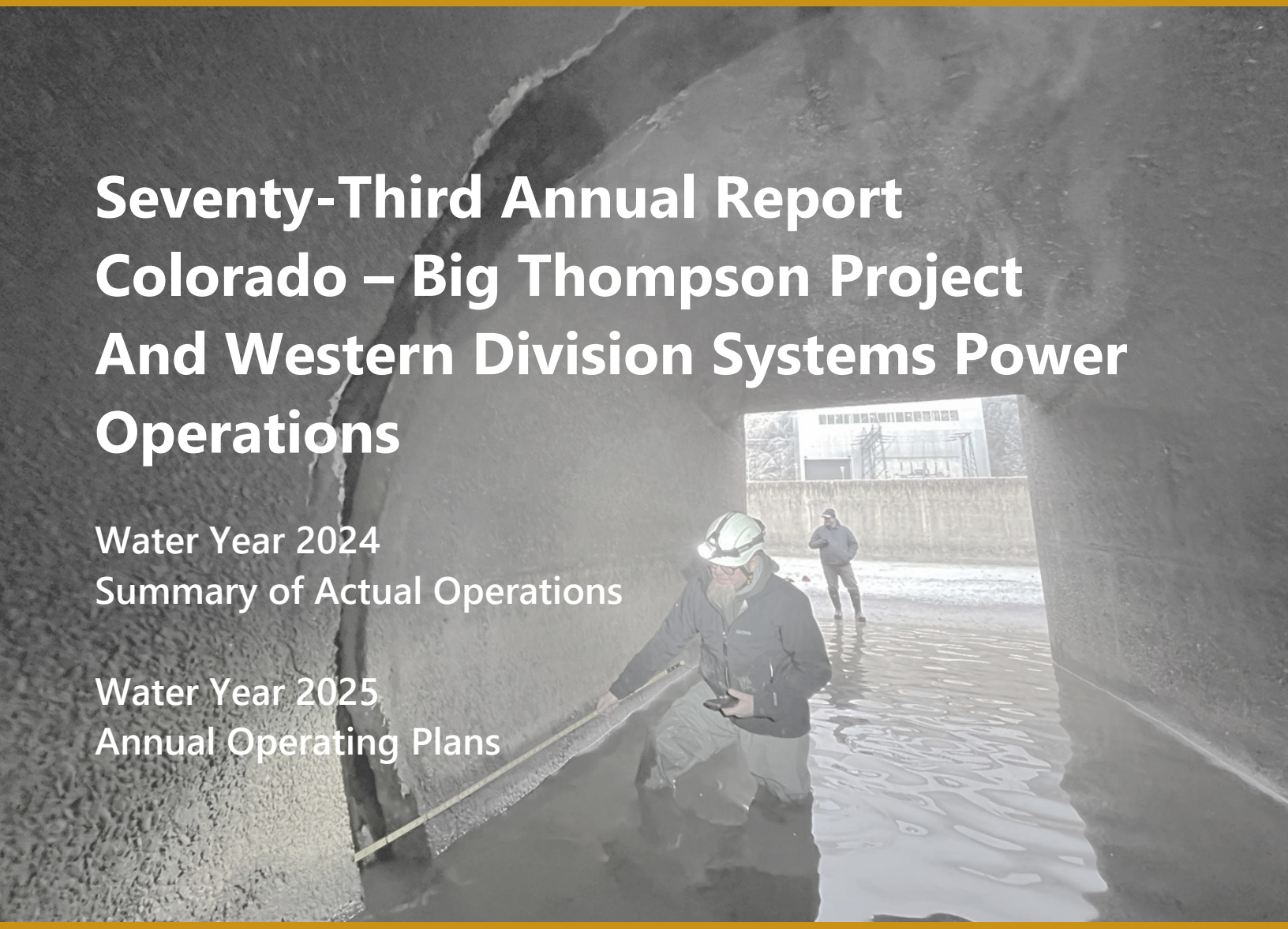
BUREAU OF RECLAMATION

Annual Operating Plans

Seventy-Third Annual Report Colorado – Big Thompson Project And Western Division Systems Power Operations

Water Year 2024
Summary of Actual Operations

Water Year 2025
Annual Operating Plans



December 13, 2023: Pole Hill Afterbay Outlet Siphon

Eastern Colorado Area Office
Missouri Basin Region

U.S. Department of the Interior

April 2025

Missions Statements

The U.S. Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; honors its trust responsibilities or special commitments to American Indians, Alaska Natives, Native Hawaiians, and affiliated Island Communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Cover Image – The Pole Hill afterbay outlet siphon break. During a scheduled early December 2023 outage for various structure inspections on the east slope power arm, a break was discovered in the Pole Hill afterbay outlet siphon. Joel Finch (MB-2400) measures the break in foreground of photo; Travis Bauer, ECAO, further back in afterbay. Pole Hill Powerplant is shown in photo background. The project's winter fill operation was delayed by nearly 11 weeks as repairs were made and the afterbay siphon restored (photo by ECAO Adam Northrup on December 13, 2023).

Seventy-Third Annual Report Colorado – Big Thompson Project and Western Division Systems Power Operations

Water Year 2024 – Summary of Actual Operations
Water Year 2025 – Annual Operating Plans

Eastern Colorado Area Office
Missouri Basin Region

U.S. Department of the Interior **April 2025**

Acronyms and Abbreviations

AF	acre-feet
AOP	Annual Operating Plan
C-BT	Colorado – Big Thompson Project
CHFC	Charles Hansen Feeder Canal
CROs	Coordinated Reservoir Operations
ECAO	Eastern Colorado Area Office
Fry-Ark	Fryingpan Arkansas River Project
ft^3/s	cubic feet per second
GMR	Green Mountain Reservoir
GWh	gigawatt-hours
HP	horsepower
HUP	Historic Users Pool (Green Mountain Reservoir)
KAF	thousand acre-feet
LAP	Loveland Area Power
Northern Water	Northern Colorado Water Conservancy District
ShOP	Shoshone Outage Protocol (Green Mountain Reservoir)
SNOTEL	Snow Telemetry
SOP	Standard Operating Procedures
SWE	Snow Water Equivalent
WAPA	Western Area Power Administration
WD System	Western Division System
WY2024	water year 2024

Symbols

%	percent

Contents

Colorado – Big Thompson Project Appendices

Western Division Systems Power Operations Appendices

A Tables
B Exhibits

Tables

Figures

Preface

The purpose of the Annual Report for the Colorado – Big Thompson Project (C-BT) is to inform interested parties of the coordinated operation of the project. The report has two main parts. The first describes the actual operation of the project during the previous water year and the plan of operation for the upcoming water year. The second presents the hydropower operations for the previously completed water year and the forecast for the next.

This report in part fulfills requirements included within decree stipulations. These include the Stipulation dated October 5, 1955, as amended October 12, 1955, and filed with the U.S. District Court for the District of Colorado in Civil Action Nos. 2782, 5016, and 5017 for an annual report of the Green Mountain Reservoir Operations and the Agreements in the Stipulation and Agreement of the Orchard Mesa Check Case (Colo. Water Div. 5, 91CW247) dated September 6, 1996, to produce a Historic Users Pool (HUP) Annual Operating Plan (AOP).

Executive Summary

Collection system reservoirs started water year 2024 (WY2024) with well above average storage and ended WY2024 with mildly greater than average storage. Conditions were similar for east slope reservoirs; Horsetooth Reservoir started much greater than average storage and ended with well above average storage, while Carter Lake Reservoir started the water year with the largest storage content recorded in the last 30 years and ended WY2024 greater than average storage. On the west slope, snowpack was average for Willow Creek and mildly less than average for Granby Reservoir during the water year and runoff mirrored snowpack. Green Mountain Reservoir (GMR) snowpack and runoff were mildly greater than average. On the east slope, snowpack was near average and runoff was typical for the season. West slope peak runoff was near normal in magnitude, typical in terms of peak runoff timing, and of normal duration. East slope runoff was normal in magnitude, typical in terms of peak flow timing, but mildly shorter in duration. Daily air temperatures were generally above average throughout the growing season and precipitation was mildly less than average by end the water year.

The C-BT diversions totaled 202,256 acre-feet (AF) through Adams Tunnel for WY2024. Deliveries of C-BT water totaled 213,726 AF. The GMR delivered a total of 76,740 AF from storage in WY2024. Because of sufficient starting storage and runoff, WY2024 was not a substitution year.

The natural inflow to Lake Estes reached its WY2024 peak flow with a daily average flow of 935 cubic feet per second (ft^3/s) on June 10. The maximum mean daily release from Olympus Dam to the Big Thompson River was 825 ft^3/s and occurred on June 7.

The GMR achieved a physical fill in WY2024. Granby Reservoir also achieved a physical fill in WY2024. Carter Lake Reservoir was filled to within 8,000 AF of capacity on June 26 and Horsetooth Reservoir was filled on June 27 during WY2024. Sufficient storage in Carter Lake and Horsetooth Reservoirs existed to satisfy all demands for WY2024.

For the Grand Lake clarity season, the running average clarity goal qualifier of 3.8 meters Secchi depth was met (2024 clarity season running average was 4.6 meters). The minimum goal qualifier of 2.5 meters Secchi depth was also achieved (2024 clarity season minimum was 3.7 meters).A few short duration excursions of surface pH exceeding the water quality indicator were noted during two days in late August. Excursions of the pH water quality indicator were generally short-term, daily oscillations, above the threshold during the period. The Shadow Mountain Reservoir bottom dissolved oxygen water quality indicator dipped just below the 3.0 milligrams per liter (mg/L) threshold on July 3 and 4, 2024. Pumping started at Farr Pumping Plant for the clarity season later on July 4, after which time the dissolved oxygen water quality indicator was met for the remainder of the season.

General Description of the Colorado-Big Thompson Project

The Colorado-Big Thompson Project (C-BT) is one of the largest and most complex natural resource developments undertaken by the Bureau of Reclamation (Reclamation). It consists of over 100 structures integrated into a transmountain water diversion and delivery system which provides water and power benefits across the state of Colorado from the Nebraska to the Utah state lines. The project was authorized for construction in the 1930s and completed in the 1950s.

The C-BT facilities span over approximately 100 miles within north-central Colorado. The project stores, regulates, and diverts water from the Colorado River west of the Continental Divide to provide supplemental irrigation water for 615,000 acres of land east of the Rocky Mountains. It supplements municipal and industrial water supply while providing water-oriented recreation for a growing population of more than one million residents in northeastern Colorado. Approximately 3,000 feet of elevation drop allows for hydroelectric generation of the electricity required for project pumping and produces enough surplus electricity for nearly 68,000 households. Additionally, the project provides water storage within the upper Colorado River basin for agricultural, municipal, industrial, recreation, and environmental uses. Major features of the C-BT include dams, dikes, reservoirs, powerplants, pumping plants, pipelines, tunnels, transmission lines, substations, and other associated structures.

Historically, the C-BT diverts approximately 230,000 acre-feet (AF of water, annually, (310,000 AF maximum) from the Colorado River headwaters on the western slope to the South Platte River basin on the eastern slope, for distribution to project lands and communities. The Northern Colorado Water Conservancy District (Northern Water) apportions the water used for irrigation to more than 120 ditches and 60 reservoirs. 33 communities receive municipal and industrial water from the C-BT. The Western Area Power Administration (WAPA) markets and transmits the electric power produced at the six powerplants associated with the project.

Collection System and East Slope Colorado-Big Thompson Project

Overview[1]

The C-BT is often grouped by which side of the Continental Divide a sub-system is located. Facilities within the Colorado River Basin (on the west slope) include a replacement and

[1] A diagram and map of the C-BT system can be found in appendix C.1 and appendix C.2.

compensatory storage reservoir and a water collection and diversion system. East slope facilities are located within the South Platte River Basin and include a power and delivery system and a water distribution system.

The GMR provides replacement water for out-of-priority collection system diversion and storage water for other beneficial uses. The GMR is located on the Blue River, a tributary of the Colorado River approximately 30 miles southwest and downstream from the collection system. This reservoir allows for year-round diversion at the collection system by providing replacement water during periods when senior downstream water users would otherwise require the collection system to bypass inflow. The GMR also provides water storage for the benefit of water users within the Colorado River basin. Green Mountain Dam includes a powerplant for hydropower generation.

The Colorado River collection and diversion system captures snowmelt runoff from the high mountains and diverts water to the eastern slope. The system stores, regulates, and conveys Colorado River water through Grand Lake to a trans-mountain diversion tunnel for delivery to the east slope. This system includes three reservoirs, two pumping stations, conveyance canals and the trans-mountain diversion tunnel.

Authorization of the project included improvements and operational requirements to mitigate anticipated lower flows downstream from the collection system. The project included installation of pumping systems for existing irrigators upstream of the Blue River confluence. The project also required a release schedule downstream from the collection system to maintain the Colorado River fishery downstream from Granby Dam.

Photograph 1.—A summer release through the spillway at Green Mountain Dam and Reservoir. Green Mountain Powerplant, located just below the dam, is also generating power.

The west slope water collection system for the project is comprised of three reservoirs (Granby, Willow Creek and Shadow Mountain Reservoirs), one natural lake (Grand Lake) and two pumping plants (Farr and Willow Creek Pumping Plants). Granby Reservoir is located on the Colorado River and is the largest reservoir within the C-BT. Granby provides multi-year storage of Colorado River water. The Farr Pumping Plant lifts water from Granby to Shadow Mountain Reservoir. Shadow Mountain Reservoir impounds the Colorado River upstream of Granby and allows for gravity conveyance of Colorado River water through Grand Lake to the Adams Tunnel. The largest natural lake in Colorado, Grand Lake is hydraulically connected to Shadow Mountain Reservoir. The two are operated as a single regulatory reservoir. Willow Creek Reservoir is used to regulate and divert water from Willow Creek, a tributary of the Colorado River. Willow Creek Pumping Plant lifts water diverted from Willow Creek Reservoir for storage in Granby Reservoir.

Completed in 1950, Granby Dam is located on the upper Colorado River. The dam's river outlet is comprised of a 30-inch jet valve and a 12-inch gate; and has a combined capacity of 430 cubic feet per second (ft^3/s). Northern Water installed two 600 Kilowatt turbines under a Lease of Power Privilege contract in 2016. The Granby Hydropower Plant can divert a maximum of 70 ft^3/s from the outlet works. The dam spillway is controlled by two radial gates with a combined total release capacity of 11,500 ft^3/s. The reservoir stores the flow of the Colorado River and water pumped from Willow Creek Reservoir. The reservoir has a total storage capacity of 539,800 AF.

Farr Pump Plant lifts water from Granby Reservoir to Granby Pump Canal for conveyance to Shadow Mountain Reservoir. The Farr Pump Plant has three 6,000 horsepower units with a combined installed capacity of 600 ft^3/s when lifting the maximum head of 186 feet. The lifting head depends upon the storage level in Granby Reservoir and ranges between 88 feet to 186 feet. The combined lifting capacity for the 88 feet head differential is 1,200 ft^3/s. The Granby Pump Canal conveys pumped water 1.8 miles to Shadow Mountain Reservoir and has a maximum capacity of 1,100 ft^3/s.

Completed in 1953, Willow Creek Dam is located on Willow Creek, a tributary to the Colorado River below Granby Reservoir. Willow Creek Dam stores and diverts water to Granby. The dam has a river outlet with a capacity of 2,080 ft^3/s, a diversion outlet capacity of 400 ft^3/s and an uncontrolled spillway located on the left abutment with a maximum flow capacity of 3,200 ft^3/s. The reservoir has a total storage capacity of 10,600 AF. The Willow Creek Pumping Plant has two 5,000 horsepower units that lift water 175 feet with a combined capacity of 400 ft^3/s.

Completed in 1946, Shadow Mountain Dam impounds the Colorado River upstream of Granby Reservoir. The dam has an outlet with 50 ft^3/s capacity and a radial gate-controlled spillway with a capacity of 10,000 ft^3/s. The reservoir provides regulatory storage and the hydraulic head necessary for gravity conveyance to the Adams Tunnel. The reservoir has a total storage capacity of 18,400 AF including one foot of regulatory storage in Grand Lake. The dam maintains the reservoir water surface elevation well within the historic water surface elevation of Grand Lake as required under the project authorization.

Completed in 1947, the Adams Tunnel was constructed to divert water from the Colorado River watershed to the Big Thompson River watershed. The 13.1-mile, 9.75-foot diameter tunnel is concrete lined with a capacity of 550 ft^3/s. Tunnel flow is control by a radial gate inlet at a diversion structure called Adams Tunnel West Portal on the east end of Grand Lake. The tunnel passes under the Continental Divide and Rocky Mountain National Park and daylights at East Portal Reservoir approximately 4.5 miles southwest of Estes Park.

The east slope power and delivery system includes four regulatory reservoirs, five powerplants, one pumping station, multiple conveyance and diversions structures and two terminal storage reservoirs[2]. The system is typically divided into three components including an Upper Power Arm above Olympus Dam, a Lower Power Arm above Flatiron Dam and the terminal storage reservoirs. Water delivery may occur at multiple delivery points between Adams Tunnel and the two terminal storage reservoirs. Primary delivery to the terminal reservoirs occurs through the power arms.

The Upper Power Arm begins at the Adams Tunnel East Portal and ends at Olympus Dam. East Portal Dam is constructed on Wind River. It directs a portion of the natural runoff from Wind River and C-BT water exiting Adams Tunnel into a siphon under Aspen Creek and a tunnel under Rams Horn Mountain. Continuing from Rams Horn Tunnel, a penstock conducts pressurized flow to Marys Lake Powerplant and Marys Lake.

Marys Lake Powerplant and Marys Lake is the first powerplant and regulatory reservoir on the Upper Power Arm. The powerplant has a single generator with a nameplate capacity of 8.1 megawatts at 210 feet of head. The powerplant is a "run-of-the-river" type generator that follows flow diverted at East Portal Dam between 200 ft^3/s and 550 ft^3/s. All flow bypasses the powerplant over a flip-bucket spillway when generation is not available or when flows are below generation capacity of Marys Lake Powerplant. Marys Lake is a natural lake that was enhanced by construction of dikes. Marys Lake has a storage of 927 AF and regulatory capacity of 593 AF. The outlet has a capacity of 1,300 ft^3/s and no spillway. The reservoir serves as the afterbay for Marys Lake Powerplant and the forebay for Estes Powerplant. Prospect Mountain Conduit and Tunnel convey water from Marys Lake to Estes Powerplant.

[2] Significant delivery occurs from these terminal storage reservoirs through various Colorado-Big Thompson Project transferred works. These transferred works are operated and cared for by Northern Colorado Water Conservancy District and are not a focus of this operational report.

Photograph 2.—Marys Lake Penstock (left), Powerplant (center) and Marys Lake (background).

Estes Powerplant and Lake Estes is the second powerplant and regulatory reservoir on the Upper Power Arm. The powerplant has three generators with a combined nameplate capacity of 45 megawatts at 572 feet of head. The powerplant is a "peaking plant" which allows load demand following by balancing storage contents between Marys Lake and Lake Estes. Olympus Dam impounds the Big Thompson River east of the town of Estes Park to form Lake Estes. Olympus Dam includes a gated river outlet, a gated diversion outlet and radial-gated spillway. Lake Estes has a total capacity of 3,100 AF and a regulatory capacity of 740 AF. The reservoir regulates discharge from Estes Powerplant and natural runoff from the Big Thompson River and Fish Creek. Olympus Dam diverts up to 550 ft^3/s to the Lower Power Arm via Olympus Tunnel and controls release to the Big Thompson River.

Photograph 3.—Olympus Dam and Lake Estes, along with the Big Thompson River gage below Olympus Dam. Part of the Town of Estes Park and Rocky Mountain National Park can be seen in the background.

The Lower Power Arm begins at Olympus Dam and ends at Flatiron Reservoir. Water from Lake Estes and the Big Thompson River is conveyed by Olympus Siphon and Tunnel to Pole Hill Tunnel and Canal and on to the Pole Hill Powerplant forebay.

The Pole Hill Powerplant is the first powerplant in the Lower Power Arm. The powerplant is a single unit with a net head of 815 feet. The unit nameplate generation is 33.25 megawatts. The powerplant discharges into a small afterbay that diverts water into Rattlesnake Siphon and Tunnel to Pinewood Reservoir. The powerplant forebay has no storage, and generation follows release from Olympus Dam to Olympus Tunnel. When required, flow from the Pole Hill forebay can bypass the powerplant by falling into Little Hell Creek Canyon where it flows until it is re-diverted to the Pole Hill Afterbay.

Rattlesnake Tunnel conveys water from the Pole Hill Afterbay to Pinewood Reservoir. Rattlesnake Dam impounds water from Rattlesnake Tunnel in Pinewood Reservoir. The reservoir has a storage capacity of 2,180 AF with regulatory capacity of 1,422 AF and provides regulatory storage for Flatiron Powerplant. Rattlesnake Dam has an outlet for releasing native flow to Cottonwood Creek and an uncontrolled spillway. The Bald Mountain Pressure Tunnel inlet supplies water from Pinewood Reservoir to the two Flatiron Penstocks and Flatiron Powerplant.

Flatiron Powerplant is the second powerplant on the Lower Power Arm. The powerplant includes three units. Two units have nameplates of 31.5 Megawatts with a maximum head of 1,118 feet. They receive water from Pinewood Reservoir. The two turbines discharge into Flatiron

Reservoir. Flatiron Powerplant Unit 1 and 2 are operated as load-following generators. The third unit is a pump-generator connected to Carter Lake Reservoir and has a 13,000-horsepower motor with a maximum lift of 297 feet. When generating, Unit 3 is rated at 8.5 megawatts.

Flatiron Reservoir is a regulatory reservoir that controls flow to the Charles Hansen Feeder Canal (CHFC) and maintains head as an afterbay for Flatiron Powerplant generation and a forebay for Unit 3 pumping to Carter Lake Reservoir. Flatiron Dam impounds Chimney Hollow and the ephemeral tributary of Dry Creek. The reservoir stores 760 AF of water with 399 AF of regulatory storage. The dam has an uncontrolled spillway with 23,600 ft^3/s capacity and an outlet to the CHFC with a design capacity of 930 ft^3/s.

The terminal storage and delivery component of the C-BT conveys water for user delivery and provides water storage for high demand periods. The two terminal reservoirs that have not been transferred to Northern Colorado Water Conservancy District (Northern Water) are Carter Lake Reservoir and Horsetooth Reservoir. Under typical operation they receive water from Flatiron Reservoir. Carter Lake Reservoir supplies water to the project service area south of the Big Thompson River. Horsetooth Reservoir supplies water to the Cache La Poudre River project service area. The CHFC conveys water to Horsetooth Reservoir and delivers water to the Big Thompson River at the mouth of the Big Thompson Canyon and water users along the canal.

The Dille Diversion Dam and Tunnel located one mile upstream of the Big Thompson Canyon mouth, provides a redundant feature for rediverting project water from the Big Thompson River when the Lower Power Arm is unavailable. Additionally, non-project water from the Big Thompson River can be diverted into the tunnel. Tunnel water is conveyed to the CHFC and used for power generation at Big Thompson Powerplant or conveyed by the CHFC toward Horsetooth Reservoir.

Carter Lake Reservoir is impounded by three dams on ephemeral streams. Carter Lake Reservoir has a storage capacity of 112,200 AF with an active capacity of 108,900 AF. Carter Lake Reservoir receives water either from Flatiron Powerplant Unit 3 or a bypass gravity conduit. Deliveries are made through outlet works located in Dam number 1 to the Saint Vrain Supply Canal or to Flatiron Reservoir through the Flatiron Powerplant.

The CHFC transports water from Flatiron Reservoir to the Big Thompson River and Horsetooth Reservoir. The CHFC has a nominal capacity of 930 ft^3/s from Flatiron Reservoir to the Big Thompson River (930 Section). The CHFC can make water deliveries at the Big Thompson River and several turnouts along the canal. Deliveries from the canal to the river are made through a controlled wasteway or the Big Thompson Powerplant. The CHFC has a nominal capacity of 550 ft^3/s from the Big Thompson River to Horsetooth Reservoir (550 Section).

Big Thompson Powerplant is the last federal powerplant in the C-BT system. The powerplant is used to make deliveries from the CHFC or to return non-project Big Thompson River water, obligated to users downstream from the Big Thompson Powerplant and used for non-consumptive power generation known as “skim” power operations, to the river. The powerplant’s nameplate is 4.5 megawatts with an operational head of 183 feet. The powerplant

has a maximum flow rate of about 400 ft^3/s. The CHFC wasteway makes river deliveries when demand exceeds 400 ft^3/s or when the powerplant is unavailable. It has a maximum flow rate of 600 ft^3/s and is also used to deliver water to users between the wasteway outfall and powerplant tailrace. Big Thompson Powerplant is typically operated only during the snowmelt runoff and delivery season.

Horsetooth Reservoir is located west of Fort Collins, CO. The reservoir includes four dams and a dike with a storage capacity of 151,800 AF and an active capacity of 143,500 AF. Outlet works are located in two of the dams, Horsetooth Dam and Soldier Canyon Dam. Dixon and Spring Canyon Dams and Satanka Dike do not have outlet works. The reservoir has no spillway. The Soldier Canyon Dam outlet supplies water to the city of Fort Collins, three rural water districts, Colorado State University, and the Dixon Feeder Canal for irrigation. Horsetooth Dam outlet discharges to the Charles Hansen Supply Canal for water delivery to the Cache la Poudre River and water users north of the Cache la Poudre River.

Additional water delivery and power transmission features were constructed under the project authorization. These features include supply canals, diversion structures, transmission lines and substations. All water delivery features below Horsetooth Reservoir and Carter Lake Reservoir were transferred to Northern Water Conservancy District upon repayment. Northern Water maintains and operates these features. Power transmission features are maintained and operated by WAPA. These features are not further described in this document.

Planning and Control

The C-BT was authorized, constructed, and is operated to provide supplemental municipal and industrial water supply, irrigation water supply, and hydroelectric power production.

The integrated operation of the C-BT is planned and coordinated by the Water Resources Group at Eastern Colorado Area Office (ECAO) in Loveland, CO. Staff collects and analyzes information daily and makes the decisions necessary for successful operation of the C-BT. This continuous water management function involves coordination between the Colorado Division of Water Resources, Northern Water, WAPA, Bureau of Reclamation's Upper Colorado and Missouri Basin Regions, Bureau of Reclamation groups, and many other local, state, and Federal agencies.

Experience has proven that proper use of the available water resource in a multi-purpose project, such as the C-BT, can be achieved only through careful budgeting and management of the anticipated water supply. One product of this budgeting and management process is an Annual Operating Plan (AOP).

The C-BT water operations are routinely planned on a 12-month basis. The first AOP of the new water year is prepared in early October and covers the October 1 to September 30 period. Annual Operation Plans are prepared for reasonable maximum, most probable and reasonable minimum runoff conditions of water supply and associated requirements. The C-BT is operated to optimize the most probable water supply, without jeopardizing the operational position should either the

reasonable maximum or the reasonable minimum water supply conditions occur. The plan is reviewed and revised monthly, or as needed during the year as new information becomes available or conditions change. Computer programs and models are used by ECAO to develop the AOPs and water supply forecasts. Tables B-5, B-6, and B-7 include the first AOP for the upcoming water year for the most probable, minimum reasonable and maximum reasonable plans, respectively. Appendix B-8 also provides a summary view of features of interest within the project for the planned C-BT operations in the upcoming water year.

Irrigation Requirements

The amount of C-BT water made available each water year for irrigation is determined by Northern Water. This determination is subject to change by agreement throughout the remainder of the irrigation season. Adaptations may occur as a result of substantial changes in the prevailing climatic demand or operational conditions. Irrigation requirements for the three runoff conditions: (1) most probable, (2) reasonable maximum and (3) reasonable minimum, are estimated by analyzing actual use under a variety of actual runoff conditions.

Estimated supplemental irrigation deliveries from GMR to irrigators in the Colorado River Basin are included in the release from GMR, according to the "Operating Criteria for GMR."

Photograph 4.—North Inlet near Grand Lake Stream gaging house is shown on left side of photo.

East Slope Diversion Operations

Olympus Dam, East Portal Dam and the Dille Diversion Dam can divert Big Thompson River watershed flows for beneficial use. These operations include carriage contracts for decreed water, diversion and storage of decreed east slope project water and non-consumptive diversion for power generation. Carriage contracts allow for the project to divert and deliver decreed water for water users when unused capacity within the system is available. The C-BT will divert and store Big Thompson water rights when those rights are in priority as long as doing so does not adversely impact attainment of the project's objectives. The project also diverts Big Thompson River watershed flow that is obligated downstream from the Big Thompson Powerplant for non-consumptive power generation. This diversion operation is referred to as a "skim" operation. Big Thompson River water availability for diversion depends on the flow in the Big Thompson River and its tributaries above Lake Estes, C-BT water diverted through the Adams Tunnel, and its power arm capacity. Skim operations and determination of unused system capacity is managed according to the AOP and as prescribed by the ECAO Water Resources Group staff.

Flow Requirements Below Project Facilities

Many of the C-BT dams include downstream flow recommendations or requirements. Release of water from project dams for maintaining downstream river flow was one of the primary purposes included within the project authorization and a stipulation of the project's water rights. This obligation for instream flow requirements preceded recognition of instream flow as a beneficial use within the State of Colorado. Granby Dam, Green Mountain Dam, Willow Creek Dam, Shadow Mountain Dam, East Portal Dam and Olympus Dam operations include some guidance or actual obligations for meeting stream flow targets.

The Secretary of the Department of Interior issued a release schedule for Granby and Willow Creek dams to define monthly flows for the time of the year, location and hydrology. This schedule, titled "Principles to Govern the Release of Water at Granby Dam to Provide Fishery Flows Immediately Downstream in the Colorado River," was signed on January 19, 1961, by the Secretary of the Department of the Interior as directed by the project authorization. During the irrigation season, a Colorado River target flow is maintained downstream from senior irrigation diversions below Granby Dam. During the remainder of year, the target flow is maintained immediately below Granby Dam. Scheduled flows for the Colorado River range between 20 ft^3/s and 75 ft^3/s. Willow Creek Dam only releases water for this purpose during the non-irrigation season, between October and April. Willow Creek Dam release is limited to the lesser of seven ft^3/s or reservoir inflow. The schedule also allows for flow adjustments based on revised forecasts and consideration of actual flows during May through July. A copy of the document is included in the Standard Operating Procedures (SOP) for Granby Dams and Reservoir, as appendix A, exhibit 4.

In accordance with the SOP for Shadow Mountain Reservoir, chapter 4 section D, minimum releases from Shadow Mountain Reservoir are to be whichever is less between inflow and the following seasonal flows: September through October – 35 ft^3/s; November through December –

45 ft^3/s; January through May – 20 ft^3/s; June through July – 50 ft^3/s; and August – 40 ft^3/s. The purpose of these flows is to maintain the fishery within the Colorado River above Granby Reservoir.

The GMR minimum release is determined by senior adjudicated water rights downstream from the reservoir. Inflow to GMR is released, as required, to meet these downstream rights. The State of Colorado has established instream flow rights for the Blue River downstream from Green Mountain Dam including a 60 ft^3/s flow from May 1 through July 15 and an 85 ft^3/s flow from July 16 through April 30. Instream flow rights are junior to the project. The State Engineer has determined that GMR must bypass 60 ft^3/s to meet downstream senior irrigation water rights during the irrigation season from May 1 through October 31.

The United States Fish and Wildlife Service and the State of Colorado Department of Natural Resources, Parks and Wildlife Division have recommended a minimum release schedule for Lake Estes, shown in table 1 below. Although no official decision record (i.e., contract, memorandum of understanding, intergovernmental agreement) is available, Reclamation has cooperatively adopted the recommendations when inflow to Lake Estes meets or exceeds these values. Releases in excess of inflows are not required. When the minimum release objective conflicts with service of Carriage Contracts, recent practice has prioritized meeting the minimum release flows over diverting water into Olympus Tunnel in service of the contracts. Likewise, diversion of flows from the Big Thompson River at Olympus Dam for power production (skim operation) is of lower priority than meeting the recommended minimum flows.

The State of Colorado decreed a direct flow water right for power generation at Olympus Dam with a water rights priority date of December 29, 2016. A minimum instream flow decreed to the State of Colorado is senior to this direct flow water right and require Olympus Dam to bypass the lesser of reservoir inflow or 40 ft^3/s between May 1 and October 31 and 15 ft^3/s between November 1 and April 30.

Table 1.—Recommended minimum release schedule for Lake Estes

Period	Minimum Releases (ft^3/s)
November 1–April 15	25
April 16–April 30	50
May 1–May 15	100
May 16–August 15	125
August 16–August 31	100
September 1–September 15	75
September 16–October 31	50

Minimum release schedule for Lake Estes. Recommended by the U.S. Fish and Wildlife Service and the Colorado Department of Natural Resources, Parks and Wildlife Division.

Annual Operating Plan

Beginning each water year, the C-BT Most Probable Annual Operating Plan (AOP) is developed considering the effects of historical average runoff values, the expected demands and depletions of Northern Water and Denver Water, the project's initial states (e.g., pool levels/reservoir storages), other average values, special operations such as previously planned system outages and maintenance schedules, and an assumed Northern Water quota for their water users of 70 percent.

The operations at Granby Reservoir are highly dependent on the runoff conditions on both sides of the Continental Divide. The conditions on the east slope have a direct effect on the diversions through the Adams Tunnel. The diversions through the Adams Tunnel affect the pumping operations at the Farr Pump Plant, and consequently the reservoir levels at Granby.

The GMR operational plan was developed considering the effects of upstream operations at Dillon Reservoir, forecasted depletions provided by Denver Water and Colorado Springs Utilities, average runoff values, anticipated system outages and planned special operations.

Green Mountain Reservoir

Green Mountain Reservoir Operation References

1984 Operating Policy for Green Mountain Reservoir, Colorado - Big Thompson River Project. (1983, December 22). Federal Register, Vol 48, No. 247.

Consolidated Cases 2782, 5016 and 5017 (commonly referred to as the "Blue River Decree"). (1955, 1964, 1978).

Consolidated Cases: Stipulation and Decree (October 12, 1955).

Consolidated Cases: Stipulation and Decree (April 16, 1964).

Consolidated Cases: Supplemental Judgement and Decree (February 9, 1978).

Director, Secretary of Interior. (1964, December 15). Certain Green Mountain Reservoir Storage, Colorado - Big Thompson Project. *Reservation for Silt Project, Colorado Storage Project*. Federal Register Document 64-12867, Filed.

Green Mountain Administrative Protocol. (2013, February 22).

Manner of Operation of Project Facilities and Auziliary Features (Senate Document 80). (1937, June 15). *Senate Document No. 80, 75th Congress, 1st Session* .

Recovery Implementation Program. (1996, October 15). *Recovery Action Plan, Colorado Endangered Fish Recovery Program*.

Shoshone Outage Protocol (ShOP). (2016, June 27). *Agreement Number 13XX6C0129*.

Stipulation and Agreement, 91CW247 (Orchard Mesa Check Case) and attached Historic Users Pool Operating Criteria (Colorado Water Division 5 September 4, 1996).

Reservoir Administration

Provisions guiding GMR operations are contained within multiple contractual and legally binding documents (referenced cited above). Paragraph six of the October 1955 Decree (Consolidated Cases: Stipulation and Decree, 1955) stipulates that Reclamation periodically develop operational plans for GMR. This report partially fulfills this requirement.

Colorado Springs Utilities and Denver Water Board (Cities) operate trans-mountain water projects upstream of GMR that substantially influence the timing and volume of reservoir filling and water available for power generation. The Denver Water Board's water project includes 255 thousand acre-feet (KAF) Dillon Reservoir and a trans-basin diversion tunnel. Colorado Springs Utilities' project includes a direct-flow collection system, small regulatory reservoirs, and a trans-basin diversion tunnel. Combined, the Cities divert approximately 80 KAF annually from the basin which would otherwise be available for GMR storage and power generation. The right for these water projects to divert against GMR's senior water rights and how the Cities compensate the Project for diversions junior to the Project is stipulated within the Project's and Cities water rights (Consolidated Cases 2782, 5016 and 5017 (commonly referred to as the "Blue River Decree"), 1955, 1964, 1978). The Cities and the Project have established agreements to fulfill these stipulations. The Green Mountain Administrative Protocol (Green Mountain Administrative Protocol, 2013) provides procedures for quantifying water owed to GMR.

GMR was authorized and constructed to store and deliver two pools of water. Senate Document 80 (Manner of Operation of Project Facilities and Auziliary Features (Senate Document 80), 1937) identified a 52,000-AF pool designated for the singular purpose of replacement of water diverted or stored out-of-priority by the Colorado River Collection System. The remainder of reservoir storage and refill storage are designated as the "100,000-acre-foot power pool.". This pool is primarily for power generation and can be delivered for the beneficial use of water users located within the Upper Colorado River basin above the confluence with the Gunnison River in Grand Junction. The Project water rights include these two pools within the decree (Consolidated Cases 2782, 5016 and 5017 (commonly referred to as the "Blue River Decree"), 1955, 1964, 1978).

Additional agreements and directives have further sub-divided the "100,000-acre-foot power pool". The sub-divisions include, replacement losses for GMR (Manner of Operation of Project Facilities and Auziliary Features (Senate Document 80), 1937), a 5,000 AF allocation for the Silt Project replacement (Director, Secretary of Interior, 1964), the HUP and water contract

allocations (1984 Operating Policy for Green Mountain Reservoir, Colorado - Big Thompson River Project, 1983), and storage available for Shoshone Powerplant outage operations (Shoshone Outage Protocol (ShOP), 2016).

The Colorado State Engineer has administered GMR water rights in accordance with the Green Mountain Administrative Protocol since 2014 (Green Mountain Administrative Protocol, 2013).

Green Mountain Historic Users Pool and the Orchard Mesa Check Case Settlement

The GMR's largest single purpose allocation is the Historic User Pool (HUP) and is designated for Upper Colorado River Basin beneficiary use. The HUP allocation is composed of 66,000 AF of the "100 KAF Power Pool". This allocation is defined within the 1984 Operating Policy (1984 Operating Policy for Green Mountain Reservoir, Colorado - Big Thompson River Project, 1983). The intent is that the HUP allocation is delivered in most years.

The HUP operating criteria is stipulated under the 1996 Orchard Mesa Check Case Decree (Stipulation and Agreement, 1996). The stipulations include a variety of criteria for how and when GMR can deliver HUP. The operating criteria also identifies a group of irrigation, state, and federal stakeholders responsible for cooperative management the HUP allocation. The HUP Managing Entities include Orchard Mesa Irrigation District, Grand Valley Irrigation Company, Grand Valley Water Users Association, the Colorado Water Conservation Board, the Colorado State Engineer, the U.S Fish and Wildlife Service and the Bureau of Reclamation. Regular meetings for cooperatively managing the HUP are a requirement of the operating criteria.

A primary purpose of the HUP allocation is to provide replacement water and irrigation water for HUP beneficiaries. This water is provided at no cost to the water users from the HUP allocation. In dryer years nearly the entire HUP allocation is delivered during the irrigation season. This delivery may include both replacement water for consumptive use by a beneficiary or delivered directly to Grand Valley irrigators. 500 AF of the HUP allocation is reserved for consumptive use replacement during the non-irrigation season.

Providing water for supporting the recovery of Colorado River endangered fish is a secondary beneficial use of the HUP allocation. In most years the entire HUP allocation is not required for irrigation and replacement. In these years the HUP managing entities can declare that surplus HUP allocation is available (Recovery Implementation Program, 1996). The managing entities will collaboratively determine the timing and volume of water for delivery to the 15-mile Colorado River reach (15-Mile Reach) between the Grand Valley Irrigation Company diversion dam and the confluence with the Gunnison River.

The HUP managing entities have established standing weekly conference call meetings for coordination of Colorado River operations. These meeting are open to the public and provides a forum for coordination of reservoir and diversion operations within the Colorado River basin.

Regular participants on the call include: the HUP managing entities, Denver Water, Northern Water, Colorado River Water Conservation District, the National Weather Service, Colorado Basin River Forecast Center, and others.

Reservoir Operation

GMR operations are controlled by water rights administration, authorizing documentation, litigation stipulations, agreements, facility limitations, and safety of dam directives. Normal reservoir operations generally focus on three goals: not harming downstream senior water rights, enhancing the beneficial use of the waters of the Colorado River, and maximizing power generation.

Administration of downstream Colorado River water rights and GMR storage and direct flow for power generation water rights guide GMR operations.[3] GMR stored water is largely allocated as replacement water for consumptive use of Project beneficiary junior water right users. The State Engineer curtails junior water use without this replacement water. The GMR stored water replacement releases allow for out-of-priority diversion of the Colorado River Collection System, HUP beneficiaries, Silt Project, GMR evaporative losses and most GMR water contract release. The storage release flow rate is dependent upon the priority and location of the calling right. In addition, GMR is obligated to bypass reservoir inflow as needed to not injure calling water rights senior to the GMR's water rights. Simultaneous administration and exercise of GMR's storage and Green Mountain Powerplant's direct flow for power water right results in nearly perpetual water rights administration for water users upstream of GMR.

Conserving and making use of Colorado River water to create the greatest benefit is one of the primary purposes of the Project (Manner of Operation of Project Facilities and Auziliary Features (Senate Document 80), 1937). Reclamation plans reservoir operations to increase the probability that GMR's first-fill storage water right is satisfied each year. In drier years managing GMR fill demands reduction of reservoir release below the powerplant capacity. In addition, operation plans usually avoids reservoir release exclusive for power generation. In most years, GMR operation plans substantially reduce power generation to allow Denver and Colorado Springs to exercise their upstream junior water rights as stipulated in the Blue River Decree (Consolidated Cases 2782, 5016 and 5017 (commonly referred to as the "Blue River Decree"), 1955, 1964, 1978).

Reclamation schedules GMR operations in a manner to maximize Green Mountain Powerplant power production. The powerplant is the principal mechanism for release of stored water and

[3] The Colorado State Engineer is responsible to administer water rights under the Prior Appropriation Doctrine. When a downstream water right is not satisfied by existing river flow, the State Engineer will determine an administrative priority that will require upstream water users, junior to the administrative priority, to curtail diversion or replace diversion with an equivalent stored replacement source. The establishment of this administrative priority is commonly referred to as a water right's administrative "call".

bypass of inflow. Reclamation schedules powerplant release to fulfill obligations for storage delivery and inflow bypass, control reservoir fill rate, and minimize the volume of water that will bypass the powerplant. Stored water release generation often provides other beneficial uses including Shoshone Outage Protocol operations, direct delivery of HUP water for irrigation, and HUP surplus delivery to the 15-Mile Reach for the benefit of Colorado River Endangered Fish recovery efforts.

Coordinated Reservoir Operations (CROs) are an example of special power generation operations. When GMR participates in CROs efforts, Reclamation designs reservoir operations that reshape and times powerplant release to help enhance river peak flow for the benefit of Colorado River Endangered Fish recovery efforts. Design of GMR CROs cannot impact the project yield and do not require bypass of the Green Mountain Powerplant.

The GMR typical operations results in three operational seasons: Winter Delivery (November–April), Spring Runoff/Fill (April–August) and Irrigation Delivery (August–October).

During the Winter Delivery Season, GMR storage decreases as releases are made to avoid harming downstream senior water rights. Native winter flow within the Colorado River is typically less than the Shoshone Powerplant senior water right of 1,250 ft^3/s. During this period, reservoir storage releases replace water for the Project, HUP beneficiaries, and most GMR contractors out of priority diversions. On average, GMR delivers 23 KAF from storage during the winter season while passing all reservoir inflow. Storage release for Colorado River Collection System Replacement constitutes the largest portion of winter storage delivery.

The Spring Runoff/Fill Season normally begins when river flow exceeds plant capacity at the Shoshone Powerplant. Colorado River flow typically exceeds 1,250 ft^3/s between the last week of March and the second week of April. The Blue River Decree obligates Reclamation to declare the Start of Fill for the Senior First Fill Storage Water Right between April 1 and May 15. On average, Green Mountain reaches a minimum fill of 64 KAF in mid-April. Once Reclamation declares Start of Fill, GMR will simultaneously exercise storage and direct flow for power water rights and adjust operations to maximize stored water while optimizing power generation. The GMR normally reaches its maximum fill during the first two weeks of July. After satisfying GMRs Senior Storage water right, refill storage rights and power generation direct flow rights will be used to maintain reservoir storage until an administrative call is placed on the Colorado River. The Colorado State Engineer typically places the Colorado River under water rights administration between the third week of August and the second week of September. Colorado River water rights administrative calls may occur in June during drier years. The Colorado State Engineer's placement of a senior administrative water right's call ends the Spring Runoff/Fill Season.

Irrigation Delivery Season begins once Colorado River flows decrease below water rights administrative levels. The senior administrative calling right may be at the Shoshone Powerplant, a Grand Junction Area irrigation water right or both. During Irrigation Delivery Season, GMR

delivers approximately 20 KAF per month. The HUP deliveries constitute the largest portion of the storage releases during the Irrigation Delivery Season. Irrigation Delivery Season ends with the ceasing of irrigation operations around October 31.

Operational Summary: Water Year (WY) 2024

Summary of System-wide Conditions

Last water year's AOP was summarized in the previous Annual Operating Report of the Colorado-Big Thompson Project[4]. The following four sub-sections summarize *actual* operational results for WY2024.

Weather and Inflow Hydrology

Precipitation was near average to less than average over the mountains from October 2023 through February 2024. March 2024 precipitation was substantially greater than average while the remainder of the water year was mildly less than normal. The exception was August 2024, which experienced greater than average precipitation. The monsoonal moisture season, typically from late July through mid-August, in the Northern Colorado Mountains near Granby, Green Mountain and the east slope of the project area was later than normal but provided greater than average precipitation for the month of August. The August precipitation events provided some mild boosts to summer streamflow in mid-August 2024. Total precipitation for the water year was mildly less than average.

On the east slope, snow accumulation at the start of WY2024 lagged behind typical accumulation for the season until mid-March 2024, at which point accumulation increased to near normal until late April 2024 when accumulations increased again to mildly above normal. On the west slope, Granby Reservoir drainage accumulation lagged behind normal, moderately, for the season until early April 2024 when accumulations increased to near, but still slightly below, normal. The Willow Creek drainage accumulation was normal to slightly below normal through mid-March 2024 when accumulations increased to near normal. By the end of March 2024, the Willow Creek drainage accumulation increased further to mildly above normal and remained near normal through late April 2024. The GMR drainage snowpack generally followed the east slope accumulation pattern as the first part of the season was mildly less than normal until mid-March when accumulation increased to slightly above normal. By mid-May accumulation was above normal. Initial melt was one to two weeks late on both the east and west slope in WY2024. Willow Creek snow accumulation reported less than the long-term average by late May 2024, while the other drainages associated with the project were back down to long-

[4] Available online at https://www.usbr.gov/gp/aop/cbt/23cbt_24forecast.pdf (accessed December 11, 2024)

term average accumulation by early June 2024. By the second week of June 2024, most snow telemetry (SNOTEL) sites at those locations reported zero accumulation. In the GMR drainage, snow melt was later than the long-term average by a couple of weeks.

Table 2 provides an overview of the snowpack condition on April 1, 2024, for some of the contributing watersheds within the C-BT project. The first column in table 2 is the average snow water equivalent (SWE) of the SNOTEL sites contributing to each reservoir on April 1, 2024. For a historical comparison to the April 2024 condition, the average April 1 SWE of the same SNOTEL sites for the 1988-2023 period was computed and then a combined site average calculated for those sites. The west slope runoff forecast for April 1, 2024, was generally near or mildly above the typical condition over the last 30 years for most locations within the C-BT region. The east slope runoff forecast was also slightly above typical.

Table 2.—Snow-water content for April 1, 2024

Watershed	Snow-Water Content		
	2024 (in)	30-Yr. Avg. (in)	Percent of Average
Green Mountain Reservoir	16.6	15.8	105
Willow Creek Reservoir	10.3	9.8	105
Granby Reservoir	12.8	13.3	96
Lake Estes Reservoir	17.0	16.7	102

Table 3 (below) provides the resulting April 1, 2024 runoff forecasts for several C-BT facilities across intervals of estimated probabilities of occurrence.

Table 3.—Reclamation runoff forecast for C-BT locations

April 1, 2024, Forecast of April-July Volume (KAF)

Chance of Exceeding						
Forecast Point	90 percent Reasonable Min[1]	75 Percent	50 percent Most Probable	25 Percent	10 percent Reasonable Max[1]	50 percent Most Probable (as percent of avg runoff)
Green Mtn. Res	238	261	286	311	334	104
Willow Creek Res	41.7	47.6	55.7	63.4	68.2	119
Granby Res	167	186	207	226	244	100
Big Thompson River Above Lake Estes	56.0	63.3	71.8	79.2	86.5	99
Big Thompson River at Canyon Mouth	64.2	75.5	88.1	100	112	101

[1] The probability is *estimated* to be eight chances in ten that the actual runoff volume will fall between the reasonable minimum and reasonable maximum forecast.

The coldest temperatures in the project area were recorded during the first half of January 2024. Temperatures, when compared to the 30-year average, were mostly normal. March and most of May 2024 temperatures were below normal, October 2023 was mildly above normal, June, the last half of July, August and September 2024 were well above normal for the water year. By mid-May, area temperatures began to rise rapidly, and snow at lower elevations began to melt. The Northern Mountains of Colorado showed signs that runoff had begun, slightly later than normal. Most locations began to experience rising inflows by May. During the last half of May and into early June 2024, the snowpack at higher elevations began to melt. Willow Creek Reservoir, with greater than average snowpack, reached peak runoff slightly after mid-May, while inflows to Lake Estes, Granby and Green Mountain reached their peaks during the second week of June. East and west slope peaks were near average in magnitude, and runoff volume and duration were slightly shorter to typical for the season.

On the east slope, with slightly less than normal precipitation in May, June, July, and September and slightly greater than normal precipitation in August, normal snowpack by May 1 and with warming temperatures by mid-May, the runoff seasonal peak timing was near normal for the water year. Slightly less than normal precipitation increased irrigation demands on east slope terminal reservoir storage by late June. The C-BT was in priority on the east slope sporadically from late April through mid-June. The monsoon season was short but did boost August precipitation totals to slightly greater than average. Cooler than normal temperatures were experienced from mid-April through mid-May, and warmer than normal temperature were generally observed from late May through the end of the water year.

Most northern Colorado reservoirs throughout the spring season were near average in storage content to slightly less than average. By the end of April 2024, most were full. Irrigation season precipitation was below average, temperatures were mildly greater than normal from late May through the end of the season. As a result, demands for water were high. With pressure put on reservoir storage, area reservoir capacity was lower than previous years by the end of the water year. Most reservoirs in the area ended WY2024 with substantially less storage than they started.

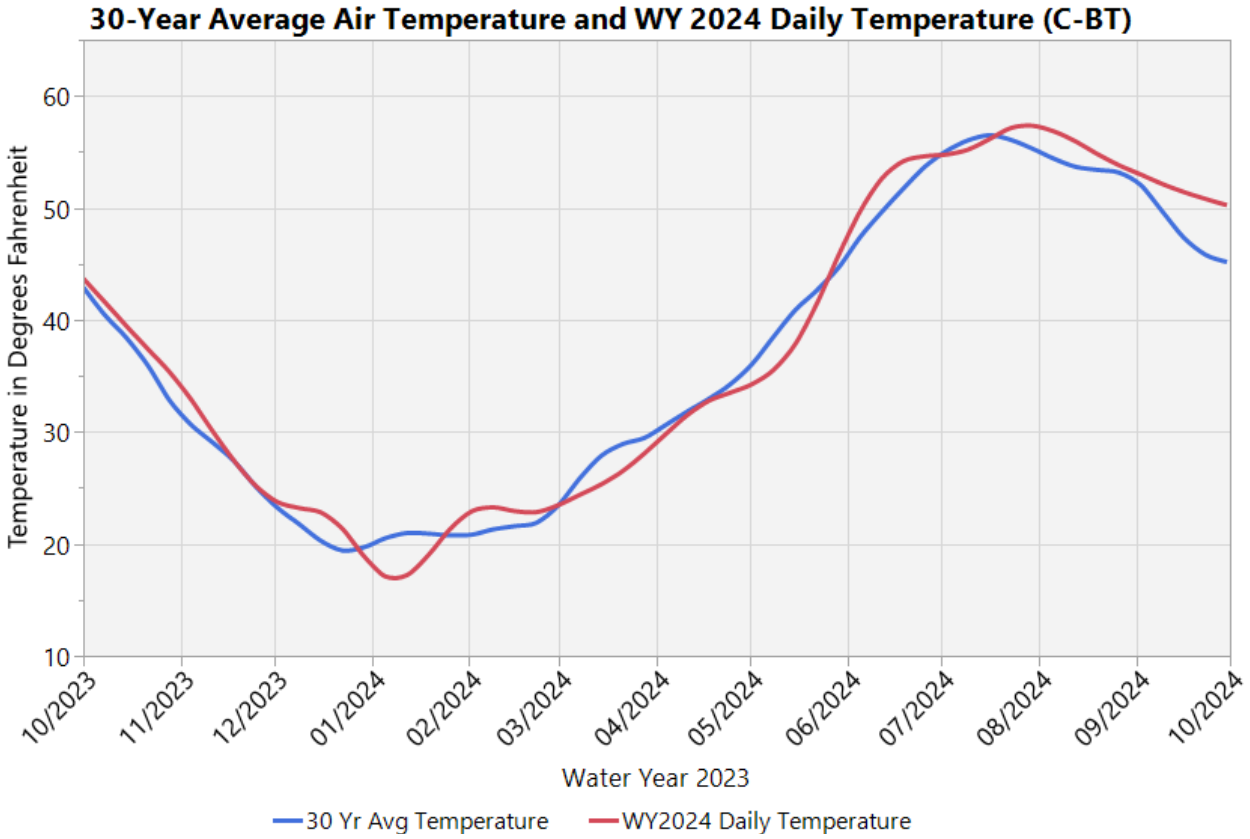


Figure 1.—WY2024 air temperature and 30-year average air temperature.
(daily data have been smoothed for trend display purposes)

System Demands and Deliveries

Northern Water established a quota of 50 percent in October 2023, and then revisited that quota in April 2024, increasing it by 20 percent. The quota assumed for the AOP 2024 prepared in October 2023 was 70 percent. With the warm, dry summer of WY2024, the Northern Water Board allocated an additional ten percent to the quota in August. AOP "Most-Probable" scenario monthly updates used a quota of 70 percent throughout WY2024, then the AOP increased to 80 percent in August and September to match the additional quota set by Northern Water.

During a scheduled, early-December 2023 outage for various structure inspections on the east slope power arm, a break was discovered in the Pole Hill afterbay outlet siphon. The east slope lower power arm could not be operated until the afterbay and outlet siphon were fixed. As a result, the winter diversion through Adams Tunnel for start of refill of Horsetooth and Carter Lake Reservoirs was delayed until early March and late March, respectively. The forced outage significantly impacted winter operations.

For the first time since the Cameron Peak fire, which occurred on the east slope near the Project in August 2020, the Big Thompson River water quality was not significantly impacted by the burn scar left in the North Fork Big Thompson River drainage. East Troublesome Creek fire, which also occurred in 2020 and burned areas in the Willow Creek and the Project's Three Lakes Collection System, did not substantially impact west slope project operations during WY2024.

Water Year 2024 saw two new east slope fires in or near the project area. The Alexander Mountain fire started west of the Charles Hansen Feeder Canal 550 Section the morning of July 29, 2024. Multiple evacuation orders were issued during the fire, and ultimately forced the shutdown of Pole Hill Powerplant, Dille Diversion, Charles Hansen Feeder Canal, and the Trifurcation on the canal. The Alexander Mountain fire evacuation orders, as related to C-BT facilities were lifted by August 5, 2024. The fire and resulting facility and conveyance shutdowns impacted power generation and project operations between July 29 and August 8, 2024, when the system was fully returned to normal operational status. The Alexander Mountain fire burned nearly 10,000 acres west of the Charles Hansen Feeder Canal 550 Section and north of the Big Thompson River. The other fire in WY2024 was the Stone Canyon fire which started on July 30, 2024, immediately north of Lyons, CO, and burned just over 1,500 acres south and west of Carter Lake Reservoir. The Stone Canyon fire, started a day after the Alexander Mountain fire and would have caused evacuation orders for areas in the vicinity of Flatiron and Pole Hill Reservoirs, had those areas not already been under evacuation orders for the Alexander Mountain fire. The monsoon moisture that moved into the area in early August allowed fire fighters to finally contain both fires.

An accounting summary of the C-BT west slope collection system in WY2024 shows there were 205,425 AF available for diversion to the east slope. Adams Tunnel diversions were 202,256 AF, a difference of 1.5 percent when comparing available collection system diversions versus reported diversions. That percent difference was well within the errors associated with the various measurements for the data used to create the accounting terms summarized in table 4. The formula for determining the collection system volume available for diversion to the east slope is shown below:

$$
\begin{aligned}
&\textit{West Slope Collection Made Available for Diversion} \\
&\quad = \textit{Natural Inflow}\,(\textit{Granby}, \textit{Shadow Mountain}, \textit{Grand Lake}) + \textit{Windy Gap Pumping} \\
&\quad + \textit{Willow Creek Pumping} - \textit{Change in Storage}\,(\textit{Granby}, \textit{Shadow Mountain}, \textit{Grand Lake}) \\
&\quad - \textit{Granby Spill} - \textit{Granby Releases} \\
&\quad - \textit{Net Evaporation}\,(\textit{Granby}, \textit{Shadow Mountain}, \textit{Grand Lake}) - \textit{Granby Seepage}
\end{aligned}
$$

The Granby Release term (above) includes both scheduled releases plus any over-releases reported, as operations attempted to meet downstream flow targets.

Table 4.—C-BT west slope collection system water balance

Volume available for Diversion from west slope collection system and reported diversions through Adams Tunnel for WY2024

	WY2024 (acre-feet)
Combined 3 lakes natural inflow	261,892
Willow Creek Pumping	17,843
Windy Gap Pumping	0
Combined 3 Lakes change in storage	-16,768
Granby Spill	42,511
Granby releases	31,758
Combined 3 lakes net evaporation	14,691
Granby seepage	2,118
Volume available for diversion	205,425
Reported Adams Tunnel Diversion	202,256
Percent difference	1.5

On the east slope, total supplies were compared to total deliveries for WY2024. Total supplies were calculated to be 203,077 AF and total deliveries were calculated to be 190,910 AF (table 5). The difference was seven percent. That difference is similar to previous years and can be explained by delivery system transit losses and measurement error on the terms that went into the calculations. The formula for determining total east slope supplies is shown below:

$$
\begin{aligned}
&\textit{East Slope Supplies} \\
&\quad = \textit{Adams Tunnel diversions} + \textit{East Slope Priority Water} \\
&\quad - \textit{Net Evaporation (Carter and Horsetooth Reservoir)} \\
&\quad - \textit{End of WY East Slope Reservoirs' Change in Storage} \\
&\quad - \textit{Tridistrict Excess Capacity Account Change in Storage at Horsetooth} \\
&\quad - \textit{Predetermined CBT River Delivery Losses}
\end{aligned}
$$

During CHFC 550 and 930 Section outages, project demands were met via a release to the Big Thompson River from Olympus Dam. A predetermined delivery loss is applied when that method of delivery occurs. The "Predetermined C-BT River Delivery Losses" term in the supplies equation (table 5) includes any assigned delivery losses in the east slope system. For WY2024, a 2.1 percent delivery loss was established for those Big Thompson River deliveries of C-BT water. Supply releases had to be greater than the requested deliveries by 2.1 percent to offset the loss and that known difference was subtracted from the supply term in table 5. In addition, due to an unplanned outage on the Pole Hill afterbay outlet siphon during the winter of 2024, project water was released from Olympus Dam for re-diversion at Dille Diversion on the Big Thompson River from March 5 through March 26, 2024. About 40 ft^3/s per day of the project water released from Olympus Dam could not be rediverted at Dille, to ensure the Dille sand sluice had enough flow passing through it to maintain the sluice's functionality. That project water was added to the 'Predetermined C-BT River Delivery Losses' term for WY2024.

The formula for determining total deliveries is as follows:

$$\begin{aligned} &Total\ Deliveries \\ &\quad = Total\ CBT\ Deliveries + Total\ Windy\ Gap\ Deliveries\ (east\ slope) \\ &\quad + Eureka, Estes\ Park\ \&\ RMNP\ Replacement\ Delivery \end{aligned}$$

The results of the supplies versus east slope deliveries are shown in table 5 below.

