



— BUREAU OF —
RECLAMATION

Annual Operating Plans

Seventieth Annual Report Colorado – Big Thompson Project And Western Division Systems Power Operations

Water Year 2021
Summary of Actual Operations

Water Year 2022
Annual Operating Plans

September 2021: Field teams inspect placement of mulch in the burn scar of the East Troublesome Fire

**Eastern Colorado Area Office
Missouri Basin Region**

Cover Photo: Field teams inspect the placement of mulch in the burn scar of the East Troublesome Fire in the headwaters of the Colorado River. In the background, far upper-left of photo, is Shadow Mountain Reservoir part of the Three Lakes collection system for the Colorado-Big Thompson Project. (Photo provided courtesy of Northern Water)

Mission Statements

The Department of the Interior conserves and manages the Nation's natural resources and cultural heritage for the benefit and enjoyment of the American people, provides scientific and other information about natural resources and natural hazards to address societal challenges and create opportunities for the American people, and honors the Nation's trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities to help them prosper.

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.

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 United States 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 2021 (WY 2021) with slightly greater than average storage and ended WY 2021 with less than average storage. East slope reservoirs, in the case of Horsetooth Reservoir, started with substantially less than average storage and ended with greater than average storage, while Carter Lake Reservoir started and ended WY 2021 with slightly greater than average storage. On the west slope, snowpack was generally much less than average for the water year and runoff mirrored snowpack. On the east slope, snowpack was near average and runoff was slightly greater than average. West slope peak runoff was less than normal in magnitude, and earlier than typical. East slope runoff was normal in magnitude and typical in terms of timing. Daily air temperatures were generally higher than average throughout the growing season and growing season precipitation was marginally below average by end the water year.

C-BT diversions totaled 247,707 acre-feet (AF) through Adams Tunnel for WY 2021. Deliveries of C-BT water totaled 201,067 AF. Addition to east slope reservoir storage from the beginning to end of the water year was the primary reason for the difference. Green Mountain Reservoir delivered a total of 109,583 AF from storage in WY 2021. Green Mountain Reservoir delivery included 28,254 AF released from Wolford Reservoir, Williams Fork Reservoir, Homestake Reservoir, Upper Blue Reservoir, and Ruedi Reservoir to fulfill substitution replacement obligations by the City of Denver and City of Colorado Springs.

The natural inflow to Lake Estes reached its WY 2021 peak flow with a daily average flow of 1,022 cubic feet per second (cfs) on June 7. The maximum mean daily release from Olympus Dam to the Big Thompson River was 769 cfs, also occurring on June 7.

Green Mountain Reservoir did not achieve a physical fill in WY 2021. Granby Reservoir was 70,000 AF short of a fill in WY 2021. Carter Lake Reservoir was filled twice in WY 2021 and Horsetooth

Reservoir achieved a fill in WY 2021. Sufficient storage in Carter Lake and Horsetooth Reservoirs existed to satisfy all demands for WY 2021.

For the Grand Lake clarity season, the seasonal running average clarity goal qualifier of 3.8 meters Secchi depth was not met (2021 clarity season running average was 3.6 meters). The minimum goal qualifier of 2.5 meters Secchi depth was achieved. Shadow Mountain Reservoir surface pH exceeded the water quality indicator threshold from July 24 through September 11, 2021, generally oscillating above and below the threshold daily during the period. The Shadow Mountain Reservoir bottom dissolved oxygen threshold was not met from July 1 through July 10, 2021, until pumping started at Farr Pumping Plant for the clarity season.

Contents

Preface	i
Executive Summary	i
Contents	iii
List of Tables	iv
List of Figures	v
Acronyms and Abbreviations	vi
General Description of the Colorado-Big Thompson Project	1
Collection System and East Slope Colorado-Big Thompson Project	1
Overview	1
Planning and Control	7
Irrigation Requirements	8
East Slope Diversion Operations	8
Flow Requirements Below Project Facilities	9
Annual Operating Plan	10
Green Mountain Reservoir	11
Green Mountain Reservoir Operation References	11
Reservoir Administration	11
Green Mountain Historic Users Pool and the Orchard Mesa Check Case Settlement	12
Reservoir Operation	13
Operational Summary: Water Year (WY) 2021	14
Summary of System-wide Conditions	14
Weather and Inflow Hydrology	14
System Demands and Deliveries	17
Maintenance and System Outages	19
Operations and Outcomes	20
C-BT Operations by Facility	22
Collection System	22
Willow Creek Reservoir	22
Granby Reservoir and Shadow Mountain Reservoir/Grand Lake:	24
East Slope	28
Adams Tunnel, Marys Lake and Lake Estes	28
Lower Power Arm, Carter Lake and Horsetooth Reservoirs	31
Green Mountain Reservoir	36
2022 Annual Operation Plan	41
Collection System and East Slope Colorado-Big Thompson Project	41
Green Mountain Reservoir	42
APPENDICES	43
APPENDIX A: DAILY RECORDS FOR WY2021	43
APPENDIX B—TABLES	81

B-1: WESTERN DIVISION–PICK-SLOAN MISSOURI BASIN PROGRAM PERTINENT RESERVOIR DATA.....	81
B-2: C-BT MONTHLY SUMMARY OF BLUE RIVER OPERATIONS.....	82
B-3: PICK-SLOAN MISSOURI BASIN PROGRAM 2021 SUMMARY ACTUAL OPERATIONS.....	83
B-4: 2022 FLOOD DAMAGE PREVENTED.....	86
B-5: C-BT OCTOBER 2021 MOST PROBABLE PLAN FOR WATER YEAR 2022.....	87
B-6: C-BT OCTOBER 2021 MINIMUM REASONABLE PLAN FOR WATER YEAR 2022.....	97
B-7: C-BT OCTOBER 2021 MAXIMUM REASONABLE PLAN FOR WATER YEAR 2022.....	107
B-8: WATER YEAR 2022 PLAN SUMMARY CHARTS.....	117
APPENDIX C—EXHIBITS.....	122
C-1: PUBLICITY MAP, EXTENTS, FACTS AND CONNECTIVITY SCHEMATIC OF THE COLORADO-BIG THOMPSON PROJECT.....	122
C-2: PROFILE VIEW OF THE COLORADO-BIG THOMPSON PROJECT.....	124
SEVENTIETH ANNUAL REPORT OF THE WESTERN DIVISION SYSTEM POWER OPERATIONS.....	125
PREFACE	125
WATER YEAR 2021—GENERATION AND PUMP ENERGY SUMMARY.....	125
WATER YEAR 2022—GENERATION AND PUMP ENERGY FORECAST.....	126
APPENDICES	127
APPENDIX A—TABLES.....	127
A-1: WESTERN DIVISION SYSTEM GENERATION FOR WATER YEAR 2021.....	127
A-2: PUMP ENERGY USED DURING WATER YEAR 2021.....	128
A-3: GROSS GENERATION LESS PUMPING FOR WATER YEAR 2021.....	129
A-4: MOST PROBABLE INFLOW PROJECTED GROSS GENERATION AND PUMPING FOR WATER YEAR 2022.....	130
A-5: ESTIMATED MAINTENANCE SCHEDULE FOR WATER YEAR 2022—COLORADO-BIG THOMPSON AND FRYINGPAN-ARKANSAS PROJECTS.....	131
A-6: POWER PLANT DATA.....	132
A-7: PUMPING PLANT DATA.....	133
APPENDIX B—EXHIBITS.....	134
B-1: WESTERN DIVISION WATER RESOURCE MAP.....	134
B-2: LAP GROSS GENERATION LESS PUMPING FOR WATER YEAR 2021.....	135
B-3: MOST PROBABLE INFLOW PROJECTED LAP GROSS GENERATION LESS PUMPING FOR WATER YEAR 2022.....	136

List of Tables

Table 1: Recommended minimum release schedule for Lake Estes.....	10
Table 2: Snow-Water Content for April 1, 2021.....	15
Table 3: Reclamation Runoff Forecast for C-BT Locations.....	16
Table 4: C-BT West Slope Collection System Water Balance.....	18
Table 5: C-BT East Slope Water Balance.....	19

List of Figures

Figure 1: WY 2021 air temperature and 30-year average air temperature	17
Figure 2: Big Thompson River gages above and below Lake Estes: Late April through August 2021.	21
Figure 3: WY 2021 and 35-year average SWE for the Willow Creek Reservoir drainage area.....	23
Figure 4: Computed Inflow to Willow Creek Reservoir during WY 2021.....	23
Figure 5: WY 2021 versus 35-year average SWE for the Granby Reservoir drainage area.....	25
Figure 6: North Inlet turbidity and seasonal clarity in Grand Lake.	27
Figure 7: Granby Reservoir storage content, WY 2021 versus the 30-year average storage content	28
Figure 8: WY 2021 and 35-year average SWE for the Olympus Dam drainage area.	29
Figure 9: Computed cumulative native inflow for Lake Estes during WY 2021 versus 30-year average.	30
Figure 10: Big Thompson River above Lake Estes, WY 2021 gage flow vs. distribution of 15-year daily flows.....	31
Figure 11: Olympus Tunnel mean daily flow during WY 2021.....	33
Figure 12: Carter Lake Reservoir storage content during WY 2021 versus its 30-year average.....	35
Figure 13: Horsetooth Reservoir storage content during WY 2021 versus its 30-year average.....	35
Figure 14: WY 2021 and 30-year average SWE for the Green Mountain Reservoir drainage area.....	36
Figure 15: Green Mountain Reservoir monthly content during WY 2021 and 30-year average content.....	38

Acronyms and Abbreviations

AF	acre-feet (foot)
AOP	Annual Operating Plan
C-BT	Colorado – Big Thompson Project
cfs	cubic feet per second
CHFC	Charles Hansen Feeder Canal
CROs	Coordinated Reservoir Operations
ECAO	Eastern Colorado Area Office
Fry-Ark	Fryingpan Arkansas River Project
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
WY	Water Year

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. It consists of over 100 structures integrated into a trans-mountain 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 1930's and completed in the 1950's.

C-BT project 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 1 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 acre-feet 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. Twenty-nine 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

Overview¹

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 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.

Green Mountain Reservoir provides replacement water for out-of-priority collection system diversion and storage water for other beneficial uses. Green Mountain Reservoir is located on the Blue River, a tributary of the Colorado River approximately 30 miles southwest and downstream of the collection system. This reservoir allows for year-round diversion at the collection system by providing

¹ A diagram and map of the C-BT system can be found in [Appendix C.1](#) and [Appendix C.2](#).

replacement water during periods when senior downstream water users would otherwise require the collection system to bypass inflow. Green Mountain Reservoir 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 of 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 of the collection system to maintain the Colorado River fishery downstream of Granby Dam.



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 (cfs). 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 cubic feet per second from the outlet works. The dam spillway is controlled by two radial gates with a combined total release capacity of 11,500 cfs. 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 cfs 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 cfs. The Granby Pump Canal conveys pumped water 1.8 miles to Shadow Mountain Reservoir and has a maximum capacity of 1,100 cfs.

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 cfs, a diversion outlet capacity of 400 cfs and an uncontrolled spillway located on the left abutment with a maximum flow capacity of 3,200 cfs. 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 cfs.

Completed in 1946, Shadow Mountain Dam impounds the Colorado River upstream of Granby Reservoir. The dam has an outlet with 50 cfs capacity and a radial gate controlled spillway with a capacity of 10,000 cfs. 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 1 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 cfs. 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 daylight 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 diversion structures and two terminal storage reservoirs². The system is typically divided into three components including an Upper Power Arm above Olympus

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.

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. Below 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 cfs and 550 cfs. 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 cfs 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.



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 cfs to the Lower Power Arm via Olympus Tunnel and controls release to the Big Thompson River.



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 KHp 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 cfs capacity and an outlet to the CHFC with a design capacity of 930 cfs.

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 from 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. CHFC has a nominal capacity of 930 cfs 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 cfs 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 of 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 cfs. The CHFC wasteway makes river deliveries when demand exceeds 400 cfs or when the powerplant is unavailable. It has a maximum flow rate of 600 cfs 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, Colorado. 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 present 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, Colorado. 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, U.S. Bureau of Reclamation's Upper Colorado and Missouri Basin Regions, other U.S. 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 WY is prepared in early October and covers the October 1 to September 30 period. AOPs 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 WY 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 WY.

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 Green Mountain Reservoir to irrigators in the Colorado River Basin are included in the release from Green Mountain Reservoir, according to the "Operating Criteria for Green Mountain Reservoir".



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 of 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 of 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 cfs and 75 cfs. 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 7 cfs 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 cfs; November through December -- 45 cfs; January through May -- 20 cfs; June through July -- 50 cfs; and August -- 40 cfs. The purpose of these flows is to maintain the fishery within the Colorado River above Granby Reservoir.

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

Table 1: Recommended minimum release schedule for Lake Estes

Period	Minimum Releases (cfs)
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 WY, 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 Green Mountain Reservoir 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 Decrees"). (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 Auxiliary 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 Green Mountain Reservoir operations are contained within multiple contractual and legally binding documents (referenced cited above). Paragraph 6 of the October 1955 Decree (Consolidated Cases: Stipulation and Decree, 1955) stipulates that Reclamation periodically develop operational plans for Green Mountain Reservoir. This report partially fulfills this requirement.

Colorado Springs Utilities and Denver Water Board (Cities) have water projects upstream of Green Mountain Reservoir 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 Green Mountain Reservoir storage and power generation. The right for these water projects to divert against Green Mountain Reservoir'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 Decrees"), 1955, 1964, 1978). The Cities and the Project have established agreements to fulfill these stipulations. Stipulated agreement to how the Cities deliver water owed to Green Mountain Reservoir is included within the Green Mountain Administrative Protocol (Green Mountain Administrative Protocol, 2013).

Green Mountain Reservoir was authorized and constructed to store and deliver two pools of water. Senate Document 80 (Manner of Operation of Project Facilities and Auxiliary Features (Senate Document 80), 1937) identified a 52,000 acre-foot 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 Decrees"), 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 Green Mountain Reservoir (Manner of Operation of Project Facilities and Auxiliary Features (Senate Document 80), 1937), a 5,000 acre-foot 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 Green Mountain Reservoir water rights in accordance with the Green Mountain Administrative Protocol since 2014 (Green Mountain Administrative Protocol, 2013). This protocol is currently under review by the Colorado State Water Court.

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

Green Mountain Reservoir’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 acre-feet 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 Green Mountain Reservoir 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 acre-feet 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 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 meetings are open to the public and provide 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

Green Mountain 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, maximizing power generation, and conserving and enhancing the beneficial use of the waters of the Colorado River.

Reservoir operations frequently occur in response to administrative calls from senior downstream water rights. Reservoir storage is largely allocated for replacement water for consumptive use of junior water right users. Junior water diversion operations would be curtailed without this replacement water. Reservoir replacement releases cover out-of-priority diversion of the Colorado River Collection System, HUP beneficiaries, Silt Project, Green Mountain Reservoir evaporative losses and most contract release. The storage release flow rate is dependent upon the priority and location of the calling right. In addition, Green Mountain reservoir is obligated to bypass reservoir inflow as needed to not harm the senior calling right.

Reclamation operates the reservoir in a manner to maximize the power generation through Green Mountain Powerplant. The powerplant is the principal mechanism for release of all stored water and bypass of inflow. Generation of storage releases often provide 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. Reclamation schedules powerplant release to control reservoir fill rate and minimize the volume of water that will bypass the powerplant. Coordinated Reservoir Operations (CROs) are designed to reshape powerplant release to help enhance river peak flow for the benefit of Colorado River Endangered Fish recovery efforts. The Green Mountain Powerplant direct flow water right places an administrative call on upstream water users most of the year.

Conserving and making use of Colorado River water to create the greatest benefit is one of the primary purposes of the Project. Reclamation plans reservoir operations to increase the probability that Green Mountain Reservoir's first-fill storage water right will refill each year. In drier years this may require reduction of reservoir release below the powerplant capacity. In addition, operation plans avoid reservoir release exclusive for power generation.

Administration of water rights dictates reservoir operations throughout most of the year. This results in three typical operational seasons: Winter Delivery (November-April), Spring Runoff/Fill (April-August) and Irrigation Delivery (August-October).

During the Winter Delivery Season, Green Mountain Reservoir 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 cfs. During this period, reservoir storage releases replace water for the Project, HUP beneficiaries, and most Green Mountain Reservoir contractors. On average, Green Mountain Reservoir 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 cfs between the last week of March and the second week of April. On average, Green Mountain reaches a minimum fill of 64 KAF in mid-April. Green Mountain Reservoir will exercise storage rights and adjust operation to maximize stored water while optimizing power generation once the Project water rights come into priority. Green Mountain Reservoir normally reaches its maximum fill during the first two weeks of July. After satisfying Green Mountain Reservoirs 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. A Colorado River administrative call typically occurs between the third week of August and the second week of September. Colorado River administrative calls may occur in June during drier years. The Colorado State Engineers placement of a senior administrative water rights call ends the Spring Runoff / Fill Season.

Irrigation Delivery Season begins once Colorado River flows decrease below water rights administrative levels. The calling right may be at the Shoshone Powerplant, a Grand Junction Area irrigation water right or both. During Irrigation Delivery Season, Green Mountain Reservoir delivers approximately 20 KAF per month. 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) 2021

Summary of System-wide Conditions

Last water year's AOP was summarized in the previous Annual Operating Report of the Colorado-Big Thompson Project³. The following four sub-sections summarize *actual* operational results for WY 2021.

Weather and Inflow Hydrology

Generally, precipitation was less than average over the mountains from October 2020 through April 2021 and the last 3 months of the water year. May through June precipitation was slightly higher to near average. The monsoonal season in the Northern Colorado Mountains near Granby Reservoir and the east slope of the project area was below normal. The monsoonal season for Green Mountain

³ Available online at https://www.usbr.gov/gp/aop/cbt/20cbt_21forecast.pdf (accessed December 5, 2021)

Reservoir was also below normal for 2021. Total precipitation for the WY ended slightly less than average.

On the east slope, snow accumulation at the start of WY 2021 was near normal to slightly above normal until mid-November 2020 at which point accumulation fell below average to well below average until mid-March 2021. By mid-March snow accumulation was near average. The first half of April 2021 saw little additional accumulation but by the end of April snowpack was back to average. On the west slope, Granby Reservoir drainage and Willow Creek Reservoir drainage were near average until mid-November 2020. However, after that point both remained below to well below average throughout the remainder of the snow accumulation period of WY 2021. The Green Mountain Reservoir drainage remained below average for snow accumulation for the entire season. Melt was early on the west slope in WY 2021 with all drainage’s snow accumulation reporting less than the long-term average by mid-May. On the east slope, snow melt was slower than average until very early June 2021, when melt reached the long-term average. Generally, snowpack was near the median for the east slope by May 1, and less than the median for most of the entire season on the west slope.

Table 2 provides an overview of the snowpack condition on April 1, 2021, for some of the contributing watersheds within the C-BT project system. The first column in Table 2 is the average Snow Water Equivalent (SWE) of the snow telemetry (SNOTEL) sites contributing to each reservoir on April 1, 2021. For a historical comparison to the April 1, 2021, condition, the average April 1 SWE of the same SNOTEL sites for the 1991-2020 period was calculated to create a combined site average for those locations. The west slope runoff forecast for April 1, 2021, was generally much below the typical condition over the last thirty years for locations within the C-BT region. The east slope runoff forecast was only marginally below the typical condition.

Table 2: Snow-Water Content for April 1, 2021

Watershed	Snow-Water Content		
	2021 (In.)	30-Yr. Avg. (In.)	Percent of Avg.
Green Mountain Reservoir	12.4	14.9	83
Willow Creek Reservoir	8.3	9.7	86
Granby Reservoir	11.0	13.2	83
Lake Estes Reservoir	16.2	16.6	98

Table 3 displays the April 1, 2021, runoff forecasts for several C-BT facilities across intervals of predicted probabilities of occurrence.

**Table 3: Reclamation Runoff Forecast for C-BT Locations
April 1, 2021, Forecast of April-July Volume (KAF)**

Forecast Point	Chance of Exceeding					50 percent Most Probable (as percent of avg runoff)
	90 percent Reasonable Min ¹	75 percent	50 percent Most Probable	25 percent	10 percent Reasonable Max ¹	
Green Mtn. Res	138	162	191	215	239	68
Willow Crk. Res	19.4	26.3	34.8	41.4	48.3	69
Granby Res	117	136	165	178	297	79
Big Thompson River Above Lake Estes	46	53	62.4	68	75	87
Big Thompson River at Canyon Mouth	53.6	60.7	71.9	76.1	83.1	89

¹ The probability is estimated to be 8 chances in 10 that the actual volume will fall between the reasonable minimum and reasonable maximum forecast.

The coldest temperatures in the project area were recorded during the middle of February 2021. (Figure 1). Temperatures, when compared to the thirty-year average, saw the last part of October 2020 through the last part of November slightly below average. Temperatures were near normal from the middle of February 2021 through the middle of May. The rest of the water year, temperatures were slightly to considerably higher than the thirty-year average. By late April the 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 as normal. Most locations began to experience rising inflows by early May. By mid to late May 2021, the snowpack at higher elevations began to melt. Willow Creek Reservoir, with less than average snowpack, reached peak runoff in early May, while inflows to Lake Estes, Granby and Green Mountain Reservoirs reached their peaks during the first week of June. West slope peaks were less than average in magnitude. East slope peak was near to slightly higher than average. The runoff season for 2021 was shorter in duration than typical on the west slope and about average duration on the east slope.

On the east slope, timely rainfall events in May and June delayed crop planting to later than normal which reduced irrigation demands for snowmelt runoff. The C-BT came into priority to capture and store east slope water nearly every day between May 23 and June 17 during WY 2021. The monsoonal season started in late July but ended the second week of August. Hotter and drier than normal conditions persisted throughout the remainder of the WY.

Most Northern Colorado reservoirs throughout the spring season were slightly above average in storage content. By the end of May most approached fill. The dry and hot weather from mid-August through September put pressure on those reserves reducing storages down to 55 percent of capacity, however, most reservoirs in the area ended WY 2021 higher than they started the water year.

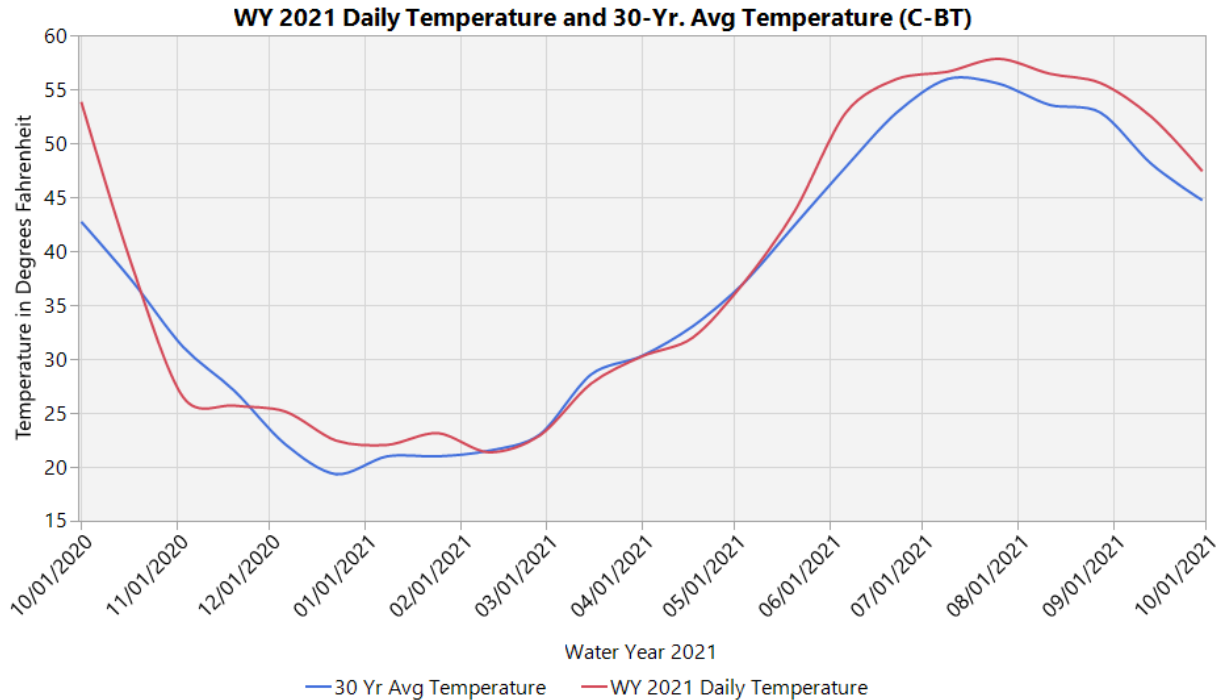


Figure 1: WY 2021 air temperature and 30-year average air temperature (daily data have been smoothed for display purposes)

System Demands and Deliveries

Northern Water established a quota of 50 percent in October 2020, and then revisited that quota in April 2021, increasing it by 20 percent. The quota assumed for the AOP 2021 prepared in October 2020 was 70 percent and no adjustments were made throughout the monthly updates to the AOP 2021.

