulders that, in many cases, encourage illegal roadside parking. A solution Denver Water has implemented historically is to position large boulders along the shoulders of the road, effectively narrowing the roadway and making it more difficult for visitors to illegally park. Denver Water may continue using this strategy as new areas prone to illegal roadside parking are identified following the completion of the GRE Project. In addition to physical road design is the potential for more strategic sign placement (see Section 3.3.3)
 - c. **Modified trail construction/design:** Trail erosion and the development of social trails are among Denver Water’s chief management concerns for Gross Reservoir. Moving forward, there are opportunities to improve trail alignment, drainage, and designation, both in the construction of new post-GRE Project trail alignments, as well as those that are existing (see Section 4.4 for detailed solutions to this issue). Physical barriers along trails such as buck and rail fencing or felled trees may be effective at diverting foot traffic away from social trails. In instances where reconstruction is not feasible, trail hardening techniques through use of aggregate or stone will be considered.

The implementation of these strategies will be contingent on data collection and observation. For a better understanding of how these management challenges will be monitored by Denver Water following the completion of the GRE Project, refer to Article 417 – Recreation Monitoring Plan.

4.4 Erosion Control, Restoration and Rehabilitation

4.4.1 Purpose

This section discusses the various monitoring and mitigation measures for addressing erosion caused by recreation related activities at Gross Reservoir. The described measures were developed in consultation with USFS in the original development of the plan to satisfy Articles 401 and 405. Since FERC has not removed these articles from the 2020 FERC Order, Denver Water is still committed to the implementation of erosion control, restoration, and rehabilitation measures for all Gross Reservoir recreation areas within the FERC project boundary.

4.4.2 Goals

The goals of erosion control, restoration, and rehabilitation measures implemented by Denver Water are as follows:

- Mitigate the impacts associated with the development of new recreation facilities.
- Continue to maintain and monitor existing recreation facilities to mitigate resource damage.
- Where practical, restore natural drainage patterns and erosion control impacted by recreation.
- Manage and divert surface runoff along designated trails to prevent erosion.
- Divert foot traffic away from eroded social trails.
- Where appropriate, initiate recovery of natural vegetation to support erosion control:
 - Revegetate with native species.
 - Establish protection of revegetated areas.
 - Use on-site materials whenever possible.
 - Provide visual amelioration of disturbed and rehabilitated areas.

4.4.3 Facilities and Trails Condition Monitoring

Denver Water plans to use the following methods for monitoring recreation related impact to facilities, trails, and campsites at Gross Reservoir:

- Photo point surveying of recreation area infrastructure (picnic areas, parking lots, boat launch areas, campsites etc.). A method for capturing the scale of changes, with the use of a yardstick or other point of reference, within the photo will be completed.
- A trail condition inventory will be created and updated annually, providing recreation staff with a location-based system for tracking trail maintenance needs.
- In addition to photo point monitoring for campsites along Winiger Ridge, a Frissell's Condition Class System for monitoring the user footprint of individual campsites will be used to mitigate impact to natural resources within the FERC project boundary.
- A location-based social trail inventory will be created and updated annually to track and mitigate natural resource damage caused by the creation of social trails across all Gross Reservoir Recreation areas within the FERC project boundary.

For a more detailed plan and methodology regarding the monitoring techniques listed above, see the Article 417 – Recreation Monitoring Plan.

4.4.4 Rehabilitation and Restoration Techniques

After a thorough evaluation of existing site conditions, the following rehabilitation and restoration techniques will be implemented.

Social Trails without Major Soil Loss

In these areas, the major effort will be to loosen compacted soils, rake materials from adjacent areas and/or seed with the appropriate mix, stabilize during establishment, and protect from further use as trails. These areas generally will have to be treated with manual labor. In some

cases, small, probably tracked, machines could be employed to rip/chisel the surface prior to seeding, but most areas will require hand treatment with picks, McLeods, or Pulaskis. Nearby spoils from native vegetation sources can be used to encourage regrowth in restoration areas. If natural regrowth is unsuccessful seeding of the mix in Table 5 will be done at the rate indicated and then the area will be raked with metal-tined rakes. In extreme cases, the area will be mulched with certified weed-free straw and jute netting will be applied over the straw, then anchored with rocks, logs, and/or biodegradable staples. For all social trail restoration, obstacles, especially dead and un-limbed or partially limbed Gees will be placed across the rehabilitated area to strongly discourage users from entering. Such efforts will be most intensive in the areas of heaviest use and in areas where it will be difficult to deflect attention from a potential "shortcut."

Social Trails with Complete Soil Loss Down to Weathered Granite

Areas where soils have been eroded down to weathered granite parent material, the surface will be loosened as described in above. Then, BioSol will be added at the rate of 40 lb./1000 sq. ft. and worked into the soil with rakes. Seeding and mulching will follow. In addition to seeding and mulching, nursery stock will be placed in locations chosen to block/divert pedestrian use and provide visual amelioration of social trail damage (see Table 6 below).

Seed Mixes and Planting

The following seed mixes and nursery stock plantings (Tables 5 and 6) will be used for revegetation and restoration at Gross Reservoir.

Table 5: Seed Mix for Revegetation of Social Trails and other Disturbances

Species	Common Name	Variety Rate	(PLS lb/ac) %
Festuca saximontana	Rocky Mtn Fescue — Native	0.7	20
Bouteloua gracilis	Blue Grama — (Bad River)	1.1	20
Sitanion hystrix	Bottlebrush	4.5	20
Agropyron üachycaulum	Squirreltail — Native	2.7	10
Agropyron Trachycaulum	Slender Wheatgrass — San Luis	2.7	10
Ceratochloa marginata	Slender Wheatgrass — Revenue	3.9	08
Muhlenbergia montana	Mountain Brome — Bromar	0.05	02
L.eucopoa kingii	Mountain Muhly — Native	0.4	06
Artemisia frigida	King Fescue - Native	0.02	02
Achillea lanulosa	Fringed Sagewort Western Yarrow	0.03	0.2

Table 6: Species to be planted as Nursery Stock

Shrubs Scientific Name (Common Name)	Trees Scientific Name (Common Name)
Salix scouleriana (Scouler Willow)	Pinus ponderosa (Ponderosa Pine)
Acer glabrum (Rocky Mountain Maple)	Pinus flexilis (Limber Pine)
Padus virginiana (Chokecherry)	Pseudotsuga mensziesii (Douglas-fir)
Oreobatus deliciosa (Boulder Raspberry)	
Ribes cereum (Squaw Currant)	
Arctostaphylos uva-ursi (Kinnikinnik)	

Fertilization and Irrigation Requirements

In general, native plant species in this area, do not respond to fertilizer like other plants do. Therefore, fertilizer will not be applied to the restored areas unless the borrow material proves to be deficient. In this case, a slow-release nitrogen amendment will be added.

Unless extreme drought conditions persist after seeding, none of the seeded areas will require watering. All woody plantings will be watered in late spring at the time of planting and for every two to three weeks during the first growing season. The use of landscape fabric and mulch should promote the efficient use of water.

Rehabilitation Monitoring Program

As described in Article 417 – Recreation Monitoring Plan, a Resource Survey will be used to monitor rehabilitation and restoration efforts.

Monitoring Reports Filing Procedure

The facility and resource condition data collected through this monitoring program will be maintained in one location at Denver Water. The monitoring results will be evaluated each year by the Interagency Committee¹.

Procedure for Modifying Unsuccessful Restoration

Upon evaluation of each year's monitoring results, needed changes will be identified and implemented in a prioritized manner. The variety of restoration and erosion control techniques

¹ Interagency Committee includes the following organizations: U.S. Forest Service, U.S. Fish and Wildlife Service, Colorado Parks and Wildlife, and Boulder County.

implemented should reveal some basis for modifying practices that prove unsuccessful. In the event adopted practices are unsuccessful, alternative methods will be explored and implemented.

4.4.5 Implementation Schedule

Erosion control and restoration issues and techniques will be identified and documented, for each of the nine recreation areas, following the completion of the GRE Project. For those areas that currently exist and will remain in place post-GRE Project, erosion, and restoration issues are being monitored. Specific techniques have been developed to address erosion control and restoration. These erosion control and rehabilitation and restoration practices will be implemented in conjunction with site improvements on a site-by-site basis.

4.5 Temporary Recreation Management Plan

4.5.1 Scope

The scope of this temporary Recreation Management Plan (temp RMP) covers closures that will be implemented during the GRE Project and the temporary recreation facilities that will be created. This temp RMP does not cover construction related to the final layout of the permanent recreation facilities and associated operations post-GRE Project construction. A final layout of recreation facilities is featured in Figure 2. Additionally, this plan does not fully address safety and security for the GRE Project construction sites (Gross Dam, Quarry, staging area, etc.). A separate Site-Specific Safety Plan will be developed for the construction site.

4.5.2 General Overview

For planning purposes, the GRE Project construction has been broken down by year to illustrate when major changes to recreation will occur. Table 7 provides a summary of the changes to recreation facilities and public access, and a general timeframe for which these changes should occur. The expected timeframe may vary depending on construction progress. Table 8 provides the schedule of activities for the GRE Project by year.

Table 7: Overview of GRE Project Dates and Changes to Recreation

GRE Project Dates	Changes to Public Access/Recreation Facilities
October 2021- May 2028	<ul style="list-style-type: none"> • Closure of Osprey Point Boat Ramp within the Haul Road Recreation Area.
October 2021 -May 2028	<ul style="list-style-type: none"> • Full closure of South Side Dam Recreation Area and Haul Road Recreation Area. • Closure of the Scenic Overlook Recreation Area (future Northern Dam Viewpoint).
January 2022-May 2022	<ul style="list-style-type: none"> • Develop temporary parking lot at Northshore Recreation area to accommodate visitors during GRE project construction. • Improve access road to Peninsula Recreation Area to accommodate emergency vehicles, staff, and concessionaire. • Improve boat launch sites at Peninsula Recreation area per ADA requirements and to accommodate trailered operational vessels.
January 2022- May 2028	<ul style="list-style-type: none"> • Denver Water will continue to operate temporary facilities as well as existing recreation facilities that will remain in place post-GRE Project construction.
January 2026 – December 2027	<ul style="list-style-type: none"> • Relocation of facilities within the final configurations of the existing recreation areas. Building new facilities within the newly configured Recreation Areas.
May 2028	<ul style="list-style-type: none"> • Closures no longer in place, continue to operate existing recreation areas and establish final placement of all facilities. These facilities are fully described in the new Recreation Management Plan.

Table 8: Anticipated GRE Project Timeline

Activity/Year	2022	2023	2024	2025	2026	2027	2028
Site Mobilization							
Dam surface preparation, Materials Lab, early site grading for temporary facilities							
Public access to South Shore closed (North Shore open throughout construction)							
Install temporary recreation facilities, public road improvements, site development							
Quarrying operations							
Dam foundation excavation, grouting, plant setup							
Dam raise activities — materials trucking							
Initial Phase of Tree Removal (tree removal and clearing)							
Inundation Area Phase of Tree Removal (forestry activities/tree clearing)							
Install permanent recreation facilities							
First year to being filling to new high-water mark							

4.5.3 Existing Recreation Facilities and Uses

Gross Reservoir currently includes recreation areas with facilities that provide free access to the public. Examples of recreation facilities include hiking trails, picnic areas, boat launch, and restrooms, to name a few. A map of the existing recreation areas at Gross Reservoir is shown in Figure 1 and a detailed description of each existing and new recreation area is described in Section 3.2 above. A summary of the allowable public recreation activities, as described in Denver Water’s 2017 FERC License Amendment Application, is provided below.

- **Fishing:** Gross Reservoir is a cold-water fishing destination for anglers and is stocked by CPW. The reservoir has become a frequent destination of Front Range anglers as it allows the use of non-motorized car top boating. The waters support popular fish species such as brook trout, brown trout, kokanee, and others. Fishing is allowed year-round including ice fishing.
- **Hiking:** Hiking areas include access to the reservoir from several trails at the North Shore Picnic Area, the South Boulder Creek Inlet Trail at Osprey Point, and Winiger Ridge Access Area.

- **Picnicking:** Picnic areas at Gross Reservoir include: the North Shore Picnic Area, the Boat House Picnic Area at the Peninsula Recreation Area, the Scenic Overlook Area, the South Side Picnic Area, the Windy Point Picnic Area, the Miramonte Picnic Area and Osprey Point.
- **Camping:** There is limited access to camping at Winiger Ridge as high clearance vehicles are required to reach the west side camping areas via FSR 359. The Winiger Ridge Recreation Area located on the west side of the reservoir is managed by USFS and Denver Water. The area is closed to the public, as necessary, for wildlife migration and times of high wildfire danger.
- **Boating:** The current Gross Reservoir boat launch at Osprey Point is located at the end of the road within the Haul Road Recreation Area. Permitted watercraft are limited to car top, non-motorized boats including canoes, kayaks, and row boats. Prohibited watercraft include trailer-hitched boats, motorized boats (gas or electric), sailboats, belly boats, and single-chambered flotation devices.

Recreation operating hours at Gross Reservoir are from sunrise to sunset. The reservoir is open to boating beginning the Friday of Memorial Day Weekend through September 30. The construction of the GRE Project will impact the existing recreation facilities and opportunities available to the public during the construction period. Therefore, temporary recreation facilities will be developed to provide safe access for public recreation at select locations during GRE Project construction.

4.5.4 Closures to Recreation Facilities

The primary recreation activities at Gross Reservoir as mentioned above are fishing, hiking, picnicking, camping, and paddling. For safety reasons, the public will be restricted from specific areas due to closures during construction. Specifically, the following recreation areas will be affected by the GRE Project construction activities (refer to Figure 1):

- **South Side Dam Recreation Area:** This recreation area includes Windy Point Picnic Area and the South Side Picnic Area, which will be closed during construction. The remaining picnic amenities will be removed and stored during construction for reuse where possible. Vault toilets in areas that will be inundated will be properly abandoned and demolished prior to raising the new high-water line. Signage notifying the public of the closure of this recreation area will be provided.
- **Haul Road Recreation Area:** This recreation area includes Osprey Point boat ramp, Miramonte Picnic Area, and the South Boulder Creek Inlet Trail, which will be closed during construction. The picnic facilities will be removed and stored during construction for reuse where possible. Vault toilets in areas that will be inundated will be properly abandoned and demolished prior to raising the new high-water line.
- **Scenic Overlook Recreation Area:** This area will be closed to the public during GRE Project construction due to its proximity to Gross Dam. Temporary fencing and signage will be used to deter vehicles from stopping at or entering the area.

In general, recreation activities impacted at some locations during the GRE Project include fishing, hiking, and access to picnic areas, restrooms, and shelters. Watercraft recreation will also be affected since the current boat launch area will be inaccessible due to the development of the Osprey Point quarry. However, boating access will be maintained, where safe conditions exist, from the Peninsula Recreation Area. Fishing will be affected for the same reason, as some anglers access the water using watercraft. Shore fishing will still be available for most areas of the reservoir but will be closed from the Osprey Point quarry to Gross Dam and from Gross Dam to the North Shore peninsula. Hiking at the South Boulder Creek Inlet Trail will also be inaccessible due to the development of the Osprey Point quarry.