Table 5.—C-BT east slope water balance

Volume available for supply vs. reported east slope deliveries for WY2024

Supply	**WY2024 (acre-feet)**
Adams Tunnel Diversion	202,256
East Slope Priority Water	14,981
Carter Lake + Horsetooth Reservoir net evap.	5,499
Total East Slope Reservoir change in storage	-38,236
Tridistrict Excess Capacity change in storage	161
Predetermined C-BT River delivery loss	1,636
Total Supply	248,177
Delivery	
Total C-BT deliveries[5]	213,726
Total Windy Gap deliveries (east slope)	16,9292
Eureka, Estes Park & RMNP replacement delivery	757
Total deliveries	230,775
Percent difference (of total supply)	7.0

Maintenance and System Outages

A number of major projects, unplanned outages or system limitations in the C-BT impacted the typical operations during WY2024. The water year began with an outage for Carter Lake Reservoir pressure conduit of Flatiron Powerplant Unit No. 3 for Northern Water to perform encasement of the section of the pressure conduit which will run under the location of the to-be-built Chimney Hollow Reservoir spillway. The encasement was completed in mid-December 2023. However, during a scheduled early December 2023 outage for various structure inspections on the east slope power arm, a break was discovered in the Pole Hill afterbay outlet siphon. The east slope lower power arm could not be operated until the afterbay and outlet siphon were repaired. Those repairs were completed in mid-March 2024. The turbine overhaul of the Marys Lake Powerplant bottom end continued in WY2024. Marys Lake Powerplant was

[5] Includes non-charge water delivered during the water year, which was zero AF in WY2024.

under an outage the entire water year. The operation restriction, put in place at Pole Hill Powerplant, continued throughout the water year. The restriction is due to cracks and missing material discovered on the runner blade in WY2023. Operation of the powerplant was limited to 24 megawatts per hour to full capacity load or approximately 425 ft^3/s to 550 ft^3/s of flow. Another unplanned outage for the water year began with the Alexander Mountain fire, which started west of the Charles Hansen Feeder Canal 550 Section the morning of July 29, 2024. Multiple evacuation orders were issued during the fire, and ultimately forced the shutdown of Pole Hill Powerplant, Dille Diversion, Charles Hansen Feeder Canal, and the Trifurcation on the canal. The Alexander Mountain fire evacuation orders, as related to C-BT facilities were lifted by August 5, 2024. The fire and resulting facility and conveyance shutdowns impacted power generation and project operations between July 29 and August 8, 2024, when the system was fully returned to normal operational status. The final major outage of the water year began in late August 2024 and continued through the end of the water year (ending in mid-December 2024). This planned outage was again on the Carter Lake Reservoir pressure conduit for Northern Water to connect the Chimney Hollow Project to the pressure conduit. The GMR Powerplant Unit No. 1 penstock recoating project began on November 7, 2023, and continued until June 2024. During the peak runoff season, both units of the Green Mountain Powerplant were available, allowing for Coordinated Reservoir Operations (CROs) and late season HUP and HUP surplus deliveries.

Starting in WY2023 and continuing for WY2024, the timing for major maintenance of project powerplants during the water year was altered with the purpose of enhancing power values. Powerplant outages were scheduled (outside east slope power skim months) in months of historically lower power values to optimize the water year total project power value.

Estes Powerplant Unit No. 2 had its maintenance performed in the spring of 2024. In May 2024, WAPA and Estes Powerplant staff performed relay swap overs on consecutive weeks for Units 1 and 3. Two units were always available for generation during maintenance and relay work.

The Flatiron Powerplant staff completed the maintenance of Flatiron Powerplant Unit No. 1 in the spring of 2024. Starting the last days of February into mid-March, WAPA and Flatiron Powerplant staff preformed relay swap overs on consecutive weeks for units 1 and 2. One unit was always available for generation during maintenance and relay work. The CHFC trifurcation wasteway and Big Thompson Powerplant were winterized during the first week of November 2023. Flatiron Powerplant Unit No. 3 underwent maintenance in the fall of 2024 during the same period Unit No. 3 was under clearance for the Northern Water Chimney Hollow connection to Carter Lake Reservoir pressure conduit.

The C-BT water deliveries were met throughout WY2024 in coordination with outage work. Deliveries to the CHFC continued as planned, using water from Carter Lake Reservoir during the 14-week Pole Hill Powerplant afterbay and outlet siphon repair to refill Flatiron Reservoir and meet CHFC demands during the outage. Maintenance outages at Flatiron and Estes Powerplants did not impact planned water operations.

Operations and Outcomes

Generally, starting around the middle of December, the project begins to divert water through Adams Tunnel at full capacity to refill Carter Lake and Horsetooth Reservoirs for the upcoming season. The first refill is planned prior to when skim and priority water typically become available in mid to late May through late June to maximize use of east slope skim and priority water by the project. In most cases, a small amount of space is left open in Horsetooth Reservoir to store unanticipated priority water that may become available at Dille Diversion on the Big Thompsons River. Unfortunately, this operation could not be implemented as planned in WY2024. The break discovered in the Pole Hill afterbay outlet siphon in December 2023 meant the east slope lower power arm could not be operated until the afterbay and outlet siphon were repaired. Winter fill of Carter Lake Reservoir was delayed by 14 weeks. To complicate matters, Dille Diversion on the Big Thompson River could not be used until temperatures increased enough to reduce concerns of ice dams forming in the river and at the Dille diversion structure if project water was released from Olympus Dam. Therefore, the upper power arm of the project could not be used until Dille Diversion was available. Dille Diversion was placed back into service earlier than typical in WY2024. By early March 2024, air temperatures had increased enough that project water releases from Olympus Dam began. This allowed use of the project's upper power arm and helped refill Horsetooth Reservoir to capacity by late June 2024. Once repairs to the Pole Hill Powerplant afterbay and outlet siphon were complete later in March 2024, Adams Tunnel diversions were increased to capacity and for the first time during the water year, the project's lower power arm was opened and pumping to Carter Lake Reservoir began, after the planned start of the project's winter fill operations. Flatiron Powerplant Unit No. 3 pumping to Carter Lake Reservoir continued, apart from a handful of short unplanned outages, from late March 2024 until the planned outage on the Flatiron Powerplant Unit No. 3 pressure conduit in late August 2024. Carter Lake Reservoir achieved its maximum storage content for the water year in late June 2024 and was within 8,000 AF of capacity at that time. Horsetooth Reservoir was filled to capacity in late June 2024 and generally held near full through the first week of July 2024. For the water year, just under 15,000 AF of east slope priority water was diverted and delivered to storage in Horsetooth or Carter Lake Reservoirs.

April 1, May 1, and June 1 east and west slope runoff forecasts were steady in their predicted runoff volumes for the season and generally maintained their near average to slightly greater than average forecast throughout the period. The exception was Willow Creek Reservoir forecast which increased from April 1 to May 1 going from mildly greater than average to greater than average forecasted runoff for the period. By early May, with much greater than average carryover storage at Granby Reservoir, a late start on the seasonal winter refill of Carter Lake and Horsetooth Reservoirs and near average runoff forecasted, it was evident that the potential for a spill at Granby Reservoir was extremely high. Willow Creek pumping to Granby ceased at the end of April, greater than average east slope priority water became available for the project in late April, May into mid-June 2024, and Granby spilled about 42,500 AF from mid-May to early July 2024. The Granby spill ceased in the first week of July for the water year and Willow Creek pumping resumed later that same month.

Carter Lake Reservoir was filled to within 8,000 AF of capacity by June 26, 2024. For the water year, pumping to Carter began on March 26 and, apart from a couple unscheduled outages due to Flatiron Unit 3 pump trips, continued until August 26, 2024. A Chimney Hollow outage on the Unit 3 pressure conduit began the same day Flatiron pumping ceased for the water year. To make up for the late start of the winter refill diversion period, due to the Pole Hill Powerplant afterbay outage, and to minimize Granby spill during WY2024, from March 14, 2024, through September 16, 2024, Adams Tunnel diversions were greater than 400 ft^3/s 90 percent of that time and over 525 ft^3/s for half that same period. As a result, Olympus Tunnel skim opportunities were rare and small in magnitude. Since nearly 15,000 AF of priority water became available during the WY2024 season in conjunction with the need to minimize west slope spill, Olympus Tunnel skim operations were largely supplanted by the need to move priority water into storage at Horsetooth and Carter Lake Reservoirs and move project water diverted through Adams Tunnel and Olympus Tunnel from late April to late August 2024. However, Dille Diversion power skim opportunities were maximized during WY2024. Even though by June 20, 2024, the project moved out of priority on the east slope, Adams Tunnel diversion remained high to minimize west slope spill. By the time west slope spill ceased on July 4, support of Grand Lake clarity operations for the season was underway and Adams Tunnel diversion remained high through the end of August 2024.

At the end of the fall inspection period in mid-December 2023, Horsetooth Reservoir had about 46,700 AF of free space. Due to the unplanned Pole Hill afterbay during the winter of 2024, Horsetooth available storage space increased to about 50,000 AF of fill by mid-March 2024. From that point, Horsetooth Reservoir storage increased to capacity by June 19 and remained near capacity through approximately July 7, when demands began to exceed supply to the reservoir. Throughout the season, Horsetooth and Carter Lake reservoir demands were mildly higher than projected mainly due to less than normal rainfall from June through September during the irrigation season and warmer than normal temperatures. Horsetooth Reservoir ended the WY2024 with nearly 114,700 AF in storage. Carter Lake reservoir ended the water year with just over 74,600 AF in storage. Both storages were greater than typical for the end of the water year, but less than their initial storages for the start of the water year.

Previously explained limitations to C-BT project operations and skim operations, particular to WY2024, increased daily mean releases from Olympus Dam to the Big Thompson River. Figure 2 illustrates how the Olympus Dam instantaneous releases were managed during the runoff of mid-April through August 2024. The peak instantaneous release from Olympus Dam was 842 ft^3/s and occurred on June 7, 2024. Maximum instantaneous inflow to Lake Estes was 1,090 ft^3/s and occurred on June 9, 2024. Although Olympus Tunnel skim occasions were rare in WY2024, when capacity for skim was available in Olympus Tunnel all opportunities were utilized for Olympus Tunnel skim operations in the water year.

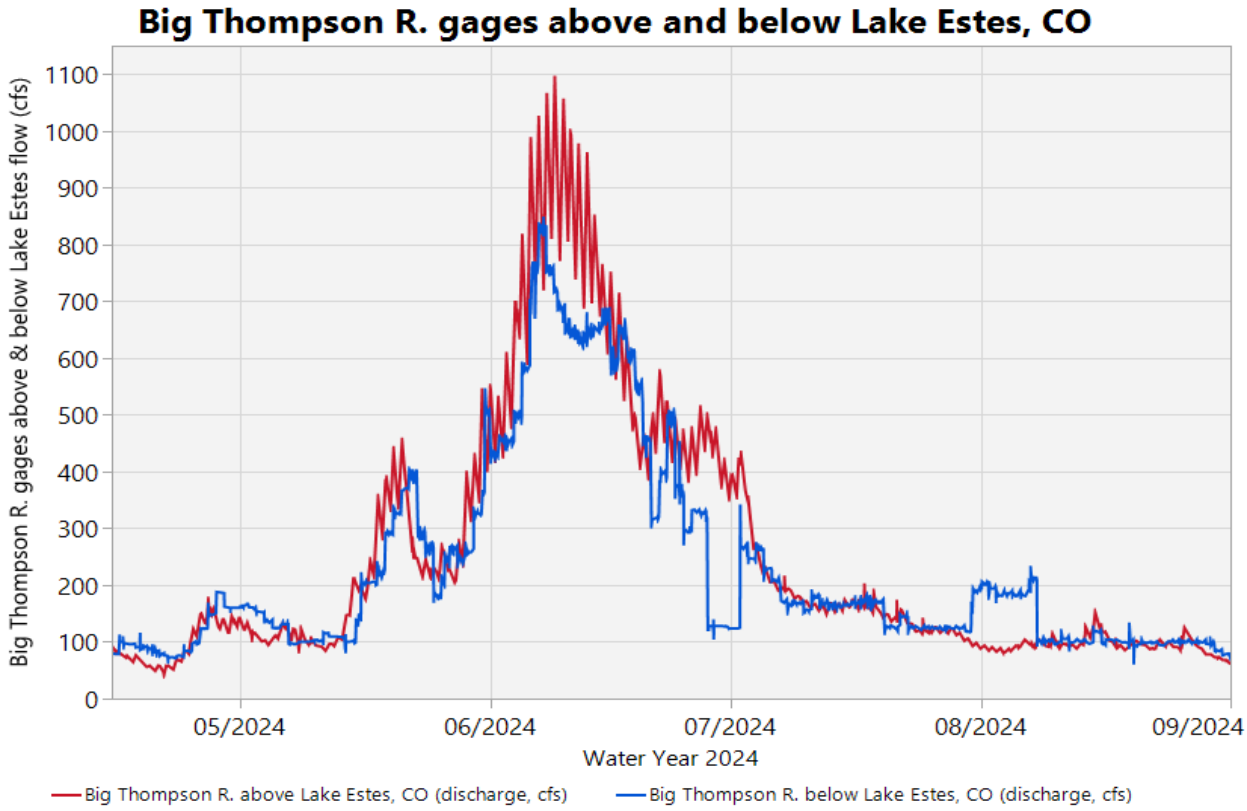


Figure 2.—Big Thompson R. gages above and below Lake Estes: April through August 2024 discharge (ft^3/s).

C-BT Operations by Facility

Collection System

Willow Creek Reservoir

October through March: Figure 3 shows snow accumulation in the Willow Creek Reservoir basin was average during October 2023 and moved to mildly below average until March 2024. By mid-March accumulation increased to average for the season.

Reservoir release operations followed standing operating procedures. Winter reservoir release was maintained near seven ft^3/s for Colorado River fishery maintenance as directed by the Secretary of Interior schedule of release.

April: The very first signs of runoff in the Willow Creek watershed began in early April 2024 (figure 4). Pumping from Willow Creek Reservoir to Granby Reservoir also began in earnest April 2024. At least one pump ran from April 9 through April 30, 2024. Throughout April, though snow melt runoff had begun for the season, the snowpack was replenished by additional snowfall events (figure 3). With much greater than average carryover storage at Granby

Reservoir to start the water year, a late start on east slope winter refill of Carter and Horsetooth Reservoirs, and near average runoff forecasted on for Granby and greater than average runoff forecasted for Willow Creek watersheds, it was evident that the potential for a spill at Granby Reservoir was extremely high. Willow Creek pumping to Granby ceased at midday on April 30, 2024. For the month, a total of 13,210 AF was pumped to Granby Reservoir.

May: The WY2024 computed daily peak inflow of 948 ft^3/s was reached on May 19, 2024 (figure 4). Since pumping operations had ceased at the end of April and Willow Creek Reservoir storage was being maintained at a relatively constant volume, the daily peak release from Willow Creek Reservoir of 944 ft^3/s also occurred on May 19, 2024. For the month, total inflow was about 34.5 KAF and total releases were 34.8 KAF.

June: Willow Creek Reservoir continued to release most inflow to the reservoir throughout the first half of June. By the end of June, as seasonal runoff slowed, reservoir storage increased mildly in anticipation of pumping operations later in July.

July: Pumping resumed on July 22 once sufficient space became available in Granby Reservoir. For the month 2,309 AF was pumped to Granby Reservoir and for the season, just over 49.5 KAF was spilled at Willow Creek Reservoir during WY2024.

August and September: No additional water was pumped to Granby Reservoir for the remainder of the water year.

The observed April-July runoff to Willow Creek Reservoir was 66.4 KAF, more than the long-term median seasonal runoff volume of 47 KAF. The April 1 most probable forecast (forecasts are from table 3, presented earlier in this report) was 55.7 KAF. May 1 most probable forecast was 64.8 KAF and June 1 most probable forecast was 66.8 KAF, very close to the observed April–July runoff.

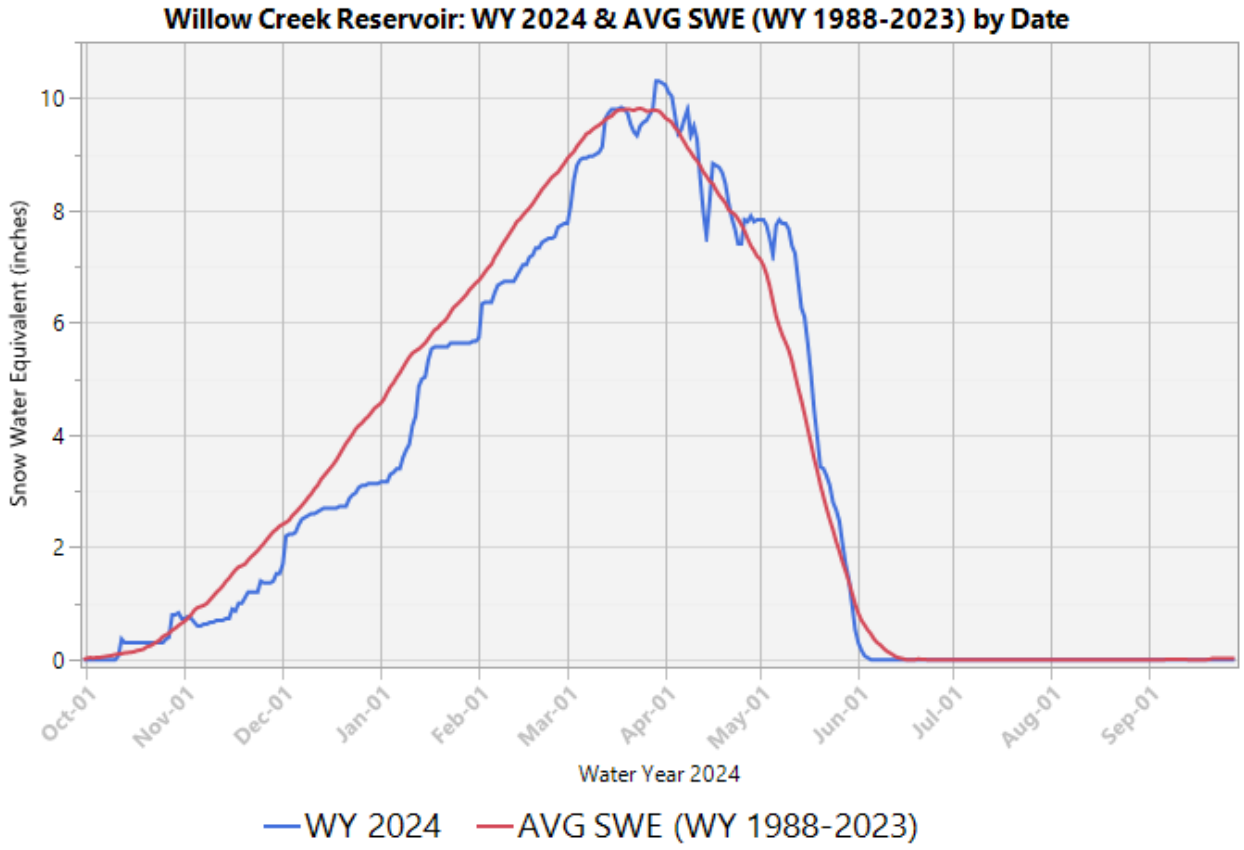


Figure 3.—WY2024 and 35-year average SWE for the Willow Creek Reservoir drainage area.

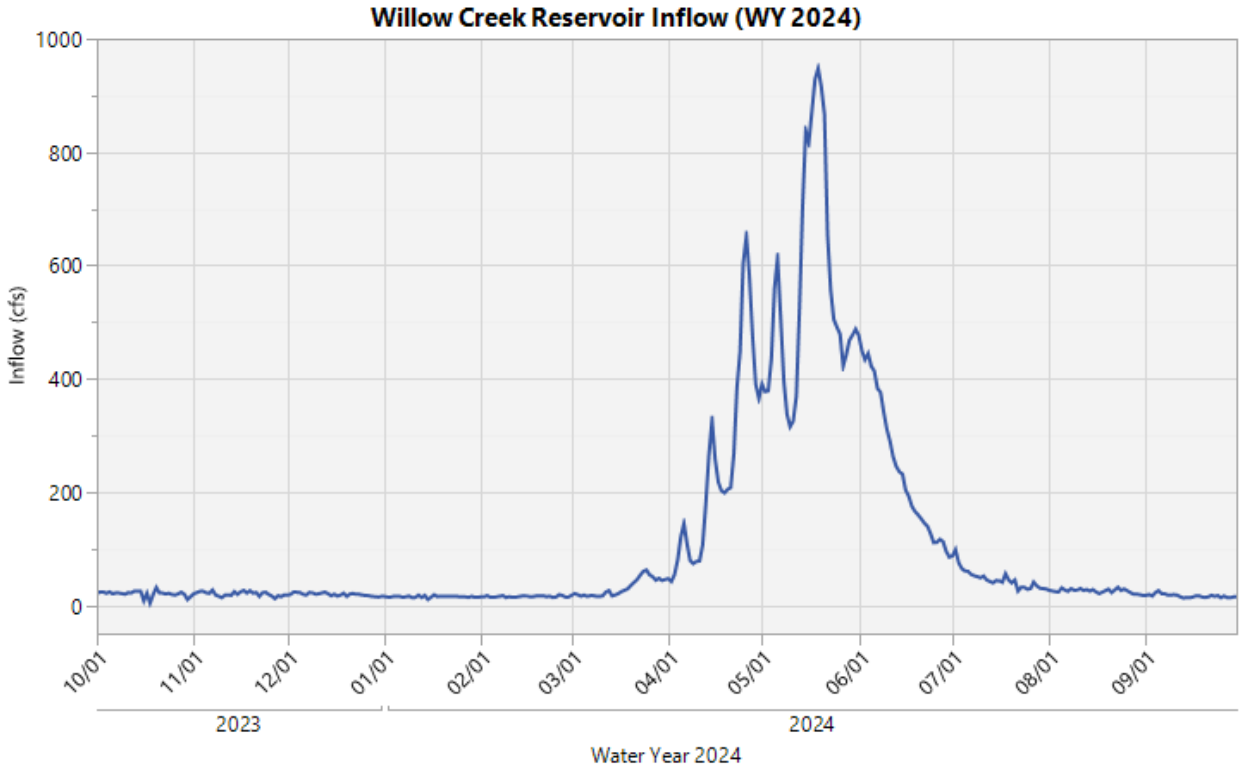


Figure 4.—Computed inflow to Willow Creek Reservoir during WY2024.

Granby Reservoir and Shadow Mountain Reservoir/Grand Lake

Granby Reservoir, Shadow Mountain Reservoir, and Grand Lake are located on the Upper Colorado River. Grand Lake and Shadow Mountain Reservoir are hydraulically connected and function, operationally, as a single body of water with the water surface elevation controlled by Shadow Mountain Dam. Operations maintain water surface elevation between 8,366 and 8,367 feet. The two water bodies provide approximately 1,700 AF of regulatory storage and function as the forebay for Adams Tunnel and an afterbay for the Farr Pump Plant. The Farr Pump Plant moves water from Granby to Shadow Mountain Reservoir as needed to augment Adams Tunnel diversion of Shadow Mountain Reservoir and Grand Lake native flow. During spring runoff, native flow usually exceeds Adams Tunnel diversion and excess water is released from Shadow Mountain Reservoir down the Colorado River for storage within Granby Reservoir. During WY2024, Shadow Mountain Dam maintained minimum flows to the Colorado River and maintained water surface elevation as described within the Standing Operating Procedures.

Unless otherwise noted, the balance of this section emphasizes Granby Reservoir operations which are considerably more variable, and therefore, of more operational interest than that of Shadow Mountain Reservoir and Grand Lake.

October through February: The carryover content from WY2023 for Granby Reservoir was 484,991 AF or 110 percent of the 30-year average start of water year content (441,389 AF). At full capacity Granby storage is 539,758 AF. The planned diversions through the Adams Tunnel were delayed by 11 weeks due to a break discovered on the project's east slope Pole Hill afterbay outlet siphon in December 2023. By the end of February 2024, Granby Reservoir content had reached 135 percent of the 30-year average for that time of year. Figure 5 shows snow accumulation in the Granby basin was below average for most of the early part of season.

March through April: Snow accumulation remained below average in March and reached its seasonal peak at the end of March. Adams Tunnel diversions began in early March and reached full capacity later that month as repairs were completed to the Pole Hill afterbay outlet siphon. The average daily Adams Tunnel diversion from March through the end of April 2024 were 426 ft^3/s.

April/May through June: By the beginning of April 2024 snow conditions in the Granby Reservoir watershed were slightly below normal. By the end of April, the average Granby Reservoir storage content had reached 140 percent of the 30-year average for that time of year primarily due to the project's inability to start east slope winter fill operations as planned. Adams Tunnel diversions were delayed 11 weeks and full capacity diversion in Adams Tunnel was delayed 14 weeks from the originally planned start of winter refill of Carter and Horsetooth Reservoirs, as the Pole Hill afterbay outlet siphon was repaired. The likelihood of a project spill at Granby Reservoir had approached near certainty. By May 15, 2024, Granby Reservoir preemptive releases began. Releases averaged about 230 ft^3/s from May 15 through June 10, the maximum release through the Granby hollow jet valve while still allowing operation of Northern Water's Granby hydropower plant. This took full advantage of Northern Water's power generation capabilities from preemptively released water during that period. By June 1 Granby, Horsetooth and Carter Lake Reservoirs' combined storage was 734.6 KAF, nearly 116 KAF greater than the average combined storage for the preceding 30 years for that date. Granby Reservoir storage was 487 KAF, nearly 89 KAF greater than the 30-year average by that point in time. Daily air temperatures began to increase rapidly. By late May and throughout most of June, temperatures were mildly greater than average. The slightly less than average snowpack and warmer than normal air temperatures created a slightly greater than average runoff peak, near average timing of that peak and a runoff duration slightly shorter than normal. Computed mean daily natural inflow to Granby, which peaked on June 14, was 1,167 ft^3/s. Adams Tunnel diversions in May 2024 averaged over 530 ft^3/s as the project attempted to minimize Granby Reservoir spill for the water year.

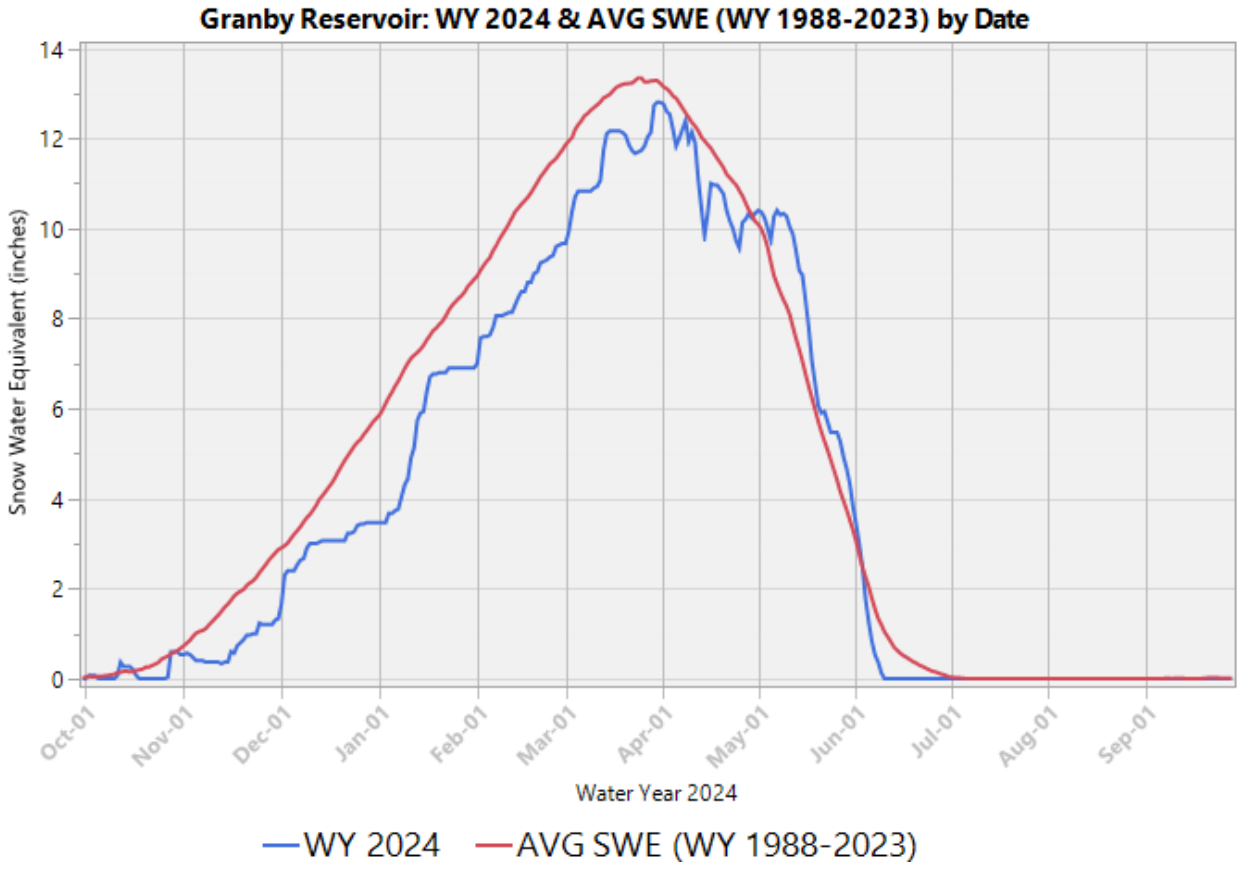
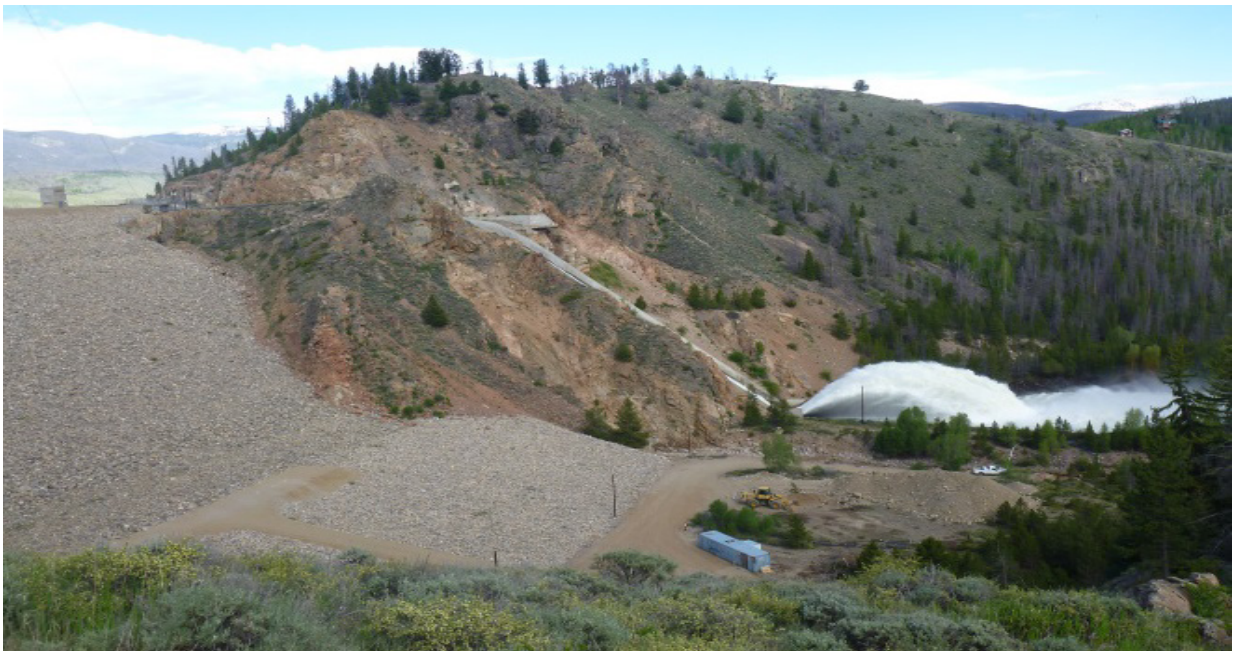


Figure 5.—WY2024 versus 35-year average SWE for the Granby Reservoir drainage area.

July through September: Adams Tunnel diversions remained between 400 and 550 ft^3/s until the last few days in September 2024. Pumping to Carter Lake Reservoir continued throughout July until a planned outage on the Carter Lake Reservoir pressure conduit began on August 26, 2024.

Throughout the runoff forecast season there was strengthening indication that a spill was likely at Granby Reservoir for WY2024. Preemptive releases from Granby in excess of the minimum required release began on May 15 and continued until July 4, 2024. Granby reached its maximum storage of 535,916 AF on June 26, 2024. The Granby Reservoir maximum average daily release of 1,176 ft^3/s reached its peak on June 15, 2024. The seasonal spill volume from Granby Reservoir was about 42.5 KAF in WY2024.

Granby Reservoir finished WY2024 with 468,335 AF of water in storage. Granby storage remained above the end of month 30-year average storage the entire water year (figure 6).



Photograph 5.—Granby Reservoir spill; approximately 2,400 ft^3/s, June 13 through June 21, 2015.

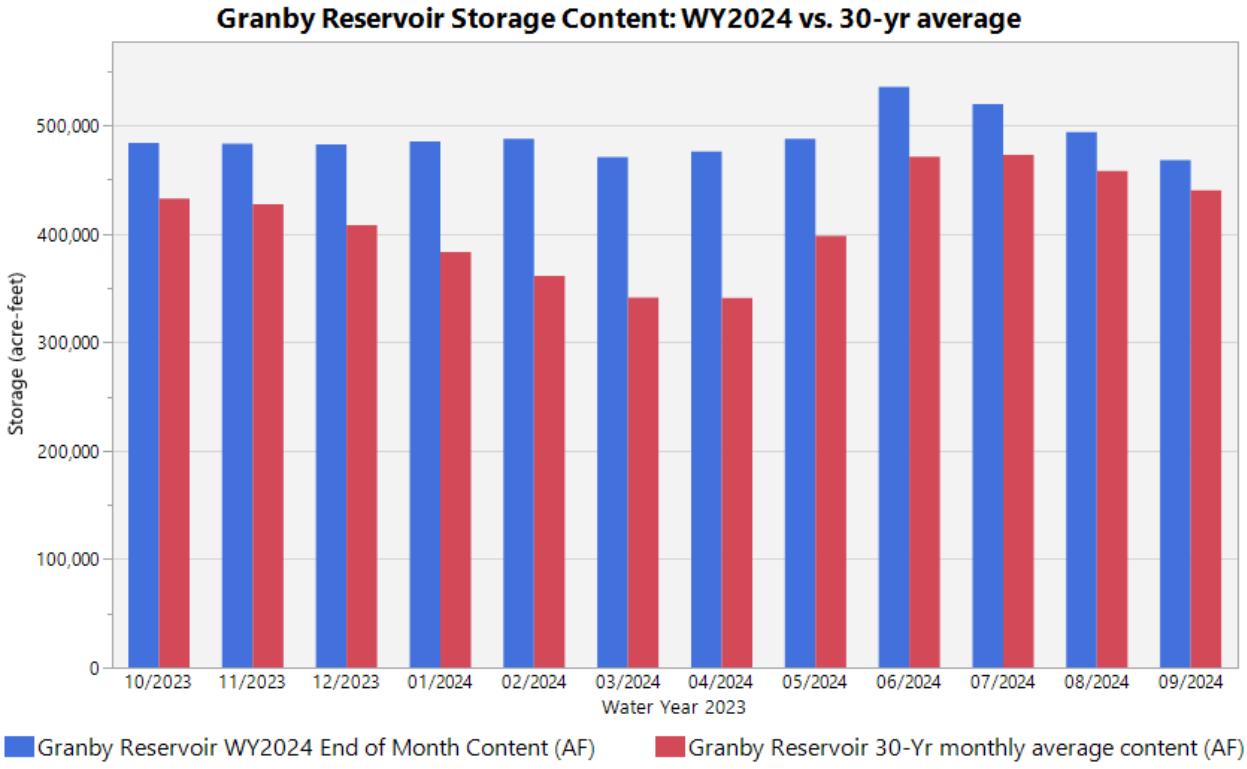


Figure 6.—Granby Reservoir storage content, WY2024 versus the 30-year average storage content.

The observed April-July runoff to Granby, Shadow Mountain Reservoirs and Grand Lake was approximately 224 KAF. The April 1 most probable forecast (displayed previously in table 3) was 200 KAF, May 1 was 224 KAF and June 1 was 216 KAF.

Similar to the successful seasons in 2018 and 2019, the initial Grand Lake Water Clarity operation plan within AOP 2024 included a pre-clarity operation in mid to late June to reduce Adams Tunnel diversions to slightly less than Grand Lake natural inflow in an attempt enhance total suspended solids settling, post peak runoff, and minimize introduction of Shadow Mountain Reservoir water into Grand Lake. Due to the unplanned Pole Hill afterbay outage from December 2023 to March 2024, which forced a late start to the east slope terminal reservoir fill season, and the increasing likelihood of Granby Reservoir spill, the pre-clarity settling operation could not be accommodated. From June 18 through June 26, 2024, flows in the connecting channel between Shadow Mountain Reservoir and Grand Lake shifted directions daily, however, the magnitude of those flows, regardless of direction were relatively small. On June 27, a power failure occurred at Flatiron and Big Thompson Powerplants. Although Big Thompson and Flatiron Units No. 1 and 2 were restored shortly after the failure, Flatiron Unit No. 3 needed a replacement part installed prior to resumption of pumping to Carter Lake Reservoir. The part arrived within a couple of days and pumping to Carter resumed the afternoon of July 1. While the pump was down, Adams Tunnel diversion was reduced which created a favorable flow direction in the Shadow Mountain and Grand Lake connecting channel allowing for a better settling period for pre-clarity operations at Grand Lake than anticipated. Adams Tunnel diversion was returned to capacity by July 4 and the pre-clarity operation, such that it was for WY2024, concluded. As is typically observed, Grand Lake Secchi depth was better than Shadow Mountain clarity in early July. The Granby Reservoir spill ceased on July 4 with the resumption of full diversions at Adams Tunnel. The daily average Farr Plant pumping rate from July 4 through the end of the Grand Lake Clarity Season was 440 ft^3/s. The average Grand Lake Secchi depth declined with the start of pumping (5.0 to 3.95 meters). Gradual improvement in clarity was observed from early July to the end of the month. Grand Lake Secchi depths generally remain near 4.75 to slightly over five meters for the remainder of the season. Once the probability of additional Granby spill had passed, by approximately the third week of July, the plan to increase Adams Tunnel diversions during the workdays and reduce diversions on weekends was implemented throughout the remainder clarity season The weekday/weekend cycling operation was similar to the successful clarity season operation executed during the 2018 and 2019 clarity season and was designed to increase the power generation benefit and create a destabilized environment theorized to be unconducive to blue-green algae growth in Shadow Mountain Reservoir and Grand Lake.

For the WY2024 season, both the minimum clarity goal of 2.5 meters and the seasonal running average clarity goal qualifier of 3.8 meters were met during Grand Lake Clarity operations. The minimum clarity was 3.7 meters, and the running average was 4.6 meters for the season (figure 7).

A full description of the planned clarity operations and actual operations for the WY2024 clarity period can be found in the 2024 Grand Lake Clarity Adaptive Management Final Report[6].

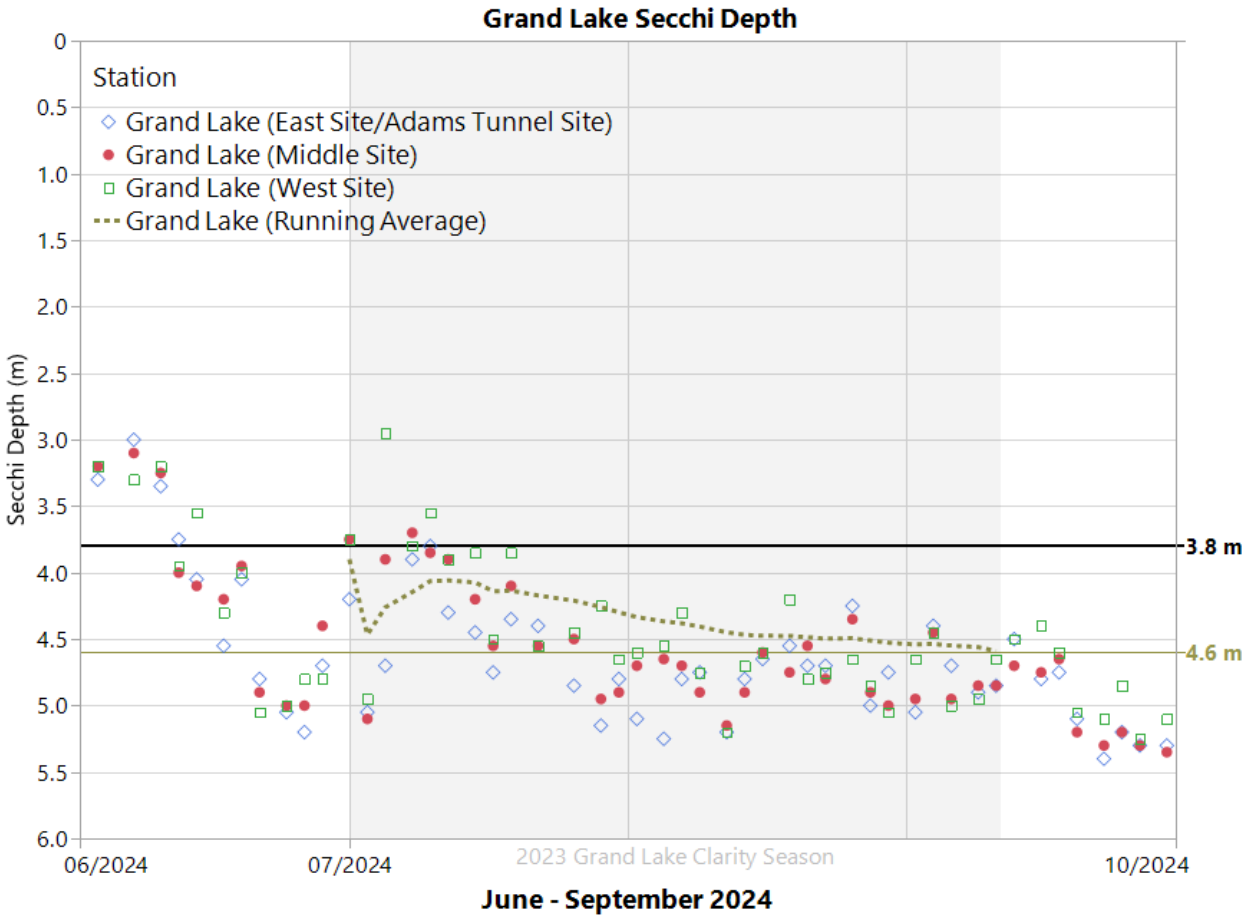


Figure 7.—Seasonal Secchi depths in Grand Lake for 2024 clarity season.

East Slope

Adams Tunnel, Marys Lake and Lake Estes

November–December 2023: WY2024 was the first full year implementing a scheduling change for powerplant maintenance. Most maintenance will take place in the spring of each year to optimize power values during the water year. Water year 2024 started with a Northern Water outage on the Carter Lake Reservoir pressure conduit to perform encasement of a section of the conduit which runs under the Chimney Hollow Spillway. In addition, numerous inspections took place at different facilities and east slope power arm waterways during late fall and early winter

[6] 2024 Grand Lake Clarity Report available online from Northern Water website (accessed February 10, 2024)

of 2023. Water diversions from the west slope were suspended from November 17, 2023, through December 10, 2023, to accommodate these activities. During the inspection period, a break was discovered in the Pole Hill afterbay outlet siphon. The east slope lower power arm could not be operated as planned until the afterbay and outlet siphon were repaired. Consequently, west slope diversion through Adams Tunnel was delayed by 11 weeks. Near full capacity Adams Tunnel diversions began later in March 2024, 14 weeks after the originally planned date for the start of the winter fill operation of east slope terminal reservoirs. The snowpack in the Lake Estes watershed was well below normal at the end of December 2023 (figure 8).

December 14: Pole Hill afterbay and siphon placed on clearance as soon as emergency outage request was approved that same day. The outage included Olympus Tunnel and Flatiron Units 1 and 2.

December 19: Estes Powerplant units 1, 2, and 3 were placed under clearance due to Pole Hill afterbay and siphon outage. Project water diversion through Adams Tunnel ceased.

January-March 2024: The snowpack above Olympus Dam started the calendar year below average and maintained its below average accumulation until mid-March when accumulation increased to near average (figure 8). Estes Powerplant Unit No. 2 maintanence started in mid-March and ended in mid-May. Two units were always available for generation during the period during the maintanence period. Adams Tunnel diversions began for season in early March.

March 4: Adam Tunnel diversion initiated for winter fill season, 11 weeks after planned start. Project water was released from Olympus Dam to the Big Thompson River and rediverted at Dille for start of refill of Horsetooth Reservoir. The project water flow released from Olympus Dam to the river started small and was gradually increased to about 435 ft^3/s over the span of 11days. This operation was implemented to enhance ice melt in the Big Thompson River and reduce ice dam concerns in Big Thompson River and at Dille Diversion.

March 18: Maintenance of Estes Powerplant Unit No. 2 began.

March 22: Pole Hill afterbay and siphon repairs were completed and all clearances associated with the Pole Hill afterbay and siphon lifted on the project's east slope. Adams Tunnel flows increased to capacity for the first time during the water year. Olympus Tunnel flows resumed to gradually refill Pinewood Reservoir.

March 28: Adams and Olympus Tunnel flows were both at capacity for the first time for the water year.

April: Air temperatures increased gradually starting in late March and throughout April which began to melt some of the snow at lower elevations. The inflow to Lake Estes generally increased during the same period.

April 27: The project came into priority on the east slope for the first time during the water year. The timing of priority water becoming available in WY2024 was much earlier than typical. Due to the low demand for water in WY2023, most reservoirs on the east slope were full or nearly full by the beginning of May, which helped the project come into priority much sooner in the runoff season than previous years. For the month, 1,425 AF of priority water was sent to Horsetooth Reservoir from Dille Diversion.

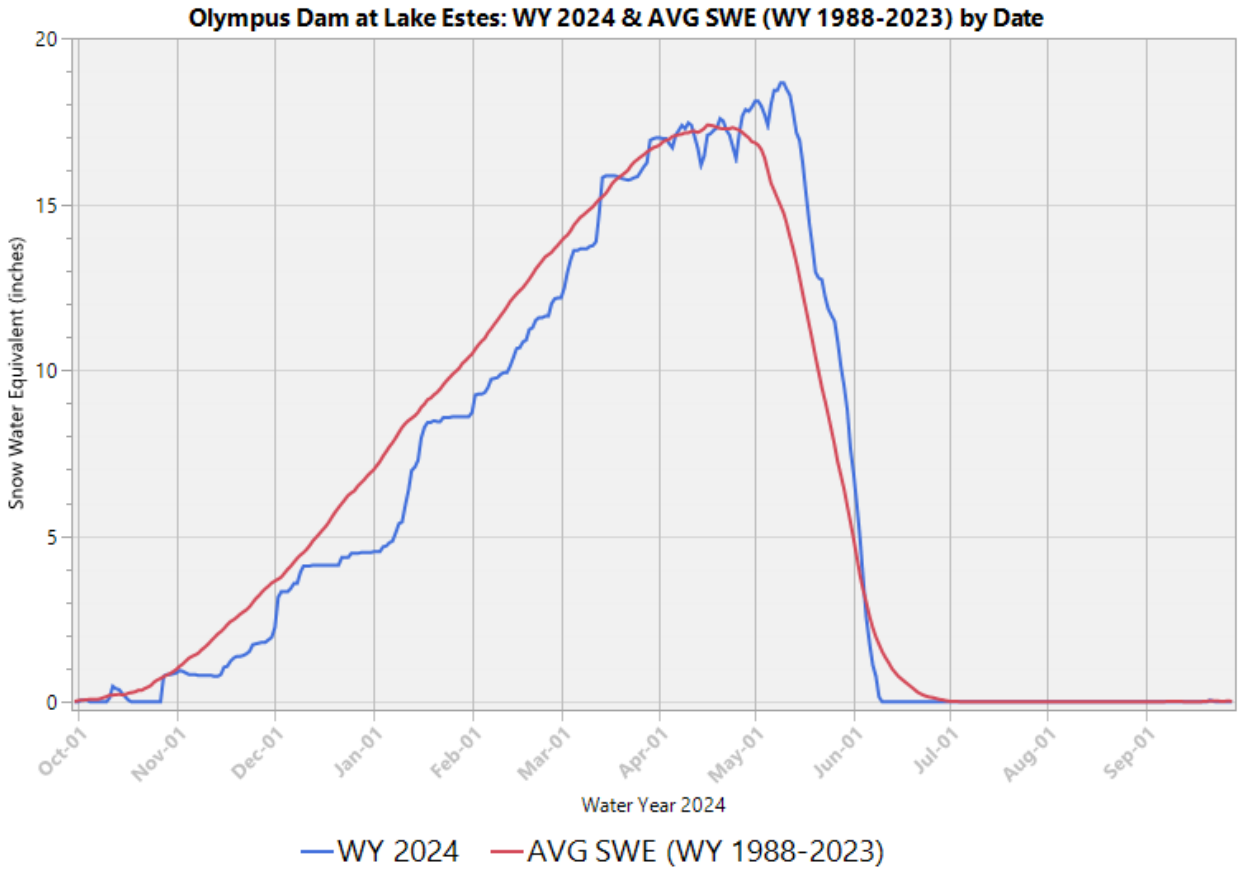


Figure 8.—WY2024 and 35-year average SWE for the Olympus Dam drainage area.

May: Mean daily air temperatures over the Front Range were 2 to 3 degrees Fahrenheit below normal during first half of May, slowing snow melt and the natural inflow to Lake Estes. However, temperatures increased to above normal by the end of May and the natural inflow to Lake Estes increased rapidly. For the water year, the cumulative natural inflow to Lake Estes was mildly less than the 30-year average. The exception was June 2024 which had near average natural inflow (figure 9). East slope priority water continued sporadically throughout the month with an additional 3,674 AF diverted at Dille for storage in Horsetooth Reservoir and 571 AF diverted to storage in Carter Lake Reservoir via Olympus Tunnel. Adams Tunnel diversions remained near capacity during May, averaging 532 ft^3/s for the month, as the project continued to attempt to reduce west slope spill.

May 7: For the first time during the water year, Olympus Tunnel was used to divert east slope priority water to Carter Lake Reservoir.

May 10: Maintenance of Estes Powerplant Unit No. 2 was completed, and the unit was brought online and back to service.

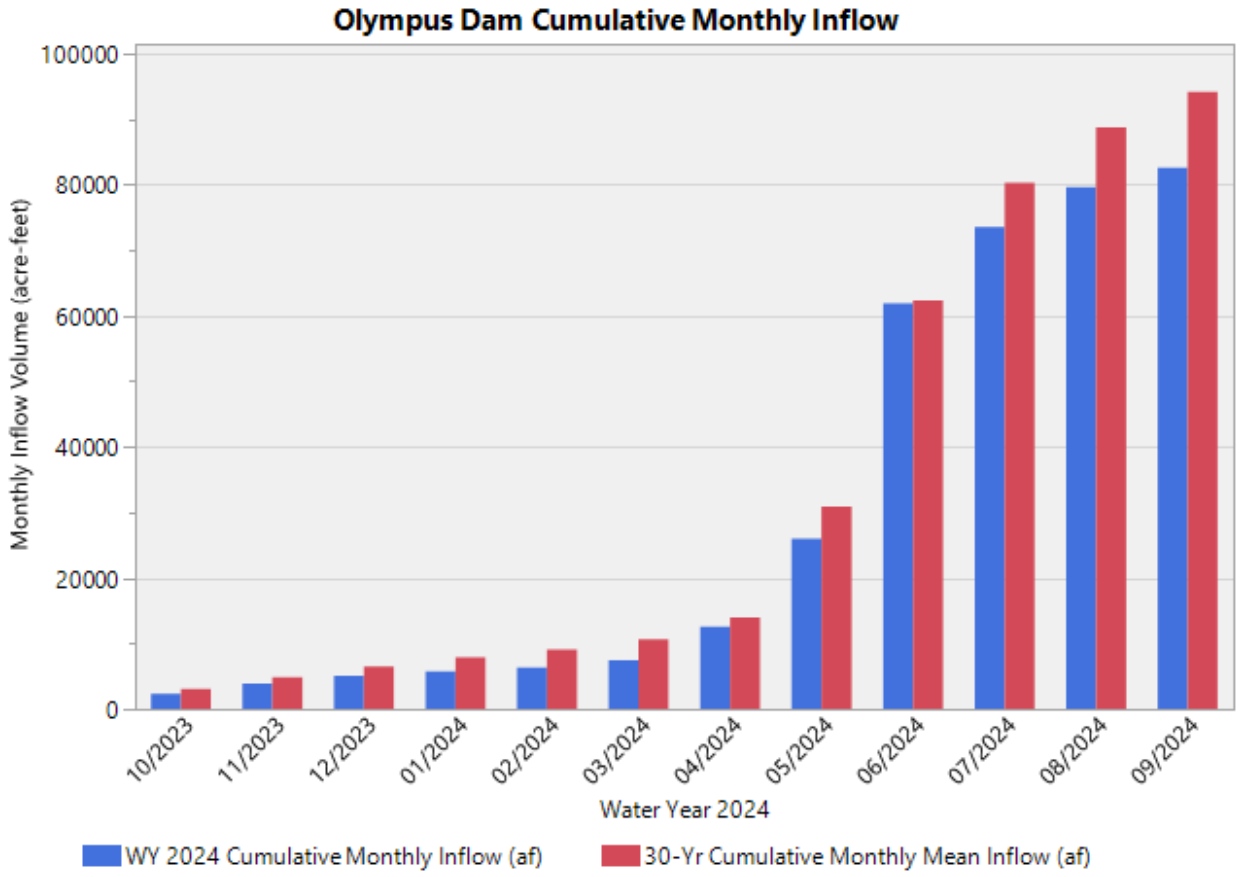


Figure 9.—Computed cumulative native inflow for Lake Estes during WY2024 versus 30-year average.

June: Mean daily temperatures over the Front Range continued to increase. Average daily air temperatures were nearly three degrees above normal for the month. Big Thompson River above Lake Estes flows peaked on June 8, slightly before the fifteen-year average date of June 11. Adams Tunnel diversion remained much higher than typical for June, as the project continued to attempt to minimize west slope spill. Adams Tunnel diversions averaged 432 ft^3/s in June.

June 3: Wind River skim operations began for the water year. A total of 464 AF for the water year was skimmed for power generation at Marys and Estes Powerplants between June 2 and July 21, 2024. This value is lower than typical and was the result of the project needing all available conveyance space in Rams Horn Tunnel to reduce west slope spill during runoff.

June 8: Mean daily flow for the Big Thompson River above Lake Estes peaked at 946 ft^3/s. The instantaneous peak flow, recorded on June 9 was 1,088 ft^3/s. The maximum mean daily release to the Big Thompson River below Lake Estes, 825 ft^3/s, occurred June 7, 2024.

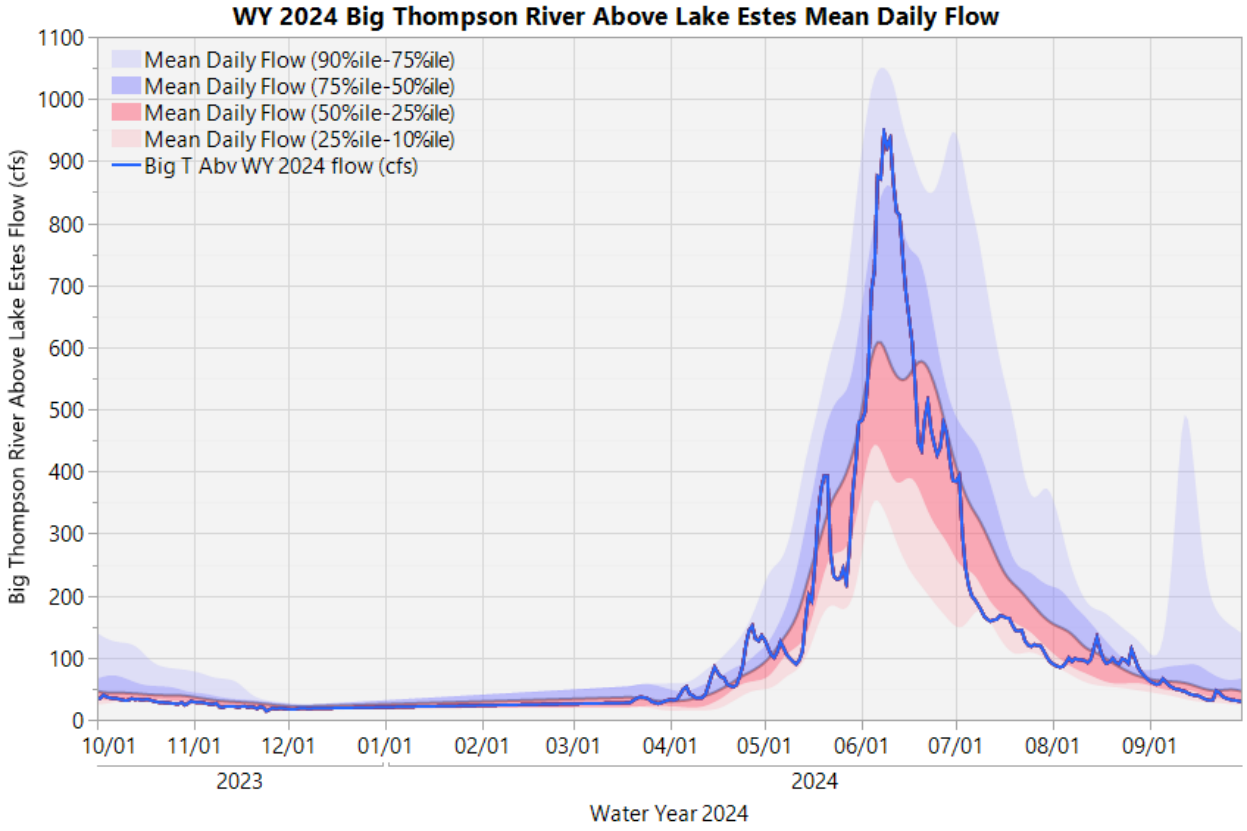


Figure 10.—Big Thompson River above Lake Estes, WY2024 gage flow vs. distribution of 15-year daily flows.

July-September: Adams Tunnel diversions averaged 505 ft^3/s for July, 476 ft^3/s for August and 402 ft^3/s for September. Big Thompson inflows to Lake Estes declined to below 15-year median inflows by July but moved back to near median flows by mid-August (figure 10).

The observed April–July runoff to Lake Estes was approximately 66.0 KAF. The April 1 most probable forecast (table 3, above) was 71.8 KAF. May 1 most probable forecast was 74.2 KAF and June 1 most probable forecast was 75.4 KAF.

Lower Power Arm, Carter Lake and Horsetooth Reservoirs

October–November 2023: Multiple outages occurred at the start of the WY2024 as the project took advantage of the Northern Water planned outage that began at the end of WY2023 on the Carter Lake Reservoir pressure conduit so Northern Water could perform encasement of the section of the conduit that runs under the Chimney Hollow spillway. CHFC 930 and 550 Sections maintenance and repairs occurred during October and into early November.

December 2023: Numerous inspections were made during late November through early December. During the inspection period, a break was discovered in the Pole Hill afterbay outlet siphon. The east slope lower power arm could not be operated as planned until the afterbay and outlet siphon were repaired. Pole Hill afterbay and siphon were placed on clearance. The outage included Olympus Tunnel and Flatiron powerplant units 1 and 2. Flatiron Unit No. 3 was used in generation mode three times in December 2023 to refill Flatiron Reservoir and maintain based flows in the CHFC to support canal project water demands and mitigate any canal icing concern.

January and February 2024: Flatiron Unit No. 3 was used in generation mode seven times in January and February 2024 to refill Flatiron Reservoir and maintain based flows in the CHFC supporting canal project water demands and mitigating any canal icing concern. Repairs to the Pole Hill afterbay outlet siphon continued.

March and April: With repairs completed to the Pole Hill afterbay outlet siphon, diversions began through Olympus Tunnel (figure 11) for the first time since December 3, 2023. A minor maintenance was started for Flatiron powerplant Unit No. 1 in early March and was completed in mid-April. Pumping to Carter Lake Reservoir began for the first time during the water year by the fourth week of March.

During the previous water year, a January 2023 inspection and report revealed cracks and missing material on the Pole Hill Powerplant runner blade. To minimize stress on the runner blade, an operation restriction was placed on Pole Hill Powerplant in March 2023 limiting generation to loads between 24MW and full load (flows of approximately 425 ft^3/s or greater). The restriction remained in place throughout WY2024 and will remain until the issue is resolved.

March 4: Minor maintenance of Flatiron Powerplant Unit No. 1 began.

March 22: Flows began in Olympus Tunnel. The first task was to refill Pinewood Reservoir's operational storage.

March 26: Flatiron Unit No. 3 pumping to Carter Lake Reservoir began for the season nearly 14 weeks after the planned start of winter fill operations for Carter Lake Reservoir. With the exception of three unplanned, short outages, Flatiron Unit No. 3 continued pumping until a planned outage in late August 2024.

April 12: Maintenance of Flatiron Powerplant Unit No. 1 was completed, the unit was brought online and remained available for the rest of the water year.

April 27: The first east slope priority water became available for the project. A total of 1,425 AF of priority water was diverted from the Big Thompson River at Dille in April 2024.

May: The first Olympus Tunnel priority water was diverted for the season and pumped to Carter Lake Reservoir. Due to late start of winter fill operations and the need to reduce west slope spill during the season, less than the typical percent of the total east slope priority water that was available for the project was diverted through Olympus Tunnel in WY2024. Most priority water was selectively diverted at Dille and sent to Horsetooth Reservoir to maximize project water flow in Olympus Tunnel.