Two major wildfires were burning at the start of the WY 2021 and had an impact on C-BT operations. The East Troublesome Creek wildfire, mostly on the west slope, burned substantial portions of Willow Creek Reservoir, Shadow Mountain Reservoir and Grand Lake drainages. Rainfall driven runoff in late July and early August carried burn scar debris into Grand Lake. The debris caused clogging issues at the Adams Tunnel West Portal trash rack reducing the available diversion rate. Daily cleanouts of Adams Tunnel West Portal trash rack were necessary to keep required diversions running. On the east slope, the Cameron Peak wildfire burned some of the North Fork Big Thompson River drainage. Runoff from rainfall events on that burn scar degraded the water quality at the Dille Diversion on the Big Thompson River to the point that diversions had to be dramatically reduced or ceased during those events. This impacted Dille skim operations for the Big Thompson Powerplant during the water year, greatly reducing its generation compared to previous years.

An accounting summary of the C-BT west slope collection system in WY 2021 shows there were 248,693 AF made available for diversion to the east slope. Adams Tunnel diversions were 247,707 AF, a difference of 0.40 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:

West Slope Collection Made Available for Diversion

$$= \text{Natural Inflow (Granby, Shadow Mountain and Grand Lake)} + \text{Windy Gap Pumping} \\ + \text{Willow Creek Pumping} - \text{Change in Storage (Granby, Shadow Mountain, Grand Lake)} \\ - \text{Granby Spill} - \text{Granby Releases} \\ - \text{Net Evaporation (Granby, Shadow Mountain, Grand Lake)} - \text{Granby Seepage}$$

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 WY 2021**

	WY 2021 (acre-feet)
Combined 3 Lakes Natural Inflow	177,405
Willow Creek Pumping	34,534
Windy Gap Pumping	15,435
Combined 3 Lakes Change in Storage	-72,659
Granby Spill	0
Granby Releases	32,431
Combined 3 Lakes Net Evaporation	15,593
Granby Seepage	3,316
Volume Available for Diversion	248,693
Reported Adams Tunnel Diversion	247,707
Percent Difference	0.40%

On the east slope, total supplies were compared to total deliveries for WY 2021. Total supplies were calculated to be 212,899 AF and total deliveries were calculated to be 201,067 AF (Table 5). The percent difference was 5.6 percent. That percentage is similar to previous years and can be explained by delivery system transit losses and measurement error of the terms that went into the calculations. The formula for determining total east slope supplies is shown below:

East Slope Supplies

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

During CHFC 550 and 930 Section outage, 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 WY 2021, 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.

The formula for determining total deliveries is as follows:

$$\begin{aligned} \textit{Total Deliveries} \\ &= \textit{Total CBT Deliveries} + \textit{Total Windy Gap Deliveries} \\ &+ \textit{Eureka Replacement Delivery} \end{aligned}$$

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 WY 2021**

<u>Supply</u>	WY 2021 (acre-feet)
Adams Tunnel Diversion	247,707
East Slope Priority Water	19,243
Carter Lake + Horsetooth Reservoir Net Evap	4,652
Total East Slope Reservoir Change in Storage	48,578
Tridistrict Excess Capacity Change in Storage	853.8
Predetermined C-BT River Delivery Loss	34
Total Supply	212,899
<u>Delivery</u>	
Total C-BT Deliveries ⁴	181,441
Total Windy Gap Deliveries	19,466
Eureka Replacement Delivery	180
Total Deliveries	201,067
Percent Difference (of Total Supply)	5.6%

Maintenance and System Outages

No major maintenance projects in the C-BT impacted the typical operations during the WY. Many normally scheduled inspections took place at different facilities during the fall maintenance outage period from early November through early December 2020. Water diversions from the west slope were suspended for about four and a half weeks from early November through early December 2020 to accommodate these activities. West slope diversion through Adams Tunnel began earlier than typical in 2020, starting on December 8. Full capacity diversions began on December 14, 2020, thanks to the speed and efficiency of the fall maintenance work in WY 2021.

⁴ Includes non-charge water delivered, which was zero AF in WY 2021.

Estes Powerplant personnel conducted annual maintenance for Marys Powerplant for the upcoming WY 2021 season during the fall outage. Estes Powerplant units #1, #2 and #3 had their annual maintenance performed in succession from January 4 through April 29, 2021. Two units were always available for generation during the Estes Powerplant annual maintenance period.

The Flatiron Powerplant staff completed the annual maintenance of the Pole Hill Powerplant unit during November 2020 through mid-December 2020. Annual maintenance of Flatiron Powerplant unit #3 was completed by mid-October 2020 and resumed maintenance again during WY 2021 in early September 2021. The annual maintenance of Flatiron Powerplant units #1 and #2 occurred in succession starting in mid-February 2021 and ending in mid-May 2021. The CHFC trifurcation wasteway and Big Thompson Powerplant were winterized during the second week of November 2020. No annual maintenance of the CHFC 930 and 550 Sections took place in WY2021, although canal maintenance did occur immediately before and immediately after WY 2021.

C-BT water deliveries were met throughout WY 2021 in coordination with outage work. Fall 2020 deliveries to the CHFC continued as planned, only using water from Carter Lake Reservoir three times during the four and a half week fall maintenance season to refill Flatiron Reservoir to meet canal demands during the outage. Annual maintenance outages at Flatiron and Estes Powerplants did not impact planned water operations. Big Thompson Powerplant maintenance had no impact on water or power operations for the season.

Operations and Outcomes

Typically, starting around the middle of December after fall annual outages are lifted, 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. This operation was implemented as planned in WY 2021. Carter Lake Reservoir was first filled in mid-March 2021 and came within about 5,000 AF of a second fill by mid-June as the start of the Grand Lake Clarity settling period operation began. Horsetooth Reservoir was filled by mid-June 2021.

April 1, May 1, and June 1 west slope runoff forecasts were rapidly downgrading runoff volumes for the season. By early June, even with slightly higher than average carryover storage at Granby Reservoir from the previous water year, it was evident that the potential for a spill at Granby was extremely unlikely. By mid-June, it was clear a spill would not occur at Granby.

Carter Lake Reservoir was initially filled on March 16, 2021. Pumping to Carter resumed on May 20 and continued until June 17. The final pumping period to Carter started on July 20 in support of Grand Lake clarity operations and ended on September 7, 2021, as clarity operations wound down for the season. Adams Tunnel diversions were reduced with the first fill of Carter Lake Reservoir to maximize east slope skim throughout runoff. Priority water became available during the resumption of pumping to Carter in May. Priority water was diverted through Olympus Tunnel and most was pumped into Carter Lake Reservoir. As a result, Adams Tunnel diversions remained low until mid-July when pumping to Carter resumed a the third time for the season. Throughout the 2021 runoff

season sufficient space remained available in Olympus Tunnel to take advantage of skim and priority water. At the end of the fall maintenance period in mid- December 2020, Horsetooth Reservoir had just under 84,000 AF of free space. It was within 2,500 AF of fill by mid-May 2021. From that point, Horsetooth Reservoir was slowly filled to the top of its operational pool by June 16. Horsetooth Reservoir demands were lower than projected mainly due to timely east slope rains during the irrigation season. Horsetooth Reservoir ended the WY 2021 with over 125,000 AF in storage.

C-BT operations and the skimming of water from the Big Thompson River inflows to Lake Estes through Olympus Tunnel kept daily mean releases from Olympus Dam to the Big Thompson River at or below 769 cubic feet per second (cfs) during runoff. Figure 2 illustrates how the Olympus Dam instantaneous releases were managed during the runoff of late April through August 2021. The peak instantaneous release from Olympus Dam was 836 cfs and occurred on June 7, 2021. Even the rainfall-driven runoff events during the monsoon season (late July and early August) were utilized for skim operations.

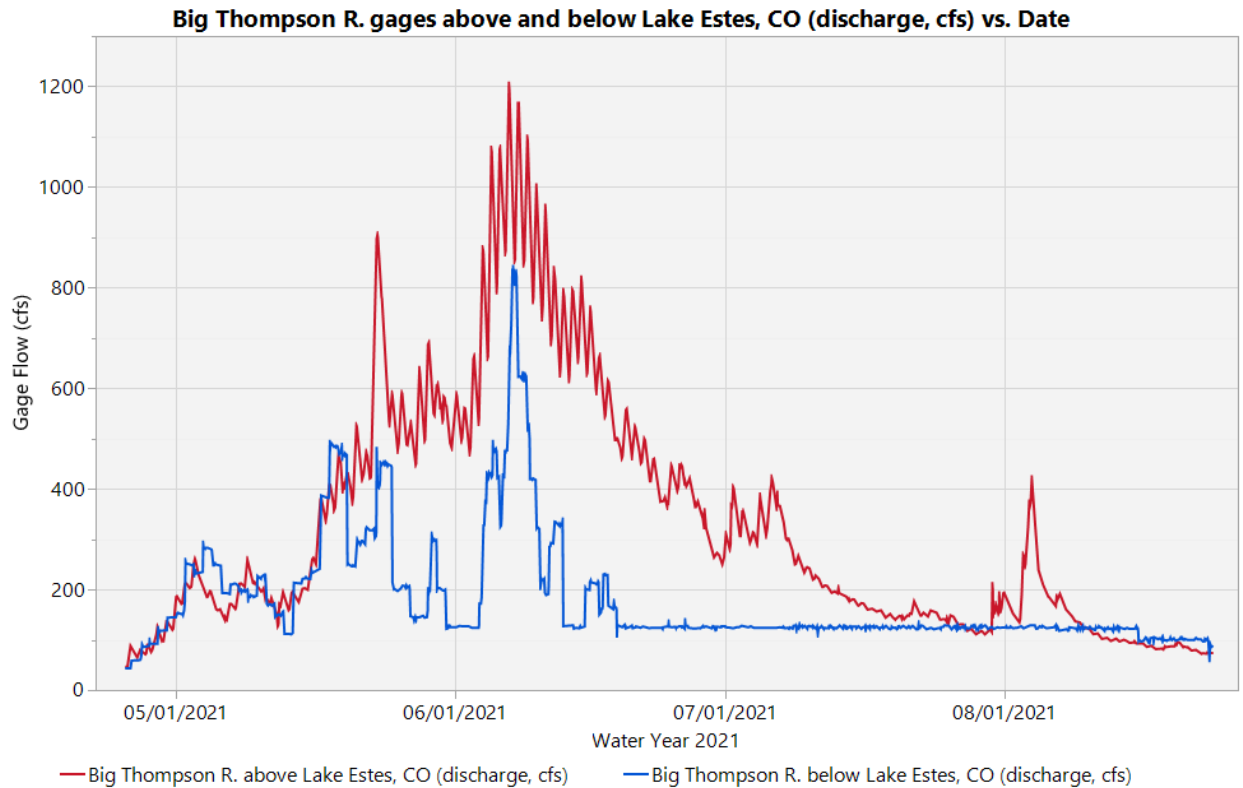


Figure 2: Big Thompson River gages above and below Lake Estes: Late April through August 2021.

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 below average starting in November 2020 and remained below average throughout the snow accumulation season of the WY.

The East Troublesome Creek fire started in October 2020 and burned approximately eighty-nine percent of the Willow Creek Reservoir watershed. Throughout WY 2021, Willow Creek Reservoir elevations were maintained lower within the operational pool than previous years. WY 2021 daily average elevation was 8,119.37 feet, while the previous five years' daily average elevation during typical reservoir operations was 8,123.0 feet. This operational change was made due to concerns regarding runoff of snowmelt and rainfall runoff events being enhanced by the large portion of the watershed that was burned.

Reservoir release operations followed standing operating procedures. Winter reservoir release was maintained at 7 cfs for Colorado River fishery maintenance as directed by the Secretary of Interior schedule of release.

April: The first signs of runoff in the Willow Creek watershed began in early April 2021 (Figure 4). Pumping to Granby Reservoir also began in earnest April 2021. The pump ran three times in April for a monthly total volume of 6,379 AF.

May: The WY 2021 computed daily peak inflow of 391 cfs was reached on May 2, 2021 (Figure 4). With the exception of one day in late May 2021, the Willow Creek Pump Canal ran daily from April 26 to June 6. During the month of May, 15,357 AF was pumped from Willow Creek Reservoir to Granby Reservoir.

June: Willow Creek Reservoir pumping continued through June 6 and then again for a couple of days twice more later in the month for a monthly total volume of nearly 4,208 AF. Early runoff and less than average snow accumulation throughout the snow season reduced the total volume of water pumped to Granby Reservoir for WY 2021 compared to previous years.

July: In support of the lower operational elevation target at Willow Creek Reservoir, four additional short pumping periods occurred in July. An additional 2,113 AF was pumped to Granby Reservoir in July.

August and September: Willow Creek elevation remained between 8,118.0 feet and 8,122.5 feet throughout the remainder of the WY. Four more short pumping operations occurred during the last two months of the WY.

The observed April-July runoff to Willow Creek Reservoir was approximately 32.1 KAF. The April 1 most probable forecast (forecasts are from Table 3, presented earlier in this report) was 34.8 KAF. May 1 most probable forecast was 29.4 KAF and June 1 most probable forecast was 31.8 KAF nearly matching the observed April-July runoff.

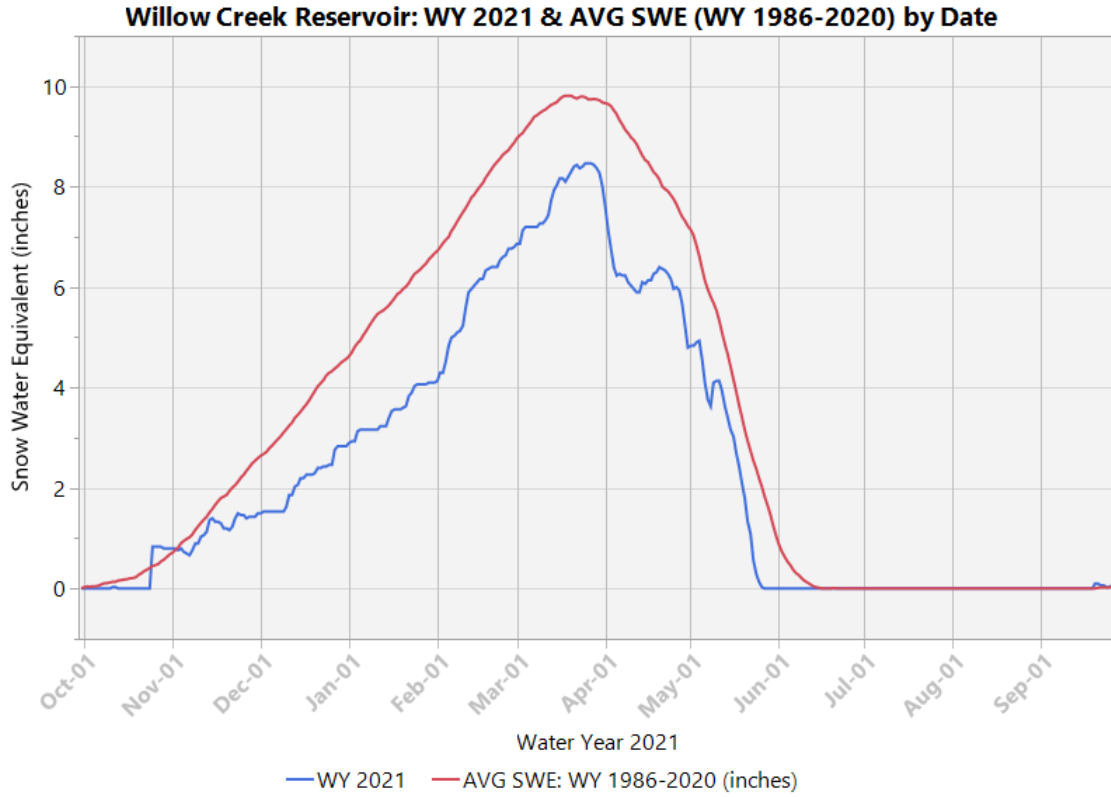


Figure 3: WY 2021 and 35-year average SWE for the Willow Creek Reservoir drainage area.

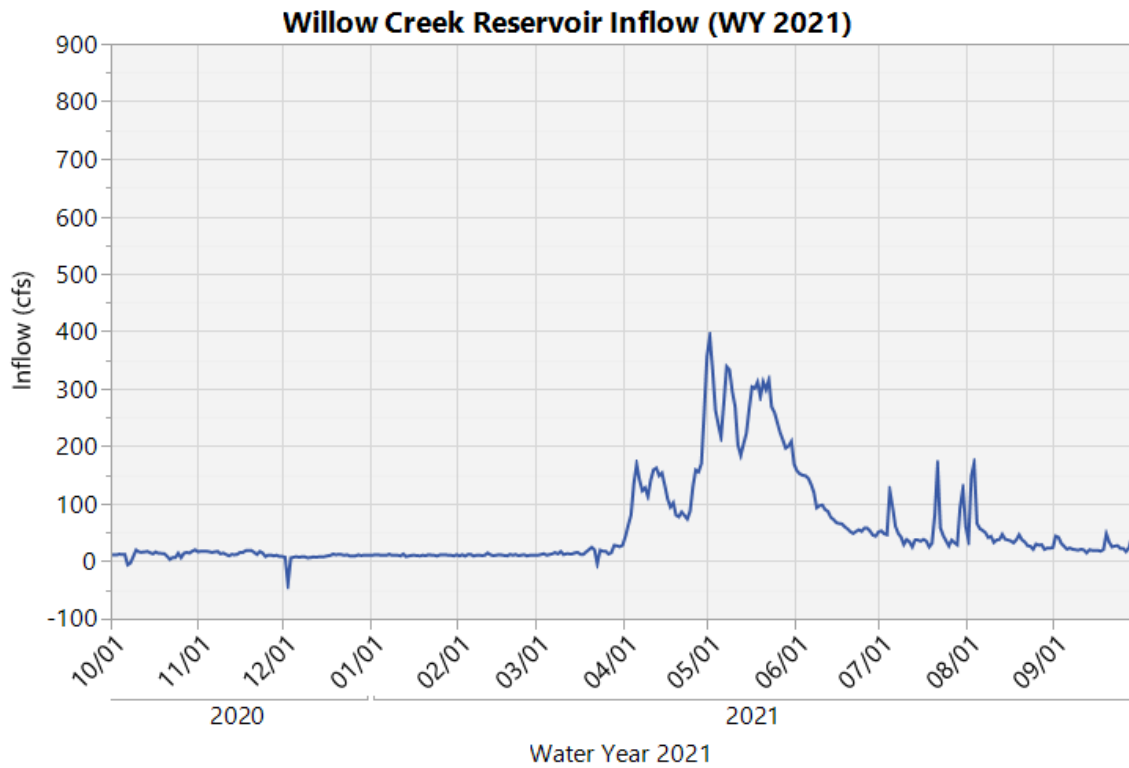


Figure 4: Computed Inflow to Willow Creek Reservoir during WY 2021.

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 as a single body of water operationally 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 to the Colorado River for storage within Granby Reservoir. During WY 2021, 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 2020 through February 2021: The carryover content from WY 2020 for Granby Reservoir was 475,524 AF, 114 percent of the thirty-year average (416,750 AF). At full capacity Granby storage is 539,758 AF. The reservoir content remained above the thirty-year average content until January 22, 2021. As diversions through the Adams Tunnel resumed in the second week of December 2020, Granby content began to fall steadily. Figure 5 shows snow accumulation in the Granby basin was below average starting in mid-November and stayed below average for the season.

March through April: Snow accumulation reached its peak in late March and was less than average. Adams Tunnel diversions continued from mid-December until the first fill of Carter Lake Reservoir on March 15, 2021. Full Adams Tunnel diversions were not needed after that time during the winter months of WY 2021 because Horsetooth Reservoir storage content was ahead of schedule for its planned fill in mid-June. Mean Adams Tunnel diversion from mid-March through the end of April were 419 cfs.

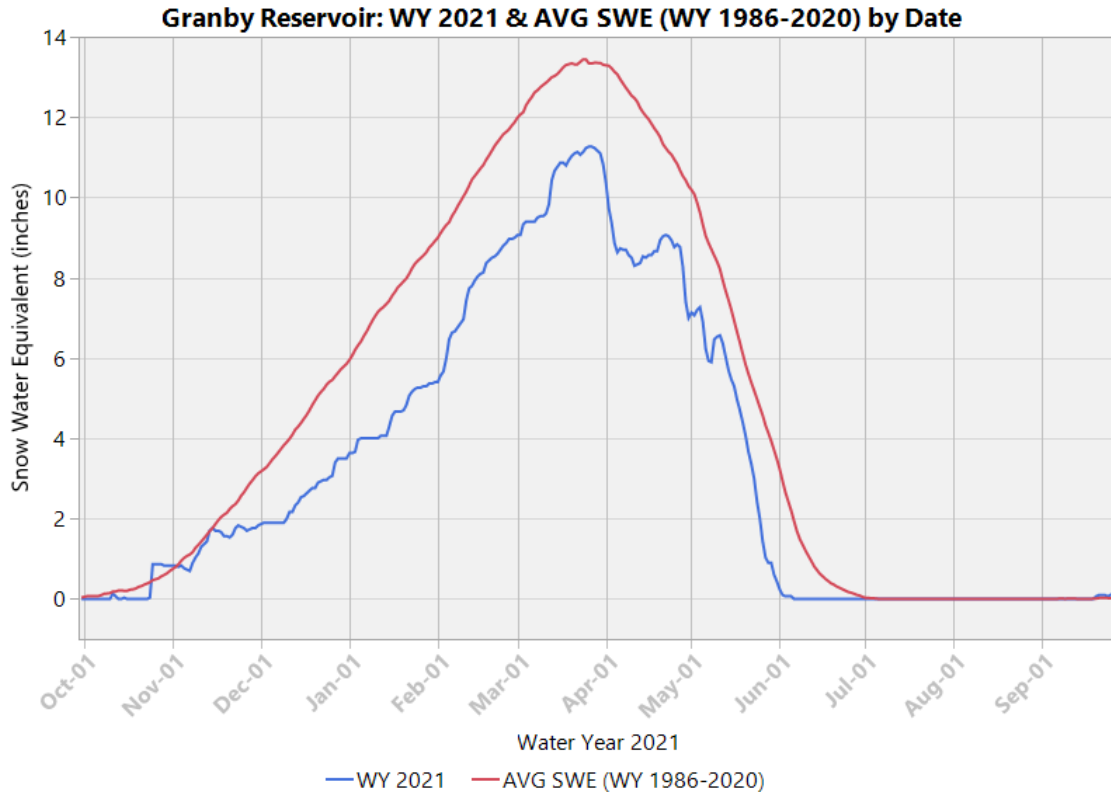


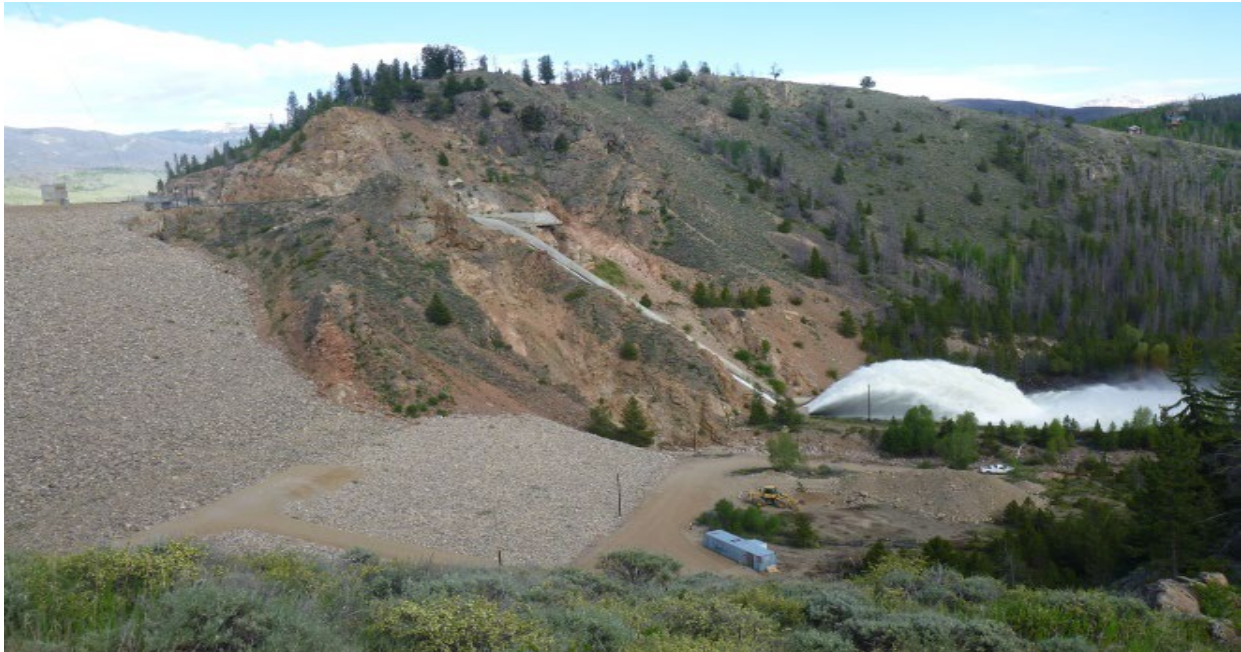
Figure 5: WY 2021 versus 35-year average SWE for the Granby Reservoir drainage area.