During blasting operations, temporary closures to portions of the Winiger Ridge Recreation Area, Gross Dam Road, and North Shore Recreation may be implemented to ensure public and worker safety. Area closures will be necessary, and Denver Water will notify the public of upcoming closures beforehand using a variety of outreach methods, see Section 4.5.8.

Tree removal below the new reservoir high water line will also cause short-term closures to ensure safety over the term of the GRE Project depending on where tree removal activities are taking place. Existing recreation areas that will require partial, short-term closures during tree removal include North Shore Recreation Area, Peninsula Recreation Area, and Winiger Ridge Recreation Area. Details of the tree removal operations can be found in the 2021 Tree Removal Plan.

Additional temporary recreation closures may be necessary in the case of unforeseen extreme weather events, emergencies, or construction related circumstances. Changes to temporary recreation plans may be necessary if visitor activity is found to compromise reservoir operations, cause beyond reasonable disturbances to adjacent landowners, or create hazardous situations on county road systems. As previously mentioned, Denver Water recognizes the popularity of recreation at this facility and will make all efforts to maximize recreation with consideration of public safety as the top priority.

4.5.5 Temporary Plan Summary

This section provides an overview of the necessary recreation closures and the design of temporary recreation facilities to be implemented as part of the GRE Project construction phase. This temp RMP is based on the existing Recreation Management Plan for Gross Reservoir (2004) approved by FERC and what Denver Water anticipates a new recreation plan might encompass. During the construction process, Denver Water will make efforts to ensure recreation closures are minimal and will plan for closures to occur outside of weekends, holidays, and peak visitation hours. Denver Water will work extensively to mitigate inconveniences to reservoir visitors and area residents to ensure a quality recreation experience throughout the construction phase of the GRE Project. Below are the areas that will remain open to the public during the GRE Project and any anticipated changes.

- **North Shore Recreation Area:** The existing recreation facilities in this area will remain in place during and after construction. Denver Water is working with an engineering consultant to develop strategies to enhance the recreation experience and promote

public safety at the North Shore Recreation Area during construction. Denver Water plans to develop a temporary parking area adjacent to the existing lot to mitigate congestion and improve traffic flow. The parking lot addition will be located directly north of the existing lot, providing a total of 111 parking spaces at the Northshore Recreation Area during construction. Hiring a concessionaire to transport hand-launched boats and assist mobility-impaired visitors to the peninsula shoreline is under consideration. Public access will be restricted at certain times during the tree removal phase and for blasting activities related to GRE Project construction.

- **Peninsula Recreation Area:** The existing recreation facilities in this area will remain in place during construction. Denver Water plans to improve the road that connects the North Shore Recreation Area parking lot to the Peninsula Recreation Area to ensure access for emergency vehicles. Additionally, a temporary boat-launch and potentially a mobile dock will be placed on the east side of the peninsula to improve access for trailered vehicles including (but not limited to), emergency vessels, and Denver Water recreation staff. Post-GRE Project construction, all facilities at this recreation area will be removed as they will be inundated by the new reservoir level. Vault toilets in inundation areas will be properly abandoned and removed prior to raising the new high-water line.
- **Winiger Ridge Recreation Area:** No changes are anticipated during construction; however, public access will be restricted at certain times during the tree removal phase and blasting activities.
- **South Boulder Creek Outlet Trail:** No changes are anticipated during construction.

4.5.6 General Design Criteria for Temporary Facilities

The design criteria used in this Plan is summarized as follows:

- The layouts and locations for the temporary recreation facilities will be incorporated into the permanent recreation facilities where possible.
- Recreation facilities at the Peninsula Recreation Area will be left in place during construction for public use. Temporary boating access will be created in this area during GRE Project construction due to the closure of the Osprey Point boat ramp.
- The Peninsula Recreation Area temporary boat ramp access will consider the water level that will be maintained during the construction phase of the GRE Project. Access will provide flexibility within normal reservoir fluctuations.
- The layout and details of temporary recreation facilities will be consistent with those of the existing permanent facilities, such as:
 - Gravel surfacing and general dimensions of parking areas.
 - Restroom facilities.
 - Group and individual picnic sites.
 - Signage.

4.5.7 Temporary Recreation Facilities

To enable continued enjoyment of recreation activities at Gross Reservoir during construction, Denver Water will make temporary improvements to the existing Peninsula Recreation Area, and North Shore Recreation Area.

In general, the Peninsula Recreation Area will be modified with improvements including the addition of an ADA-compliant hand boat launch/retrieval area and associated parking to temporarily replace the Osprey Point facilities, which will be closed for quarry development.

Figure 7 shows the improvements to a non-public roadway from the North Shore parking lot to the Peninsula Recreation Area. This roadway is currently being designed to be a one-lane road which will allow Denver Water to operate an on-site shuttle to transport recreationists and their gear (paddleboards, kayaks, etc.) from the North Shore Recreation Area to the Peninsula Recreation Area. This road will also allow water access for emergency response activities throughout construction.

Due to closure of recreation facilities on the south side of Gross Reservoir, Denver Water identified a need to provide safe parking for the public. Denver Water has begun preliminary designs for a temporary parking lot at the North Shore Recreation Area. This parking will have a maximum of 111 parking spots, which matches the current number of parking spots available between the North Shore Recreation Area, South Side Recreation Area, and Osprey Point Recreation Area. Figure 8 represents the current configuration of the parking lot. This parking lot would be temporary for use during the GRE Project only.

Figure 7: Proposed Peninsula Access Road Improvements

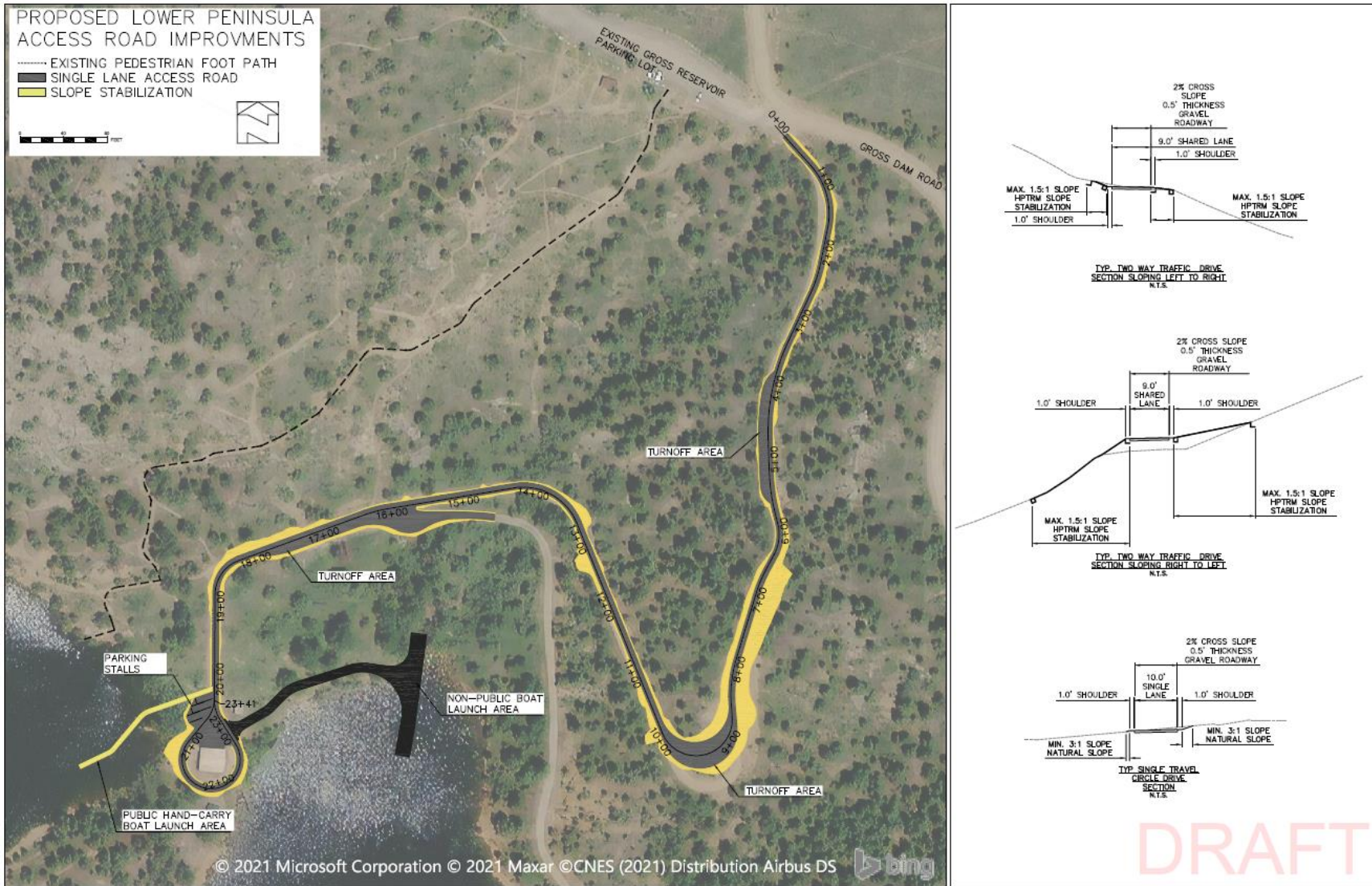
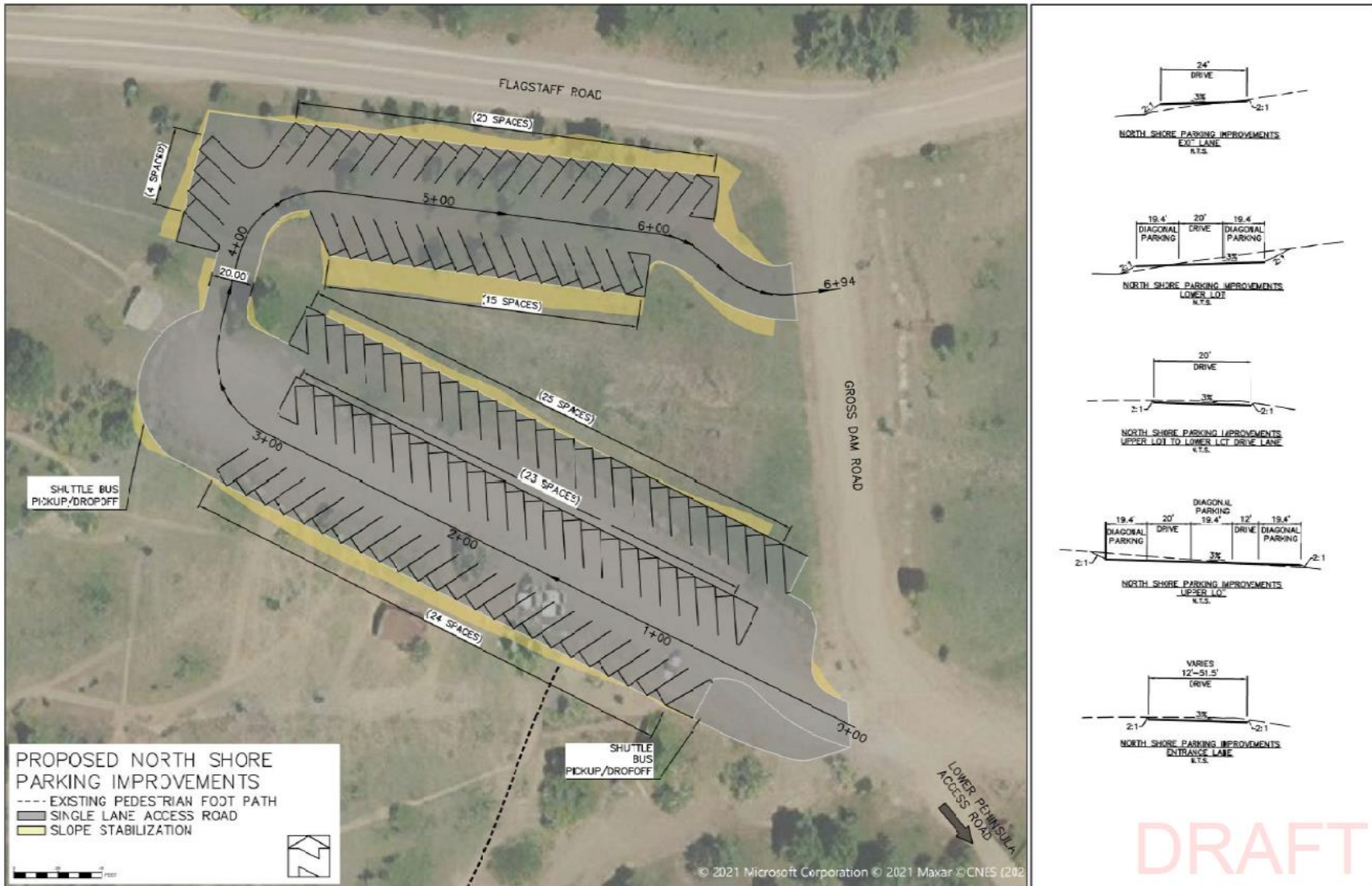


Figure 8: Proposed Northshore Recreation Area Parking Lot Improvements



Two floating barriers are proposed for the reservoir during the GRE Project construction phase. The first barrier will be used to restrict public boating on the reservoir surface close to the dam. The second barrier will be used to prohibit the public from getting too close to Osprey Point where blasting will occur during quarry activities.

A conceptual signage plan has been developed to provide clear notice of the closure of existing facilities on the south shore during construction and to guide recreation users to the Peninsula Recreation Area. The proposed signage plan will be coordinated between USFS and Denver Water.

Denver Water will also consider implementing additional temporary trash receptacles and toilet facilities at sites experiencing increased use. This could include adding portable toilets to open recreation sites during the summer boating season if necessary.

4.5.8 Signage and Notification

Denver Water has identified locations for temporary signage to alert the public to closures and construction activities related to the GRE Project. A layout of the temporary signage locations is provided on Figure 9. Specific appearance and language will be coordinated with Denver Water's Public Affairs Department and with USFS, as applicable.

Leading up to the start of construction and throughout construction, Denver Water will provide updates to the public related to recreation changes and access through a variety of channels. Depending on the information to be shared, the updates could take place through one or more of the following channels:

- On-site signage.
- Website, both GRE Project and Denver Water's Gross Reservoir Recreation page.
- Social media.
- Outreach to neighbors of Gross Reservoir.
- Outreach to recreation groups that frequent Gross Reservoir.
- Outreach to recreation outfits and retail stores.
- Email newsletters.

Denver Water will work to ensure the public is clearly informed on changes and closures related to recreation. These outreach mechanisms may change as the GRE Project progresses and more effective channels are identified.