May 7: The first Olympus Tunnel priority was diverted to Carter Lake Reservoir. For May, 571 AF of priority water was diverted in Olympus Tunnel and pumped to Carter Lake Reservoir, while 3,674 AF was diverted at Dille for storage in Horsetooth Reservoir.

May 13: Big Thompson Powerplant began generation for the first time during the water year using flow from the water skimmed at Dille Diversion.

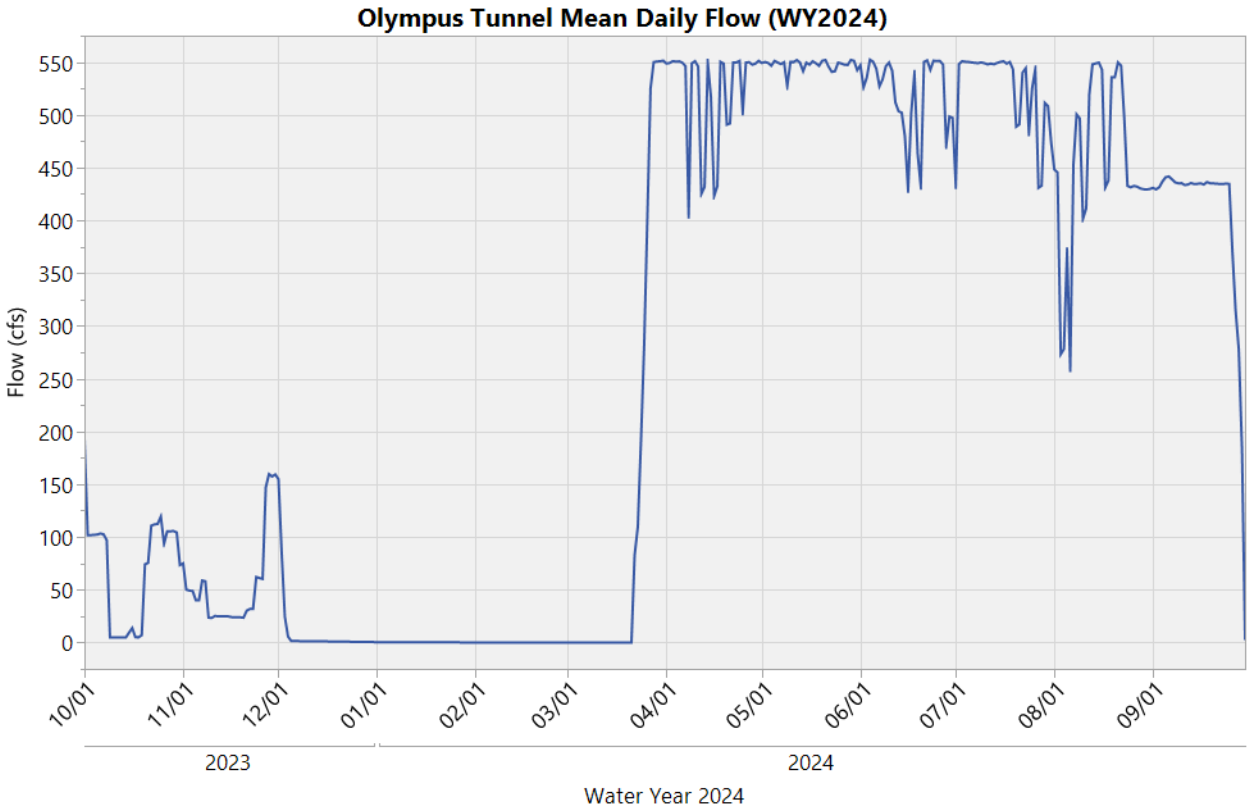


Figure 11.—Olympus Tunnel mean daily flow during WY2024.

June: Most area reservoirs were full by the end of the first week of June. As a result, the project remained in priority on the east slope throughout much of the first three weeks of June. Temperature increased to above normal for June increasing demand for irrigation storage in area reservoirs and the project fell out of priority by June 19 ending the priority water for the season. Olympus Tunnel skim and priority water volumes for the month were much lower than typical as the project continued to mimimize west slope spill. Given the constraint on Olympus Tunnel, Dille skim and priority water diversion was maximized for the month. For the month, a total of 7,841 AF of priority water was diverted at Dille and an additional 1,469 AF diverted through Olympus Tunnel. Adams Tunnel diversions were mildly reduced in June but remained very high for the season, averaging 432 ft^3/s for the month, primarily because of the continuing need to reduce west slope spill. Carter Lake Reservoir reached its seasonal peak storage in June, filling to within eight KAF of capacity. Horsetooth Reservoir was filled to capacity by the third week of June.

June 20: Horsetooth was filled and remained near capacity for the next two weeks.

June 26: Carter reached its maximum storage content for the season, about eight KAF short of capacity. A short, unplanned outage at Flatiron Unit No. 3 occurred on June 27 and by the time the unit was restored for operation and pumping resumed (on July 1), demands on Carter Lake Reservoir exceeded pump supply.

July-September: The Alexander Mountain fire started west of the Charles Hansen Feeder Canal 550 Section the morning of July 29, 2024. Multiple evacuation orders were issued during the fire, and ultimately forced the shutdown of Pole Hill Powerplant, Dille Diversion, Charles Hansen Feeder Canal, and the Trifurcation on the canal. The Alexander Mountain fire evacuation orders, as related to C-BT facilities were lifted by August 5, 2024. The fire and resulting facility and conveyance shutdowns impacted power generation and project operations between July 29 and August 8, 2024, when the system was fully returned to normal operational status. The monsoon moisture that moved into the area in early August allowed fire fighters to finally contain area wildfires. The August precipitation events associated with monsoon moisture provided some mild boosts to summer streamflow in mid-August 2024.

July 29: Alexander Mountain fire started just west of the CHFC 550 Section.

July 30: Stone Canyon started at a location immediately north of Lyons, CO, southwest of Carter Lake Reservoir.

August 3: Olympus Tunnel flows reduced, Pole Hill Powerplant, Dille Diversion and CHFC Trifurcation shut down and CHFC 930 Section flow ceased due to Alexander Mountain fire evacuation orders. Pumping to Carter Lake Reservoir continued.

August 5: Evacuation orders related to Alexander Mountain fire lifted.

August 7: Flows in Olympus Tunnel increased, Pole Hill Powerplant generation resumed, and the lower power arm restored to normal operations.

August 26: Pumping to Carter Lake Reservoir ended for the water year as a Northern Water outage began. The outage was for Northern Water to install a wye in a section of Carter Lake pressure conduit for the Chimney Hollow Reservoir project.

September 16: Annual maintenance of Flatiron Unit No. 3 began.

September 26: Dille skim operations ended for the water year. About 18,700 AF were skimmed into Dille Tunnel for the season, which is slightly more than the long term average for the project and much better than previous years. By comparison, Olympus Tunnel skim operations only totaled 6,970 AF for the season. This volume is much lower than typical, and was impacted by the late start of winter fill of terminal east slope reservoirs and the need to reduce west slope spill. Project water movement through Olympus Tunnel took precedent over skim water diverted through Olympus Tunnel during the water year.

Throughout WY2024: Carter Lake and Horsetooth Reservoirs elevations started the water year with substantially greater than average storage contents. Both reservoirs supported all boat ramps during the recreation season. Sufficient supplies met all water demands for the water year. A total of 86,524 AF was delivered to Carter Lake Reservoir during the water year; 114,605 AF were delivered to Horsetooth Reservoir and customers along the CHFC 550 Section. Carter Lake Reservoir ended the water year with 75,066 AF in storage, still greater than average and about 30,000 AF less than it started the water year. Horsetooth Reservoir had 115,128 AF in storage at the end of the water year, also above average and about 6,300 AF less than it started the water year.

Carter Lake and Horsetooth Reservoirs demands were mildly greater than projected for the water year. Warmer than normal temperatures in June, August and September 2024 increased demands on the system. Both Carter Lake and Horsetooth Reservoir end of month content remained above the 30-year average content for most of the water year (figures 12 and 13). The exception was late winter/early spring 2024 and was caused by the late start of winter fill operations of Carter Lake and Horsetooth Reservoirs in WY2024.

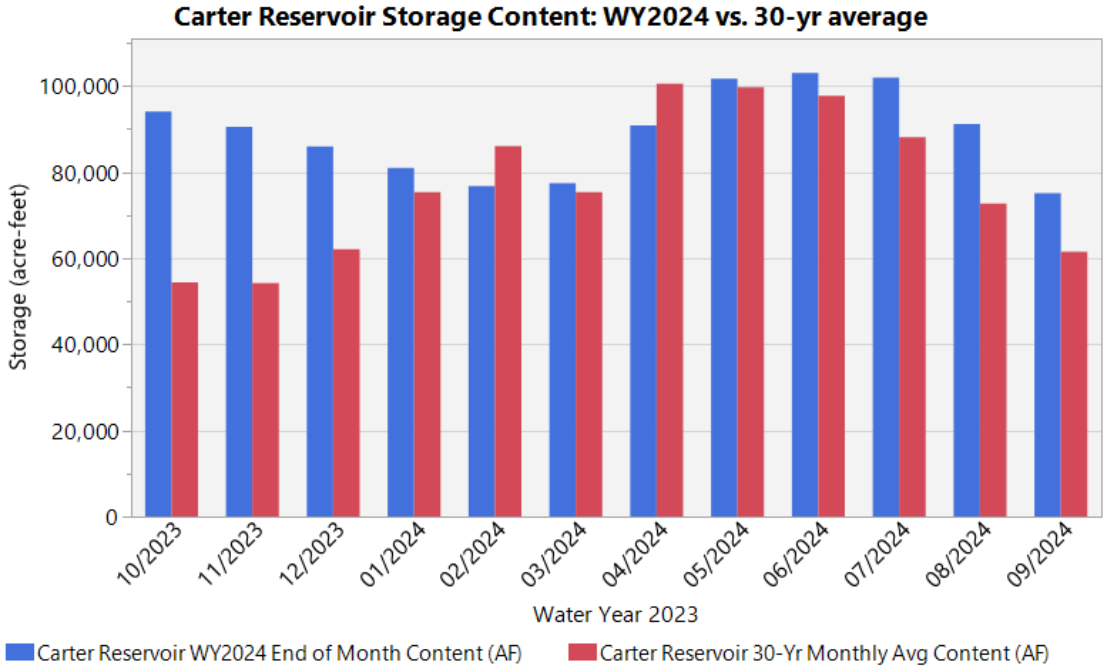


Figure 12.—Carter Lake Reservoir storage content during WY2024 versus its 30-year average.

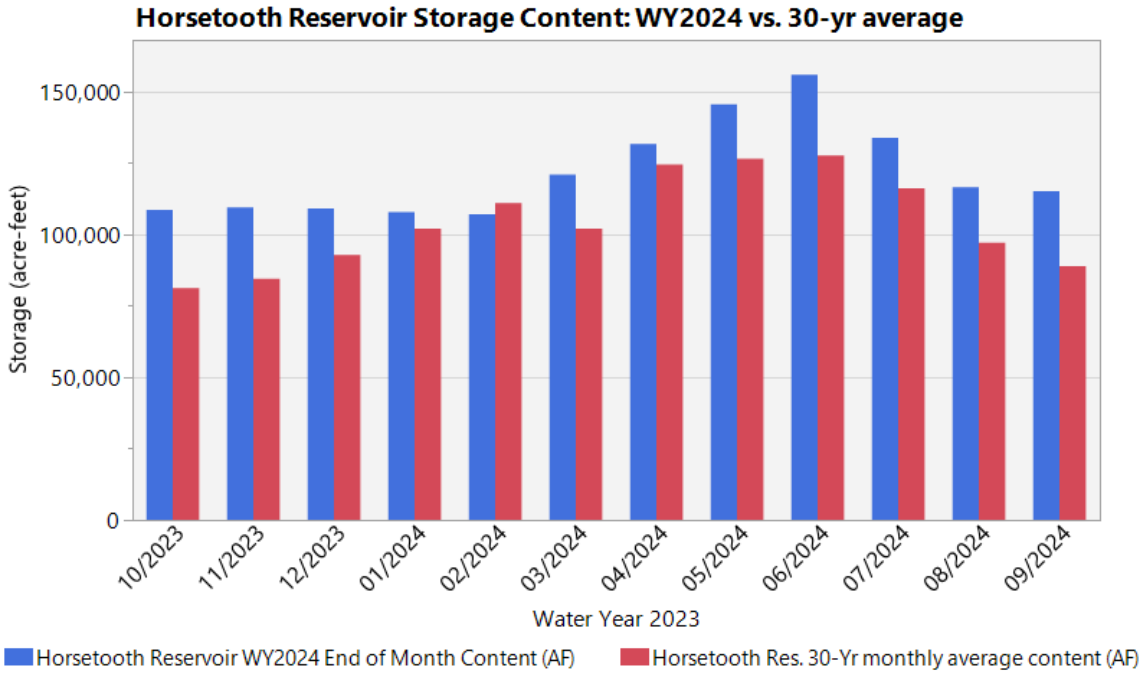


Figure 13.—Horsetooth Reservoir storage content during WY2024 versus its 30-year average.

Green Mountain Reservoir

Climate and Hydrology WY2024: Hydrologic conditions within the Upper Colorado River basin were mildly below normal for GMR operations during the winter delivery season. Mildly below normal snow accumulation was also observed from the beginning of the water year through mid-March 2024 when snow accumulations became mildly greater than normal. By mid-May accumulations had become greater than normal (figure 14), mainly due to a colder than normal start to May. Excluding HUP surplus releases by GMR in October 2023, main stem Colorado River flow was near to below normal from October through March. By the time of the average peak snow accumulation date of April 27, the observed accumulation was 101.3 percent of the seasonal average. Peak seasonal accumulation during WY2024 occurred on May 14 and was 133.5 percent of the seasonal average on that date. The April 1 runoff forecast projected an undepleted runoff volume to GMR of 286 KAF, approximately 101 percent of normal (table 3, shown previously). The May 1 runoff forecast was 285 KAF and the June 1 forecast was 277 KAF. The observed April through July runoff for the water year was nearly 293 KAF, 103 percent of average.

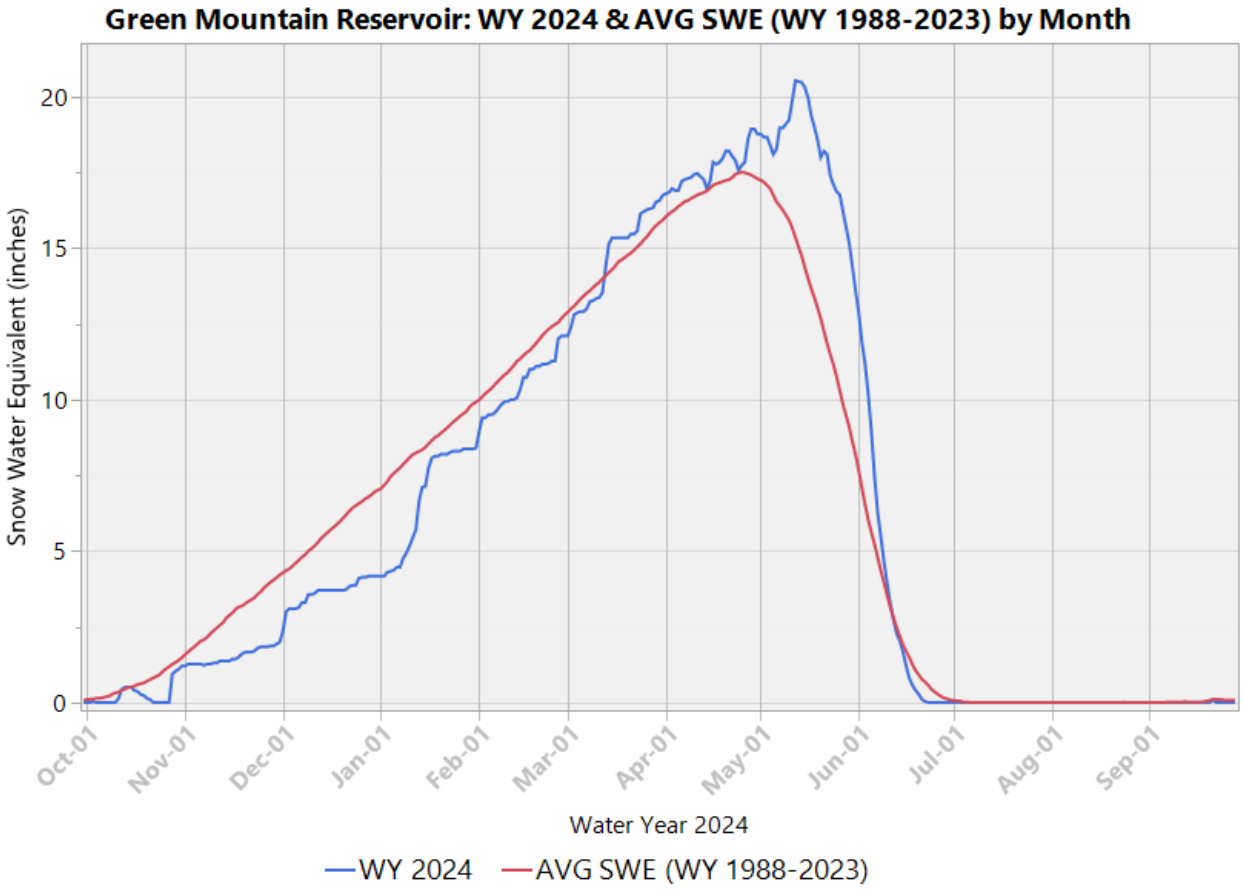


Figure 14.—WY2024 and 30-year average SWE for the Green Mountain Reservoir drainage area.

Blue River basin above GMR snow-accumulation and melt resulted in mildly above average April-July runoff volume. Snow accumulation tracked with the near average to mildly above average runoff years of 2003, 2007 and 2016 on April 1, 2024. Average daily inflow to GMR peaked at 2,986 ft^3/s on June 10, 2024, with lower-than-normal upstream diversion by the cities of Denver and Colorado Springs due to carryover storage from the previous year and precipitation in the South Platte basin that reduced demand for Blue River and Colorado River water. The total observed April-July runoff was 293 KAF, 2.3 percent greater than the April 1 forecast for the most probable plan. Total April–July runoff volume was three percent greater than the forty-year average April-July runoff volume.

The above average starting contents, sufficient runoff and lower than normal upstream diversion operations by the Cities of Colorado Springs and Denver combined to allow GMR to reach a physical fill on July 1, 2024 and a partial refill in August 2024. Dillon Reservoir April 1 carry over storage was at the tenth percentile and increased storage 37.0 KAF between April 1 and June 1. Dillon Reservoir began uncontrolled spill release on June 2. During the January 10 to July 12 period, Roberts Tunnel diversion was off. Colorado Spring Utilities April-July east slope diversion was normal at 7.2 KAF. During most of the April to July fill period, sufficient flows at Dotsero satisfied the ShOP required flow, allowing free river conditions for most of the fill season.

The continuing outage at the Shoshone Powerplant caused ShOP operations to start at GMR and other major reservoirs on June 30, 2024. On August 9, 2024, both units at Shoshone were available and the Division 5 Engineer implemented Colorado River main stem water rights administration with the Continental-Hoosier Tunnel priority (1940). In August, GMR was able to refill some evaporation losses from July and August until the call shifted to the Shoshone Junior on August 14, 2024. Mainstem water rights administration remained in effect continuously through the end of WY2024.

HUP Surplus releases to support irrigation and the 15-Mile Reach included irrigation startup releases and Coordinated Reservoir Operations (CROs). Irrigation startup releases were coordinated to conserve water and achieve at least 810 ft^3/s at the 15-Mile Reach during startup. The CROS releases were successfully in augmenting the peak runoff at the Cameo gage. Cameo reached a runoff peak on June 10, 2024 of 21,050 ft^3/s, assisted by releases from multiple reservoirs.

October 2023 through April 2024 – WY2024 Delivery Operations: GMR continued stored water delivery through the end of the irrigation season and throughout the winter delivery season. Colorado River mainstem water rights administration was in effect for the period of October 1, 2023 through February 28, 2024. ShOP operations were also in effect from October 1, 2023 to March 4, 2024. The Shoshone Powerplant returned to service on November 4, 2024, and the Shoshone water rights call remained in effect until the end of February. The GMR delivered 26,477 AF of stored water, including 829 AF of HUP allocation for ShOP operations during the period from October 1, 2023, to April 7, 2024.

The HUP water delivery operations continued through the end of the 2023 irrigation season. GMR delivered 26,044 AF of HUP water in October 2023 and November 1, 2023. This delivery included 1,622 AF for HUP beneficiaries' replacement. This replacement release included 396 AF of HUP water release to fulfill ShOP obligations. Direct delivery for Grand Valley irrigation included 626 AF for Grand Valley Irrigation Company junior irrigation water right and 60 AF for Grand Valley Water Users Association water right. The HUP entities declared HUP Surplus for the 2023 fill year on August 30, 2023 and began surplus delivery targeting 10,000 AF carryover. A total HUP surplus delivery of 23,737 AF between October 1 and November 1 in support of the Colorado River Endangered Fish Recovery Program occurred. HUP storage was 12,697 AF at the end of the irrigation season.

GMR delivered HUP stored water for winter replacement and ShOP operations from October 1, 2023, through April 7, 2024. A total of 433 AF of HUP allocated stored was delivered during this period all of which were allocated towards ShOP operations. The HUP Management Entities elected to deliver additional 849 AF of HUP Surplus water in April 2024. Colorado River stream flow exceeded irrigation demand without substantially impacting flow within the 15-Mile Reach. HUP allocation carry over storage was 22,330 AF at the declared Start of Fill on May 01, 2024.

GMR provided stored replacement water between October 2023 through November 1, 2023. GMR delivered 1,199 AF of C-BT stored collection system replacement water, 249 AF of GMR evaporation loss replacement and 390 AF of contracted stored water during this period. Because the Shoshone Powerplant was out of service throughout the November 1, 2023 through April 7, 2023 winter delivery season, GMR delivered zero AF of C-BT stored collection system replacement water, 91 AF of GMR evaporation loss replacement and 848 AF of contracted stored water during this period

The ShOP Agreement parties agreed to implement ShOP for 124 days during the November 1, 2023 through April 7, 2024 winter delivery season. Green Mountain Powerplant exercised the direct flow power right generating power during ShOP operations while releasing reservoir inflow plus 10,292 AF from storage for discretionary power generation. Reclamation would like to thank all the contract holders who voluntarily provided unused contract water to augment the total ShOP delivery in water year 2023. Total WY2023 ShOP delivery was a record at 16,733 AF.

On April 11, 2024, GMR reached the water year's minimum storage at 73,771 AF, with a water surface elevation of 7,902.40 feet. GMR was not impacted by any operating restrictions during the winter delivery season. The Heeney Slide operating restriction applies below 7,865 feet (36,957 AF) where drawdown cannot exceed 0.5 feet per day. End of month storage contents for the reservoir during WY2024 are compared to the 30-year average below (figure 15). There were no other operating restrictions for GMR in WY2024.

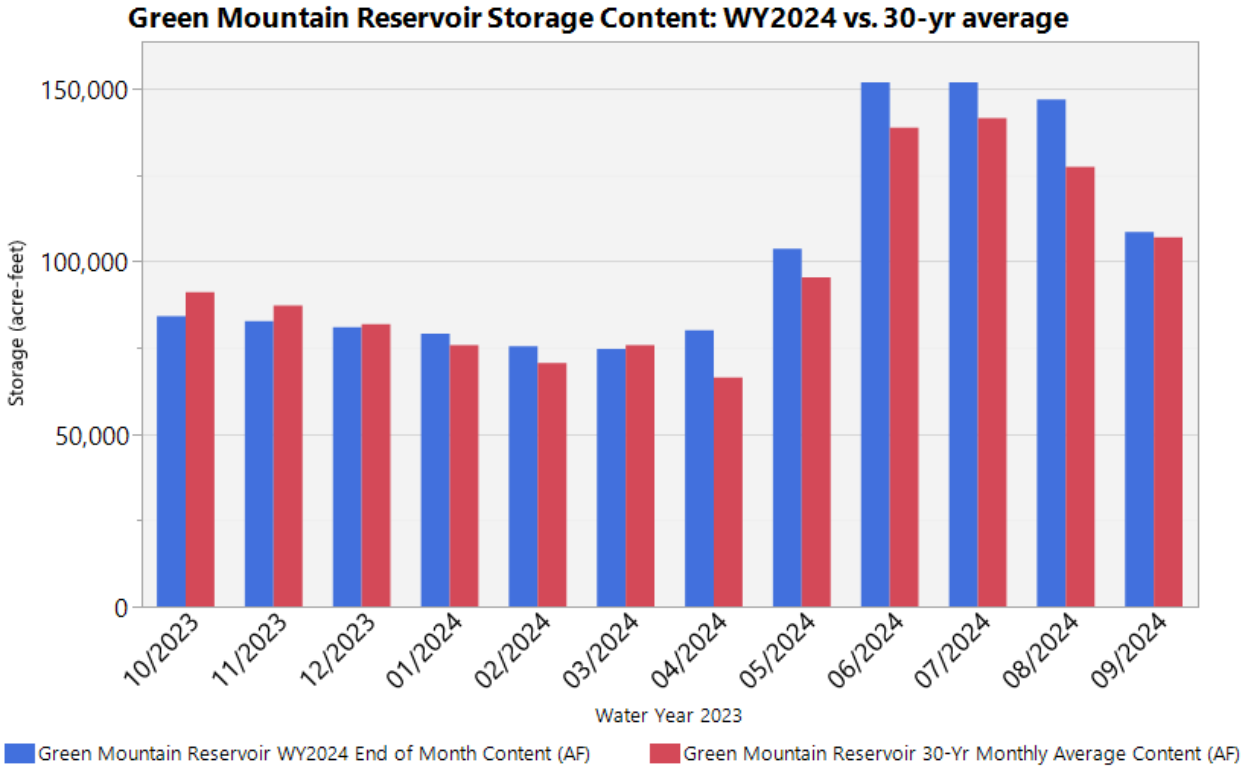


Figure 15.—Green Mountain Reservoir monthly content during WY2024 and 30-year average content.

March 20, 2024: The HUP managing entities held the 2023 HUP Operations Wrap Up meeting at the Colorado River Water Conservation District, Glenwood Springs, CO. The agenda included reports on total HUP deliveries and GMR Operations for the 2023 Irrigation Year and Endangered Fish Recovery 2023 Operations. Reclamation informed the entities that GMR was forecast to have a physical fill with a low probability of substitution operations due to a near average forecasted runoff and above average storage. Reclamation informed meeting participants that the HUP allocation was expected to refill the full 66,000 AF. Reclamation also discussed the status of the Heeney Slide operation restriction informing participants that the restriction is not expected to become effective during the 2024 irrigation season.

April 3, 2024: The HUP managing entities held the 2024 Irrigation Startup Planning meeting to discuss potential HUP operations. Hydrologic conditions and forecasted flows indicated that spring snowmelt runoff was in the average category, with guidance for augmented flow to maintain above 810 ft^3/s in the 15-Mile Reach during irrigation diversion startup. There was sufficient carryover of HUP water that GMR released about 850 AF of surplus under the direction of the HUP managing entities in April 2024.

April through July Fill Operations: Reclamation declared Start-of-Fill on May 1, 2024 as required by the Blue River Decree. Reservoir storage was 79,960 AF at Start of Fill, near the ninety-fifth percentile of the historical average storage for that date.

Reclamation forecasted that GMR would obtain a physical fill in WY2024 with no substitution replacement volume owed by the Cities for out of priority diversion. Sufficient May 1, 2024, runoff projections indicated a reservoir physical fill in more than 90 percent of possible hydrologic scenarios. The Denver Water Board and Colorado Springs Utilities were permitted to divert out of priority since the most probable forecasts projected a volume of runoff available for power generation.

The Colorado State Engineer office administered GMR fill operations under the Green Mountain Administrative Protocol (Protocol) for the 2024 fill season. Green Mountain Powerplant maintained power generation for the entire fill season.

May 3: Reclamation declared start of fill for Green Mountain First Fill Storage Right for WY2024. Re-allocation of the carry over storage replenished the 52,000 AF collection system replacement pool, and a portion 100 KAF Power Pool. The runoff forecast provided adequate confidence in refill of contract water for the 2024 fill season. Reclamation placed no limitation on Water Contract release during the fill season.

May 11: Sufficient forecasted flow and the availability of both GMR Powerplants allowed GMR to participate in the Colorado River Endangered Fish Recovery Program CROs for 2024. Reclamation coordinated with CWCB and Endangered fish recovery program to make a maximum powerplant release at GMR for ten days with flow rates exceeding 1,575 ft^3/s.

June 26: The HUP Managing Entities held their initial meeting at Western Colorado Area Office to consider hydrologic conditions and to plan for Irrigation Year 2024 operations. A total of 14 weekly conference calls were held between July 24 and October 23, 2024, to manage releases from Green Mountain, Ruedi, Granby, Wolford Mountain, and Williams Fork Reservoirs, coordinate irrigation diversions in the Grand Valley, and attempt to maintain the mean monthly target flows in the 15-Mile Reach. The U.S. Fish and Wildlife Service proposed an average-wet year target flow of 1,240 ft^3/s due to a wetter than normal runoff forecast.

July 01: GMR begins spillway bypass and declares a physical fill of the 1935 First Fill Storage Right under Protocol Section II.A.3.a. GMR obtained the 2024 fill level of 7,949.38 feet. The GMR continues to operate at two units plus the spillway release for several days. With the available generation capacity satisfied, the Division Engineer relaxed GM Powerplant water rights administration call and declared the First Fill Storage Water Rights satisfied. GMR continued spillway release until July 4. Reclamation notifies Blue River Decree parties that the Cities will not owe any replacement water for GMR First Fill Storage Right.

July 30: ShOP parties declare to participate in ShOP operations with the Shoshone Powerplant remaining unavailable and Colorado River flow at the Shoshone Powerplant in Glenwood Canyon decreasing below the 1,250 ft^3/s target. GMR commences release of stored water while exercising the GM Powerplant Direct Flow for Power Generation water right.

August 8-13: GMR operates to refill under its senior refill right, partially refilling July evaporation and releases.

August 14: Shoshone Powerplant in Glenwood Canyon returns to operation. Colorado River Water Rights Administration became effective with the Shoshone Powerplant Junior water right at a 1940 priority. The Shoshone Powerplant operates through the water year at various priority dates for the remainder of the year.

September 4: HUP managing entities make surplus declaration with Grand Valley Irrigation Company opposing. GMR commences HUP Surplus release for 15-Mile Reach flow augmentation.

September 7: Colorado River Water Rights Administration became effective with the Grand Valley Irrigation Canal (GVIC) Junior water right at a 1948 priority. The GVIC administrative water rights call remain in effect intermittently at various priority dates for the remainder of September.

May-September: GMR made storage releases from May 1 through the end of the water year. The Colorado River mainstem was under water rights administration starting August 14 and continuing through the remainder of WY2024. Because of sufficient early season flows, GMR operated under the ShOP Agreement for ten days in the late summer, starting July 30, 2024. GMR delivered 46,264 AF from reservoir storage. Delivered storage included: 7,137 AF for Colorado River Collection System replacement, 33,146 AF for HUP beneficiary replacement, irrigation direct delivery, and surplus, 1,414 AF for Silt Project Replacement, 2,676 AF for contracts, 1,462 AF for GMR evaporation losses, and 427 AF for ShOP operations.

2025 Annual Operation Plan

Collection System and East Slope Colorado-Big Thompson Project

The 2025 C-BT Most-Probable Annual Operating Plan (2025 AOP)[7] is developed considering the effects of historical average runoff values, the expected demands and depletions of Northern Water and Denver Water (including an assumed Northern Water quota of 70 percent), the project's initial states (e.g., pool levels, storage), other average values, special operations such as previously planned system outages and maintenance schedules. Included in the 2025 AOP is one significant C-BT outage for the start of water year 2025. The outage, which began in late August 2024 and extends through mid-December 2024, is related to Chimney Hollow Reservoir. This Northern Water outage is to install a wye of the Carter Lake Reservoir pressure conduit to connect Chimney Hollow Reservoir diversion works to the pressure conduit. Pumping to Carter Lake Reservoir is not available during the outage. In addition, the 2025 AOP includes some of the Chimney Hollow Reservoir's first fill plan hold points established for the State of Colorado inspections of the reservoir. The 2025 AOP follows the Chimney Hollow Reservoir fill schedule as approved by the state.

The 2025 AOP used a projected 250,700 AF total inflow to the west slope collection system during WY2024. It simulated pumping 48,300 AF of water from Willow Creek Reservoir and no spill at Granby Reservoir for the water year. The 2025 AOP also included 11,300 AF Windy Gap water pumped to Granby Reservoir in WY2025.

The 2025 AOP projected diversions totaling 251,000 AF through Adams Tunnel during the water year. Nearly half of the projected diversions were planned between December 2024 and March 2025. Sufficient capacity remained and is simulated to convey 31,500 AF of Big Thompson River skim water at Olympus Tunnel and 26,800 AF of skim at Dille Tunnel for power generation. The 2025 AOP includes 5,900 AF of priority water from the Big Thompson River.

The 2025 AOP simulated a fill of Horsetooth Reservoir in early June 2025, and multiple fills of Carter Lake Reservoir between late March and late June 2025. Carter Lake Reservoir was expected to reach fill in late March, May and June. Demands were projected to exceed supplies starting in July at Carter, with an associated reservoir drawdown through the end of the water year to an ending elevation of about 5,733.9 feet. Horsetooth Reservoir maximum content was achieved in early June 2025 and generally maintain fill through end of June, after which time demands are expected to exceed supplies and the reservoir elevation will decline to a minimum

[7] Graphs summarizing C-BT Most-Probable, Minimum Reasonable and Maximum Reasonable AOPs are provided in Appendix B-8. Only the Most-Probable AOP is summarized in the text of this section.

5,399.3 feet at the end of the water year. Total deliveries from Carter Lake and Horsetooth Reservoirs were simulated as 106,100 and 107,800 AF, respectively. Initial water year storage content of Carter Lake Reservoir is 74,300 AF and simulated ending content is 84,800 AF. Horsetooth Reservoir's initial content is 114,600 AF and the simulated ending content is 100,700 AF.

For Chimney Hollow Reservoir, the 2025 AOP simulated achieving the first hold point fill of 2,472 AF at the very end of July 2025 and the second hold point fill of 13,250 AF later in September 2025. A total of five hold points of increasingly greater storage volume are part of the first fill schedule for Chimney Hollow Reservoir approved by the Office of the State Engineer, Colorado.

Green Mountain Reservoir

The GMR Most-Probable 2025 AOP[8] used a projected 262,800 AF total (depleted) reservoir inflow. With that inflow, plans forecast for GMR to fill in 2025, achieving maximum content in mid-July. Total GMR releases are simulated as 253,300 AF, all through the powerplant. The most probable scenario required no substitution obligation for Denver and Colorado Springs because the reservoir obtained a physical fill. The Green Mountain 2025 AOP included refill of all GMR allocations for delivery during the 2024-2025 delivery season. The simulated minimum reservoir water surface elevation was about 7,898.4 feet in mid-April before refill begins, which is over 33 feet above the Heeney Slide operational restriction of 7,865.0 feet.

The GMR 2025 AOP assumed that Denver and Colorado Springs would deplete a total of 104,110 AF. Per the Blue River decree, the cities would be required to replace water obligated toward the senior storage right should a fill shortage occur in GMR due to the cities' out-of-priority diversion.

[8] Graphs summarizing Green Mountain Reservoir Most Probable, Minimum Reasonable and Maximum Reasonable AOPs are provided in appendix B-8. Only the Most-Probable AOP is summarized in the text of this section.

Appendix A

Daily Records for WY2024

The following 38 pages of appendix A summarize the daily operations by primary feature of Green Mountain Reservoir and the Colorado-Big Thompson Project for Water Year 2024.

APPENDIX A - DAILY RECORDS FOR WY2024
Appendix A (1 of 38)
Green Mountain Reservoir, CO

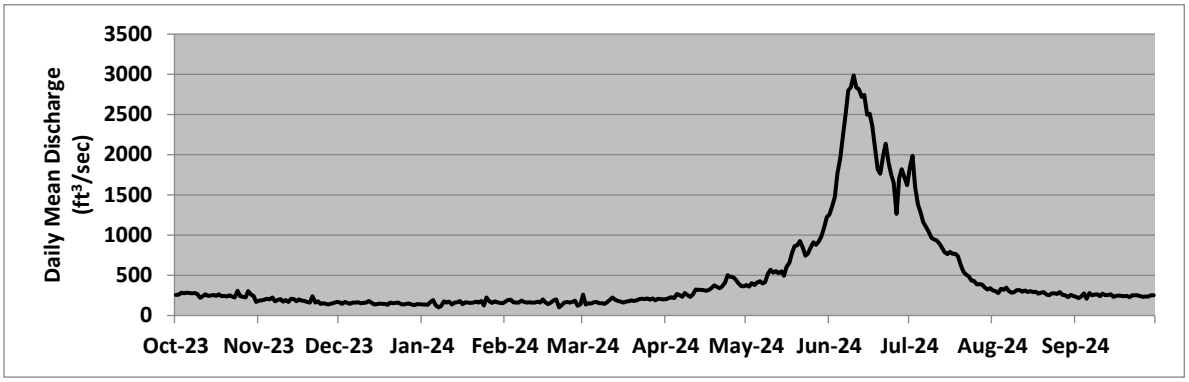
Location. – Lat 39°52'42", long 106°19'42", Summit County, Hydrologic Unit 14010002, on Green Mountain Dam, 13 miles southeast of Kremmling, CO, on the Blue River.

Gage. –Water level recorder with satellite telemetry. Elevation of gage is 7,960 feet (m.s.l.) from topographic map.

Remarks. -- Inflow computed daily based on change in content from midnight to midnight, and on the 24-hour average releases from Green Mountain Reservoir. Recorders were operated from 01-Oct-2023 to 30-Sep-2024. Records are complete and fair. This record consists of operational data which could be subject to future revisions and changes.

Inflow, ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	257	185	165	137	173	261	206	381	1,256	1,852	313	232
2	262	190	146	136	193	137	216	359	1,365	1,987	305	217
3	284	199	168	133	196	154	230	402	1,474	1,596	282	237
4	276	208	159	170	165	149	217	379	1,764	1,379	333	278
5	283	203	147	192	163	167	270	412	1,960	1,283	321	208
6	280	226	163	132	163	170	257	425	2,223	1,167	346	282
7	278	175	160	102	187	153	234	400	2,514	1,102	304	253
8	280	192	166	116	168	153	281	416	2,798	1,047	286	259
9	270	205	152	179	161	147	254	524	2,839	966	290	266
10	220	175	158	160	165	164	234	571	2,986	946	316	242
11	241	194	161	173	163	196	259	533	2,835	935	315	273
12	266	169	180	139	163	226	322	552	2,815	894	295	253
13	244	209	161	162	175	196	319	527	2,721	842	313	258
14	247	206	136	167	161	183	320	548	2,744	789	292	263
15	255	179	142	180	199	173	315	494	2,498	765	305	234
16	243	201	150	140	163	160	309	604	2,508	792	293	245
17	263	184	144	165	142	172	321	659	2,357	770	298	248
18	241	180	144	160	162	178	344	777	2,074	766	273	243
19	244	169	133	157	189	189	377	864	1,821	736	284	239
20	236	162	160	160	203	182	356	875	1,765	625	293	246
21	251	239	153	174	103	188	341	928	1,988	548	259	228
22	237	162	157	161	129	206	363	846	2,138	509	253	254
23	226	176	163	182	161	209	410	746	1,903	486	276	251
24	309	145	142	127	167	206	504	774	1,757	433	276	253
25	240	153	137	226	161	212	481	852	1,650	433	268	241
26	233	147	145	176	168	198	480	911	1,263	386	291	234
27	225	139	148	158	183	214	446	879	1,706	392	258	237
28	303	150	136	179	123	189	399	924	1,819	384	252	235
29	260	158	131	165	143	208	366	987	1,713	346	231	253
30	243	170	143	157		205	362	1,101	1,619	322	257	253
31	171		142	153		201		1,224		338	245	
Min	171	139	131	102	103	137	206	359	1,256	322	231	208
Max	309	239	180	226	203	261	504	1,224	2,986	1,987	346	282
Mean	254	182	151	159	165	185	326	673	2,096	833	288	247
ac-ft	15,604	10,805	9,310	9,757	9,506	11,400	19,428	41,399	124,709	51,208	17,695	14,704



Appendix A (2 of 38)
Elliot Creek Canal near Green Mountain Reservoir, CO

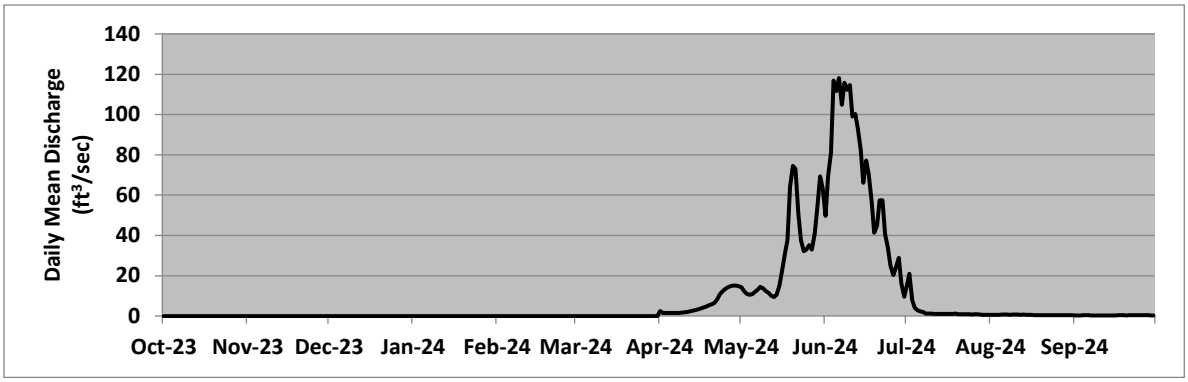
Location. – Lat 39°52'25", long 106°19'49", Summit County, Hydrologic Unit 14010002 , on left bank at concrete flume structure, and 1.1 mi west of Heeney.

Gage. – Water-stage recorder with satellite telemetry. Elevation of gage is 8,050 ft (m.s.l.) from topographic map.

Remarks.—This is a diversion from Elliot Creek in the Blue River Basin to Green Mountain Reservoir. Recorder was winterized on 01-Oct-2023. The station was put back into service from 22-Apr-2024 to 30-Sep-2024. Flows for the period 01-Apr-2024 through 21-Apr-2024 are reported as estimates by the United State Geological Survey. Values for the off-season were set to zero. Records are reliable while recorder is operated. This record contains operational data which could be subject to future revisions and changes. Official data is published by the USGS as site #09056500.

Discharge, ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	0	0	0	0	3	14	50	15	1	0
2	0	0	0	0	0	0	1	12	70	21	1	0
3	0	0	0	0	0	0	1	11	81	8	1	0
4	0	0	0	0	0	0	1	10	117	4	1	0
5	0	0	0	0	0	0	2	11	112	3	1	0
6	0	0	0	0	0	0	2	12	118	2	1	0
7	0	0	0	0	0	0	1	13	105	2	1	0
8	0	0	0	0	0	0	2	14	116	1	1	0
9	0	0	0	0	0	0	2	14	112	1	1	0
10	0	0	0	0	0	0	2	12	115	1	1	0
11	0	0	0	0	0	0	2	11	99	1	1	0
12	0	0	0	0	0	0	2	10	100	1	1	0
13	0	0	0	0	0	0	3	9	93	1	1	0
14	0	0	0	0	0	0	3	11	83	1	1	0
15	0	0	0	0	0	0	3	15	66	1	1	0
16	0	0	0	0	0	0	4	22	77	1	1	0
17	0	0	0	0	0	0	4	31	70	1	0	0
18	0	0	0	0	0	0	5	38	57	1	0	0
19	0	0	0	0	0	0	5	64	41	1	0	0
20	0	0	0	0	0	0	6	75	45	1	0	0
21	0	0	0	0	0	0	6	73	57	1	0	0
22	0	0	0	0	0	0	8	51	57	1	0	0
23	0	0	0	0	0	0	11	38	41	1	0	0
24	0	0	0	0	0	0	12	32	34	1	0	0
25	0	0	0	0	0	0	13	33	25	1	0	0
26	0	0	0	0	0	0	14	35	20	1	0	0
27	0	0	0	0	0	0	15	33	24	1	0	0
28	0	0	0	0	0	0	15	41	29	1	0	0
29	0	0	0	0	0	0	15	53	16	1	0	0
30	0	0	0	0		0	15	69	10	1	0	0
31	0		0	0		0		64		1	0	
Min	0	0	0	0	0	0	1	9	10	1	0	0
Max	0	0	0	0	0	0	15	75	118	21	1	0
Mean	0	0	0	0	0	0	6	30	68	2	1	0
ac-ft	0	0	0	0	0	0	353	1,851	4,046	153	32	20



Appendix A (3 of 38)
Green Mountain Reservoir, CO

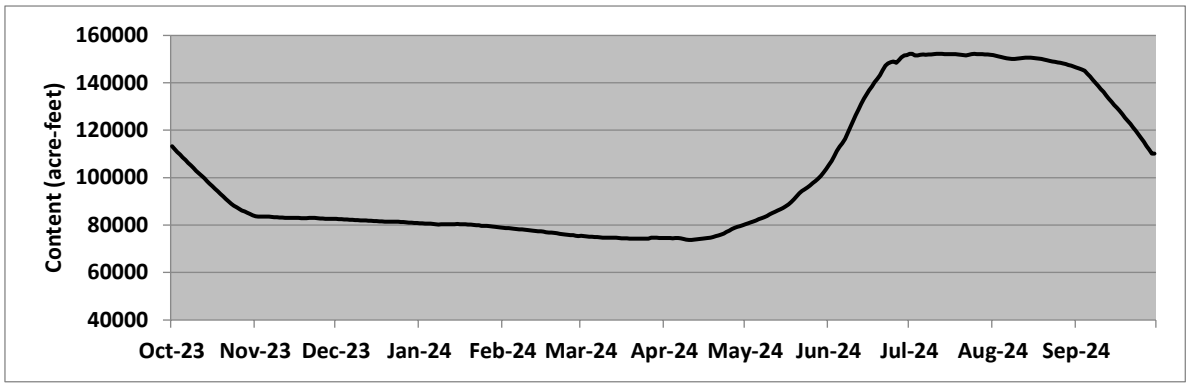
Location. – Lat 39°52'42", long 106°19'42", Summit County, Hydrologic Unit 14010002, on Green Mountain Dam, 13 miles southeast of Kremmling, CO, on the Blue River.

Gage. – Water level recorder with satellite telemetry. Elevation of gage is 7,960 ft (m.s.l.) from topographic map.

Remarks. – Reservoir is formed by an earth-fill dam. Construction completed in 1943. Impoundment began on 16-Nov-1942. Green Mountain Reservoir provides storage used for replacement water of the C-BT diversions. Recorder was operated from 01-Oct-2023 to 30-Sep-2024. Maximum capacity is 153,639 AF at elevation 7,950.00 ft, with 146,779 AF of active capacity. Records are complete and fair, but the data has not been revised. This record consists of operational data which could be subject to future revisions and changes.

Storage, AF, 2400-hour Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	113,240	83,736	82,627	80,789	78,861	75,470	74,526	80,348	105,245	152,200	151,651	146,404
2	112,030	83,599	82,545	80,709	78,795	75,342	74,501	80,696	107,091	152,179	151,419	145,993
3	110,881	83,585	82,504	80,616	78,729	75,253	74,501	81,138	109,133	151,588	151,104	145,582
4	109,722	83,613	82,436	80,602	78,597	75,151	74,476	81,530	111,221	151,566	150,854	145,070
5	108,594	83,626	82,341	80,629	78,465	75,087	74,551	81,990	113,187	151,799	150,581	143,886
6	107,441	83,654	82,273	80,535	78,334	75,023	74,577	82,463	114,530	151,884	150,392	142,609
7	106,278	83,517	82,206	80,388	78,255	74,921	74,400	82,888	116,362	151,863	150,245	141,356
8	105,147	83,366	82,152	80,281	78,137	74,832	74,186	83,339	118,736	151,884	150,098	140,074
9	104,041	83,270	82,071	80,308	78,007	74,730	73,921	83,915	121,180	151,905	150,077	138,777
10	102,925	83,175	82,003	80,321	77,876	74,666	73,795	84,537	123,913	152,095	150,224	137,449
11	101,856	83,134	81,936	80,361	77,746	74,653	73,794	85,077	126,370	152,222	150,371	136,131
12	100,826	83,038	81,922	80,334	77,615	74,704	73,919	85,649	128,782	152,285	150,455	134,722
13	99,708	83,038	81,895	80,348	77,510	74,679	74,044	86,167	131,010	152,243	150,581	133,301
14	98,587	83,066	81,814	80,375	77,380	74,640	74,169	86,728	133,282	152,095	150,602	131,971
15	97,493	83,038	81,747	80,428	77,328	74,577	74,289	87,181	135,072	152,074	150,539	130,667
16	96,407	83,038	81,692	80,388	77,197	74,488	74,403	87,875	136,878	152,116	150,434	129,425
17	95,360	82,997	81,624	80,361	77,028	74,425	74,539	88,675	138,480	152,137	150,329	128,176
18	94,248	82,970	81,557	80,321	76,899	74,375	74,717	89,709	140,254	152,074	150,203	126,764
19	93,162	82,929	81,489	80,267	76,821	74,350	74,985	90,911	141,740	151,968	150,035	125,287
20	92,082	82,888	81,503	80,174	76,770	74,312	75,329	92,111	143,235	151,778	149,785	124,025
21	91,058	83,025	81,503	80,107	76,524	74,287	75,648	93,384	145,151	151,630	149,512	122,680
22	90,013	82,997	81,489	80,014	76,331	74,299	76,008	94,338	147,166	151,609	149,262	121,216
23	88,962	82,997	81,462	79,947	76,202	74,312	76,460	95,103	14,8182	15,1799	149,033	119,781
24	88,217	82,915	81,395	79,747	76,086	74,324	77,106	95,845	148,659	152,053	148,826	118,304
25	87,450	82,833	81,314	79,747	75,957	74,337	77,707	96,726	148,929	152,179	148,639	116,752
26	86,828	82,737	81,246	79,640	75,828	74,312	78,307	97,693	148,494	152,095	148,431	115,092
27	86,195	82,641	81,179	79,495	75,725	74,730	78,835	98,571	149,470	152,074	148,182	113,431
28	85,719	82,600	81,098	79,390	75,508	74,666	79,258	99,568	150,686	152,031	147,891	111,771
29	85,160	82,600	81,003	79,258	75,355	74,640	79,614	100,700	151,503	151,968	147,497	110,148
30	84,606	82,627	80,936	79,112		74,602	79,960	102,047	151,736	151,884	147,166	110,148
31	84,094		80,869	78,967		74,564		103,635		151,799	146,816	
Min	84,094	82,600	80,869	78,967	75,355	74,287	73,794	80,348	105,245	151,566	146,816	110,148
Max	113,240	83,736	82,627	80,789	78,861	75,470	79,960	103,635	151,736	152,285	151,651	146,404
Mean	97,043	83,108	81,736	80,128	77,237	74,669	75,551	89,695	132,856	151,970	149,717	129,566
ac-ft	84,094	82,627	80,869	78,967	75,508	74,564	79,960	103,635	151,736	151,799	146,816	110,148



Appendix A (4 of 38)
Blue River below Green Mountain Reservoir, CO

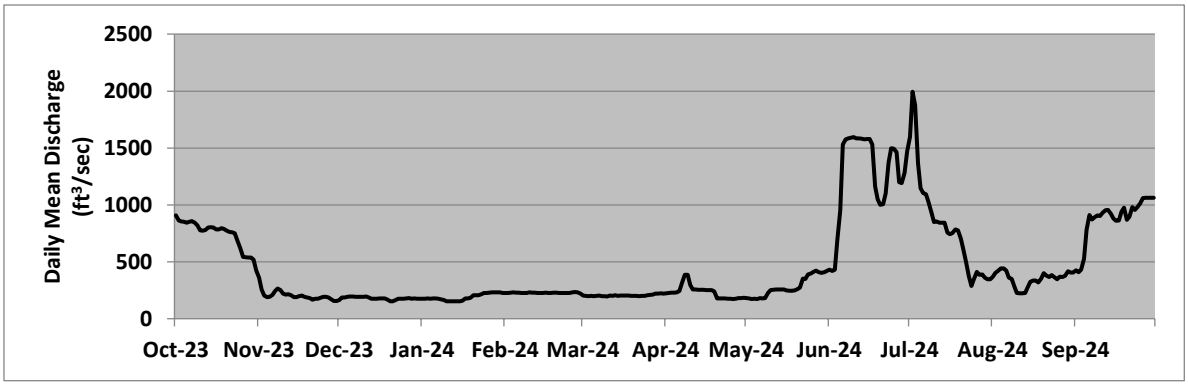
Location.– Lat 39°52'49", long 106°20'00", Summit County, Hydrologic Unit 14010002, on left bank 0.3 miles upstream of Elliot Creek, 0.3 miles downstream from Green Mountain Reservoir and 13 miles southeast of Kremmling.

Gage.– Water-stage recorder with satellite telemetry. Datum of gage is 7,682.66 feet (levels by Bureau of Reclamation).

Remarks.–Drainage area is 599 sq. mi. including 15.3 sq. mi. of Elliot Creek above the diversion for Elliot Creek feeder canal. Flow regulated by Green Mountain Reservoir since 1942. Diversions for irrigation of 5,000 acres upstream of station. Trans-mountain diversions upstream of station. Recorder was operated from 01-Oct-2023 to 30-Sep-2024. Recorded values are complete and reliable. This record consists of operational data which could be subject to future revisions and changes. Official record is published by the United States Geological Survey as site #09057500.

Discharge, ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	908	363	165	177	226	203	224	181	430	1,598	371	425
2	864	256	187	176	226	202	228	179	421	1,996	405	410
3	856	203	188	180	229	199	230	174	431	1,877	423	431
4	852	191	193	177	232	201	229	176	697	1,370	442	526
5	845	194	195	179	229	199	232	174	954	1,146	441	783
6	854	209	197	179	229	202	243	181	1,532	1,104	423	912
7	857	242	194	176	227	204	322	180	1,575	1,093	360	872
8	843	266	193	170	228	198	388	183	1,585	1,024	349	892
9	820	252	193	165	226	198	387	227	1,591	935	286	907
10	776	221	192	154	231	196	297	251	1,596	850	225	903
11	774	213	195	153	228	203	259	254	1,584	856	224	930
12	779	216	187	153	229	201	258	256	1,584	843	225	954
13	801	208	175	155	228	208	255	258	1,581	845	226	957
14	806	191	177	153	226	203	256	258	1,575	845	277	922
15	801	191	176	154	226	205	254	257	1,578	757	325	880
16	785	200	178	160	229	205	251	250	1,580	744	336	860
17	785	204	178	178	227	203	251	247	1,531	755	335	863
18	797	193	178	180	227	203	253	246	1,161	787	320	940
19	787	188	167	185	229	202	240	248	1,050	777	353	975
20	775	182	153	207	229	202	180	260	1,002	703	400	870
21	762	169	153	208	227	201	178	275	1,008	605	378	896
22	760	175	164	208	226	200	179	354	1,102	502	366	982
23	751	176	177	216	226	203	180	349	1,371	373	383	957
24	681	186	176	228	226	200	176	389	1,497	289	365	983
25	623	193	177	226	226	206	175	397	1,494	351	348	1,014
26	543	194	179	230	233	211	175	412	1,464	411	369	1,060
27	541	187	182	231	235	214	177	424	1,200	386	367	1,064
28	539	170	176	231	232	221	182	409	1,191	389	379	1,063
29	538	158	179	231	221	221	183	404	1,281	360	417	1,063
30	519	156	177	231		223	183	409	1,470	347	408	1,063
31	426		176	227		220		422		348	407	
Min	426	156	153	153	221	196	175	174	421	289	224	410
Max	908	363	197	231	235	223	388	424	1,596	1,996	442	1,064
Mean	743	205	180	190	228	205	234	280	1,271	815	353	879
ac-ft	45,711	12,191	11,065	11,659	13,118	12,605	13,928	17,221	75606	50,114	21,685	52,280



Appendix A (5 of 38)
Willow Creek Reservoir, CO

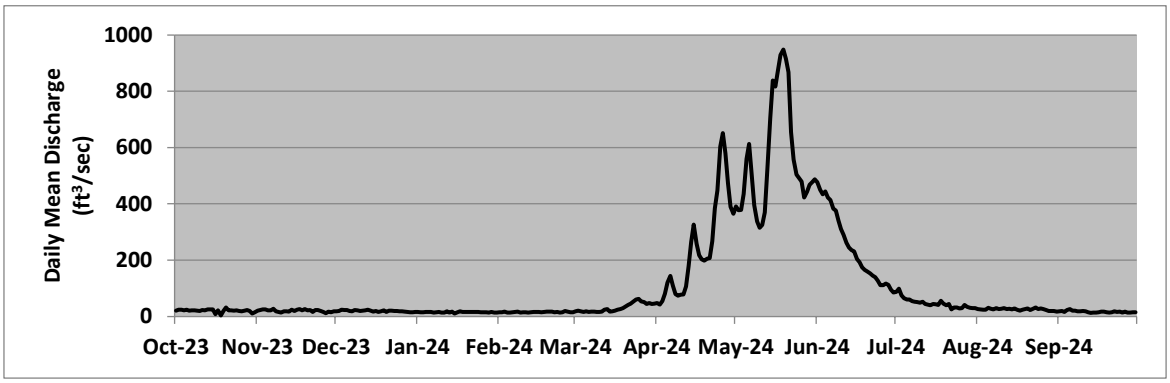
Location. – Lat 40°08'52", long 105°56'28", Grand County, Hydrologic Unit 14010001, at Willow Creek Dam, four miles north of Granby, CO, on Willow Creek, a tributary of the Colorado River.

Gage.— Water level recorder with satellite telemetry. Elevation of gage is 8,130 ft (m.s.l.) from topographic map.

Remarks.—Inflow computed daily using change in content from midnight to midnight, plus the 24-hour average releases through the Willow Creek Pump Canal and the reservoir outlet works. Recorders were operated from 01-Oct-2023 to 30-Sep-2024. Records are complete. Negative values are based on accounting procedures and mass balances. This record consists of operational data which could be subject to future revisions and changes.

Inflow, ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	21	20	18	16	15	18	47	391	477	87	26	18
2	24	23	19	15	15	21	42	377	450	98	25	19
3	24	25	24	15	17	19	54	379	434	75	24	16
4	21	25	23	16	14	16	80	435	444	65	23	22
5	24	22	23	16	14	18	121	560	422	61	31	26
6	21	21	19	16	15	16	144	613	413	60	27	21
7	22	27	18	14	16	17	108	505	383	54	25	20
8	22	18	23	15	17	17	79	396	376	52	29	18
9	21	16	22	16	14	16	74	338	341	51	27	18
10	19	14	20	13	15	16	78	315	311	48	27	19
11	22	18	20	14	14	17	78	325	290	52	30	18
12	22	19	22	18	14	24	106	369	262	45	26	15
13	25	18	23	14	15	26	178	523	245	42	28	13
14	25	24	21	17	16	17	264	704	236	40	25	14
15	25	19	17	10	16	18	326	838	232	44	28	14
16	8	24	20	14	16	21	258	817	204	43	24	15
17	21	26	16	19	15	24	218	873	193	41	21	17
18	4	22	18	15	16	27	202	928	175	56	23	17
19	19	26	21	16	17	29	198	948	166	45	26	15
20	31	22	16	16	17	35	205	915	160	40	29	14
21	22	23	20	16	17	40	208	867	153	45	23	15
22	22	16	21	16	15	46	267	655	145	25	27	18
23	20	22	19	16	16	53	385	557	140	32	32	16
24	21	23	19	16	14	60	448	505	126	32	26	17
25	19	19	18	15	15	62	603	491	111	28	29	13
26	18	16	18	15	19	54	652	479	111	29	26	17
27	20	12	17	15	18	50	580	422	116	41	23	14
28	23	17	16	14	15	44	474	443	113	34	20	13
29	19	15	15	16	15	48	390	468	95	30	20	15
30	10	18	15	14		44	365	477	85	29	19	15
31	15		16	14		46		488		29	18	
Min	4	12	15	10	14	16	42	315	85	25	18	13
Max	31	27	24	19	19	62	652	948	477	98	32	26
Mean	20	20	19	15	16	31	241	561	247	47	25	17
ac-ft	1,250	1,210	1,184	936	895	1,899	14,345	34,514	14,692	2,884	1,556	991



Appendix A (6 of 38)
Willow Creek Reservoir, CO

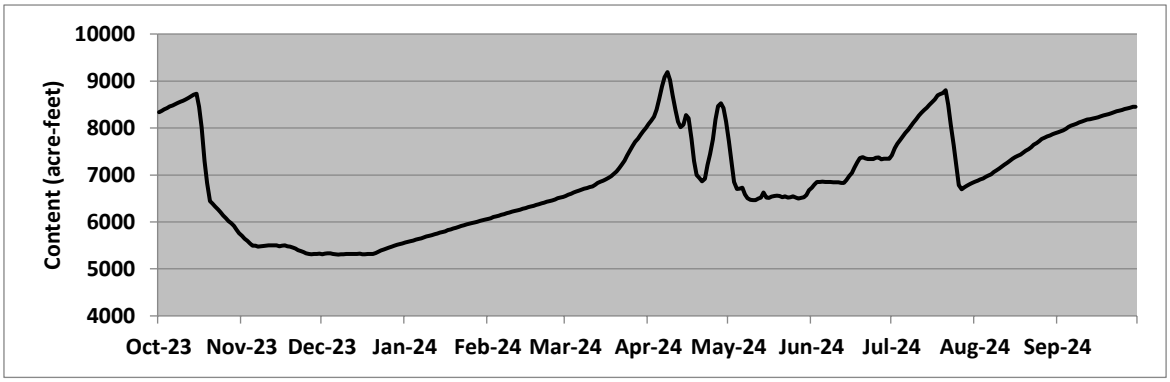
Location. – Lat 40° 08’52”, long 105° 56’28”, Grand County, Hydrologic Unit 14010001, at Willow Creek Dam, four miles north of Granby, CO, on Willow Creek, a tributary of the Colorado River.