April/May through early July: Throughout April, snow conditions on the west slope indicated that the potential for a spill at Granby Reservoir was unlikely. Snow accumulation remained below average through the end of April. There was very little additional snow added in May. By June 1 Granby, Horsetooth and Carter Lake Reservoirs’ combined storage was 658 KAF, still more than 66 KAF greater than the average combined storage for the preceding thirty years, however Granby Reservoir storage was only 401 KAF by that point in time. This storage condition for Granby continued to indicate a spill was unlikely. Warmer than average temperatures in the second half of May coupled with the below average snowpack in May caused a slightly earlier than average runoff peak whose magnitude was also less than average. Computed mean daily natural inflow to Granby, which peaked on June 10, was 789 cfs. Adams Tunnel diversions remained low in late May through mid-June even when pumping to Carter Lake Reservoir resumed on May 21. This was because priority water became available on the east slope at about the same time as pumping resumed to Carter. Most of the east slope priority water was pumped to Carter Lake Reservoir in WY 2021 based on this timing.

Throughout the runoff forecast season there was strong indication that the probably of a spill was low at Granby Reservoir for WY 2021.

Below average snowpack created below average peak runoff and inflows at Granby Reservoir. By June 21, the daily marginal rate of Granby fill was indicating very little chance of a spill at Granby in WY 2021. Granby reached its WY maximum storage of 469,485 AF on July 6, 2021. That storage was just over 70 KAF short of fill.

The observed April-July runoff to Granby and Shadow Mountain Reservoirs and Grand Lake was approximately 146.4 KAF. The April 1 most probable forecast (displayed previously in Table 3) was 164.6 KAF. May 1 was 148.1 KAF and June 1 was 158.3 KAF.



Granby Reservoir spill; approximately 2,400 cfs, June 13 through June 21, 2015.

Early July through September: Adams Tunnel diversions were increased in the second week of July to match Big Thompson River demands and pumping to Carter Lake Reservoir resumed on July 20 and continued until September 7, 2021.

Grand Lake Water Clarity operational plan for WY 2021 was similar to the successful 2018 and 2019 plans. The plan included a pre-clarity operation in late June to reduce Adams Tunnel diversions to slightly less than Grand Lake natural inflow in an attempt to enhance total suspended solids settling and minimize introduction of Shadow Mountain Reservoir water into Grand Lake. Interestingly, the disparity between runoff on the west and east slope of the project (west slope was considerably less than average, while the east slope was slightly above average), impacted operations for June 2021 into early July 2021. The 2021 pre-clarity settling period began in early June and ended in the second week of July. By July 1, Shadow Mountain Reservoir clarity was substantially better than Grand Lake clarity and that difference carried through until Adams Tunnel diversions began on July 8. In fact, the settling period was planned to last longer into July, but the Grand Lake Adaptive Management Committee requested Reclamation end the period earlier because Grand Lake clarity was so much worse than Shadow Mountain's clarity. It was theorized Farr pumping would move higher clarity water from Shadow Mountain into Grand Lake to improve its condition. That change in operations was implemented and successful as Grand Lake clarity improved from a low of approximately 2.7 meters in early July to about of 5.6 meters on July 26. Unfortunately, a smaller precipitation event in late July and a couple much larger events in early August mobilized sediment and debris from the East Troublesome Creek fire burn scar in the Grand Lake North Inlet drainage (shown as higher turbidity peaks in Figure 6) which coincided with a degradation in clarity from about 5.6 meters to 2.7 meters in the span of one week. Only a couple of smaller precipitation events occurred after early August

and Grand Lake clarity generally improved from early August to the end of the clarity season. The seasonal running average Secchi disc depth was 3.6 meters, less than the running average seasonal goal qualifier of 3.8 meters.

Adams Tunnel diversion commenced on July 8. During the workweek the tunnel diversions were generally maintained at system capacity. During the weekend, diversions decreased to approximately 325 cfs. The cycling operation was similar to the successful operation executed during the 2018 and 2019 clarity seasons. The weekday/weekend diversion difference in Adams Tunnel was designed to increase the power generation benefit and create a destabilized environment theorized to impede blue-green algae growth in Shadow Mountain Reservoir and Grand Lake. As a result of the burn scar debris introduced to Grand Lake from the precipitation events in early August, Adam Tunnel West Portal trash rack had issues with fouling and had to be cleaned almost daily throughout much of August to maintain required diversions.

A full description of the planned clarity operations and actual operations for the WY 2021 clarity period can be found in the 2021 Grand Lake Clarity Adaptive Management Final Report.

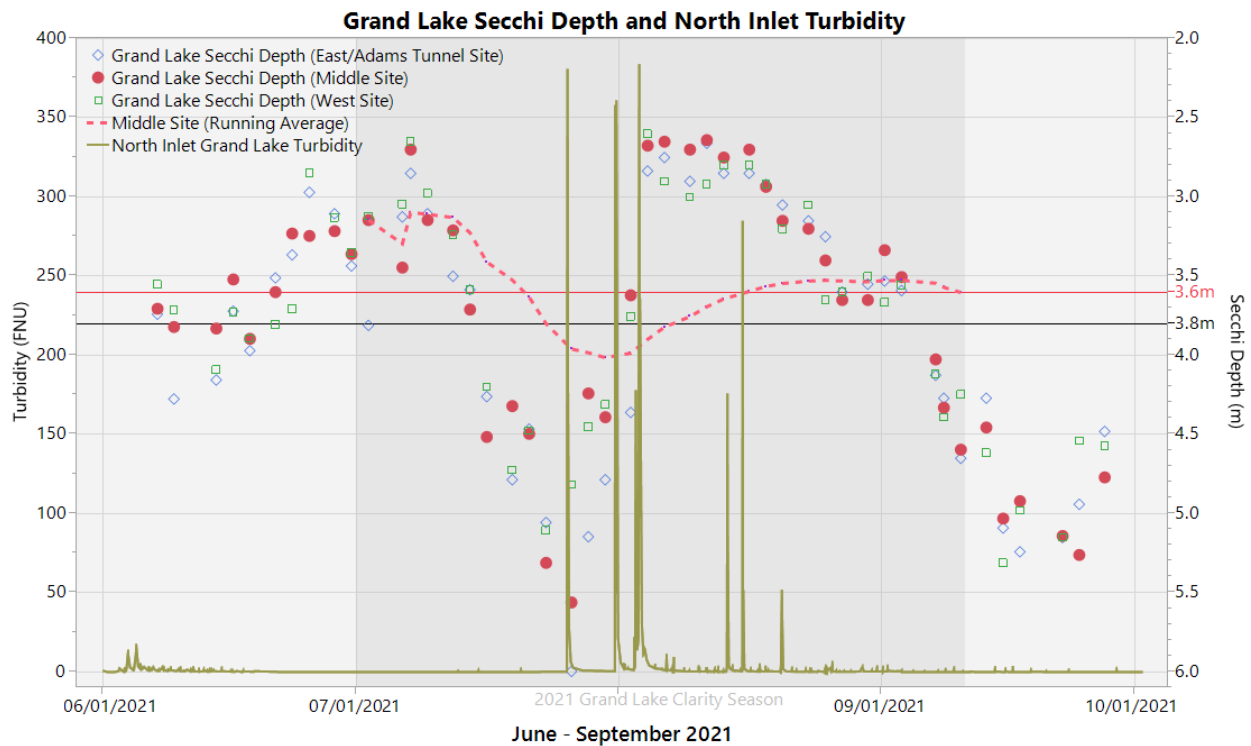


Figure 6: North Inlet turbidity and seasonal clarity in Grand Lake.

September: As the end of clarity season approached, pumping to Carter Lake Reservoir ceased while diversions through Adams Tunnel continued their weekday/weekend schedule through the end of the month. The exception for the month was a short, three-day outage that was placed on Adams Tunnel for an East Portal inspection in mid-September. Granby Reservoir finished WY 2021 with 402,704 AF of water in storage. Granby storage remained above its end of month thirty-year average storage until the end of July 2021. For the remainder of the WY, storage was less than the thirty-year average (Figure 7).

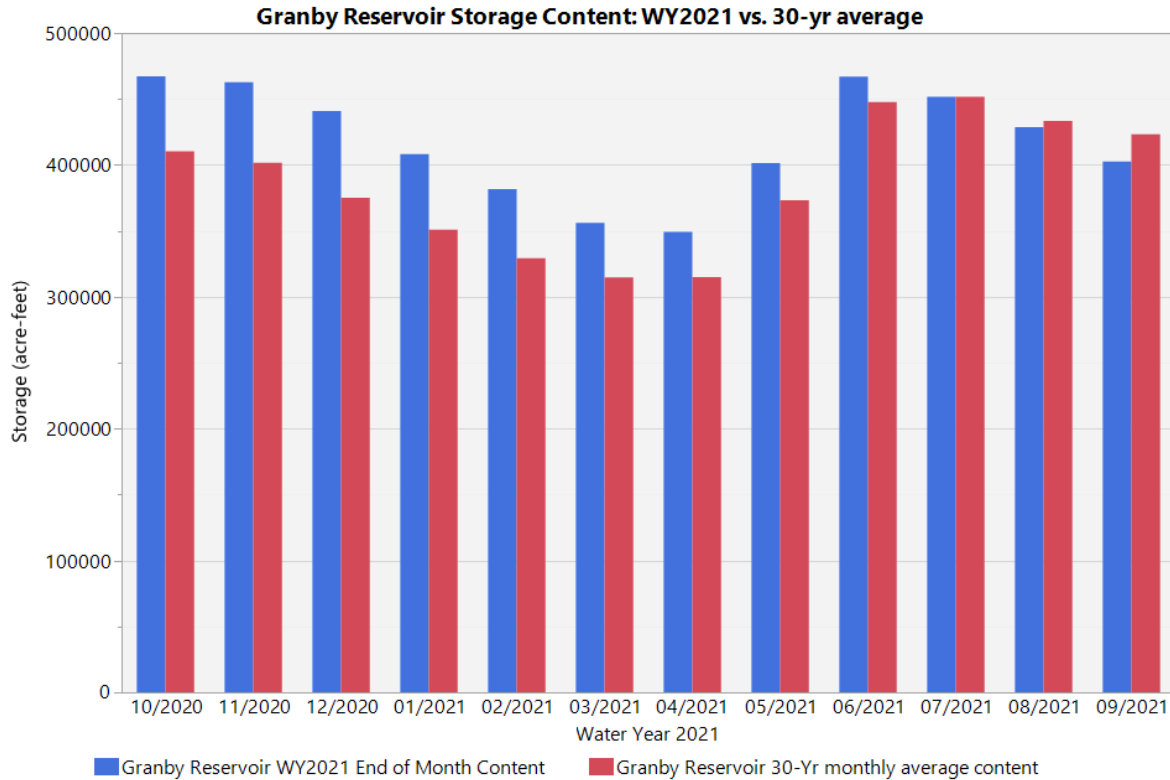


Figure 7: Granby Reservoir storage content, WY 2021 versus the 30-year average storage content.

East Slope

Adams Tunnel, Marys Lake and Lake Estes

November-December 2020: Like previous years, the months of November and December 2020 brought multiple inspections and maintenance projects for the C-BT. All maintenance and inspection work were completed within the outage time requested. Marys Lake Powerplant unit #1 underwent its annual maintenance and Adams Tunnel had its annual inspection.

December 8: Water began to flow through the Adams Tunnel once again to refill Marys Lake and Lake Estes prior to operation of the upper power arm.

December 9: The elevation at Lake Estes reached normal operational pool and generation began for the season at Estes Powerplant. Functional testing of Marys Lake Powerplant was performed prior to it coming online for the season.

December 11: Generation at Marys Powerplant began for the season.

December 14: The C-BT maintenance season came to an end as Adams Tunnel flows reached 535 cfs and winter fill of east slope terminal reservoirs began. Flatiron unit #3 pumping to Carter Lake Reservoir began at 0800 hours. Diversions through the Adams Tunnel continued at or near capacity until March 15, 2021, as the first fill of Carter Lake Reservoir was achieved for the season.

January-March 2021: The snowpack above Olympus Dam started the water year near average then fell to below average by November 2020. Snowfall was poor in December and January while February snowfall pushed accumulation back to slightly below average. The marginal snowpack accumulation for March was near average maintaining the slightly below average snowpack condition (Figure 8). Estes Powerplant units #1, #2 and #3 annual maintenance started in early January and ended on April 29. Two units were always available for generation during the period.

January 4: The annual maintenance of Estes Powerplant unit #1 began.

February 5: Annual maintenance of Estes Powerplant unit #1 was completed.

February 16: Annual maintenance of Estes Powerplant unit #2 began.

March 19: Annual maintenance of Estes Powerplant unit #2 was completed.

March 29: Annual maintenance of Estes Powerplant unit #3 began.

April: A mild warming trend in the last half of April 2021 (Figure 1 above) began to melt some of the snow at lower elevations. The inflow to Lake Estes gradually increased during the same period. Horsetooth Reservoir fill rate was on target throughout the month. Adams Tunnel diversions averaged 411 cfs in April.

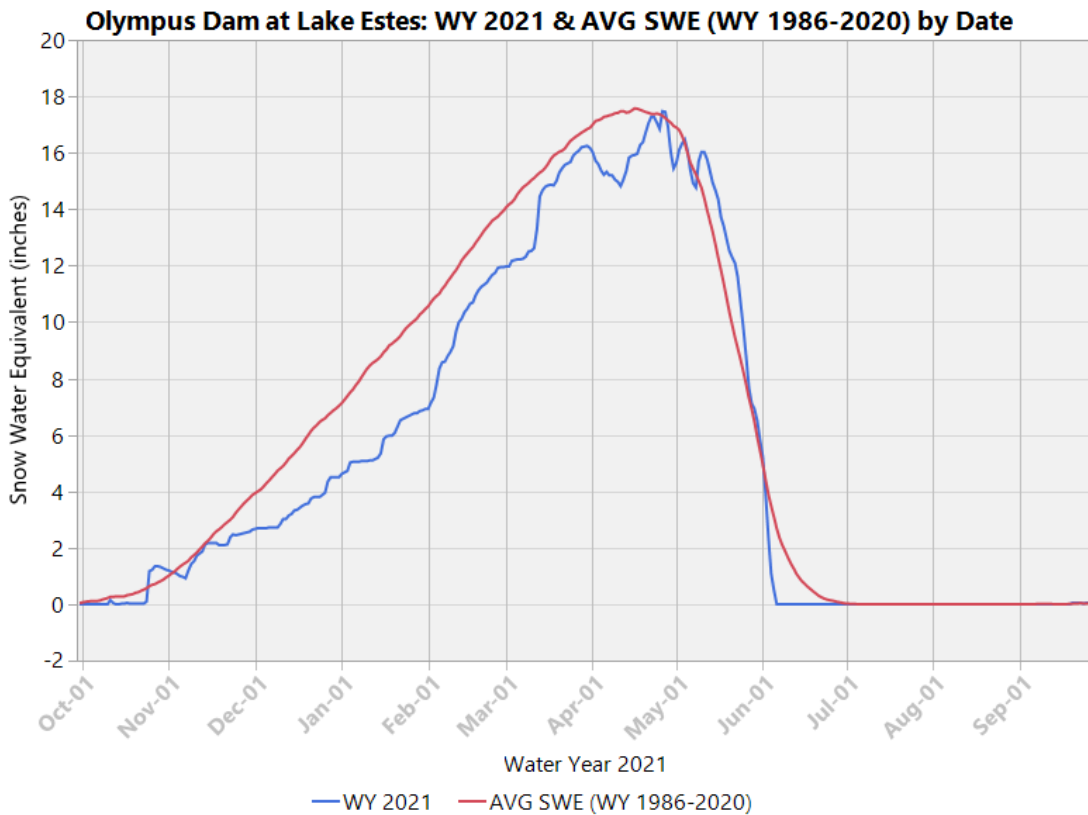


Figure 8: WY 2021 and 35-year average SWE for the Olympus Dam drainage area.

May: Mean daily temperatures over the Front Range were four to five degrees above normal the last half of May. In the first half of May some new snow was added to the snowpack (Figure 8). The natural inflow to Lake Estes continued to increase throughout the month. For the water year the cumulative natural inflow to Lake Estes was less than the thirty-year average until May of 2021 when cumulative inflow became and remained greater than the thirty-year average (Figure 9).

May 18: Wind River skim operations began for the water year. A total of 1,042 AF for the WY was skimmed for power generation at Marys and Estes Powerplants between May 18 and August 4, 2021.

May 20: Pumping to Carter Lake Reservoir resumed on May 20, however Adams Tunnel diversions average less than the pumping rate to Carter Lake Reservoir because the C-BT project came into priority on the east slope on May 23 for the first time during the season. Adams Tunnel diversions averaged 166 cfs from May 20 to 31, while pumping to Carter Lake Reservoir averaged 280 cfs.

June: Mean daily temperatures over the Front Range remained above normal during June 2021 with monthly precipitation near normal. Big Thompson River above Lake Estes flows peaked about five days earlier than the fifteen-year average. The C-BT remained in priority on the east slope until June 17, in WY 2021. Adams Tunnel diversion remained well below capacity as the project took full advantage of available east slope priority water and skim. Adams Tunnel diversions averaged 68 cfs in June.

June 7: Mean daily flow for the Big Thompson River above Lake Estes peaked at 1,022 cfs on June 7. The instantaneous peak flow was also recorded on June 7 of 1,210 cfs. The maximum mean daily release to the Big Thompson River below Lake Estes, 769 cfs, also occurred on June 7.

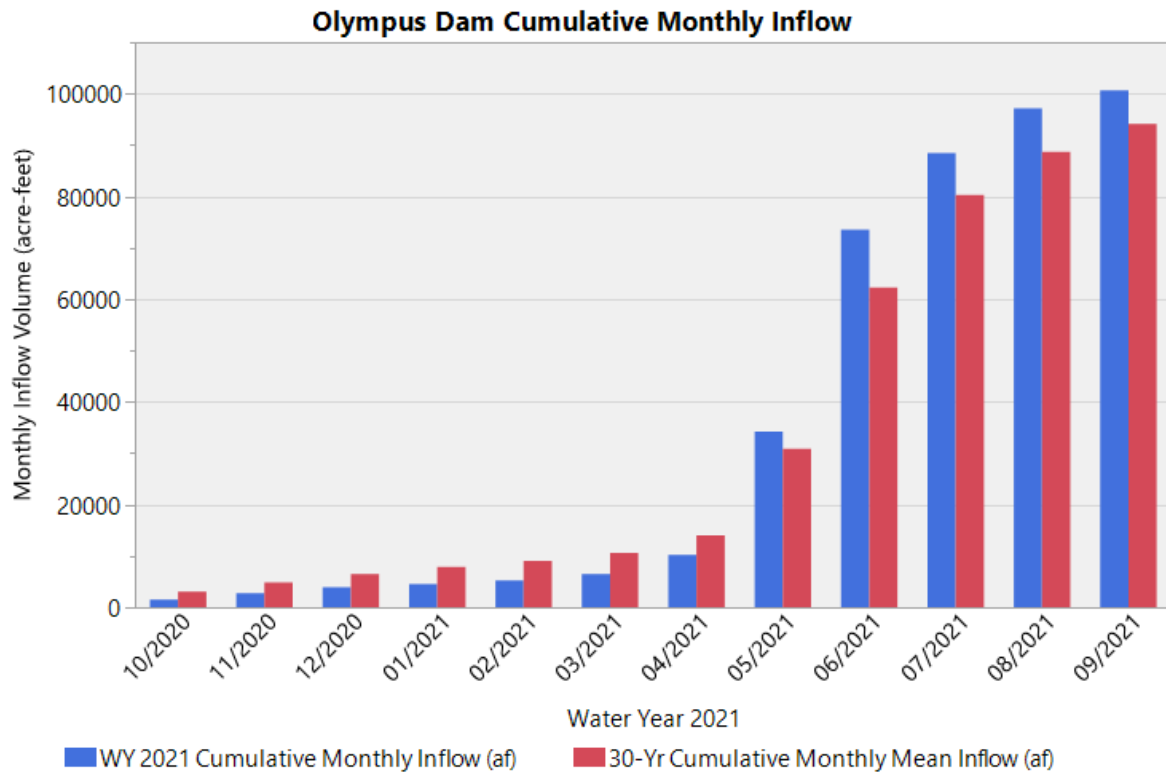


Figure 9: Computed cumulative native inflow for Lake Estes during WY 2021 versus 30-year average.

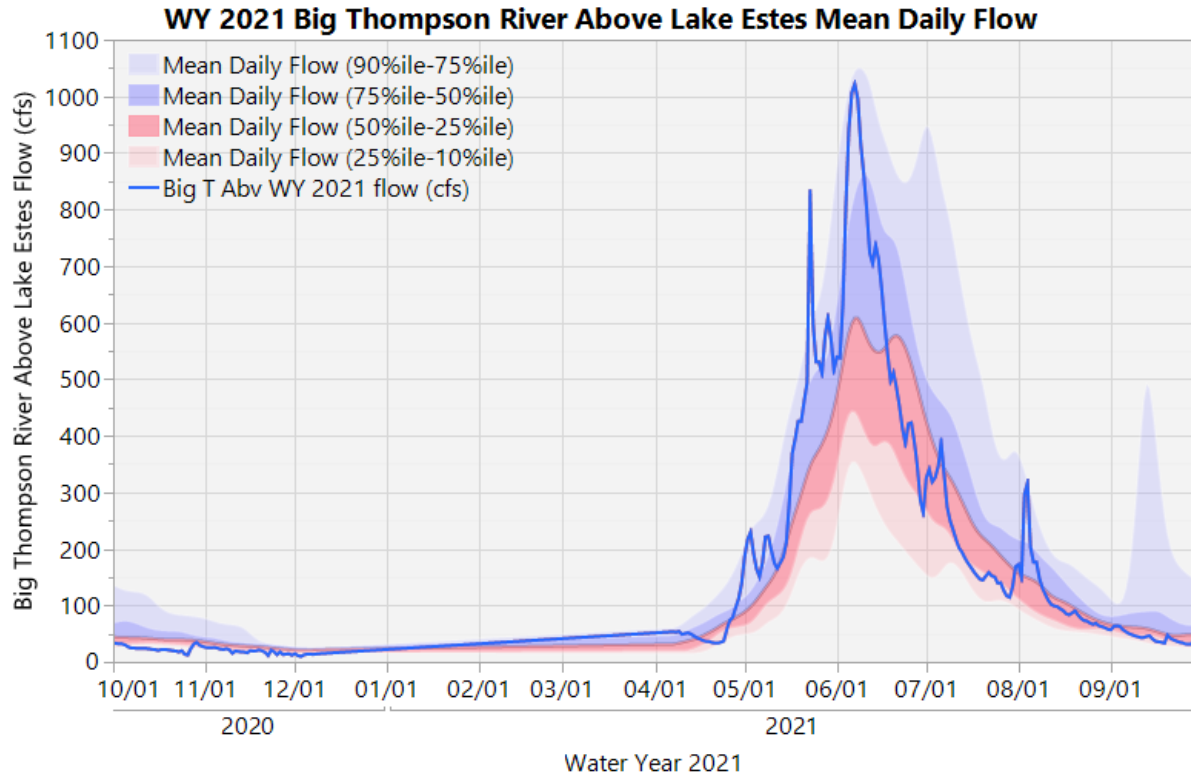


Figure 10: Big Thompson River above Lake Estes, WY 2021 gage flow vs. distribution of 15-year daily flows.

June 16 and 17: Horsetooth Reservoir was filled on June 16. Throughout the remainder of the WY, storage in Horsetooth declined as planned since demands generally exceeded C-BT supply. Pumping to Carter Lake Reservoir ended for the second time of the season on June 17 to support the previously planned Grand Lake clarity settling period. This second pumping period refilled Carter Lake Reservoir within 5,000 AF of full storage.

July-September: Adams Tunnel diversions averaged about 428 cfs for July through September 9 as pumping to Carter Lake Reservoir resumed on July 20. Big Thompson inflows to Lake Estes dropped and generally stayed below the 15-year median inflows (Figure 10). The exception was an August precipitation event during the short monsoon season that drove runoff to Lake Estes higher than the 15-year median flows for the first eight days of August.

The observed April - July runoff to Lake Estes was approximately 82 KAF. The April 1 most probable forecast (Table 3, above) was 62.5 KAF. May 1 most probable forecast was 65.6 KAF and June 1 most probable forecast was 78.3 KAF.