Figure 9: Temporary Sign Locations



4.5.9 Safety and Security

The construction contractor, or its sub-contractor, in coordination with Denver Water’s Safety and Security team, will provide oversight for dam security and public safety. A security presence will be employed by the construction contractor to secure the project area.

Enforcement of Gross Reservoir rules and regulations is carried out by Denver Water Recreation Rangers, interns, and operations staff. Additionally, Denver Water contracts three Boulder County commissioned rangers for the summer boating season. Contracting a Boulder County Deputy for additional law enforcement presence is also being considered for weekends during the summer boating season.

Closures will be coordinated by the construction contractor in coordination with Denver Water. On-site and on-water closures will include those necessary for blasting activities to ensure all persons are safely at a distance from the blasting location. Additionally, buoy lines may be set up to prevent access to areas within construction areas.

Further information about site safety can be found in the Site-Specific Safety Plan. For safety purposes, closures will also occur in phases during tree removal activities around the reservoir. For details on measures to manage traffic and when tree removal is planned to occur, see section 2.2 and 3, respectively, in the Tree Removal Plan.

4.5.10 Next Steps

Next steps Denver Water will perform prior to temp RMP implementation include finalizing:

- The design of temporary recreation improvements, including final inventories for removal, storage, relocation, and purchase of recreation facilities items.
- Layouts, grading and specifications to be issued for construction bids.
- Structural details for concrete slabs for picnic areas and toilets.
- Signage requirements in coordination with Denver Water’s Public Affairs Department and, if applicable, USFS.
- Enforcement of parking and facilities use regulations.

4.6 Fiscal and Budgetary Commitments

4.6.1 General Management and Budgeting Procedures

Most recreation-related operating activities at Gross Reservoir are authorized and paid for by Denver Water’s Operations and Maintenance and Recreation budgets. Denver Water’s Recreation section employs a full-time, year-round ranger position at Gross Reservoir. This position’s primary focus involves all aspects of recreation at the reservoir including (but not limited to) safety, natural resource management, and facility maintenance. Denver Water also enters into an inter-governmental agreement annually with the BCSO to provide three rangers from mid-May through November 1. The BCSO Rangers carry limited commissions and are allowed to issue citations while also being in communication with Boulder County Dispatch.

Denver Water Caretakers also spend a portion of their work time assisting with recreation issues. Time is allocated to recreation as judged appropriate by caretaker staff. There is an area

of cross-over with respect to some activities at Gross Reservoir that could potentially be classified as either operations-related or recreation-related, such as repair of vandalized facilities. There are no written rules for allocating time to recreation, but caretakers use their best judgment to accurately reflect the actual allocation of time to recreation.

Recreation-related capital projects such as sign replacement, picnic tables, fire rings, and bathrooms are authorized and paid for by Denver Water's Recreation section. In addition to being involved in capital projects, recreation staff also is involved in intergovernmental issues at Gross Reservoir that involve contact with other governmental agencies.

4.6.2 Average Monthly and Annual Recreation-Related Expenses

Denver Water spent an average of \$197,382 annually for recreation-specific costs at Gross Reservoir over the last three calendar years between January 1, 2018 and December 31, 2020. Average monthly expenditures were \$16,449 over the same period. The data is based on Denver Water accounting statements. Expenses are assigned as "recreation-related." As noted above, cross-over exists between expenditures allocated to Recreation and to Operations and Maintenance, such as responding to illegal activity and regular road grading. Some expenditures largely allocated to operations (e.g., road grading) also serve visitors; recreation costs would likely be higher if such expenditures were allocated to recreation.

5. Agency Coordination and Review

This Recreation Management Plan is one of several required plans per the FERC Order. The FERC Order requires Denver Water to consult with USFS, USFWS, CPW, Boulder County, and Boulder County Sherriff Office for preparation of the Recreation Management Plan.

Denver Water provided a draft Recreation Management Plan to the above agencies for review and comment on April 15, 2021. All comments that were received on this plan are included in Appendix A. Denver Water reviewed and responded to all received comments and made necessary changes to this final Recreation Management Plan. A matrix of comments and Denver Water responses are provided in Appendix A. Consistent with the terms of 4(e) Condition 24, this Recreation Management Plan was approved by USFS prior to submittal to FERC (Appendix B).

6. Additional Tables

There are no additional tables to display at this time.

7. Additional Figures

7.1 Facilities Figures

7.1.1 *Single Vault Restroom Facility*



7.1.2 Double Vault Restroom Facility



7.1.3 Individual Picnic Site



7.1.4 Group Picnic Site



7.1.5 Natural Surface Trail

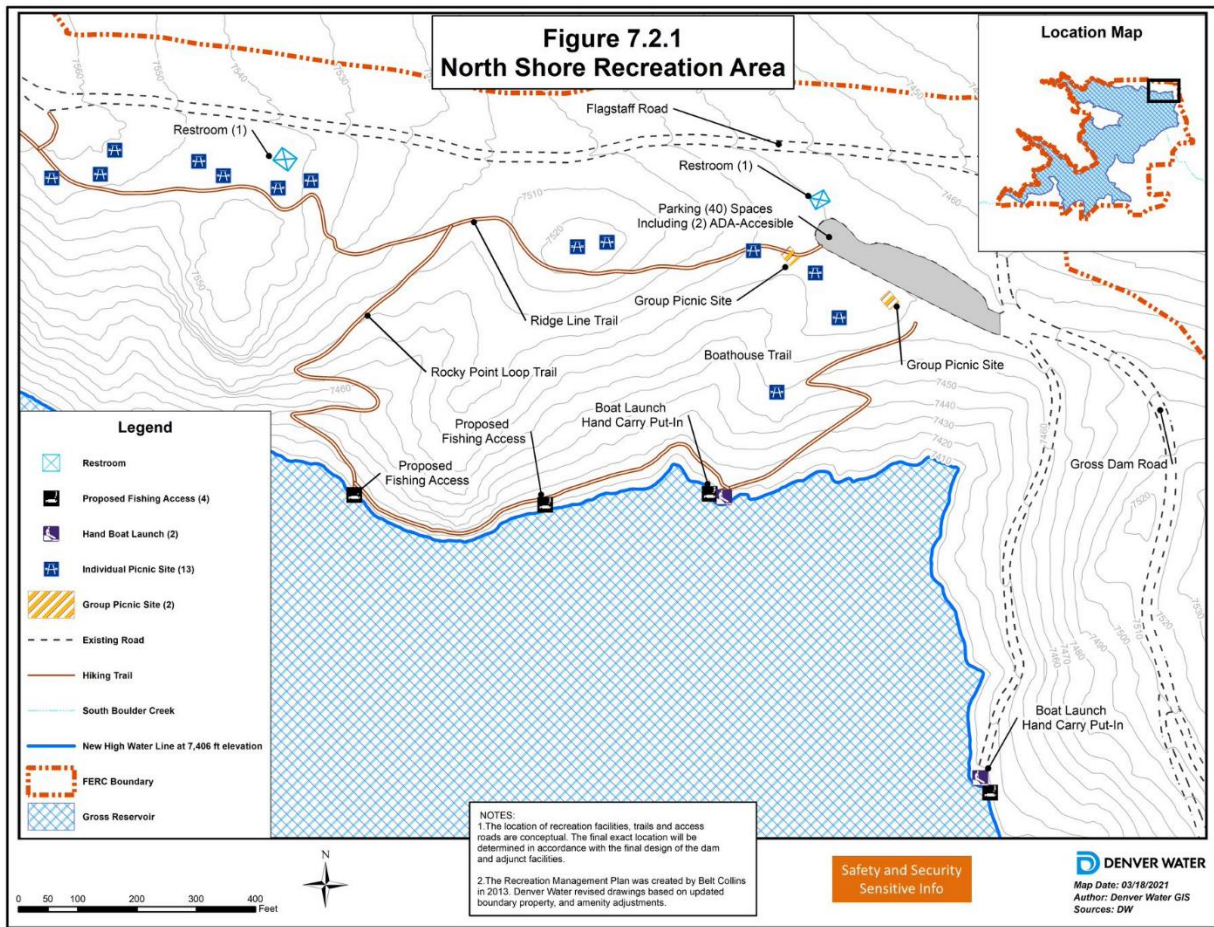


7.1.6 Crusher Fine Trail

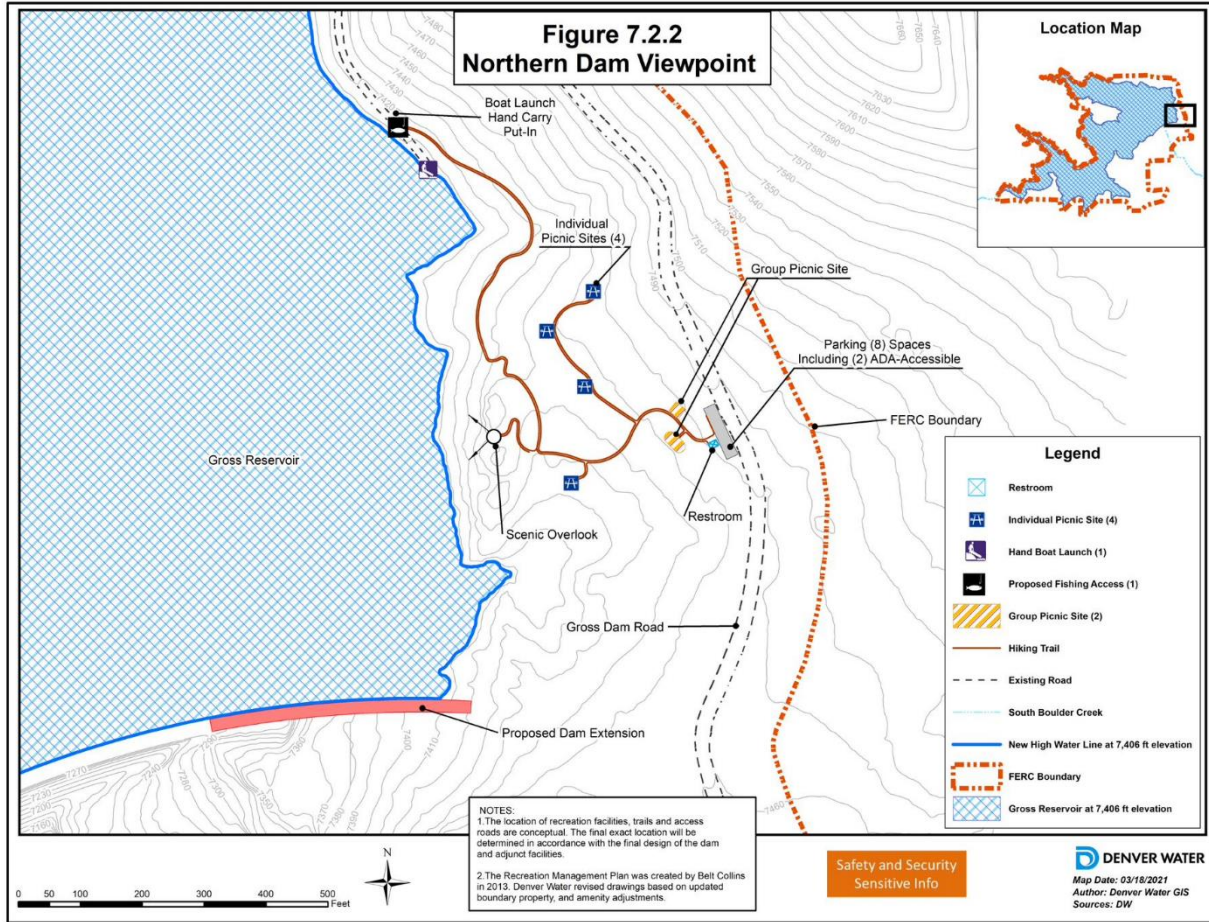


7.2 Gross Reservoir Map Figures

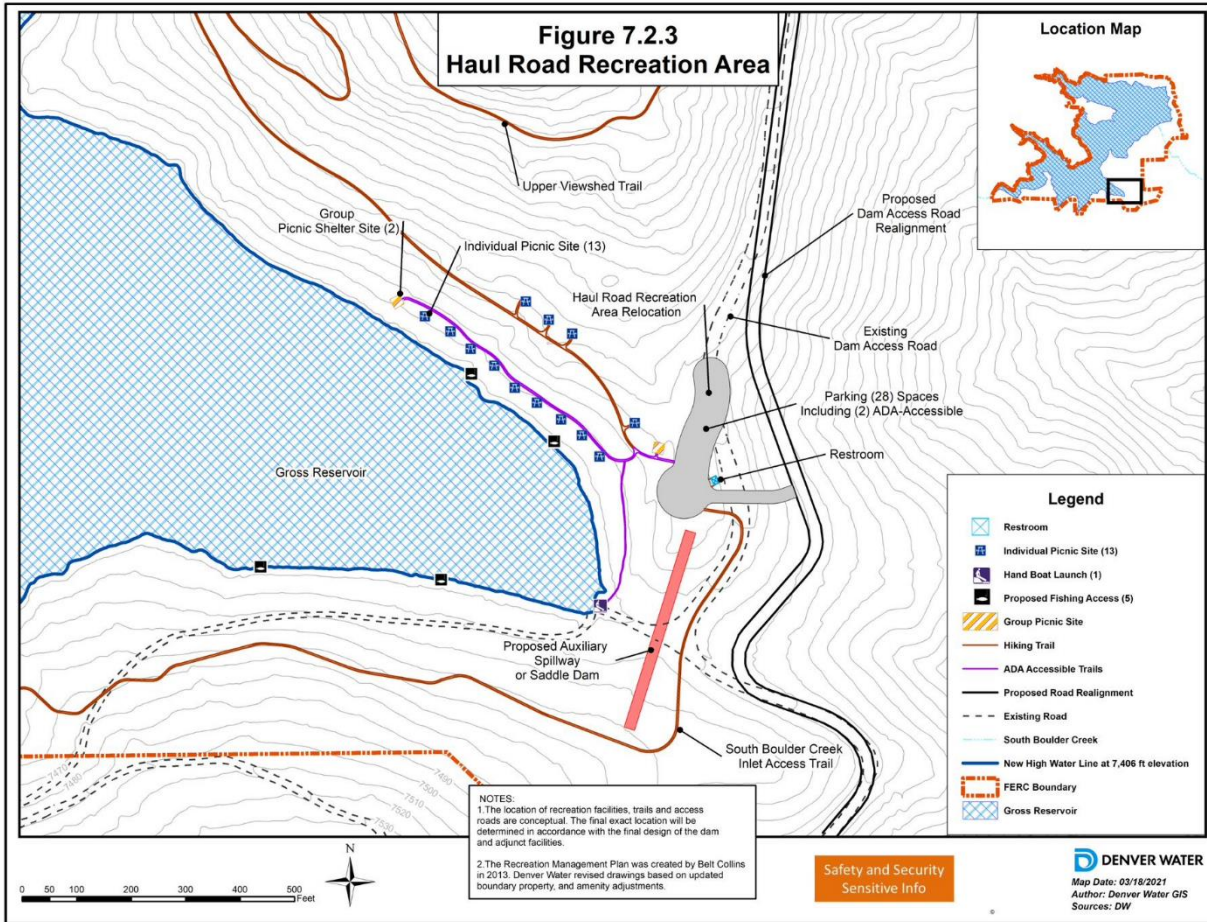
7.2.1 Map of North Shore Recreation Area