Gage.— Water level recorder with satellite telemetry. Elevation of gage is 8,130 ft (m.s.l.) from topographic map.

Remarks.—Reservoir is formed by an earth-fill dam. Construction completed in 1953. Impoundment began on April 2, 1953. Willow Creek Reservoir stores water from Willow Creek for diversion to Granby Reservoir via the Willow Creek Canal. Maximum capacity is 10,600 AF at elevation 8,130.00 ft, with 9,100 AF of active capacity between elevations 8,077.00 and 8,130.00 feet. Recorder was operated from 01-Oct 2023 to 30-Sep-2024. Record is complete and fair. This record consists of operational data which could be subject to future revisions and changes.

Storage, AF, 2400-hour Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	8,335	5,702	5,315	5,561	6,066	6,553	8,083	7,715	6,731	7,420	6,857	7,909
2	8,365	5,647	5,325	5,575	6,081	6,580	8,151	7,280	6,800	7,568	6,882	7,932
3	8,397	5,595	5,334	5,590	6,107	6,603	8,244	6,848	6,851	7,667	6,904	7,950
4	8,427	5,543	5,334	5,606	6,120	6,628	8,389	6,699	6,853	7,746	6,924	7,981
5	8,457	5,492	5,316	5,623	6,134	6,651	8,614	6,708	6,855	7,822	6,958	8,023
6	8,482	5,492	5,315	5,639	6,150	6,668	8,885	6,731	6,853	7,899	6,986	8,049
7	8,509	5,476	5,302	5,654	6,167	6,687	9,085	6,588	6,848	7,966	7,016	8,075
8	8,534	5,480	5,315	5,670	6,189	6,706	9,189	6,505	6,851	8,038	7,060	8,096
9	8,558	5,489	5,315	5,689	6,203	6,723	9,025	6,472	6,842	8,114	7,097	8,117
10	8,580	5,492	5,318	5,702	6,219	6,740	8,702	6,466	6,842	8,188	7,135	8,141
11	8,608	5,501	5,318	5,717	6,233	6,759	8,387	6,462	6,846	8,263	7,180	8,162
12	8,641	5,500	5,321	5,739	6,247	6,792	8,130	6,497	6,831	8,325	7,218	8,178
13	8,675	5,500	5,321	5,752	6,262	6,829	8,015	6,522	6,831	8,381	7,261	8,188
14	8,708	5,503	5,316	5,773	6,278	6,855	8,072	6,626	6,891	8,433	7,301	8,202
15	8,727	5,484	5,323	5,786	6,294	6,877	8,274	6,520	6,981	8,493	7,345	8,215
16	8,449	5,494	5,315	5,802	6,312	6,904	8,207	6,509	7,039	8,553	7,379	8,231
17	8,010	5,500	5,315	5,825	6,326	6,938	7,773	6,536	7,156	8,611	7,405	8,250
18	7,299	5,484	5,318	5,844	6,342	6,977	7,301	6,551	7,270	8,697	7,437	8,268
19	6,833	5,471	5,318	5,861	6,361	7,020	7,002	6,557	7,362	8,725	7,476	8,284
20	6,444	5,451	5,316	5,878	6,379	7,076	6,931	6,555	7,381	8,744	7,518	8,298
21	6,387	5,432	5,341	5,895	6,397	7,142	6,866	6,526	7,352	8,803	7,548	8,314
22	6,328	5,398	5,367	5,912	6,413	7,218	6,922	6,549	7,340	8,490	7,588	8,335
23	6,266	5,377	5,390	5,929	6,431	7,309	7,208	6,522	7,338	8,065	7,642	8,354
24	6,207	5,358	5,412	5,946	6,444	7,413	7,445	6,528	7,340	7,640	7,680	8,373
25	6,142	5,332	5,434	5,962	6,458	7,526	7,763	6,546	7,367	7,211	7,723	8,387
26	6,077	5,316	5,455	5,977	6,481	7,617	8,180	6,522	7,374	6,783	7,766	8,406
27	6,017	5,311	5,476	5,992	6,503	7,703	8,463	6,501	7,335	6,695	7,796	8,419
28	5,973	5,318	5,496	6,006	6,518	7,776	8,526	6,511	7,347	6,738	7,819	8,433
29	5,912	5,318	5,514	6,023	6,532	7,858	8,422	6,526	7,347	6,772	7,845	8,449
30	5,831	5,323	5,528	6,037		7,929	8,141	6,576	7,347	6,805	7,868	8,449
31	5,761		5,545	6,050		8,005		6,674		6,831	7,888	
Min	5,761	5,311	5,302	5,561	6,066	6,553	6,866	6,462	6,731	6,695	6,857	7,909
Max	8,727	5,702	5,545	6,050	6,532	8,005	9,189	7,715	7,381	8,803	7,888	8,449
Mean	7,482	5,459	5,365	5,807	6,298	7,066	8,080	6,623	7,080	7,887	7,371	8,216
ac-ft	5,761	5,323	5,545	6,050	6,518	8,005	8,141	6,674	7,347	6,831	7,888	8,449



Appendix A (7 of 38)
Willow Creek below Willow Creek Reservoir, CO

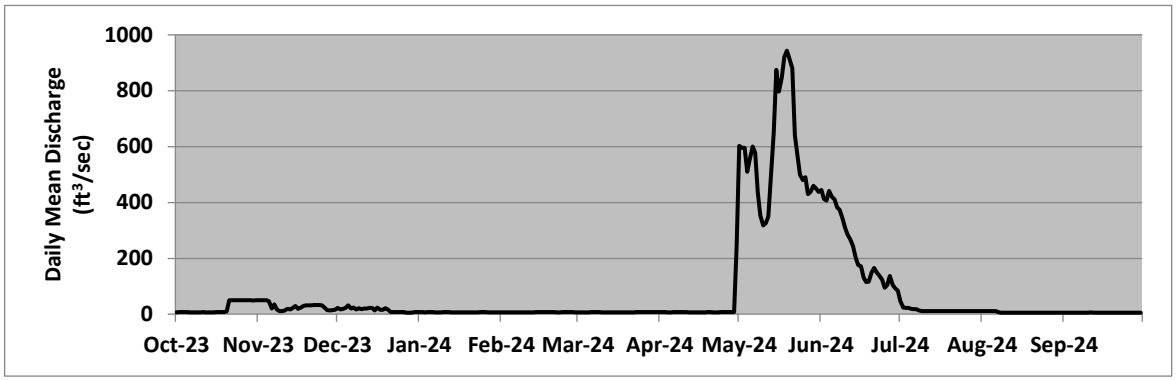
Location. – Lat 40°08'50", long 105°56'16", Grand County, Hydrologic Unit 14010001, at Willow Creek Dam, four miles north of Granby, Colorado, on Willow Creek, a tributary of the Colorado River.

Gage. – Water-stage recorder with satellite telemetry. Elevation of gage is 8,040 feet (m.s.l.) from topographic map.

Remarks. – Drainage area is 127 square miles. Recorder was operated from 01-Oct-2023 to 30-Sep-2024. Records are complete and reliable. The official record is published by the Division of Water Resources, State of Colorado. This record contains operational data which could be subject to future revisions and changes.

Discharge, ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	7	50	22	7	7	7	8	602	445	47	11	6
2	7	50	17	8	7	7	7	596	413	24	11	6
3	8	50	19	7	7	7	7	595	407	23	11	6
4	7	50	23	7	7	7	7	509	442	23	11	5
5	7	47	31	7	7	7	7	554	419	20	11	6
6	7	21	20	7	7	7	7	600	412	18	11	6
7	7	35	24	7	7	7	7	577	383	18	8	5
8	7	17	17	7	7	7	7	436	374	14	6	6
9	7	11	22	7	7	7	7	353	343	11	6	6
10	7	12	18	7	7	7	7	317	309	11	5	6
11	7	13	20	7	7	7	7	326	285	11	5	6
12	7	19	20	7	7	7	7	349	268	11	5	6
13	7	17	23	7	7	7	7	509	243	11	5	5
14	7	22	23	7	8	7	7	651	203	11	5	5
15	7	29	14	7	8	7	7	875	176	11	5	5
16	7	19	24	7	8	7	7	797	172	11	5	5
17	7	24	16	7	8	7	7	846	132	11	5	5
18	7	30	16	7	8	7	7	920	115	11	5	5
19	7	32	21	7	8	7	7	944	117	11	5	5
20	11	32	17	7	8	7	7	915	149	11	5	5
21	50	32	8	7	8	7	7	881	166	12	5	5
22	51	33	8	7	7	7	7	641	149	12	5	5
23	51	33	8	7	7	7	7	569	139	11	5	5
24	51	33	8	7	8	7	7	500	123	11	5	5
25	50	32	7	7	7	7	7	480	95	11	5	5
26	50	24	7	7	7	7	7	490	105	11	5	5
27	50	15	6	7	7	7	7	430	137	11	6	5
28	50	14	6	7	7	7	7	438	106	11	6	5
29	50	15	6	7	7	7	7	459	93	11	5	5
30	50	16	7	7		8	247	450	85	11	5	5
31	50		7	7		8		438		11	5	
Min	7	11	6	7	7	7	7	317	85	11	5	5
Max	51	50	31	8	8	8	247	944	445	47	11	6
Mean	23	28	16	7	7	7	15	582	233	14	7	5
ac-ft	1,389	1,643	969	447	428	448	912	35,801	13,893	885	408	324



Appendix A (8 of 38)
Willow Creek Pump Canal, CO

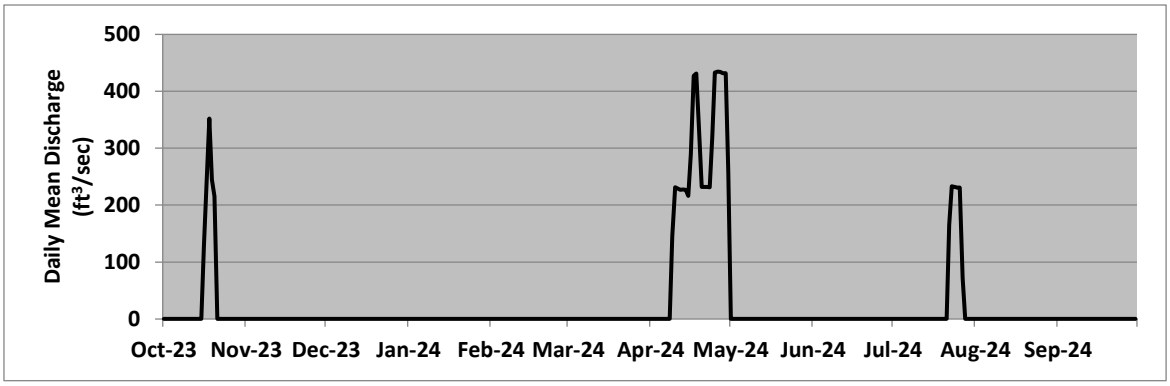
Location. – Lat 40°08'39", long 105°54'10", Grand County, Hydrologic Unit 14010001, at Willow Creek Pump Canal, four miles north of Granby, CO, on Willow Creek, a tributary of the Colorado River.

Gage. – Water-stage recorder with satellite telemetry at 15-foot Parshall Flume. Elevation of gage is 8,300 feet (m.s.l.) from topographic map.

Remarks. – Canal is used to divert water from Willow Creek Reservoir to Granby Reservoir. Diversions are seasonal, mainly during late spring and early summer. Construction completed in 1953. Length of the canal is 3.4 miles. Recorder was operated from 01-Oct-2023 to 30-Sep-2024. Records are complete and reliable. This record consists of operational data which could be subject to future revisions and changes.

Discharge, ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	145	0	0	0	0	0
10	0	0	0	0	0	0	231	0	0	0	0	0
11	0	0	0	0	0	0	229	0	0	0	0	0
12	0	0	0	0	0	0	227	0	0	0	0	0
13	0	0	0	0	0	0	227	0	0	0	0	0
14	0	0	0	0	0	0	227	0	0	0	0	0
15	0	0	0	0	0	0	216	0	0	0	0	0
16	127	0	0	0	0	0	290	0	0	0	0	0
17	233	0	0	0	0	0	427	0	0	0	0	0
18	352	0	0	0	0	0	431	0	0	0	0	0
19	245	0	0	0	0	0	340	0	0	0	0	0
20	215	0	0	0	0	0	232	0	0	0	0	0
21	0	0	0	0	0	0	232	0	0	0	0	0
22	0	0	0	0	0	0	232	0	0	165	0	0
23	0	0	0	0	0	0	232	0	0	233	0	0
24	0	0	0	0	0	0	320	0	0	232	0	0
25	0	0	0	0	0	0	433	0	0	231	0	0
26	0	0	0	0	0	0	434	0	0	231	0	0
27	0	0	0	0	0	0	434	0	0	72	0	0
28	0	0	0	0	0	0	432	0	0	0	0	0
29	0	0	0	0	0	0	432	0	0	0	0	0
30	0	0	0	0		0	258	0	0	0	0	0
31	0		0	0		0		0		0	0	
Min	0	0	0	0	0	0	0	0	0	0	0	0
Max	352	0	0	0	0	0	434	0	0	233	0	0
Mean	38	0	0	0	0	0	222	0	0	38	0	0
ac-ft	2,325	0	0	0	0	0	13,210	0	0	2,309	0	0



Appendix A (9 of 38)
Windy Gap Pumping Plant, CO

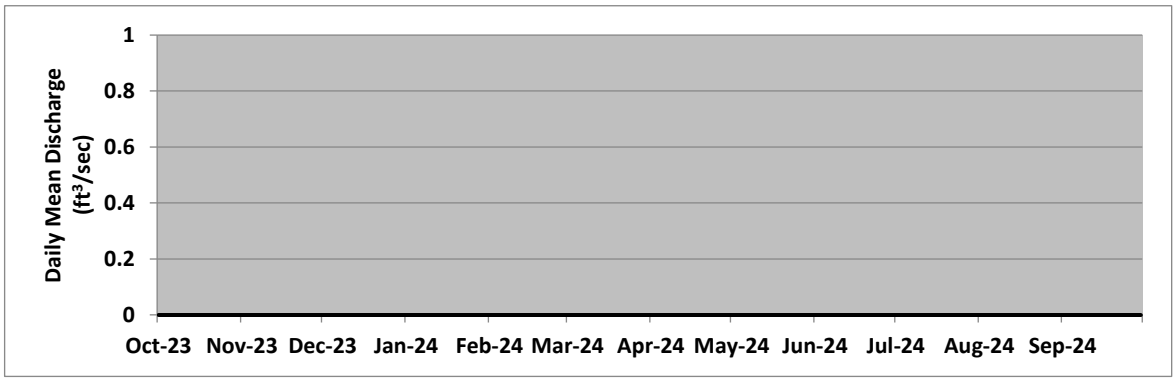
Location. – Lat 40°06'24", long 105°58'48", Grand County, Hydrologic Unit 14010001, 5.5 miles northeast of Granby, CO, on the Colorado River.

Gage. – Reading taken directly from the pumps. Elevation of the pumping plant is 7,823 (m.s.l.) from topographic map.

Remarks. – Water is pumped from Windy Gap Reservoir to Granby Reservoir. Water is stored at Granby Reservoir before delivery through Adams Tunnel. Data was provided by Farr Pumping Plant operators each morning. Data was collected from 01-Oct-2023 to 30-Sep-2024. Records are complete and reliable, but the data has not been reviewed. This record consists of operational data which could be subject to future revisions and changes. Readings were provided by the Northern Water.

Windy Gap Pump Discharge, ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0		0	0	0	0	0	0	0
31	0		0	0		0		0		0	0	
Min	0	0	0	0	0	0	0	0	0	0	0	0
Max	0	0	0	0	0	0	0	0	0	0	0	0
Mean	0	0	0	0	0	0	0	0	0	0	0	0
ac-ft	0	0	0	0	0	0	0	0	0	0	0	0



Appendix A (10 of 38)
Granby Reservoir, CO

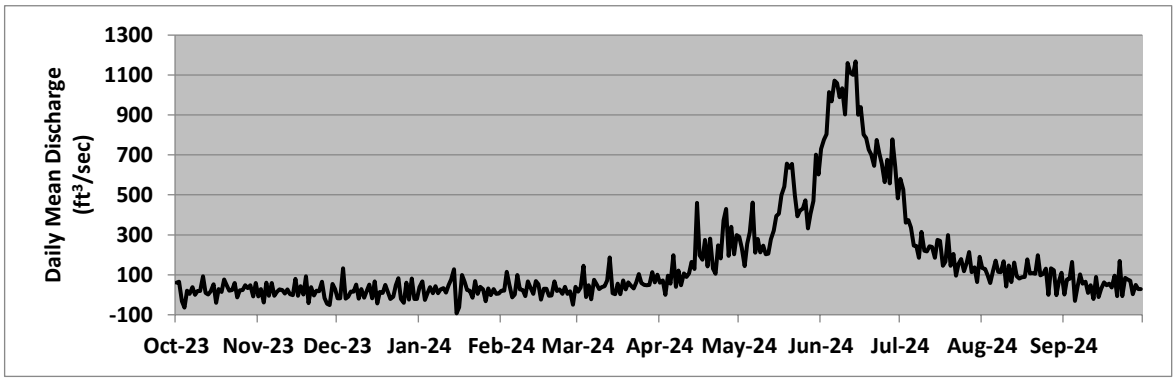
Location. – Lat 40°08'54", long 105°51'48", Grand County, Hydrologic Unit 14010001, on Granby Dam, 5.5 miles northeast of Granby, Colorado, on the Colorado River.

Gage. – Water level recorder with satellite telemetry. Elevation of gage is 8,300 (m.s.l.) from topographic map.

Remarks. – Inflow computed daily flow based on change in content from midnight to midnight, and on the average daily releases through the reservoir outlet works. Records were computed from 01-Oct-2023 to 30-Sep-2024. Records are complete. Negative values are based on accounting procedures and mass balances. This record consists of operational data which could be subject to future revisions and changes.

Inflow, ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	61	-8	-17	39	21	15	61	290	730	579	134	1
2	65	29	-18	68	20	37	72	234	776	527	129	77
3	-32	-38	132	-26	115	145	0	144	803	361	98	80
4	-65	61	-19	9	51	-11	96	255	1,014	374	59	165
5	21	-5	-10	39	-14	49	55	313	969	337	121	-31
6	5	60	16	8	2	-22	198	461	1,072	246	171	40
7	39	-5	16	43	99	74	39	210	1,058	245	114	102
8	-1	14	51	8	27	53	122	279	989	186	113	56
9	20	27	-19	27	23	28	47	212	1,034	314	167	65
10	19	24	29	34	-6	39	107	246	903	221	41	10
11	93	6	-15	11	68	43	90	203	1,160	217	147	47
12	10	28	19	48	37	72	107	207	1,111	243	64	-20
13	1	4	50	77	5	187	164	278	1,101	239	161	89
14	18	-1	-18	128	69	9	130	321	1,167	185	93	-11
15	52	80	66	-93	52	3	460	395	900	275	81	31
16	-40	-4	-43	-62	-24	56	198	405	940	271	87	62
17	28	43	14	98	30	3	176	499	803	145	90	48
18	14	1	10	65	30	72	274	542	784	166	177	55
19	77	93	49	24	-5	27	141	657	728	299	106	37
20	47	-42	14	20	-3	62	281	635	701	145	109	96
21	21	38	-21	-15	66	46	131	656	645	204	106	-6
22	24	-3	-10	69	19	32	105	498	774	96	197	170
23	58	21	48	5	28	62	248	393	708	155	98	-6
24	-12	18	83	39	4	104	182	422	655	179	106	85
25	22	66	-21	28	39	60	372	432	563	119	130	76
26	23	-16	-41	-33	5	49	430	472	676	158	-1	70
27	47	-45	60	32	17	47	194	333	558	214	133	3
28	33	-51	-24	-2	-49	49	341	406	778	113	123	50
29	48	54	82	29	39	113	203	470	639	137	-2	28
30	-8	29	-21	4		62	299	702	482	64	69	28
31	60		-20	6		101		602		190	110	
Min	-65	-51	-43	-93	-49	-22	0	144	482	64	-2	-31
Max	93	93	132	128	115	187	460	702	1,167	579	197	170
Mean	24	16	14	23	26	54	177	393	841	232	107	50
ac-ft	1,486	942	836	1,443	1,519	3,304	10,557	24,142	50,025	14,285	6,609	2,972



Appendix A (11 of 38)
Granby Reservoir, CO

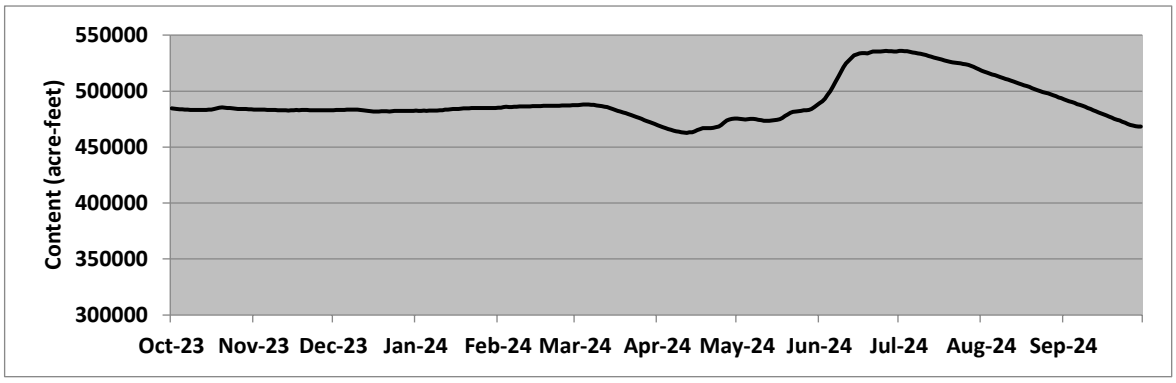
Location. – Lat 40°08'54", long 105°51'48", Grand County, Hydrologic Unit 14010001, on Granby Dam, 5.5 miles northeast of Granby, CO, on the Colorado River.

Gage. – Water level recorder with satellite telemetry. Elevation of gage is 8,300 (m.s.l.) from topographic map.

Remarks. – Reservoir is formed by an earth-fill dam and four earth-fill dikes. Construction completed in 1950. Impoundment began on 14-Sep-1949. Granby Reservoir provides west-slope storage for the C-BT project. Maximum capacity is 539,800 AF at elevation 8,280.00, with 463,300 AF of active capacity between elevations 8,186.90 and 8,280.00 feet. Recorder was operated from 01-Oct-2023 to 30-Sep-2024. Records are complete and reliable. This record consists of operational data which could be subject to future revisions and changes.

Storage, AF, 2400-hour Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	484,575	483,534	482,910	482,495	485,199	487,423	469,564	475,595	489,165	535,916	518,399	492,725
2	484,367	483,465	483,118	482,425	485,269	487,423	468,676	475,252	490,978	535,916	517,331	491,816
3	484,158	483,395	483,257	482,425	485,685	487,701	467,652	474,908	493,285	535,554	516,477	490,908
4	483,881	483,326	483,257	482,495	485,894	487,910	466,903	474,496	496,580	535,554	515,623	490,210
5	483,673	483,326	483,257	482,425	485,685	488,049	466,017	474,908	499,886	535,048	514,913	489,304
6	483,465	483,257	483,326	482,495	485,685	487,980	465,473	475,321	504,051	534,615	514,274	488,328
7	483,326	483,257	483,395	482,633	485,894	487,840	464,657	475,252	508,184	534,181	513,351	487,632
8	483,049	483,118	483,534	482,703	486,102	487,632	464,113	474,840	512,713	533,676	512,500	486,797
9	483,049	483,118	483,534	482,633	486,172	487,214	463,637	474,290	517,117	533,387	511,791	485,894
10	483,049	482,980	483,534	482,841	486,172	486,936	463,230	474,084	521,539	532,810	510,941	484,852
11	483,118	482,841	483,118	482,980	486,310	486,519	462,891	473,604	524,830	532,161	510,304	483,950
12	483,257	482,910	482,841	483,326	486,380	485,894	462,755	473,535	527,340	531,440	509,385	482,910
13	483,257	482,910	482,633	483,465	486,380	485,616	463,162	473,604	529,784	530,864	508,679	482,010
14	483,257	482,703	482,218	483,881	486,519	484,991	463,162	473,810	532,088	530,072	507,761	480,973
15	483,326	482,841	482,010	483,950	486,589	484,020	464,045	474,084	532,810	529,424	506,914	480,075
16	483,465	482,910	481,802	483,950	486,658	483,257	465,269	474,428	533,676	528,921	505,997	479,246
17	483,950	483,049	481,872	484,158	486,728	482,425	466,085	474,908	533,964	528,202	505,151	478,280
18	484,644	482,841	481,802	484,436	486,797	481,733	466,766	476,145	533,892	527,412	504,593	477,247
19	485,199	483,049	481,941	484,575	486,797	480,973	466,766	477,660	533,676	526,838	503,697	476,214
20	485,477	483,049	482,010	484,644	486,797	480,282	467,039	479,039	534,398	526,263	502,637	475,321
21	485,199	483,118	482,010	484,644	487,005	479,591	467,039	480,697	535,265	525,761	501,578	474,290
22	484,991	482,910	481,872	484,783	486,936	478,556	467,243	481,388	535,481	525,331	500,732	473,741
23	484,852	482,980	482,010	484,783	487,005	477,660	467,789	481,733	535,265	524,973	500,027	472,643
24	484,575	482,980	482,218	484,852	487,005	476,834	468,403	482,079	535,265	524,901	499,252	471,685
25	484,367	482,910	482,218	484,783	487,075	476,008	469,837	482,425	535,554	524,257	498,618	470,726
26	484,158	482,910	482,218	484,852	487,075	475,046	471,685	482,841	535,916	523,827	497,915	469,769
27	483,950	482,910	482,218	484,991	487,214	474,084	473,741	482,980	535,699	523,397	497,213	469,154
28	484,158	482,841	482,218	484,991	487,214	473,124	474,634	483,257	535,699	522,610	496,369	468,676
29	484,158	482,980	482,425	484,922	487,423	472,370	475,321	483,950	535,481	521,682	495,317	468,335
30	483,881	482,910	482,425	484,922		471,411	475,595	485,685	535,409	520,467	494,406	468,335
31	483,742		482,425	484,991		470,521		487,423		519,397	493,705	
Min	483,049	482,703	481,802	482,425	485,199	470,521	462,755	473,535	489,165	519,397	493,705	468,335
Max	485,477	483,534	483,534	484,991	487,423	488,049	475,595	487,423	535,916	535,916	518,399	492,725
Mean	483,986	483,044	482,569	483,821	486,471	481,839	467,305	477,878	523,500	528,866	505,995	479,735
EOM	483,742	482,910	482,425	484,991	487,214	470,521	475,595	487,423	535,409	519,397	493,705	468,335



Appendix A (12 of 38)
Granby Reservoir, CO

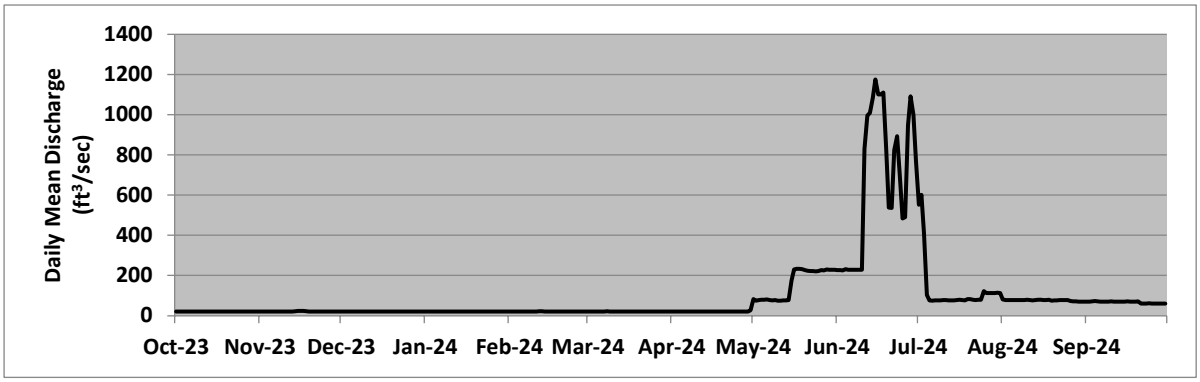
Location. – Lat 40°08'54", long 105°51'48", Grand County, Hydrologic Unit 14010001, on Granby Dam, 5.5 miles northeast of Granby, CO, on the Colorado River.

Gage. – Water level recorder with satellite telemetry. Elevation of gage is 8,300 feet (m.s.l.), from topographic map.

Remarks. – Reservoir is formed by an earth-fill dam and four earth-fill dikes. Construction completed in 1950. Impoundment began on 14-Sep-1949. Granby Reservoir provides west-slope storage for the C-BT project. Data was provided by personnel from the Northern Water. The stream gage directly below the dam is used to measure flows during winter. A USGS station further downstream is used to measure flows between spring and fall. Data was recorded from 01-Oct-2023 to 30-Sep-2024. Records are complete and fair. This record contains operational data which could be subject to future revisions and changes.

Discharge, ft^3/s , 2400-hour Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	20	21	20	20	20	21	21	82	228	553	81	71
2	20	21	20	20	20	20	20	75	227	602	78	71
3	20	20	20	20	20	20	20	78	226	409	77	71
4	21	20	20	20	20	20	20	80	231	103	77	72
5	21	20	20	20	20	20	20	80	228	75	78	72
6	20	20	20	20	20	20	20	81	228	75	78	71
7	20	20	20	20	21	21	20	78	228	76	79	70
8	20	20	20	20	21	22	20	77	228	75	78	70
9	20	20	20	20	21	20	21	77	228	76	78	70
10	20	20	20	21	21	20	20	75	228	79	79	71
11	20	20	20	21	21	20	20	75	829	77	78	70
12	20	20	20	21	22	20	20	75	996	76	77	70
13	20	21	20	20	22	21	21	76	1,009	76	78	71
14	20	23	20	20	20	21	21	77	1,084	76	80	71
15	20	23	20	20	20	20	21	175	1,176	78	79	71
16	20	24	20	20	20	20	20	230	1,101	79	78	71
17	20	24	20	20	21	20	20	234	1,100	78	78	70
18	20	22	20	20	20	20	20	233	1,110	76	79	70
19	20	21	20	20	20	20	20	232	825	83	75	70
20	20	20	20	20	20	20	20	226	538	83	76	71
21	20	20	20	20	21	20	20	223	535	79	77	60
22	21	20	20	20	21	20	20	223	824	78	78	60
23	21	20	20	20	20	20	21	221	892	79	78	60
24	21	20	20	20	20	20	20	220	707	80	77	62
25	21	20	20	20	20	20	20	222	483	122	77	60
26	21	20	20	20	20	20	20	227	490	113	72	61
27	20	20	20	20	20	20	20	225	947	113	72	61
28	20	20	20	20	20	20	20	230	1,091	113	71	61
29	20	20	20	20	21	21	20	229	999	113	70	61
30	20	20	20	21		21	27	229	768	114	71	61
31	20		20	21		21		229		112	70	
Min	20	20	20	20	20	20	20	75	226	75	70	60
Max	21	24	20	21	22	22	27	234	1,176	602	81	72
Mean	20	21	20	20	20	20	21	158	659	130	77	67
ac-ft	1,249	1,236	1,238	1,247	1,179	1,254	1,224	9,709	39,240	7,973	4,713	4,007



Appendix A (13 of 38)
Farr Pumping Plant, Granby Reservoir, CO

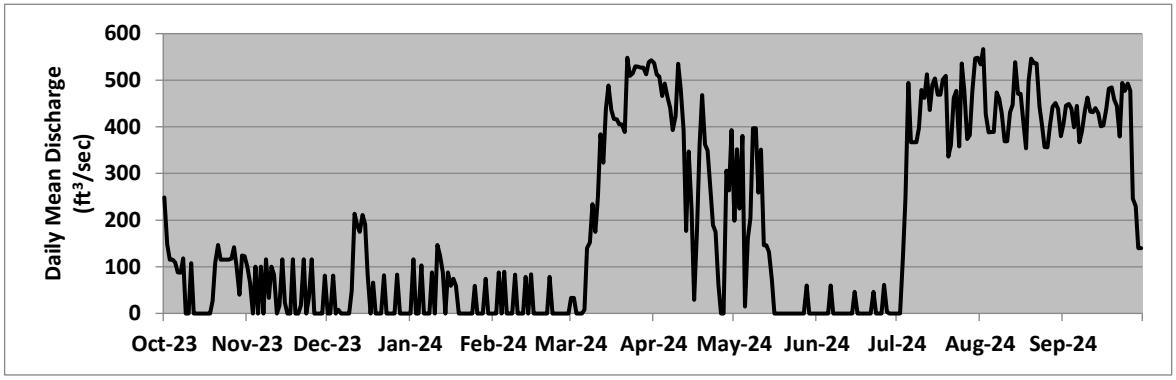
Location. – Lat 40°11'30", long 105°52'52", Grand County, Hydrologic Unit 14010001, at Farr Pumping Plant on the north end of Granby Reservoir, eight miles northeast of Granby, CO, on the Colorado River.

Gage. – Reading taken directly from the pumps, based on conduit pressure and Granby Reservoir's elevation. Elevation of the pumping plant is 8,320 ft from topographic map.

Remarks. – Water is pumped from Granby to the Granby Pump Canal which discharges into Shadow Mountain Reservoir. The operation keeps Shadow Mountain Reservoir/Grand Lake at a steady water surface level (within 0.72 feet for this period) when trans-mountain diversions via Adams Tunnel are taking place. Data was provided by Farr Pumping Plant operators for Northern Water, each morning. Data was collected from 01-Oct-2023 to 30-Sep-2024. Records are complete and reliable. This record contains operational data which could be subject to future revisions and changes.

Discharge, ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	249	99	0	0	0	33	537	199	0	0	534	406
2	148	66	0	116	0	33	512	352	0	0	567	446
3	115	0	81	0	88	0	508	225	0	121	427	449
4	115	100	0	0	0	0	466	381	0	249	388	439
5	109	0	8	103	89	0	493	15	0	494	389	399
6	88	100	0	0	0	8	463	161	60	367	389	445
7	87	0	0	0	0	140	441	204	0	367	474	367
8	118	116	0	0	0	152	393	397	0	367	461	391
9	0	33	0	88	83	234	423	397	0	397	429	435
10	0	100	48	0	0	175	535	259	0	479	369	463
11	108	83	214	147	0	249	481	351	0	462	369	433
12	0	0	190	125	0	384	393	146	0	513	431	431
13	0	17	175	88	78	323	177	146	0	436	447	440
14	0	116	211	0	0	439	347	132	0	490	539	429
15	0	23	191	88	84	489	222	73	46	504	471	401
16	0	0	82	59	0	436	29	0	0	469	471	403
17	0	0	0	74	0	417	180	0	0	469	415	439
18	0	116	66	59	0	416	361	0	0	502	354	482
19	27	0	0	0	0	405	468	0	0	509	498	485
20	108	0	0	0	0	405	362	0	0	336	546	458
21	147	17	0	0	0	389	349	0	0	361	537	445
22	115	116	82	0	78	548	275	0	46	462	536	379
23	115	0	0	0	0	509	189	0	0	477	444	494
24	115	33	0	0	0	515	175	0	0	358	403	477
25	115	116	0	59	0	530	61	0	0	536	357	493
26	117	0	0	0	0	529	0	0	61	477	356	478
27	142	0	83	0	0	527	0	0	3	374	403	246
28	100	0	0	0	0	527	306	60	0	382	443	230
29	40	0	0	74	0	513	264	0	0	476	451	140
30	124	81	0	0		539	393	0	0	547	439	140
31	123		0	0		543		0		548	380	
Min	0	0	0	0	0	0	0	0	0	0	354	140
Max	249	116	214	147	89	548	537	397	61	548	567	494
Mean	81	44	46	35	17	336	327	113	7	404	442	405
ac-ft	5,008	2,642	2,838	2,142	992	20,642	19,444	6,938	428	24,851	27,207	24,125



Appendix A (14 of 38)
Shadow Mountain/Grand Lake, CO

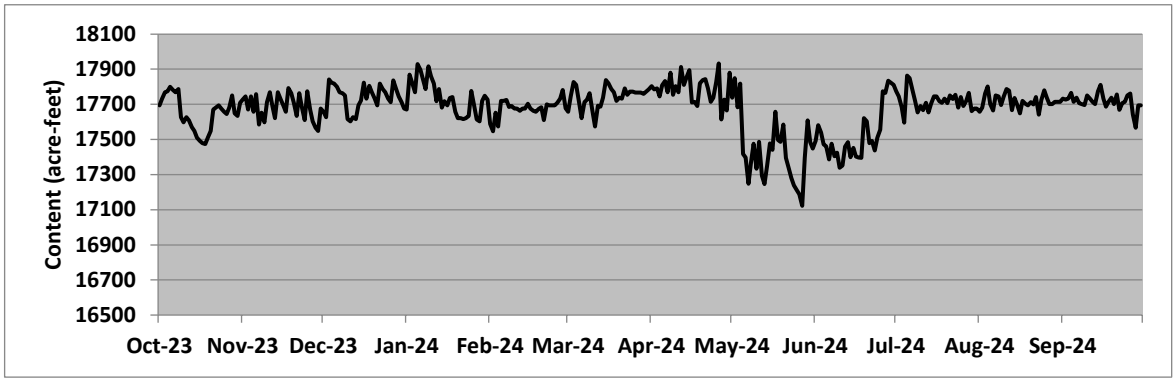
Location. – Lat 40°12'26", long 105°50'28", Grand County, Hydrologic Unit 14010001, on the Colorado River at the Shadow Mountain outlet works structure, ten miles northeast of Granby, CO.

Gage. – Water-stage recorder with satellite telemetry. Elevation of gage is 8,375 feet (m.s.l.) from topographic map.

Remarks. – Shadow Mountain/Grand Lake was constructed between 1944 and 1946. Impoundment began in 1946. Active capacity between elevations 8,366 and 8,367 is 1,800 AF. Grand Lake is used as forebay storage for Adams Tunnel. Recorder was operated from 01-Oct-2023 to 30-Sep-2024. Some data were provided by Farr Pumping Plant personnel during down time. Records are complete and fair. This record contains operational data which could be subject to future revisions and changes.

Storage, AF, 2400-hour Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	17,695	17,726	17,658	17,671	17,588	17,658	17,804	17,738	17,492	17,773	17,657	17,732
2	17,731	17,745	17,626	17,868	17,547	17,745	17,786	17,848	17,581	17,745	17,680	17,727
3	17,768	17,671	17,842	17,823	17,653	17,826	17,791	17,683	17,538	17,684	17,761	17,732
4	17,773	17,745	17,823	17,768	17,573	17,810	17,746	17,817	17,472	17,596	17,801	17,764
5	17,800	17,658	17,818	17,929	17,719	17,713	17,809	17,418	17,461	17,863	17,701	17,714
6	17,782	17,758	17,800	17,897	17,719	17,621	17,833	17,396	17,386	17,848	17,664	17,738
7	17768	17,584	17,768	17,842	17,724	17,713	17,769	17,247	17,476	17,779	17,751	17,706
8	17,787	17,653	17,763	17,787	17,684	17,726	17,880	17,371	17,405	17,719	17,746	17,701
9	17,626	17,598	17,750	17,915	17,690	17,763	17,754	17,476	17,425	17,654	17,696	17,696
10	17,598	17,713	17,616	17,860	17,676	17,661	17,804	17,334	17,339	17,691	17,743	17,751
11	17,626	17,768	17,603	17,818	17,676	17,574	17,769	17,486	17,352	17,667	17,788	17,732
12	17,608	17,690	17,626	17,718	17,663	17,693	17,913	17,294	17,459	17,709	17,777	17,714
13	17,571	17,621	17,616	17,787	17,676	17,688	17,811	17,246	17,485	17,654	17,667	17,701
14	17,548	17,768	17,695	17,681	17,676	17,738	17,853	17,348	17,399	17,704	17,736	17,774
15	17,511	17,731	17,721	17,718	17,703	17,838	17,895	17,477	17,453	17,746	17,694	17,811
16	17,492	17,695	17,823	17,695	17,676	17,819	17,711	17,440	17,403	17,746	17,649	17,732
17	17,479	17,658	17,731	17,737	17,663	17,788	17,714	17,658	17,397	17,717	17,719	17,688
18	17,474	17,792	17,805	17,742	17,658	17,769	17,691	17,498	17,395	17,709	17,704	17,714
19	17,511	17,763	17,768	17,658	17,673	17,719	17,819	17,487	17,621	17,732	17,694	17,738
20	17,548	17,708	17,731	17,621	17,683	17,738	17,838	17,584	17,603	17,706	17,712	17,701
21	17,671	17,634	17,695	17,621	17,610	17,732	17,843	17,395	17,479	17,751	17,699	17,756
22	17,681	17,763	17,818	17,616	17,700	17,791	17,793	17,335	17,492	17,730	17,741	17,669
23	17,695	17,684	17,787	17,621	17,695	17,754	17,714	17,280	17,437	17,754	17,641	17,706
24	17,676	17,611	17,768	17,634	17,695	17,772	17,738	17,238	17,511	17,680	17,724	17,714
25	17,658	17,773	17,731	17,776	17,695	17,772	17,826	17,211	17,556	17,741	17,779	17,751
26	17,645	17,671	17,713	17,692	17,708	17,767	17,932	17,188	17,773	17,691	17,738	17,761
27	17,681	17,603	17,837	17,613	17,731	17,767	17,614	17,123	17,765	17,719	17,701	17,643
28	17,750	17,566	17,787	17,603	17,782	17,767	17,727	17,395	17,834	17,764	17,701	17,566
29	17,648	17,548	17,745	17,719	17,678	17,759	17,664	17,608	17,823	17,662	17,714	17,695
30	17,634	17,676	17,713	17,748		17,772	17,880	17,484	17,810	17,675	17,714	17,695
31	17,708		17,676	17,726		17,786		17,447		17,675	17,714	
Min	17,474	17,548	17,603	17,603	17,547	17,574	17,614	17,123	17,339	17,596	17,641	17,566
Max	17,800	17,792	17,842	17,929	17,782	17,838	17,932	17,848	17,834	17,863	17,801	17,811
Mean	17,650	17,686	17,737	17,739	17,676	17,743	17,791	17,437	17,521	17,719	17,716	17,717
EOM	17,708	17,676	17,676	17,726	17,782	17,786	17,880	17,447	17,810	17,675	17,714	17,695



Appendix A (15 of 38)
Alva B. Adams Tunnel at East Portal, near Estes Park, CO

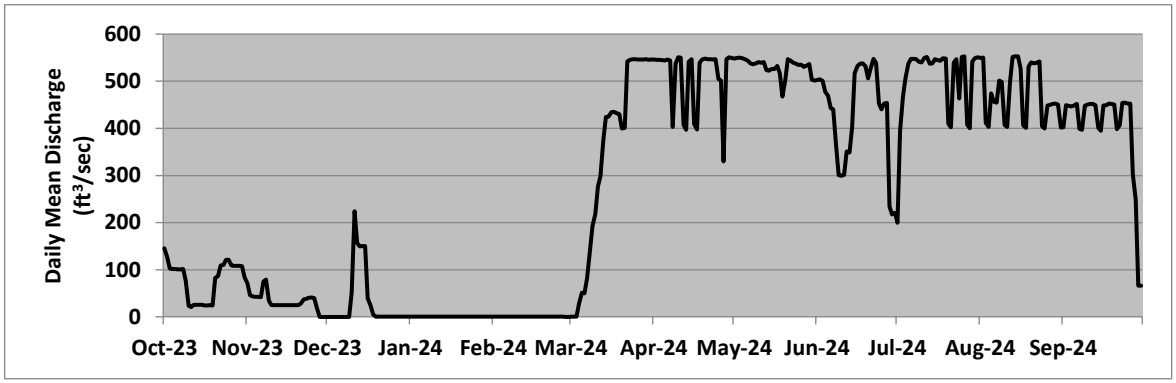
Location. – Lat 40°19'40", long 105°34'39", Larimer County, Hydrologic Unit 10190006, 4.5 miles southwest of Estes Park, CO.

Gage. – Water-stage recorder with satellite telemetry at 15-foot Parshall flume. Elevation of gage is 8,250 ft (m.s.l.) from topographic map.

Remarks. – Constructed between 1940 and 1947. Tunnel is 13.1 miles long, and extends between Grand Lake and East Portal approximately four miles southwest of Estes Park. Its maximum capacity is 550 ft^3/s. Recorder was operated from 01-Oct-2023 to 30-Sep-2024. Records are complete and reliable. This record contains operational data which could be subject to future revisions and changes. Official record published by the Colorado Division of Water Resources.

Discharge, ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	146	71	0	0	0	0	546	548	503	200	550	402
2	127	46	0	0	0	0	546	549	504	394	550	449
3	103	44	0	0	0	0	545	550	501	467	412	448
4	101	42	0	0	0	28	545	549	478	507	403	446
5	101	42	0	0	0	52	544	547	469	537	474	448
6	101	42	0	0	0	50	546	543	443	548	457	452
7	101	75	0	0	0	81	544	538	440	548	455	399
8	101	79	0	0	0	140	403	536	363	547	501	397
9	77	34	0	0	0	192	537	538	301	541	498	448
10	23	25	53	0	0	218	551	541	300	540	407	450
11	21	25	224	0	1	277	550	539	302	549	403	452
12	25	25	157	0	0	299	407	541	351	551	499	452
13	26	25	150	1	0	375	397	523	349	537	551	449
14	26	25	150	1	0	424	542	522	402	538	553	401
15	26	25	151	0	0	425	547	527	517	547	553	395
16	24	25	39	0	0	434	409	526	533	545	527	449
17	24	25	24	0	1	435	398	533	537	544	407	449
18	25	25	6	0	0	432	540	517	538	549	401	453
19	25	25	1	0	0	430	546	468	532	548	531	452
20	83	25	1	0	0	400	548	503	506	410	540	450
21	87	28	1	0	0	401	547	547	527	403	538	398
22	109	37	0	0	0	542	547	544	548	539	539	407
23	110	38	0	0	0	545	546	540	539	547	542	454
24	121	40	0	0	0	546	546	537	453	463	405	455
25	121	41	0	0	0	546	505	535	441	552	400	453
26	109	40	0	0	0	546	501	535	453	553	449	453
27	108	19	0	0	0	546	330	530	454	408	450	302
28	108	0	0	0	0	546	547	533	234	400	452	249
29	108	0	0	0	0	547	551	537	217	542	452	67
30	107	0	0	0		545	549	503	221	550	451	67
31	84		0	0		546		501		551	402	
Min	21	0	0	0	0	0	330	468	217	200	400	67
Max	146	79	224	1	1	547	551	550	548	553	553	455
Mean	79	33	31	0	0	340	512	532	432	505	476	402
ac-ft	4,712	1,968	1,904	20	21	19,843	30,464	31,693	25,690	29,956	28,462	23,893



Appendix A (16 of 38)
Marys Lake, CO

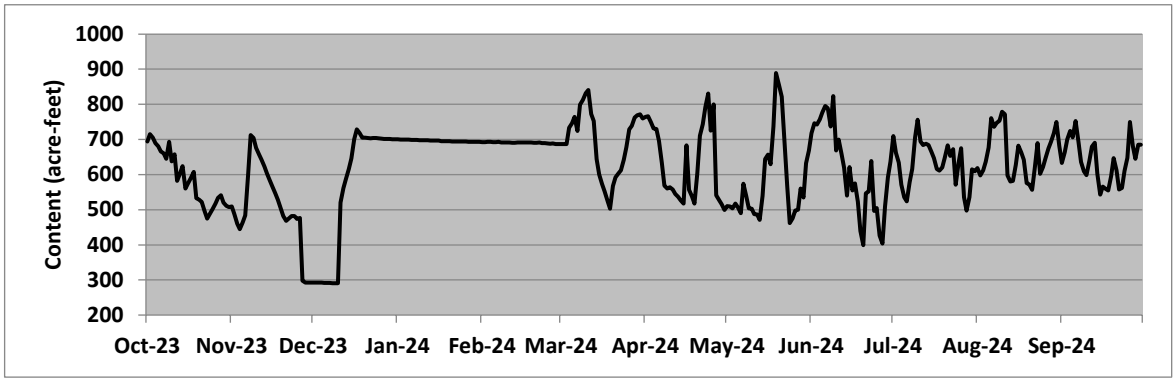
Location. – Lat 40°22'40", long 105°31'50", Larimer County, Hydrologic Unit 10190006, two miles southwest of Estes Park, CO.

Gage. – Water-level recorder with satellite telemetry. Elevation of gage is 8,060 feet (m.s.l.) from topographic map.

Remarks. – Constructed between 1947 and 1949. Impoundment began in August 1950. Active capacity between elevations 8,025 and 8,040 is 500 AF. Used as a forebay storage for Estes Powerplant. The only measurable inflow into the reservoir comes from Adams Tunnel. Recorder was operated from 01-Oct-2023 to 30-Sep-2024. Record is complete and reliable. The gage does not record water surface levels below elevation 8,022.62 feet, content of 322 AF. Values reported as less than 322 AF are estimates. These are operational data which could be subject to further revisions and changes.

Storage, AF, 2400-hour Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	694	510	292	700	692	687	764	510	718	710	619	633
2	715	487	292	700	692	686	766	510	746	662	598	663
3	705	460	292	700	693	687	748	504	743	634	612	701
4	690	445	292	700	693	734	731	517	757	571	637	724
5	680	464	292	699	692	746	730	507	777	535	677	706
6	666	484	292	699	692	764	696	490	796	524	760	752
7	661	599	291	699	693	725	633	574	789	579	736	694
8	645	712	291	698	692	798	569	539	737	615	747	635
9	693	704	291	698	692	812	560	504	823	706	753	610
10	637	676	291	698	692	832	564	503	669	756	779	599
11	658	658	520	698	692	841	558	488	700	694	772	639
12	582	642	561	698	690	773	545	487	658	684	597	680
13	603	623	588	697	691	752	537	471	619	688	580	691
14	624	603	616	697	691	644	527	540	540	684	582	602
15	560	583	646	697	691	601	518	644	621	665	628	543
16	575	566	701	696	692	573	683	657	555	647	682	565
17	590	546	729	695	692	553	557	629	575	616	663	559
18	607	528	718	695	691	526	539	737	523	611	643	555
19	533	504	705	695	691	503	518	889	439	620	575	595
20	528	482	705	695	691	568	605	856	399	649	572	647
21	522	469	704	694	690	592	711	821	547	683	556	612
22	496	476	703	694	691	603	743	702	552	653	616	558
23	475	482	704	694	690	613	792	568	639	672	690	562
24	489	482	704	694	690	643	831	462	497	572	602	610
25	502	474	703	694	688	678	725	476	505	633	622	648
26	518	477	702	694	688	729	800	498	427	675	647	750
27	534	298	702	693	688	739	542	500	404	535	674	682
28	542	293	701	693	687	762	527	560	509	498	693	645
29	520	293	701	693	687	769	516	535	592	535	718	685
30	511	292	701	693		771	499	632	637	615	749	685
31	508		700	693		760		668		609	681	
Min	475	292	291	693	687	503	499	462	399	498	556	543
Max	715	712	729	700	693	841	831	889	823	756	779	752
Mean	589	510	553	696	691	692	634	580	616	630	660	641
EOM	508	292	700	693	687	760	499	668	637	609	681	685



Appendix A (17 of 38)
Big Thompson River above Lake Estes, CO

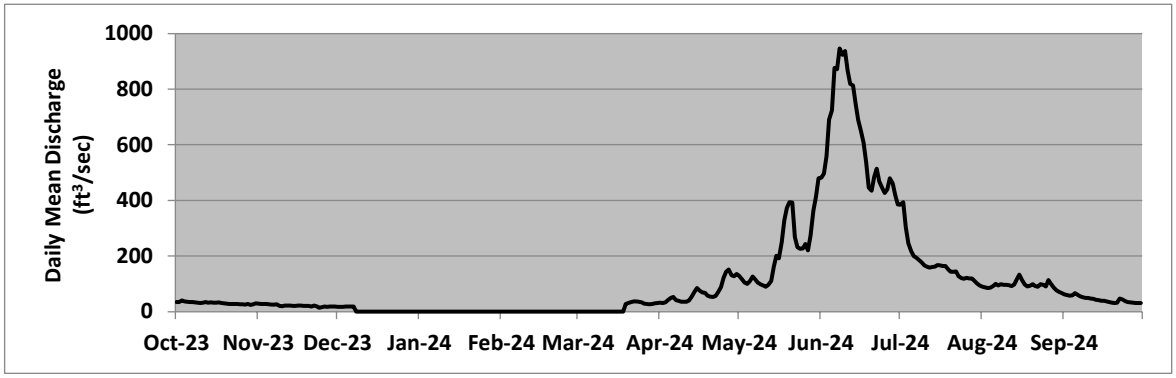
Location. – Lat 40°22'42", long 105°30'48", Larimer County, Hydrologic Unit 10190006, 600 feet downstream from bridge on state highways 7 and 36 in Estes Park, CO, downstream from Black Canyon Creek, and 0.3 miles northwest of Estes Powerplant.

Gage. – Water-stage recorder with satellite telemetry. 15-foot Parshall flume with overflow weirs and supplemental outside gage. Datum of gage at 7,492.5 feet.

Remarks. – Drainage area is 137 mi^2. Station consists of an automated data collection platform. Recorder was operated from 01-Oct-2023 until 07-Dec-2023, before it was winterized. The station was put back into service from 19-Mar-2024 to 30-Sep-2024. Values for the off-season are marked as zero, but winter month flows normally fluctuate between ten and 30 ft^3/s. This record contains operational data which could be subject to future revisions and changes. The official record for this station is published by the Colorado Division of Water Resources.

Discharge, ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	35	29	17	0	0	0	33	129	482	384	90	62
2	35	28	17	0	0	0	32	116	496	393	87	59
3	40	28	17	0	0	0	33	105	559	303	85	57
4	37	28	18	0	0	0	41	100	690	246	86	59
5	36	26	19	0	0	0	50	110	724	217	92	66
6	35	26	19	0	0	0	53	126	876	200	100	61
7	35	25	18	0	0	0	42	116	872	194	94	55
8	33	27	0	0	0	0	39	105	946	186	99	52
9	32	21	0	0	0	0	36	99	923	177	97	50
10	31	20	0	0	0	0	35	94	936	167	97	49
11	32	22	0	0	0	0	36	90	867	162	95	47
12	34	22	0	0	0	0	40	96	819	159	92	46
13	33	22	0	0	0	0	55	111	813	161	97	43
14	33	21	0	0	0	0	71	161	748	162	116	41
15	32	21	0	0	0	0	85	201	689	168	133	40
16	33	21	0	0	0	0	76	192	648	167	113	39
17	33	22	0	0	0	0	69	251	607	164	97	37
18	32	20	0	0	0	0	68	328	537	164	91	35
19	30	21	0	0	0	28	58	373	446	153	93	32
20	29	21	0	0	0	31	55	393	435	144	99	32
21	28	18	0	0	0	34	53	393	484	143	92	32
22	28	21	0	0	0	36	56	268	514	144	90	47
23	27	20	0	0	0	36	70	232	469	127	99	44
24	27	14	0	0	0	35	88	226	445	121	96	38
25	27	17	0	0	0	33	122	228	427	118	91	35
26	26	19	0	0	0	29	144	244	439	121	114	33
27	26	18	0	0	0	28	151	220	479	119	100	32
28	28	19	0	0	0	26	131	274	462	119	86	31
29	24	19	0	0	0	28	127	364	419	111	77	31
30	27	18	0	0		30	136	413	385	101	71	31
31	30		0	0		32		480		94	66	
Min	24	14	0	0	0	0	32	90	385	94	66	31
Max	40	29	19	0	0	36	151	480	946	393	133	66
Mean	31	22	4	0	0	13	69	214	621	174	95	44
ac-ft	1,921	1,295	249	0	0	806	4,134	13,159	36,965	10,687	5,821	2,613



Appendix A (18 of 38)
Olympus Dam, CO

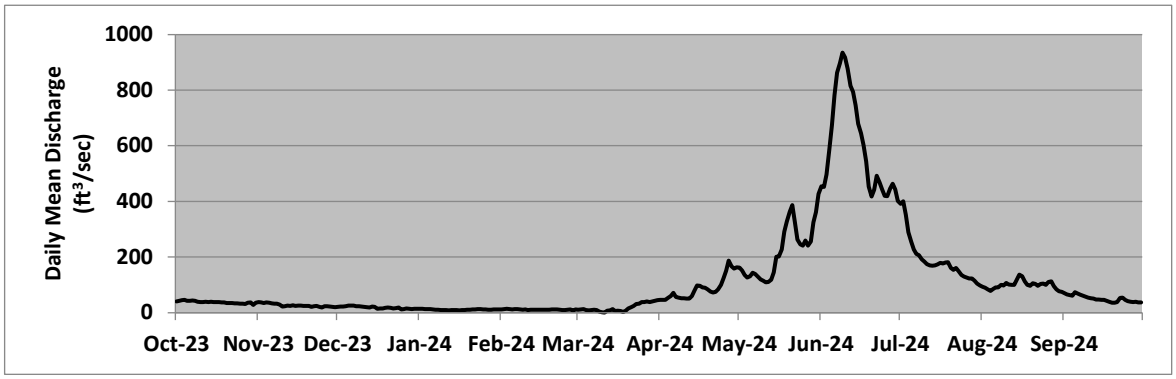
Location. – Lat 40°22'31", long 105°29'15", Larimer County, Hydrologic Unit 10190006, 1.5 miles east of Estes Park, CO, on the Big Thompson River.

Gage. – Water-stage recorders with satellite telemetry. Inflow computed daily based on the change in content from midnight to midnight at Marys Lake and Lake Estes, daily average releases from Olympus Dam, and daily average discharge at Olympus Tunnel and Adams Tunnel.

Remarks. – Olympus dam was constructed between 1947 and 1949. Impoundment began in November 1948. Total capacity at maximum water surface elevation of 7475.0 feet is 2,579 AF. System starts up can create computation errors in the calculated inflows. No adjustments to the record were required for the period. This record contains operational data which could be subject to future revisions and changes.

Computed Inflow, ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2	42	37	22	14	13	11	46	152	452	400	90	66
4	46	37	23	13	13	10	52	126	588	289	78	61
6	43	34	26	11	13	10	71	144	783	228	91	68
8	43	33	23	10	11	9	54	130	897	207	100	61
10	38	22	22	9	11	1	52	115	917	184	106	54
12	39	25	20	9	11	7	51	110	816	170	100	51
14	39	26	22	9	10	12	79	145	746	170	118	48
16	38	25	14	9	11	7	96	202	645	179	131	46
18	37	24	15	9	10	2	90	292	544	180	100	40
20	34	24	19	11	11	15	76	362	418	160	106	36
22	35	23	15	12	11	24	74	326	493	160	97	53
24	34	21	19	12	10	33	100	245	443	136	105	46
26	33	23	13	12	10	38	150	260	419	126	111	40
28	36	22	14	11	7	38	166	255	463	123	96	39
30	28	20	14	12		43	163	361	401	105	77	37
Max	46	38	26	14	14	45	187	427	935	400	136	74
ac-ft	2,317	1,581	1,147	670	637	1,088	5,134	13,450	35,842	11,621	6,107	2,986



Appendix A (19 of 38)
Olympus Dam, CO

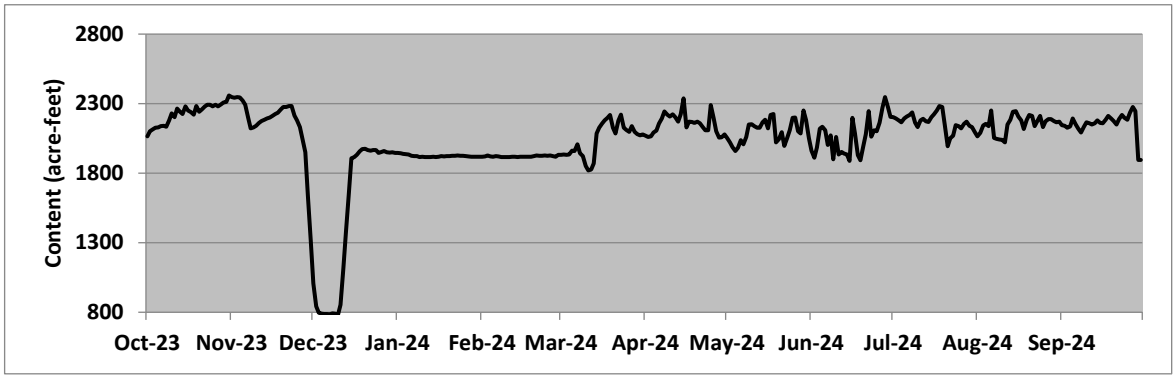
Location. – Lat 40°22'31", long 105°29'19", Larimer County, Hydrologic Unit 10190006, 1.5 miles east of Estes Park, CO, on the Big Thompson River.