Lower Power Arm, Carter Lake and Horsetooth Reservoirs

November 2020: The Big Thompson Powerplant and Trifurcation Wasteway were winterized in early November 2020, as the annual maintenance season started for the Lower Power Arm. Pole Hill Powerplant underwent its annual maintenance in November through early December. Flatiron unit #3 was run three times in generation mode to refill Flatiron Reservoir so water would remain available

for the CHFC to meet C-BT demands and maintain sufficient flows to keep the canal from freezing during the outage season.

December 2020: The Pole Hill Powerplant annual maintenance was completed on schedule and its functional tests were performed on December 9 and 10. Generation at Pole Hill Powerplant began for the water year at 1500 hours on December 10.

December 14: Pumping to Carter Lake Reservoir from Flatiron Powerplant unit #3 commenced at 0800 hours. Both Adams Tunnel diversions and Olympus Tunnel were set to capacity on this same date.

January and February 2021: Both Adams and Olympus Tunnels remained near capacity throughout January and February as pumping to Carter Lake Reservoir continued. Horsetooth Reservoir fill remained on, to slightly above, the target fill rate. Flatiron unit #1 annual maintenance began as scheduled in mid-February.

February 16: Flatiron unit #1 annual maintenance began.

March and April: As Carter Lake Reservoir was filled for the first time during the season in mid-March, diversions from the west slope and Olympus Tunnel (Figure 11) were reduced to the CHFC 550 Section maximum flow rate as operations turned to toward filling Horsetooth Reservoir at the operationally planned rate for the period.

March 15: Carter Lake Reservoir was filled and pumping to the reservoir ceased.

March 22: Functional testing, following the annual maintenance of Flatiron Powerplant unit #1, was complete and the unit was brought back into service.

April 8: C-BT skim operations for the Lower Power Arm began for first time for the WY diverting skim water into Olympus Tunnel.

April 12: Flatiron unit #2 annual maintenance began.

May: Olympus Tunnel skim of excess Big Thompson River flows continued through May. Dille diversion and Big Thompson Powerplant were brought online in early May. Pumping to Carter Lake Reservoir resumed in late May and the project came into priority on the east slope for the first time during the season in late May.

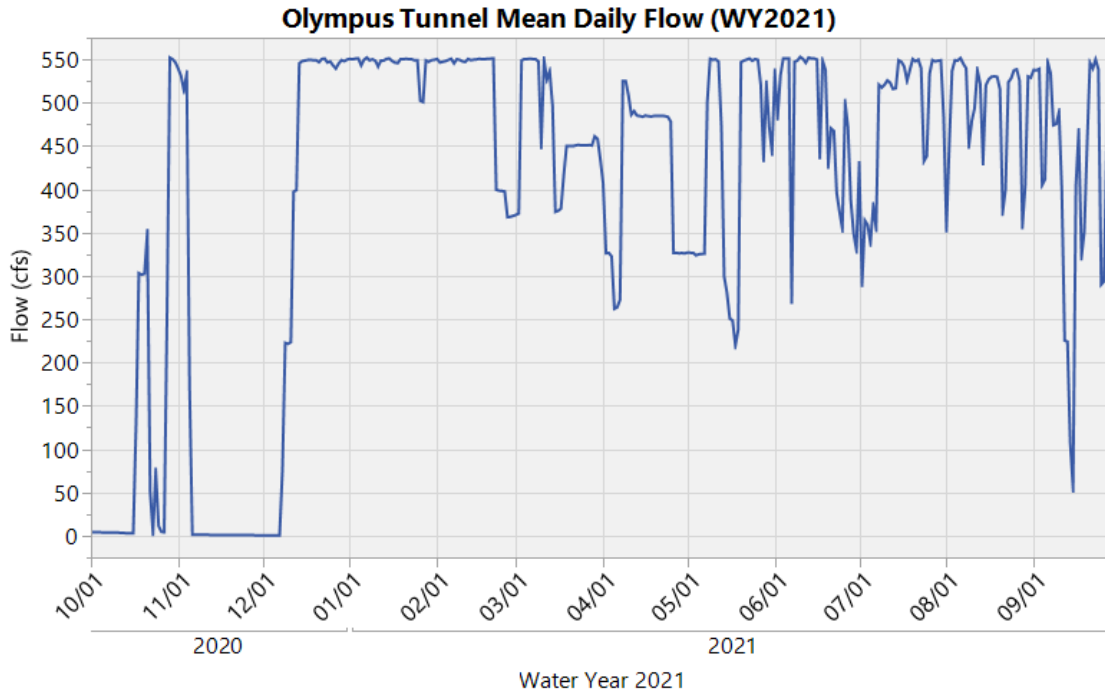


Figure 11: Olympus Tunnel mean daily flow during WY 2021.

May 20: Pumping to Carter Lake Reservoir resumed, however, Adams Tunnel diversions were not increased because priority water became available May 23. In addition, ample skim water was available to keep Olympus Tunnel near capacity throughout the remainder of May (Figure 11).

May 23: The first Olympus Tunnel priority became available for the season. A total of 3,636 AF of priority was diverted to Carter Lake Reservoir in May as pumping to Carter had resumed on May 20.

June: Pumping to Carter Lake Reservoir continued through to the middle of the month. A second complete fill of Carter was not planned. Operationally, the intent was to enhance Carter storage during the second pumping period until pumping would resume again in July in support of Grand Lake clarity operations. Horsetooth Reservoir was filled by the middle of June. Demands from Horsetooth exceeded available flows in the CHFC shortly after and storage generally declined throughout the remainder of the water year.

June 17: Horsetooth achieved operational fill for the water year. East slope priority water ended for the season. Total priority water for WY 2021 was 15,606 AF of which nearly all was diverted at Olympus Tunnel and most was placed into storage in Carter Lake Reservoir.

July-September: Pumping to Carter Lake Reservoir resumed in mid-July. Olympus Tunnel skim operations ended in mid-August. Dille skim ended in mid-September but was hampered throughout the skim season by poor water quality issues in the Big Thompson River from runoff events originating from the North Fork Big Thompson River drainage area on the burn scar left by the Cameron Peak fire.

July 20: Pumping to Carter Lake Reservoir resumed for the third time during the season in support of Grand Lake clarity objectives. Pumping to Carter would continue throughout most the clarity season and ended in early September.

August 22: Olympus Tunnel skim operations ended for the WY as the natural inflow to Lake Estes declined.

September 7: Pumping to Carter Lake Reservoir ended for the WY as the Grand Lake clarity season wound down. On the same day, Flatiron unit #3 started its annual maintenance for the season.

September 17: Dille skim operations ended for the WY. Only 8,934 AF were skimmed into Dille Tunnel for the season, which is less than average and was due to water quality issues in the Big Thompson River associated with rainfall events over the burn scar in the North Fork Big Thompson River. By comparison, Olympus Tunnel skim operations totaled 27,123 AF for the season as the project took full advantage of the water available for skim originating above the North Fork Big Thompson River burn scar.

Throughout WY 2021: Carter Lake and Horsetooth Reservoirs elevations supported all boat ramps during the recreation season. Sufficient supplies met all water deliveries for the water year. A total of 101,772 AF were delivered to Carter Lake Reservoir during the water year; 148,457 AF were provided to Horsetooth Reservoir and customers along the CHFC 550 Section. Carter Lake Reservoir ended the WY with 83,800 AF in storage, higher than average and about the same storage as it started the WY. Horsetooth Reservoir had 125,690 AF in storage at the end of the WY, well above average and much higher than it started the WY (the storage at Horsetooth Reservoir was lower than normal at the start of the WY as was required for the Soldier Canyon Dam outlet works project at that time).

Carter Lake and Horsetooth Reservoirs demands were lower than projected. Rainfall events on irrigated lands supplied by the C-BT delayed planting in May and into early June. Other timely rainfall events occurred during the short but beneficial monsoon season in late July and early August to reduce demands further. Carter Lake Reservoir end of month content remained above the thirty-year average content for the entire WY (Figure 12). By the end of March 2021, Horsetooth Reservoir content remained above its thirty-year average content and was significantly above the average content from April through the end of the WY (Figure 13).

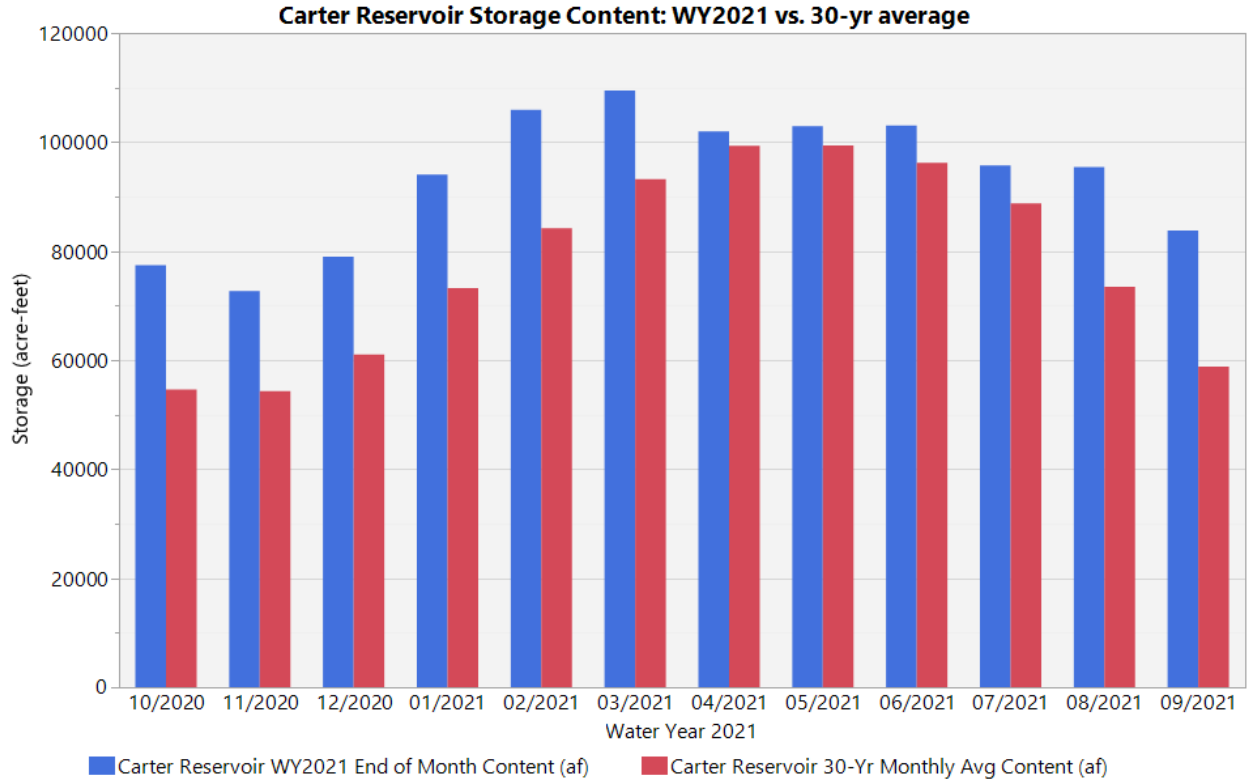


Figure 12: Carter Lake Reservoir storage content during WY 2021 versus its 30-year average.

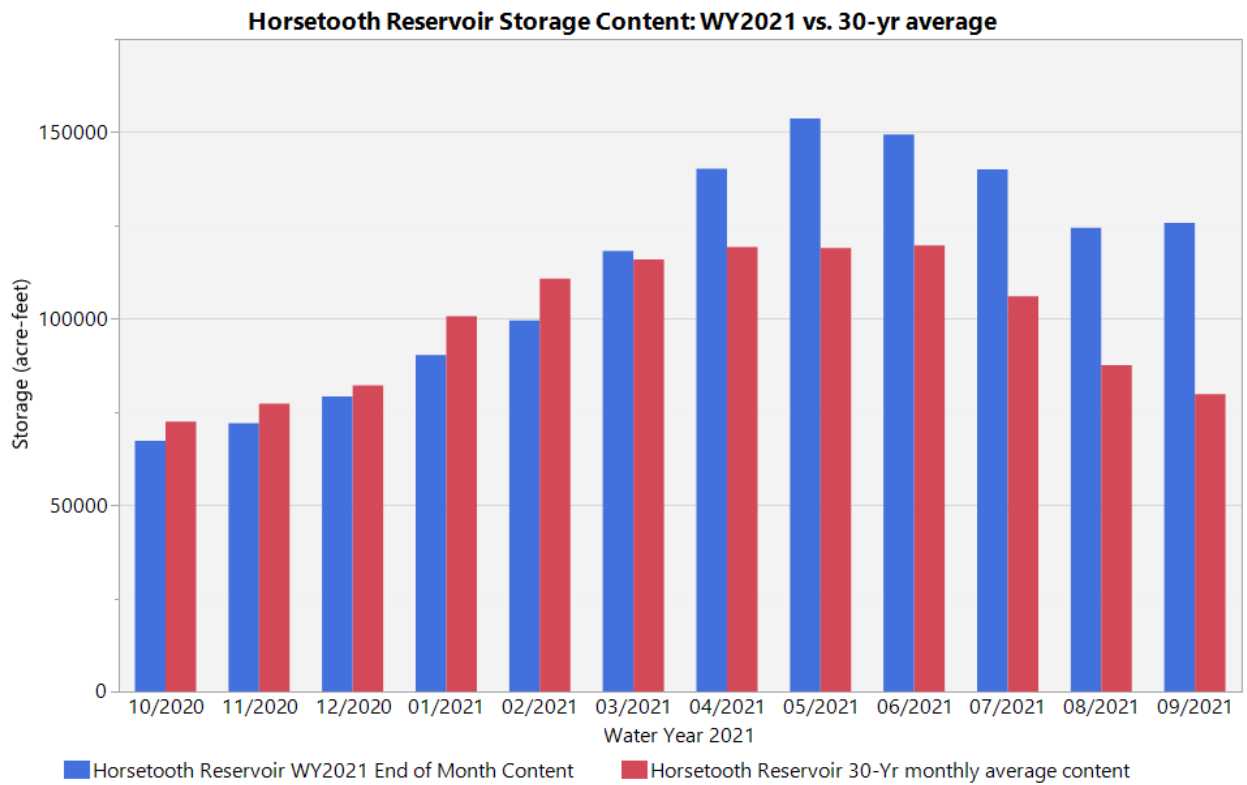


Figure 13: Horsetooth Reservoir storage content during WY 2021 versus its 30-year average.

Green Mountain Reservoir

Climate and Hydrology WY 2021: Hydrologic conditions within the Upper Colorado River basin were below normal for Green Mountain Reservoir operations during the winter delivery season. Less than average snow accumulation was observed from October 2020 through the end of the season (Figure 14). Main stem Colorado River flow was below normal from October through March. Peak snow accumulation occurred on April 29, 2021, approximately 83 percent of the seasonal average accumulation by that date. The April 1 runoff forecast projected an undepleted runoff volume to Green Mountain Reservoir of 191 KAF, approximately 68 percent of normal (Table 3, shown previously)

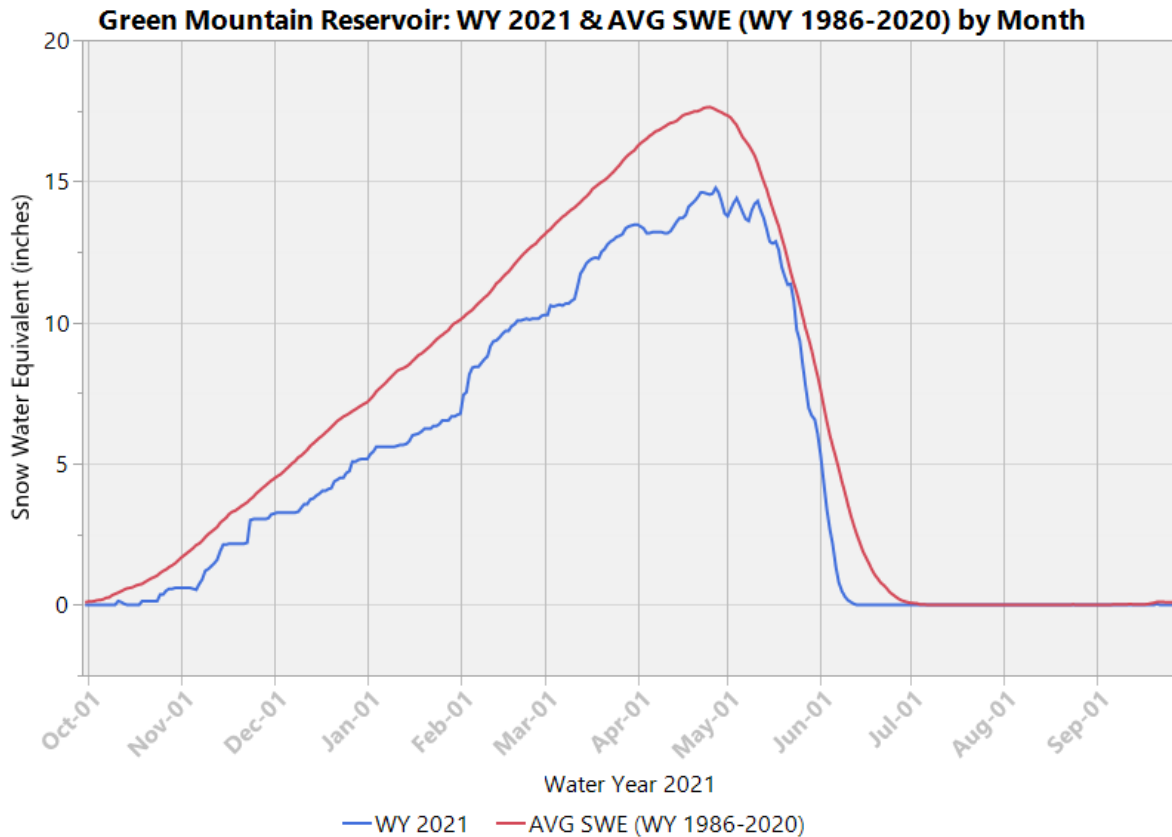


Figure 14: WY 2021 and 30-year average SWE for the Green Mountain Reservoir drainage area.

Blue River basin above Green Mountain Reservoir 2021 snow-accumulation and melt resulted in the lowest April-July runoff volume since the 2012 runoff year. Snow water equivalent remained below normal for the entire accumulation and runoff period. Snow accumulation tracked with the drought years of 2002 and 2012 until late spring when cooler temperatures and above average precipitation resulted in late-season accumulation. Average daily inflow to Green Mountain Reservoir peaked at 918 cfs on June 6, 2021, with substantial diversion by the cities of Denver and Colorado Springs. The total observed April-July runoff was 170 KAF, 11 percent less than the April 1 forecast for the most probable plan. Total April-July runoff volume was 71 percent of the median April-July runoff volume.

The low runoff and substantial upstream diversion operations by the Cities of Colorado Springs and Denver precluded Green Mountain Reservoir from reaching a physical fill. South Platte Basin's peak

snow accumulation was near normal for seasonal average accumulation. Dillon Reservoir carry over storage was near the tenth percentile and obtained a fill by storing 56 KAF, 170 percent of normal between April 1 and July 1. Due to wetter conditions in the South Platte, Denver Water's Roberts Tunnel diverted 10.3 KAF, only 63 percent of normal. Colorado Spring Utilities April-July east slope diversion was 7.4 KAF, 130 percent of normal, which included storage of water owed to Green Mountain Reservoir in Upper Blue Reservoir.

Despite the upper Colorado River basin's 90% of normal April 1 SWE, a drier than normal April through June resulted in below average April-July runoff. Main stem Colorado River flow remained well below average leading into the snow-melt runoff season. A Grand Valley Irrigation Company Water Rights Administrative Call was in place for sixteen days during April. The Colorado River at Cameo reached a runoff peak on June 6, 2021, of 6,610 cfs the fourth lowest snow-melt runoff peak in eighty-eight years. Streamflow remained well below average during runoff and resulting in main stem flow dropping to below Shoshone Powerplant Senior water rights administrative levels on June 23, 2021. The Shoshone Outage Protocol became effective since the Shoshone Powerplant was not fully operational. The Colorado State Engineer placed a Cameo Administrative Water Right Call on July 11, 2021. The Cameo Call remained in effect until October 20, 2021.

October through April WY 2021 Delivery Operations: Green Mountain Reservoir continued stored water delivery through the end of the irrigation season and throughout the winter delivery season. The Colorado River remained under administration from October 1, 2020 until April 30, 2021 except for 20 days of Shoshone Outage Protocol (ShOP) operations due to unavailability of the Shoshone Power Plant.

Considerable HUP water delivery operations continued through October. During the end of the irrigation season Green Mountain Reservoir delivered 14,368 AF of HUP water. Delivery included 2,890 AF for HUP beneficiaries' replacement. This replacement release included 543 AF of HUP water release to fulfill ShOP obligations. Direct delivery for Grand Valley irrigation included 6,270 AF for Grand Valley Irrigation Company and 2,824 AF for the Grand Valley Project. The HUP entities declared HUP Surplus for the 2020 fill year on October 14, 2020 and began Surplus delivery. A total HUP surplus delivery of 2,385 AF between October 14 and October 26 in support of the Colorado River Endangered Fish Recovery Program occurred. HUP storage was 8,545 AF at the end of the irrigation season.

Green Mountain Reservoir delivered HUP stored water for winter replacement and irrigation season startup from November 1 through April 29. A total of 571 AF of HUP replacement was delivered during this period which included 46 AF for ShOP operations. This exceeded the 500 AF of HUP water that is typically reserved for winter HUP beneficiary replacement. This was due in part to the low flow conditions and the 16 days of water rights administration in April 2021. The HUP Management Entities elected to deliver additional HUP Surplus water in April 2021. Colorado River stream flow was inadequate to meet irrigation demand without substantially impacting flow within the 15 Mile Reach. Green Mountain Reservoir delivered 6,226 AF of HUP Surplus in April. Surplus release rates averaged 121 cfs over 26 days and with delivery rates between 44 and 246 cfs.

Green Mountain Reservoir provided stored replacement water for the Silt Project in October 2020 and April 2021. The Silt Project continued to divert out of priority while exchanging 1,745 AF of replacement water from Green Mountain Reservoir.

The C-BT project remained out-of-priority for 191 days from October 1, 2020 through April 30, 2021. Not including the 20 days that ShOP was in effect, Green Mountain Reservoir delivered 14,694 AF of C-BT stored collection system replacement water. Green Mountain Reservoir delivered, during this period, 2,879 AF for contract deliveries, 773 AF for Green Mountain Reservoir evaporative losses, and 1,502 AF for ShOP.

The Shoshone Outage Protocol Agreement parties arranged to implement ShOP for 20 days during the October-April delivery season. This included a twelve-day period between October 26 and November 6 and an eight-day period between April 6 and April 13. Green Mountain Dam exercised the direct flow power right during this period and released reservoir inflow plus 1,501 AF from storage for discretionary power generation.

Green Mountain Reservoir was able to exercise a refill for a single partial day in WY 2021. This was due to well below normal stream flow requiring the Colorado River remain under water rights administration until April 30, 2021. Green Mountain Reservoir exercised the 1935 refill storage water right for a total storage of 157 AF.

On April 30, 2020, Green Mountain Reservoir reached the water year’s minimum storage at 54,086 AF, with a water surface elevation of 7,884.80 feet. Green Mountain Reservoir 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 WY 2020 are compared to the thirty-year average below (Figure 15). There were no other operating restrictions for Green Mountain Reservoir in WY 2021.