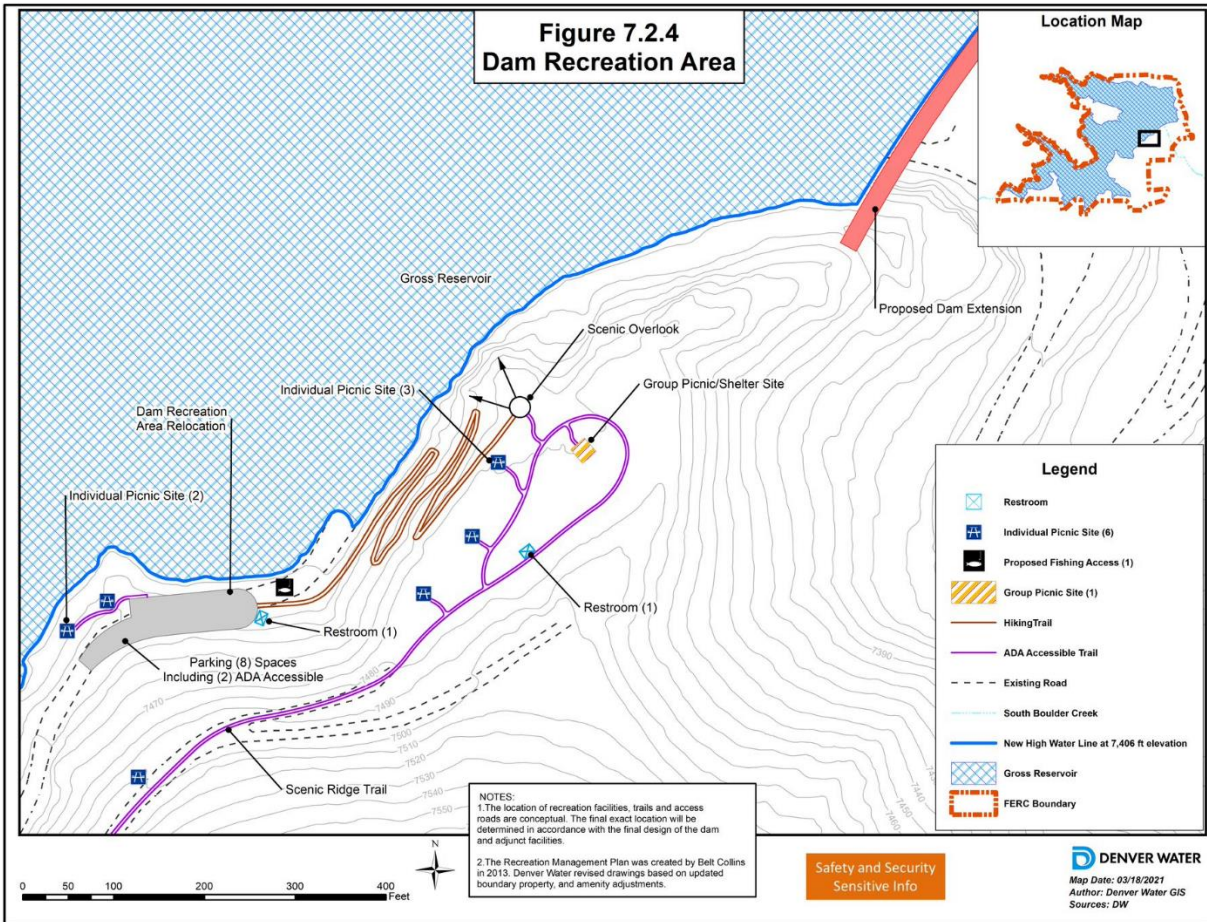
7.2.2 Map of Northern Dam Viewpoint (NEW)



7.2.3 Map of Haul Road Recreation Area (NEW)

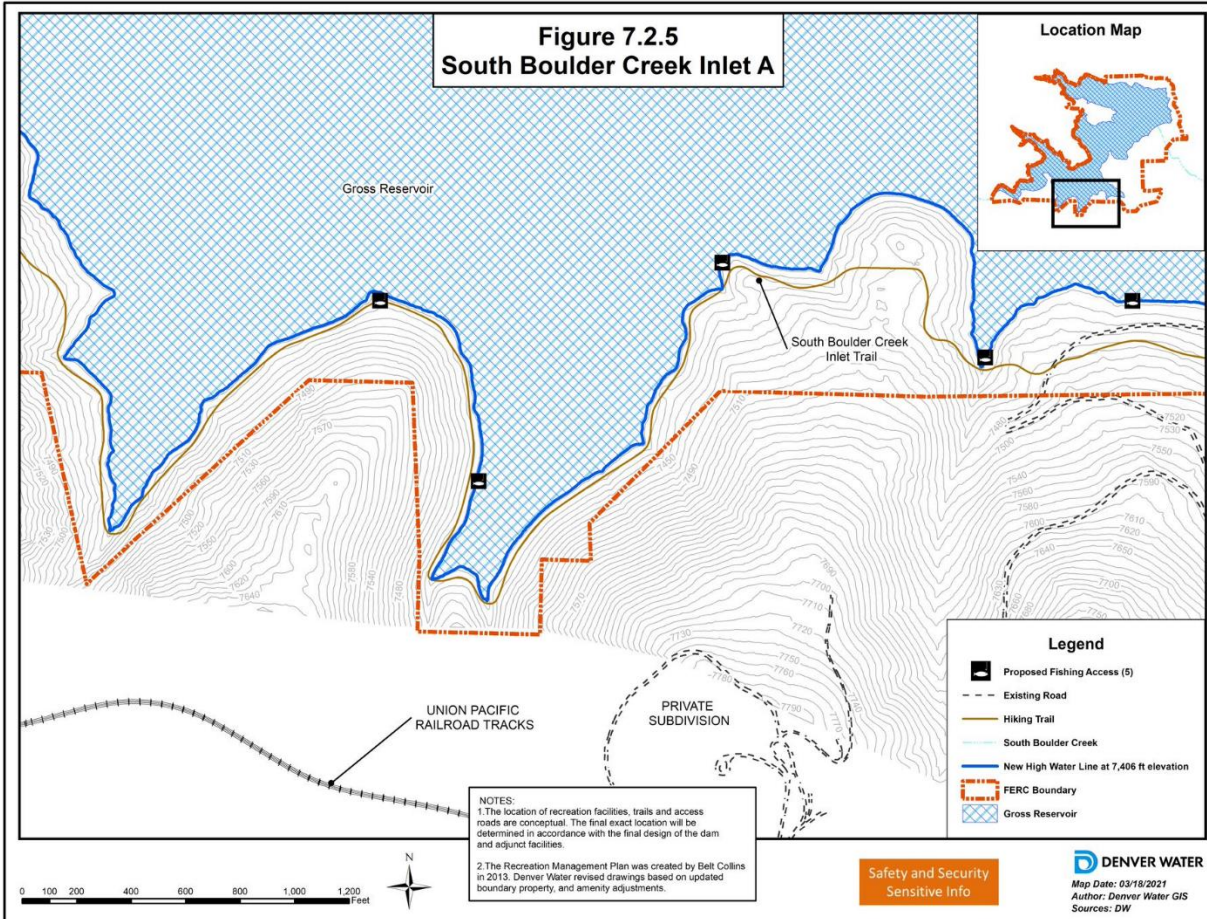


7.2.4 Map of Dam Recreation Area (NEW)

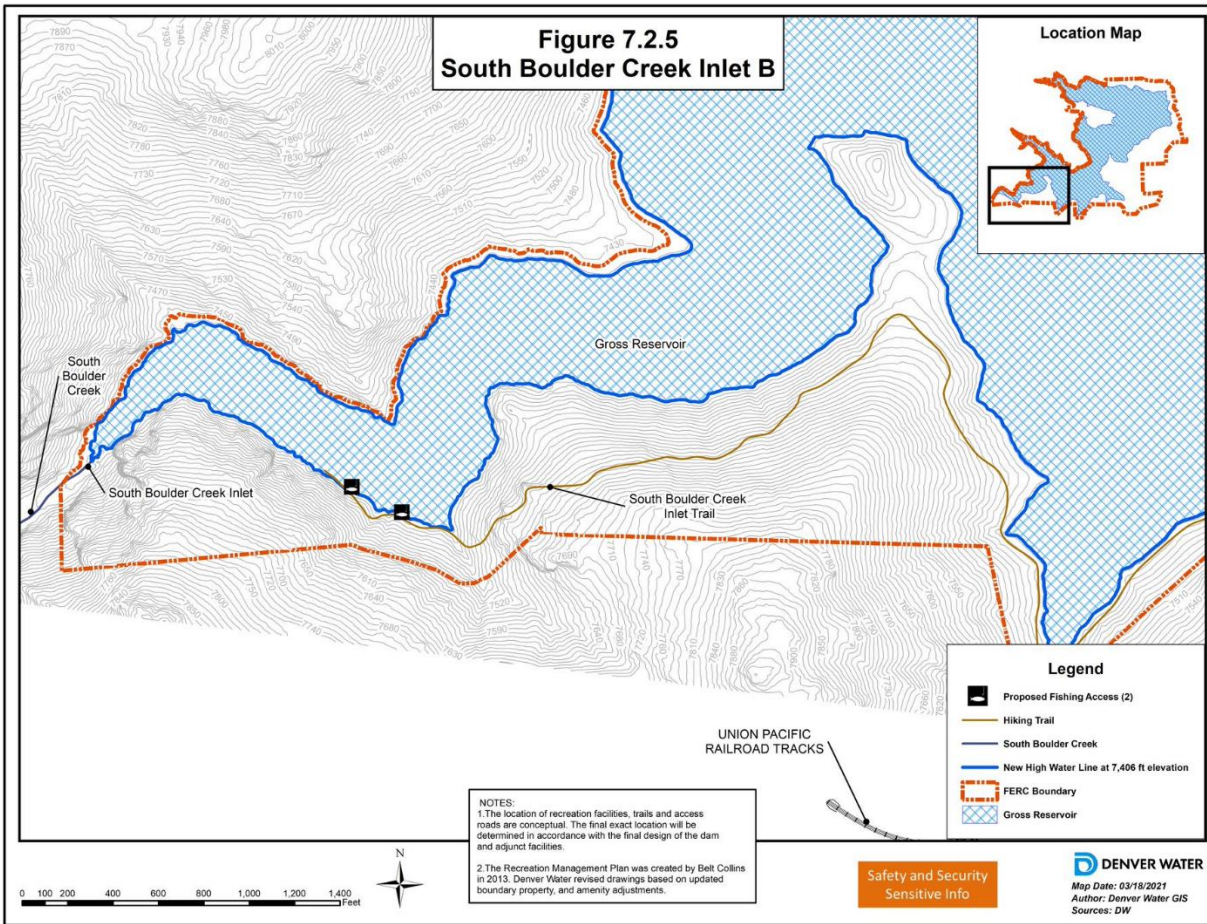


7.2.5 Map of South Boulder Creek Inlet Trail (NEW)

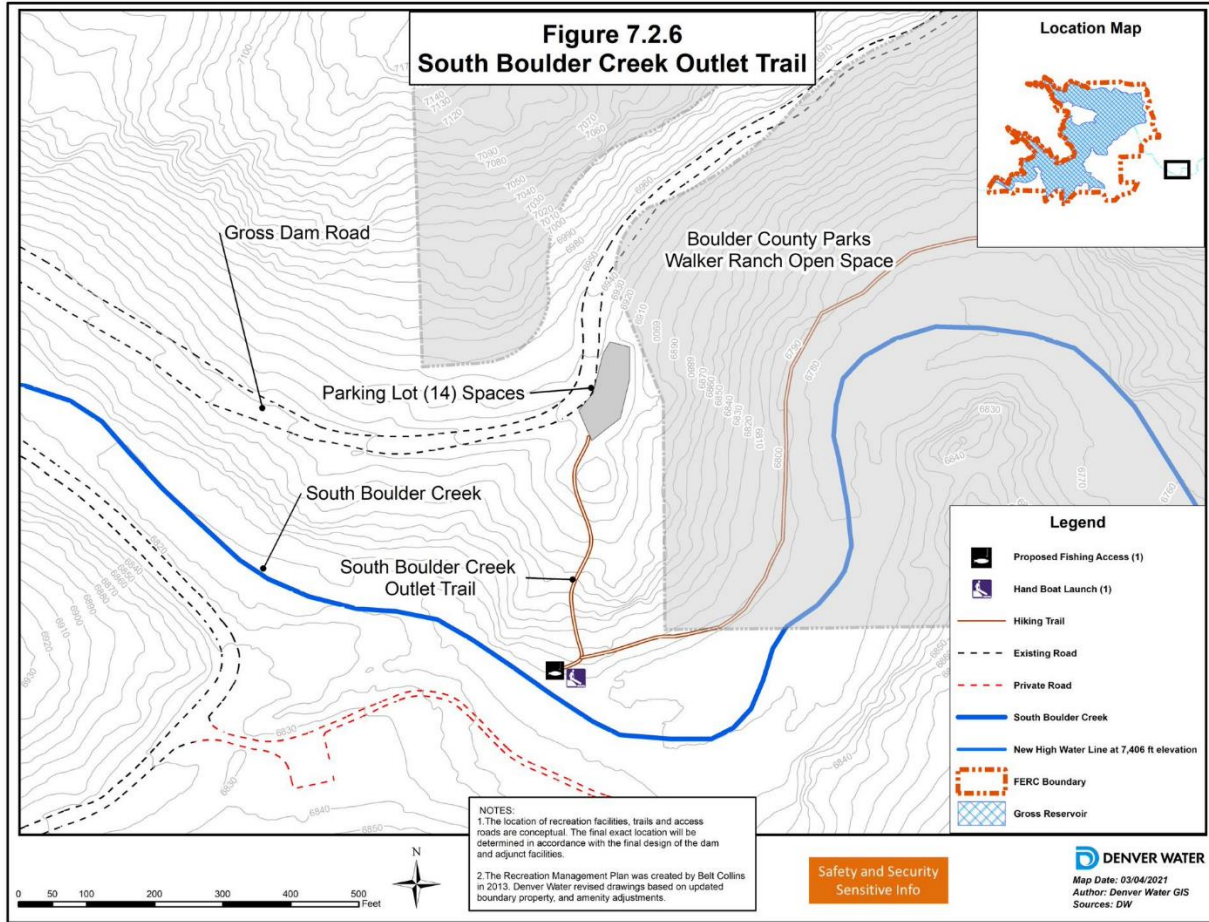
7.2.5.1 South Boulder Creek Inlet Trail A