Gage. – Water-level recorder with satellite telemetry. Elevation of gage is 7,490 feet (m.s.l.) from topographic map.

Remarks. – Constructed between 1947 and 1949. Impoundment began in November 1948. Active capacity between elevations 7,450.25 and 7,474.00 is 2,259 AF. Used as afterbay storage for Estes Powerplant and forebay for Olympus Tunnel. Recorder was operated from 01-Oct-2023 to 30-Sep-2024. Records are complete and reliable. This record contains operational data which could be subject to future revisions and changes.

Storage, AF, 2400-hour Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	2,066	2,347	1,008	1,946	1,920	1,931	2,070	2,054	1,962	2,202	2,066	2,145
2	2,102	2,344	843	1,943	1,921	1,934	2,060	2,021	1,911	2,194	2,091	2,140
3	2,116	2,348	796	1,940	1,927	1,933	2,066	1,988	1,985	2,180	2,143	2,128
4	2,128	2,345	790	1,937	1,921	1,934	2,093	1,960	2,120	2,166	2,156	2,137
5	2,130	2,323	789	1,934	1,918	1,962	2,107	1,984	2,134	2,194	2,139	2,194
6	2,139	2,293	787	1,925	1,922	1,959	2,157	2,037	2,110	2,208	2,252	2,153
7	2,142	2,201	785	1,924	1,921	2,007	2,193	2,009	2,003	2,218	2,054	2,119
8	2,134	2,123	792	1,922	1,917	1,944	2,244	2,060	2,072	2,236	2,048	2,093
9	2,180	2,130	789	1,917	1,915	1,924	2,221	2,150	1,901	2,163	2,043	2,134
10	2,230	2,140	781	1,918	1,917	1,852	2,208	2,153	2,061	2,133	2,040	2,166
11	2,202	2,162	853	1,915	1,917	1,820	2,222	2,139	1,934	2,179	2,022	2,160
12	2,265	2,174	1,117	1,915	1,918	1,826	2,202	2,128	1,953	2,191	2,150	2,150
13	2,241	2,184	1,377	1,917	1,918	1,869	2,171	2,128	1,941	2,173	2,184	2,160
14	2,225	2,193	1,652	1,918	1,917	2,087	2,224	2,166	1,934	2,168	2,241	2,179
15	2,280	2,201	1,908	1,917	1,918	2,128	2,337	2,184	1,888	2,202	2,247	2,162
16	2,251	2,211	1,915	1,920	1,918	2,157	2,130	2,122	2,197	2,222	2,208	2,159
17	2,240	2,225	1,933	1,922	1,920	2,179	2,171	2,218	2,087	2,251	2,180	2,184
18	2,221	2,235	1,957	1,921	1,920	2,197	2,168	2,225	1,930	2,282	2,119	2,213
19	2,282	2,258	1,973	1,924	1,920	2,219	2,162	2,021	1,892	2,277	2,182	2,194
20	2,243	2,277	1,975	1,924	1,924	2,128	2,171	2,045	1,994	2,145	2,218	2,174
21	2,257	2,277	1,966	1,925	1,928	2,087	2,160	2,096	2,082	1,994	2,211	2,150
22	2,279	2,283	1,963	1,925	1,925	2,177	2,131	1,997	2,247	2,051	2,139	2,188
23	2,291	2,283	1,966	1,927	1,925	2,221	2,110	2,054	2,063	2,069	2,177	2,219
24	2,293	2,215	1,966	1,925	1,927	2,126	2,108	2,108	2,108	2,145	2,211	2,197
25	2,280	2,180	1,947	1,925	1,925	2,111	2,290	2,197	2,102	2,139	2,131	2,184
26	2,293	2,131	1,953	1,924	1,928	2,097	2,196	2,201	2,163	2,122	2,173	2,235
27	2,280	2,048	1,959	1,921	1,922	2,139	2,102	2,102	2,272	2,156	2,190	2,276
28	2,295	1,951	1,950	1,920	1,918	2,097	2,055	2,085	2,348	2,170	2,188	2,247
29	2,309	1,637	1,949	1,920	1,933	2,081	2,058	2,252	2,277	2,142	2,176	1,896
30	2,312	1,314	1,950	1,920		2,073	2,079	2,182	2,205	2,131	2,166	1,896
31	2,358		1,947	1,920		2,079		2,052		2,094	2,170	
Min	2,066	1,314	781	1,915	1,915	1,820	2,055	1,960	1,888	1,994	2,022	1,896
Max	2,358	2,348	1,975	1,946	1,933	2,221	2,337	2,252	2,348	2,282	2,252	2,276
Mean	2,228	2,168	1,495	1,924	1,921	2,041	2,156	2,100	2,063	2,168	2,152	2,154
EOM	2,358	1,314	1,947	1,920	1,918	2,079	2,079	2,052	2,205	2,094	2,170	1,896



Appendix A (20 of 38)
Big Thompson River below Olympus Dam, CO

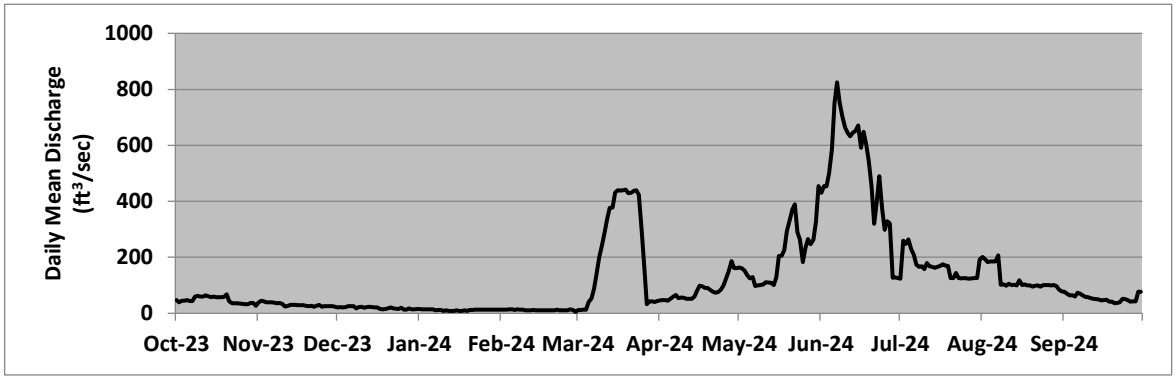
Location. – Lat 40°22'35", long 105°29'06", Larimer County, Hydrologic Unit 10190006, 620 feet downstream from Olympus Dam and 100 feet upstream of Dry Gulch, two miles east in Estes Park.

Gage. – Water-stage recorder with satellite telemetry. 15-foot Parshall flume with overflow weirs in a concrete shelter with a supplemental outside gage. Datum of gage at 7,422.50 feet.

Remarks. – Drainage area is 155 square miles. Area at site used between 29-Jan-1934 and 21-Mar-1951 was 162 square miles. Station consists of automated data collection platform and digital recorder as primary record. Recorder was operated from 01-Oct-2023 to 30-Sep-2024. Record is complete. Flow calculations during peak runoff could lose accuracy as the water begins to flow over the outside boards. This record contains operational data which could be subject to future revisions and changes. The official record for this station is published by the Colorado Division of Water Resources.

Discharge, ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	47	38	21	15	12	12	45	164	430	124	201	77
2	39	44	21	14	12	12	47	160	454	259	193	70
3	45	42	21	14	13	12	47	152	453	248	183	65
4	45	39	22	14	14	13	45	136	500	264	185	64
5	47	39	25	14	14	40	52	124	586	228	185	59
6	43	39	26	14	11	52	59	129	751	209	185	73
7	43	38	25	11	13	89	66	97	825	174	207	69
8	59	35	17	11	13	141	54	99	754	166	102	63
9	62	36	22	11	12	198	56	101	701	168	103	59
10	59	33	23	9	10	245	55	103	664	157	98	57
11	59	24	20	11	11	289	51	111	645	179	105	54
12	64	25	22	9	10	337	51	110	633	168	101	51
13	61	30	23	8	11	377	52	108	646	166	102	50
14	57	30	22	8	11	378	59	100	652	162	99	49
15	59	30	20	10	11	431	80	129	671	165	118	46
16	57	29	21	8	11	440	98	204	591	169	101	47
17	57	29	15	8	10	438	96	206	649	174	103	48
18	57	29	14	10	11	440	90	226	604	170	100	42
19	58	26	15	9	11	442	90	294	546	169	99	42
20	67	26	18	11	11	429	83	329	452	126	95	36
21	42	26	21	11	11	431	77	370	320	126	99	36
22	35	23	17	12	12	437	73	390	396	144	99	39
23	35	26	16	12	11	440	75	290	490	126	95	51
24	35	30	16	12	10	423	84	263	374	124	101	50
25	35	24	19	12	10	295	100	182	298	125	101	47
26	33	26	12	12	10	167	124	233	329	124	101	42
27	33	25	13	12	14	33	150	264	321	124	100	42
28	32	25	18	12	11	43	186	247	127	125	101	43
29	37	26	14	12	5	43	161	262	128	125	97	76
30	37	23	14	12		40	161	327	126	126	85	76
31	26		15	12		43		455		192	78	
Min	26	23	12	8	5	12	45	97	126	124	78	36
Max	67	44	26	15	14	442	186	455	825	264	207	77
Mean	47	30	19	11	11	233	82	205	504	165	120	54
ac-ft	2,908	1,814	1,161	705	651	14,296	4,899	12,622	29,984	10,132	7,380	3,222



Appendix A (21 of 38)
Olympus Tunnel near Estes Park, CO

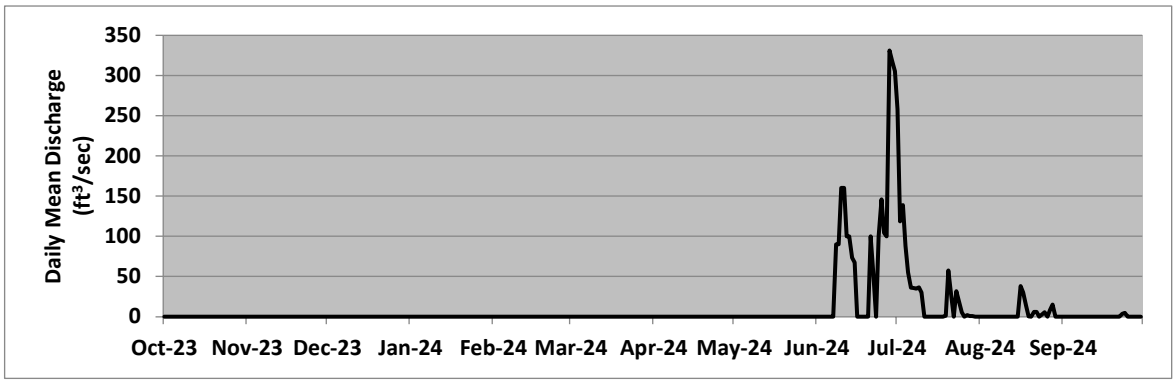
Location. – Lat 40°22'24", long 105°29'00", Larimer County, Hydrologic Unit 10190006, southeast of Estes Park, CO.

Gage. – Water-stage recorder and satellite telemetry. Elevation of gage is 7,460 ft (m.s.l.) from topographic map.

Remarks. – Constructed between 1949 and 1952. The tunnel is 7.2 miles long, between Estes Park and the Pole Hill Canal. Its diameter is 9.75 feet and maximum design capacity is 550 ft^3/s. The hydropower diversion operation, also known as the skim operation, diverts water from the Big Thompson River through Olympus Tunnel for power generation at three power plants down the foothills, before returning it to the Big Thompson River near the canyon mouth. The skim daily value is determined based on the data from the stream gages in the system. Period of record includes 01-Oct-2023 through 30-Sep-2024. Records are complete and reliable. This record contains operational data which could be subject to future revisions and changes.

Hydropower Diversion (Skim), ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	0	0	0	0	0	0	0	258	0	0
2	0	0	0	0	0	0	0	0	0	119	0	0
3	0	0	0	0	0	0	0	0	0	139	0	0
4	0	0	0	0	0	0	0	0	0	88	0	0
5	0	0	0	0	0	0	0	0	0	55	0	0
6	0	0	0	0	0	0	0	0	0	36	0	0
7	0	0	0	0	0	0	0	0	0	36	0	0
8	0	0	0	0	0	0	0	0	90	35	0	0
9	0	0	0	0	0	0	0	0	90	37	0	0
10	0	0	0	0	0	0	0	0	160	30	0	0
11	0	0	0	0	0	0	0	0	160	0	0	0
12	0	0	0	0	0	0	0	0	100	0	0	0
13	0	0	0	0	0	0	0	0	100	0	0	0
14	0	0	0	0	0	0	0	0	73	0	0	0
15	0	0	0	0	0	0	0	0	68	0	0	0
16	0	0	0	0	0	0	0	0	0	0	38	0
17	0	0	0	0	0	0	0	0	0	0	30	0
18	0	0	0	0	0	0	0	0	0	0	14	0
19	0	0	0	0	0	0	0	0	0	1	0	0
20	0	0	0	0	0	0	0	0	0	58	0	0
21	0	0	0	0	0	0	0	0	100	30	6	0
22	0	0	0	0	0	0	0	0	50	0	6	0
23	0	0	0	0	0	0	0	0	0	32	0	4
24	0	0	0	0	0	0	0	0	100	20	3	5
25	0	0	0	0	0	0	0	0	146	6	6	0
26	0	0	0	0	0	0	0	0	104	0	0	0
27	0	0	0	0	0	0	0	0	100	2	8	0
28	0	0	0	0	0	0	0	0	331	1	15	0
29	0	0	0	0	0	0	0	0	318	1	0	0
30	0	0	0	0		0	0	0	305	0	0	0
31	0		0	0		0		0		0	0	
Min	0	0	0	0	0	0	0	0	0	0	0	0
Max	0	0	0	0	0	0	0	0	331	258	38	5
Mean	0	0	0	0	0	0	0	0	80	32	4	0
ac-ft	0	0	0	0	0	0	0	0	4,751	1,948	250	16



Appendix A (22 of 38)
Olympus Tunnel, CO

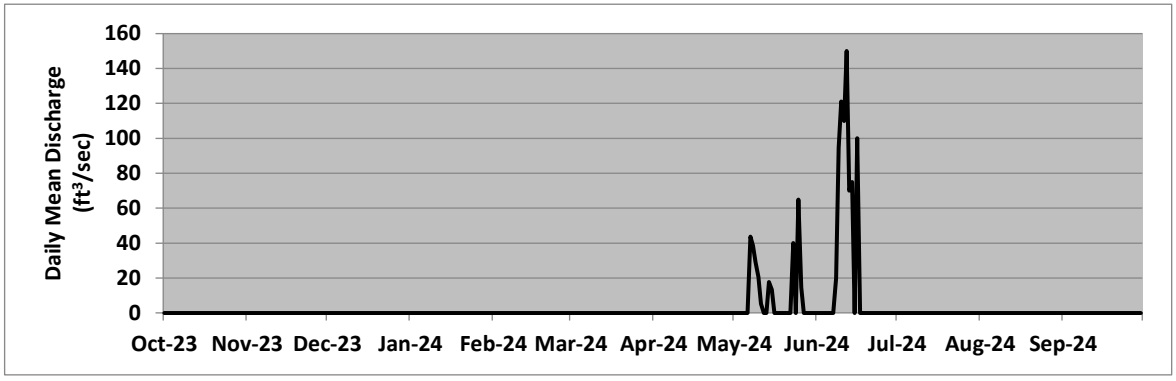
Location. --Lat 40°22'24", long 105°29'00", Larimer County, Hydrologic Unit 10190006, southeast of Estes Park, Colorado.

Gage. -- Water-stage recorder and satellite telemetry. Elevation of gage is 7,460 ft (m.s.l.) from topographic map.

Remarks.— Constructed between 1949 and 1952. The tunnel is 7.2 miles long, between Estes Park and the Pole Hill Canal. Its diameter is 9.75 feet and maximum design capacity is 550 ft^3/s. The right to divert native run-off is determined by the Colorado Division of Water Resources. Period of record from 01-Oct-2023 through 30-Sep-2024. Record is complete and reliable.

Priority Diversion Flow, ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	44	0	0	0	0
8	0	0	0	0	0	0	0	39	20	0	0	0
9	0	0	0	0	0	0	0	29	95	0	0	0
10	0	0	0	0	0	0	0	21	121	0	0	0
11	0	0	0	0	0	0	0	5	110	0	0	0
12	0	0	0	0	0	0	0	0	150	0	0	0
13	0	0	0	0	0	0	0	0	70	0	0	0
14	0	0	0	0	0	0	0	18	75	0	0	0
15	0	0	0	0	0	0	0	13	0	0	0	0
16	0	0	0	0	0	0	0	0	100	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	40	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	65	0	0	0	0
26	0	0	0	0	0	0	0	15	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0		0	0	0	0	0	0	0
31	0		0	0		0		0		0	0	
Min	0	0	0	0	0	0	0	0	0	0	0	0
Max	0	0	0	0	0	0	0	65	150	0	0	0
Mean	0	0	0	0	0	0	0	9	25	0	0	0
ac-ft	0	0	0	0	0	0	0	571	1,469	0	0	0



Appendix A (23 of 38)
Olympus Tunnel, CO

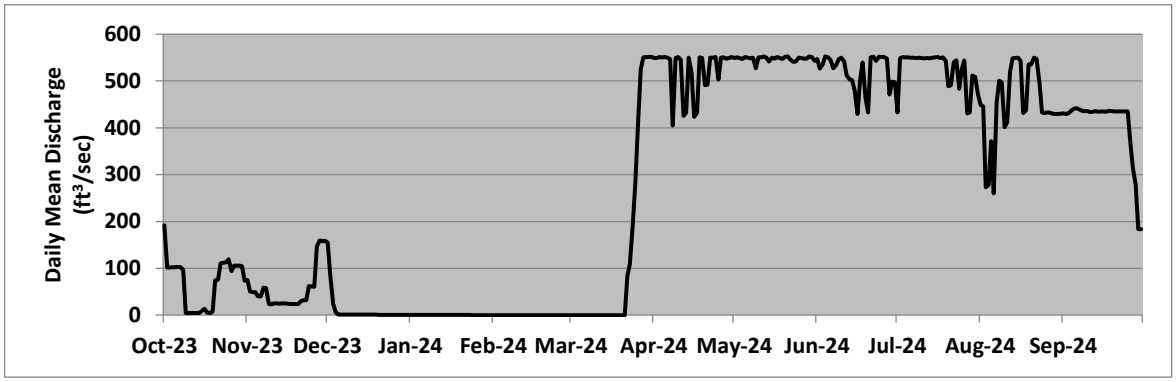
Location. – Lat 40°22'24", long 105°29'00", Larimer County, Hydrologic Unit 10190006, southeast of Estes Park, CO, on the Big Thompson River.

Gage. – Water-stage recorder with satellite telemetry. Elevation of gage is 7,460 ft (m.s.l.) from topographic map.

Remarks. – Constructed between 1949 and 1952. The tunnel is 7.2 miles long, between Estes Park and the Pole Hill Canal. Its diameter is 9.75 feet and maximum design capacity is 550 ft^3/s. Recorder was operated from 01-Oct-2023 to 30-Sep-2024. Records are complete and reliable. This record contains operational data which could be subject to future revisions and changes. Official record is published by the Colorado Division of Water Resources.

Discharge, ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	192	75	155	1	0	0	549	549	547	433	448	431
2	102	50	85	0	0	0	549	550	526	548	446	429
3	102	49	24	0	0	0	551	549	535	551	273	432
4	102	49	6	0	0	0	551	547	552	550	278	437
5	102	40	2	0	0	0	551	551	550	550	371	441
6	103	40	2	0	0	0	550	550	544	550	260	442
7	103	59	2	0	0	0	546	548	527	549	454	439
8	97	58	1	0	0	0	405	550	534	549	500	436
9	5	24	1	0	0	0	549	527	546	550	497	435
10	5	23	1	0	0	0	551	550	550	549	402	435
11	5	25	1	0	0	0	546	550	542	548	412	434
12	5	25	1	0	0	0	425	552	512	549	519	434
13	5	25	1	0	0	0	432	550	503	548	548	436
14	5	25	1	0	0	0	550	541	502	549	549	435
15	9	25	1	0	0	0	517	550	480	550	550	435
16	14	24	1	0	0	0	423	548	430	551	543	435
17	5	24	1	0	0	0	432	551	502	549	431	434
18	5	24	1	0	0	0	550	549	539	550	438	436
19	7	24	1	0	0	0	549	547	463	543	536	435
20	74	24	1	0	0	0	491	551	433	489	536	435
21	76	30	1	0	0	0	492	552	550	491	550	435
22	111	32	1	0	0	83	550	546	552	540	547	435
23	112	32	1	0	0	110	550	541	543	544	497	435
24	113	62	1	0	0	192	551	541	551	483	433	435
25	119	61	1	0	0	281	503	550	551	525	431	435
26	94	60	1	0	0	402	550	549	551	543	433	370
27	106	147	1	0	0	525	550	548	548	431	432	315
28	106	160	1	0	0	550	548	547	471	433	430	278
29	106	157	1	0	0	551	549	552	499	511	430	184
30	104	159	1	0		551	551	551	497	508	429	184
31	74		1	0		551		542		474	430	
Min	5	23	1	0	0	0	405	527	430	431	260	184
Max	192	160	155	1	0	551	551	552	552	551	550	442
Mean	70	54	10	0	0	122	522	548	521	525	453	407
ac-ft	4,297	3,202	592	21	1	7,528	31,060	33,677	31,004	32,311	27,829	24,218



Appendix A (24 of 38)
Pinewood Reservoir near Loveland, CO

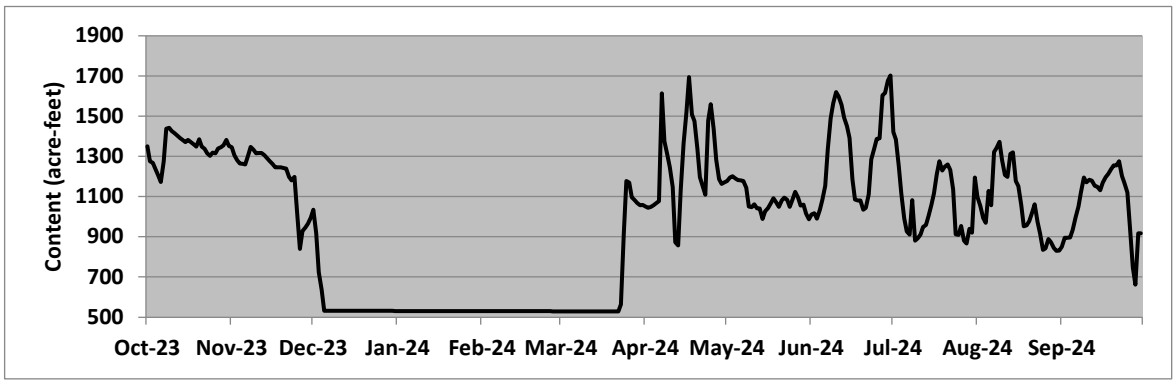
Location. – Lat 40°22', long 105°17.9', Larimer County, Hydrologic Unit 10190006, ten miles southwest of Loveland, CO.

Gage. – Water-level recorder with satellite telemetry. Elevation of gage is 6,600 feet (m.s.l.) from topographic map.

Remarks. – Constructed between 1951 and 1952. Impoundment began on January 4, 1954. Active capacity between elevations 6,550.00 and 6,580.00 is 1,570 AF. The gage is capable of measuring the water surface elevation down to 6,555.70 feet, a content of 604 AF. Used as the forebay storage for Flatiron Powerplant. Recorder was operated from 01-Oct-2023 to 30-Sep-2024. Record is complete and reliable. This record contains operational data which could be subject to future revisions and changes.

Storage, AF, 2400-hour Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	1,350	1,345	1,035	531	530	529	1,051	1,178	1,010	1,422	1,097	850
2	1,276	1,306	917	531	530	529	1,044	1,195	1,017	1,383	1,054	895
3	1,267	1,281	723	531	530	529	1,048	1,200	991	1,252	994	895
4	1,237	1,265	636	531	530	529	1,057	1,190	1,033	1,114	969	897
5	1,204	1,263	532	531	530	529	1,067	1,181	1,084	992	1,128	934
6	1,173	1,260	532	531	530	529	1,078	1,180	1,154	926	1,057	997
7	1,274	1,303	532	531	530	529	1,613	1,178	1,336	911	1,322	1,051
8	1,437	1,346	532	531	530	529	1,375	1,143	1,489	1,082	1,343	1,123
9	1,442	1,333	532	531	530	529	1,309	1,051	1,564	880	1,373	1,194
10	1,426	1,315	532	531	530	529	1,245	1,047	1,619	892	1,282	1,171
11	1,415	1,316	532	531	530	529	1,146	1,061	1,597	911	1,207	1,184
12	1,404	1,317	532	531	530	529	872	1,041	1,556	950	1,199	1,178
13	1,392	1,306	532	531	530	529	857	1,041	1,493	959	1,312	1,154
14	1,381	1,291	532	531	530	529	1,131	988	1,451	1,004	1,320	1,149
15	1,371	1,276	532	531	530	529	1,364	1,026	1,392	1,059	1,177	1,131
16	1,382	1,263	532	531	530	529	1,522	1,043	1,187	1,115	1,152	1,169
17	1,371	1,246	532	531	530	529	1,694	1,065	1,085	1,212	1,058	1,196
18	1,359	1,245	532	530	530	529	1,509	1,092	1,081	1,275	952	1,212
19	1,348	1,246	531	530	530	529	1,475	1,072	1,081	1,230	957	1,236
20	1,385	1,242	531	530	530	529	1,341	1,049	1,035	1,248	978	1,255
21	1,348	1,239	531	530	530	529	1,196	1,081	1,044	1,260	1,020	1,255
22	1,337	1,199	531	530	530	529	1,151	1,094	1,110	1,233	1,061	1,276
23	1,315	1,181	531	530	530	564	1,109	1,084	1,285	1,136	975	1,202
24	1,302	1,199	531	530	530	916	1,479	1,048	1,337	913	916	1,165
25	1,319	1,026	531	530	530	1,177	1,559	1,087	1,387	910	836	1,120
26	1,315	840	531	530	530	1,170	1,438	1,123	1,389	954	842	948
27	1,338	929	531	530	529	1,096	1,283	1,094	1,604	880	888	748
28	1,345	945	531	530	529	1,082	1,186	1,055	1,615	867	872	662
29	1,355	965	531	530	529	1,067	1,163	1,060	1,677	940	845	917
30	1,382	995	531	530		1,056	1,171	1,015	1,703	920	829	917
31	1,352		531	530		1,058		987		1,195	831	
Min	1,173	840	531	530	529	529	857	987	991	867	829	662
Max	1,442	1,346	1,035	531	530	1,177	1,694	1,200	1,703	1,422	1,373	1,276
Mean	1,342	1,209	570	531	530	672	1,251	1,089	1,313	1,065	1,059	1,069
EOM	1,352	995	531	530	529	1,058	1171	987	1,703	1,195	831	917



Appendix A (25 of 38)
Flatiron Reservoir, CO

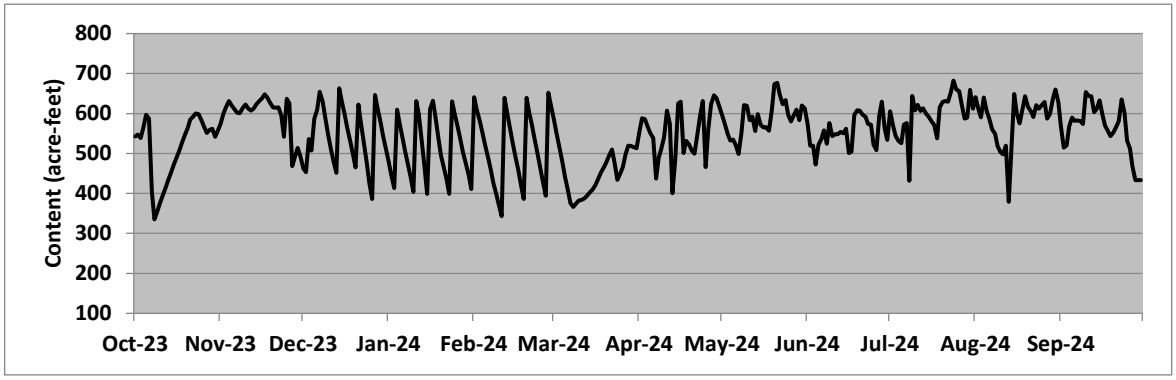
Location. – Lat 40°22.1', long 105°13.3', Larimer County, Hydrologic Unit 10190006, eight miles southwest of Loveland, CO.

Gage. – Water-level recorder with satellite telemetry. Elevation of gage is 5,600 feet (m.s.l.) from topographic map.

Remarks. – Constructed between 1951 and 1953. Impoundment began in January 1954. Active capacity between elevations 5,462.00 and 5.472.80 is 436 AF. Used as the afterbay storage for Flatiron Powerplant. Recorder was operated from 01-Oct-2023 to 30-Sep-2024. Record is complete and reliable. This record contains operational data which could be subject to future revisions and changes.

Storage, AF, 2400-hour Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	543	574	462	478	641	583	555	597	573	606	640	568
2	547	600	453	445	610	549	588	574	520	569	611	514
3	538	616	536	413	584	514	586	549	519	544	590	520
4	566	631	507	609	551	478	566	532	472	531	640	568
5	597	621	587	574	522	442	550	535	522	526	606	589
6	587	611	610	539	491	409	538	521	536	572	587	582
7	405	602	654	506	459	376	437	499	558	576	560	583
8	335	601	630	472	426	366	488	552	524	431	549	581
9	355	613	591	438	399	375	514	620	576	644	519	574
10	375	622	548	404	372	382	541	619	544	608	503	654
11	395	613	511	631	343	384	607	584	548	622	498	644
12	414	607	481	597	639	388	574	592	548	607	520	643
13	433	612	452	532	602	394	400	556	553	612	379	603
14	452	623	663	464	563	403	486	598	550	600	507	611
15	471	631	631	399	528	409	625	571	561	591	649	633
16	489	638	597	610	493	421	630	565	501	581	601	597
17	507	648	564	632	458	436	501	566	504	571	576	570
18	526	640	532	591	423	452	531	557	597	538	611	556
19	545	627	497	539	386	464	522	609	608	615	643	543
20	563	615	465	496	639	478	507	673	607	629	617	552
21	585	614	623	465	603	495	500	677	597	631	606	566
22	592	615	576	434	569	510	546	647	592	629	591	581
23	600	594	526	399	536	477	591	623	574	654	620	636
24	598	542	477	631	501	434	631	633	572	683	612	601
25	583	637	427	599	462	450	466	597	522	660	621	532
26	567	625	386	568	429	466	558	580	508	656	629	512
27	551	468	647	534	394	500	623	594	594	621	587	466
28	559	493	613	503	652	520	646	610	629	587	599	433
29	562	514	579	474	617	518	638	584	562	590	637	433
30	542	492	544	445		515	617	620	534	659	660	433
31	556		512	411		513		612		612	629	
Min	335	468	386	399	343	366	400	499	472	431	379	433
Max	600	648	663	632	652	583	646	677	629	683	660	654
Mean	514	598	545	511	514	455	552	589	554	599	587	563
EOM	556	492	512	411	652	513	617	612	534	612	629	433



Appendix A (26 of 38)
Flatiron Powerplant Unit No. 3 Pump, CO

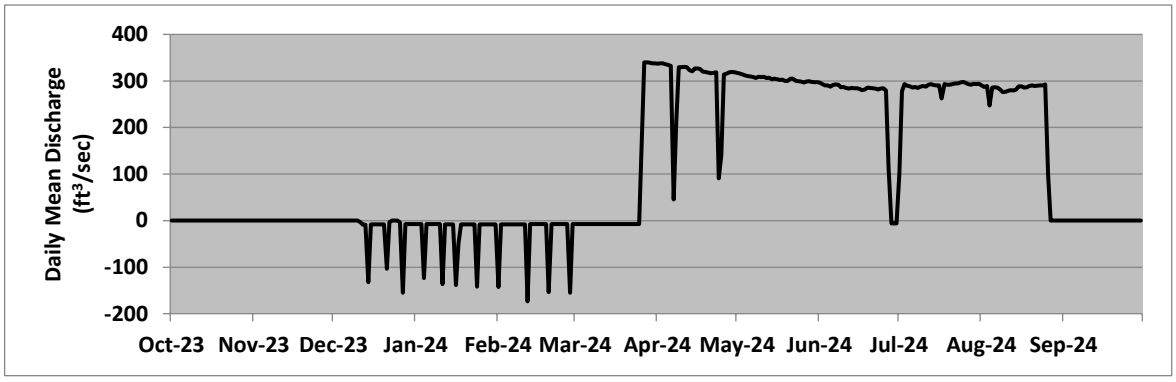
Location. – Lat 40°21'53", long 105°14'09", Larimer County, Hydrologic Unit 10190006, nine miles west of Loveland, Colorado

Gage. – There is a flow meter in place.

Remarks. – Constructed between 1951 and 1953. The Powerplant consists of three generating units. Unit No. 3 can be used to pump water from Flatiron Reservoir to Carter Lake Reservoir, or to generate power. For the purpose of this table, negative values indicate power generation or leakage through the conduit from Carter Lake Reservoir into Flatiron Reservoir. The maximum capacity of the pump is approximately 480 ft^3/s, but the efficiency varies according to the water surface levels at Carter Lake and Flatiron Reservoirs. Discharges are measured using a flow meter inside the pressure conduit. Recorder was operated from 01-Oct-2023 to 30-Sep-2024. Record is complete and reliable. This record contains operational data which could be subject to future revisions and changes.

Discharge, ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	0	-7	-143	-7	337	317	296	103	290	0
2	0	0	0	-7	-8	-7	338	316	293	278	287	0
3	0	0	0	-7	-8	-7	338	314	290	293	289	0
4	0	0	0	-123	-8	-7	336	312	291	290	248	0
5	0	0	0	-7	-8	-7	335	311	288	288	286	0
6	0	0	0	-7	-8	-7	332	310	291	286	286	0
7	0	0	0	-7	-8	-7	45	308	293	287	285	0
8	0	0	0	-7	-8	-7	210	306	292	285	281	0
9	0	0	0	-7	-8	-7	330	309	286	287	276	0
10	0	0	0	-7	-8	-7	330	308	287	289	277	0
11	0	0	-3	-136	-8	-7	331	309	285	287	279	0
12	0	0	-9	-8	-173	-7	329	306	284	292	280	0
13	0	0	-9	-8	-7	-7	323	307	285	293	279	0
14	0	0	-132	-8	-7	-7	321	304	284	291	282	0
15	0	0	-8	-8	-7	-7	327	305	284	290	288	0
16	0	0	-8	-139	-7	-7	326	303	283	291	288	0
17	0	0	-8	-48	-7	-7	325	302	280	262	286	0
18	0	0	-8	-8	-7	-7	320	303	281	293	286	0
19	0	0	-8	-8	-7	-7	319	300	286	292	289	0
20	0	0	-8	-8	-154	-7	318	300	285	292	291	0
21	0	0	-103	-8	-7	-7	317	305	285	293	289	0
22	0	0	-3	-8	-7	-7	317	305	284	294	289	0
23	0	0	0	-8	-7	-7	319	300	282	295	290	0
24	0	0	0	-142	-7	-7	91	299	284	297	290	0
25	0	0	0	-8	-7	-7	140	299	284	298	292	0
26	0	0	-4	-8	-7	167	314	297	279	296	99	0
27	0	0	-155	-8	-7	340	316	299	115	293	0	0
28	0	0	-7	-8	-155	340	319	299	-6	292	0	0
29	0	0	-7	-8	-7	339	319	298	-6	294	0	0
30	0	0	-7	-8		338	319	297	-6	293	0	0
31	0		-7	-8		338		298		294	0	
Min	0	0	-155	-142	-173	-7	45	297	-6	103	0	0
Max	0	0	0	-7	-7	340	338	317	296	298	292	0
Mean	0	0	-16	-26	-28	54	298	305	251	284	232	0
ac-ft	0	0	-978	-1,569	-1,610	3,340	17,730	18,736	14,953	17,473	14,291	0



Appendix A (27 of 38)
CHFC 930 Section, CO

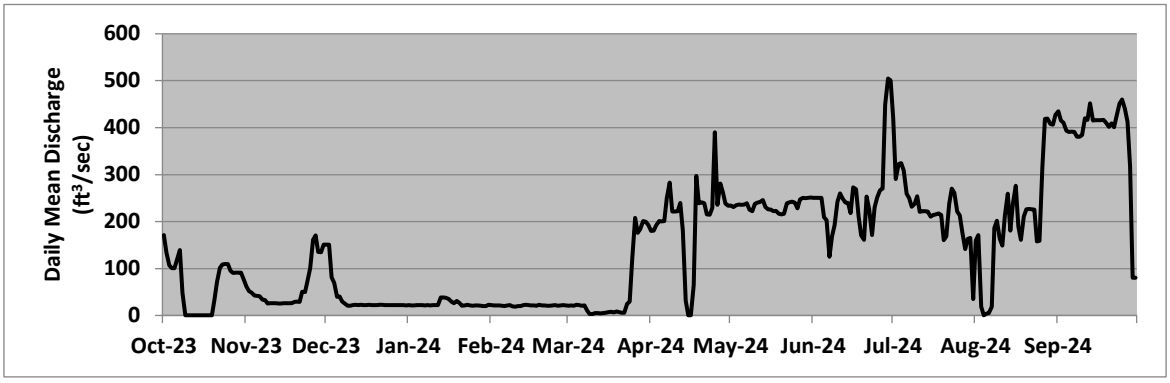
Location. – Lat 40°22'26", long 105°13'52", Larimer County, Hydrologic Unit 10190006, eight miles southwest of Loveland, CO.

Gage. – Water-stage recorder with satellite telemetry. Elevation of gage is 5,470 feet from topographic map.

Remarks. – Constructed between 1949 and 1953. The canal is 3.8 miles long and has a maximum capacity of 930 ft^3/s. The canal is used to move C-BT water and diverted native water to the Big Thompson River and/or Horsetooth Reservoir. Recorder was operated from 01-Oct-2023 to 30-Sep-2024. Canal algae growth can create accuracy issues. The record is complete and fair. This record contains operational data which could be subject to future revisions and changes.

Flow, ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	171	61	151	22	22	21	180	234	251	421	160	435
2	134	52	151	22	21	21	181	231	251	290	171	415
3	107	48	81	22	21	21	192	235	251	322	19	410
4	101	43	70	22	22	23	201	237	251	324	0	394
5	101	42	40	22	21	22	201	236	209	309	4	391
6	121	41	40	22	20	21	201	236	203	259	5	391
7	140	33	30	22	21	21	251	239	125	250	18	391
8	48	33	26	22	22	10	283	225	169	232	186	380
9	1	25	21	22	20	3	221	222	192	238	202	381
10	0	26	21	22	19	3	221	238	242	254	163	384
11	0	26	22	22	20	5	222	241	260	221	149	420
12	0	26	23	22	20	5	240	242	249	222	213	417
13	0	26	22	39	22	5	180	246	241	222	259	452
14	0	26	23	39	23	5	32	231	240	221	181	415
15	0	26	22	38	22	6	1	226	218	211	238	416
16	0	26	22	35	21	7	0	226	273	214	276	416
17	1	26	23	30	21	8	65	222	269	216	190	416
18	1	26	22	26	21	7	297	223	211	217	161	416
19	1	29	22	31	23	9	239	217	170	214	211	411
20	34	30	22	27	22	7	241	215	161	161	226	402
21	72	29	23	21	22	6	239	217	253	169	227	409
22	102	51	23	21	21	6	215	239	226	238	226	401
23	109	50	22	23	21	25	215	241	171	270	225	428
24	110	75	22	22	22	30	229	242	230	261	158	451
25	110	101	22	21	22	121	390	240	252	221	159	460
26	95	161	22	21	21	208	236	228	267	213	315	440
27	91	171	22	22	21	176	281	247	270	177	419	412
28	91	135	22	21	22	184	262	250	449	141	419	318
29	91	135	22	20	22	201	238	250	505	163	408	81
30	91	151	22	20		200	234	250	500	165	406	81
31	76		22	23		193		251		35	427	
Min	0	25	21	20	19	3	0	215	125	35	0	81
Max	171	171	151	39	23	208	390	251	505	421	427	460
Mean	64	58	35	25	21	51	206	235	252	228	207	388
ac-ft	3,962	3,431	2,176	1,511	1,223	3,133	12,278	14,432	14,991	14,025	12,739	23,074



Appendix A (28 of 38)
Dille Tunnel near Drake, CO

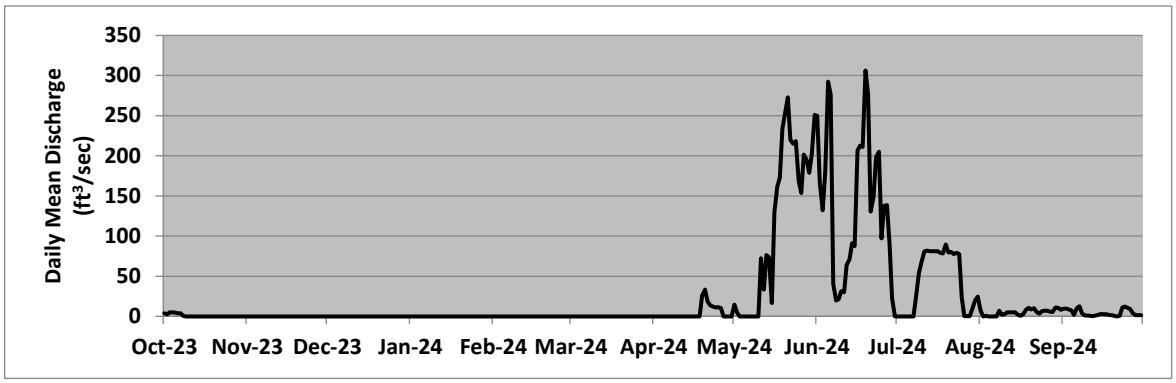
Location. – Lat 40°25'02", long 105°14'35", Larimer County, Hydrologic Unit 10190006, 11 miles west of Loveland, CO, on the Big Thompson River.

Gage. – Water-stage recorder with satellite telemetry at Parshall Flume. Elevation of gage is 5,520 feet (m.s.l.) from topographic map.

Remarks. – Constructed in 1950. Maximum capacity is 600 ft^3/s, but only 400 ft^3/s can be measured accurately. Dille Tunnel diverts water from the Big Thompson River for power generation and water supply. The hydropower diversion operation, also known as the skim operation, diverts water from the Big Thompson River through Dille Tunnel for power generation at the Big Thompson Powerplant, where the diverted water is returned to the river. The skim daily value is determined based on the data from the gage. Record is complete and accurate.

Hydropower Diversion Flow (Skim), ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	4	0	0	0	0	0	0	15	249	0	7	10
2	3	0	0	0	0	0	0	5	166	0	0	10
3	5	0	0	0	0	0	0	0	132	0	1	8
4	5	0	0	0	0	0	0	0	180	0	0	7
5	5	0	0	0	0	0	0	0	292	0	0	2
6	4	0	0	0	0	0	0	0	276	0	0	10
7	4	0	0	0	0	0	0	0	40	0	0	13
8	1	0	0	0	0	0	0	0	20	28	7	4
9	0	0	0	0	0	0	0	0	21	54	2	1
10	0	0	0	0	0	0	0	0	31	68	3	1
11	0	0	0	0	0	0	0	72	30	81	5	1
12	0	0	0	0	0	0	0	33	64	82	5	0
13	0	0	0	0	0	0	0	77	71	81	5	1
14	0	0	0	0	0	0	0	74	91	81	5	2
15	0	0	0	0	0	0	0	17	88	81	2	3
16	0	0	0	0	0	0	0	130	207	81	1	3
17	0	0	0	0	0	0	0	162	212	79	3	3
18	0	0	0	0	0	0	0	173	211	78	8	2
19	0	0	0	0	0	0	26	234	306	90	11	1
20	0	0	0	0	0	0	34	255	276	80	9	1
21	0	0	0	0	0	0	19	273	131	80	10	0
22	0	0	0	0	0	0	14	220	148	77	6	1
23	0	0	0	0	0	0	12	215	198	79	4	11
24	0	0	0	0	0	0	11	218	205	78	7	12
25	0	0	0	0	0	0	12	169	97	24	7	11
26	0	0	0	0	0	0	10	153	138	0	7	9
27	0	0	0	0	0	0	0	201	139	0	6	4
28	0	0	0	0	0	0	0	195	91	0	5	1
29	0	0	0	0	0	0	0	179	22	10	11	1
30	0	0	0	0		0	0	202	0	20	11	1
31	0		0	0		0		251		25	8	
Min	0	0	0	0	0	0	0	0	0	0	0	0
Max	5	0	0	0	0	0	34	273	306	90	11	13
Mean	1	0	0	0	0	0	5	114	138	44	5	4
ac-ft	59	0	0	0	0	0	271	6,982	8,202	2,691	306	265



Appendix A (29 of 38)
Dille Tunnel near Drake, CO

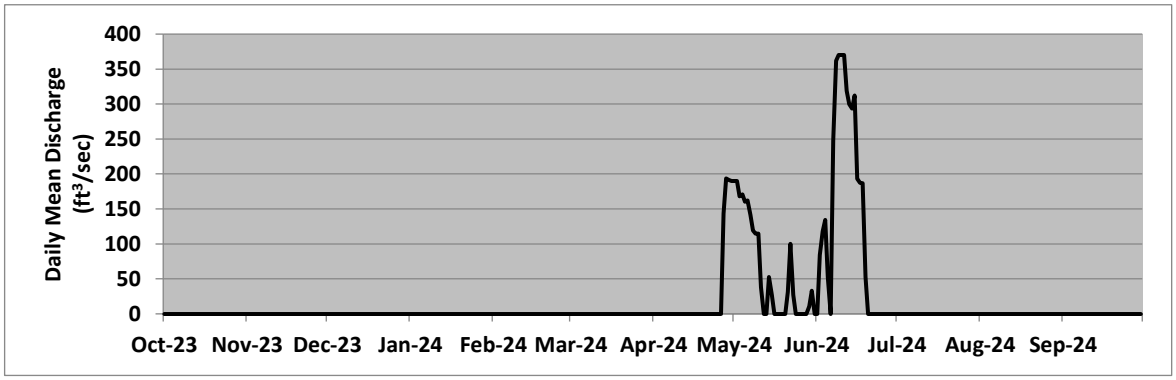
Location. – Lat 40°25'02", long 105°14'35", Larimer County, Hydrologic Unit 10190006, 11 miles west of Loveland, CO, on the Big Thompson River.

Gage. – None.

Remarks. – Constructed in 1950. Maximum capacity is 600 ft^3/s. Dille Tunnel diverts water from the Big Thompson River for power generation and water supply. The right to divert native run-off is determined by the State of Colorado. The numbers presented in this table are based on gaged flows and available priority water. Record is complete and reliable. This record contains operational data which could be subject to future revisions and changes.

Priority Diversion Flow, ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	0	0	0	0	0	190	0	0	0	0
2	0	0	0	0	0	0	0	190	84	0	0	0
3	0	0	0	0	0	0	0	168	118	0	0	0
4	0	0	0	0	0	0	0	171	134	0	0	0
5	0	0	0	0	0	0	0	160	53	0	0	0
6	0	0	0	0	0	0	0	162	0	0	0	0
7	0	0	0	0	0	0	0	142	248	0	0	0
8	0	0	0	0	0	0	0	119	362	0	0	0
9	0	0	0	0	0	0	0	115	370	0	0	0
10	0	0	0	0	0	0	0	115	370	0	0	0
11	0	0	0	0	0	0	0	38	370	0	0	0
12	0	0	0	0	0	0	0	0	319	0	0	0
13	0	0	0	0	0	0	0	0	300	0	0	0
14	0	0	0	0	0	0	0	53	294	0	0	0
15	0	0	0	0	0	0	0	27	312	0	0	0
16	0	0	0	0	0	0	0	0	193	0	0	0
17	0	0	0	0	0	0	0	0	187	0	0	0
18	0	0	0	0	0	0	0	0	187	0	0	0
19	0	0	0	0	0	0	0	0	53	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	31	0	0	0	0
22	0	0	0	0	0	0	0	100	0	0	0	0
23	0	0	0	0	0	0	0	27	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	143	0	0	0	0	0
28	0	0	0	0	0	0	194	0	0	0	0	0
29	0	0	0	0	0	0	191	11	0	0	0	0
30	0	0	0	0		0	190	33	0	0	0	0
31	0		0	0		0		0		0	0	
Min	0	0	0	0	0	0	0	0	0	0	0	0
Max	0	0	0	0	0	0	194	190	370	0	0	0
Mean	0	0	0	0	0	0	24	60	132	0	0	0
ac-ft	0	0	0	0	0	0	1,425	3,674	7,841	0	0	0



Appendix A (30 of 38)
Dille Tunnel near Drake, CO

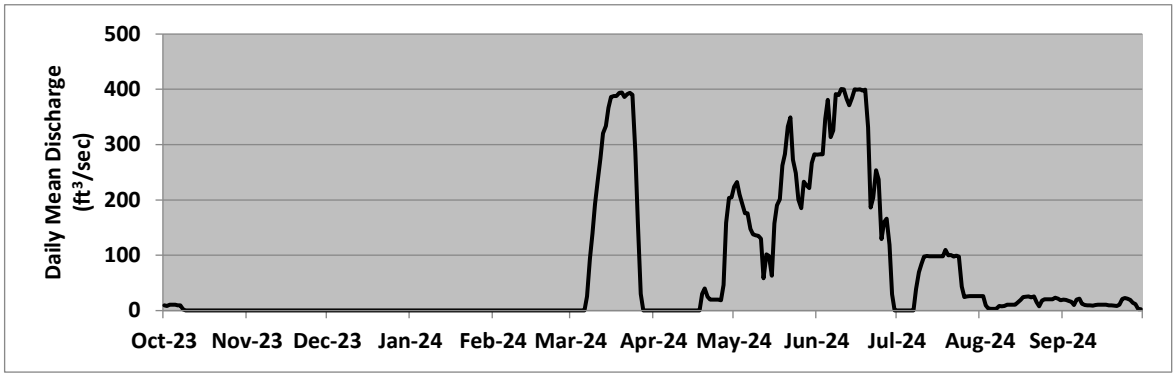
Location. – Lat 40°25'02", long 105°14'35", Larimer County, Hydrologic Unit 10190006, 11 miles west of Loveland, CO, on the Big Thompson River.

Gage. – Water-stage recorder with satellite telemetry at Parshall Flume. Elevation of gage is 5,520 feet from topographic map.

Remarks. – Constructed in 1950. The Dille Tunnel has a maximum capacity is 600 ft^3/s, but only 400 ft^3/s can be measured accurately. Dille Tunnel diverts water from the Big Thompson River for power generation and water supply. Record is complete and reliable. This record contains operational data which could be subject to future revisions and changes. The official record is published by the Colorado Division of Water Resources.

Discharge, ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2	8	0	0	0	0	0	0	232	283	0	26	19
4	11	0	0	0	0	0	0	194	346	0	3	16
6	10	0	0	0	0	0	0	176	314	0	3	20
8	2	0	0	0	0	93	0	138	391	39	9	13
10	0	0	0	0	0	192	0	135	401	84	8	10
12	0	0	0	0	0	276	0	58	383	99	11	9
14	0	0	0	0	0	334	0	99	385	98	11	11
16	0	0	0	0	0	386	0	158	400	98	19	11
18	0	0	0	0	0	388	0	201	398	98	25	10
20	0	0	0	0	0	394	40	283	332	100	24	9
22	0	0	0	0	0	391	20	350	204	97	15	10
24	0	0	0	0	0	390	20	249	237	98	18	23
26	0	0	0	0	0	158	19	185	160	24	20	19
28	0	0	0	0	0	0	159	227	119	26	20	12
30	0	0	0	0		0	205	267	0	26	22	2
Max	11	0	0	0	0	394	205	350	401	110	26	23
ac-ft	141	0	0	0	0	11,846	1,600	12,165	17,347	3,528	961	771



Appendix A (31 of 38)
Big Thompson Power Plant, CO

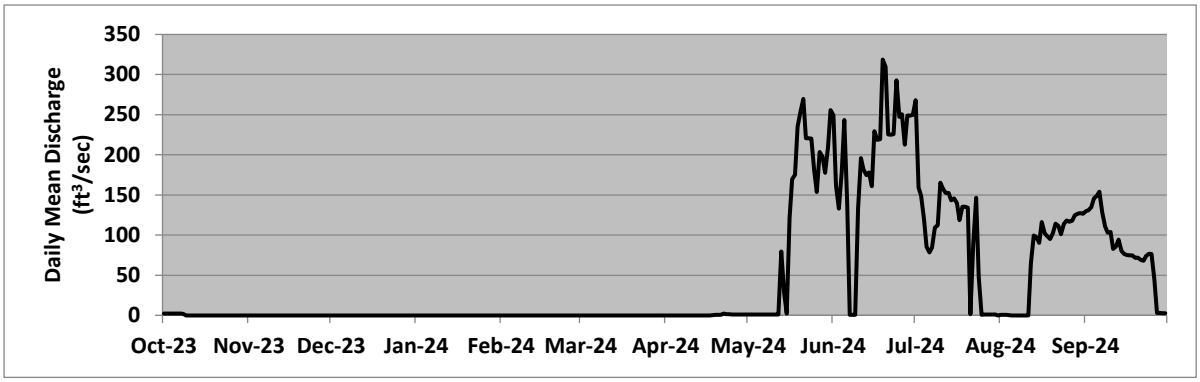
Location. – Lat 40°25'16", long 105°13'26", Larimer County, Hydrologic Unit 10190006, nine miles west of Loveland, CO, on the Big Thompson River.

Gage. – Flow meter with satellite telemetry. Elevation of gage is 5,280 feet (m.s.l.) from topographic map.

Remarks. – Initial operation in 1959. Maximum capacity is 400 ft^3/s. Power plant returns hydropower diversions to the Big Thompson River downstream from the Big Thompson River canyon mouth. The plant is also used to deliver C-BT project and Windy Gap Project water to the Big Thompson River. Depending on weather, the plant is generally winterized from November through April, each year. This record contains data recorded between 01-Oct-2023 and 30-Sep-2024. Record is complete and fair. This record contains operational data which could be subject to future revisions and changes.

Discharge, ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	2	0	0	0	0	0	0	1	249	268	1	130
2	2	0	0	0	0	0	0	1	162	159	1	131
3	2	0	0	0	0	0	0	1	133	149	1	135
4	2	0	0	0	0	0	0	1	179	120	0	146
5	2	0	0	0	0	0	0	1	243	85	0	149
6	2	0	0	0	0	0	0	1	139	78	0	154
7	2	0	0	0	0	0	0	1	1	84	0	128
8	2	0	0	0	0	0	0	1	1	109	0	111
9	0	0	0	0	0	0	0	1	1	112	0	103
10	0	0	0	0	0	0	0	1	133	165	0	104
11	0	0	0	0	0	0	0	1	196	157	0	83
12	0	0	0	0	0	0	0	1	181	153	65	86
13	0	0	0	0	0	0	0	79	175	152	100	94
14	0	0	0	0	0	0	0	28	178	143	98	80
15	0	0	0	0	0	0	0	2	161	146	90	76
16	0	0	0	0	0	0	0	122	229	140	116	75
17	0	0	0	0	0	0	0	170	218	119	102	75
18	0	0	0	0	0	0	0	175	219	135	98	75
19	0	0	0	0	0	0	1	235	319	135	95	72
20	0	0	0	0	0	0	1	254	309	134	103	72
21	0	0	0	0	0	0	1	269	225	2	114	69
22	0	0	0	0	0	0	2	220	225	90	111	68
23	0	0	0	0	0	0	1	220	226	147	101	74
24	0	0	0	0	0	0	1	220	293	48	114	77
25	0	0	0	0	0	0	1	180	247	1	118	76
26	0	0	0	0	0	0	1	154	250	1	117	44
27	0	0	0	0	0	0	1	203	213	1	118	3
28	0	0	0	0	0	0	1	197	249	1	125	3
29	0	0	0	0	0	0	1	178	249	1	126	3
30	0	0	0	0		0	1	209	250	1	127	3
31	0		0	0		0		256		0	127	
Min	0	0	0	0	0	0	0	1	1	0	0	3
Max	2	0	0	0	0	0	2	269	319	268	127	154
Mean	1	0	0	0	0	0	0	109	195	98	70	83
ac-ft	34	0	0	0	0	0	29	6,716	11,610	6,023	4,299	4,956



Appendix A (32 of 38)
CHFC Wasteway, CO

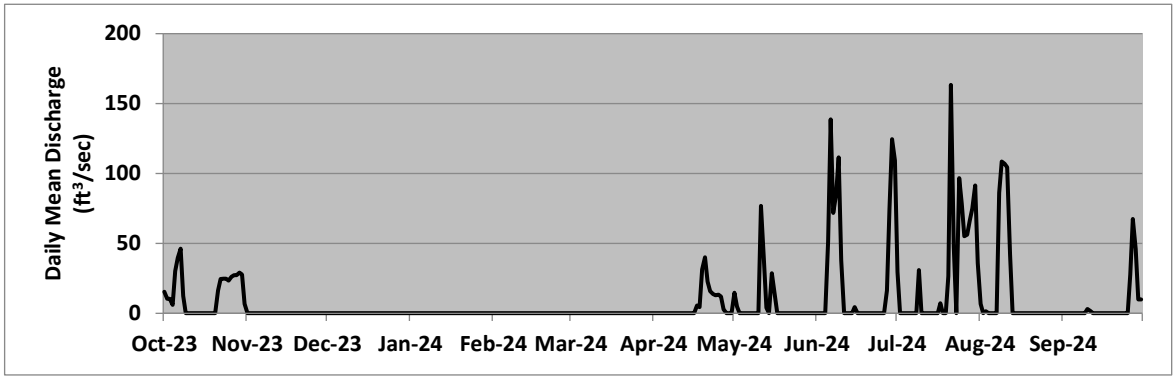
Location. – Lat 40°25'13", long 105°13'28", Larimer County, Hydrologic Unit 10190006, nine miles west of Loveland, CO, on the Big Thompson River.

Gage. – Water-stage recorder with satellite telemetry at 15-foot Parshall Flume. Elevation of gage is 5,465 feet (m.s.l.) from Designer's Operating Criteria.

Remarks. – Constructed between 1949 and 1953. Maximum capacity is 400 ft^3/s. The structure is used to return diverted water and to deliver C-BT and Windy Gap Project water to the Big Thompson River. Depending on weather, the facility is generally winterized between November and April. Recorder was operated from 01-Oct-2023 until 01-Nov-2023, when it was winterized. The station was put back into service from 17-Apr-2024 to 30-Sep-2024. Record is complete and reliable. These data are provisional operations data and are subject to further revision and change. The official record is published by the Colorado Division of Water Resources.