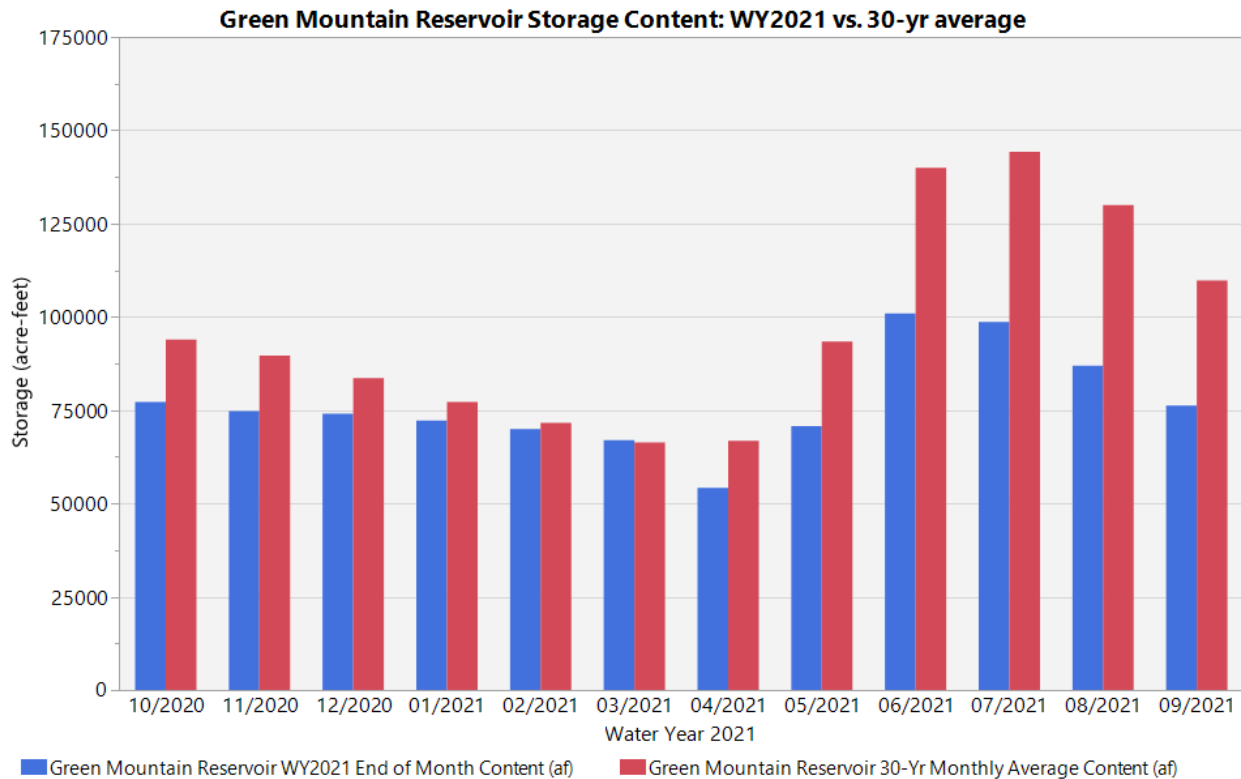


Figure 15: Green Mountain Reservoir monthly content during WY 2021 and 30-year average content.

March 24, 2021: The HUP managing entities held the 2020 HUP Operations Wrap Up meeting. The agenda included reports on total HUP deliveries and Green Mountain Reservoir Operations for the 2020 Irrigation Year and Endangered Fish Recovery 2020 Operations. Reclamation informed the entities that Green Mountain Reservoir was forecast to have an administrative fill with a high probability of substitution operations due to a below average forecasted runoff, and that the HUP allocation was expected to refill the full 66,000 AF. The status of the Heeney Slide operation restriction was also discussed including the expectation that it would not apply during the 2021 irrigation season.

April through July Fill Operations: Green Mountain Reservoir exercised refill storage rights on April 30, 2021. Under the 1935 refill storage right, Green Mountain Reservoir stored 157 AF. The Start-of-Fill was declared on May 1, 2020. On May 1, reservoir storage was 66,843 AF, about 83 percent of the historical average storage for that date.

Reclamation forecasted that Green Mountain Reservoir would obtain an administrative fill in WY 2021 with a substantial substitution replacement volume owed by the Cities for out of priority diversion. The below-average May 1, 2021, runoff projections indicated a reservoir physical fill in less than 20 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 small volume of runoff available for power generation.

The Colorado State Engineer office administered Green Mountain Reservoir operations under the Green Mountain Administrative Protocol (Protocol) for the 2021 fill season. Green Mountain Reservoir discontinued power generation from May 1 through June 22 to increase the runoff volume for storage and upstream diversion.

May 1: The start of fill for Green Mountain Senior Refill Right was declared for WY 2021. 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 2021 fill season. Reclamation placed no limitation on Water Contract release during the fill season.

May 14: Shoshone Outage Protocol participants consider ShOP operations in anticipation of an extended Shoshone Powerplant outage. One unit was operational. Xcel Energy anticipated the second unit to be unavailable for an extended period. Reclamation informed the participants the Green Mountain Reservoir could not participate in ShOP due to the potential of not obtaining an administrative fill.

May 15: Forecasted runoff did not support conducting the Colorado River Endangered Fish Recovery Program CROs for 2021.

June 10: Reclamation revised the 2021 fill plan and notified the Blue River Decree parties that Green Mountain Reservoir revised fill plan reduced the forecasted runoff, allocation for power, and estimated substitution volume.

June 23: The HUP Managing Entities held their initial meeting remotely to consider hydrologic conditions and to plan for Irrigation Year 2021 operations. A total of 18 weekly conference calls were held between June 30 and October 27, 2021, 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 year target flow of 810 cfs due to hot and dry forecast. The Recovery Program stated that due to the limited chance for HUP Surplus and reduced pools within Ruedi Reservoir that scheduling of endangered fish flow would attempt to maintain release of recovery program stored water at closer to 200 and 250 cfs for the season. This release rate would likely result in extended periods of flow with 15-Mile Reach below the 810 cfs target.

June 23: Shoshone Outage Protocol participants began ShOP operations including voluntary releases from Wolford and Williams Fork Reservoir. Aurora Water partially participated by using Green Mountain Reservoir contracted water to fulfill their ShOP obligation. Green Mountain Reservoir did not initially participate due to uncertainty of obtaining an administrative fill.

June 27: Green Mountain Reservoir achieved an administrative fill with out-of-priority water diverted by the Cities.

June 28: Green Mountain Reservoir commenced participation in ShOP. ShOP operations would remain in effect for an extended period due to extensive landslides within Glenwood Canyon that effected the operations and availability of the Shoshone Powerplant. Much of the summer delivery season included both ShOP operations above Shoshone Powerplant and Cameo Call water rights administration below Glenwood Canyon.

June 29: Green Mountain Reservoir first fill storage right began administration with a 1955 priority date to facilitate exchange of Cities out-of-priority diversions.

July 11: Colorado River Water Rights Administration became effective with the Grand Valley Irrigation Company Jr. diversion right. ShOP continued to be in effect to maintain the 1,250 cfs ShOP Colorado River flow target. Green Mountain Reservoir obtained maximum fill level of 7,925.59 feet for the 2021 fill year.

August 20: End of 1935 Storage Water Right fill as per the Green Mountain Administrative Protocol Section per II.A.3.b. Green Mountain Reservoir fill included a Cities replacement obligation of 37,818 AF.

August 21: The Cities began substitution replacement operations with releases from Wolford Reservoir, Williams Fork Reservoir, Dillon Reservoir, Upper Blue Reservoir and Homestake Reservoir. Transit losses were calculated for releases from Upper Blue, Dillon and Homestake Reservoirs. In addition, Ruedi Reservoir Insurance Pool water contract released water to mitigate injury from the use of the Redtop Ditch for the 5,412.5 AF Endangered Fish allocation in Granby Reservoir.

May-September: Green Mountain Reservoir made storage releases from May 1 through the end of the water year. During the 2021 fill and delivery period, Green Mountain Reservoir delivered 67,200 AF from reservoir storage including 28,254 AF from the Cities replacement obligations and the Ruedi Reservoir Insurance Pool. Delivered storage included: 9,559 AF for Colorado River Collection System replacement, 44,418 AF for HUP beneficiary replacement and irrigation direct delivery, 3,434 AF for Silt Project Replacement, 3,579 AF for contracts, 2,255 AF for Green Mountain Reservoir evaporation losses, and 3,955 AF for ShOP operations. Since Green Mountain Reservoir did not physically fill in

2021, the reservoir stored and delivered 73 AF for the Colorado River District Moser Ditch Excess Capacity Contract.

2022 Annual Operation Plan

Collection System and East Slope Colorado-Big Thompson Project

The 2022 C-BT Most-Probable Annual Operating Plan (2022 AOP)⁵ 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 2022 AOP are two significant C-BT outages concurrently scheduled to begin in mid-September 2022. One is for East Portal concrete spillway repairs, plus Olympus Dam controls upgrade and radial gate cable overhaul and the other for Chimney Hollow Reservoir Conduit interconnect to Bald Mountain Tunnel. Adams Tunnel diversions will cease for three months to accommodate that work.

The 2022 AOP used a projected 206,500 acre-feet (AF) total inflow to the west slope collection system during water year (WY) 2022. It simulated pumping 40,100 AF of water from Willow Creek Reservoir and no spill at Granby Reservoir for the WY. Windy Gap was not expected to pump to Granby in WY 2022.

The 2022 AOP projected diversions totaling 220,100 AF through the Adams Tunnel during the WY. About half of the projected diversions were planned between December 2021 and May 2022. Sufficient capacity remained and is simulated to convey 26,800 AF of Big Thompson River skim water at Olympus Tunnel and 29,000 AF of skim at Dille Tunnel for power generation. The 2022 AOP includes 700 AF of priority water from the Big Thompson River.

The 2022 AOP simulated a fill of both Carter Lake and Horsetooth Reservoirs. Carter Lake Reservoir was expected to first fill by mid-March 2022, achieve a second fill at the end of May after which demands were projected to exceed supplies by mid-July, with an associated reservoir drawdown through the end of the WY to an ending elevation of 5,726 feet. Horsetooth Reservoir maximum content was achieved by the start of July 2022 after which time, demands are expected to exceed supplies and the reservoir elevation will decline to a minimum 5,415.5 feet at the end of the WY. Total deliveries from Carter Lake and Horsetooth Reservoirs were simulated as 98,900 and 94,700 AF, respectively. Initial WY content of Carter Lake Reservoir is 83,800 AF and simulated ending content is 76,400 AF. Horsetooth Reservoir's initial content is 125,700 AF and the simulated ending content is 128,600 AF.

⁵ 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.

Green Mountain Reservoir

The Green Mountain Reservoir Most-Probable 2022 AOP⁶ used a projected 219,100 AF Green Mountain Reservoir total (depleted) inflow. With that inflow, plans provided for Green Mountain to fill in 2022, achieving maximum content in the toward the middle of July. Total Green Mountain Reservoir releases are simulated as 159,400 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 2022 AOP included refill of all Green Mountain Reservoir allocations for delivery during the 2021-2022 delivery season. The simulated minimum reservoir water surface elevation was 7,869.5 feet in mid-April before refilling begins, four and a half feet above the Heeney Slide operational restriction of 7,865.0 feet.

The Green Mountain 2022 AOP assumed that Denver and Colorado Springs would deplete a total of 98,200 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 Green Mountain Reservoir due to the cities' out-of-priority depletions.

⁶ 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.

APPENDICES

APPENDIX A: DAILY RECORDS FOR WY2021

The following thirty-eight pages of Appendix A summarize the daily operations by primary feature of Green Mountain Reservoir and the Colorado-Big Thompson Project for Water Year 2021.

APPENDIX A - DAILY RECORDS FOR WY2021

Appendix A (1 of 38)

Green Mountain Reservoir, CO

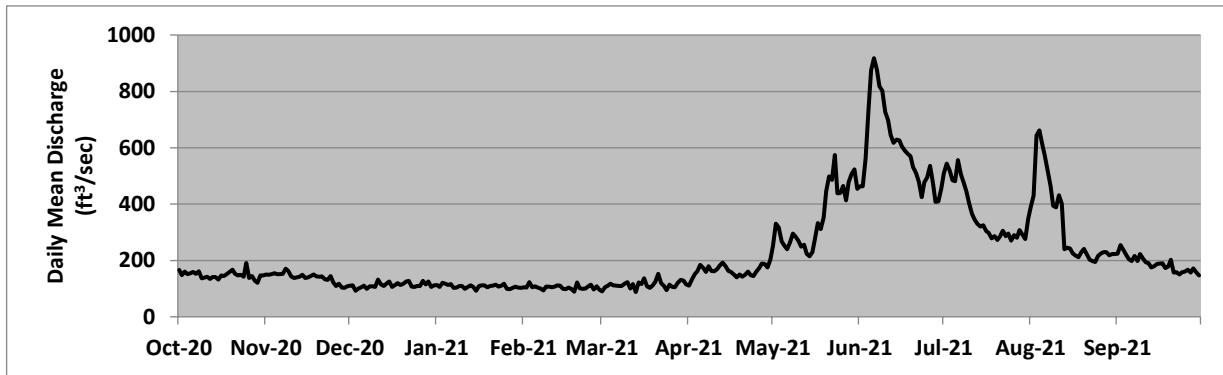
Location. --Lat 39°52'42", long 106°19'42", Summit County, Hydrologic Unit 14010002, on Green Mountain Dam, 13 miles southeast of Kremmling, Colorado, on the Blue River.

Gage. --Water level recorder with satellite telemetry. Elevation of gage is 7960 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-2020 to 30-Sep-2021. Records are complete and fair. This record consists of operational data which could be subject to future revisions and changes.

Inflow, cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	166	150	110	113	105	90	111	253	464	509	390	224
2	149	149	112	106	104	105	132	331	463	544	431	254
3	160	152	93	120	123	111	152	317	563	520	643	238
4	151	154	100	117	105	118	162	268	737	485	662	219
5	155	151	106	113	108	112	185	254	875	482	617	205
6	160	152	111	116	104	111	174	240	918	556	571	198
7	153	152	99	102	100	109	160	263	878	506	518	216
8	161	170	109	104	94	110	180	296	818	476	463	198
9	137	163	108	109	107	117	163	285	802	446	395	223
10	140	144	106	109	107	123	162	271	728	402	389	207
11	142	138	133	100	105	100	170	249	698	365	432	193
12	134	140	115	106	108	116	182	256	646	343	401	191
13	142	143	110	112	112	88	192	224	618	330	240	176
14	142	150	117	106	110	121	179	215	629	321	245	180
15	132	138	125	92	99	116	163	229	627	325	242	188
16	147	140	106	109	98	136	159	277	605	305	225	189
17	145	144	113	112	104	109	151	333	590	297	218	190
18	152	150	120	112	99	103	140	312	579	279	212	173
19	160	144	113	105	89	112	150	352	570	286	230	179
20	167	143	117	110	122	124	143	447	531	272	242	203
21	153	143	125	110	101	153	149	498	511	286	222	157
22	146	134	128	114	100	119	161	487	479	306	202	158
23	149	131	107	107	100	109	148	574	424	287	198	150
24	143	145	106	111	108	95	145	439	477	296	195	158
25	191	123	109	117	114	114	160	439	495	270	216	160
26	137	110	109	99	97	106	173	465	536	290	226	167
27	144	118	128	99	108	105	189	414	474	281	230	157
28	128	104	115	103	96	121	188	479	408	308	230	172
29	121	103	126	107		131	176	506	411	293	218	159
30	147	109	106	104		129	204	524	456	276	223	147
31	146		112	102		115		455		348	223	
Min	121	103	93	92	89	88	111	215	408	270	195	147
Max	191	170	133	120	123	153	204	574	918	556	662	254
Mean	148	140	113	108	105	114	163	353	600	364	327	188
ac-ft	9125	8307	6930	6643	5811	7001	9718	21722	35724	22394	20127	11167



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

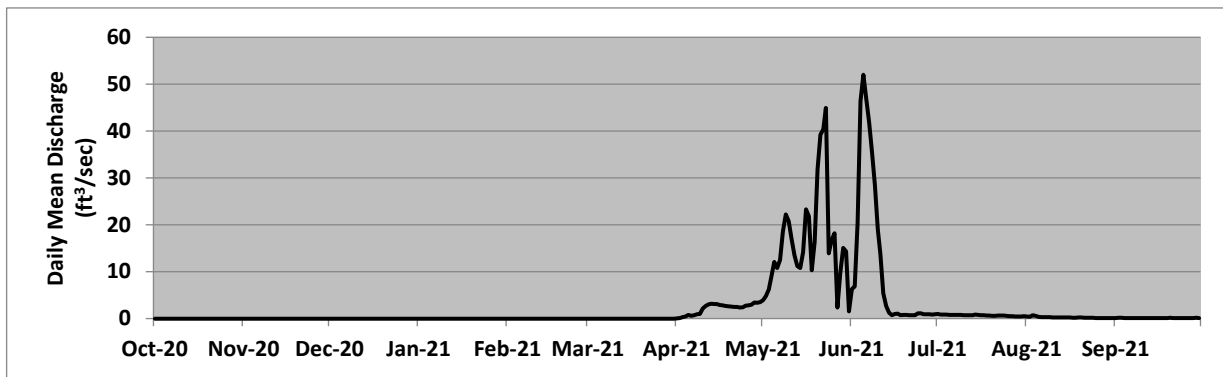
Location. --Lat 39°52'25", long 106°19'49", Summit County, Hydrologic Unit 14010002 , on left bank at concrete flume structure, and 1.1 mi west of Heeney.

Gage.--Water-stage recorder with satellite telemetry. Elevation of gage is 8050 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-2020. The station was put back into service from 5-Apr-2021 to 30-Sep-2021. Missing values for the off-season are marked as 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 United States Geological Survey as site #09056500.

Discharge, cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	0	0	0	0	0	4	6	1	0	0
2	0	0	0	0	0	0	0	5	7	1	0	0
3	0	0	0	0	0	0	0	6	21	1	1	0
4	0	0	0	0	0	0	0	9	46	1	1	0
5	0	0	0	0	0	0	1	12	52	1	0	0
6	0	0	0	0	0	0	1	11	47	1	0	0
7	0	0	0	0	0	0	1	13	42	1	0	0
8	0	0	0	0	0	0	1	19	35	1	0	0
9	0	0	0	0	0	0	1	22	28	1	0	0
10	0	0	0	0	0	0	2	21	19	1	0	0
11	0	0	0	0	0	0	3	17	14	1	0	0
12	0	0	0	0	0	0	3	14	5	1	0	0
13	0	0	0	0	0	0	3	11	3	1	0	0
14	0	0	0	0	0	0	3	11	1	1	0	0
15	0	0	0	0	0	0	3	14	1	1	0	0
16	0	0	0	0	0	0	3	23	1	1	0	0
17	0	0	0	0	0	0	3	22	1	1	0	0
18	0	0	0	0	0	0	3	10	1	1	0	0
19	0	0	0	0	0	0	3	16	1	1	0	0
20	0	0	0	0	0	0	3	32	1	1	0	0
21	0	0	0	0	0	0	2	39	1	1	0	0
22	0	0	0	0	0	0	3	40	1	1	0	0
23	0	0	0	0	0	0	2	45	1	1	0	0
24	0	0	0	0	0	0	2	14	1	1	0	0
25	0	0	0	0	0	0	3	17	1	1	0	0
26	0	0	0	0	0	0	3	18	1	1	0	0
27	0	0	0	0	0	0	3	2	1	1	0	0
28	0	0	0	0	0	0	3	10	1	0	0	0
29	0	0	0	0	0	0	3	15	1	0	0	0
30	0	0	0	0	0	0	4	14	1	0	0	0
31	0	0	0	0	0	0	0	2	0	1	0	0
Min	0	0	0	0	0	0	0	2	1	0	0	0
Max	0	0	0	0	0	0	4	45	52	1	1	0
Mean	0	0	0	0	0	0	2	16	11	1	0	0
ac-ft	0	0	0	0	0	0	129	1007	676	43	16	7



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

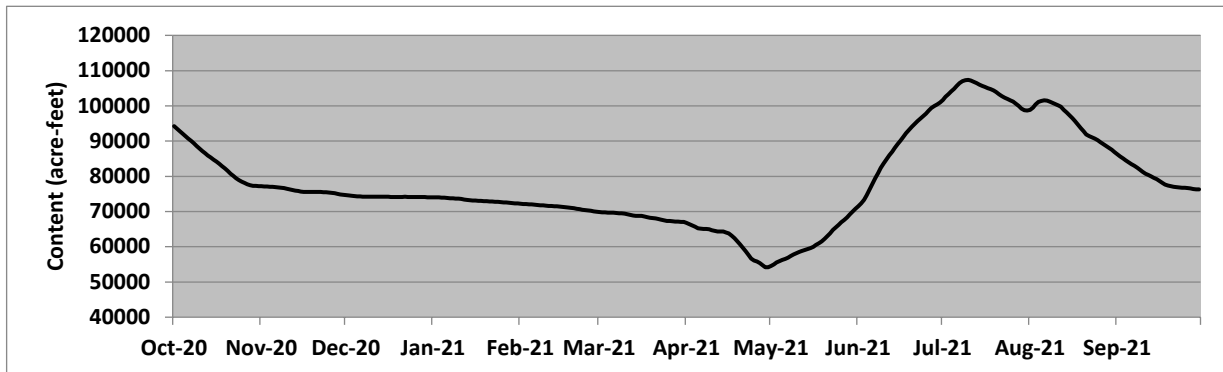
Location. --Lat 39°52'42", long 106°19'42", Summit County, Hydrologic Unit 14010002, on Green Mountain Dam, 13 miles southeast of Kremmling, Colorado, on the Blue River..

Gage. --Water level recorder with satellite telemetry. Elevation of gage is 7960 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-2020 to 30-Sep-2021. Maximum capacity is 153,639 AF at elevation 7950.00 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	94248	77184	74679	74035	72209	69811	66761	54501	71506	101712	98867	86264
2	93517	77132	74590	74009	72146	69763	66389	55008	72271	102542	99491	85663
3	92820	77093	74463	73997	72121	69726	66041	55488	73255	103344	100431	85118
4	92111	77054	74387	73959	72059	69714	65639	55871	74577	104089	101141	84537
5	91409	76989	74324	73909	71997	69690	65249	56224	76163	104819	101441	83970
6	90723	76899	74274	73858	71936	69654	65099	56550	77850	105704	101552	83476
7	90028	76808	74211	73783	71862	69605	65030	56908	79442	106444	101472	82970
8	89319	76757	74198	73720	71776	69533	65019	57339	80910	106991	101219	82436
9	88589	76667	74186	73669	71715	69473	64927	57753	82341	107258	100841	81895
10	87889	76486	74161	73619	71653	69377	64711	58147	83613	107341	100479	81287
11	87195	76279	74186	73532	71604	69186	64508	58492	84828	107224	100164	80736
12	86531	76086	74186	73431	71555	69043	64361	58797	85957	106875	99739	80348
13	85943	75905	74173	73343	71506	68875	64350	59071	87011	106460	98898	80000
14	85342	75802	74173	73242	71457	68803	64293	59333	88088	106049	98092	79587
15	84731	75674	74186	73130	71383	68743	64090	59621	89161	105688	97292	79151
16	84150	75597	74161	73080	71310	68731	63740	60005	90202	105393	96498	78689
17	83517	75584	74148	73042	71248	68612	63170	60497	91219	105065	95648	78124
18	82901	75584	74148	73005	71137	68421	62383	60952	92199	104786	94699	77654
19	82260	75572	74135	72943	70990	68254	61559	61483	93176	104429	93710	77354
20	81516	75559	74135	72893	70904	68113	60670	62207	94069	103927	92746	77197
21	80776	75546	74148	72843	70782	68030	59664	63025	94909	103338	91907	77054
22	80080	75521	74173	72806	70648	67877	58692	63819	95663	102733	91438	76937
23	79442	75508	74148	72757	70515	67700	57649	64790	96286	102270	91087	76808
24	78887	75495	74123	72719	70406	67487	56643	65490	97016	101935	90694	76783
25	78491	75406	74098	72682	70308	67357	56053	66192	97785	101600	90231	76744
26	78059	75278	74072	72607	70175	67275	55761	66936	98649	101219	89694	76680
27	77746	75164	74085	72532	70066	67192	55307	67582	99382	100574	89132	76550
28	77471	75023	74072	72457	69932	67134	54739	68349	99943	99974	88603	76395
29	77328	74883	74085	72395		67110	54173	69174	100368	99241	88074	76292
30	77275	74768	74060	72333		67075	54163	70042	100936	98774	87549	76266
31	77223		74047	72271		67017		70757		98649	86927	
Min	77223	74768	74047	72271	69932	67017	54163	54501	71506	98649	86927	76266
Max	94248	77184	74679	74035	72209	69811	66761	70757	100936	107341	101552	86264
Mean	84436	75977	74200	73181	71264	68528	61694	61303	88293	103756	95476	79766
ac-ft	77223	74768	74047	72271	0	67017	54163	70757	100936	98649	86927	76266



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

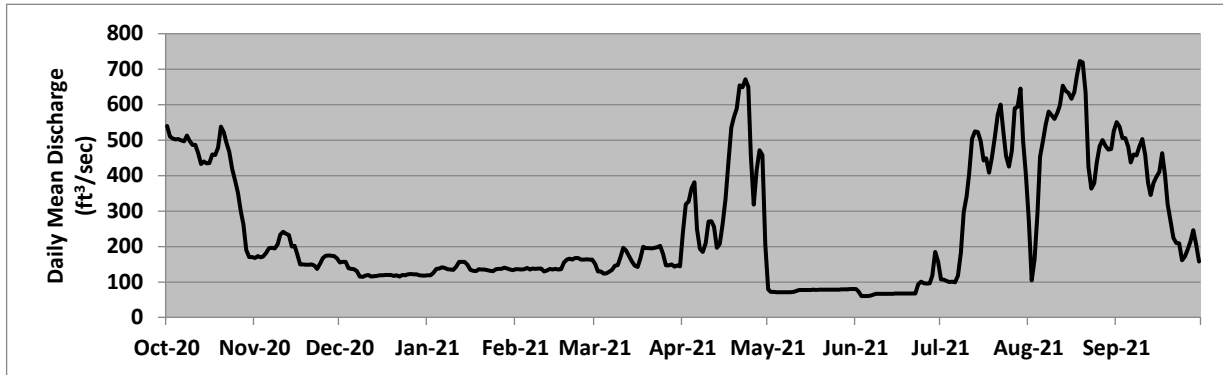
Location.--Lat 39°52'49", long 106°20'00", Summit County, Hydrologic Unit 14010002, on left bank 0.3 miles upstream from Elliot Creek, 0.3 miles downstream from Green Mountain Reservoir and 13 miles southeast of Kremmling.