7.2.5.2 South Boulder Creek Inlet Trail B

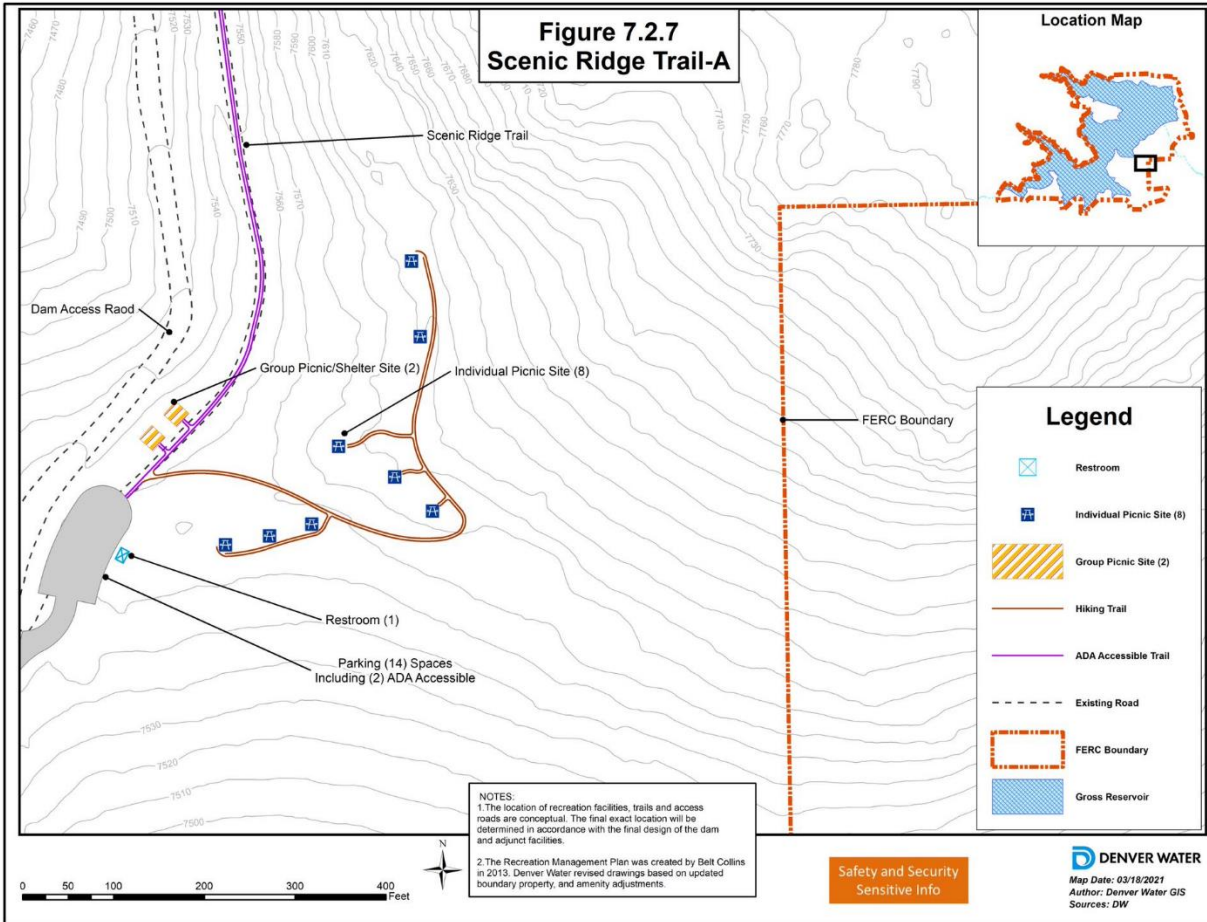


7.2.6 Map of South Boulder Creek Outlet Trail (EXISTING)

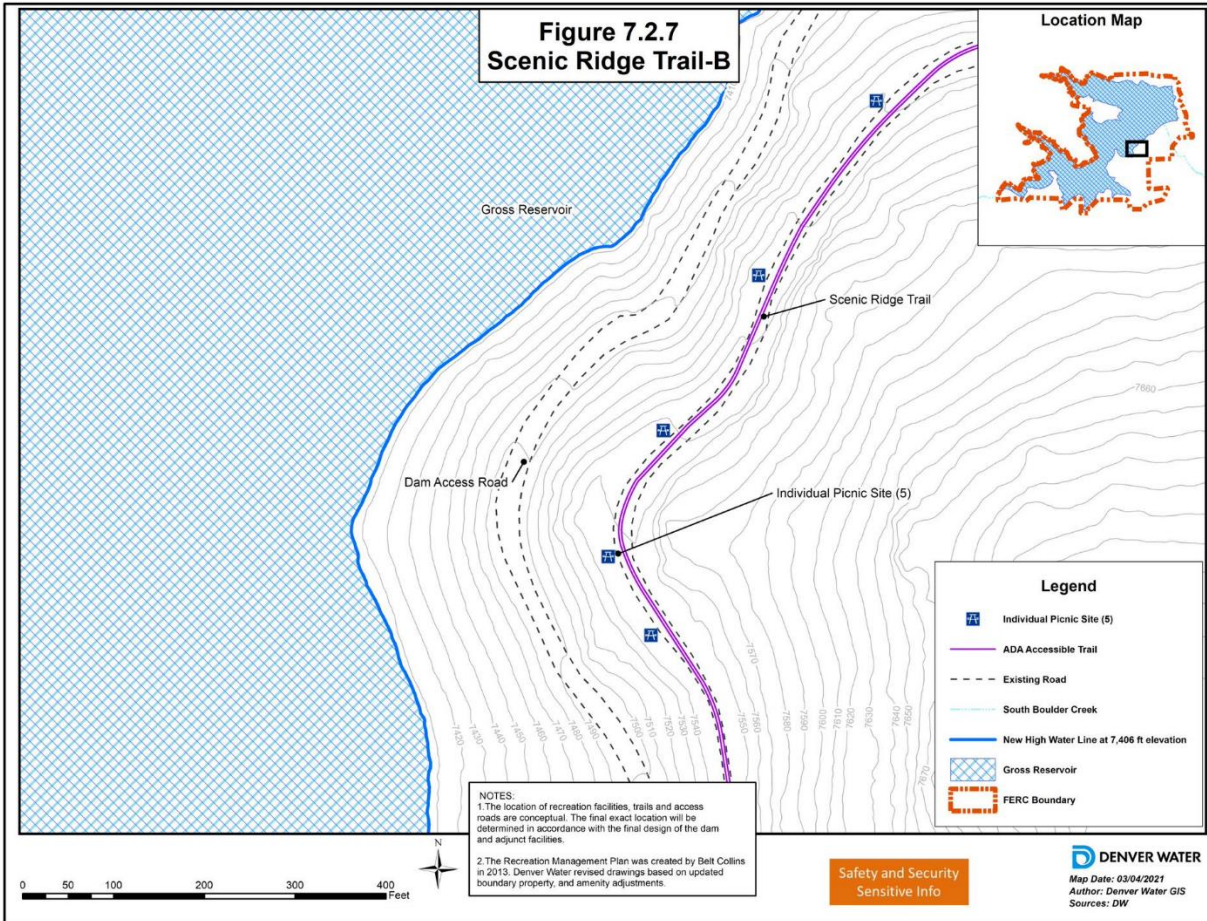


7.2.7 Map of Scenic Ridge Trail (NEW)

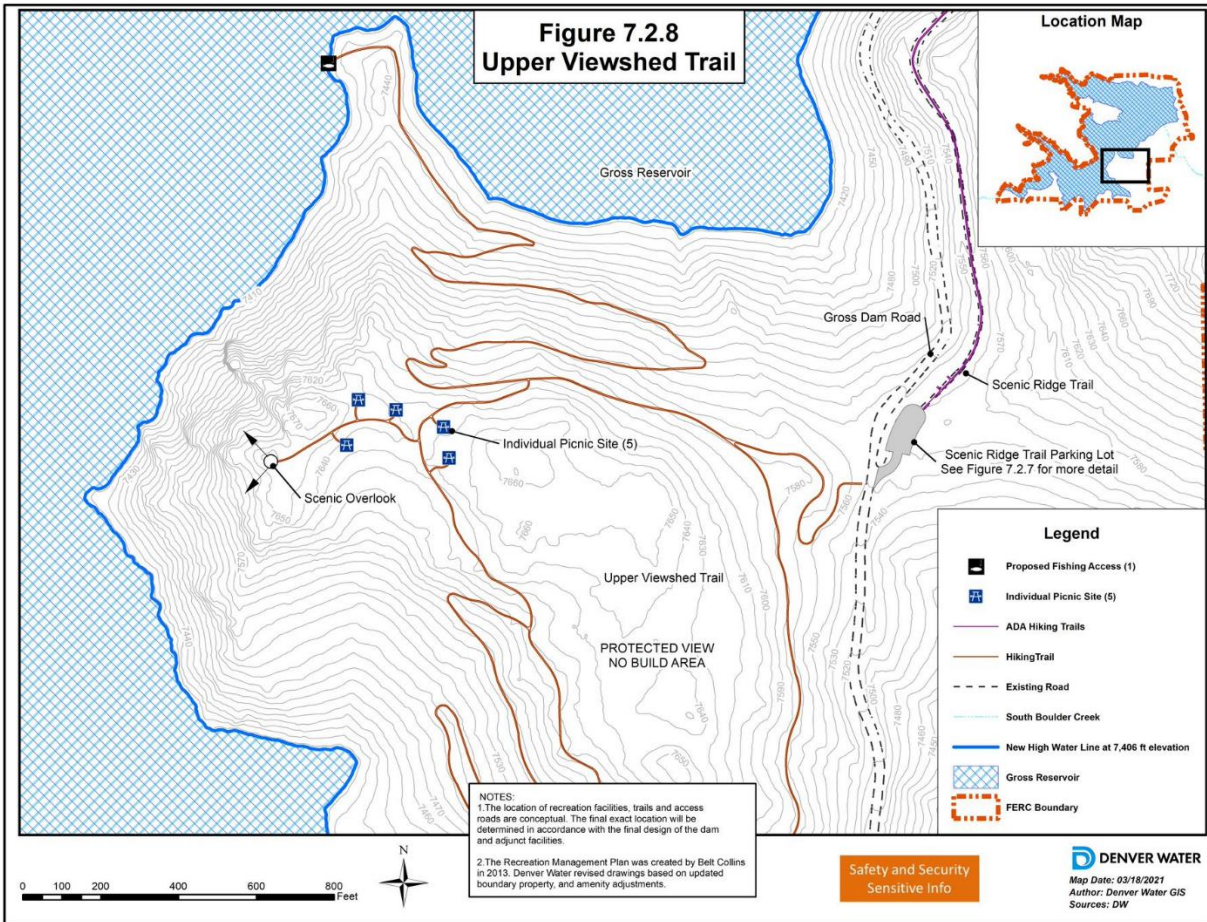
7.2.7.1 Scenic Ridge Trail A



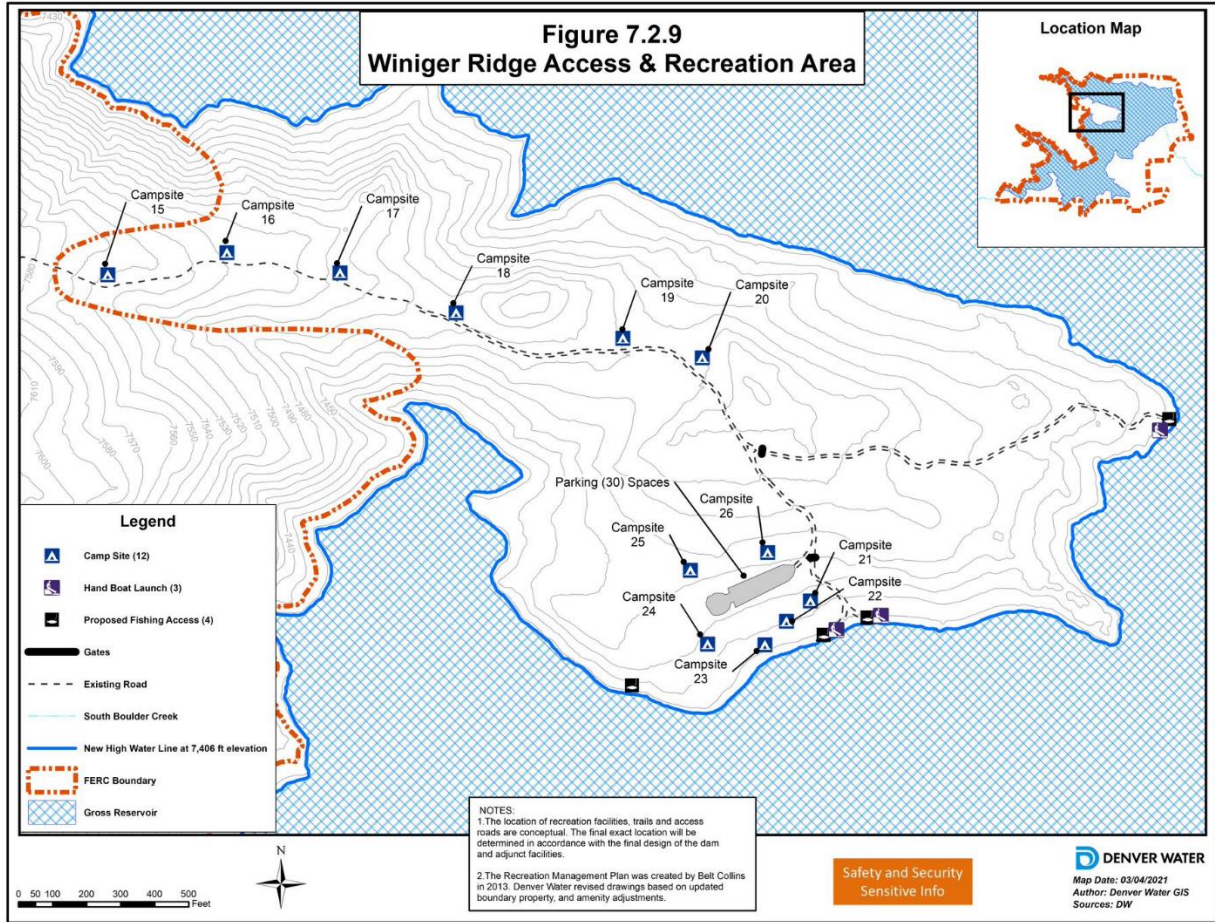
7.2.7.2 Scenic Ridge Trail B



7.2.8 Map of Upper Viewshed Trail (NEW)



7.2.9 Map of Winiger Ridge Access and Recreation Area (EXISTING)



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Appendix A: Stakeholder Coordination and Review