Discharge, ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2	10	0	0	0	0	0	0	5	0	0	0	0
4	6	0	0	0	0	0	0	0	0	0	0	0
6	40	0	0	0	0	0	0	0	139	0	0	0
8	12	0	0	0	0	0	0	0	85	0	86	0
10	0	0	0	0	0	0	0	0	38	0	107	3
12	0	0	0	0	0	0	0	39	0	0	42	0
14	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	15	0	0	0	0
18	0	0	0	0	0	0	4	0	0	0	0	0
20	0	0	0	0	0	0	40	0	0	27	0	0
22	24	0	0	0	0	0	16	0	0	47	0	0
24	25	0	0	0	0	0	13	0	0	97	0	0
26	26	0	0	0	0	0	12	0	0	55	0	28
28	27	0	0	0	0	0	0	0	75	66	0	46
30	28	0	0	0		0	0	0	109	91	0	10
Max	46	0	0	0	0	0	40	77	139	163	109	67
ac-ft	849	0	0	0	0	0	346	363	1,637	1,704	907	330



Appendix A (33 of 38)
CHFC 550 Section, CO

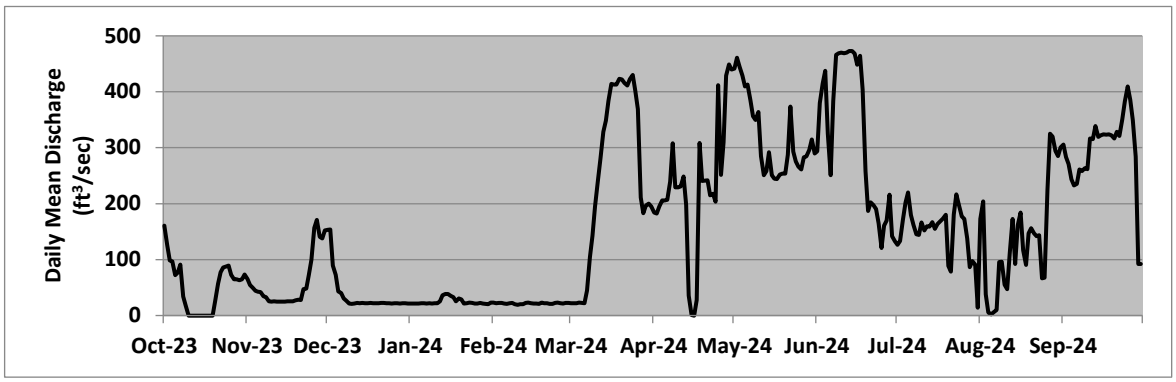
Location. – Lat 40°25'25", long 105°13'34", Larimer County, Hydrologic Unit 10190006, nine miles west of Loveland, CO.

Gage. – Water-stage recorder with satellite telemetry. Elevation of gage is 5,460 feet (m.s.l.) from topographic map.

Remarks. – Constructed between 1949 and 1953. The canal is 9.4 miles long and has a maximum design capacity of 550 ft^3/s. The canal is used to move C-BT water and Big Thompson River priority water to Horsetooth Reservoir. Recorder was operated from 01-Oct-2023 to 30-Sep-2024. Algae growth in canal can create accuracy issues. Record is complete and reliable. This record contains operational data which could be subject to future revisions and changes.

Discharge, ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2	126	55	154	21	22	22	182	461	380	133	204	283
4	96	44	73	22	22	23	206	429	437	201	5	244
6	77	42	40	22	21	22	207	413	251	180	6	236
8	34	33	26	22	23	104	308	357	466	145	96	258
10	0	25	21	22	19	195	229	364	470	166	55	262
12	0	25	23	26	20	281	248	251	470	159	111	315
14	0	25	22	39	23	348	36	292	473	167	92	319
16	0	25	22	35	21	414	0	244	448	164	184	324
18	0	25	22	25	21	413	308	252	403	173	91	324
20	26	28	22	29	22	422	241	254	187	89	156	316
22	78	47	22	22	21	411	215	373	197	180	142	321
24	88	73	22	22	22	430	204	275	165	197	67	383
26	73	157	22	22	22	369	252	261	161	173	225	385
28	65	141	22	22	23	183	429	284	216	87	320	284
30	65	152	22	20		200	440	315	133	91	285	92
Max	161	171	154	39	23	430	449	461	473	220	325	409
ac-ft	3,175	3,422	2,208	1,528	1,251	15,316	13,657	19,558	19,236	9,253	8,486	17,515



Appendix A (34 of 38)
Horsetooth Reservoir near Fort Collins, CO

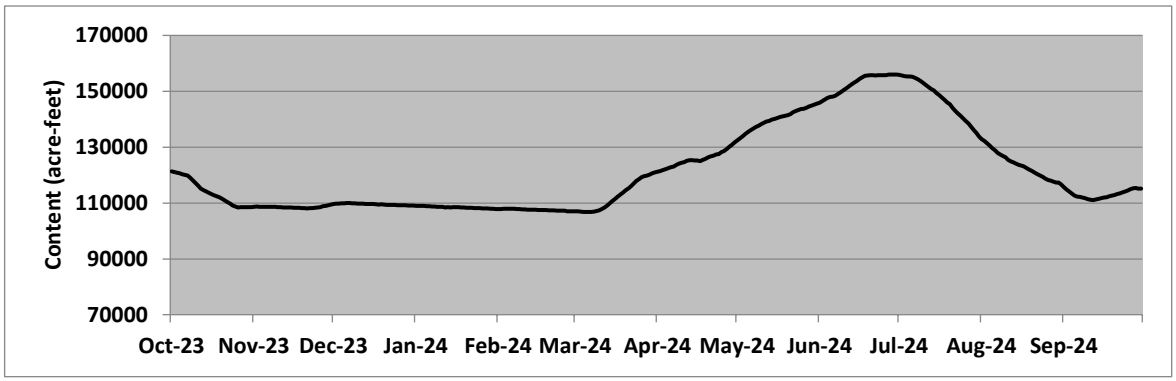
Location. – Lat 40°36'00", long 105°10'05" , Larimer County, Hydrologic Unit 10190007, at Horsetooth Dam outlet works, 4.8 miles west of Fort Collins, CO.

Gage. – Water level recorder with satellite telemetry. Elevation of gage is 5,300 feet (m.s.l.) from topographic map.

Remarks. – Reservoir is formed by four earth-fill dams. Construction completed in 1949. Impoundment began in 1951. Horsetooth Reservoir is one of two terminal reservoirs for C-BT diversions. Trans-mountain diversions are stored at Horsetooth Reservoir before final delivery. Maximum capacity is 156,735 AF at elevation 5,430.00 ft, with 142,038 AF of active storage. Recorder was operated from 01-Oct-2023 to 30-Sep-2024. Record is complete and reliable. This record contains operational data which could be subject to future revisions and changes.

Storage, AF, 2400-hour Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	121,334	108,636	109,629	109,005	107,798	107,030	121,227	132,415	145,872	155,819	132,843	115,631
2	121,139	108,736	109,747	108,972	107,815	107,030	121,476	133,159	146,441	155,575	132,211	114,870
3	120,856	108,669	109,814	108,938	107,982	106,880	121,832	133,906	147,013	155,371	131,414	114,110
4	120,660	108,652	109,950	108,938	107,982	106,797	122,152	134,655	147,584	155,310	130,565	113,337
5	120,341	108,669	109,933	108,837	107,982	106,830	122,474	135,425	147,940	155,249	129,682	112,634
6	120,059	108,669	110,034	108,837	107,898	106,763	122,760	136,122	148,058	155,148	128,820	112,310
7	119,847	108,636	109,966	108,770	107,949	106,763	123,081	136,708	148,434	154,743	127,979	112,174
8	119,089	108,585	109,899	108,787	107,781	106,930	123,673	137,238	149,109	154,257	127,395	112,003
9	118,106	108,585	109,865	108,619	107,831	107,163	124,031	137,693	149,724	153,631	126,832	111,679
10	117,126	108,535	109,797	108,636	107,731	107,430	124,373	138,283	150,381	152,946	126,324	111,356
11	116,203	108,484	109,781	108,619	107,714	107,848	124,697	138,663	151,021	152,242	125,491	111,185
12	115,180	108,434	109,747	108,400	107,664	108,417	125,112	139,122	151,701	151,520	124,877	111,083
13	114,559	108,367	109,679	108,468	107,614	109,072	125,347	139,408	152,423	150,861	124,517	111,270
14	114,076	108,384	109,662	108,451	107,614	109,933	125,310	139,867	153,067	150,202	124,067	111,458
15	113,629	108,417	109,662	108,518	107,664	110,761	125,238	140,135	153,692	149,386	123,583	111,696
16	113,165	108,350	109,646	108,501	107,547	111,525	125,166	140,480	154,358	148,652	123,386	111,934
17	112,737	108,249	109,578	108,484	107,530	112,293	125,004	140,768	154,946	147,782	123,045	112,122
18	112,412	108,266	109,494	108,400	107,547	113,063	125,491	140,961	155,473	146,914	122,456	112,412
19	112,071	108,149	109,562	108,367	107,530	113,801	125,834	141,230	155,676	146,049	121,850	112,651
20	111,508	108,149	109,477	108,333	107,413	114,576	126,306	141,442	155,717	145,324	121,423	112,926
21	110,964	108,116	109,376	108,316	107,363	115,319	126,704	141,828	155,697	144,095	120,873	113,217
22	110,371	108,182	109,376	108,283	107,430	116,065	126,977	142,484	155,656	143,047	120,341	113,474
23	109,747	108,165	109,359	108,232	107,313	116,934	127,341	142,969	155,717	142,156	119,882	113,750
24	109,123	108,249	109,308	108,182	107,296	117,931	127,505	143,241	155,758	141,269	119,335	114,110
25	108,703	108,417	109,224	108,132	107,280	118,614	128,199	143,570	155,758	140,270	118,649	114,507
26	108,434	108,552	109,207	108,066	107,246	119,247	128,636	143,765	155,778	139,351	118,193	114,921
27	108,518	108,854	109,156	108,016	107,063	119,617	129,332	144,115	156,002	138,511	117,983	115,215
28	108,552	109,005	109,156	108,016	107,030	119,900	130,086	144,484	156,022	137,314	117,703	115,371
29	108,535	109,224	109,089	107,932	107,080	120,200	130,842	144,895	156,002	136,217	117,319	115,128
30	108,501	109,460	109,072	107,898		120,625	131,710	145,246	155,940	135,087	117,284	115,128
31	108,568		109,056	107,882		120,962		145,539		133,794	116,587	
Min	108,434	108,116	109,056	107,882	107,030	106,763	121,227	132,415	145,872	133,794	116,587	111,083
Max	121,334	109,460	110,034	109,005	107,982	120,962	131,710	145,539	156,022	155,819	132,843	115,631
Mean	114,004	108,528	109,558	108,446	107,575	112,462	125,597	139,994	152,565	147,358	123,642	113,122
EOM	108,568	109,460	109,056	107,882	107,030	120,962	131,710	145,539	155,940	133,794	116,587	115,128



Appendix A (35 of 38)
Charles Hansen Supply Canal below Horsetooth Reservoir, CO

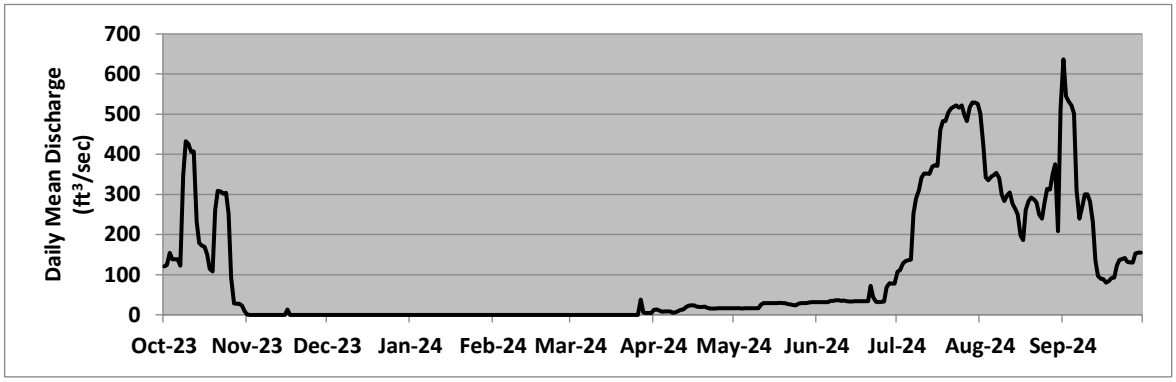
Location. – Lat 40°36'01", long 105°10'18", Larimer County, Hydrologic Unit 10190007, four miles west of Fort Collins, CO.

Gage. – Two flow meters with satellite telemetry measure the flow for each conduit leading toward the hollow jet valves.

Remarks. – Constructed between 1950 and 1952. The canal is 5.1 miles long and has a maximum capacity of 1,500 ft^3/s. The canal is used to deliver C-BT and Windy Gap Project water stored at Horsetooth Reservoir. Recorder was operated from 01-Oct-2023 to 30-Sep-2024 by the Northern Water and the Colorado Division of Water Resources. Record is complete and fair. This record contains operational data which could be subject to future revisions and changes.

Discharge, ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	121	0	0	0	0	0	12	17	32	107	502	636
2	124	0	0	0	0	0	13	16	32	111	427	545
3	154	0	0	0	0	0	11	17	32	128	342	532
4	139	0	0	0	0	0	8	16	32	134	335	522
5	138	0	0	0	0	0	9	16	32	136	344	502
6	139	0	0	0	0	0	9	17	35	138	348	310
7	122	0	0	0	0	0	8	16	35	252	354	239
8	347	0	0	0	0	0	5	17	37	290	341	267
9	432	0	0	0	0	0	7	17	36	311	299	300
10	426	0	0	0	0	0	10	17	35	342	283	300
11	406	0	0	0	0	0	13	25	35	352	298	283
12	407	0	0	0	0	0	14	30	34	352	305	231
13	234	0	0	0	0	0	20	30	34	352	277	136
14	179	0	0	0	0	0	23	30	34	370	265	97
15	173	0	0	0	0	0	23	30	34	373	250	90
16	170	13	0	0	0	0	24	30	34	371	197	89
17	150	0	0	0	0	0	21	30	34	461	186	80
18	115	0	0	0	0	0	20	30	34	483	261	84
19	108	0	0	0	0	0	20	30	34	482	283	92
20	261	0	0	0	0	0	21	30	34	504	292	93
21	309	0	0	0	0	0	18	27	73	514	287	122
22	308	0	0	0	0	0	16	26	43	519	280	137
23	302	0	0	0	0	0	16	25	33	522	250	140
24	304	0	0	0	0	0	16	24	32	516	240	141
25	251	0	0	0	0	0	17	28	33	521	280	132
26	92	0	0	0	0	0	17	30	33	499	314	131
27	29	0	0	0	0	38	17	30	69	482	312	131
28	27	0	0	0	0	6	17	30	78	517	349	153
29	28	0	0	0	0	5	17	31	78	529	375	155
30	23	0	0	0		5	16	32	78	529	208	155
31	10		0	0		5		32		526	513	
Min	10	0	0	0	0	0	5	16	32	107	186	80
Max	432	13	0	0	0	38	24	32	78	529	513	636
Mean	194	1	0	0	0	2	15	25	41	378	310	228
ac-ft	11,957	43	18	19	19	132	904	1,530	2,440	23,251	19,039	13,537



Appendix A (36 of 38)
Carter Lake near Berthoud, Colorado, CO

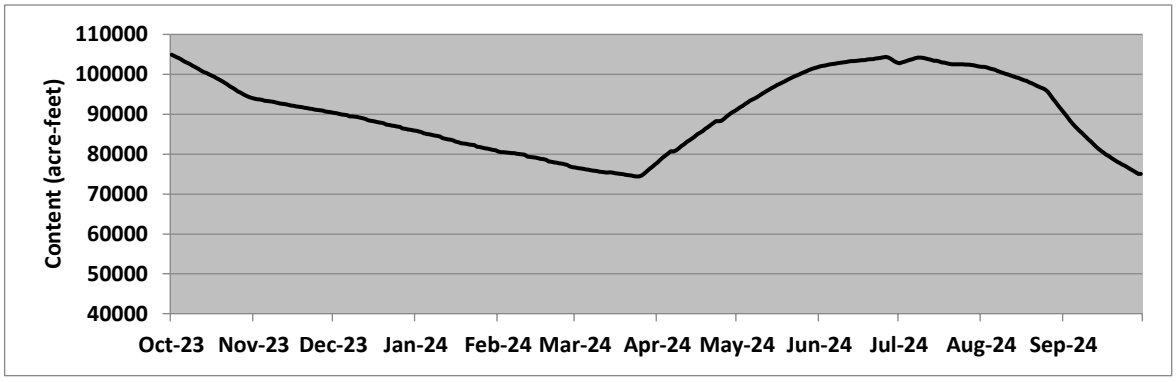
Location. – Lat 40°19' 28" , long 105°12' 41" , Larimer County, Hydrologic Unit 10190006, on Dam #1, seven miles northwest of Berthoud, CO, and ten miles west of Loveland, CO.

Gage. – Water level recorder with satellite telemetry. Elevation of gage is 5,770 feet (m.s.l.) from topographic map.

Remarks.– Reservoir is formed by three earth-fill dams. Construction completed in 1952. Carter Lake Reservoir is one of two terminal reservoirs for C-BT water diversions. Trans-mountain water diversions are stored at Carter Lake Reservoir before final delivery. Maximum capacity is 112,200 AF at elevation 5,759.00 feet, with 108,900 AF of active capacity. Recorder was operated from 01-Oct-2023 to 30-Sep-2024. Record is complete and fair. This record contains operational data which could be subject to future revisions and changes.

Storage, AF, 2400-hour Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	104,926	93,966	90,365	85,818	80,615	76,682	77,964	91,248	101,913	102,767	101,847	90,344
2	104,614	93,783	90,280	85,703	80,502	76,510	78,553	91,717	102,080	102,944	101,836	89,517
3	104,257	93,708	90,110	85,557	80,492	76,390	79,102	92,122	102,201	103,144	101,703	88,672
4	103,922	93,601	89,930	85,203	80,379	76,309	79,653	92,561	102,367	103,378	101,482	87,829
5	103,555	93,397	89,824	85,057	80,328	76,148	80,195	93,011	102,501	103,622	101,316	87,084
6	103,155	93,289	89,739	84,943	80,256	76,057	80,768	93,440	102,589	103,800	101,107	86,382
7	102,856	93,225	89,496	84,808	80,277	75,927	80,655	93,762	102,645	103,989	100,820	85,745
8	102,534	93,107	89,432	84,683	80,103	75,837	80,953	94,096	102,789	104,156	100,600	85,140
9	102,135	92,989	89,380	84,600	80,021	75,737	81,446	94,537	102,900	104,212	100,357	84,485
10	101,781	92,839	89,263	84,402	79,960	75,626	81,982	94,980	102,966	104,100	100,116	83,862
11	101,383	92,689	89,157	84,018	79,816	75,526	82,508	95,412	103,099	103,922	99,929	83,220
12	101,008	92,604	88,988	83,831	79,398	75,436	83,024	95,792	103,200	103,756	99,720	82,610
13	100,600	92,486	88,840	83,676	79,296	75,386	83,479	96,182	103,322	103,588	99,500	81,951
14	100,335	92,336	88,482	83,625	79,184	75,416	83,945	96,552	103,278	103,422	99,226	81,333
15	100,028	92,197	88,376	83,490	79,102	75,336	84,412	96,910	103,378	103,344	99,029	80,799
16	99709	92,069	88,239	83,117	78,950	75,216	84,943	97,314	103,455	103,189	98,777	80,318
17	99,358	91,962	88,092	82,962	78,777	75,126	85,359	97,651	103,533	102,999	98,525	79,868
18	99,018	91,844	87,976	82,755	78,726	75,025	85,776	97,968	103,577	102,900	98,306	79,418
19	98,656	91,749	87,829	82,693	78,594	74,946	86,330	98,296	103,689	102,756	97,979	79,011
20	98,296	91,599	87,693	82,559	78,177	74,836	86,811	98,645	103,756	102,612	97,706	78,563
21	97,859	91,514	87,367	82,425	78,066	74,706	87,294	98,952	103,823	102,534	97,390	78,096
22	97,433	91,375	87,283	82,363	77,914	74,626	87,798	99,281	103,945	102,478	97,041	77,752
23	97,008	91,279	87,168	82,229	77,833	74,476	88,229	99,588	104,011	102,490	96,758	77,367
24	96,552	91,151	87,052	81,858	77,661	74,447	88,239	99,885	104,111	102,490	96,464	77,024
25	96,160	91,055	86,916	81,745	77,600	74,397	88,344	100,171	104,234	102,501	96,160	76,641
26	95,716	90,981	86,842	81,601	77,448	74,646	88,809	100,523	104,357	102,456	95,521	76,279
27	95,347	90,864	86,424	81,477	77,276	75,136	89,421	100,754	104,167	102,401	94,656	75,867
28	94,991	90,694	86,319	81,343	76,894	75,697	89,898	101,030	103,745	102,334	93,816	75,486
29	94,689	90,598	86,173	81,231	76,762	76,299	90,397	101,305	103,311	102,256	92,914	75,066
30	94,332	90,481	86,079	81,087		76,823	90,811	101,527	102,955	102,080	92,058	75,066
31	94,085		85,954	80,974		77,378		101,692		101,936	91,184	
Min	94,085	90,481	85,954	80,974	76,762	74,397	77,964	91,248	101,913	101,936	91,184	75,066
Max	104,926	93,966	90,365	85,818	80,615	77,378	90,811	101,692	104,357	104,212	101,847	90,344
Mean	99,558	92,181	88,228	83,285	78,979	75,552	84,570	96,997	103,263	103,050	98,188	81,360
EOM	94,085	90,481	85,954	80,974	76,894	77,378	90,811	101,692	102,955	101,936	91,184	75,066



Appendix A (37 of 38)
Saint Vrain Canal below Carter Reservoir, CO

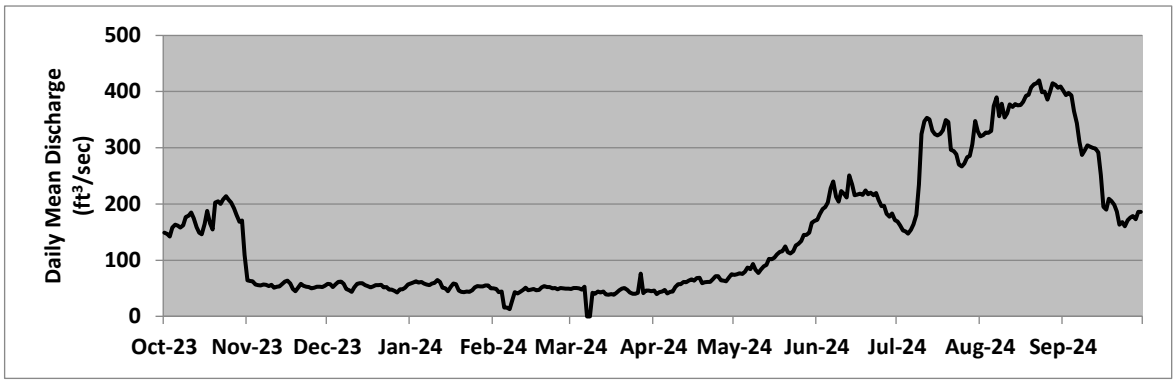
Location. – Lat 40°19'27", long 105°12'35", Larimer County, Hydrologic Unit 10190006, downstream from Carter Reservoir Dam #1, seven miles northwest of Berthoud, CO, and ten miles west of Loveland, CO.

Gage. – Water-stage recorder with telephone telemetry. Data provided by the Northern Water. Elevation of gage is 5,590 feet from topographic map.

Remarks. – Constructed between 1952 and 1954. The canal is 9.8 miles long and has a maximum capacity of 625 ft^3/s. The canal is used to deliver C-BT and Windy Gap Project water, as well as diverted native water from conveyance contract holders. Record was provided by the Northern Water for the period 01-Oct-2023 to 30-Sep-2024. Record is complete and fair. This record contains operational data which could be subject to future revisions and changes.

Flow, ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	149	64	58	58	50	49	46	74	172	169	320	401
2	147	63	57	60	49	51	40	75	182	162	322	394
3	142	62	52	62	43	50	43	77	191	153	327	398
4	158	57	58	60	44	50	44	75	195	151	327	393
5	163	56	61	62	16	48	47	80	202	147	330	365
6	162	55	62	59	16	53	41	87	228	154	374	344
7	158	57	58	57	13	0	44	84	240	164	389	311
8	162	56	49	56	29	0	44	93	213	181	356	287
9	177	54	46	59	43	42	52	83	204	234	378	296
10	179	56	44	60	41	40	58	78	223	324	354	304
11	185	51	52	65	44	44	57	84	218	347	361	302
12	174	53	58	62	47	42	61	89	212	353	377	300
13	158	53	59	51	51	44	61	91	251	351	373	298
14	149	57	59	50	46	39	63	103	235	330	378	292
15	146	62	55	45	47	39	66	102	216	324	375	251
16	164	64	54	53	49	40	64	104	217	322	376	195
17	188	59	52	58	47	39	68	110	219	325	382	190
18	166	49	53	57	47	42	69	115	216	331	393	209
19	155	45	55	46	52	47	59	116	224	349	394	205
20	203	52	56	43	54	50	61	125	217	346	407	199
21	205	58	56	43	52	50	61	114	220	296	413	187
22	200	55	51	44	52	47	62	112	215	294	414	163
23	208	53	52	44	50	43	67	116	220	289	420	168
24	214	52	48	46	50	40	71	126	207	270	399	161
25	208	50	48	52	48	40	72	129	196	267	400	171
26	202	51	46	54	51	42	64	134	197	272	385	176
27	192	53	43	54	50	76	64	145	183	283	400	179
28	180	53	48	53	50	41	62	145	178	286	415	173
29	168	52	48	55	50	46	69	149	183	306	412	186
30	171	54	51	55		46	75	167	171	348	407	186
31	109		57	50		45		170		329	409	
Min	109	45	43	43	13	0	40	74	171	147	320	161
Max	214	64	62	65	54	76	75	170	251	353	420	401
Mean	172	55	53	54	44	43	58	108	208	273	380	256
ac-ft	10,592	3,283	3,265	3,316	2,537	2,626	3,479	6,644	12,382	16,770	23,335	15,236



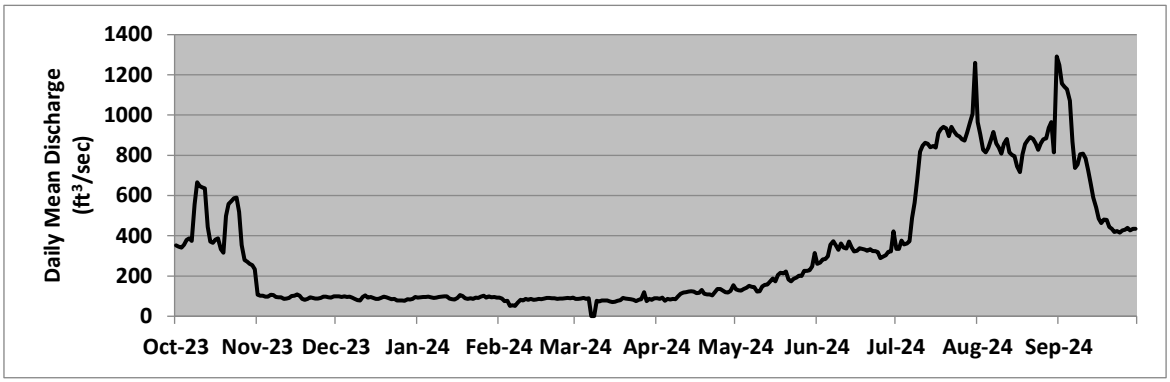
Appendix A (38 of 38)
Colorado-Big Thompson Project, CO

Location. – Larimer , Grand, Summit, Boulder, Weld counties in Colorado, hydrologic units 14010001, 14010002 and 10190006, 10190007, on the Colorado River, Big Thompson River and Cache La Poudre River basins.

Remarks. – This table presents a summation of all the daily deliveries of C-BT and Windy Gap Project water through the Saint Vrain Canal, the Charles Hansen Supply Canal, the Dixon Canal, the Charles Hansen Feeder Canal and small deliveries upstream of Flatiron Reservoir. These values include metered water. The water diverted is used for agricultural, municipal and industrial purposes, to generate hydroelectric power and to provide recreation for the public. This record contains operational data which could be subject to future revisions and changes. Period of record is between 01-Oct-2023 and 30-Sep-2024. Data were provided by the Northern Water. Record is complete and reliable.

Total Daily Water Deliveries, ft^3/s, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	352	107	99	93	93	86	89	134	260	336	966	1,249
2	347	103	100	95	88	86	86	129	268	336	905	1,157
3	342	102	96	96	75	89	93	128	282	376	827	1,140
4	356	97	99	96	77	91	77	136	285	358	815	1,127
5	379	97	96	97	51	87	86	142	298	363	838	1,070
6	387	107	98	94	55	89	83	151	356	373	874	869
7	374	106	93	91	52	1	87	147	373	489	916	736
8	557	96	86	93	67	1	85	145	353	564	860	755
9	666	94	80	95	82	77	100	123	330	676	838	805
10	647	94	79	98	79	74	112	124	362	818	808	808
11	640	87	95	99	86	79	118	148	341	847	857	785
12	636	88	104	99	83	78	120	155	336	862	880	726
13	444	92	94	88	86	79	122	157	372	857	815	660
14	371	100	96	85	81	74	124	173	344	840	801	590
15	365	103	91	83	83	71	123	187	323	846	795	541
16	382	108	87	91	86	73	115	173	326	839	746	485
17	388	103	87	106	85	77	116	205	339	909	717	463
18	333	86	91	101	88	80	131	216	335	930	805	481
19	315	82	97	90	92	92	112	213	333	942	856	479
20	498	87	95	87	91	89	108	222	326	934	875	445
21	559	94	89	90	89	86	109	183	333	895	890	435
22	570	91	85	86	90	86	104	174	325	942	881	419
23	586	88	86	93	87	81	120	186	325	919	859	423
24	589	88	79	92	89	76	136	193	320	901	827	416
25	518	92	78	97	89	81	135	201	290	894	858	427
26	353	98	78	103	90	85	127	201	296	880	880	430
27	279	97	78	93	91	119	120	226	303	873	884	439
28	271	95	85	98	90	76	117	225	320	913	936	426
29	261	93	84	94	93	86	126	228	323	963	965	435
30	255	98	86	97		82	155	249	421	1,006	815	435
31	234		96	93		90		315		1,259	1,290	
Min	234	82	78	83	51	1	77	123	260	336	717	416
Max	666	108	104	106	93	119	155	315	421	1,259	1,290	1,249
Mean	428	96	90	94	82	78	111	180	327	772	867	655
ac-ft	26,289	5,702	5,523	5,777	4,735	4,800	6,618	11,087	19,429	47,483	53,317	38,991



Appendix B

Tables

Table B-1.—Western Division–Pick-Sloan Missouri Basin Program pertinent reservoir data

Western Division – Pick-Sloan Missouri Basin Program Pertinent Reservoir Data (data in acre-feet)					
Reservoir	**Dead Storage[9]**	**Active Storage[10]**	**Total Storage**	**Normal Minimum Storage**	**Limitation on Normal Minimum Storage**
Green Mountain	6,860	146,779	153,639	47,684	Minimum elevation for rated power output
Willow Creek	1,486	9,067	10,553	6,675	Elevation of pump canal headworks
Granby	74,190	465,568	539,758	74,190	Lowest outlet elevation
Shadow Mountain	506	16,848	17,354	16,026	Minimum permissible Grand Lake elevation; 8,366 ft.
Grand Lake	NA[11]	511	1,015	504	Legislation limits fluctuation
Marys Lake	42	885	927	308	Minimum elevation for power generation
Lake Estes	409	2,659	3,068	740	Minimum elevation to release 550 ft^3/s
Pinewood Lake	416	1,765	2,181	613	Minimum elevation for power generation
Flatiron	125	635	760	324	Minimum elevation to release 550 ft^3/s
Carter Lake	3,306	108,924	112,230	306	Lowest outlet elevation
Horsetooth	7,003	149,732	156,735	17,600	Elevation on highest delivery works
Total	94,343	907,085	998,220	167,970	

[9] Storage capacity below elevation of lowest outlet
[10] Total storage minus dead storage
[11] Not determined

Table B-2.—C-BT monthly summary of Blue River operations

C-BT
Monthly Summary
of Blue River Operations

Water Year 2024 **(AF)**

	Initial	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Total or Avg. %
Undepleted Runoff Above Green Mountain Reservoir		16,321	10,746	8,608	8,964	8,108	10,536	25,131	51,507	159,265	56,559	24,388	17,103	397,237
Undepleted Runoff Above Dillon Reservoir		7,168	5,871	4,868	4,906	4,387	5,259	11,690	29,515	93,112	28,687	13,422	8,818	217,702
Percent Of Total Undepleted Runoff Abv Dillon Reservoir		43.9	54.6	56.6	54.7	54.1	49.9	46.5	57.3	58.5	50.7	55.0	51.6	54.8
Depletions By 1929 Colorado Springs Right		0	0	0	0	0	0	23	111	787	232	102	0	1,254
Depletions By 1948 Colorado Springs Right		1,818	254	0	0	0	0	55	643	2,774	1,594	49	198	7,383
Inflow To Dillon Reservoir		7,045	6,012	4,868	4,906	4,387	5,259	11,579	28,615	87,631	26,861	13,271	8,775	209,207
DILLON RESERVOIR STORAGE (1,000 Acre-Feet)	236.8	227.0	223.5	220.6	219.6	218.2	217.3	222.9	231.6	259.9	255.5	247.2	230.1	
Roberts Tunnel Diversions		9,291	2,709	2,255	218	0	0	0	0	0	6,841	13,799	18,248	53,361
Dillon Reservoir Outflow To The River		6,451	5,929	5,570	5,699	5,784	6,122	5,987	19,407	58,555	23,336	6,730	6,368	155,938
Total Depletions By Denver		594	82	-702	-793	-1,398	-863	5,592	9,208	29,075	3,525	6,542	2,407	53,270
Runoff Between Dillon Reservoir and Green Mountain Reservoir		9,153	4,872	3,745	4,067	3,726	5,278	13,442	22,245	66,201	27,472	10,954	8,282	179,437
Actual Inflow To Green Mountain Reservoir		15,604	10,805	9,310	9,757	9,506	11,400	19,428	41,399	124,709	51,208	17,695	14,653	335,473
Green Mountain Reservoir End of Month Storage (1,000 Acre-Feet)	114.5	84.1	82.6	80.9	79.0	75.4	74.6	80.0	103.6	151.7	151.8	146.8	108.5	
Total Green Mountain Outflow		45,711	12,191	11,065	11,659	13,118	12,605	13,928	17,221	75,606	50,114	21,685	52,278	337,180

Table B-3.—Pick-Sloan Missouri Basin Program 2024 Summary Actual Operations

(Part 1 of 3)

2024 Actual Operations. Water in 1,000 Acre-Feet. Energy in Gigawatt hours

Green Mountain Reservoir	**Initial or Total**	**Oct.**	**Nov.**	**Dec.**	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**June**	**July**	**Aug.**	**Sept.**
Depleted Watershed Inflow	335.5	15.6	10.8	9.3	9.8	9.5	11.4	19.4	41.4	124.7	51.2	17.7	14.7
Turbine Release	333.0	45.7	12.2	11.1	11.7	13.1	12.6	13.9	16.5	75.1	47.2	21.7	52.3
Bypass	1.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.5	0.0	0.0	0.0
Spill	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0	0.0
End of Month Content	114.5	84.1	82.6	80.9	79.0	75.4	74.6	80.0	103.6	151.7	151.8	146.8	108.5
Kwh/AF		168.2	128.5	121.9	125.4	134.1	126.2	130.6	142.9	201.5	191.5	178.8	187.7
Generation	57.4	7.7	1.6	1.3	1.5	1.8	1.6	1.8	2.4	15.1	9.0	3.9	9.8
Willow Creek Reservoir		**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**
Inflow	76.4	1.3	1.2	1.2	0.9	0.9	1.9	14.3	34.5	14.7	2.9	1.6	1.0
Release to River	57.6	1.4	1.6	1.0	0.4	0.4	0.4	0.9	35.8	13.9	0.9	0.4	0.3
Pumped to Granby	17.8	2.3	0.0	0.0	0.0	0.0	0.0	13.2	0.0	0.0	2.3	0.0	0.0
End of Month Content	8.3	5.8	5.3	5.5	6.1	6.5	8.0	8.1	6.7	7.3	6.8	7.9	8.5
Pump Energy	3.9	0.5	0.0	0.0	-0.1	0.0	0.0	2.8	0.0	0.0	0.5	0.0	0.0
Granby - Shadow Mountain - Grand Lake		**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**
Natural Watershed Inflow	265.9	4.8	3.3	3.0	4.2	3.9	5.7	24.4	56.7	117.2	24.9	12.2	5.6
Total Inflow into Granby	210.4	6.2	3.7	3.7	5.6	4.4	4.6	25.6	30.8	91.1	20.4	9.2	5.1
Granby Fish Release	31.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	4.6	4.5	5.1	4.6	4.0
Granby Seepage	4.2	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.4
Granby Spill	43.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	34.8	2.9	0.2	0.0
Adams Tunnel	202.7	4.9	2.0	1.9	0.0	0.0	20.9	30.5	32.7	25.7	31.0	29.3	23.8
Granby End of Month content	485.0	483.7	482.9	482.4	485.0	487.4	470.5	475.6	487.4	535.4	519.4	493.7	468.0
SM-GL End of Month Content	17.5	17.7	17.7	17.7	17.7	17.7	17.8	17.9	17.4	17.8	17.7	17.7	17.8
Pumped from Granby	137.2	5.0	2.6	2.8	2.1	1.0	20.6	19.4	6.9	0.4	24.9	27.2	24.1
Granby Pump Kwh/AF		161.9	180.1	195.6	231.3	313.5	148.6	152.7	0.0	270.3	140.9	143.1	147.9
Granby Pump Energy	20.9	0.8	0.5	0.6	0.5	0.3	3.1	3.0	1.1	0.1	3.5	3.9	3.6

(Part 2 of 3)
2024 Actual Operations. Water in 1,000 Acre-Feet. Energy in Gigawatt hours

Marys Lake – Estes – Flatiron	**Initial or Total**	**Oct.**	**Nov.**	**Dec.**	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**June**	**July**	**Aug.**	**Sept.**
Adams Tunnel Water	202.7	4.9	2.0	1.9	0.0	0.0	20.9	30.5	32.7	25.7	31.0	29.3	23.8
Marys Lake Generation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Estes Generation	88.7	1.8	0.5	0.0	0.0	0.0	9.3	14.0	14.7	11.0	13.9	13.0	10.6
Divertible Big-Thompson	30.0	0.0	0.0	0.0	0.0	0.0	1.2	5.9	6.4	5.3	6.1	5.0	0.0
Diverted Big-Thompson Water	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8	1.9	0.2	0.0
Olympus Tunnel	195.4	4.3	3.2	0.6	0.0	0.0	7.5	31.1	33.7	31.0	32.3	27.8	23.9
Pole Hill Generation	126.9	0.2	0.0	0.0	0.0	0.0	4.1	22.1	24.2	22.5	22.1	16.5	15.3
Flatiron 1 & 2 Generation	166.9	3.0	2.3	0.8	0.0	0.0	5.8	27.6	30.2	27.1	27.5	23.3	19.4
Flatiron 3 Turbine Release		0.0	0.0	0.8	1.1	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flatiron 3 Kwh/AF Gen.		-	-	-	-	-	-	-	-	-	-	-	-
Flatiron 3 Generation		0.0	0.0	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flatiron 3 Pumping	86.9	0.0	0.0	0.0	0.0	0.0	3.7	17.9	18.6	15.0	17.3	14.4	0.0
Flatiron 3 Kwh/AF Pump		0.0	0.0	0.0	0.0	0.0	319.4	0.0	346.4	354.8	354.5	0.0	0.0
Flatiron 3 Pump Energy	30.0	0.0	0.000	0.0	0.0	0.0	1.2	5.9	6.4	5.3	6.1	5.0	0.0
Carter Lake		**Oct.**	**Nov.**	**Dec.**	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**June**	**July**	**Aug.**	**Sept.**
Pumped from Flatiron	86.9	0.0	0.0	0.0	0.0	0.0	3.7	17.9	18.6	15.0	17.3	14.4	0.0
Release to Flatiron	3.1	0.0	0.0	0.8	1.1	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Irrigation Delivery	86.9	0.0	0.0	0.0	0.0	0.0	3.7	17.9	18.6	15.0	17.3	14.4	0.0
Evaporation & Seepage	3.1	0.3	0.1	0.0	0.0	0.0	0.1	0.3	0.4	0.5	0.5	0.5	0.4
End of Month Content	105.2	94.1	90.5	86.0	81.0	76.8	77.4	90.8	101.7	103.0	101.9	91.2	74.6
Big Thompson Powerplant		**Oct.**	**Nov.**	**Dec.**	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**June**	**July**	**Aug.**	**Sept.**
Diverted Dille Tunnel Water	48.2	0.1	0.0	0.0	0.0	0.0	11.8	1.6	12.2	17.1	3.6	1.0	0.8
Irrigation Delivery	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turbine Release	33.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7	11.6	6.0	4.3	4.9
Generation	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.6	0.7	0.4	0.5
Horsetooth Reservoir		**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**
Hansen Feeder Canal Inflow	106.4	2.7	3.4	2.1	1.5	1.2	15.2	13.1	17.6	17.6	8.2	7.8	16.1
Irrigation Delivery	105.6	13.8	2.2	2.2	2.4	2.1	2.1	2.7	3.7	6.1	27.2	23.5	17.7
Evaporation	5.3	0.4	0.2	0.0	0.0	0.0	0.2	0.5	0.7	0.9	1.0	0.8	0.6
End of Month Content	121.5	108.6	109.5	109.1	107.9	107.1	121.0	131.7	145.5	155.9	133.8	116.6	114.6
Total CBT Delivery[12]	**192.5**	**13.8**	**2.2**	**2.2**	**2.4**	**2.1**	**5.8**	**20.6**	**22.3**	**21.1**	**44.5**	**37.9**	**17.7**

[12] May include Windy Gap and/or carriage contract water

(Part 3 of 3)
2024 Actual Operations Summary. Energy in Gigawatt Hours

Base Generation	**Initial or Total**	**Oct.**	**Nov.**	**Dec.**	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**June**	**July**	**Aug.**	**Sept.**
Green Mountain	57.4	7.7	1.6	1.3	1.5	1.8	1.6	1.8	2.4	15.1	9.0	3.9	9.8
Flatiron 3	0.6	0.0	0.0	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Big Thompson	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.6	0.7	0.4	0.5
Total	62.0	7.7	1.5	1.5	1.7	2.0	1.6	1.8	3.2	16.7	9.7	4.3	10.3
Load Following Generation		**Oct.**	**Nov.**	**Dec.**	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**June**	**July**	**Aug.**	**Sept.**
Marys Lake	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Estes	88.7	1.8	0.5	0.2	0.0	0.0	9.3	14.0	14.7	11.0	13.9	13.0	10.6
Pole Hill	126.9	0.2	0.0	0.0	0.0	0.0	4.1	22.1	24.2	22.5	22.1	16.5	15.3
Flatiron 1 & 2	166.9	3.0	2.3	0.8	0.0	0.0	5.8	27.6	30.2	27.1	27.5	23.3	19.4
Total	382.4	5.0	2.7	0.9	0.0	0.0	19.2	63.8	69.1	60.6	63.4	52.8	45.4
Pump Energy		**Oct.**	**Nov.**	**Dec.**	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**June**	**July**	**Aug.**	**Sept.**
Willow Creek	4.1	0.5	0.0	0.0	0.1	0.0	0.0	2.8	0.0	0.0	0.5	0.0	0.0
Granby	20.9	0.8	0.5	0.6	0.5	0.3	3.1	3.0	1.1	0.1	3.5	3.9	3.6
Flatiron 3	30.0	0.0	0.0	0.0	0.0	1.2	5.9	6.4	5.3	6.1	5.1	0.0	0.0
Total	55.0	1.3	0.5	0.6	0.5	0.3	4.3	11.7	7.6	5.5	10.1	9.0	3.6
Total Generation	444.5	12.7	4.3	2.4	1.4	1.8	20.8	65.6	72.4	77.3	73.2	57.1	55.6
Total Generation Minus Pump	389.5	11.3	3.8	1.8	0.8	1.4	16.5	53.9	64.8	71.8	63.1	48.1	52.1

Table B-4.—2024 Flood damage prevented

C-BT Flood Damage Prevented in Water Year 2024			
	Cumulative Total Prior to WY2024	**WY2024**	**Cumulative Total Current**
Granby, Willow Creek, Shadow Mountain and Grand Lake	$853,559	$65,135	$918,694
Green Mountain	$369,707	$65,335	$435,042
Total	**$1,223,266**	**$130,470**	**$1,353,736**

HYDROLOGY OPERATIONS

Dillon Reservoir

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Dillon Inflow	kaf	6.3	5.4	5.0	4.5	3.7	5.0	12.9	46.9	64.7	32.2	14.6	8.2	209.4
DL to GM Gain	kaf	5.3	4.5	4.3	4.0	3.3	5.5	13.8	31.8	37.2	25.2	12.0	6.5	153.4

Green Mountain Reservoir

Init Cont: 108.00 kaf Maximum Cont: 154.60 kaf Minimum Cont: 8.00 kaf
Elev: 7926.3 ft Elev: 7950.4 ft Elev: 7804.7 ft

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Depletion	kaf	0.2	-0.5	-1.1	-1.6	-1.8	-1.1	7.0	36.6	42.2	10.4	7.8	2.2	100.3
Depleted Inflow	kaf	11.4	10.5	10.5	10.1	8.9	11.7	19.7	42.1	59.7	47.1	18.8	12.5	263.0
Turbine Release	kaf	45.7	11.4	11.0	10.6	8.9	13.6	17.0	19.3	5.1	46.4	27.2	37.1	253.3
Spill/Waste	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total River Release	cfs	743	192	178	173	160	221	285	314	85	754	442	623	
Total River Release	kaf	45.7	11.4	11.0	10.6	8.9	13.6	17.0	19.3	5.1	46.4	27.2	37.1	253.3
Evaporation	kaf	0.2	0.1	0.0	0.0	0.0	0.1	0.2	0.3	0.6	0.7	0.5	0.4	3.1
End-Month Targets	kaf	74.0	73.0	72.5	72.0	72.0	70.0	95.0	95.0	149.0	149.0	140.0	115.0	
End-Month Contents	kaf	74.0	73.0	72.5	72.0	72.0	70.0	72.5	95.0	149.0	149.0	140.0	115.0	
End-Month Elevation	ft	7902.57	7901.77	7901.37	7900.97	7900.97	7899.33	7901.40	7917.78	7947.79	7947.79	7943.38	7930.06	

Willow Creek Reservoir

Init Cont: 8.00 kaf Maximum Cont: 10.20 kaf Minimum Cont: 7.20 kaf
Elev: 8125.4 ft Elev: 8128.8 ft Elev: 8116.9 ft

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Native Inflow	kaf	1.2	1.2	1.2	1.0	0.9	0.9	3.7	22.7	15.2	3.3	1.6	1.2	54.1
Spill/Bypass	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.4
Total River Release	kaf	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	4.8
Pumped to Granby	kaf	1.7	0.0	0.7	0.6	0.5	0.5	3.2	20.6	15.9	2.8	1.1	0.7	48.3
Evaporation	kaf	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.7
End-Month Contents	kaf	7.5	8.2	8.2	8.2	8.2	8.2	8.2	9.4	8.2	8.2	8.2	8.2	
End-Month Elevation	ft	8121.49	8124.28	8124.40	8124.40	8124.40	8124.40	8124.40	8128.51	8124.40	8124.40	8124.40	8124.40	

BUREAU OF RECLAMATION

COLORADO - BIG THOMPSON MONTHLY OPERATIONS
United States Bureau of Reclamation
Eastern Colorado Area Office
Loveland, Colorado

CBT October 2024 Most Probable: 01-OCT-2024

Granby Reservoir

Init Cont: 468.00 kaf **Maximum Cont:** 539.80 kaf **Minimum Cont:** 76.50 kaf
Elev: 8269.8 ft **Elev:** 8280.0 ft **Elev:** 8186.9 ft

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Native Inflow	kaf	2.4	2.2	2.2	1.9	1.6	1.8	3.7	25.3	46.6	11.6	4.4	3.1	106.8
Release from Shadow Mtn	kaf	2.3	2.7	2.8	1.2	1.1	1.2	2.2	8.7	51.2	6.7	2.5	2.1	84.7
Pump from Windy Gap	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.2	2.1	0.0	0.0	0.0	11.3
Pump from Willow Creek	kaf	1.7	0.0	0.7	0.6	0.5	0.5	3.2	20.6	15.9	2.8	1.1	0.7	48.3
Total Inflow	kaf	6.4	4.9	5.7	3.7	3.1	3.5	9.0	63.7	115.7	21.1	8.0	5.9	250.7
Spill/Bypass	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total River Release	kaf	1.2	1.2	1.2	1.2	1.1	1.2	1.2	4.6	4.5	4.6	2.5	1.2	25.7
Pumped to Shadow Mtn	kaf	3.4	2.9	31.4	32.5	29.6	21.0	1.1	4.7	0.0	13.5	28.0	28.8	196.9
Evaporation	kaf	1.6	0.7	0.0	0.0	0.0	0.8	1.4	2.2	3.1	2.9	2.3	2.0	17.0
Seepage loss	kaf	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.6
End-Month Contents	kaf	467.9	467.8	440.5	410.2	382.4	362.6	367.6	419.6	527.5	527.3	502.2	475.8	
End-Month Elevation	ft	8269.80	8269.78	8265.72	8261.03	8256.57	8253.30	8254.14	8262.50	8278.30	8278.27	8274.74	8270.95	

Shadow Mountain Reservoir

Init Cont: 17.00 kaf **Maximum Cont:** 18.40 kaf **Minimum Cont:** 16.60 kaf
Elev: 8366.7 ft **Elev:** 8367.0 ft **Elev:** 8366.0 ft

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Native Inflow	kaf	3.2	2.9	2.9	2.5	2.1	2.4	4.9	33.5	61.8	15.4	5.8	4.1	141.5
Pumped from Granby	kaf	3.4	2.9	31.4	32.5	29.6	21.0	1.1	4.7	0.0	13.5	28.0	28.8	196.9
Total Inflow	kaf	6.6	5.8	34.3	35.0	31.7	23.4	6.0	38.2	61.8	28.8	33.9	32.9	338.4
Spill/Bypass	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total River Release	kaf	2.3	2.7	2.8	1.2	1.1	1.2	2.2	8.7	51.2	6.7	2.5	2.1	84.7
Adams Tunnel Flow	kaf	4.1	3.0	31.5	33.8	30.5	22.0	3.4	28.8	9.7	21.4	30.8	30.3	249.3
Evaporation	kaf	0.3	0.1	0.0	0.0	0.0	0.2	0.3	0.5	0.6	0.5	0.4	0.4	3.3
End-Month Contents	kaf	16.8	16.8	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	
End-Month Elevation	ft	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	

Adams Tunnel

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Maximum Tunnel Capacity	kaf	4.6	3.0	31.5	33.8	30.5	28.6	11.2	28.8	9.8	19.0	29.3	20.9	251.0
Actual Diversion	kaf	4.1	3.0	31.5	33.8	30.5	22.0	3.4	28.8	9.7	21.4	30.8	30.3	249.3
% Maximum Delivery	%	90	100	100	100	100	77	31	100	99	112	105	145	

Lake Estes

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Big Thompson Inflow	kaf	2.1	1.4	0.9	0.6	0.5	1.0	2.3	7.9	41.5	18.7	7.9	4.2	89.0
Actual River Release	kaf	3.4	1.4	0.9	0.6	0.5	1.0	2.3	5.9	18.5	7.8	6.9	3.7	52.9
Max Diversion Available	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Priority Water Diverted	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.7	0.2	0.0	0.0	5.9
Skim Water Diverted	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.9	17.3	10.7	1.0	0.5	31.5
Irrigation Demand	kaf	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.2	0.2	1.3
Irrigation Delivery	kaf	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.2	0.2	1.3
Total River Release	kaf	3.4	1.4	0.9	0.6	0.5	1.0	2.3	5.9	18.5	7.8	6.9	3.7	52.9

Olympus Tunnel

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Maximum Tunnel Capacity	kaf	33.8	32.7	33.8	33.8	30.5	33.8	32.7	33.8	32.7	33.8	33.8	32.7	397.9
Actual Delivery	kaf	2.7	2.9	31.5	33.8	30.5	21.9	3.5	30.6	32.6	31.9	31.6	30.6	284.1
% Maximum Delivery	%	8	9	93	100	100	65	11	91	99	94	93	93	
Inflow to Flatiron	kaf	2.7	2.9	31.5	33.8	30.5	21.9	3.5	30.6	32.6	29.6	30.1	21.2	270.9

Carter Lake

Init Cont: 75.00 kaf **Maximum Cont:** 112.20 kaf **Minimum Cont:** 6.00 kaf
Elev: 5723.9 ft **Elev:** 5759.0 ft **Elev:** 5626.8 ft

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Pumped from Flatiron	kaf	0.0	0.0	11.3	20.7	17.0	13.8	0.0	12.3	9.4	12.7	17.9	5.6	120.7
Flatiron Bifurcation	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Carter to Flatiron	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Evaporation Loss	kaf	0.2	0.1	0.0	0.0	0.0	0.2	0.3	0.4	0.5	0.5	0.4	0.3	2.9
Seepage Loss	kaf	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	1.9
End-Month Contents	kaf	65.2	61.3	69.2	86.9	101.2	111.3	106.0	110.8	110.0	104.5	98.2	84.8	
End-Month Elevation	ft	5714.28	5710.05	5718.38	5735.91	5748.62	5758.16	5753.47	5757.71	5757.07	5751.62	5745.89	5733.86	
Priority Water Diverted to Carter	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	5.0
Irrigation & Metered Demand	kaf	8.6	3.1	2.5	2.2	2.2	2.9	4.5	6.5	8.4	16.8	22.9	17.9	98.5
Windy Gap demand	kaf	0.4	0.6	0.8	0.6	0.4	0.5	0.3	0.5	1.1	0.9	0.8	0.7	7.6
Total Demand	kaf	9.0	3.7	3.2	2.8	2.6	3.4	4.9	7.0	9.5	17.7	23.7	18.6	106.1
Total Delivery	kaf	9.0	3.7	3.2	2.8	2.6	3.4	4.9	7.0	9.5	17.7	23.7	18.6	106.1
% Required Delivery	%	100	100	100	100	100	100	100	100	100	100	100	100	
Shortage	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Hansen Canal 930

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Maximum Flow	kaf	33.2	55.3	57.2	57.2	51.6	57.2	55.3	57.2	55.3	57.2	57.2	55.3	649.2
Actual Flow	kaf	2.7	2.9	20.2	13.1	13.5	8.1	3.5	18.3	23.2	16.9	12.1	15.5	150.0

Dille Tunnel

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Big Thompson River Below Lake Estes	kaf	3.4	1.4	0.9	0.6	0.5	1.0	2.3	5.9	18.5	7.8	6.9	3.7	52.9
North Fork Big Thompson River at Drake	kaf	0.4	0.3	0.3	0.2	0.2	0.2	0.2	1.7	4.6	2.2	1.4	0.8	12.5
Dille Skim Water Diverted	kaf	0.1	0.0	0.0	0.0	0.0	0.0	0.2	5.1	7.5	6.0	5.8	2.1	26.8
Dille Priority Water Diverted	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
water available	kaf	3.8	1.7	1.2	0.8	0.7	1.2	2.5	7.6	23.1	9.9	8.3	4.5	65.3
water diverted	kaf	0.1	0.0	0.0	0.0	0.0	0.0	0.2	5.1	7.5	6.0	5.8	2.1	26.8
% Diverted	%	2	0	0	0	0	0	4	95	138	111	107	40	
Big T @ Canyon Mouth	kaf	3.7	1.7	1.2	0.8	0.7	1.2	2.3	2.5	15.6	3.9	2.5	2.4	38.5

Trifurcation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Release from Flatiron	kaf	2.7	2.9	20.2	13.1	13.5	8.1	3.5	18.3	23.2	16.9	12.1	15.5	150.0
Release to 550 Canal	kaf	0.4	2.9	20.1	12.9	13.5	8.0	3.0	15.7	5.4	4.4	6.2	7.8	100.3
Dille Tunnel	kaf	0.1	0.0	0.0	0.0	0.0	0.0	0.2	5.1	7.5	6.0	5.8	2.1	26.8
Total release to river	kaf	3.4	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.2	1.2	4.2	6.1	15.5
Irrigation demand	kaf	3.4	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.2	1.2	4.1	6.0	15.3
Windy Gap demand	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Total requirement	kaf	3.4	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.2	1.2	4.2	6.1	15.5
Total delivery	kaf	3.4	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.2	1.2	4.2	6.1	15.5
% Required Delivery	%	100	100	100	100	100	100	100	100	100	100	100	100	
Shortage	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Hansen Canal 550

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Inflow from Flatiron	kaf	0.4	2.9	20.1	12.9	13.5	8.0	3.0	15.7	5.4	4.4	6.2	7.8	100.3
Maximum flow	kaf	17.5	29.1	30.1	30.1	27.2	30.1	29.1	30.1	29.1	30.1	30.1	29.1	341.7
Irrigation demand	kaf	1.2	0.0	0.1	0.1	0.1	0.1	0.3	0.4	0.2	0.5	0.8	1.2	5.0
Irrigation delivery	kaf	0.4	0.0	0.1	0.1	0.1	0.1	0.3	0.4	0.2	0.5	0.8	1.2	4.2
Rels to Horsetooth	kaf	0.4	2.9	20.1	12.9	13.5	8.0	3.0	15.7	5.4	4.4	6.2	7.8	100.3

Horsetooth Reservoir

Init Cont: 115.00 kaf **Elev:** 5407.6 ft

Maximum Cont: 157.00 kaf **Elev:** 5430.0 ft

Minimum Cont: 13.00 kaf **Elev:** 5316.8 ft

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Inflow	kaf	0.4	2.9	20.1	12.9	13.5	8.0	3.0	15.7	5.4	4.4	6.2	7.8	100.3
Total irrigation delivery	kaf	9.3	2.8	2.9	2.7	2.4	2.6	3.3	6.7	8.7	19.6	28.6	18.2	107.8
Evaporation loss	kaf	0.4	0.2	0.0	0.0	0.0	0.3	0.5	0.7	0.9	0.8	0.6	0.5	4.9
Seepage loss	kaf	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.3
End-Month Content	kaf	105.2	105.0	122.0	132.1	142.9	148.0	147.1	155.3	151.0	134.9	111.7	100.7	
End-Month Elevation	ft	5402.03	5401.90	5411.81	5417.34	5423.06	5425.64	5425.20	5429.28	5427.14	5418.85	5405.89	5399.28	
Priority water diverted to Horsetooth	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.1	0.0	0.0	0.7
Irrigation demand	kaf	6.0	0.0	0.0	0.0	0.0	0.0	0.2	2.0	2.7	12.6	21.9	12.1	57.5
Metered Demand	kaf	2.7	2.3	2.6	2.4	2.2	2.2	2.5	4.2	5.2	6.2	5.7	5.2	43.4
Windy Gap demand	kaf	0.5	0.4	0.3	0.3	0.3	0.3	0.5	0.5	0.8	0.8	1.1	0.9	6.7
Total demand	kaf	9.3	2.8	2.9	2.7	2.4	2.6	3.3	6.7	8.7	19.6	28.6	18.2	107.8
% Required Delivery	%	100	100	100	100	100	100	100	100	100	100	100	100	
Shortage	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CBT Project Summary

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Total CBT Delivery	kaf	21.3	5.6	5.2	4.8	4.5	5.2	7.7	13.4	16.9	37.6	55.6	42.5	220.3

Windy Gap

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Pumping	**kaf**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.2	2.1	0.0	0.0	0.0	11.3
Losses	**kaf**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.2	0.0	0.0	0.0	1.1
Spill	**kaf**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delivery	**kaf**	0.9	1.0	1.1	0.9	0.7	0.8	0.8	1.0	1.9	1.7	1.9	1.7	14.4

PUMPING AND GENERATION OPERATIONS

Green Mountain Generation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Maximum Generation	**gwh**	18.600	18.000	18.600	18.600	16.800	18.600	18.000	18.600	18.000	18.600	18.600	18.000	219.000
Generation	**gwh**	8.200	1.900	1.800	1.800	1.500	2.300	2.800	3.400	1.000	9.800	5.700	7.400	47.600
% Maximum Generation	**%**	44	11	10	10	9	12	16	18	6	53	31	41	
Average	**kwh/af**	180	168	168	167	167	166	165	174	198	211	209	200	

Willow Creek Pumping

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Maximum Pumping	**kaf**	24.6	23.8	24.6	24.6	22.2	24.6	23.8	24.6	23.8	24.6	24.6	23.8	289.6
Actual Pumping	**kaf**	1.7	0.0	0.7	0.6	0.5	0.5	3.2	20.6	15.9	2.8	1.1	0.7	48.3
Pump Energy	**gwh**	0.400	0.000	0.100	0.100	0.100	0.100	0.700	4.400	3.400	0.600	0.200	0.200	10.300
% Maximum Pumping	**%**	7	0	3	2	2	2	13	84	67	11	5	3	199
Average	**kwh/af**	213	0	213	213	213	213	213	213	213	213	213	213	

Lake Granby Pumping

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Maximum Pumping	**kaf**	36.9	35.7	36.9	36.9	33.3	36.9	35.7	36.9	35.7	36.9	36.9	35.7	434.4
Actual Pumping	**kaf**	3.4	2.9	31.4	32.5	29.6	21.0	1.1	4.7	0.0	13.5	28.0	28.8	196.9
Pump Energy	**gwh**	0.500	0.400	4.500	4.700	4.400	3.100	0.200	0.700	0.000	1.900	4.000	4.100	28.500
% Maximum Pumping	**%**	9	8	85	88	89	57	3	13	0	36	76	81	
Average	**kwh/af**	143	143	144	146	148	149	150	149	0	140	141	142	