Gage.-- Water-stage recorder with satellite telemetry. Datum of gage is 7682.66 feet (levels by U.S. 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 from station. Trans-mountain diversions upstream from station. Recorder was operated from 01-Oct-2020 to 30-Sep-2021. 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.

Discharge, cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	540	167	155	119	136	151	239	79	80	107	274	550
2	510	173	157	119	136	130	319	72	73	107	104	538
3	505	169	156	126	135	129	327	72	60	103	164	505
4	502	172	138	137	136	124	364	71	60	100	294	506
5	503	182	137	138	139	124	381	71	60	101	452	481
6	499	195	136	142	135	129	249	71	61	99	498	437
7	497	196	131	140	138	134	194	71	64	118	545	460
8	513	194	115	136	137	146	185	71	66	182	580	457
9	499	206	114	135	138	147	209	72	66	298	571	482
10	487	234	118	135	138	172	270	72	67	342	559	503
11	486	241	120	144	130	197	271	75	67	407	577	459
12	464	236	115	157	132	188	256	78	67	504	598	380
13	433	233	116	156	137	173	197	78	67	525	653	345
14	439	200	117	157	135	158	207	78	67	523	639	379
15	435	202	119	148	137	146	264	78	67	497	633	397
16	435	178	119	135	135	142	335	78	67	443	616	410
17	459	150	120	131	136	169	437	78	67	449	635	463
18	458	150	120	131	155	199	535	78	67	409	681	400
19	479	149	120	136	163	196	564	78	68	451	723	319
20	538	148	117	135	166	195	589	78	68	509	719	272
21	522	149	119	135	163	195	654	78	68	571	636	225
22	493	146	115	133	167	197	649	78	68	600	425	210
23	467	137	119	132	167	198	672	79	94	520	363	209
24	419	151	119	130	163	202	650	79	101	455	379	161
25	387	168	122	136	163	180	455	79	96	426	437	172
26	352	174	122	137	164	147	318	79	95	469	483	190
27	299	175	121	137	163	147	415	79	96	590	500	214
28	264	174	121	140	163	150	471	79	118	594	484	246
29	190	173	119	138		143	458	80	185	645	473	205
30	170	167	118	135		146	206	80	158	500	475	158
31	170		118	134		144		80		402	526	
Min	170	137	114	119	130	124	185	71	60	99	104	158
Max	540	241	157	157	167	202	672	80	185	645	723	550
Mean	433	180	124	137	147	161	378	76	80	388	506	358
ac-ft	26602	10690	7649	8419	8150	9914	22493	4696	4777	23886	31135	21289



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

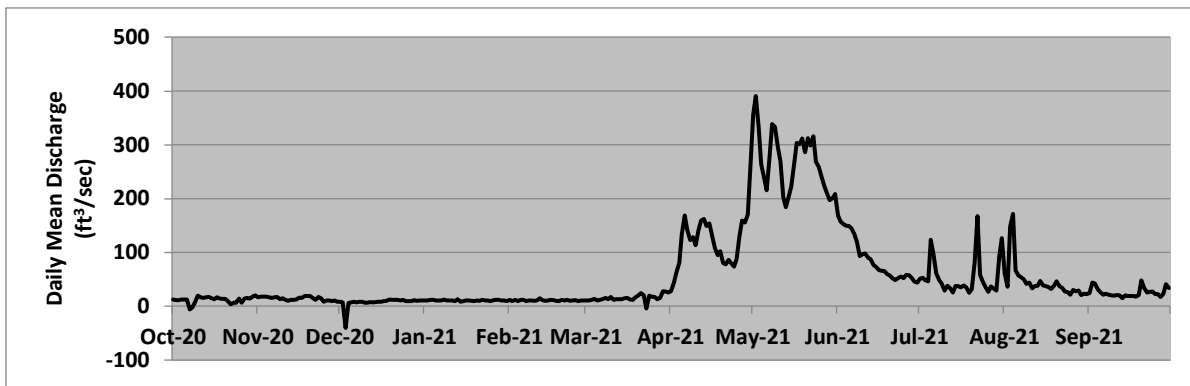
Location. -- Lat 40°08'52", long 105°56'28", Grand County, Hydrologic Unit 14010001, at Willow Creek Dam, 4 miles north of Granby, Colorado, on Willow Creek, a tributary of the Colorado River.

Gage.— Water level recorder with satellite telemetry. Elevation of gage is 8130 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-2020 to 30-Sep-2021. 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, cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	12	17	8	11	12	11	28	356	169	51	61	24
2	11	18	7	11	9	11	43	391	157	53	36	44
3	11	18	-40	12	12	12	63	333	152	48	148	42
4	13	18	6	12	9	13	81	263	150	46	171	31
5	12	17	7	11	12	11	135	238	149	123	66	26
6	12	16	8	11	12	12	169	216	145	95	57	21
7	-6	16	7	10	9	13	141	277	134	61	54	23
8	-3	17	8	12	11	15	123	339	120	49	50	21
9	8	13	8	10	11	13	128	333	93	42	41	20
10	20	15	6	11	10	17	113	296	97	29	44	20
11	17	12	7	11	11	12	141	270	98	38	33	21
12	16	10	8	9	15	13	159	203	90	34	37	20
13	16	12	7	13	11	13	162	184	87	25	38	15
14	17	12	8	8	10	13	149	204	77	37	47	20
15	15	12	8	9	11	15	154	223	73	37	38	19
16	13	16	8	10	12	16	132	265	67	35	37	19
17	16	16	9	10	11	12	109	303	66	38	36	19
18	14	19	10	10	10	12	95	301	65	35	32	18
19	14	19	13	9	10	16	102	312	60	25	38	20
20	14	19	12	11	12	20	80	286	57	32	46	48
21	9	15	12	10	11	24	77	312	51	80	38	34
22	3	12	12	12	12	20	86	299	49	168	34	25
23	7	17	10	11	10	-4	80	316	52	58	27	27
24	7	15	12	11	11	19	74	268	55	45	26	27
25	14	8	9	9	11	18	87	259	52	36	21	22
26	6	11	9	11	9	17	130	241	58	27	30	23
27	14	11	9	12	11	13	159	224	58	37	28	17
28	16	10	11	12	11	15	155	211	53	32	29	23
29	14	11	10	11		28	170	197	45	29	21	41
30	18	8	11	11		27	256	201	44	93	23	34
31	20		11	9		25		209		126	23	
Min	-6	8	-40	8	9	-4	28	184	44	25	21	15
Max	20	19	13	13	15	28	256	391	169	168	171	48
Mean	12	14	7	11	11	15	119	269	87	54	45	25
ac-ft	734	846	461	652	602	938	7105	16518	5201	3302	2797	1515



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

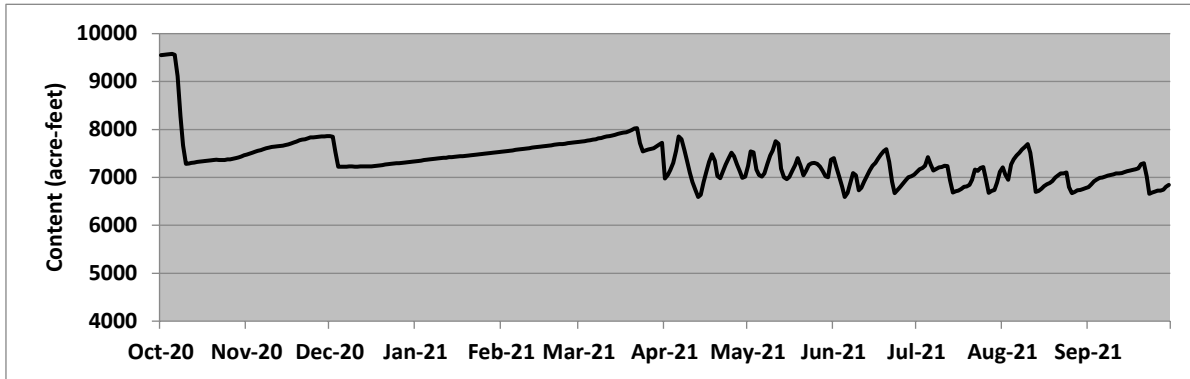
Location.—Lat 40° 08'52", long 105° 56'28", Grand County, Hydrologic Unit 14010001, at Willow Creek Dam, 4 miles north of Granby, Colorado, on Willow Creek, a tributary of the Colorado River.

Gage.— Water level recorder with satellite telemetry. Elevation of gage is 8130 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 8077.00 and 8130.00 feet. Recorder was operated from 01-Oct 2020 to 30-Sep-2021. 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	9553	7479	7863	7339	7538	7743	6977	7246	7401	7111	7208	6800
2	9559	7499	7847	7346	7543	7750	7048	7545	7211	7168	7060	6855
3	9564	7518	7536	7352	7552	7759	7156	7521	7009	7194	6949	6918
4	9572	7536	7224	7361	7556	7771	7301	7161	6802	7242	7273	6958
5	9578	7554	7224	7368	7565	7778	7555	7050	6594	7420	7376	6988
6	9556	7570	7226	7374	7577	7787	7858	7020	6680	7261	7454	6995
7	9115	7588	7226	7380	7581	7798	7799	7085	6900	7142	7516	7016
8	8278	7607	7228	7389	7588	7814	7570	7275	7092	7175	7583	7034
9	7671	7623	7228	7395	7595	7824	7350	7454	7044	7211	7637	7050
10	7282	7637	7226	7402	7601	7844	7100	7565	6731	7215	7698	7067
11	7292	7646	7226	7408	7607	7854	6904	7756	6783	7242	7518	7085
12	7301	7650	7228	7413	7621	7865	6744	7703	6915	7239	7104	7083
13	7311	7659	7228	7422	7630	7877	6590	7187	7039	6942	6695	7092
14	7324	7666	7228	7424	7637	7890	6636	7007	7144	6682	6718	7111
15	7330	7675	7230	7428	7644	7906	6904	6968	7242	6710	6768	7128
16	7335	7691	7232	7435	7652	7923	7128	7013	7306	6727	6815	7144
17	7346	7707	7237	7441	7659	7935	7321	7139	7393	6761	6859	7158
18	7352	7729	7243	7446	7666	7944	7486	7258	7476	6805	6882	7173
19	7359	7750	7251	7450	7671	7960	7352	7405	7553	6811	6927	7192
20	7365	7773	7260	7457	7680	7986	7032	7246	7588	6846	6995	7275
21	7368	7789	7268	7461	7687	8024	6986	7046	7326	6953	7044	7299
22	7361	7798	7277	7470	7693	8027	7137	7135	6911	7164	7083	7016
23	7361	7819	7284	7477	7698	7714	7273	7263	6674	7135	7085	6659
24	7361	7833	7290	7483	7705	7543	7396	7294	6738	7199	7104	6687
25	7376	7835	7294	7488	7716	7563	7516	7306	6798	7220	6798	6706
26	7376	7842	7299	7496	7720	7583	7442	7282	6873	6945	6672	6725
27	7391	7849	7303	7505	7729	7594	7275	7225	6942	6680	6701	6723
28	7406	7854	7311	7512	7736	7610	7128	7139	7002	6716	6729	6742
29	7419	7858	7320	7518		7648	6988	7027	7023	6736	6736	6802
30	7437	7860	7326	7525		7689	7018	7002	7055	6893	6757	6846
31	7461		7332	7529		7725		7371		7121	6779	
Min	7282	7479	7224	7339	7538	7543	6590	6968	6594	6680	6672	6659
Max	9578	7860	7863	7529	7736	8027	7858	7756	7588	7420	7698	7299
Mean	7883	7696	7306	7435	7637	7798	7199	7248	7041	7021	7049	6978
ac-ft	7461	7860	7332	7529	0	7725	7018	7371	7055	7121	6779	6846



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

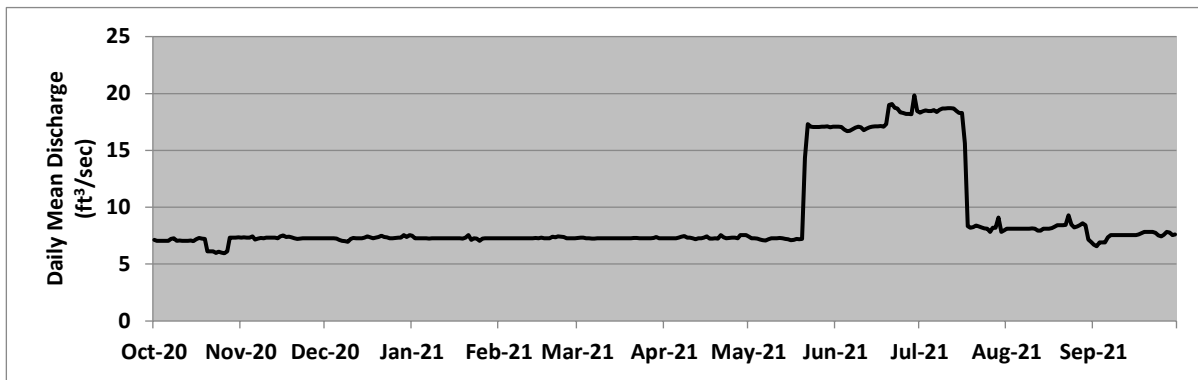
Location.--Lat 40°08'50", long 105°56'16", Grand County, Hydrologic Unit 14010001, at Willow Creek Dam, 4 miles north of Granby, Colorado, on Willow Creek, a tributary of the Colorado River.

Gage.--Water-stage recorder with satellite telemetry. Elevation of gage is 8040 feet (m.s.l.) from topographic map.

Remarks.-- Drainage area is 127 square miles. Recorder was operated from 01-Oct-2020 to 30-Sep-2021. 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, cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	7	7	7	8	7	7	7	7	17	18	8	7
2	7	7	7	7	7	7	7	7	17	18	8	7
3	7	7	7	7	7	7	7	7	17	19	8	7
4	7	7	7	7	7	7	7	7	17	18	8	7
5	7	7	7	7	7	7	7	7	17	18	8	7
6	7	7	7	7	7	7	7	7	17	19	8	7
7	7	7	7	7	7	7	7	7	17	18	8	8
8	7	7	7	7	7	7	7	7	17	19	8	8
9	7	7	7	7	7	7	7	7	17	19	8	8
10	7	7	7	7	7	7	7	7	17	19	8	8
11	7	7	7	7	7	7	7	7	17	19	8	8
12	7	7	7	7	7	7	7	7	17	19	8	8
13	7	7	7	7	7	7	7	7	17	19	8	8
14	7	7	7	7	7	7	7	7	17	18	8	8
15	7	7	7	7	7	7	7	7	17	18	8	8
16	7	8	7	7	7	7	7	7	17	18	8	8
17	7	7	7	7	7	7	7	7	17	16	8	8
18	7	7	7	7	7	7	7	7	17	8	8	8
19	7	7	7	7	7	7	7	7	17	8	8	8
20	6	7	7	7	7	7	7	7	19	8	8	8
21	6	7	7	8	7	7	8	14	19	8	8	8
22	6	7	7	7	7	7	7	17	19	8	8	8
23	6	7	7	7	7	7	7	17	19	8	9	8
24	6	7	7	7	7	7	7	17	18	8	8	8
25	6	7	7	7	7	7	7	17	18	8	8	7
26	6	7	7	7	7	7	7	17	18	8	8	8
27	6	7	7	7	7	7	7	17	18	8	8	8
28	7	7	7	7	7	7	8	17	18	8	9	8
29	7	7	8	7		7	8	17	20	9	8	8
30	7	7	7	7		7	8	17	18	8	7	8
31	7		8	7		7		17		8	7	
Min	6	7	7	7	7	7	7	7	17	8	7	7
Max	7	8	8	8	7	7	8	17	20	19	9	8
Mean	7	7	7	7	7	7	7	11	18	14	8	7
ac-ft	422	435	448	447	405	447	436	654	1048	847	503	445



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

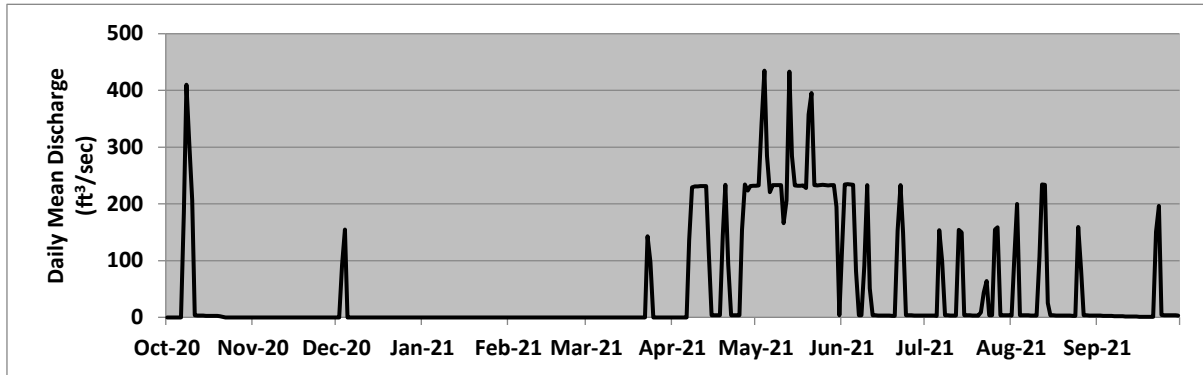
Location.—Lat 40°08'39", long 105°54'10", Grand County, Hydrologic Unit 14010001, at Willow Creek Pump Canal, 4 miles north of Granby, Colorado, on Willow Creek, a tributary of the Colorado River.

Gage.— Water-stage recorder with satellite telemetry at 15 foot Parshall Flume. Elevation of gage is 8300 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-2020 to 30-Sep-2021. Records are complete and reliable. This record consists of operational data which could be subject to future revisions and changes.

Discharge, cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	0	0	0	0	0	232	128	3	4	3
2	0	0	0	0	0	0	0	232	234	3	100	3
3	0	0	92	0	0	0	0	341	235	3	200	3
4	0	0	155	0	0	0	0	435	234	3	4	3
5	0	0	0	0	0	0	0	285	234	3	4	3
6	0	0	0	0	0	0	0	221	82	154	4	3
7	186	0	0	0	0	0	136	233	4	99	4	2
8	410	0	0	0	0	0	229	233	4	4	4	2
9	306	0	0	0	0	0	231	233	91	4	3	2
10	207	0	0	0	0	0	231	233	233	4	3	2
11	4	0	0	0	0	0	231	166	51	4	107	2
12	3	0	0	0	0	0	232	206	4	3	235	2
13	3	0	0	0	0	0	232	433	4	154	234	2
14	3	0	0	0	0	0	118	284	4	150	25	2
15	3	0	0	0	0	0	4	233	4	4	4	1
16	3	0	0	0	0	0	4	232	3	4	4	1
17	3	0	0	0	0	0	4	232	3	4	4	1
18	3	0	0	0	0	0	4	233	3	4	4	1
19	3	0	0	0	0	0	145	228	3	4	4	1
20	2	0	0	0	0	0	234	358	3	3	4	1
21	1	0	0	0	0	0	93	396	153	9	3	1
22	0	0	0	0	0	0	4	233	233	44	3	151
23	0	0	0	0	0	143	4	233	149	64	3	197
24	0	0	0	0	0	98	4	233	4	4	3	4
25	0	0	0	0	0	0	4	233	4	4	159	4
26	0	0	0	0	0	0	154	233	4	155	83	4
27	0	0	0	0	0	0	234	233	4	159	4	4
28	0	0	0	0	0	0	223	233	4	4	4	4
29	0	0	0	0	0	0	231	233	4	4	4	4
30	0	0	0	0	0	0	232	195	3	4	3	4
31	0	0	0	0	0	0	0	4	0	4	3	0
Min	0	0	0	0	0	0	0	4	3	3	3	1
Max	410	0	155	0	0	143	234	435	235	159	235	197
Mean	37	0	8	0	0	8	107	250	71	34	39	14
ac-ft	2259	0	490	0	0	477	6379	15357	4208	2113	2426	824



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

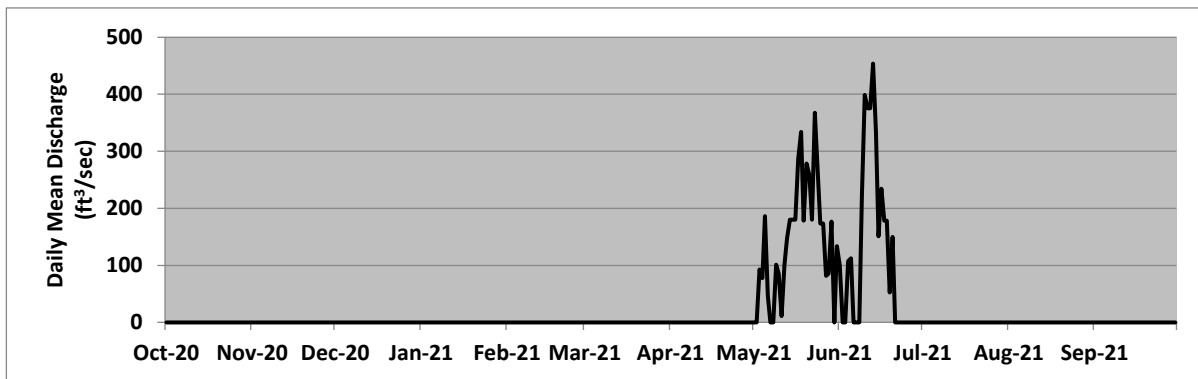
Location. --Lat 40°06'24", long 105°58'48", Grand County, Hydrologic Unit 14010001, 5.5 miles northeast of Granby, Colorado, on the Colorado River.

Gage.-- Reading taken directly from the pumps. Elevation of the pumping plant is 7823 (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-2020 to 30-Sep-2021. 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, cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	0	0	0	0	0	0	100	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	93	0	0	0	0
4	0	0	0	0	0	0	0	78	107	0	0	0
5	0	0	0	0	0	0	0	186	113	0	0	0
6	0	0	0	0	0	0	0	47	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	101	220	0	0	0
10	0	0	0	0	0	0	0	85	399	0	0	0
11	0	0	0	0	0	0	0	11	376	0	0	0
12	0	0	0	0	0	0	0	101	375	0	0	0
13	0	0	0	0	0	0	0	147	454	0	0	0
14	0	0	0	0	0	0	0	180	334	0	0	0
15	0	0	0	0	0	0	0	180	151	0	0	0
16	0	0	0	0	0	0	0	180	234	0	0	0
17	0	0	0	0	0	0	0	287	178	0	0	0
18	0	0	0	0	0	0	0	334	178	0	0	0
19	0	0	0	0	0	0	0	179	53	0	0	0
20	0	0	0	0	0	0	0	279	150	0	0	0
21	0	0	0	0	0	0	0	258	0	0	0	0
22	0	0	0	0	0	0	0	180	0	0	0	0
23	0	0	0	0	0	0	0	368	0	0	0	0
24	0	0	0	0	0	0	0	264	0	0	0	0
25	0	0	0	0	0	0	0	174	0	0	0	0
26	0	0	0	0	0	0	0	174	0	0	0	0
27	0	0	0	0	0	0	0	82	0	0	0	0
28	0	0	0	0	0	0	0	86	0	0	0	0
29	0	0	0	0	0	0	0	177	0	0	0	0
30	0	0	0	0		0	0	0	0	0	0	0
31	0		0	0		0		134		0	0	
Min	0	0	0	0	0	0	0	0	0	0	0	0
Max	0	0	0	0	0	0	0	368	454	0	0	0
Mean	0	0	0	0	0	0	0	141	114	0	0	0
ac-ft	0	0	0	0	0	0	0	8649	6786	0	0	0



Appendix A (10 of 38)
Granby Reservoir, CO

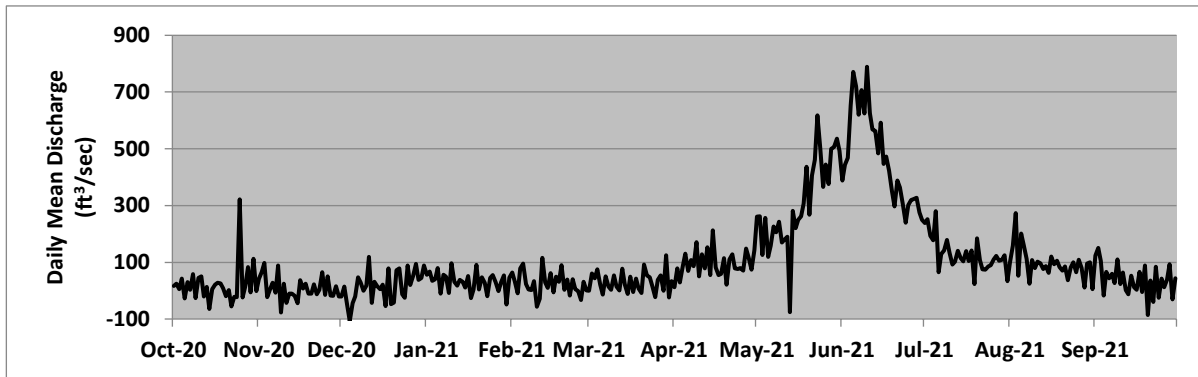
Location. --Lat 40°08'54", long 105°51'48", Grand County, Hydrologic Unit 14010001, on Granby Dam, 5.5 miles northeast of Granby, Colorado, on the Colorado River.