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**Draft Recreation Management Plan
Agency Comment Matrix**

Comment ID	Commenter Section Number	Commenter Page Number (or Figure Number)	Agency Comment	Denver Water Response	Denver Water Edits to Final Recreation Management Plan
U.S. Forest Service – 5/27/21					
USFS-01	1.5	11	Site specific nature of trails, campsites, picnic areas... This is a misleading statement, as all of these facilities can be moved to provide better opportunity, more sustainability, expansion, increased capacity. This is especially true for trail and campsite layout and design, making this agreement in the field with Forest Service staff confusing.	Denver Water agrees these facilities can be moved to provide better opportunities and mitigate resource damage as may be needed in the future. Coordination with USFS will occur to ensure a mutual understanding of recreation amenities.	Clarification was made that these facilities can move in the future with coordination between Denver Water and USFS.
USFS-02	1.5.1	11	2008 consultation – given this in 2021, is this still valid? Does it meet current recreation management goals and priorities? Future?	Section 1.5.1 is included to provide background to the reader on the history of this plan and previous meetings and consultations that have occurred leading up to this revised 2021 Recreation Management Plan.	None
USFS-03	1.5.1	12	Draft amendment Application 2009 – “reiterated the desire to not allow for increased recreation but maintain the facilities and opportunities that currently exist”- is this background or are you thinking that this 2009 recreation plan is still valid? Does it meet existing demand?	Section 1.5.1 is included to provide background to the reader on the history of this plan and previous meetings and consultations that have occurred leading up to this revised 2021 Recreation Management Plan.	None
USFS-04	1.5.1	12	Forsythe Falls – the primary hiking attraction will be removed. Have you thought through the displacement of this and where people might go? Are you thinking of extending the trail to manage the access along the lakeshore or letting visitors create their own path? With the primary attraction	Denver Water intends to keep the trail accessible and allow for lakeshore access. This location will continue to be a great area for picnic and fishing access.	None

Comment ID	Commenter Section Number	Commenter Page Number (or Figure Number)	Agency Comment	Denver Water Response	Denver Water Edits to Final Recreation Management Plan
			being removed, and there are no trail opportunities that exist, is there a need for a trailhead?		
USFS-05	2	14	Goals -	No comment provided.	None
USFS-06	3.1.3	16	Erosion – this indicates that the majority of erosion is from the undesignated roads and trails. What data do you have that supports this and how have you measured it? How are you managing both designated and undesignated roads and trails to alleviate this?	Denver Water has collected annual photo monitoring at specific sites to monitor resource impacts. Gross Reservoir staff actively manages undesignated roads and trails through use of slash, signage, fencing, or natural barriers if necessary. In the future, staff may also consider whether undesignated trails fulfill an unmet need and consult with partnering agencies about the feasibility of permanent designation.	None
USFS-07	3.1.4	16-17	Vegetation – not sure why this is here, and whether you’re trying to describe an effect to these resources	Information provided in Section 3.1.4 is provided as background information for the reader about the natural setting present at Gross Reservoir.	None
USFS-08	3.1.5	17-18	Fish and Wildlife -	No comment provided	None
USFS-09	3.1.7	19	Visual Resources Overview -	No comment provided	None
USFS-10	3.2.1-3.2.9	20-30	General Statement on Site Conditions - All = Multiple management challenges are listed for existing and new facilities. However there’s little/no mention how these “management challenges” will be addressed, except through adaptive management as needed. This Recreation Management Plan seems like the opportunity to do that. What recreation management and/or visitor use management strategies do you intend to implement and how do these tie to your Goals list on page 14?	Denver Water acknowledges that post-GRE Project parking lot layouts may be updated and reconfigured to help reduce traffic congestion and visitor stresses. The location and design of the new recreation areas will take into consideration existing management challenges. Denver Water is documenting recreation visitor information, stresses on resources, management challenges experienced now and during implementation of this plan. Denver Water can use this record as a tool to demonstrate the need for future changes to recreation areas, at which point we can pursue	None

Comment ID	Commenter Section Number	Commenter Page Number (or Figure Number)	Agency Comment	Denver Water Response	Denver Water Edits to Final Recreation Management Plan
				corrective action with necessary permitting agencies (as described in section 4.3).	
USFS-11	3.2.1-3.2.9	20-30	<p>General Statement on Trails and parking – may want to think big picture on connectivity for trails, where visitors are parking – and where you want them to go. User created trails are a result of the lack of recreation management and design, and not meeting a visitor demand/need (such as a trail that terminates before a scenic vista or waterfall- visitors will keep going); Therefore knowing what visitors are seeking can help you with the opportunities that provide and how you manage those. Trails are a facility that can be moved, as are parking area. Is it worth thinking through a larger trail opportunity plan now that may increase trail connectivity? Maybe it closes certain trails in some areas, adding them somewhere else.</p> <p>Erosion from trails is due to improper alignment – consider professional trail layout and design standards for existing trails. At a minimum, all trails on National Forest should adhere to USFS Handbook 2309.18.</p>	Denver Water will be monitoring trail conditions and connectivity as a part of this management plan. If additional trail connections are identified, Denver Water will work with the necessary permitting agencies. If new trails are constructed, Denver Water will ensure property alignment, layout and design standards are followed to reduce erosion. Denver Water will adhere to USFS Handbook 2309.18.	Added a statement in sections 3.2.1 through 3.2.9 pertaining to all new trail construction located in National Forest System lands adhering to USFS Handbook 2309.18
USFS-12	3.2.9	28-31	Winiger Ridge Access and Recreation Area – this ownership and management between Denver Water and Forest Service properties will likely continue to create confusion. Make every effort possible to provide for a	<p>Denver Water and USFS have been coordinating to ensure campsites are similar in appearance and enforcement is consistent.</p> <p>Boulder County Sherriff Office Rangers were given law enforcement approval for all sites on</p>	Added language to note the need to remain consistent in appearance and enforcement.

Comment ID	Commenter Section Number	Commenter Page Number (or Figure Number)	Agency Comment	Denver Water Response	Denver Water Edits to Final Recreation Management Plan
			consistent experience for the opportunities across the different ownership.	Winiger Ridge starting in 2019. Site amenities between USFS property and Denver Water property are now virtually the same. Section 3.3.3 addresses the commitment from Denver Water to coordinate with the USFS to ensure signage and enforcement are uniform.	
USFS-13	3.3.3	35	Sign Plan – does directional signage indicate vehicular route-finding signage to facilitate the access and circulation in 3.3.2 for visitors to find their destination?	In coordination with USFS, Denver Water will determine the type and location of signs for the Gross Reservoir site. If wayfinding directional signs are needed, Denver Water will identify the best locations for those signs.	Clarification was added to section 3.3.3 to acknowledge wayfinding signage.
USFS-14	3.3.4	35-36	According to Forest Service’s National Visitor Use Monitoring, the visitation numbers that we witnessed in 2020 were forecasted for the year 2040. Do you have recreation monitoring that forecasts out similar to this that you are using? It’s fair to state the uncertainty of whether these visitation numbers will remain in the next few years. However, these numbers are a window into what’s to come, do these 2020 visitation numbers make you think about what you can do now to be ready for the future, considering a design study from 2008?	<p>Denver Water acknowledges that COVID-19 related recreation increase numbers have provided a glimpse to what the future may look like. Denver Water Recreation does not currently have recreation forecasts numbers similar to those references by USFS.</p> <p>Denver Water would be interested in doing a joint study on potential recreation number increases and how to accommodate and plan for those increases. This aligns with the adaptive management strategies that are discussed in section 4.3 USFS recommended.</p>	None
USFS-15	3.3.4.1	37	Figure 3. Unclear what the asterisks are for next to the rec sites/trails?	The asterisks are there to delineate the locations whose counts are vehicle counts adjusted by a people-per-vehicle coefficient. This methodology is further described in Article 417.	Clarification was added to those figures in Section 3.3.4.1.
USFS-16	3.3.4.1	37-38	Figure 3-6 – these are good. Would also be helpful to know duration of visit and	Denver Water acknowledges this request and will attempt to capture this type of information in future Visitor Intercept Survey efforts which	None

Comment ID	Commenter Section Number	Commenter Page Number (or Figure Number)	Agency Comment	Denver Water Response	Denver Water Edits to Final Recreation Management Plan
			primary recreation activities engaged in. Maybe how far visitors drove?	are discussed in Article 417 Recreation Monitoring Plan.	
USFS-17	3.3.4.2	39	Future Implications – This is good too. It’s difficult to gage the short term impacts and displacement during construction. These short term effects are generally less important than the long term plan. That being said, it’s reasonable to believe that exposure to these lessor used sites may increase their demand after construction has been completed. When closing an area for construction, consider leaving another area open that provides for similar recreation activities and access.	Denver Water will work to maximize recreation opportunities when and where possible consistent with a safe and efficient construction process. Additional details are provided in section 4.4.4 and 4.5.	None
USFS-18	4	40-42	Recreation Management Strategies - General Statements – this section is heavy on rules, regulations, and enforcement. These are different things, and there doesn’t appear to be a recreation management strategy that applies to an issue to be resolved or ties to any goals, future desired conditions, or what is being proactively managed for.	Rules and regulations have been developed at Gross Reservoir to ensure visitor safety, resource protection, and provide an enjoyable experience for all visitors and staff. Many of these regulations are in line with state fishing and boating laws while others are in place to protect water quality and alleviate traffic congestion.	Additional clarification added to the plan.
USFS-19	4.1.1	42-45	Article 418, Condition 29 – Safety and Law Enforcement Plan – may need review for FS Law Enforcement and Investigations.	Denver Water is willing to provide a copy of the latest Safety and Law Enforcement Plan to USFS. An updated Article 418 will be submitted to USFS post project completion.	None
USFS-20	4.2.2	47-48	Winiger Ridge Dispersed Recreation – This is strong on monitoring and adapting to changed conditions, as requested by the Forest Service. Does it make sense to start thinking of this area of Winiger Ridge Recreation	Denver Water agrees and acknowledges USFS comment regarding Winiger Ridge campgrounds. Denver Water is prepared to discuss a better approach to recreation amenities on Winiger Ridge. There is a potential for more campsites with active management	No changes made at this time.

Comment ID	Commenter Section Number	Commenter Page Number (or Figure Number)	Agency Comment	Denver Water Response	Denver Water Edits to Final Recreation Management Plan
			<p>Area/Campground? Meaning – is the time ripe to look at designing campsites and locations that provide for better opportunities and the management challenges listed before? It doesn't appear that the existing campsites were designed as much as they were designated far enough apart. If any monitoring data supports it, new camping opportunities could provide for a variety of camping opportunities in concentrated areas and through more development scale/infrastructure. This would bump the one-to-one replacement, however, may likely lead to a better experience and resource protection to meet the intention.</p> <p>While this isn't the request under this condition, it would be an idea the Forest Service would likely pursue.</p>	<p>strategies (reservations, camp host, etc). As noted, because of the one-for-one replacement requirement, coordination must be done with FERC prior to any increases in recreation facilities within the FERC boundary.</p>	
USFS-21	4.3	48-50	<p>Adaptive Management Plan – This is all good information. And more aligns with recreation management strategies and visitor use management.</p>	<p>Denver Water acknowledges this comment.</p>	<p>None</p>
USFS-22	4.3.4 C	50	<p>Modified Trail construction/design – as mentioned above, understanding the use type, demand, and patterns, and using proper trail design and construction will alleviate almost all erosion issues and less user-created trails. There are a variety of techniques that can be used on fall line trails where reconstruction cannot occur,</p>	<p>In instances where reconstruction is not feasible, trail hardening techniques through use of aggregate or stone will be considered.</p>	<p>Additional clarification on reconstruction details were added.</p>

Comment ID	Commenter Section Number	Commenter Page Number (or Figure Number)	Agency Comment	Denver Water Response	Denver Water Edits to Final Recreation Management Plan
			such as trail hardening through stone pitching could occur.		
USFS-23	4.4.3	51	Facilities and Trails Condition Monitoring – consider measurements of trails, sites, etc in addition to the photos	Denver Water will identify opportunities to capture measurements of trails, sites, etc in addition to photo monitoring. This may include point sampling by recording depth and width of trail segments and monitoring them annually for changes.	Clarification was made to include a measurement point of reference in photo monitoring.
USFS-24	4.4.4	50-51	Trails rehab of social trails – May consider if a trail is closed, will it be created again – and whether there’s a need for it. Generally, full decompaction of 12-18 inches depth has been most success. Local, native seed sources work best – including spoils from the surrounding trail area. In this arid environment, imported materials such as netting are overkill and unsightly. Wildlands Restoration Volunteers have very good methods for this type of rehab.	Nearby spoils from native vegetation sources can be used to encourage regrowth in restoration areas. If natural regrowth is unsuccessful, seeding of the mix in Table 5 will be done at the rate indicated and then the area will be raked with metal-tined rakes. In extreme cases, the area will be mulched with certified weed-free straw and jute netting will be applied over the straw, then anchored with rocks, logs, and/or biodegradable staples.	Additional clarification provided in plan.
USFS-25	4.5	54-60	Temporary Recreation Mgmt Plan – this is good.	Denver Water acknowledges this comment.	None
Boulder County – Public Works – Mike Thomas – June 1, 2021 – Received June 8, 2021					
BC-PW-01			Due to higher visitation expected both short-term and long-term, the applicant must develop a plan to mitigate parking overflow onto county roads as part of the Dam construction and future recreation site improvements.	Denver Water actively works to reduce the overflow of parking onto county roads by posting clear and sufficient signage and addressing illegal parking via citations. Denver Water has coordinated with the Boulder County Sherriff's Office as well as local residents to address/prevent overflow parking along Flagstaff Rd in 2020. The current FERC Order does not allow Denver Water to increase recreation amenities at this	None

Comment ID	Commenter Section Number	Commenter Page Number (or Figure Number)	Agency Comment	Denver Water Response	Denver Water Edits to Final Recreation Management Plan
				time. Denver Water heard from many local residents that increases to recreation were not desired which is a large reason why the FERC Order does not allow for additional amenities to be added at this time. Additional parking areas and capacity may be increased in the future with approval by FERC. Article 417 goes into further detail regarding monitoring efforts (car counts, trail counts, citation tracking, etc.)	
BC-PW-02			Increased dust from increased use of the gravel roads will create air quality concerns on Gross Dam Road and adjacent properties once the project is completed and recreational activities resume. The recreational management plan must address dust control on adjacent roadways.	The current facility has gravel roads and the GRE Project is not changing the road base during or after the project. Dust control during the GRE Project construction is addressed in the Traffic Management Plan.	None
BC-PW-03			It is noted on p. 34 of the plans that it addresses traffic from Lakeshore Park to Magnolia on CR 68. The applicant must recognize that this is a “Jeep” road that does not have a maintenance level to support regular traffic. Additionally, the plan calls out the city of Boulder, but should state Boulder County.	Denver Water acknowledges that County Road 68 from the termination of Flagstaff Road to Magnolia Road is a “Jeep” road. Section 3.3.2 is used for orienting the reader to the roads in the area and the mention of City of Boulder is not intended to denote ownership of roadways.	Edits made to section 3.3.2 to clarify CR 68 vs 68J.
Boulder County – Community Planning & Permitting – Amelia Willits – May 28, 2021 – Received June 8, 2021					
BC-CPP-01			Anticipated recreational traffic and parking for individual sites is outlined in detail in the Recreation Management Plan. However, impacts and challenges for each recreational area are identified, but no mitigation strategies are presented. Denver Water states that the organization will	At this time, the FERC Order does not allow increases in any recreation amenity, including parking spaces. Denver Water may be able to recognize improved layouts for parking lots with the relocation of some recreation amenities with the completed GRE Project. However, identifying increase parking areas is not possible with the current FERC Order. Section 4.3	None