Marys Lake Generation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Adams Tunnel Flow	kaf	4.1	3.0	31.5	33.8	30.5	22.0	3.4	28.8	9.7	21.4	30.8	30.3	249.3
Maximum Generation	gwh	0.000	0.000	6.400	6.400	5.800	6.400	6.200	6.400	6.200	6.400	6.400	6.200	62.800
Generation	gwh	0.000	0.000	5.900	6.400	5.800	3.900	0.000	5.300	1.200	3.600	5.700	5.700	43.500
% Maximum Generation	%	0	0	19	19	19	18	0	18	13	17	19	19	
Average	kwh/af	0	0	187	189	189	177	0	185	126	168	186	187	

Lake Estes Generation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Adams Tunnel Flow	kaf	4.1	3.0	31.5	33.8	30.5	22.0	3.4	28.8	9.7	21.4	30.8	30.3	249.3
Maximum Generation	gwh	16.000	15.500	16.000	16.000	14.500	16.000	15.500	16.000	15.500	16.000	16.000	15.500	188.500
Generation	gwh	1.000	0.500	15.000	16.000	14.500	10.100	0.700	13.500	4.200	9.600	14.400	14.200	113.700
% Maximum Generation	%	6	3	93	100	100	63	5	84	27	60	90	92	
Average	kwh/af	249	156	474	473	473	460	203	467	426	451	468	469	

Pole Hill Generation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Olympus Tunnel Flow	kaf	33.8	32.7	33.8	33.8	30.5	33.8	32.7	33.8	32.7	33.8	33.8	32.7	397.9
Maximum Generation	gwh	0.000	0.000	25.800	25.800	23.300	21.600	0.000	25.800	25.000	25.800	25.800	25.000	223.900
Generation	gwh	0.000	0.000	24.100	25.800	23.300	16.200	0.000	23.400	24.800	24.400	24.100	23.300	209.400
% Maximum Generation	%	0	0	93	100	100	75	0	91	99	94	93	93	
Average	kwh/af	0	0	713	762	762	478	0	691	759	720	713	712	

Flatiron Units 1 and 2 Generation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Inflow to Flatiron	kaf	2.7	2.9	31.5	33.8	30.5	21.9	3.5	30.6	32.6	29.6	30.1	21.2	270.9
Maximum Generation	gwh	32.200	31.200	32.200	32.200	29.100	32.200	31.200	32.200	31.200	32.200	32.200	31.200	379.300
Generation	gwh	1.600	1.400	28.900	32.200	29.100	18.700	1.800	27.800	30.900	26.300	27.000	17.700	243.400
% Maximum Generation	%	5	4	90	100	100	58	6	86	99	81	84	57	
Average	kwh/af	588	470	917	952	952	852	523	907	949	887	899	838	

Flatiron Unit 3 Pump/Generation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Maximum Pumping	kaf	0.0	0.0	11.3	20.7	17.0	13.8	0.0	12.3	9.4	12.7	17.9	5.6	120.7
Pump from Flatiron	kaf	0.0	0.0	11.3	20.7	17.0	13.8	0.0	12.3	9.4	12.7	17.9	5.6	120.7
Pump Energy	gwh	0.000	0.000	3.400	6.700	5.800	5.000	0.000	4.500	3.400	4.500	6.300	2.000	41.600
% Maximum Pumping	%	0	0	100	100	100	100	0	100	100	100	100	100	
Average	kwh/af	0	0	305	322	342	359	0	361	362	356	351	347	
Maximum Turbine release	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Carter to Flatiron	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum Generation	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Actual Generation	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Big Thompson Generation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Total release	kaf	2.0	0.0	0.0	0.0	0.0	0.0	0.4	7.3	25.0	17.9	11.0	8.7	72.3
Turbine release	kaf	2.0	0.0	0.0	0.0	0.0	0.0	0.4	7.3	23.7	17.3	11.0	8.7	70.4
Wasteway release	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.6	0.0	0.0	1.9
Maximum Generation	gwh	2.200	0.000	0.000	0.000	0.000	0.000	1.900	3.800	3.700	3.800	3.800	3.700	22.900
Generation	gwh	0.100	0.000	0.000	0.000	0.000	0.000	0.000	0.900	3.700	2.700	1.600	1.100	10.100
% Maximum Generation	%	2	0	0	0	0	0	0	24	100	70	41	31	
Average	kwh/af	28	0	0	0	0	0	2	127	156	154	142	131	

Project Generation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Total Generation	**gwh**	10.900	3.700	75.700	82.100	74.000	51.100	5.300	74.200	65.800	76.300	78.500	69.500	667.100
Total Max Generation	**gwh**	69.100	64.700	99.100	99.100	89.500	94.900	72.700	102.900	99.600	102.900	102.900	99.600	1097.000

Project Pump Energy

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Granby	**gwh**	0.500	0.400	4.500	4.700	4.400	3.100	0.200	0.700	0.000	1.900	4.000	4.100	28.500
Willow Creek	**gwh**	0.400	0.000	0.100	0.100	0.100	0.100	0.700	4.400	3.400	0.600	0.200	0.200	10.300
Flatiron Unit 3	**gwh**	0.000	0.000	3.400	6.700	5.800	5.000	0.000	4.500	3.400	4.500	6.300	2.000	41.600
Total Pump Energy	**gwh**	0.900	0.400	8.100	11.500	10.300	8.200	0.800	9.500	6.800	7.000	10.500	6.200	80.200

HYDROLOGY OPERATIONS

Dillon Reservoir

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Dillon Inflow	kaf	6.3	5.6	5.1	4.6	3.9	4.3	7.2	38.0	48.5	20.8	9.6	6.2	160.1
DL to GM Gain	kaf	5.4	4.9	4.6	4.1	3.6	4.3	6.7	19.9	23.3	11.2	10.3	5.3	103.6

Green Mountain Reservoir

Init Cont: 108.00 kaf Elev: 7926.3 ft | Maximum Cont: 154.60 kaf Elev: 7950.4 ft | Minimum Cont: 8.00 kaf Elev: 7804.7 ft

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Depletion	kaf	0.2	-0.4	-1.0	-1.6	-1.7	-1.8	1.2	31.8	42.6	9.2	3.4	0.2	82.1
Depleted Inflow	kaf	11.5	10.9	10.7	10.2	9.2	10.5	12.6	26.0	29.3	22.8	16.5	11.3	181.5
Turbine Release	kaf	42.3	11.8	11.2	10.7	9.2	10.4	7.9	5.2	4.5	4.6	28.2	35.9	181.9
Spill/Waste	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total River Release	cfs	688	198	182	174	165	169	133	85	75	75	458	603	
Total River Release	kaf	42.3	11.8	11.2	10.7	9.2	10.4	7.9	5.2	4.5	4.6	28.2	35.9	181.9
Evaporation	kaf	0.2	0.1	0.0	0.0	0.0	0.1	0.2	0.4	0.6	0.6	0.5	0.4	3.1
End-Month Targets	kaf	77.5	76.5	76.0	75.5	75.5	75.5	120.0	120.0	152.0	150.0	130.0	105.0	
End-Month Contents	kaf	77.5	76.5	76.0	75.5	75.5	75.5	80.0	100.4	124.7	142.2	130.0	105.0	
End-Month Elevation	ft	7905.30	7904.53	7904.14	7903.75	7903.75	7903.75	7907.21	7921.32	7935.43	7944.49	7938.26	7924.16	

Willow Creek Reservoir

Init Cont: 8.00 kaf Elev: 8125.4 ft | Maximum Cont: 10.20 kaf Elev: 8128.8 ft | Minimum Cont: 7.20 kaf Elev: 8116.9 ft

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Native Inflow	kaf	1.1	1.0	1.1	1.0	0.9	1.1	3.4	8.9	4.7	1.8	1.1	0.9	27.0
Spill/Bypass	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total River Release	kaf	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	4.8
Pumped to Granby	kaf	1.7	0.0	0.5	0.6	0.5	0.6	2.9	8.3	4.1	1.3	0.5	0.4	21.4
Evaporation	kaf	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.7
End-Month Contents	kaf	7.4	8.1	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	
End-Month Elevation	ft	8121.44	8123.84	8124.40	8124.40	8124.40	8124.40	8124.40	8124.40	8124.40	8124.40	8124.40	8124.40	

BUREAU OF RECLAMATION

COLORADO - BIG THOMPSON MONTHLY OPERATIONS
United States Bureau of Reclamation
Eastern Colorado Area Office
Loveland, Colorado

CBT October 2024 Min Reasonable: 01-OCT-2024

Granby Reservoir

Init Cont: 468.00 kaf **Maximum Cont:** 539.80 kaf **Minimum Cont:** 76.50 kaf
Elev: 8269.8 ft **Elev:** 8280.0 ft **Elev:** 8186.9 ft

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Native Inflow	kaf	2.4	2.1	2.0	1.8	1.5	3.3	8.8	20.2	19.6	11.3	5.4	3.2	81.6
Release from Shadow Mtn	kaf	2.2	2.7	2.8	1.2	1.1	2.0	7.4	3.5	8.6	5.6	2.5	2.1	41.7
Pump from Windy Gap	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.5	4.0	0.0	0.0	0.0	17.5
Pump from Willow Creek	kaf	1.7	0.0	0.5	0.6	0.5	0.6	2.9	8.3	4.1	1.3	0.5	0.4	21.4
Total Inflow	kaf	6.3	4.8	5.3	3.6	3.1	5.9	19.0	45.6	36.3	18.1	8.4	5.6	162.0
Spill/Bypass	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total River Release	kaf	1.2	1.2	1.2	1.2	1.1	1.2	1.2	4.6	4.5	4.6	2.5	1.2	25.7
Pumped to Shadow Mtn	kaf	3.5	3.1	31.7	32.7	29.7	18.4	0.1	6.5	1.9	17.6	28.3	30.8	204.3
Evaporation	kaf	1.6	0.7	0.0	0.0	0.0	0.8	1.4	2.2	2.9	2.7	2.1	1.8	16.2
Seepage loss	kaf	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.6
End-Month Contents	kaf	467.7	467.3	439.3	408.7	380.8	365.9	381.9	413.9	440.8	433.7	409.0	380.5	
End-Month Elevation	ft	8269.77	8269.70	8265.53	8260.79	8256.30	8253.84	8256.50	8261.62	8265.75	8264.67	8260.83	8256.27	

Shadow Mountain Reservoir

Init Cont: 17.00 kaf **Maximum Cont:** 18.40 kaf **Minimum Cont:** 16.60 kaf
Elev: 8366.7 ft **Elev:** 8367.0 ft **Elev:** 8366.0 ft

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Native Inflow	kaf	3.2	2.7	2.6	2.4	2.0	4.4	11.6	26.8	26.0	15.0	7.1	4.2	108.0
Pumped from Granby	kaf	3.5	3.1	31.7	32.7	29.7	18.4	0.1	6.5	1.9	17.6	28.3	30.8	204.3
Total Inflow	kaf	6.7	5.8	34.3	35.0	31.7	22.8	11.7	33.3	27.9	32.6	35.4	35.0	312.2
Spill/Bypass	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total River Release	kaf	2.2	2.7	2.8	1.2	1.1	2.0	7.4	3.5	8.6	5.6	2.5	2.1	41.7
Adams Tunnel Flow	kaf	4.2	3.0	31.5	33.8	30.5	20.6	3.9	29.1	18.5	26.3	32.4	32.4	266.2
Evaporation	kaf	0.3	0.1	0.0	0.0	0.0	0.2	0.3	0.5	0.6	0.5	0.4	0.4	3.3
End-Month Contents	kaf	16.8	16.8	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	
End-Month Elevation	ft	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	

Adams Tunnel

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Maximum Tunnel Capacity	kaf	4.6	3.0	31.5	33.8	30.5	28.6	11.2	29.1	18.5	25.4	30.6	25.5	272.3
Actual Diversion	kaf	4.2	3.0	31.5	33.8	30.5	20.6	3.9	29.1	18.5	26.3	32.4	32.4	266.2
% Maximum Delivery	%	92	100	100	100	100	72	34	100	100	103	106	127	

Lake Estes

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Big Thompson Inflow	kaf	1.8	1.1	0.8	0.5	0.4	0.4	1.9	16.2	20.0	10.5	5.7	3.2	62.5
Actual River Release	kaf	3.2	1.1	0.8	0.5	0.4	0.4	1.5	12.2	9.2	8.6	5.7	3.2	46.8
Max Diversion Available	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Priority Water Diverted	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Skim Water Diverted	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.3	4.0	10.8	1.9	0.0	0.0	17.0
Irrigation Demand	kaf	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.3	0.3	0.2	0.1	1.5
Irrigation Delivery	kaf	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.3	0.3	0.2	0.1	1.5
Total River Release	kaf	3.2	1.1	0.8	0.5	0.4	0.4	1.5	12.2	9.2	8.6	5.7	3.2	46.8

Olympus Tunnel

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Maximum Tunnel Capacity	kaf	33.8	32.7	33.8	33.8	30.5	33.8	32.7	33.8	32.7	33.8	33.8	32.7	397.9
Actual Delivery	kaf	2.7	2.9	31.5	33.8	30.5	20.6	4.1	32.8	29.0	27.9	32.1	32.3	280.2
% Maximum Delivery	%	8	9	93	100	100	61	13	97	89	82	95	99	
Inflow to Flatiron	kaf	2.7	2.9	31.5	33.8	30.5	20.6	4.1	32.8	29.0	27.0	30.3	25.4	270.6

Carter Lake

Init Cont: 75.00 kaf **Maximum Cont:** 112.20 kaf **Minimum Cont:** 6.00 kaf
Elev: 5723.9 ft **Elev:** 5759.0 ft **Elev:** 5626.8 ft

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Pumped from Flatiron	kaf	0.0	0.0	11.3	20.6	16.9	12.5	0.0	15.5	12.5	13.4	19.2	6.0	127.9
Flatiron Bifurcation	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Carter to Flatiron	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Evaporation Loss	kaf	0.2	0.1	0.0	0.0	0.0	0.2	0.3	0.4	0.5	0.4	0.3	0.3	2.7
Seepage Loss	kaf	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	1.9
End-Month Contents	kaf	64.3	61.4	69.9	87.7	102.2	111.3	105.8	108.2	104.3	95.2	87.1	76.8	
End-Month Elevation	ft	5713.29	5710.15	5719.11	5736.62	5749.61	5758.22	5753.31	5754.99	5752.01	5743.10	5736.08	5726.04	
Priority Water Diverted to Carter	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Irrigation & Metered Demand	kaf	9.5	1.9	1.7	2.0	1.7	2.5	4.7	11.9	14.4	20.9	25.8	15.1	112.1
Windy Gap demand	kaf	0.5	0.8	0.9	0.7	0.5	0.6	0.4	0.6	1.3	1.1	0.9	0.8	9.1
Total Demand	kaf	9.9	2.7	2.6	2.7	2.2	3.1	5.1	12.5	15.8	22.0	26.7	15.9	121.2
Total Delivery	kaf	9.9	2.7	2.6	2.7	2.2	3.1	5.1	12.5	15.8	22.0	26.7	15.9	121.2
% Required Delivery	%	100	100	100	100	100	100	100	100	100	100	100	100	
Shortage	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Hansen Canal 930

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Maximum Flow	kaf	33.2	55.3	57.2	57.2	51.6	57.2	55.3	57.2	55.3	57.2	57.2	55.3	649.2
Actual Flow	kaf	2.7	2.9	20.2	13.1	13.6	8.0	4.1	17.3	16.5	13.6	11.2	19.4	142.6

Dille Tunnel

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Big Thompson River Below Lake Estes	kaf	3.2	1.1	0.8	0.5	0.4	0.4	1.5	12.2	9.2	8.6	5.7	3.2	46.8
North Fork Big Thompson River at Drake	kaf	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.9	1.9	1.2	0.7	0.4	7.0
Dille Skim Water Diverted	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.1	10.4	8.3	7.3	3.9	1.2	31.2
Dille Priority Water Diverted	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
water available	kaf	3.5	1.4	1.0	0.7	0.5	0.6	1.8	13.1	11.1	9.8	6.4	3.6	53.5
water diverted	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.1	10.4	8.3	7.3	3.9	1.2	31.2
% Diverted	%	0	0	0	0	0	0	3	192	154	136	73	23	
Big T @ Canyon Mouth	kaf	3.5	1.4	1.0	0.7	0.5	0.6	1.7	2.7	2.7	2.5	2.5	2.4	22.2

Trifurcation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Release from Flatiron	kaf	2.7	2.9	20.2	13.1	13.6	8.0	4.1	17.3	16.5	13.6	11.2	19.4	142.6
Release to 550 Canal	kaf	0.0	2.8	20.1	12.9	13.4	7.8	3.5	12.2	3.6	8.5	5.5	13.4	103.7
Dille Tunnel	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.1	10.4	8.3	7.3	3.9	1.2	31.2
Total release to river	kaf	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.6	2.5	4.8	5.2	18.5
Irrigation demand	kaf	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.6	2.5	4.7	5.1	18.3
Windy Gap demand	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Total requirement	kaf	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.6	2.5	4.8	5.2	18.5
Total delivery	kaf	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.6	2.5	4.8	5.2	18.5
% Required Delivery	%	100	100	100	100	100	100	100	100	100	100	100	100	
Shortage	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Hansen Canal 550

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Inflow from Flatiron	kaf	0.0	2.8	20.1	12.9	13.4	7.8	3.5	12.2	3.6	8.5	5.5	13.4	103.7
Maximum flow	kaf	17.5	29.1	30.1	30.1	27.2	30.1	29.1	30.1	29.1	30.1	30.1	29.1	341.7
Irrigation demand	kaf	1.9	0.1	0.1	0.2	0.1	0.2	0.3	0.5	0.5	0.6	1.0	0.7	6.2
Irrigation delivery	kaf	0.7	0.1	0.1	0.2	0.1	0.2	0.3	0.5	0.5	0.6	1.0	0.7	5.0
Rels to Horsetooth	kaf	0.0	2.8	20.1	12.9	13.4	7.8	3.5	12.2	3.6	8.5	5.5	13.4	103.7

Horsetooth Reservoir

Init Cont: 115.00 kaf **Maximum Cont:** 157.00 kaf **Minimum Cont:** 13.00 kaf
Elev: 5407.6 ft **Elev:** 5430.0 ft **Elev:** 5316.8 ft

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Inflow	kaf	0.0	2.8	20.1	12.9	13.4	7.8	3.5	12.2	3.6	8.5	5.5	13.4	103.7
Total irrigation delivery	kaf	10.5	2.0	2.0	2.5	2.4	2.6	4.5	13.1	17.4	28.0	29.0	10.0	124.0
Evaporation loss	kaf	0.4	0.2	0.0	0.0	0.0	0.3	0.5	0.7	0.8	0.7	0.5	0.4	4.5
Seepage loss	kaf	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.3
End-Month Content	kaf	103.6	104.1	122.0	132.3	143.2	148.0	146.4	144.6	129.8	109.4	85.1	88.0	
End-Month Elevation	ft	5401.02	5401.34	5411.81	5417.45	5423.19	5425.64	5424.83	5423.90	5416.08	5404.51	5389.22	5391.12	
Priority water diverted to Horsetooth	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Irrigation demand	kaf	6.7	0.1	0.0	0.0	0.0	0.0	0.7	7.8	9.8	19.3	20.9	4.1	69.4
Metered Demand	kaf	3.3	1.5	1.6	2.1	2.1	2.2	3.1	4.7	6.7	7.8	6.9	4.8	46.8
Windy Gap demand	kaf	0.6	0.4	0.4	0.4	0.3	0.4	0.6	0.6	0.9	0.9	1.3	1.1	7.9
Total demand	kaf	10.5	2.0	2.0	2.5	2.4	2.6	4.5	13.1	17.4	28.0	29.0	10.0	124.0
% Required Delivery	%	100	100	100	100	100	100	100	100	100	100	100	100	
Shortage	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CBT Project Summary

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Total CBT Delivery	kaf	24.0	3.6	3.4	4.4	3.9	5.0	8.9	25.8	33.3	51.4	59.5	29.9	253.1

Windy Gap

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Pumping	**kaf**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.5	4.0	0.0	0.0	0.0	17.5
Losses	**kaf**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.4	0.0	0.0	0.0	1.8
Spill	**kaf**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delivery	**kaf**	1.1	1.2	1.3	1.1	0.8	1.0	1.0	1.2	2.3	2.0	2.2	2.0	17.2

PUMPING AND GENERATION OPERATIONS

Green Mountain Generation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Maximum Generation	**gwh**	18.600	18.000	18.600	18.600	16.800	18.600	18.000	18.600	18.000	18.600	18.600	18.000	219.000
Generation	**gwh**	7.700	2.000	1.900	1.800	1.600	1.800	1.300	0.900	0.900	0.900	5.800	7.000	33.600
% Maximum Generation	**%**	41	11	10	10	9	9	7	5	5	5	31	39	
Average	**kwh/af**	181	171	170	170	169	170	170	180	194	204	205	196	

Willow Creek Pumping

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Maximum Pumping	**kaf**	24.6	23.8	24.6	24.6	22.2	24.6	23.8	24.6	23.8	24.6	24.6	23.8	289.6
Actual Pumping	**kaf**	1.7	0.0	0.5	0.6	0.5	0.6	2.9	8.3	4.1	1.3	0.5	0.4	21.4
Pump Energy	**gwh**	0.400	0.000	0.100	0.100	0.100	0.100	0.600	1.800	0.900	0.300	0.100	0.100	4.600
% Maximum Pumping	**%**	7	0	2	3	2	2	12	34	17	5	2	2	88
Average	**kwh/af**	213	0	213	213	213	213	213	213	213	213	213	213	

Lake Granby Pumping

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Maximum Pumping	**kaf**	36.9	35.7	36.9	36.9	33.3	36.9	35.7	36.9	35.7	36.9	36.9	35.7	434.4
Actual Pumping	**kaf**	3.5	3.1	31.7	32.7	29.7	18.4	0.1	6.5	1.9	17.6	28.3	30.8	204.3
Pump Energy	**gwh**	0.500	0.400	4.600	4.800	4.400	2.800	0.000	1.000	0.300	2.600	4.100	4.500	30.000
% Maximum Pumping	**%**	9	9	86	89	89	50	0	18	5	48	77	86	
Average	**kwh/af**	143	143	144	146	148	149	149	148	146	145	146	148	

Marys Lake Generation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Adams Tunnel Flow	kaf	4.2	3.0	31.5	33.8	30.5	20.6	3.9	29.1	18.5	26.3	32.4	32.4	266.2
Maximum Generation	gwh	0.000	0.000	6.400	6.400	5.800	6.400	6.200	6.400	6.200	6.400	6.400	6.200	62.800
Generation	gwh	0.000	0.000	5.900	6.400	5.800	3.500	0.000	5.400	3.000	4.700	6.100	6.100	46.900
% Maximum Generation	%	0	0	19	19	19	17	0	18	16	18	19	19	
Average	kwh/af	0	0	187	189	189	171	0	185	163	180	188	189	

Lake Estes Generation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Adams Tunnel Flow	kaf	4.2	3.0	31.5	33.8	30.5	20.6	3.9	29.1	18.5	26.3	32.4	32.4	266.2
Maximum Generation	gwh	16.000	15.500	16.000	16.000	14.500	16.000	15.500	16.000	15.500	16.000	16.000	15.500	188.500
Generation	gwh	1.100	0.500	15.000	16.000	14.500	9.400	1.000	13.600	8.000	12.100	15.200	15.300	121.700
% Maximum Generation	%	7	3	93	100	100	59	6	85	52	76	95	99	
Average	kwh/af	254	162	474	473	473	457	246	469	432	460	471	472	

Pole Hill Generation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Olympus Tunnel Flow	kaf	33.8	32.7	33.8	33.8	30.5	33.8	32.7	33.8	32.7	33.8	33.8	32.7	397.9
Maximum Generation	gwh	0.000	0.000	25.800	25.800	23.300	21.600	0.000	25.800	25.000	25.800	25.800	25.000	223.900
Generation	gwh	0.000	0.000	24.100	25.800	23.300	14.700	0.000	25.000	21.900	20.200	24.500	24.600	204.100
% Maximum Generation	%	0	0	93	100	100	68	0	97	88	78	95	99	
Average	kwh/af	0	0	713	761	762	434	0	740	669	598	726	753	

BUREAU OF RECLAMATION

COLORADO - BIG THOMPSON MONTHLY OPERATIONS
United States Bureau of Reclamation
Eastern Colorado Area Office
Loveland, Colorado

CBT October 2024 Min Reasonable: 01-OCT-2024

Flatiron Units 1 and 2 Generation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Inflow to Flatiron	kaf	2.7	2.9	31.5	33.8	30.5	20.6	4.1	32.8	29.0	27.0	30.3	25.4	270.6
Maximum Generation	gwh	32.200	31.200	32.200	32.200	29.100	32.200	31.200	32.200	31.200	32.200	32.200	31.200	379.300
Generation	gwh	1.600	1.400	28.900	32.100	29.000	17.400	2.300	30.700	26.700	24.200	27.100	22.600	244.000
% Maximum Generation	%	5	4	90	100	100	54	7	95	86	75	84	72	
Average	kwh/af	585	473	917	952	952	847	566	936	922	896	893	889	

Flatiron Unit 3 Pump/Generation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Maximum Pumping	kaf	0.0	0.0	11.3	20.6	16.9	13.7	0.0	15.5	12.5	13.4	19.2	6.0	129.1
Pump from Flatiron	kaf	0.0	0.0	11.3	20.6	16.9	12.5	0.0	15.5	12.5	13.4	19.2	6.0	127.9
Pump Energy	gwh	0.000	0.000	3.400	6.700	5.800	4.500	0.000	5.600	4.500	4.600	6.500	2.000	43.600
% Maximum Pumping	%	0	0	100	100	100	91	0	100	100	100	100	100	
Average	kwh/af	0	0	306	323	344	360	0	358	361	345	338	334	
Maximum Turbine release	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Carter to Flatiron	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum Generation	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Actual Generation	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Big Thompson Generation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Total release	kaf	2.0	0.0	0.0	0.0	0.0	0.0	0.5	15.0	20.7	11.7	8.7	6.5	65.1
Turbine release	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.5	15.0	20.7	11.7	8.7	6.5	63.1
Wasteway release	kaf	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
Maximum Generation	gwh	0.000	0.000	0.000	0.000	0.000	0.000	1.900	3.800	3.700	3.800	3.800	3.700	20.700
Generation	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.200	3.300	1.700	1.100	0.700	9.000
% Maximum Generation	%	0	0	0	0	0	0	1	58	89	44	29	20	
Average	kwh/af	0	0	0	0	0	0	52	149	158	145	129	112	

BUREAU OF RECLAMATION

COLORADO - BIG THOMPSON MONTHLY OPERATIONS
United States Bureau of Reclamation
Eastern Colorado Area Office
Loveland, Colorado

CBT October 2024 Min Reasonable: 01-OCT-2024

Project Generation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Total Generation	**gwh**	10.300	3.900	75.800	82.100	74.100	46.800	4.600	77.900	63.800	63.900	79.900	76.300	659.400
Total Max Generation	**gwh**	66.900	64.700	99.100	99.100	89.500	94.900	72.700	102.900	99.600	102.900	102.900	99.600	1094.800

Project Pump Energy

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Granby	**gwh**	0.500	0.400	4.600	4.800	4.400	2.800	0.000	1.000	0.300	2.600	4.100	4.500	30.000
Willow Creek	**gwh**	0.400	0.000	0.100	0.100	0.100	0.100	0.600	1.800	0.900	0.300	0.100	0.100	4.600
Flatiron Unit 3	**gwh**	0.000	0.000	3.400	6.700	5.800	4.500	0.000	5.600	4.500	4.600	6.500	2.000	43.600
Total Pump Energy	**gwh**	0.900	0.400	8.100	11.600	10.300	7.400	0.600	8.300	5.700	7.500	10.700	6.600	78.100

HYDROLOGY OPERATIONS

Dillon Reservoir

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Dillon Inflow	kaf	6.6	5.8	5.1	4.6	3.8	3.9	8.9	37.2	110.2	75.2	21.4	10.3	293.0
DL to GM Gain	kaf	5.7	5.1	4.4	3.9	3.3	3.8	9.5	27.6	53.8	49.0	14.7	7.5	188.3

Green Mountain Reservoir

Init Cont: 108.00 kaf Maximum Cont: 154.60 kaf Minimum Cont: 8.00 kaf
Elev: 7926.3 ft Elev: 7950.4 ft Elev: 7804.7 ft

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Depletion	kaf	0.4	-0.1	-1.0	-1.6	-1.8	-2.3	2.6	11.4	15.8	22.3	10.6	4.4	60.7
Depleted Inflow	kaf	11.9	11.1	10.5	10.1	8.9	9.9	15.9	53.4	148.2	102.0	25.5	13.4	420.8
Turbine Release	kaf	46.1	12.0	11.0	10.6	8.9	12.9	15.7	50.1	85.7	90.3	29.0	38.0	410.3
Spill/Waste	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0
Total River Release	cfs	750	202	179	172	160	209	264	814	1440	1485	471	639	
Total River Release	kaf	46.1	12.0	11.0	10.6	8.9	12.9	15.7	50.1	85.7	91.3	29.0	38.0	411.3
Evaporation	kaf	0.2	0.1	0.0	0.0	0.0	0.1	0.2	0.3	0.5	0.7	0.5	0.4	3.0
End-Month Targets	kaf	74.0	73.0	72.5	72.0	72.0	69.0	69.0	72.0	134.0	144.0	140.0	115.0	
End-Month Contents	kaf	74.0	73.0	72.5	72.0	72.0	69.0	69.0	72.0	134.0	144.0	140.0	115.0	
End-Month Elevation	ft	7902.57	7901.77	7901.37	7900.97	7900.97	7898.49	7898.49	7900.97	7940.34	7945.36	7943.38	7930.06	

Willow Creek Reservoir

Init Cont: 8.00 kaf Maximum Cont: 10.20 kaf Minimum Cont: 7.20 kaf
Elev: 8125.4 ft Elev: 8128.8 ft Elev: 8116.9 ft

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Native Inflow	kaf	1.2	1.1	1.1	1.0	0.9	1.4	3.8	37.8	31.6	5.2	2.8	2.7	90.6
Spill/Bypass	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.5	31.2	4.7	0.6	0.0	71.0
Total River Release	kaf	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	4.8
Pumped to Granby	kaf	1.7	0.0	0.6	0.6	0.5	0.9	3.4	0.9	0.0	0.0	3.3	2.2	14.1
Evaporation	kaf	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.7
End-Month Contents	kaf	7.5	8.1	8.2	8.2	8.2	8.2	8.2	10.0	9.9	9.8	8.2	8.2	
End-Month Elevation	ft	8121.47	8124.04	8124.40	8124.40	8124.40	8124.40	8124.40	8130.77	8130.26	8130.10	8124.40	8124.40	

BUREAU OF RECLAMATION

COLORADO - BIG THOMPSON MONTHLY OPERATIONS
United States Bureau of Reclamation
Eastern Colorado Area Office
Loveland, Colorado

CBT October 2024 Max Reasonable: 01-OCT-2024

Granby Reservoir

Init Cont: 468.00 kaf **Maximum Cont:** 539.80 kaf **Minimum Cont:** 76.50 kaf
Elev: 8269.8 ft **Elev:** 8280.0 ft **Elev:** 8186.9 ft

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Native Inflow	kaf	2.6	2.4	2.1	1.9	1.6	2.5	3.3	17.5	66.4	43.7	9.7	4.7	158.4
Release from Shadow Mtn	kaf	2.3	2.7	2.8	1.2	1.1	1.2	1.7	7.5	84.1	38.9	2.5	2.1	148.1
Pump from Windy Gap	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pump from Willow Creek	kaf	1.7	0.0	0.6	0.6	0.5	0.9	3.4	0.9	0.0	0.0	3.3	2.2	14.1
Total Inflow	kaf	6.5	5.1	5.4	3.7	3.2	4.6	8.3	25.9	150.5	82.7	15.5	9.0	320.4
Spill/Bypass	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	72.5	0.3	0.0	72.8
Total River Release	kaf	1.2	1.2	1.2	1.2	1.1	1.2	1.2	4.6	4.5	4.6	4.9	1.2	28.1
Pumped to Shadow Mtn	kaf	3.0	2.6	31.6	32.6	26.9	15.2	0.7	3.6	0.0	1.6	20.6	19.2	157.6
Evaporation	kaf	1.6	0.7	0.0	0.0	0.0	0.8	1.4	2.2	3.0	3.0	2.3	2.1	17.1
Seepage loss	kaf	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.6
End-Month Contents	kaf	468.4	468.8	441.1	410.7	385.7	372.8	377.6	392.8	535.6	536.3	523.4	509.6	
End-Month Elevation	ft	8269.87	8269.93	8265.81	8261.11	8257.11	8255.00	8255.78	8258.26	8279.43	8279.53	8277.73	8275.79	

Shadow Mountain Reservoir

Init Cont: 17.00 kaf **Maximum Cont:** 18.40 kaf **Minimum Cont:** 16.60 kaf
Elev: 8366.7 ft **Elev:** 8367.0 ft **Elev:** 8366.0 ft

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Native Inflow	kaf	3.4	3.2	2.8	2.5	2.1	3.2	4.4	23.2	88.0	58.0	12.9	6.3	210.0
Pumped from Granby	kaf	3.0	2.6	31.6	32.6	26.9	15.2	0.7	3.6	0.0	1.6	20.6	19.2	157.6
Total Inflow	kaf	6.5	5.8	34.3	35.0	29.0	18.4	5.1	26.8	88.0	59.6	33.5	25.5	367.5
Spill/Bypass	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total River Release	kaf	2.3	2.7	2.8	1.2	1.1	1.2	1.7	7.5	84.1	38.9	2.5	2.1	148.1
Adams Tunnel Flow	kaf	4.0	3.0	31.5	33.8	27.9	16.9	3.0	18.6	3.2	19.9	30.5	22.9	215.2
Evaporation	kaf	0.3	0.1	0.0	0.0	0.0	0.2	0.3	0.5	0.6	0.5	0.4	0.4	3.3
End-Month Contents	kaf	16.8	16.8	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	
End-Month Elevation	ft	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	8366.62	

Adams Tunnel

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Maximum Tunnel Capacity	kaf	4.6	3.0	31.5	33.8	27.9	26.4	3.0	23.3	4.0	20.5	30.1	16.0	224.1
Actual Diversion	kaf	4.0	3.0	31.5	33.8	27.9	16.9	3.0	18.6	3.2	19.9	30.5	22.9	215.2
% Maximum Delivery	%	87	100	100	100	100	64	100	80	79	97	101	143	

Lake Estes

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Big Thompson Inflow	kaf	2.3	1.5	1.0	0.6	0.4	0.5	3.0	13.2	48.8	35.3	11.6	6.2	124.4
Actual River Release	kaf	3.5	1.5	1.0	0.6	0.4	0.5	2.2	7.5	19.3	21.1	9.0	3.7	70.3
Max Diversion Available	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Priority Water Diverted	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.6	5.4	0.0	0.0	19.0
Skim Water Diverted	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.8	5.8	15.9	8.8	2.5	2.5	36.3
Irrigation Demand	kaf	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.1	1.2
Irrigation Delivery	kaf	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.3	0.1	1.1
Total River Release	kaf	3.5	1.5	1.0	0.6	0.4	0.5	2.2	7.5	19.3	21.1	9.0	3.7	70.3

Olympus Tunnel

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Maximum Tunnel Capacity	kaf	33.8	32.7	33.8	33.8	30.5	33.8	32.7	33.8	32.7	33.8	33.8	32.7	397.9
Actual Delivery	kaf	2.7	3.0	31.5	33.8	27.9	16.9	3.7	24.3	32.5	33.8	32.7	25.2	268.0
% Maximum Delivery	%	8	9	93	100	91	50	11	72	99	100	97	77	
Inflow to Flatiron	kaf	2.7	3.0	31.5	33.8	27.9	16.9	3.7	24.3	32.5	31.3	30.5	16.6	254.7

Carter Lake

Init Cont: 75.00 kaf Maximum Cont: 112.20 kaf Minimum Cont: 6.00 kaf
Elev: 5723.9 ft Elev: 5759.0 ft Elev: 5626.8 ft

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Pumped from Flatiron	kaf	0.0	0.0	11.1	20.4	16.7	9.7	0.0	10.5	6.9	9.5	16.9	5.2	106.9
Flatiron Bifurcation	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Carter to Flatiron	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Evaporation Loss	kaf	0.2	0.1	0.0	0.0	0.0	0.2	0.3	0.4	0.5	0.5	0.4	0.3	2.9
Seepage Loss	kaf	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.0
End-Month Contents	kaf	66.2	63.2	71.8	89.5	103.9	110.4	105.9	111.5	111.7	111.9	109.0	94.4	
End-Month Elevation	ft	5715.25	5712.13	5721.01	5738.36	5751.06	5757.43	5753.44	5758.39	5758.11	5758.23	5755.69	5742.94	
Priority Water Diverted to Carter	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.7	0.9	0.0	0.0	6.6
Irrigation & Metered Demand	kaf	7.7	2.1	1.8	2.0	1.9	2.4	3.8	3.9	5.1	7.9	18.5	18.8	75.9
Windy Gap demand	kaf	0.3	0.6	0.7	0.5	0.4	0.4	0.3	0.4	1.0	0.8	0.7	0.6	6.7
Total Demand	kaf	8.1	2.7	2.5	2.5	2.2	2.8	4.1	4.3	6.1	8.7	19.2	19.4	82.6
Total Delivery	kaf	8.1	2.7	2.5	2.5	2.2	2.8	4.1	4.3	6.1	8.7	19.2	19.4	82.6
% Required Delivery	%	100	100	100	100	100	100	100	100	100	100	100	100	
Shortage	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Hansen Canal 930

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Maximum Flow	kaf	33.2	55.3	57.2	57.2	51.6	57.2	55.3	57.2	55.3	57.2	57.2	55.3	649.2
Actual Flow	kaf	2.7	3.0	20.4	13.4	11.1	7.2	3.7	13.8	25.5	21.9	13.6	11.4	147.7

Dille Tunnel

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Big Thompson River Below Lake Estes	kaf	3.5	1.5	1.0	0.6	0.4	0.5	2.2	7.5	19.3	21.1	9.0	3.7	70.3
North Fork Big Thompson River at Drake	kaf	0.4	0.3	0.3	0.2	0.2	0.2	1.3	4.1	9.0	6.4	2.7	1.5	26.6
Dille Skim Water Diverted	kaf	0.1	0.0	0.0	0.0	0.0	0.0	1.2	8.6	8.6	14.8	9.3	2.8	45.4
Dille Priority Water Diverted	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
water available	kaf	3.8	1.8	1.2	0.9	0.6	0.7	3.4	11.6	28.3	27.5	11.7	5.2	96.7
water diverted	kaf	0.1	0.0	0.0	0.0	0.0	0.0	1.2	8.6	8.6	14.8	9.3	2.8	45.4
% Diverted	%	1	0	0	0	0	0	23	158	159	272	171	52	
Big T @ Canyon Mouth	kaf	3.8	1.8	1.2	0.9	0.6	0.7	2.2	3.0	19.7	12.8	2.5	2.4	51.6

Trifurcation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Release from Flatiron	kaf	2.7	3.0	20.4	13.4	11.1	7.2	3.7	13.8	25.5	21.9	13.6	11.4	147.7
Release to 550 Canal	kaf	0.8	3.0	20.4	13.4	11.1	7.2	2.8	7.9	9.6	12.6	8.3	4.1	101.2
Dille Tunnel	kaf	0.1	0.0	0.0	0.0	0.0	0.0	1.2	8.6	8.6	14.8	9.3	2.8	45.4
Total release to river	kaf	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.2	4.4	9.5
Irrigation demand	kaf	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.2	4.3	9.4
Windy Gap demand	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Total requirement	kaf	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.2	4.4	9.5
Total delivery	kaf	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.2	4.4	9.5
% Required Delivery	%	100	100	100	100	100	100	100	100	100	100	100	100	
Shortage	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Hansen Canal 550

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Inflow from Flatiron	kaf	0.8	3.0	20.4	13.4	11.1	7.2	2.8	7.9	9.6	12.6	8.3	4.1	101.2
Maximum flow	kaf	17.5	29.1	30.1	30.1	27.2	30.1	29.1	14.0	27.0	20.4	19.9	16.3	290.8
Irrigation demand	kaf	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.5	0.4	2.2
Irrigation delivery	kaf	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.5	0.4	1.7
Rels to Horsetooth	kaf	0.8	3.0	20.4	13.4	11.1	7.2	2.8	7.9	9.6	12.6	8.3	4.1	101.2

Horsetooth Reservoir

Init Cont: 115.00 kaf **Maximum Cont:** 157.00 kaf **Minimum Cont:** 13.00 kaf
Elev: 5407.6 ft **Elev:** 5430.0 ft **Elev:** 5316.8 ft

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Inflow	kaf	0.8	3.0	20.4	13.4	11.1	7.2	2.8	7.9	9.6	12.6	8.3	4.1	101.2
Total irrigation delivery	kaf	8.0	2.9	2.4	2.4	2.3	2.5	3.1	3.7	6.1	8.9	23.0	18.3	83.6
Evaporation loss	kaf	0.4	0.2	0.0	0.0	0.0	0.3	0.5	0.7	0.9	0.8	0.6	0.5	4.9
Seepage loss	kaf	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.3
End-Month Content	kaf	106.8	106.6	124.3	135.1	143.8	148.0	147.1	150.5	153.0	155.7	140.3	125.4	
End-Month Elevation	ft	5402.99	5402.83	5413.10	5418.97	5423.51	5425.65	5425.22	5426.91	5428.13	5429.49	5421.69	5413.69	
Priority water diverted to Horsetooth	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.8	4.3	0.0	0.0	12.1
Irrigation demand	kaf	5.2	0.6	0.0	0.0	0.0	0.0	0.1	0.8	0.5	3.2	17.2	13.6	41.2
Metered Demand	kaf	2.4	2.0	2.1	2.1	2.1	2.2	2.5	2.4	4.9	5.0	4.8	3.9	36.4
Windy Gap demand	kaf	0.5	0.3	0.3	0.3	0.2	0.3	0.5	0.5	0.7	0.7	1.0	0.8	6.1
Total demand	kaf	8.0	2.9	2.4	2.4	2.3	2.5	3.1	3.7	6.1	8.9	23.0	18.3	83.6
% Required Delivery	%	100	100	100	100	100	100	100	100	100	100	100	100	
Shortage	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CBT Project Summary

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Total CBT Delivery	kaf	18.5	4.7	3.9	4.1	3.9	4.6	6.5	7.3	10.7	16.7	43.5	41.1	165.5

Windy Gap

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Pumping	**kaf**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Losses	**kaf**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spill	**kaf**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delivery	**kaf**	0.8	0.9	1.0	0.8	0.6	0.7	0.8	0.9	1.7	1.5	1.7	1.5	12.9

PUMPING AND GENERATION OPERATIONS

Green Mountain Generation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Maximum Generation	**gwh**	18.600	18.000	18.600	18.600	16.800	18.600	18.000	18.600	18.000	18.600	18.600	18.000	219.000
Generation	**gwh**	8.300	2.000	1.800	1.800	1.500	2.100	2.600	8.300	15.900	19.000	6.000	7.600	76.900
% Maximum Generation	**%**	45	11	10	10	9	11	14	45	88	102	32	42	
Average	**kwh/af**	180	168	168	167	167	166	163	165	186	210	208	201	

Willow Creek Pumping

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Maximum Pumping	**kaf**	24.6	23.8	24.6	24.6	22.2	24.6	23.8	4.0	0.0	0.0	18.2	23.8	214.2
Actual Pumping	**kaf**	1.7	0.0	0.6	0.6	0.5	0.9	3.4	0.9	0.0	0.0	3.3	2.2	14.1
Pump Energy	**gwh**	0.400	0.000	0.100	0.100	0.100	0.200	0.700	0.200	0.000	0.000	0.700	0.500	3.000
% Maximum Pumping	**%**	7	0	2	2	2	4	14	22	0	0	18	9	80
Average	**kwh/af**	213	0	213	213	213	213	213	213	0	0	213	213	

Lake Granby Pumping

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Maximum Pumping	**kaf**	36.9	35.7	36.9	36.9	33.3	36.9	35.7	36.9	35.7	36.9	36.9	35.7	434.4
Actual Pumping	**kaf**	3.0	2.6	31.6	32.6	26.9	15.2	0.7	3.6	0.0	1.6	20.6	19.2	157.6
Pump Energy	**gwh**	0.400	0.400	4.500	4.700	4.000	2.300	0.100	0.500	0.000	0.200	2.900	2.700	22.700
% Maximum Pumping	**%**	8	7	86	88	81	41	2	10	0	4	56	54	
Average	**kwh/af**	143	143	144	146	147	149	149	149	0	140	140	141	

Marys Lake Generation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Adams Tunnel Flow	kaf	4.0	3.0	31.5	33.8	27.9	16.9	3.0	18.6	3.2	19.9	30.5	22.9	215.2
Maximum Generation	gwh	0.000	0.000	6.400	6.400	5.800	6.400	6.200	6.400	6.200	6.400	6.400	6.200	62.800
Generation	gwh	0.000	0.000	5.900	6.400	5.200	2.800	0.000	2.900	0.200	3.600	5.700	4.000	36.700
% Maximum Generation	%	0	0	19	19	19	17	0	16	5	18	19	17	
Average	kwh/af	0	0	187	189	186	165	0	156	54	181	186	173	

Lake Estes Generation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Adams Tunnel Flow	kaf	4.0	3.0	31.5	33.8	27.9	16.9	3.0	18.6	3.2	19.9	30.5	22.9	215.2
Maximum Generation	gwh	16.000	15.500	16.000	16.000	14.500	16.000	15.500	16.000	15.500	16.000	16.000	15.500	188.500
Generation	gwh	1.000	0.500	15.000	16.000	13.300	7.400	0.500	8.200	1.200	9.200	14.300	10.500	97.100
% Maximum Generation	%	6	3	93	100	92	46	3	51	8	58	89	68	
Average	kwh/af	241	167	475	474	479	440	155	443	389	464	468	459	

Pole Hill Generation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Olympus Tunnel Flow	kaf	33.8	32.7	33.8	33.8	30.5	33.8	32.7	33.8	32.7	33.8	33.8	32.7	397.9
Maximum Generation	gwh	0.000	0.000	25.800	25.800	2.500	0.000	0.000	19.100	25.000	25.800	25.800	25.000	174.800
Generation	gwh	0.000	0.000	24.100	25.800	2.300	0.000	0.000	16.100	24.800	25.800	25.000	18.000	161.900
% Maximum Generation	%	0	0	94	100	91	0	0	84	99	100	97	72	
Average	kwh/af	0	0	713	762	75	0	0	477	757	763	739	551	

Flatiron Units 1 and 2 Generation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Inflow to Flatiron	kaf	2.7	3.0	31.5	33.8	27.9	16.9	3.7	24.3	32.5	31.3	30.5	16.6	254.7
Maximum Generation	gwh	32.200	31.200	32.200	32.200	29.100	32.200	31.200	32.200	31.200	32.200	32.200	31.200	379.300
Generation	gwh	1.600	1.400	28.900	32.200	25.000	13.700	2.000	21.200	30.800	28.700	27.800	13.300	226.600
% Maximum Generation	%	5	5	90	100	86	43	6	66	99	89	86	43	
Average	kwh/af	585	476	918	953	896	814	542	875	947	917	913	801	

Flatiron Unit 3 Pump/Generation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Maximum Pumping	kaf	0.0	0.0	11.1	20.4	16.7	9.7	0.0	10.5	6.9	9.5	16.9	5.2	106.9
Pump from Flatiron	kaf	0.0	0.0	11.1	20.4	16.7	9.7	0.0	10.5	6.9	9.5	16.9	5.2	106.9
Pump Energy	gwh	0.000	0.000	3.400	6.600	5.800	3.500	0.000	3.800	2.500	3.400	6.100	1.900	37.000
% Maximum Pumping	%	0	0	100	100	100	100	0	100	100	100	100	100	
Average	kwh/af	0	0	308	326	346	361	0	361	363	364	364	361	
Maximum Turbine release	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Carter to Flatiron	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum Generation	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Actual Generation	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Big Thompson Generation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Total release	kaf	1.7	0.0	0.0	0.0	0.0	0.0	2.1	14.4	24.5	23.7	14.0	9.7	90.1
Turbine release	kaf	1.7	0.0	0.0	0.0	0.0	0.0	2.1	14.4	23.7	23.7	14.0	9.7	89.3
Wasteway release	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.8
Maximum Generation	gwh	2.200	0.000	0.000	0.000	0.000	0.000	1.900	3.800	3.700	3.800	3.800	3.700	22.900
Generation	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.200	2.100	3.700	3.700	2.100	1.300	13.100
% Maximum Generation	%	0	0	0	0	0	0	9	56	100	97	56	36	
Average	kwh/af	1	0	0	0	0	0	76	149	156	156	152	138	

Project Generation

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Total Generation	**gwh**	10.800	3.900	75.800	82.200	47.300	26.100	5.200	58.900	76.500	90.000	80.900	54.800	612.400
Total Max Generation	**gwh**	69.100	64.700	99.100	99.100	68.700	73.300	72.700	96.200	99.600	102.900	102.900	99.600	1047.900

Project Pump Energy

		Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Total
Granby	**gwh**	0.400	0.400	4.500	4.700	4.000	2.300	0.100	0.500	0.000	0.200	2.900	2.700	22.700
Willow Creek	**gwh**	0.400	0.000	0.100	0.100	0.100	0.200	0.700	0.200	0.000	0.000	0.700	0.500	3.000
Flatiron Unit 3	**gwh**	0.000	0.000	3.400	6.600	5.800	3.500	0.000	3.800	2.500	3.400	6.100	1.900	37.000
Total Pump Energy	**gwh**	0.800	0.400	8.100	11.500	9.800	5.900	0.800	4.500	2.500	3.700	9.700	5.100	62.800

Water Year 2025 Plan Summary Charts

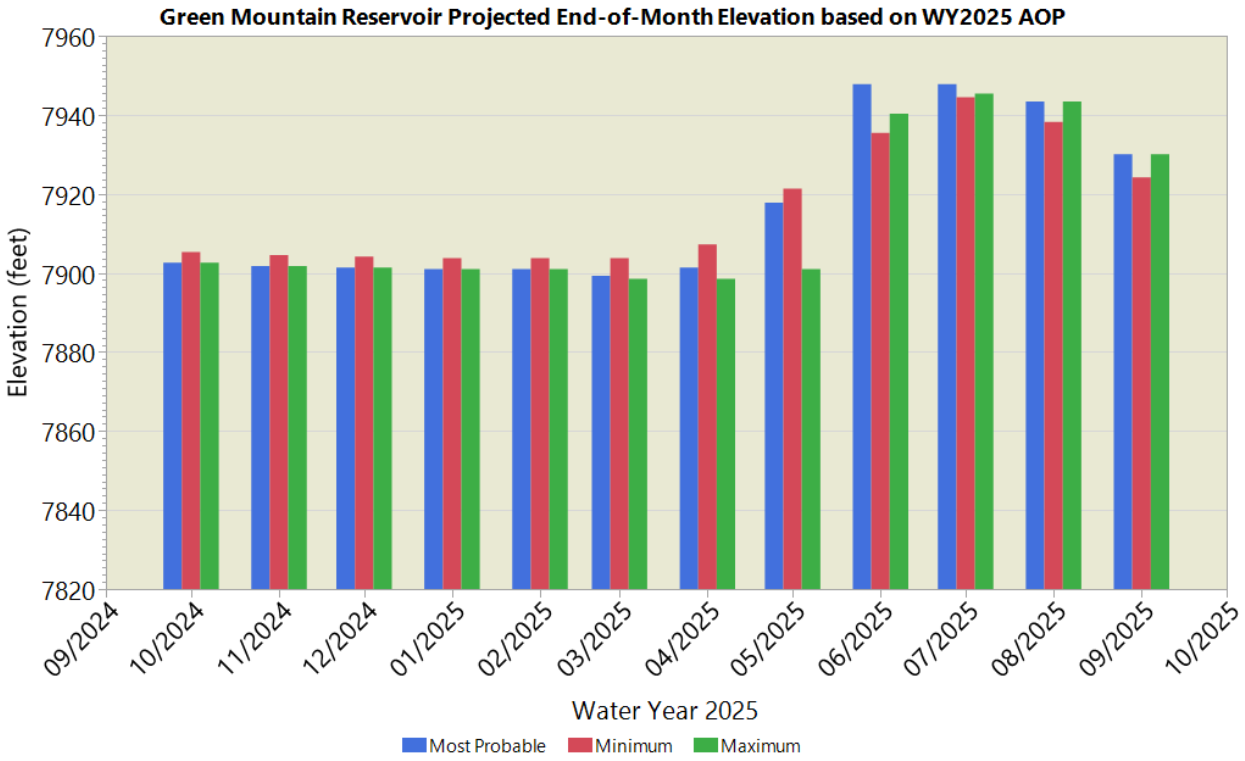


Figure B-1.—Water Year 2025 Operation Plan, Green Mountain Reservoir Elevations.

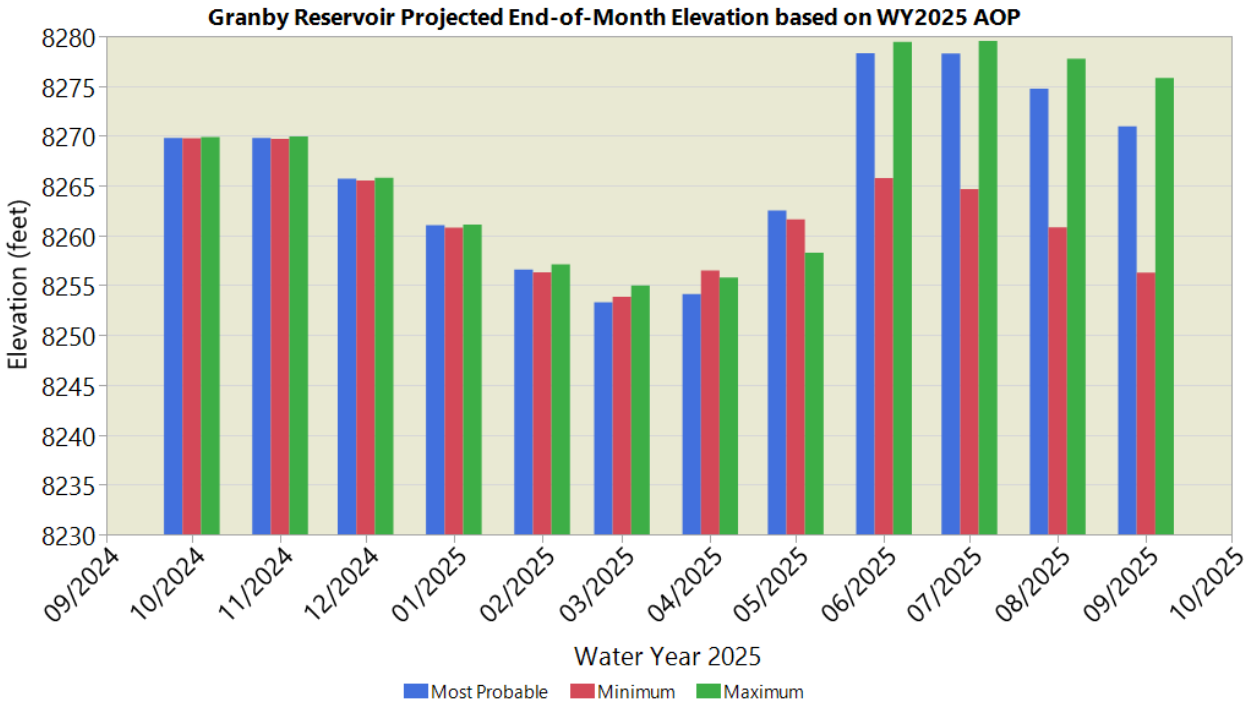


Figure B-2.—Water Year 2025 Operation Plan, Granby Reservoir Elevations.

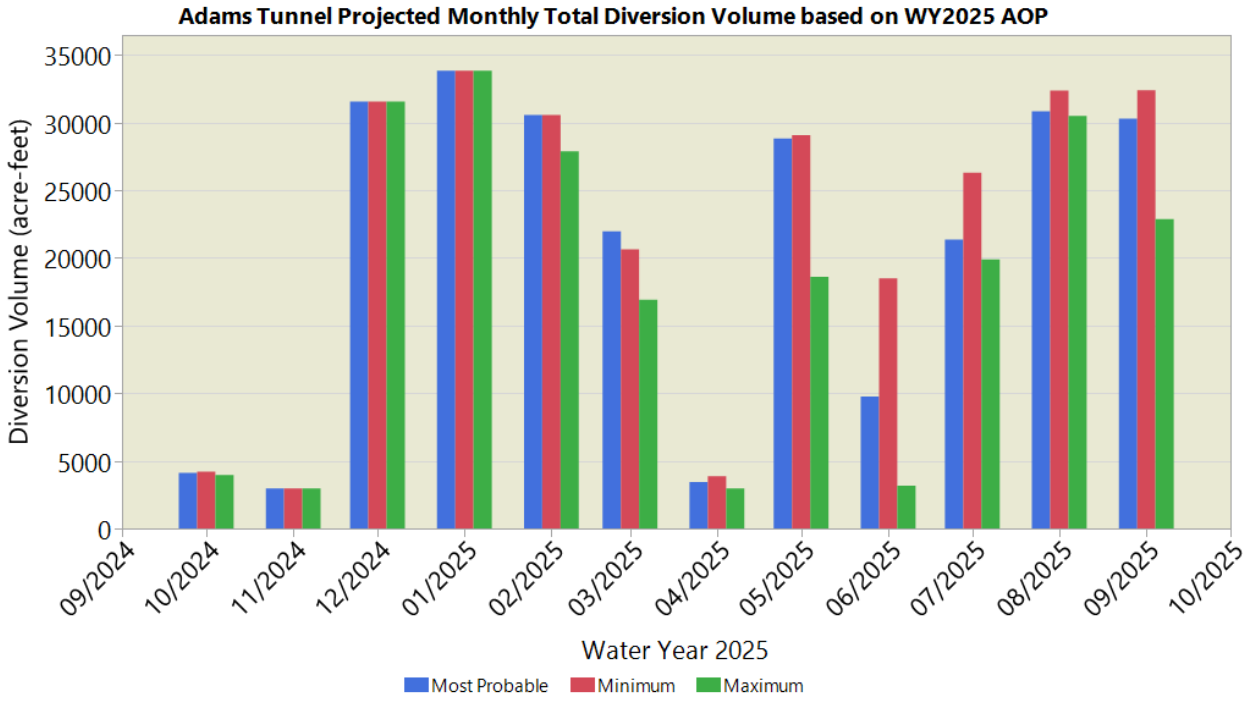


Figure B-3.—Water Year 2025 Operation Plan, Adams Tunnel Diversions.

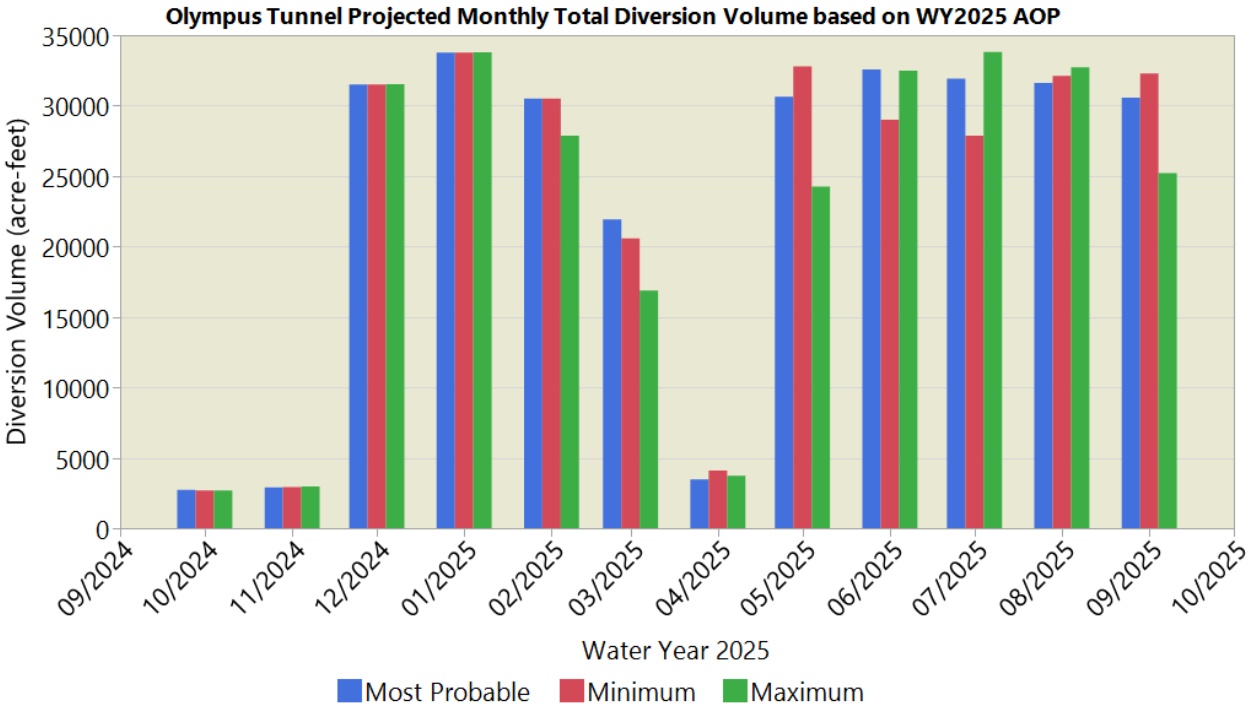


Figure B-4.—Water Year 2025 Operation Plan, Olympus Tunnel Diversions.