Gage.-- Water level recorder with satellite telemetry. Elevation of gage is 8300 (m.s.l.) from topographic map.

Remarks.-- Inflow computed daily based on change in content from midnight to midnight, and on the average daily releases through the reservoir outlet works. Recorders were operated from 01-Oct-2020 to 30-Sep-2021. 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, cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	17	41	-20	56	64	0	12	261	388	238	100	124
2	25	67	15	68	32	60	79	262	444	253	158	151
3	6	97	-44	35	-9	44	30	126	469	194	274	105
4	43	-22	-107	40	79	75	85	257	653	177	52	-17
5	-26	6	-44	80	96	22	130	120	771	280	202	67
6	31	29	-20	-10	23	-14	70	159	719	65	161	44
7	3	-6	48	56	4	51	108	226	620	130	112	60
8	58	89	30	50	2	15	86	206	707	142	25	27
9	-26	-77	0	-8	34	4	172	243	625	179	109	110
10	45	25	18	97	-56	54	51	170	789	134	80	24
11	50	-43	120	31	-28	15	128	180	625	92	103	64
12	-21	-10	-42	18	116	1	79	191	568	102	97	3
13	14	-10	31	39	29	77	153	-76	563	141	77	-13
14	-64	-18	16	31	10	21	55	282	484	115	87	53
15	6	-44	6	11	61	-12	213	221	592	104	63	13
16	21	37	21	52	-6	50	82	250	447	140	120	4
17	28	8	-54	-26	50	-4	56	262	473	105	94	66
18	26	24	79	5	32	42	60	307	423	142	106	-4
19	9	-10	-47	91	90	8	115	437	351	24	83	89
20	-19	-10	-41	5	3	-8	21	268	297	185	71	-85
21	2	23	72	47	40	92	111	406	389	108	86	36
22	-55	-13	79	28	-17	54	129	461	363	76	37	-40
23	-21	4	-12	-19	41	48	79	617	305	74	82	84
24	-23	65	-24	45	6	16	77	501	240	86	100	-24
25	321	-15	89	55	-2	-23	80	366	302	90	65	43
26	-24	51	20	30	-32	38	71	444	320	110	109	12
27	13	-17	52	-2	31	54	148	376	322	123	80	39
28	83	-18	95	29	1	0	117	499	328	106	11	94
29	-6	16	39	55		125	75	507	276	109	95	-30
30	112	-20	45	-49		-24	143	535	250	125	100	44
31	-1		89	47		33		493		33	6	
Min	-64	-77	-107	-49	-56	-24	12	-76	240	24	6	-85
Max	321	97	120	97	116	125	213	617	789	280	274	151
Mean	20	8	16	32	25	30	94	308	470	128	95	38
ac-ft	1248	496	1003	1957	1379	1817	5585	18957	27970	7897	5842	2264



Appendix A (11 of 38)
Granby Reservoir, CO

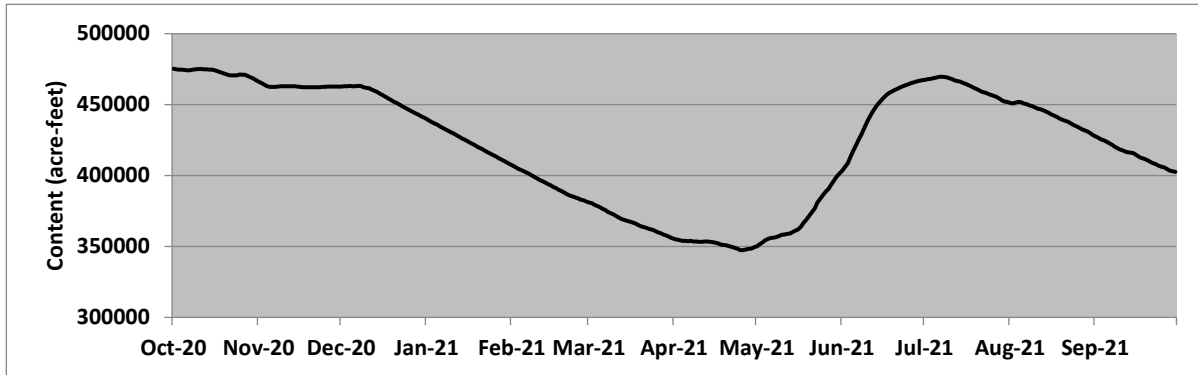
Location. --Lat 40°08'54", long 105°51'48", Grand County, Hydrologic Unit 14010001, on Granby Dam, 5.5 miles northeast of Granby, Colorado, on the Colorado River.

Gage.-- Water level recorder with satellite telemetry. Elevation of gage is 8300 (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 8186.90 and 8280.00 feet. Recorder was operated from 01-Oct-2020 to 30-Sep-2021. 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	475386	466074	462746	439750	407305	381047	355276	350210	403585	467439	451167	427659
2	474901	465057	462813	438701	406298	380435	354804	351446	405981	467778	450833	426684
3	474626	463968	462948	437582	405160	379454	354511	352917	408698	468120	451436	425653
4	474626	462813	463083	436595	404212	378603	354039	354336	412953	468463	451772	424809
5	474489	462476	462948	435614	403334	377564	353921	355394	417544	468941	451705	424036
6	474216	462544	462948	434434	402326	376466	353802	355989	421586	469485	450833	422810
7	474079	462544	463083	433386	401383	375496	353921	356344	425265	469758	450300	421650
8	474695	462746	463083	432409	400256	374341	353624	356758	429153	469485	449497	420428
9	474901	462813	462341	431299	399188	373247	353624	357472	433124	469281	448966	419339
10	475109	462881	461733	430322	397999	372342	353271	358241	437778	468463	448033	418247
11	474971	462813	461665	429282	396878	371312	353271	358598	441602	467778	447168	417609
12	474901	462813	460648	428243	396064	370222	353448	358897	444711	467029	446635	416839
13	474901	462813	459766	427140	395128	369320	353565	359195	447765	466481	446036	416267
14	474695	462813	458758	426104	394134	368715	353271	360328	450367	466142	445176	416203
15	474626	462746	457677	425004	393137	367933	353095	361219	452639	465262	444179	415568
16	474216	462544	456599	424036	392019	367389	352621	362176	454719	464442	443185	414227
17	473595	462139	455392	422810	391090	366790	352091	364208	456599	463560	442196	413017
18	472841	462206	454449	421845	390098	366070	351388	366730	458083	462746	441204	412254
19	472158	462206	453309	420880	389107	365110	351092	369079	459094	461665	440214	411618
20	471401	462206	452172	419723	387996	364208	350737	371553	460174	460783	439291	410662
21	470786	462274	451100	418698	386945	363672	350268	374280	461188	459814	438636	409651
22	470650	462274	450099	417673	386021	362894	349737	376833	462071	458960	437844	408698
23	470581	462341	449032	416648	385281	362415	349034	380924	462813	458354	436727	408066
24	470512	462544	447899	415632	384546	361758	348273	383683	463560	457610	435614	406864
25	471127	462544	446902	414610	383867	360862	347568	386207	464239	456802	434762	406298
26	471059	462679	445771	413588	383070	360089	347510	388549	465057	456195	433781	405664
27	470923	462679	444711	412509	382515	359314	347919	390781	465668	455392	432734	404527
28	470168	462679	443718	411428	381782	358419	348449	393575	466210	454247	431758	403522
29	469145	462746	442854	410409		357709	348683	396502	466686	453106	431103	402957
30	468257	462746	441801	409271		356938	349385	399188	467098	452172	429995	402704
31	467166		440808	408319		356108		401383		451772	428700	
Min	467166	462139	440808	408319	381782	356108	347510	350210	403585	451772	428700	402704
Max	475386	466074	463083	439750	407305	381047	355276	401383	467098	469758	451772	427659
Mean	472765	462824	454931	423998	393826	367943	351740	369452	445534	462823	442306	414484
EOM	467166	462746	440808	408319	0	356108	349385	401383	467098	451772	428700	402704



Appendix A (12 of 38)
Granby Reservoir, CO

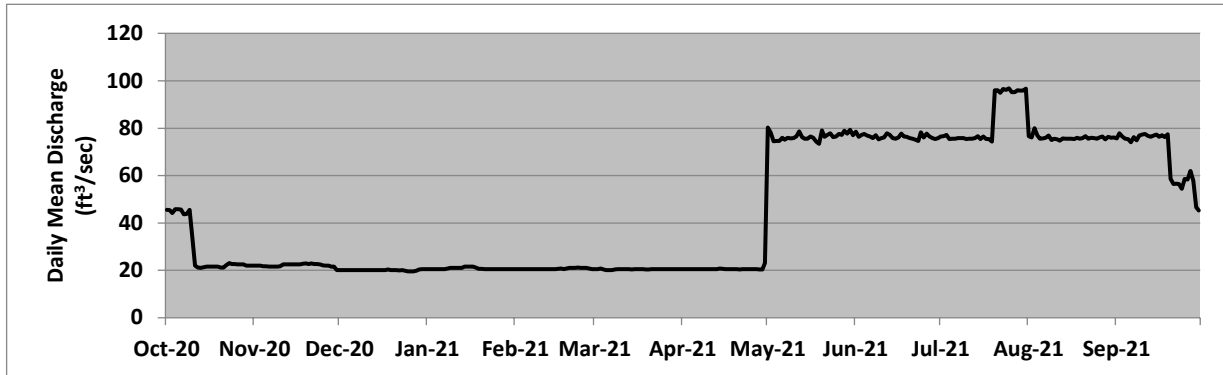
Location. --Lat 40°08'54", long 105°51'48", Grand County, Hydrologic Unit 14010001, on Granby Dam, 5.5 miles northeast of Granby, Colorado, on the Colorado River.

Gage.-- Water level recorder with satellite telemetry. Elevation of gage is 8300 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-2020 to 30-Sep-2021. Records are complete and fair. This record contains operational data which could be subject to future revisions and changes.

Discharge, cfs, 2400-hour Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	45.5	22	20.1	20.5	20.5	20.5	20.5	80.3	78.6	76.5	76.6	75.62639
2	45.4	22	20.1	20.6	20.5	20.5	20.5	78.1	76.4	76.7	76.2	77.8066
3	44.2	22	20.1	20.5	20.5	20.7	20.5	74.5	77.1	77.1	80.0	76.50347
4	45.8	21.7	20.1	20.5	20.5	20.4	20.5	74.6	77.6	75.5	76.9	75.52257
5	45.8	21.7	20.1	20.5	20.5	20.1	20.5	74.6	76.9	75.6	75.5	75.48194
6	45.7	21.5	20.1	20.5	20.5	20.1	20.5	75.9	76.6	75.6	75.7	74.11875
7	43.6	21.5	20.1	20.5	20.5	20.1	20.5	75.2	75.8	75.9	75.9	76.17257
8	43.8	21.5	20.1	20.8	20.5	20.3	20.5	75.9	77.1	75.8	76.9	74.86806
9	45.5	21.6	20.1	21.0	20.5	20.5	20.5	75.7	75.3	75.9	75.0	76.83889
10	34.6	21.7	20.1	21.0	20.5	20.5	20.5	75.8	75.8	75.4	75.5	77.36667
11	22	22.5	20.1	21.0	20.5	20.5	20.5	76.5	76.1	75.5	75.3	77.63021
12	21.1	22.5	20.1	21.0	20.5	20.5	20.5	78.6	77.9	75.5	74.7	76.80972
13	21	22.5	20.1	21.0	20.5	20.5	20.5	76.3	77.2	75.8	75.6	76.35556
14	21.3	22.5	20.1	21.5	20.5	20.4	20.7	75.5	75.9	76.6	75.6	76.90208
15	21.5	22.5	20.1	21.5	20.5	20.5	20.6	75.5	75.6	75.4	75.5	77.32986
16	21.5	22.5	20.1	21.5	20.7	20.5	20.5	76.5	76.1	76.5	75.5	76.39896
17	21.5	22.5	20.1	21.5	20.7	20.5	20.5	76.0	77.8	75.5	75.5	77.06632
18	21.5	22.8	20.3	21.2	20.5	20.5	20.5	74.4	76.5	75.4	76.0	76.17708
19	21.5	22.9	20.1	20.6	20.7	20.3	20.5	73.3	76.3	74.4	75.5	77.43125
20	21.2	22.7	20.1	20.6	21.0	20.4	20.5	79.0	75.8	96.1	75.8	58.58021
21	21.2	22.9	20.1	20.5	21.0	20.5	20.4	76.4	75.6	96.1	76.6	56.49931
22	22.3	22.7	20.0	20.5	21.0	20.5	20.5	77.2	75.2	95.0	75.6	56.55278
23	23	22.7	20.1	20.5	21.2	20.5	20.5	77.9	74.6	96.5	75.9	56.46111
24	22.7	22.5	19.9	20.5	21.0	20.5	20.5	76.2	78.3	96.1	75.9	54.41667
25	22.7	22.1	19.6	20.5	21.0	20.5	20.5	76.5	76.1	96.8	75.5	58.63819
26	22.5	22	19.6	20.5	21.0	20.5	20.5	77.6	77.7	95.2	76.1	58.38611
27	22.5	22	19.6	20.5	20.7	20.5	20.5	77.2	76.5	95.2	76.6	61.93715
28	22.5	21.6	19.9	20.5	20.5	20.5	20.3	78.9	75.9	96.0	75.3	57.83229
29	22	21.5	20.4	20.5		20.5	20.4	77.7	75.5	95.8	76.3	46.65
30	22	20.1	20.5	20.5		20.5	23.0	79.3	75.8	95.9	75.9	45.27917
31	22		20.0	20.5		20.5		77.1		96.7	76.1	
Min	21	20.1	19.6	20.5	20.5	20.1	20.3	73.3	74.6	74.4	74.7	45.27917
Max	45.8	22.9	20.5	21.5	21.2	20.7	23.0	80.3	78.6	96.8	80.0	77.8066
Mean	29	22	20	21	21	20	21	77	76	84	76	69
ac-ft	1784	1315	1233	1276	1148	1257	1224	4709	4549	5141	4671	4093



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

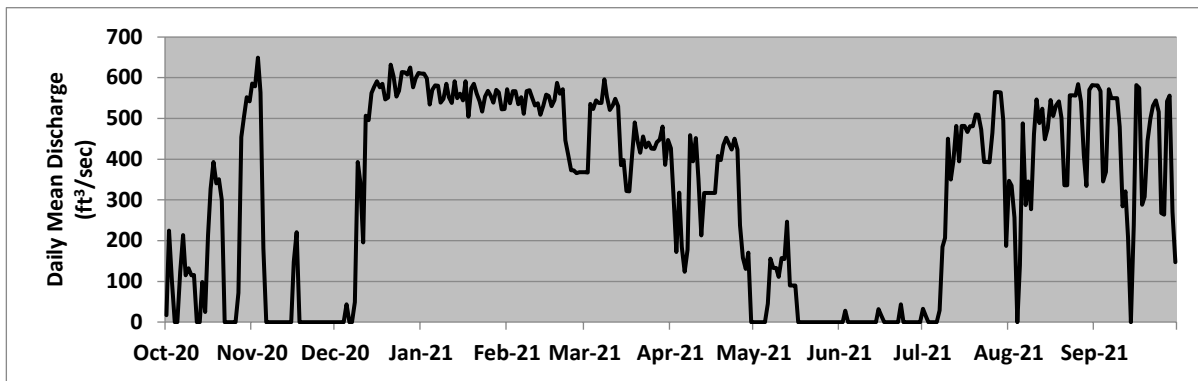
Location.--Lat 40°11'30", long 105°52'52", Grand County, Hydrologic Unit 14010001, at Farr Pumping Plant on the north end of Granby Reservoir, 8 miles northeast of Granby, Colorado, on the Colorado River.

Gage.-- Reading taken directly from the pumps, based on conduit pressure and Granby Reservoir's elevation. Elevation of the pumping plant is 8320 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, Northern Water, each morning. Data was collected from 01-Oct-2020 to 30-Sep-2021. Records are complete and reliable. This record contains operational data which could be subject to future revisions and changes.

Discharge, cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	17	586	0	610	572	368	427	0	0	33	347	581
2	225	579	0	610	537	367	312	0	0	15	335	581
3	102	649	0	598	567	536	172	0	28	0	257	567
4	0	564	0	534	567	523	318	0	0	0	0	345
5	0	181	44	570	535	544	185	0	0	0	139	369
6	124	0	0	581	552	538	124	45	0	0	488	572
7	214	0	0	580	511	538	178	156	0	29	287	550
8	115	0	49	539	567	596	459	133	0	185	345	550
9	132	0	393	548	569	553	395	133	0	207	277	550
10	115	0	344	585	551	521	452	111	0	450	461	479
11	116	0	196	552	532	532	352	157	0	350	547	284
12	0	0	507	538	537	548	213	155	0	395	489	321
13	0	0	496	591	509	530	317	247	0	482	524	209
14	99	0	562	550	531	385	317	90	0	395	449	0
15	25	0	577	561	558	398	317	90	32	482	476	237
16	214	148	591	544	555	322	317	90	16	482	545	582
17	327	221	576	591	530	321	317	0	0	467	506	575
18	393	0	585	504	545	403	408	0	0	481	532	288
19	341	0	547	574	587	490	398	0	0	481	542	308
20	351	0	551	585	561	444	435	0	0	510	501	445
21	300	0	632	561	572	416	453	0	0	509	336	500
22	0	0	603	542	446	456	437	0	0	473	336	531
23	0	0	554	517	410	429	424	0	44	393	557	544
24	0	0	568	554	373	441	450	0	0	393	557	516
25	0	0	614	568	373	426	424	0	0	392	556	268
26	0	0	613	557	366	425	238	0	0	464	584	264
27	72	0	608	539	368	442	158	0	0	565	541	542
28	454	0	625	570	368	448	131	0	0	565	409	556
29	502	0	576	564		480	171	0	0	564	334	271
30	552	0	598	522		386	0	0	0	495	570	147
31	542		612	523		447		0		187	582	
Min	0	0	0	504	366	321	0	0	0	0	0	0
Max	552	649	632	610	587	596	459	247	44	565	584	582
Mean	172	98	407	560	509	460	310	45	4	337	433	418
ac-ft	10576	5808	25033	34437	28262	28270	18444	2791	238	20715	26596	24857



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

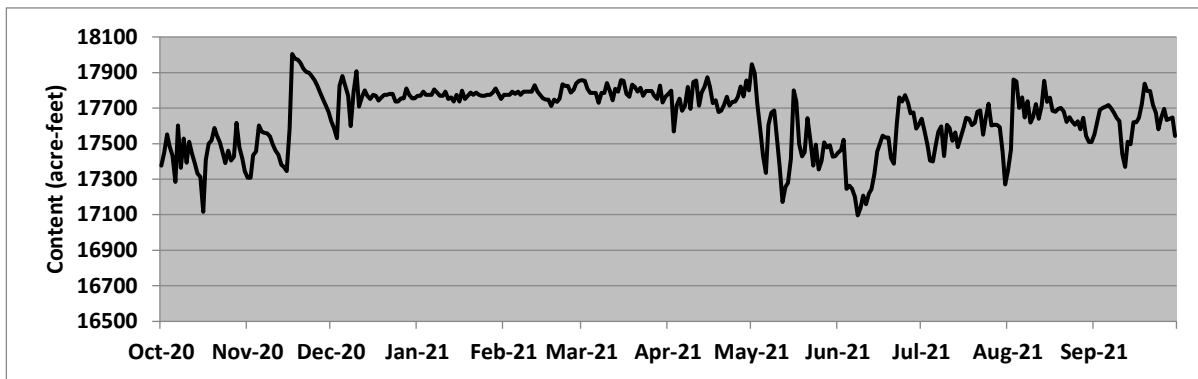
Location. --Lat 40°12'26", long 105°50'28", Grand County, Hydrologic Unit 14010001, on the Colorado River at the Shadow Mountain outlet works structure, 10 miles northeast of Granby, Colorado.

Gage.--Water-stage recorder with satellite telemetry. Elevation of gage is 8375 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-2020 to 30-Sep-2021. 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	17377	17307	17628	17769	17774	17858	17779	17947	17450	17640	17351	17552
2	17451	17307	17586	17769	17774	17853	17798	17897	17465	17571	17467	17625
3	17553	17436	17531	17793	17774	17809	17569	17726	17521	17492	17860	17691
4	17484	17455	17825	17774	17793	17786	17716	17584	17246	17406	17850	17701
5	17432	17603	17881	17774	17779	17786	17753	17432	17263	17400	17701	17709
6	17285	17566	17825	17774	17793	17786	17684	17335	17247	17492	17761	17717
7	17603	17561	17770	17806	17774	17730	17714	17606	17202	17566	17648	17699
8	17364	17558	17600	17788	17793	17786	17819	17674	17097	17598	17740	17675
9	17529	17539	17792	17769	17793	17786	17696	17688	17140	17430	17619	17644
10	17392	17498	17907	17769	17793	17841	17846	17540	17208	17606	17649	17627
11	17511	17461	17708	17793	17793	17799	17856	17370	17159	17587	17722	17443
12	17442	17437	17763	17751	17830	17744	17714	17173	17218	17517	17641	17370
13	17387	17382	17800	17761	17793	17809	17788	17256	17244	17564	17714	17511
14	17332	17369	17769	17738	17774	17793	17819	17280	17328	17480	17853	17498
15	17314	17345	17751	17774	17756	17858	17874	17414	17455	17535	17736	17620
16	17116	17584	17774	17738	17749	17853	17819	17800	17505	17590	17759	17620
17	17409	18004	17769	17798	17749	17779	17727	17737	17545	17646	17685	17646
18	17501	17978	17743	17751	17712	17764	17744	17498	17534	17641	17680	17721
19	17519	17973	17761	17769	17749	17833	17677	17429	17534	17604	17696	17838
20	17587	17954	17774	17788	17736	17819	17685	17453	17419	17617	17701	17796
21	17545	17923	17774	17774	17754	17793	17717	17645	17387	17680	17682	17796
22	17508	17904	17779	17788	17835	17814	17764	17518	17608	17688	17622	17717
23	17447	17899	17779	17774	17824	17769	17714	17376	17760	17551	17649	17675
24	17390	17881	17738	17769	17824	17796	17736	17494	17737	17643	17625	17580
25	17461	17857	17738	17769	17788	17796	17738	17356	17773	17724	17607	17648
26	17406	17825	17756	17774	17803	17796	17763	17403	17731	17602	17625	17696
27	17427	17789	17756	17774	17840	17769	17821	17507	17671	17607	17580	17633
28	17617	17752	17811	17788	17853	17751	17766	17478	17676	17607	17646	17641
29	17478	17715	17774	17811		17827	17855	17491	17584	17594	17543	17648
30	17418	17678	17756	17779		17732	17800	17426	17608	17454	17510	17542
31	17344		17756	17751		17764		17431		17270	17510	
Min	17116	17307	17531	17738	17712	17730	17569	17173	17097	17270	17351	17370
Max	17617	18004	17907	17811	17853	17858	17874	17947	17773	17724	17860	17838
Mean	17440	17651	17754	17774	17786	17796	17758	17515	17444	17561	17659	17643
EOM	17344	17678	17756	17751	0	17764	17800	17431	17608	17270	17510	17542



Appendix A (15 of 38)

Alva B. Adams Tunnel at East Portal, near Estes Park, CO

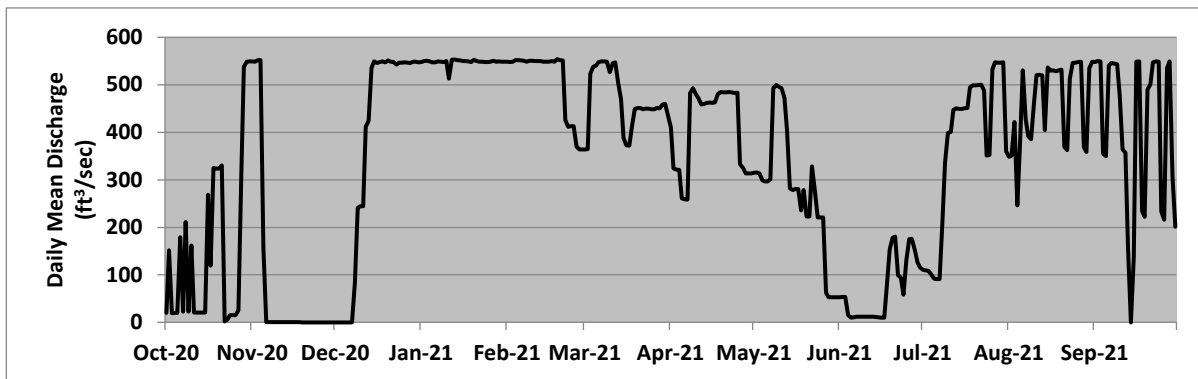
Location. --Lat 40°19'40", long 105°34'39", Larimer County, Hydrologic Unit 10190006, 4.5 miles southwest of Estes Park, Colorado.