Comment ID	Commenter Section Number	Commenter Page Number (or Figure Number)	Agency Comment	Denver Water Response	Denver Water Edits to Final Recreation Management Plan
			continually monitor the impact, but without mitigation strategies, staff has concern that recreation parking issues will continue without resolution.	outlines potential mitigation measures that may be put in place.	
BC-CPP-02			Inconsistency in the collected recreation data is acknowledged by the applicant. Denver Water states that all visitor counting technology and methodology will be updated by the end of 2021. Accurate data is vital for staff to evaluate the impact of the proposal. Corrected data must be provided to staff prior to BOCC hearing.	Data collected from summer 2019 to today is accurate and corrected. The comment in the plan addresses missing data from the beginning of 2019 that had to be extrapolated.	None
Boulder County – Parks & Open Space – June 1, 2021 – Received June 8, 2021					
BC-POS-01			<p>3. Article 8 requires that impacts to “Public outdoor recreation and open space areas” be addressed (at 8-507-D-7-b-vi-A). The county’s Walker Ranch open space is adjacent to Denver Water property, and the reservoir dam itself is only about 1500 feet from the closest part of Walker Ranch. With the enlargement of the reservoir, and the expected increase in visitation to Denver Water properties and adjacent US Forest Service lands, there will be unavoidable increased impacts to visitation at Walker Ranch.</p> <p>However, Denver Water’s April 15, 2021, draft Recreation Management Plan mentions Walker Ranch a single time, in reference to the September 2000 wildfire. The actual 1041 application has a short descriptive</p>	<p>Denver Water acknowledges recreation has increased at Gross Reservoir, as is the case for all areas around the state in the last year. As stated in the Recreation Management Plan, Denver Water will continue to work with local jurisdictions to better understand recreation amenity needs at Gross Reservoir as conditions evolve.</p> <p>However, consistent with FERC’s order, Denver Water has not included expanded recreational facilities as part of the design for this project. The current FERC order, which sets the guidelines for recreation at Gross Reservoir, does not allow for any increases in recreation amenities, including parking. During the FERC process, Denver Water also heard from many residents that increases to recreation amenities were not wanted.</p>	None

Comment ID	Commenter Section Number	Commenter Page Number (or Figure Number)	Agency Comment	Denver Water Response	Denver Water Edits to Final Recreation Management Plan
			<p>paragraph about Walker Ranch, mentions the Walker Ranch homestead structures as cultural resources, and correctly states that Flagstaff Road, a county road that runs through Walker Ranch, is the primary access route to Gross Reservoir for the public.</p> <p>From an indirect impacts point of view, increased visitation to the reservoir and adjacent federal lands, and increased public traffic on Flagstaff Road, will certainly impact the county park. The federal definition of indirect impacts is that they are “caused by the action and are later in time or farther removed in distance.” Indirect impacts to Walker Ranch would be caused by a dam expansion. Finally, cumulative impacts have not been described and analyzed in the application, nor in subsequent materials.</p>	<p>Because Denver Water is not expanding recreational facilities or access at Gross Reservoir as part of this project, the federal agencies’ analysis does not predict that this project will cause major visitation increases at the reservoir or surrounding areas, such as Walker Ranch. Denver Water remains committed to coordinating with Boulder County on recreational issues in the future, including through possible future amendments to this recreation plan if warranted by observed conditions and visitation patterns.</p> <p>The indirect and cumulative impacts analyses identified in this comment were performed by the U.S. Army Corps of Engineers and FERC in the Final Environmental Impact Statement and Supplemental Environmental Assessment for the project. Those agencies properly responded to all comments submitted by Boulder County during the federal permitting process.</p>	

Copy of Agency Comments provided to Denver Water

Denver Water provided a template to agencies to aid in the review of agency comments. Some agencies provided comments using the template and some agencies provided Denver Water with comments in either email or letter form. Below are copies of all letters received by required agencies.

Recreation Management Plan Agency Comment Matrix

Please provide your agency's comments in the template provided below. Example entries provided for reference.

Agency/Department USFS Recreation

Date of comments: 05/27/2021

Section Number	Page Number (or Figure Number)	Comment
1.5	11	Site specific nature of trails, campsites, picnic areas... This is a misleading statement, as all of these facilities can be moved to provide better opportunity, more sustainability, expansion, increased capacity. This is especially true for trail and campsite layout and design, making this agreement in the field with Forest Service staff confusing.
1.5.1	11	2008 consultation – given this in 2021, is this still valid? Does it meet current recreation management goals and priorities? Future?
1.5.1	12	Draft amendment Application 2009 – “reiterated the desire to not allow for increased recreation but maintain the facilities and opportunities that currently exist” - is this background or are you thinking that this 2009 recreation plan is still valid? Does it meet existing demand?
1.5.1	12	Forsythe Falls – the primary hiking attraction will be removed. Have you thought through the displacement of this and where people might go? Are you thinking of extending the trail to manage the access along the lakeshore or letting visitors create their own path? With the primary attraction being removed, and there are no trail opportunities that exist, is there a need for a trailhead?
2	14	Goals -
3.1.3	16	Erosion – this indicates that the majority of erosion is from the undesignated roads and trails. What data do you have that supports this and how have you measured it? How are you managing both designated and undesignated roads and trails to alleviate this?
3.1.4	16-17	Vegetation – not sure why this is here, and whether you’re trying to describe an effect to these resources
3.1.5	17-18	Fish and Wildlife -
3.1.7	19	Visual Resources Overview -
3.2.1-3.2.9	20-30	General Statement on Site Conditions - All = Multiple management challenges are listed for existing and new facilities. However there’s little/no mention how these “management challenges” will be addressed, except through adaptive management as needed. This Recreation Management Plan seems like the opportunity to do that. What recreation

		management and/or visitor use management strategies do you intend to implement and how do these tie to your Goals list on page 14?
3.2.1-3.2.9	20-30	<p>General Statement on Trails and parking – may want to think big picture on connectivity for trails, where visitors are parking – and where you want them to go. User created trails are a result of the lack of recreation management and design, and not meeting a visitor demand/need (such as a trail that terminates before a scenic vista or waterfall- visitors will keep going); Therefore knowing what visitors are seeking can help you with the opportunities that provide and how you manage those. Trails are a facility that can be moved, as are parking area. Is it worth thinking through a larger trail opportunity plan now that may increase trail connectivity? Maybe it closes certain trails in some areas, adding them somewhere else.</p> <p>Erosion from trails is due to improper alignment – consider professional trail layout and design standards for existing trails. At a minimum, all trails on National Forest should adhere to USFS Handbook 2309.18.</p>
3.2.9	28-31	Winiger Ridge Access and Recreation Area – this ownership and management between Denver Water and Forest Service properties will likely continue to create confusion. Make every effort possible to provide for a consistent experience for the opportunities across the different ownership.
3.3.3	35	Sign Plan – does directional signage indicate vehicular route-finding signage to facilitate the access and circulation in 3.3.2 for visitors to find their destination?
3.3.4	35-36	According to Forest Service’s National Visitor Use Monitoring, the visitation numbers that we witnessed in 2020 were forecasted for the year 2040. Do you have recreation monitoring that forecasts out similar to this that you are using? It’s fair to state the uncertainty of whether these visitation numbers will remain in the next few years. However, these numbers are a window into what’s to come, do these 2020 visitation numbers make you think about what you can do now to be ready for the future, considering a design study from 2008?
3.3.4.1	37	Figure 3. Unclear what the asterisks are for next to the rec sites/trails?
3.3.4.1	37-38	Figure 3-6 – these are good. Would also be helpful to know duration of visit and primary recreation activities engaged in. Maybe how far visitors drove?
3.3.4.2	39	Future Implications – This is good too. It’s difficult to gage the short term impacts and displacement during construction. These short term effects are generally less important than the long term plan. That being said, it’s reasonable to believe that exposure to these lessor used sites may increase their demand after construction has been completed. When closing an area for construction, consider leaving another area open that provides for similar recreation activities and access.
4	40-42	Recreation Management Strategies - General Statements – this section is heavy on rules, regulations, and enforcement. These are different things, and there doesn’t appear to be a

		recreation management strategy that applies to an issue to be resolved or ties to any goals, future desired conditions, or what is being proactively managed for.
4.1.1	42-45	Article 418, Condition 29 – Safety and Law Enforcement Plan – may need review for FS Law Enforcement and Investigations.
4.2.2	47-48	<p>Winiger Ridge Dispersed Recreation – This is strong on monitoring and adapting to changed conditions, as requested by the Forest Service. Does it make sense to start thinking of this area of Winiger Ridge Recreation Area/Campground? Meaning – is the time ripe to look at designing campsites and locations that provide for better opportunities and the management challenges listed before? It doesn't appear that the existing campsites were designed as much as they were designated far enough apart. If any monitoring data supports it, new camping opportunities could provide for a variety of camping opportunities in concentrated areas and through more development scale/infrastructure. This would bump the one-to-one replacement, however, may likely lead to a better experience and resource protection to meet the intention.</p> <p>While this isn't the request under this condition, it would be an idea the Forest Service would likely pursue.</p>
4.3	48-50	Adaptive Management Plan – This is all good information. And more aligns with recreation management strategies and visitor use management.
4.3.4 C	50	Modified Trail construction/design – as mentioned above, understanding the use type, demand, and patterns, and using proper trail design and construction will alleviate almost all erosion issues and less user-created trails. There are a variety of techniques that can be used on fall line trails where reconstruction cannot occur, such as trail hardening through stone pitching could occur.
4.4.3	51	Facilities and Trails Condition Monitoring – consider measurements of trails, sites, etc in addition to the photos
4.4.4	50-51	Trails rehab of social trails – May consider if a trail is closed, will it be created again – and whether there's a need for it. Generally, full decompaction of 12-18 inches depth has been most success. Local, native seed sources work best – including spoils from the surrounding trail area. In this arid environment, imported materials such as netting are overkill and unsightly. Wildlands Restoration Volunteers have very good methods for this type of rehab.
4.5	54-60	Temporary Recreation Mgmt Plan – this is good.



Public Works

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June 1, 2021

To: Summer Frederick, AICP, Planning Manager

From: Mike Thomas, P.E., County Engineer

Subject: Docket SI-20-0003, Gross Reservoir & Dam Expansion;
Denver Water Board May 11, 2021 Resubmittal

I have reviewed the most recent Denver Water Board (DWB) Re-referral packet and have the following comments on the submitted and associated referral documents:

Recreation Monitoring and Management Plans

1. Due to higher visitation expected both short-term and long-term, the applicant must develop a plan to mitigate parking overflow onto county roads as part of the Dam construction and future recreation site improvements.
2. Increased dust from increased use of the gravel roads will create air quality concerns on Gross Dam Road and adjacent properties once the project is completed and recreational activities resume. The recreational management plan must address dust control on adjacent roadways.
3. It is noted on p. 34 of the plans that it addresses traffic from Lakeshore Park to Magnolia on CR 68. The applicant must recognize that this is a “Jeep” road that does not have a maintenance level to support regular traffic. Additionally, the plan calls out the city of Boulder, but should state Boulder County.

Quarry Construction and Post-Project Reclamation

1. The applicant is required to obtain a Boulder County Stormwater quality permit prior to start of work. This is in addition to the Stormwater Discharge Permit required by the State of Colorado Department of Public Health and Environment.
2. Construction of the quarry will create loosened soils and potential for degradation of the water quality of the reservoir. The applicant must identify permanent erosive soil containment beyond the completion and reclamation of the quarry site prior to filling of the reservoir.

Tree Removal Plan

1. The tree removal plan still does not address final hauling traffic patterns. Waiting until contracting with a vendor to remove the trees does not account and plan for potential impacts up front, but rather pushes off the analysis and decision for an

extended period of time. The applicant must analyze the worst-case scenario in order to account for potential traffic impacts.

2. Soil loosening and degradation due to tree removal operations has not been addressed in the plan. The time differential between tree removal and final filling of the reservoir may be significant and cause severe erosion into the reservoir. This, in turn, would cause significant concern about the water quality not only in the reservoir, but also at the outlet of the dam into S. Boulder Creek. The applicant must address this issue and develop a soil stabilization plan prior to the BOCC Hearing on this 1041 application for all areas of disturbance prior to filling of the reservoir.

90% Roadway Improvements Plans

1. A letter of credit for all road improvements in the amount of 125% of the estimate project costs on the Boulder County segment of Gross Dam Road / CR 77S (south of the Union Pacific Railroad tracks), along with an approved Roadway Construction Permit, will be required prior to project construction. No construction will take place until both are received and signed off by Boulder County.
2. The applicant must apply for a separate Design Exception (DE) for each design element that does not meet Boulder County MultiModal Transportation Standards (MMTS). Use the latest DE application form, explaining in detail all seven points as identified in the application. Application for a DE does not automatically approve the DE.
3. Show proposed road widths on all plan views.
4. Show roadway details in standard symbology – existing information in *italics*, proposed information in vertical font.
5. Identify on the plan and profile sheets which typical section is used in each roadway segment on plan views.
6. All retaining walls greater than four vertical feet from bottom of footer to top of wall must have details with a stamp and signature by a Colorado Registered Professional Engineer; all walls designed at greater than six feet must include calculations supporting the design.
7. All culvert additions need to show extensions of horizontal and vertical straight lines, or else all bends must have a manhole, or else the entire pipe must be replaced.
8. All flow velocities in culverts must be less than 3 fps per the Boulder County Storm Drainage Criteria Manual (SDCM), or outlet mitigation must be included in the design.
9. Show outlet treatment on the culvert shown at Sta 258+78.00.
10. Show calculations that size all riprap used on the project.
11. All regraded drainage ditches must be sized to handle 2-yr storm flows (50% storm flow potential) or, at a minimum, pre-construction flows.
12. All slopes must be 2H:1V or flatter unless it is shown that a slope can be maintained on competent bedrock; all cut and fill slopes will be stabilized with suitable vegetation.
13. All fill slopes must use material of R-40 strength or better, compacted to 95% density or better.
14. New road surfacing must be a minimum depth of 4" Aggregate Base Course, Class 6.