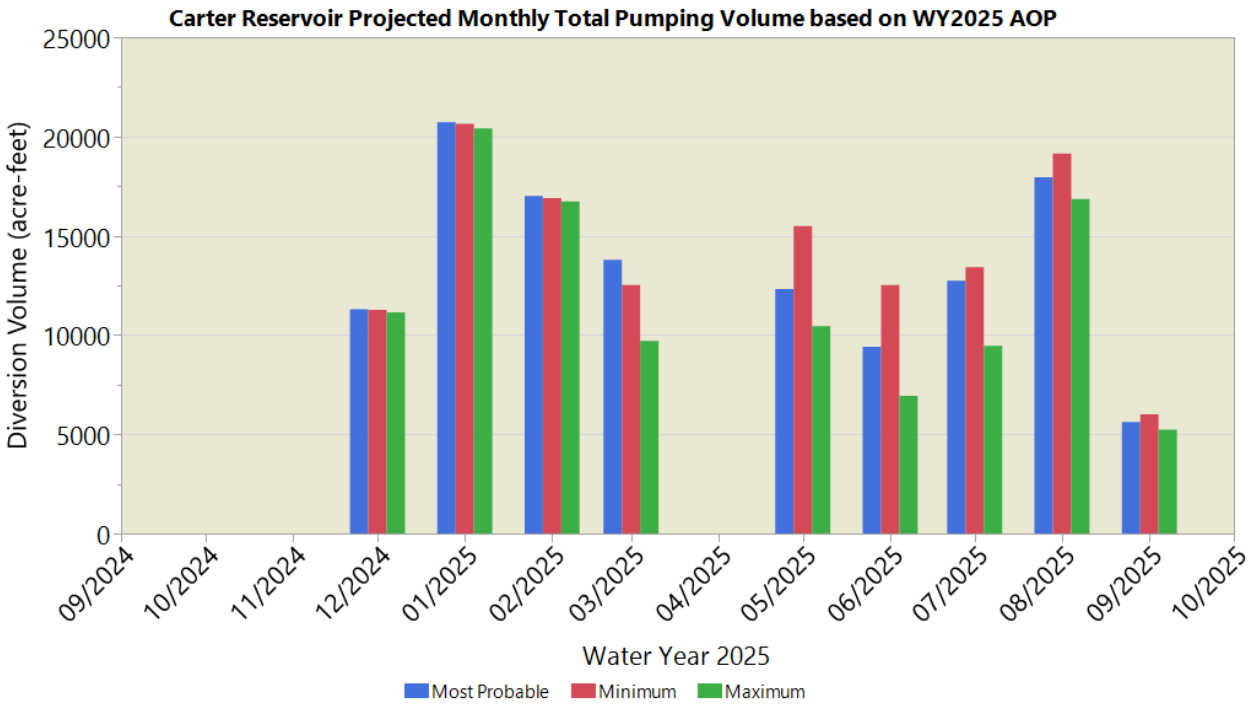


Figure B-5.—Water Year 2025 Operation Plan, Flatiron Unit #3 Pump Volume to Carter Lake Reservoir.

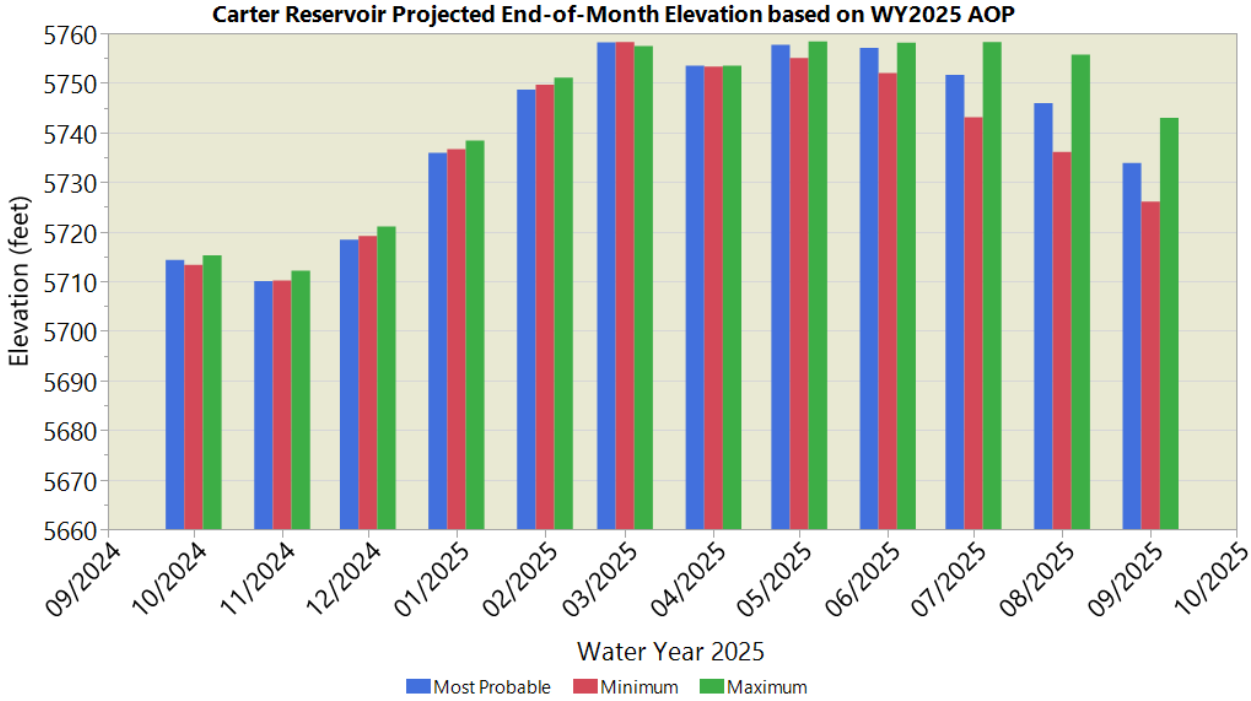


Figure B-6.—Water Year 2025 Operation Plan, Carter Lake Reservoir Elevations.

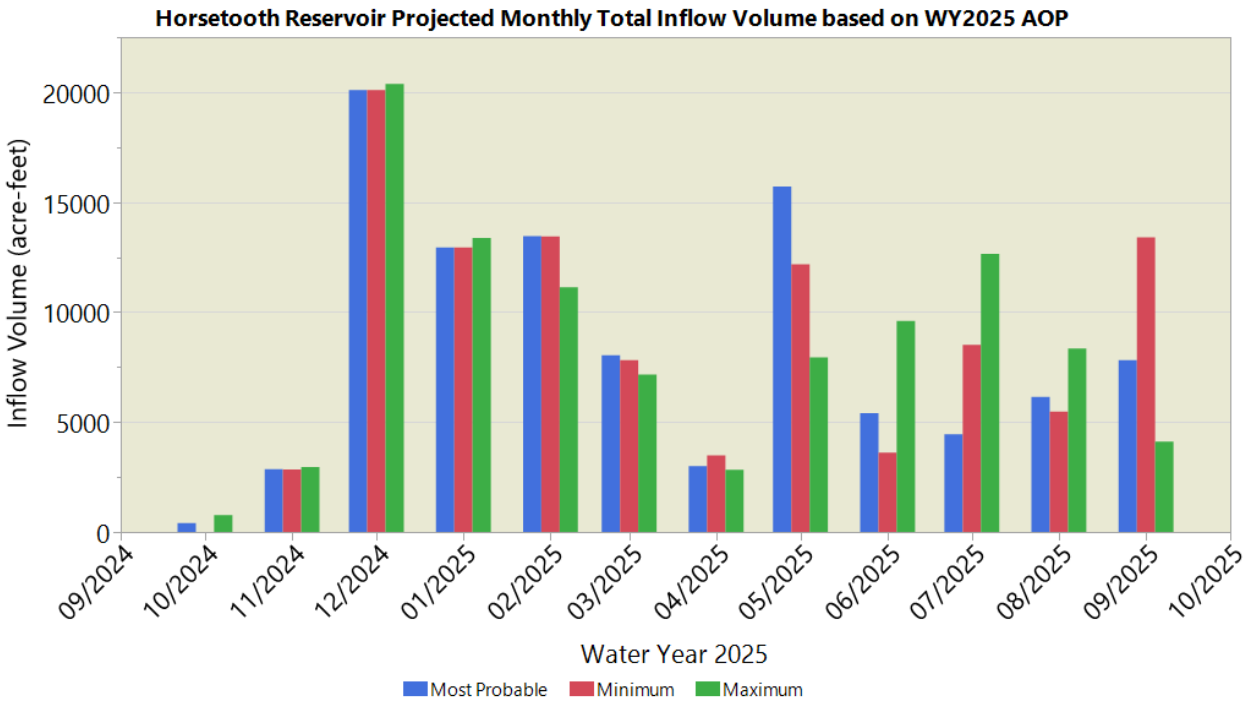


Figure B-7.—Water Year 2025 Operation Plan, Hansen Feeder Canal Inflow to Horsetooth Reservoir.

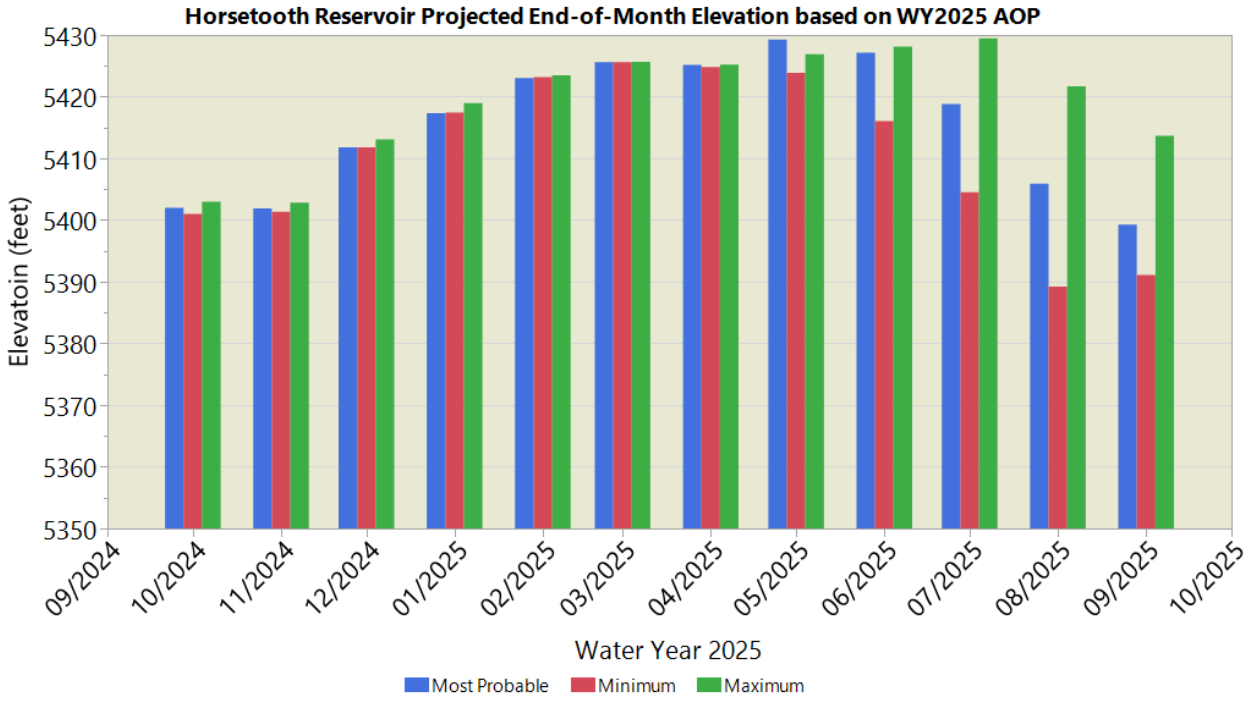


Figure B-8.—Water Year 2025 Operation Plan, Horsetooth Reservoir Elevations.

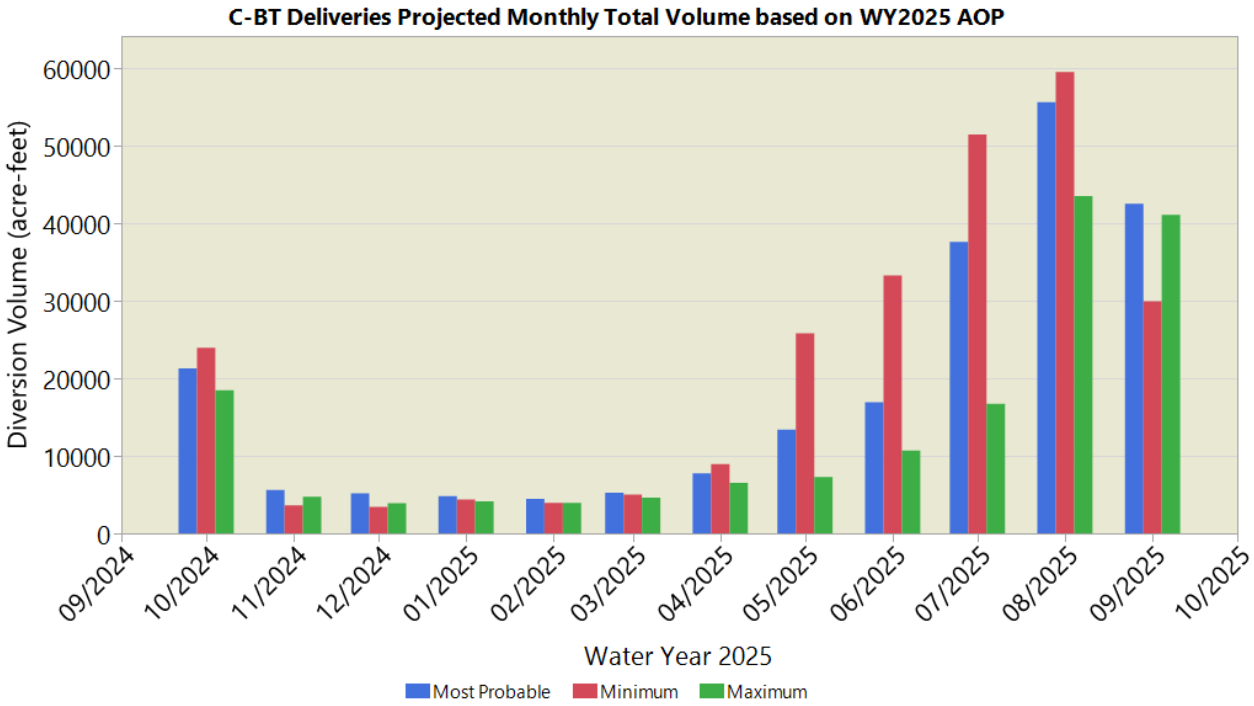


Figure B-9.—Water Year 2025 Operation Plan, C-BT monthly delivery volumes.

Appendix C

Exhibits

C-1: Publicity Map, Extents, Facts and Connectivity Schematic of The Colorado-Big Thompson Project

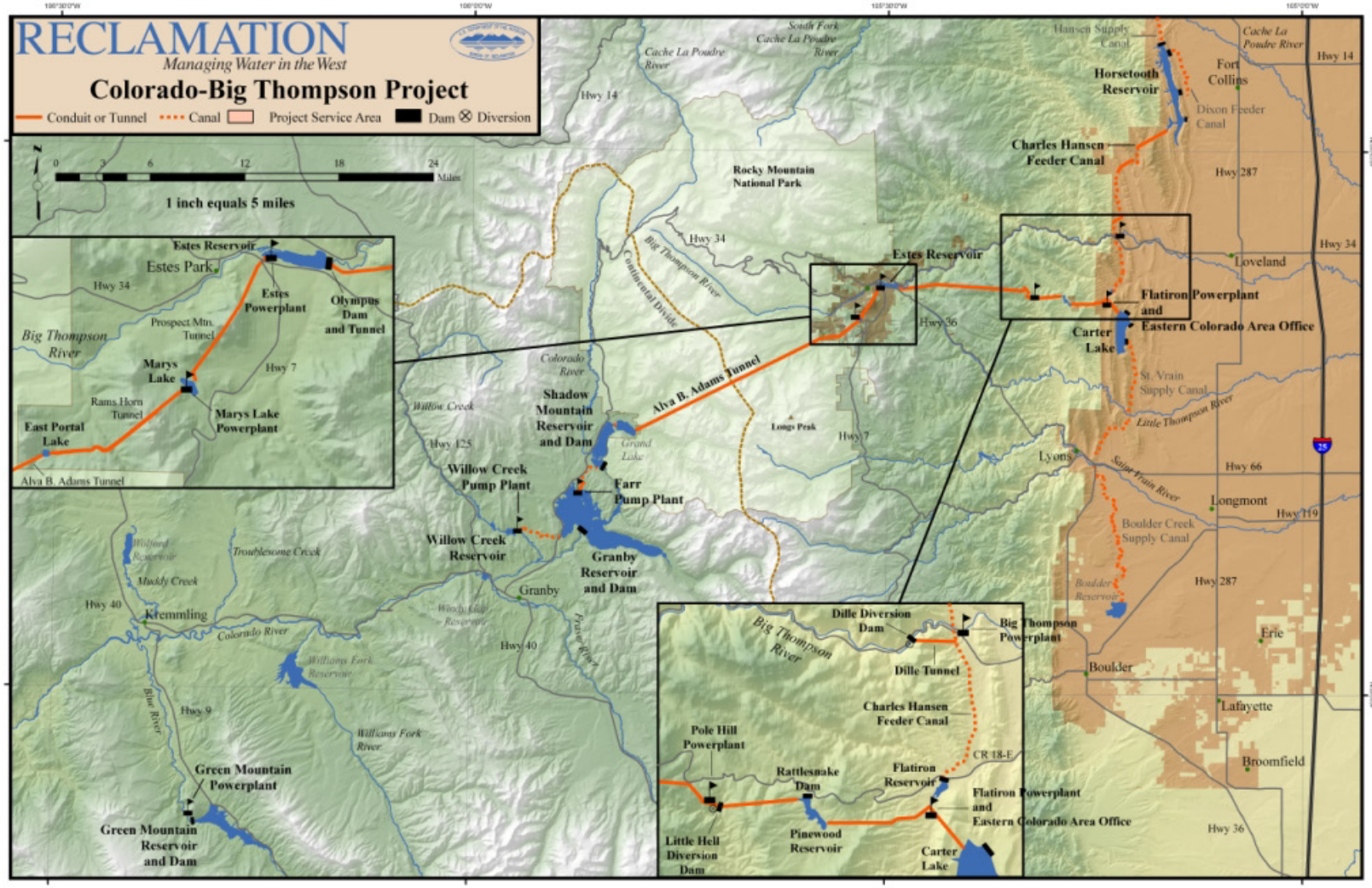
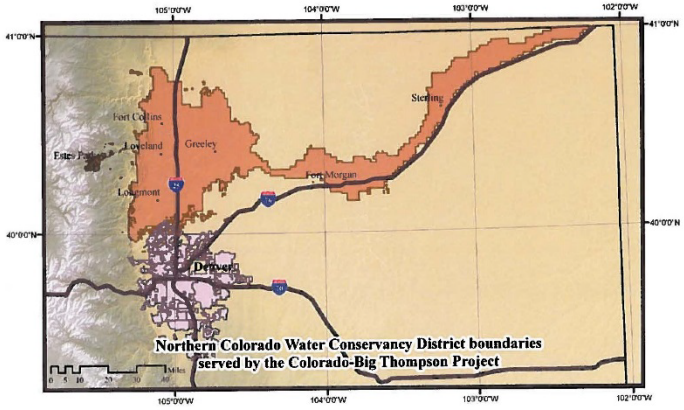


Figure C-1A.—Map showing overview of C-BT Project.

The narrative overview of the C-BT project begins on page 4 of this report.



Colorado-Big Thompson Facts

- A trans-mountain, trans-basin water diversion, storage, and delivery project
- Signed into law by President Roosevelt in 1937
- Construction period: 1938-1952
- Ten major reservoirs (Green Mountain, Willow Creek, Granby, Shadow Mountain, Marys Lake, Estes, Pinewood, Carter, Flatiron and Horsetooth)
- Twenty major dams and dikes
- Twenty-two tunnels, canals and other conduits covering about 130 miles
- Six hydroelectric powerplants (Green Mountain, Marys, Estes, Pole Hill, Flatiron, Big Thompson)
- Water right allows for diversion of up to 310,000 acre-feet of water a year
- Average annual diversion over life of project is 260,000 acre-feet
- Water falls over 2000 feet from Continental Divide to Colorado's eastern Plains, providing for hydroelectric power generation.
- Together, all six powerplants generate approximately 759 million kilo-Watt hours of electricity a year—enough to power 58,300 American homes for a year.
- The C-BT provides water to 29 cities and towns, including 620,000 irrigated acres and a population of 725,000 people

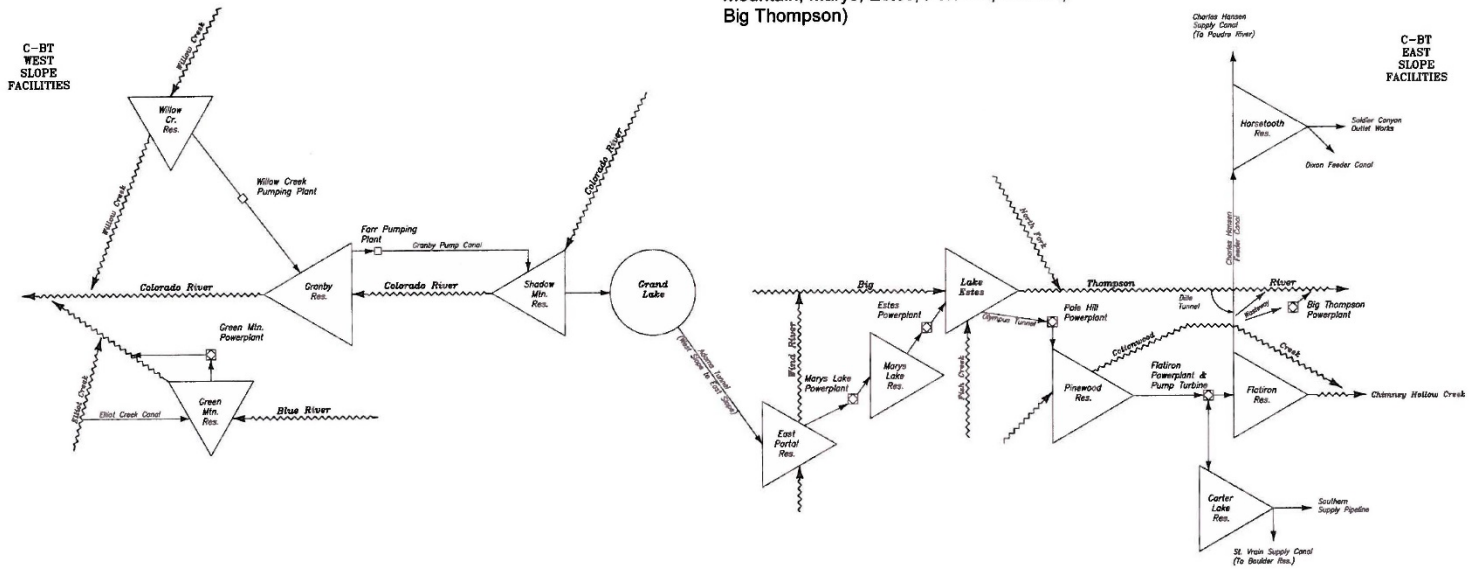


Figure C-1B.—Schematic of C-BT Project.

C-2: Profile View of the Colorado-Big Thompson Project

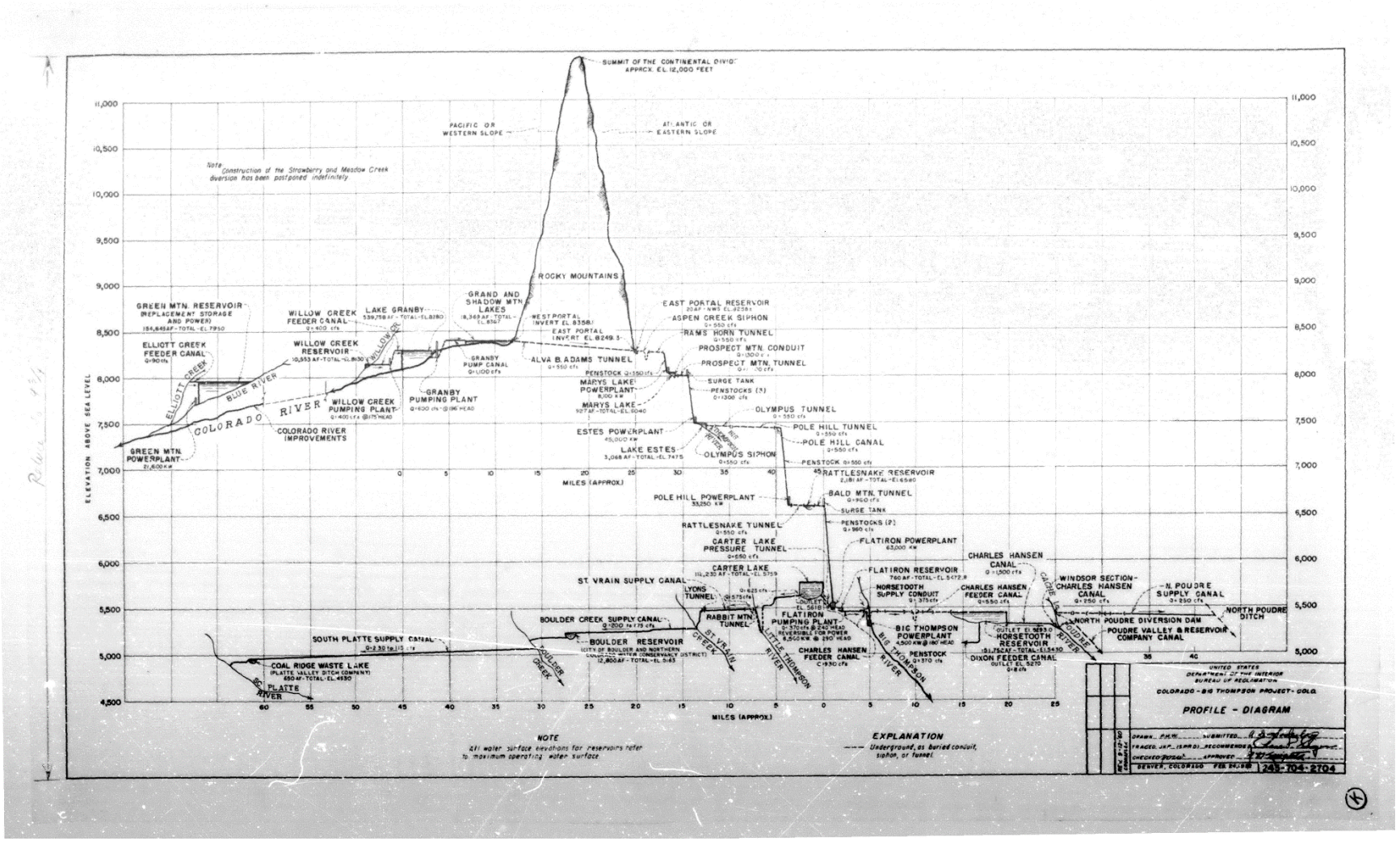


Figure C-2.—Profile view of C-BT Project.

Seventy-Third Annual Report of the Western Division System Power Operations

Preface

This is the seventy-third annual report for the Pick-Sloan Missouri Basin Program, Western Division System (WD System) power operations. For the purpose of this report, the WD System also includes the Yellowtail Powerplant Units 1 and 2 and the generating facilities of the Fryingpan Arkansas Project (Fry-Ark). The function of the report is to inform interested parties of the generation and pump energy requirements of the hydropower system. The report consists of two parts: One part describes the actual generation and pumping operations for water year WY2024 and the second part presents the plan of generation and pumping operations for WY2025.

Water Year 2024—Generation And Pump Energy Summary

Power generation for the Colorado-Big Thompson Project (C-BT) during WY2024 was considerably less than the 30-year average. The Fry-Ark was substantially less than the 30-year average for WY2024. The North Platte project was mildly greater than the 30-year average and the Big Horn project was mildly less than average. Overall, WD System power generation during WY2024 was less than average. In the C-BT all powerplants produced less than average power, while Green Mountain produced 112 percent of average during the water year.

In the case of the C-BT, observed demands for water were greater than average for WY2024. The declared quota was 70 percent by April 2024 and increased to 80 percent by August. Adams Tunnel diversions were less than average. Snowpack on the east slope of the C-BT was slightly below average but the Marys powerplant bottom end overhaul outage, and the Pole Hill afterbay and siphon repair which shut down water movement for the project for 14 weeks in the winter of WY2024, caused project generation to be considerably less than average.

From the generation data in table A-1, the C-BT powerplants produced an accumulated gross generation total of 447.3 gigawatt-hours (GWh) of electricity representing seventy-five percent of its 30-year average and 19.5 percent of gross WD System generation. The gross generation produced by the entire WD System was 1,860.6 GWh or 86 percent of the 30-year average. Gross generation includes one-half of the Yellowtail Powerplant generation. Net generation is the gross generation less the energy used for pumping at Farr Plant, Willow Creek Pump, Flatiron Unit 3 and the two Mount Elbert units. Using tables A-1 and A-2, WD System net generation for WY2024 was 1,780.8 GWh. The average for a water year is 1,921.0 GWh. The total WD System load includes firm energy deliveries, C-BT use-energy, support-energy, plant station service, and an estimate of transmission-system losses.
Table A-1 in appendix A includes the gross generation for every powerplant in the WD System.

Table A-2 reports the total energy required to operate the pumps in the WD System. Some of the numbers included in this section were provided by WAPA. Table A-3 shows monthly generation and pumping energy, by plant, and monthly WD System loads. The WD System boundaries are illustrated in appendix B-1. Figure B-2 graphically summarizes table A-3 including the C-BT contribution to the WD System.

In WY2024, the Willow Creek Pumping Station pumped to Granby Reservoir less than the total volume pumped during many previous water years. The Willow Creek Pumping Station used 3.8 GWh of power during its WY2024 operation. Meanwhile, the Farr Pumping Plant and the Flatiron Powerplant Unit 3 required 19.5 and 29.3 GWh, respectively. The Farr Pumping Plant required less energy for use than the 30-year average and Flatiron Powerplant Unit 3 operations required slightly more energy than the 30-year average. All three pump's combined power requirement was 52.6 GWh, 83.2 percent of the 30-year average, 2.8 percent of gross WD System generation. Pumping electrical demand is defined primarily by how much water is pumped and secondarily by how high the pump lifts that water.

According to the figures provided by WAPA, sales of electric power in the Western Division System totaled 2,469 GWh during WY2024, with revenue of $80,934,269. Although the firm power rate held steady between 2023-2024, there is a decrease in overall revenue due to a significant decrease (54 percent) in the average surplus sales pricing, even though WAPA sold more surplus energy in 2024 than in 2023. Energy deficits were covered by a combination of scheduled interchange energy, use of the Mount Elbert pumped storage plant, and power purchases. The power purchases totaled 646 GWh during WY2024 for which WAPA paid a total of $34,558,536, a notable decrease from the previous water year due to a substantial decrease (34 percent) in the average purchase power pricing.

Water Year 2025—Generation and Pump Energy Forecast

Under the most-probable runoff condition plan (2025 AOP), the gross generation for the C-BT powerplants is projected to be 667.7 GWh during WY2025, while pump energy requirements from the C-BT Power System are expected to reach 80.4 GWh. The result creates a projected gross generation less pumping of 587.3 GWh for the C-BT in WY2025 (table A-4). The total generation for the entire WD System is expected to be 1,880.9 GWh, with a total load of 2,135. GWh, leaving a power deficit of 274 GWh for WY2025 (includes station service use). The WD System generation includes one-half of the total Yellowtail Powerplant generation and the Mount Elbert Powerplant generation resulting from Fry-Ark Project water deliveries. The total load includes energy deliveries under firm contracts, seasonal support energy deliveries, energy dedicated for C-BT use, estimates of station service energy, and estimates of transmission WD System losses.

Table A-4 summarizes the projected monthly WD System generation, pump energy, and loads for the most probable forecasted runoff conditions for WY2025. Figure B-3 is a graphical summary of the WD System gross generation less pumping, including the C-BT contribution for the most probable inflow conditions. Table A-5 lists the scheduled maintenance for the various

facilities in the C-BT as anticipated when the AOP simulation was completed. Tables A-6 and A-7 summarize the capacity data for the powerplants and pumping plants within the WD System, including the Yellowtail and Mount Elbert Units.

Appendix A

Tables

Table A-1.—Western Division system generation for water year 2024

Powerplant	Accumulated Gross Generation		
	WY2024 (GWH)	Avg.[13] (GWH)	Percent of Avg.
Green Mountain	58.3	51.9	112
Marys Lake	0.0	37.2	0
Estes	89.9	100.3	90
Pole Hill	127.3	172.3	74
Flatiron 1&2	167.8	226.9	74
Big Thompson	4.1	10.9	37
Seminoe	138.9	132.5	105
Kortes	156.5	140.4	111
Freemont C.	228.8	239.6	95
Alcova	120.1	118.0	102
Glendo	88.4	80.1	110
Guernsey	18.5	19.4	95
Boysen	78.2	69.3	113
Heart Mountain[14]	21.5	15.8	136
Buffalo Bill[2]	70.6	68.3	103
Shoshone[2]	20.5	20.2	101
Spirit Mountain[2].	17.2	14.7	117
Mt. Elbert[15]	23.0	169	14
Yellowtail[16]	862.3	959	90
Total	**1,860.6**	**2,166.3**	**86**

Table A-2.—Pump energy used during water year 2024

Pumping Plant	October 2023–September 2024 Pump Energy		
	WY2024 (GWH)	Avg[17] (GWH)	Percent of Avg
Willow Creek	3.8	5.8	65
Farr	19.5	30.7	64
Flatiron Unit #3	29.3	26.7	110
Mt. Elbert[18]	27.1	182.1	15
Total	**79.7**	**245.3**	**33**

[13] 1976-2005 average unless noted otherwise
[14] Average gross generation for 1995–2012
[15] Gross pump/storage generation reported. Average is for 1990–1999
[16] Half of average gross generation of 1971–1990. In general, half of Yellowtail energy is dedicated the Western Division System through marketing arrangement; the other half is marketed in Eastern Division System.
[17] 1976-2005 average unless noted otherwise
[18] Average pump energy for 1990–1999

Table A-3.—Gross generation less pumping for water year 2024

Pick-Sloan Missouri Basin Program Western Division Power System Water Year 2024 Operations Gross Generation Less Pumping in Gigawatt-Hours													
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Total
Mt. Elbert[19]	0.0	0.0	7.5	7.1	6.6	1.1	2.0	7.6	4.4	2.5	3.6	3.7	46.1
Green Mountain	7.7	1.6	1.3	1.5	1.8	1.6	1.8	2.4	15.1	9.0	3.9	9.8	57.4
Willow Creek pump	-0.5	0.0	0.0	-0.1	0.0	0.0	-2.8	0.0	0.0	-0.5	0.0	0.0	-4.1
Farr pump	-0.8	-0.5	-0.6	-0.5	-0.3	-3.1	-3.0	-1.1	-0.1	-3.5	-3.9	-3.6	-20.9
Marys Lake	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
Estes	1.8	0.5	0.2	-0.2	-0.1	9.3	14.0	14.7	11.0	13.9	13.0	10.6	88.7
Pole Hill	0.2	0.0	-0.1	-0.1	-0.1	4.1	22.1	24.2	22.5	22.1	16.5	15.3	126.9
Flatiron 1&2	3.0	2.3	0.8	-0.1	0.0	5.8	27.6	30.2	27.1	27.5	23.3	19.4	166.9
Flatiron 3	0.0	0.0	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
Flatiron 3 pump	0.0	0.0	0.0	0.0	0.0	-1.2	-5.9	-6.4	-5.3	-6.1	-5.1	0.0	-30.0
Big Thompson	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.6	0.7	0.4	0.5	4.0
Seminoe	4.6	4.2	4.5	4.2	3.9	4.1	14.2	25.3	25.3	25.2	18.6	4.2	138.3
Kortes	5.6	5.0	5.4	5.4	5.1	5.2	15.4	27.9	27.2	27.4	20.0	5.7	155.4
Fremont Canyon	0.2	7.3	7.4	7.2	6.4	11.5	17.1	29.6	45.3	29.0	46.7	19.8	227.6
Alcova	3.1	2.9	3.0	1.5	2.7	4.8	4.1	13.9	24.6	26.0	25.6	6.6	118.9
Glendo	0.0	-0.1	-0.1	-0.2	-0.1	-0.1	2.0	17.5	21.3	20.5	19.0	8.0	87.7
Guernsey	0.0	0.0	-0.1	-0.1	-0.1	-0.1	1.3	4.0	4.1	1.7	4.2	3.1	18.0
Pilot Butte[20]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
Boysen	6.6	5.3	5.2	5.3	5.1	1.5	9.6	10.4	8.5	6.9	6.7	6.0	77.1
Shoshone	1.4	1.6	1.7	1.8	1.6	1.7	1.6	1.6	1.8	2.0	1.8	1.6	20.1
Buffalo Bill	3.6	0.8	0.9	0.8	0.8	0.9	8.5	11.5	12.2	12.6	10.4	6.9	69.7
Spirit Mountain	1.6	0.0	0.0	0.0	0.0	0.0	1.2	2.8	2.9	3.2	2.9	2.7	17.1
Diamond Cr. pump	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heart Mountain.	2.0	0.0	0.0	0.0	0.0	0.0	1.9	3.7	3.4	3.2	3.6	3.5	21.1

[19] Flow through energy reported, not pump/storage energy as reported in Table A-1
[20] Marketed energy

Pick-Sloan Missouri Basin Program Western Division Power System Water Year 2024 Operations Gross Generation Less Pumping in Gigawatt-Hours													
	Oct.	**Nov.**	**Dec.**	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**June**	**July**	**Aug.**	**Sept.**	**Total**
Yellowtail[21]	32.2	38.3	34.8	36.1	31.5	32.2	48.5	45.9	44.0	34.0	26.5	25.6	429.6
Fry-Ark	0.0	0.0	7.5	7.1	6.6	1.1	2.0	7.6	4.4	2.5	3.6	3.7	46.1
CBT	14.0	4.8	3.0	1.9	2.1	25.1	77.3	79.9	82.8	83.3	66.1	59.2	499.4
North Platte	13.3	19.4	20.1	18.1	18.0	25.4	54.1	118.3	147.8	129.9	134.1	47.4	745.9
Bighorn	31.3	26.8	25.3	25.9	23.1	20.1	47.0	53.0	50.8	44.8	38.6	33.3	419.9
Total Generation	58.6	50.9	55.9	53.1	49.9	71.7	180.3	258.7	285.7	260.5	242.4	143.6	1,711.3
Total Load	162.4	162.2	177	172.8	137	149.7	176.1	184.5	211.2	262.5	211.6	156.8	2,163.8
Surplus/deficit	-103.8	-111.3	-121.1	-119.7	-87.1	-78.0	4.2	74.2	74.5	-2.0	30.8	-13.2	-452.5

[21] Total Yellowtail reported in row but only half of total generation of Yellowtail used for Bighorn and Total Generation row of Western Division Power Generation Calculations. In general, half of Yellowtail energy is dedicated to the Western Division System through marketing arrangement. The other half is marketed in Eastern Division System.

Table A-4.—Most probable inflow projected gross generation and pumping for water year 2025

Pick-Sloan Missouri Basin Program Western Division Power System Water Year 2025 Forecasted Operations Most Probable Water Supply Condition Gross Generation And Pumping In Gigawatt-Hours													
	Oct.	**Nov.**	**Dec.**	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**June**	**July**	**Aug.**	**Sept.**	**Total**
Mt. Elbert[22]	0.3	0.0	2.7	3.3	4.9	4.5	3.0	2.9	2.3	1.4	5.3	2.4	33.7
Green Mountain	8.2	1.9	1.8	1.8	1.5	2.3	2.8	3.4	1.0	9.8	5.7	7.4	47.6
Willow Creek pump	0.4	0.0	0.1	0.1	0.1	0.1	0.7	4.4	3.4	0.6	0.2	0.2	10.3
Farr pump	0.5	0.4	4.5	4.7	4.4	3.1	0.2	0.7	0.0	1.9	4.0	4.1	28.5
Marys Lake	0.0	0.0	5.9	6.4	5.8	3.9	0.0	5.3	1.2	3.6	5.7	5.7	43.5
Estes	1.0	0.5	15.0	16.0	14.5	10.1	0.7	13.5	4.2	9.6	14.4	14.2	113.7
Pole Hill	0.0	0.0	24.1	25.8	23.3	16.2	0.0	23.4	24.8	24.4	24.1	23.3	209.4
Flatiron 1&2	1.6	1.4	28.9	32.2	29.1	18.7	1.8	27.8	30.9	26.3	27.0	17.7	243.4
Flatiron 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flatiron 3 pump	0.0	0.0	3.4	6.7	5.8	5.0	0.0	4.5	3.4	4.5	6.3	2.0	41.6
Big Thompson	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.9	3.7	2.7	1.6	1.1	10.1
Seminoe	5.2	5.0	5.2	5.1	4.6	5.1	9.5	26.3	26.3	19.3	11.8	6.5	130.0
Kortes	5.6	5.4	5.6	5.6	5.1	5.6	10.2	27.5	26.6	19.0	11.8	6.6	134.6
Fremont Canyon	0.5	6.8	7.0	7.1	6.4	12.1	16.5	32.7	37.3	44.6	43.0	22.5	236.6
Alcova	4.2	4.1	4.2	4.2	3.8	6.7	5.8	16.1	17.8	20.9	20.9	11.3	119.7
Glendo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Guernsey	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pilot Butte[23]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Boysen	4.6	3.5	3.6	3.6	3.3	3.6	6.2	8.4	11.5	11.0	7.5	6.5	73.5
Shoshone	1.1	1.0	1.1	1.1	1.0	1.1	1.1	1.8	2.2	2.2	1.2	1.1	16.0
Buffalo Bill	4.0	1.6	1.6	1.6	1.5	1.6	11.4	13.4	13.0	13.4	13.0	12.8	88.9
Spirit Mountain	2.5	0.0	0.0	0.0	0.0	0.0	1.2	2.4	2.8	3.2	3.2	3.1	18.3
Diamond Creek pump	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

[22] Project values are historic average flow through energy.
[23] Projected values are marketed energy

Pick-Sloan Missouri Basin Program Western Division Power System Water Year 2025 Forecasted Operations Most Probable Water Supply Condition Gross Generation And Pumping In Gigawatt-Hours													
	Oct.	**Nov.**	**Dec.**	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**June**	**July**	**Aug.**	**Sept.**	**Total**
Heart Mtn.	3.6	0.0	0.0	0.0	0.0	0.0	1.5	4.5	4.3	4.5	4.0	2.2	24.5
Yellowtail[24]	30.2	28.1	28.9	28.6	25.6	30.3	30.5	50.4	57.2	39.4	36.4	33.1	418.4
Fry-Ark	0.3	0.0	2.7	3.3	4.9	4.5	3.0	2.9	2.3	1.4	5.3	2.4	33.1
CBT	10.0	3.4	67.7	70.7	63.9	43.0	4.4	64.7	59.0	69.4	68.0	63.1	587.3
North Platte	15.4	21.3	22.0	22.0	19.9	29.5	42.0	102.6	108.0	103.8	87.5	46.8	620.9
Bighorn	45.9	34.2	35.2	34.9	31.3	36.6	51.8	80.9	90.9	73.6	65.3	58.8	639.5
Total Generation	71.6	59.0	127.6	130.9	120.0	113.7	101.3	251.1	260.2	248.2	226.1	171.1	1,880.9
Total Load	162.9	162.7	177.7	173.1	137.3	149.6	171.9	180	205.7	255.5	205.9	152.7	2,135.0
Station Service (3-yr average)	1.1	2.2	2.26	2.589	2.391	2.176	1.775	1.327	1.172	1.015	0.952	0.886	19.8
Surplus/deficit	-92.4	-105.9	-52.4	-44.7	-19.7	-38.1	-72.4	69.8	53.3	-8.3	19.3	17.6	-274.0

[24] Half of total Yellowtail generation reported in row. In general, half of Yellowtail energy is dedicated to the Western Division System through marketing arrangement. The other half is marketed in Eastern Division System.

Table A-5.—Estimated maintenance schedule for water year 2025—Colorado-Big Thompson and Fryingpan-Arkansas Projects

Colorado-Big Thompson and Fryingpan-Arkansas Projects Estimated Maintenance Schedule for Water Year 2024			
Feature	**Task Name**	**Start**	**Finish**
Big T Powerplant Unit 1	No Minor/Major Maintenance in 2025		
Marys Lake Powerplant	2022 Bottom End Turbine Overhaul	Mon 10/3/22	Mon 12/2/24
Marys Lake Powerplant	2024 Bi-Annual Maintenance - Major	Mon 9/30/24	Fri 10/25/24
Marys Lake Powerplant	Unit Inspection by American Hydro	Tue 1/14/25	Mon 2/17/25
Estes Blackstart	2024 Capability Test	Wed 10/16/24	Wed 10/16/24
Estes Unit 1	2025 Bi-Annual Maintenance - Minor	Mon 3/10/25	Fri 4/18/25
Estes Unit 2	No Minor/Major Maintenance in 2025		
Estes Unit 3	2025 Bi-Annual Maintenance - Major	Mon 9/15/25	Fri 10/24/25
Flatiron Unit 1	Penstock Coating Repair Work	Mon 10/14/24	Mon 12/2/24
Flatiron Unit 2	2025 Bi-Annual Maintenance - Minor	Mon 9/8/25	Fri 10/17/25
Flatiron XMFR KW2A	2025 Bi-Annual Maintenance - Minor	Mon 9/8/25	Thu 10/9/25
Flatiron Unit 3	2024 Bi-Annual Maintenance - Major	Mon 9/16/24	Fri 10/18/24
Flatiron Unit 3 & Carter Lake Pressure Conduit (CLPC)	Northern Water to install wye in CLPC from Chimney Hollow Project	Thu 8/29/24	Sun 12/15/24
Pole Hill Unit G1	Afterbay Bathtub and Turbine Runner inspect	Thu 9/26/24	Thu 10/10/24
Pole Hill Unit G1	2025 Bi-Annual Maintenance - Major	Mon 3/31/25	Fri 5/9/25
Pole Hill XFMR K1A	2025 Bi-Annual Maintenance - Major	Mon 4/7/25	Fri 4/25/25
Green Mtn. Unit 1	2025 Annual Maintenance	Mon 2/24/25	Thu 4/3/25
Green Mtn. XFMR KZ1A	2025 Annual Maintenance	Mon 3/3/25	Thu 3/13/25
Green Mtn. Unit 2	2025 Annual Maintenance	Mon 1/6/25	Thu 2/13/25
Green Mtn. XFMR KZ2A	2025 Annual Maintenance	Tue 1/21/25	Thu 1/30/25
Mt Elbert Unit 1	Contractor Equipment Troubleshooting	Sun 9/29/24	Thu 10/10/24
Mt Elbert Unit 1	2025 Annual Maintenance	Mon 1/13/25	Fri 3/28/25
Mt Elbert Unit 2	Extended outage for various tasks	Mon 7/1/24	Fri 6/20/25
CHFC 930 Section	2024 Northern Water Inspection & Repairs	Mon 9/30/24	Mon 10/14/24
CHFC 930 Section	2025 Northern Water Inspection & Repairs	TBD	TBD
Farr Pumping Plant	WAPA Work on Transmission Lines	Mon 4/21/25	Sat 4/26/25

Table A-6.—Power plant data

Western Division - Pick-Sloan Missouri Basin Program Powerplant Data					
Facility	**No. Units**	**Capacity Each Unit (kWh)**	**Total Installed Capacity (kWh)**	**Normal Operating Head (ft)**	**Output at Rated Head (ft^3/s)**
Green Mountain	2	13,000	26,000	192–262	1,660
Marys Lake	1	8,100	8,100	202–217	550
Estes	3	16,500	49,500	551–571	1,300
Pole Hill	1	33,250	33,250	830–838	550
Flatiron units 1 & 2	2	43,000	86,000	1,096–1,118	1,070
Flatiron unit 3[25]	1	8,500	8,500	158–287	440
Big Thompson	1	5,300	5,300	183–184	350
Seminoe	3	15,000	45,000	97–227	2,850
Kortes	3	12,000	36,000	192–204	2,700
Fremont Canyon	2	33,000	66,000	247–363	2,200
Alcova	2	18,000	36,000	153–165	2,200
Glendo	2	19,000	38,000	73–156	2,800
Guernsey	2	2,400	4,800	89–91	820
Pilot Butte	2	800	1,600		
Boysen	2	7,500	15,000	72-112	2,415
Shoshone	1	3,000	3,000		
Buffalo Bill	3	6,000	18,000		
Heart Mountain	1	5,000	5,000	265–275	355
Mt. Elbert	2	103,000	206,000	447–477	6,400
Yellowtail	4	72,000	288,000	327–440	8,500
Total	34		979,050		

[25] Pumping plant which may be operated in reverse to generate energy

Table A-7.–Pumping plant data

Western Division - Pick-Sloan Missouri Basin Program Pumping Plant Data					
Facilities	**Number**	**Capacity (ft^3/s)**	**Normal Operating Head (ft)**	**Installed (HP)**	**Kwh to Pump 1 acre-foot at Maximum Head**
Granby	3	600	92–186	18,000	227
Willow Creek	2	400	167–169	18,000	227
Flatiron Unit 3[26]	1	440	173–287	13,000	391
Mt. Elbert	2	5,690	447–477	340,000	620

[26] Pumping plant which may be operated in reverse to generate energy

Appendix B

Exhibits

B-1: Western Division Water Resource Map

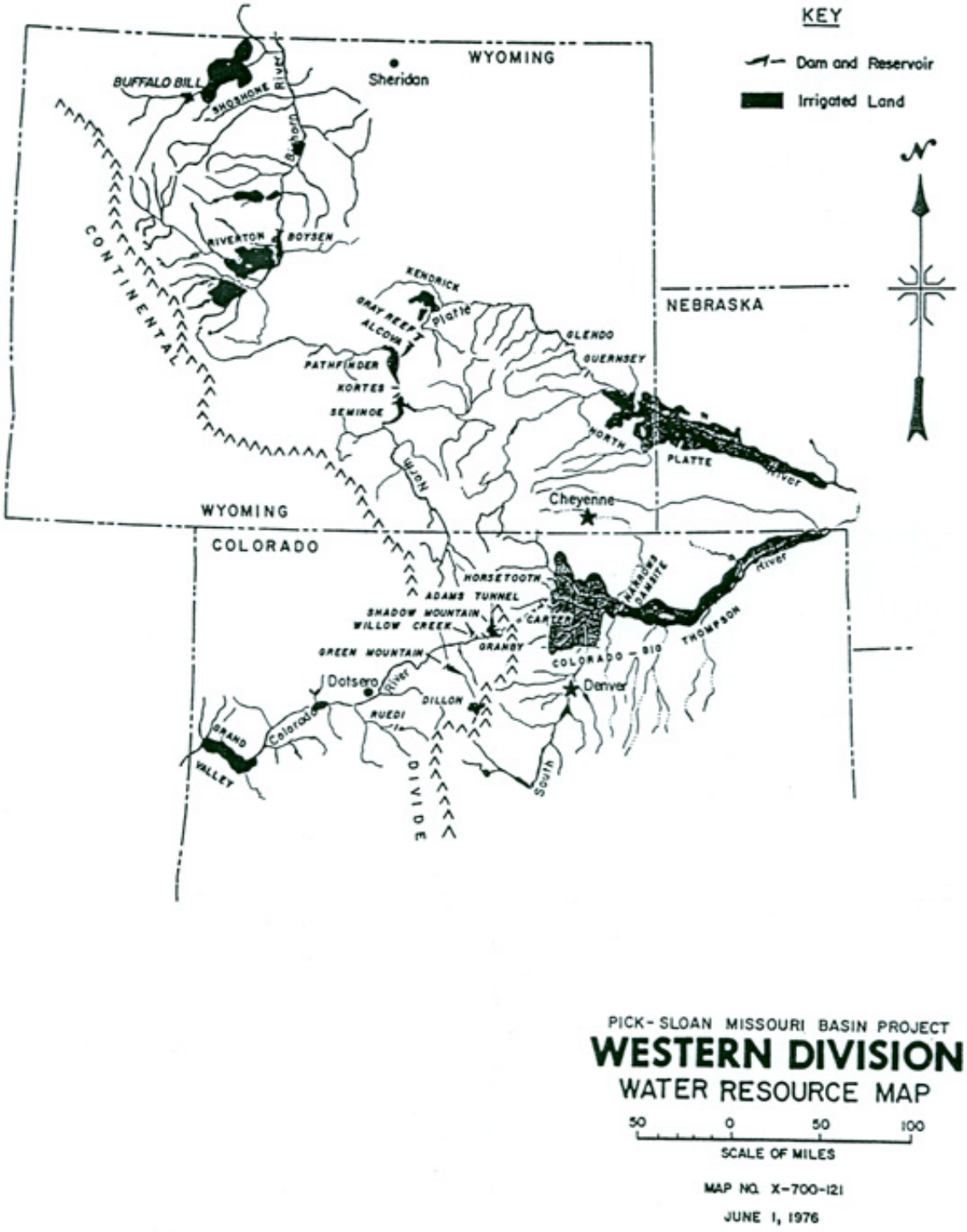


Figure B-1.—Water resource map of irrigated land and dam/reservoirs of the Western Division serving them.

B-2: Lap Gross Generation Less Pumping for Water Year 2024

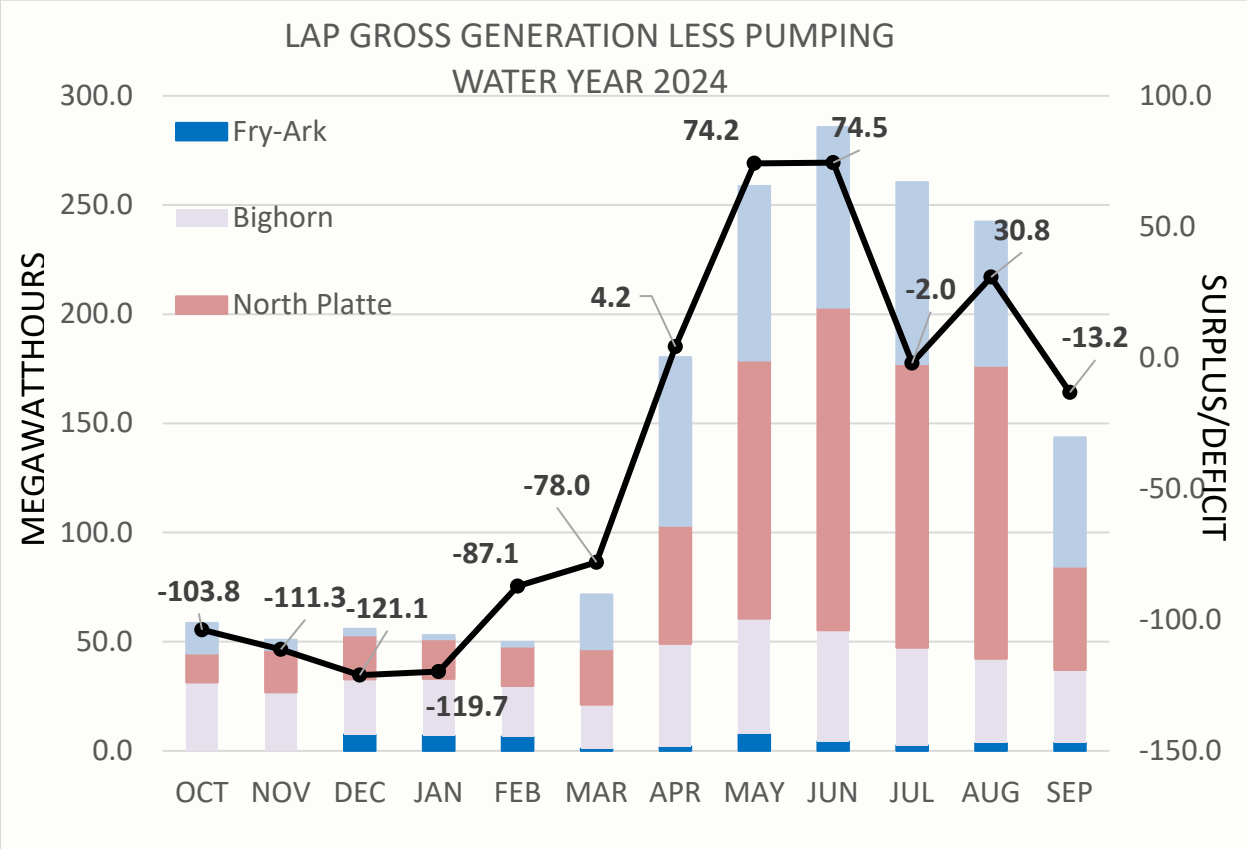


Figure B-2.—Monthly Loveland Area Power (LAP) generation less pumping for WY2024 by Reclamation projects in Western Division System. Monthly surplus and deficits are shown as overlay plot.

B-3: Most Probable Inflow Projected Lap Gross Generation Less Pumping for Water Year 2025

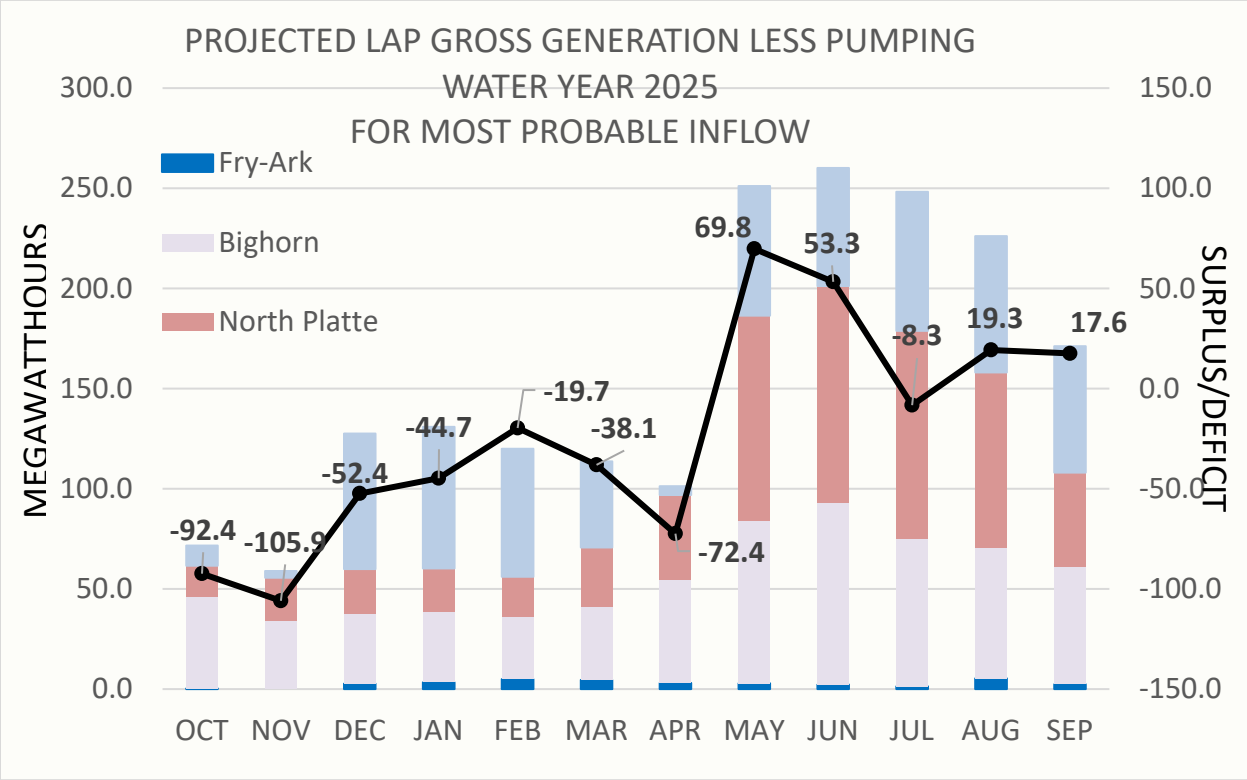


Figure B-3.—Monthly Loveland Area Power (LAP) Generation less pumping for WY2025 from October 2024 AOP Most Probable Scenario by Reclamation projects in Western Division System. Monthly surplus and deficits are shown as overlay plot.