15. The applicant must execute a maintenance agreement with Boulder County on all county maintained roads used by the applicant prior to starting haul operations on those roads.
16. Cut and fill vegetation seeding must meet Boulder County Parks and Open Space specifications.
17. Sheet C.301 – the leader to “PROPOSED EASEMENT” does not specifically identify any area or line. Provide proposed or potential easement information on the plans.
18. Sheet C.302, ff. – the leader for “EXIST. PROP ESMT.” is confusing. Is it an existing property easement? If so, provide documentation proving such.
19. Provide cross sections at 20-foot intervals along the cut and fill slopes for all grading on Grading sheets.

This concludes my comments at this time. All previous comments made on this docket remain in full force unless addressed by this review or in the re-referral packet and associated documents.



Community Planning & Permitting

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May 28, 2021

TO: Summer Frederick, Planning Division Manager; Community Planning & Permitting, Development Review Team - Zoning

FROM: Amelia Willits, Engineering Development Review Planner II; Community Planning & Permitting, Development Review Team – Access & Engineering

SUBJECT: Docket # SI-20-0003: Gross Reservoir & Dam Expansion - Denver Water Material Submittal to Boulder County May 13, 2021 Referral Comments

3817 Gross Dam Road, at parcel number 1579258000006

The Development Review – Access & Engineering Team has reviewed the materials submitted May 13, 2021 by Denver Water Board (DWB) and have the following comments. Please note, these referral comments are in addition to those provided by Mike Thomas, P.E., County Engineer, under separate cover.

Traffic Management Plan

1. Throughout the Traffic Management Plan (TMP) it is stated that the final truck routes will not be provided due to market conditions for tree removal or other construction commodities. As haul traffic significantly impacts the Boulder County road system and surrounding communities, these haul routes must be drafted and submitted to staff prior to public hearing by the Boulder County Commissioners (BOCC).
2. The TMP indicates traffic delays traveling behind heavy trucks of 12 minutes on Magnolia Road and 25.5 minutes while traveling on Forest Road 359 and Lazy Z Road. Staff prefers shorter traffic delays but prioritizes safe truck travel. Signage informing the traveling public of time delays must be posted by the applicant on roads that will experience delays due to heavy truck traffic.
3. Nightwork is planned for the dam foundation and quarry excavations. Trucks must refrain from the use of engine brakes during night hours unless engine brake mufflers are used.
4. Figure 2: Local GRE Project Construction Routes indicates that Flagstaff Road is to be used only as a workforce route. Staff's preference is that all project activities use State Highway 72 and Gross Dam Road. If the use of Flagstaff Road is still planned to be used for workforce access, the applicant must provide a rationale as to why this route must be used. This rationale must be provided to staff prior to the BOCC hearing.
5. Colorado Department of Transportation's (CDOT) Floyd Hill Project on I-70 is indicated as a potential overlapping project which may interfere with tree removal traffic. The

applicant must provide an alternate route plan which takes this potential conflict in consideration. This route plan must be submitted to staff prior to BOCC hearing.

6. All detour route maps and the Incident/Emergency Response Plan must be submitted to staff prior to BOCC Hearing for staff to consider the impacts.
7. The Public Awareness Strategies applied by the applicant must include coordination with Boulder County Public Information officers. The TMP must be updated to include this information.
8. No mention of coordination with Boulder County is included in the discussion of the Road Management Plan that the applicant plans to develop with the US Forest Service.

90% Traffic Impact Study

1. The need for possible additional analyses for Magnolia Road, Lazy Z Road, and USFS roads are postulated, but not included in the report. The worst-case scenarios must be modeled and prepared for prior to BOCC Hearing.
2. Staff required that the 3.0 passenger car equivalency figure be supported by a rationale. The report simply states that it is a CDOT requirement. Evidence must be provided for this CDOT requirement.
3. Boulder County is extremely concerned about the safety of bicycle traffic on SH 72 due to the significant increase of heavy truck traffic. Applicant is advised to look at options to improve safety on SH 72 for the duration of this project.

Recreation Management and Monitoring Plans

1. Anticipated recreational traffic and parking for individual sites is outlined in detail in the Recreation Management Plan. However, impacts and challenges for each recreational area are identified, but no mitigation strategies are presented. Denver Water states that the organization will continually monitor the impact, but without mitigation strategies, staff has concern that recreation parking issues will continue without resolution.
2. Inconsistency in the collected recreation data is acknowledged by the applicant. Denver Water states that all visitor counting technology and methodology will be updated by the end of 2021. Accurate data is vital for staff to evaluate the impact of the proposal. Corrected data must be provided to staff prior to BOCC hearing.
3. The Recreation Monitoring Plan states that the plan is designed for an initial evaluation period, which is listed as the initial three (3) years of the project. In order to evaluate the impact to the community and the roadways, plans for the entire duration of the project must be provided, as well as the succeeding three (3) years. An updated Recreation Monitoring Plan must be provided to staff prior to BOCC hearing.

This concludes my comments at this time. All previous comments made on this docket remain in full force unless addressed by this review or in the re-referral packet and associated documents.



Parks & Open Space

5201 St. Vrain Road • Longmont, CO 80503
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www.BoulderCountyOpenSpace.org

TO:	Summer Frederick, Planning Manager, CP&P
FROM:	Ron West & Jeff Moline, Planning Division
RE:	SU-20-0001, Gross Reservoir Expansion, Third Submittal
DATE:	June 1, 2021

Staff reiterates that the information submitted in Denver Water’s original 1041 application, and subsequently submitted materials, are inadequate for thorough 1041 analysis, as well as to ensure that 1041 standards are met with respect to environmental resources.

The following comments do not summarize all POS referral comments. The earlier memos -- dated December 17, 2020, and March 29, 2021 -- are incorporated here by reference.

The following submittal materials continue to lack information necessary for 1041 review:

1. Field inventories for the 12 plant species referenced on page 3 of the April 1, 2021, memo from Andy Herb, AlpineEco, to Brian Gogas, Denver Water.

Staff notes that the 2010 plant field inventories were largely limited to “presence/absence” surveys. Such surveys are not adequate to analyze impacts to these species. Additionally, four of these species were not even considered in the 2010 targeted surveys, and thus even presence/absence data is lacking.

Attachment A of this memo is a list of “Plant species of special concern potentially occurring in the Gross Reservoir expansion area.” The above 12 species are included, however there are an additional 23 species that are classed as “3,” which means that they are “potentially present,” and that, according to the attachment, there is “No documentation of presence.” Yet of these 23, 18 species were not even included in the targeted presence/absence field work, so “no documentation of presence” cannot be determined.

Two examples are worth noting – both *Carex saximontana* and *Carex torreyi* are known from Boulder County, and the Colorado Natural Heritage Program (CNHP) considers both to be “critically imperiled” in the state. Habitats for these two species, again from Attachment A, is “woodlands and dry canyons,” and “gulches in outer foothills near Boulder,” respectively. These are very much like habitats near Gross Reservoir.

Denver Water’s April 28, 2021, response to agency referral comments states that a “Special Status Plants Relocation Plan” will be completed at some time in the future. This is not adequate to evaluate impacts under the 1041 regulations at this time. The memo also states that, “...plant species of local concern” will be addressed then, yet field surveys for up to 22 species, based on the above discussion (4 + 18 species), have never occurred, and the other species have only had presence/absence information collected, which again is inadequate to analyze impacts.

In Table 2 of this memo, 35 plant community types of local/county concern are identified as known or likely to occur. These community types were not considered, or surveyed, or addressed in any of the EIS documents. Of these 35 communities, 13 are considered by CNHP to be “critically imperiled” (S1) or “imperiled” (S2) in the state. Yet for a project that would eliminate 465 acres of riparian and upland communities, these communities were neither considered nor inventoried.

Article 8-507-D-b-iv requires that the application, “Describes the impacts and net effect that the activity would have on terrestrial...plant life.” The current studies do not meet this standard.

2. Field inventories for select county-concern wildlife species also were not completed. The most important example is Preble’s Meadow Jumping Mouse (PMJM) – a federally-threatened species. Page 2 of the March 29, 2021, POS comments states, “Staff’s assessment is that suitable habitat is present in the project area. In addition, in the 2006 USFWS letter they state, ‘Should additional information regarding listed or proposed species become available, this determination may be reconsidered under the ESA.’ Recent Boulder County captures of Preble’s [on the adjacent Walker Ranch] is additional information and warrants further investigation.” Yet Denver Water’s April memo states that, “Reinitiated consultation with the [USFWS]...is not warranted.”

Staff continues to assert that suitable habitat is present and that the applicant should survey for the mouse. The successful trapping of PMJM on Walker Ranch clearly shows that it could inhabit the riparian areas to be flooded by the reservoir expansion. The Gross Reservoir riparian areas are only two to three miles distant from the known population, and only 200 vertical feet higher in elevation.

However, *regardless* of whether the USFWS endangered species process should be reconsidered, a field inventory for PMJM is still required under the 1041 regulations. For projects located in Natural Resource Areas of statewide importance (the shore lines of Gross Reservoir are such), Article 8-507-D-5 states that the application materials must include a) “A survey of habitat of applicable species,” and b) “...an analysis of the effects of the proposed development upon wildlife species within the designated wildlife habitat.” Analysis of effects is impossible to determine without a trapping survey for PMJM.

Article 8-511-B-5-f also addresses impacts to terrestrial wildlife and specifically to endangered species, including “Changes to habitat...including...any other habitat features necessary for the protection...of any terrestrial animals,” and “Changes in number of threatened or endangered species.”

At Article 8-507-D-7-b-vi-A, it is required to “...detail the potential impact of the proposal upon... Environmental Resources as defined in Article 18.” Article 18 defines Environmental Resources as including the Comprehensive Plan mapped resources as well as “Boulder County Species of Special Concern.” As documented in earlier POS referrals, there is also a large number of county wildlife species of special concern that have not been addressed nor inventoried.

Page 10 of the April 28 document from Denver Water states that, “The resource studies and surveys completed for federal and state agency reviews were comprehensive and provide a sufficient basis for Boulder County to review the Project’s effects to plant and animal resources....” And further that, “We believe...field surveys of federal species is an adequate

assessment of sensitive species within the inundation area.” Based on the above discussion of 1041 requirements, staff still requires further information to thoroughly conduct its review.

3. Article 8 requires that impacts to “Public outdoor recreation and open space areas” be addressed (at 8-507-D-7-b-vi-A). The county’s Walker Ranch open space is adjacent to Denver Water property, and the reservoir dam itself is only about 1500 feet from the closest part of Walker Ranch. With the enlargement of the reservoir, and the expected increase in visitation to Denver Water properties and adjacent US Forest Service lands, there will be unavoidable increased impacts to visitation at Walker Ranch.

However, Denver Water’s April 15, 2021, draft Recreation Management Plan mentions Walker Ranch a single time, in reference to the September 2000 wildfire. The actual 1041 application has a short descriptive paragraph about Walker Ranch, mentions the Walker Ranch homestead structures as cultural resources, and correctly states that Flagstaff Road, a county road that runs through Walker Ranch, is the primary access route to Gross Reservoir for the public.

From an indirect impacts point of view, increased visitation to the reservoir and adjacent federal lands, and increased public traffic on Flagstaff Road, will certainly impact the county park. The federal definition of indirect impacts is that they are “caused by the action and are later in time or farther removed in distance.” Indirect impacts to Walker Ranch would be caused by a dam expansion. Finally, cumulative impacts have not been described and analyzed in the application, nor in subsequent materials.

4. As stated in the March 29 POS referral memo, Denver Water is required to prepare an addendum to the current Visual Resource Protection Plan. Staff believes more information is necessary to address 1041 criteria pertaining to visual impacts. The submitted “Visual Simulations from Key Locations” are rudimentary and insufficient, and the set of “key locations” implies that the new eastern dam face would only be visible from very limited locations.

A standard GIS scenic “viewshed” analysis must be completed, that shows the terrain from which the dam will be visible. This is a basic analysis for any visual impact study. This will likely show that a large dam expansion will be significantly more visible from many areas, including parts of Walker Ranch, Eldorado Canyon State Park, and private lands. One of the most visible public views will be from passenger train service on the nearby railroad line; to staff’s knowledge this has not been addressed.

Staff finds that the visual resources of the area would be impacted by: a) the inundation of 465 acres of the landscape, and its replacement with a significantly-expanded drawdown area, or “bathtub ring” for much of the year; b) the inundation of the Forsythe Canyon waterfall; and c) increasing the dam height by 131 vertical feet, and nearly doubling the width of the crest to 1940 feet. These would significantly degrade viewsheds and scenic vistas.

Toll Property. Given snow conditions, staff has not had an opportunity to visit the property to confirm resource values in the field. Staff remains concerned with how Denver Water would

ensure the protection of these values, by transferring title. It is the responsibility of the applicant to guarantee protection of these resources in perpetuity.

Quarry Operations and Reclamation plans. Except for the plant species noted below, staff has no significant comments on these documents. The former plan is mostly an extensive effort in engineering and construction, while the latter plan is largely adequate.

The following plant species cannot be used for revegetation; they are not native to Boulder County (see p. 25 in the Reclamation Plan).

- *Bromus marginatus*
- *Poa compressa*
- *Pseudoroegneria spicata* (this is a W. Slope species; *Elymus lanceolatus* would be acceptable)
- *Thinopyrum intermedium*
- *Echinacea purpurea* (this is horticultural; *E. angustifolia* would be acceptable)
- *Penstemon strictus* (many other, native penstemons would be acceptable)

**Appendix B:
USFS Approval Letter**

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File Code: 2770
Date: July 2, 2021

Melissa Brasfield
Communications Specialist
via email
grossreservoir@denverwater.org

Dear Ms. Brasfield:

According to Articles 416, 422 and 423 of the Federal Energy Regulatory Commission Order Amending and Extending License Term dated July 16, 2020, Denver Water submitted final Recreation Management, Invasive Species Management and 2021 Tree Removal Plans, respectively, to the Forest Service for approval. The final Recreation Management Plan was submitted on June 29, 2021, the final Invasive Species Management Plan was submitted on June 9, 2021, and the final 2021 Tree Removal Plan was submitted on June 10, 2021.

I appreciate the opportunity to review and comment on the draft plans prior to our final review of the plans.

I am approving the final Invasive Species Management Plan as submitted on June 9, 2021, and the 2021 Tree Removal Plan as submitted on June 10, 2021. The final Recreation Management Plan, submitted on June 29, 2021, satisfies condition 24 of the Gross Reservoir license amendment.

If you have any questions, please contact Mike Johnson at 970-531-9609 or at Michael.johnson6@usda.gov

Sincerely,

MONTE
WILLIAMS

Digitally signed by
MONTE WILLIAMS
Date: 2021.07.02
15:04:10 -06'00'

MONTE WILLIAMS
Forest Supervisor