Gage.-- Water-stage recorder with satellite telemetry at 15 foot Parshall flume. Elevation of gage is 8250 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 4 miles southwest of Estes Park. Its maximum capacity is 550 cfs. Recorder was operated from 01-Oct-2020 to 30-Sep-2021. 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, cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	20	549	0	548	548	364	410	315	53	110	349	548
2	151	548	0	550	548	365	324	315	53	109	351	550
3	19	552	0	550	549	523	322	313	54	108	422	549
4	20	552	0	549	551	538	321	298	15	101	246	355
5	20	157	0	547	552	540	261	297	10	92	370	349
6	180	1	0	547	551	548	259	297	11	91	530	540
7	23	1	0	549	551	549	259	302	12	91	428	546
8	212	1	83	548	549	549	483	493	12	215	392	544
9	23	1	241	548	550	548	493	499	12	336	386	543
10	162	1	244	550	550	526	480	496	12	399	461	479
11	21	1	245	513	550	545	472	493	12	401	520	364
12	21	1	411	552	549	547	458	472	12	447	521	357
13	21	1	424	553	550	505	460	404	12	451	520	156
14	21	1	535	552	549	470	462	282	12	449	405	0
15	21	1	549	551	548	387	463	279	11	449	536	136
16	268	1	546	550	549	373	462	281	10	451	530	549
17	120	1	547	550	549	372	463	281	10	451	531	549
18	325	1	549	549	549	411	481	236	76	495	528	234
19	324	0	547	548	554	449	485	279	153	499	530	222
20	324	0	551	553	552	451	484	223	178	499	531	490
21	330	0	549	550	551	451	484	223	181	499	369	501
22	2	0	548	548	426	448	485	328	100	500	362	547
23	6	0	542	548	411	450	484	277	94	488	512	549
24	15	0	547	548	412	450	483	221	58	351	546	549
25	15	0	546	548	413	449	484	221	131	352	546	234
26	15	0	547	549	370	449	333	221	175	532	548	216
27	25	0	547	551	364	451	325	62	176	547	548	535
28	311	0	546	548	364	450	314	53	154	547	369	549
29	538	0	548	549		458	313	53	126	547	358	307
30	549	0	549	549		460	314	53	116	547	535	202
31	549		547	548		435		53		359	549	
Min	2	0	0	513	364	364	259	53	10	91	246	0
Max	549	552	551	553	554	549	493	499	181	547	549	550
Mean	150	79	371	548	511	468	411	278	68	371	462	408
ac-ft	8130	4696	21699	32618	28380	27919	24434	16992	4048	22126	27332	24296



Appendix A (16 of 38)
Marys Lake, CO

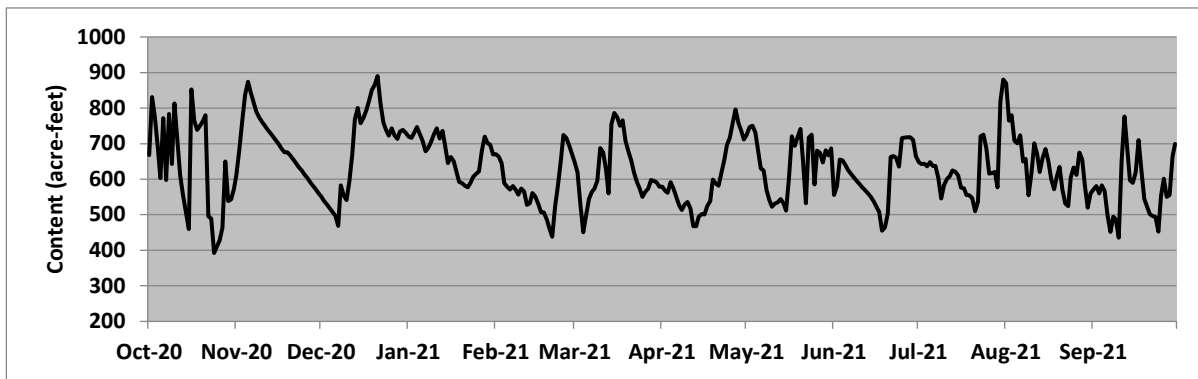
Location. --Lat 40°22'40", long 105°31'50", Larimer County, Hydrologic Unit 10190006, 2 miles southwest of Estes Park, Colorado.

Gage.-- Water-level recorder with satellite telemetry. Elevation of gage is 8060 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-2020 to 30-Sep-2021. 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	668	615	551	720	671	645	579	725	556	648	869	571
2	831	685	540	717	663	619	567	747	580	643	764	581
3	773	765	529	730	644	529	562	750	655	644	780	560
4	690	839	518	747	589	451	592	731	653	636	708	583
5	603	875	508	727	579	499	574	684	639	648	701	567
6	772	846	497	707	571	545	549	630	626	637	724	498
7	598	818	469	678	581	564	526	624	615	637	650	451
8	784	790	582	688	570	573	513	569	605	603	657	495
9	643	774	555	705	556	596	528	540	595	546	554	487
10	813	762	542	727	573	688	536	523	586	583	616	435
11	711	751	595	744	566	676	518	532	577	600	701	651
12	610	740	672	715	528	628	467	535	569	609	670	776
13	553	729	768	736	533	560	468	544	560	624	621	682
14	507	719	800	694	561	755	494	532	551	621	660	597
15	460	708	757	646	551	786	502	511	537	610	685	590
16	853	697	773	663	532	775	501	602	523	576	651	619
17	764	686	795	650	507	750	525	721	508	574	599	710
18	739	676	820	619	506	766	539	694	455	555	572	624
19	750	676	851	593	487	708	599	718	464	554	606	544
20	764	667	865	589	462	678	588	742	502	547	635	524
21	780	656	890	582	438	652	581	651	662	510	570	502
22	495	646	814	577	523	617	619	533	665	537	532	496
23	489	635	760	591	583	591	654	717	661	721	525	494
24	393	625	739	607	653	574	696	725	636	725	605	452
25	412	614	723	615	725	551	717	585	715	688	633	552
26	428	604	744	622	717	565	757	680	717	616	612	602
27	464	593	723	681	695	574	796	674	718	618	675	550
28	650	582	714	720	670	598	759	647	718	621	654	555
29	538	572	734	701		595	736	681	711	577	583	662
30	543	561	739	698		591	712	667	664	818	520	699
31	573		731	669		579		687		881	560	
Min	393	561	469	577	438	451	467	511	455	510	520	435
Max	853	875	890	747	725	786	796	750	718	881	869	776
Mean	634	697	687	673	580	622	592	642	607	626	642	570
EOM	573	561	731	669	0	579	712	687	664	881	560	699



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

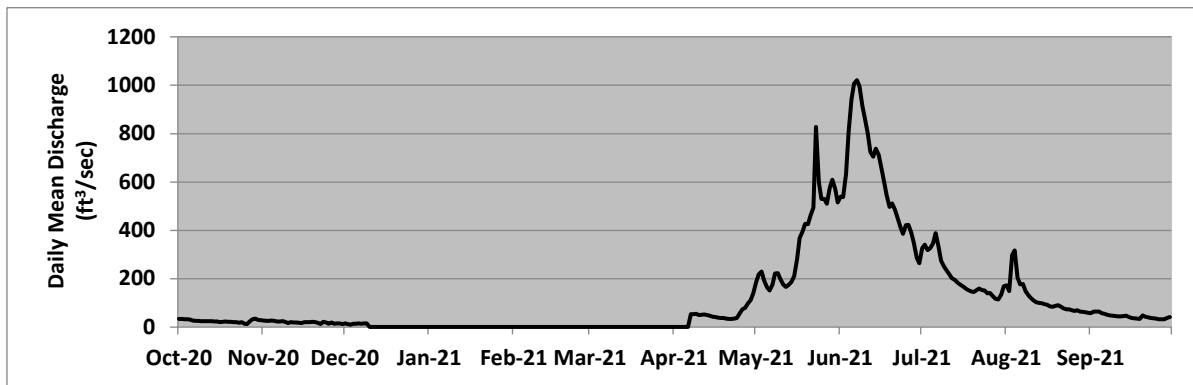
Location.--Lat 40°22'42", long 105°30'48", Larimer County, Hydrologic Unit 10190006, 600 feet downstream from bridge on state highways 7 and 36 in Estes Park, Colorado, downstream from Black Canyon Creek, and 0.3 miles northwest of Estes Powerplant.

Gage.-- Water-stage recorder with satellite telemetry. 15 foot Parshall flume with overflow weirs and supplemental outside gage. Datum of gage at 7492.5 feet.

Remarks.— Drainage area is 137 mi2. Station consists of an automated data collection platform. Recorder was operated from 01-Oct-2020 until 10-Dec-2020, before it was winterized. The station was put back into service from 7-Apr-2021 to 30-Sep-2021. Values for the off-season are marked as zero, but winter month flows normally fluctuate between 10 and 30 cfs. 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, cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	34	26	15	0	0	0	0	186	539	326	173	57
2	33	25	12	0	0	0	0	217	538	341	149	63
3	32	25	10	0	0	0	0	230	633	319	297	64
4	32	26	13	0	0	0	0	192	807	326	316	63
5	30	25	14	0	0	0	0	165	942	345	204	58
6	27	23	14	0	0	0	0	151	1007	389	177	54
7	25	22	13	0	0	0	54	175	1022	333	177	51
8	25	24	14	0	0	0	53	221	996	275	148	48
9	24	22	15	0	0	0	54	223	916	250	131	47
10	24	16	0	0	0	0	49	197	862	234	119	45
11	24	20	0	0	0	0	51	175	800	217	109	43
12	24	19	0	0	0	0	52	165	724	202	102	43
13	23	18	0	0	0	0	49	176	704	195	99	46
14	23	18	0	0	0	0	46	186	737	184	98	47
15	22	17	0	0	0	0	43	210	712	175	94	41
16	21	20	0	0	0	0	41	281	661	168	91	37
17	22	19	0	0	0	0	38	369	599	160	85	36
18	22	20	0	0	0	0	37	395	545	153	83	35
19	22	21	0	0	0	0	37	426	497	147	87	33
20	21	20	0	0	0	0	35	426	512	145	91	48
21	20	17	0	0	0	0	34	461	485	152	83	42
22	19	12	0	0	0	0	34	494	452	158	77	39
23	18	21	0	0	0	0	35	827	414	152	73	37
24	20	18	0	0	0	0	37	599	386	151	73	35
25	14	13	0	0	0	0	57	531	421	140	69	34
26	13	18	0	0	0	0	73	530	423	140	67	32
27	24	13	0	0	0	0	79	510	389	127	69	31
28	32	14	0	0	0	0	96	575	347	117	64	32
29	35	15	0	0	0	0	112	609	286	114	63	38
30	30	12	0	0	0	0	139	572	264	133	61	41
31	28		0	0		0		516		168	58	
Min	13	12	0	0	0	0	0	151	264	114	58	31
Max	35	26	15	0	0	0	139	827	1022	389	316	64
Mean	25	19	4	0	0	0	44	355	621	208	116	44
ac-ft	1511	1150	239	0	0	0	2646	21798	36933	12762	7114	2618



Appendix A (18 of 38)
Olympus Dam, CO

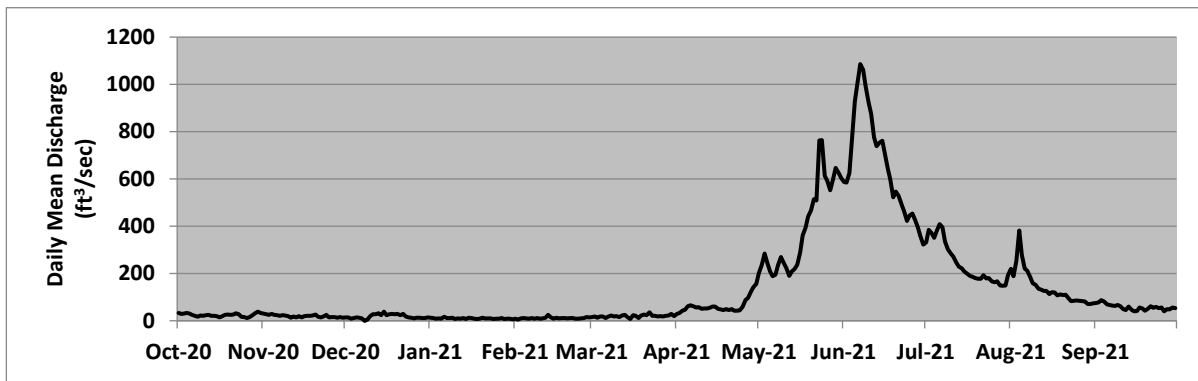
Location. --Lat 40°22'31", long 105°29'15", Larimer County, Hydrologic Unit 10190006, 1.5 miles east of Estes Park, Colorado, on the Big Thompson River.

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 on November 1948. Total capacity at maximum water surface elevation of 7475.0 feet is 3,070 AF. System start 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, cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	34	31	15	14	9	15	29	202	588	332	220	75
2	30	29	14	11	6	18	33	236	584	384	189	79
3	32	26	9	10	10	13	44	284	625	371	253	88
4	33	30	11	11	11	19	47	247	766	351	383	82
5	31	26	15	10	11	18	62	209	928	383	279	70
6	25	24	14	17	9	12	67	189	1012	408	221	67
7	22	22	11	12	12	19	62	195	1085	396	212	64
8	18	24	0	12	9	23	56	236	1061	334	186	64
9	24	23	5	13	12	19	58	271	990	303	159	67
10	21	20	20	9	9	21	52	247	923	285	152	61
11	24	13	28	11	10	16	52	222	875	271	136	50
12	25	19	28	9	14	23	52	191	776	247	132	45
13	22	15	33	12	25	26	55	210	738	230	127	61
14	22	20	24	8	15	16	61	220	753	223	127	48
15	20	14	39	14	10	8	61	237	761	209	114	41
16	14	20	24	12	13	24	52	289	706	200	122	42
17	20	21	29	9	11	22	48	361	643	190	120	57
18	26	21	30	8	12	12	46	394	597	186	108	53
19	27	23	29	9	12	23	49	442	522	181	112	42
20	26	27	30	13	11	27	45	467	547	178	109	52
21	27	18	24	10	13	24	50	515	528	179	111	62
22	32	14	29	11	13	36	43	509	493	193	96	55
23	28	19	19	10	9	21	44	762	462	180	84	60
24	18	25	15	8	9	21	45	764	422	180	85	55
25	16	15	14	9	11	18	59	614	445	167	86	57
26	12	16	11	10	12	21	88	592	453	164	85	40
27	16	17	13	12	16	19	97	552	428	168	84	49
28	24	13	13	8	15	22	122	599	396	150	83	48
29	33	17	12	10	12	23	143	647	358	148	71	57
30	38	13	12	10	10	29	157	626	322	150	72	54
31	33	15	6	6	20	604	195	75				
Min	12	13	0	6	6	8	29	189	322	148	71	40
Max	38	31	39	17	25	36	157	764	1085	408	383	88
Mean	25	21	19	11	12	20	63	391	660	243	142	58
ac-ft	1532	1221	1161	651	657	1244	3727	24062	39249	14949	8712	3465



Appendix A (19 of 38)
Olympus Dam, CO

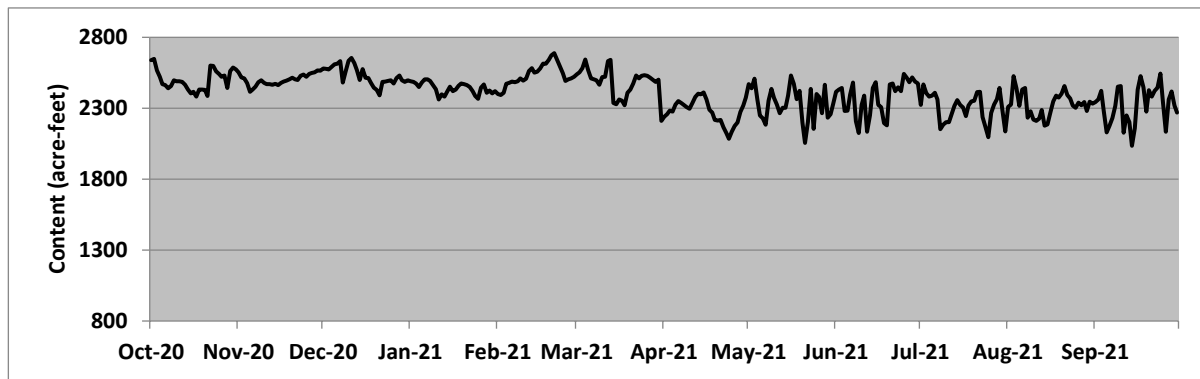
Location. --Lat 40°22'31", long 105°29'19", Larimer County, Hydrologic Unit 10190006, 1.5 miles east of Estes Park, Colorado, on the Big Thompson River.

Gage. -- Water-level recorder with satellite telemetry. Elevation of gage is 7490 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 2,476 AF. Used as afterbay storage for Estes Powerplant and forebay for Olympus Tunnel. Recorder was operated from 01-Oct-2020 to 30-Sep-2021. 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	2638	2553	2580	2491	2400	2539	2240	2469	2416	2324	2311	2343
2	2647	2516	2579	2486	2394	2553	2257	2440	2431	2467	2326	2362
3	2567	2511	2574	2473	2408	2582	2282	2509	2443	2407	2525	2423
4	2521	2476	2591	2448	2472	2643	2275	2361	2280	2383	2440	2278
5	2470	2416	2609	2481	2480	2569	2326	2249	2282	2388	2318	2130
6	2464	2431	2614	2503	2488	2511	2351	2229	2395	2409	2431	2176
7	2440	2452	2631	2504	2483	2503	2336	2183	2482	2361	2443	2231
8	2457	2483	2481	2492	2489	2496	2323	2353	2209	2153	2232	2318
9	2496	2496	2559	2464	2509	2465	2307	2436	2125	2183	2278	2452
10	2491	2478	2635	2434	2494	2519	2295	2373	2324	2201	2221	2457
11	2491	2470	2654	2362	2508	2522	2336	2326	2388	2201	2211	2129
12	2484	2470	2618	2399	2561	2631	2379	2264	2135	2262	2226	2249
13	2465	2465	2569	2381	2582	2640	2402	2302	2249	2316	2287	2201
14	2432	2472	2499	2415	2551	2336	2397	2302	2443	2357	2176	2035
15	2405	2464	2575	2452	2558	2328	2411	2388	2483	2324	2186	2158
16	2415	2478	2514	2419	2580	2362	2362	2530	2324	2306	2269	2431
17	2381	2488	2513	2431	2614	2352	2289	2473	2307	2245	2348	2527
18	2432	2494	2480	2459	2614	2322	2269	2364	2195	2319	2388	2447
19	2432	2504	2445	2473	2642	2410	2218	2423	2179	2348	2376	2275
20	2429	2514	2429	2470	2672	2432	2212	2198	2467	2353	2402	2426
21	2386	2503	2391	2462	2688	2475	2218	2056	2475	2413	2455	2383
22	2599	2499	2484	2450	2642	2530	2165	2201	2420	2416	2393	2421
23	2597	2527	2488	2419	2592	2509	2125	2436	2447	2237	2368	2445
24	2559	2537	2492	2387	2546	2527	2085	2155	2420	2168	2319	2544
25	2542	2522	2496	2367	2492	2532	2133	2400	2541	2097	2302	2341
26	2521	2541	2475	2445	2504	2527	2174	2379	2514	2267	2340	2133
27	2530	2547	2513	2468	2511	2514	2199	2264	2483	2326	2321	2362
28	2443	2553	2530	2410	2521	2499	2273	2466	2518	2364	2343	2418
29	2563	2566	2497	2424		2484	2319	2234	2487	2443	2280	2319
30	2587	2564	2486	2405		2501	2376	2259	2475	2287	2346	2269
31	2572		2496	2419		2211		2331		2137	2333	
Min	2381	2416	2391	2362	2394	2211	2085	2056	2125	2097	2176	2035
Max	2647	2566	2654	2504	2688	2643	2411	2530	2541	2467	2525	2544
Mean	2499	2500	2532	2442	2535	2485	2278	2334	2378	2305	2329	2323
EOM	2572	2564	2496	2419	0	2211	2376	2331	2475	2137	2333	2269



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

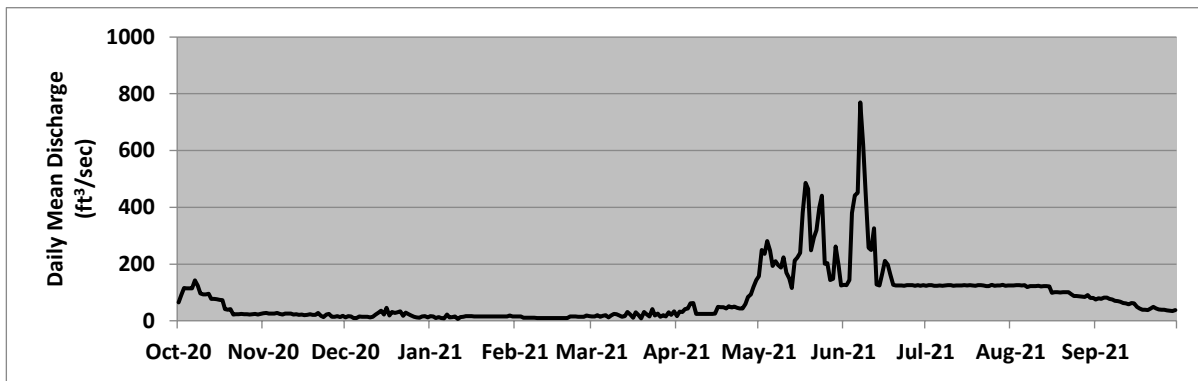
Location. --Lat 40°22'35", long 105°29'06", Larimer County, Hydrologic Unit 10190006, 620 feet downstream from Olympus Dam and 100 feet upstream of Dry Gulch, 2.0 miles east in Estes Park.

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 7422.50 feet.

Remarks.— Drainage area is 155 mi2. Area at site used between 29-Jan-1934 and 21-Mar-1951 was 162 mi2. Station consists of automated data collection platform and digital recorder as primary record. Recorder was operated from 01-Oct-2020 to 30-Sep-2021. 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, cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	66	27	13	17	16	15	16	157	127	124	125	76
2	89	28	17	15	16	15	33	250	126	126	125	80
3	116	26	16	10	16	20	32	236	143	126	126	78
4	114	26	10	13	11	14	41	281	380	124	126	82
5	115	26	11	10	11	18	44	247	442	124	124	82
6	115	28	16	9	11	20	62	193	451	124	126	78
7	143	25	14	23	11	12	63	210	769	124	120	76
8	123	22	14	13	11	19	25	197	621	125	123	71
9	97	26	14	13	11	25	25	188	445	126	123	70
10	94	26	13	16	10	24	25	223	257	126	123	67
11	94	26	14	7	10	19	25	170	249	124	123	63
12	95	23	23	14	10	15	25	149	326	125	122	62
13	78	23	29	14	10	17	25	116	128	125	122	59
14	78	22	35	17	10	32	25	213	125	125	122	63
15	76	22	22	17	10	23	26	223	169	126	121	62
16	75	20	46	17	10	11	49	240	212	125	99	50
17	73	21	19	16	10	30	49	381	198	126	101	44
18	42	23	32	16	10	20	48	486	163	125	101	39
19	39	21	28	16	10	9	44	465	128	123	100	39
20	42	21	30	16	10	31	51	249	125	126	101	38
21	23	28	34	16	16	24	47	293	125	125	101	44
22	23	18	18	16	16	16	51	319	124	125	101	50
23	23	14	29	16	15	42	46	400	124	123	95	43
24	25	23	23	16	15	20	44	441	126	122	88	40
25	23	25	19	16	15	26	44	201	126	127	88	39
26	24	14	14	16	15	14	59	204	126	124	86	39
27	23	15	12	16	19	21	84	144	123	125	86	37
28	24	17	11	16	17	16	93	149	125	125	84	36
29	24	14	15	15		30	119	263	124	127	91	35
30	22	18	17	20		21	144	197	126	124	81	38
31	25		13	15		34		125		125	81	
Min	22	14	10	7	10	9	16	116	123	122	81	35
Max	143	28	46	23	19	42	144	486	769	127	126	82
Mean	65	22	20	15	13	21	49	245	228	125	108	56
ac-ft	4005	1322	1232	915	697	1292	2906	15093	13554	7678	6620	3337



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

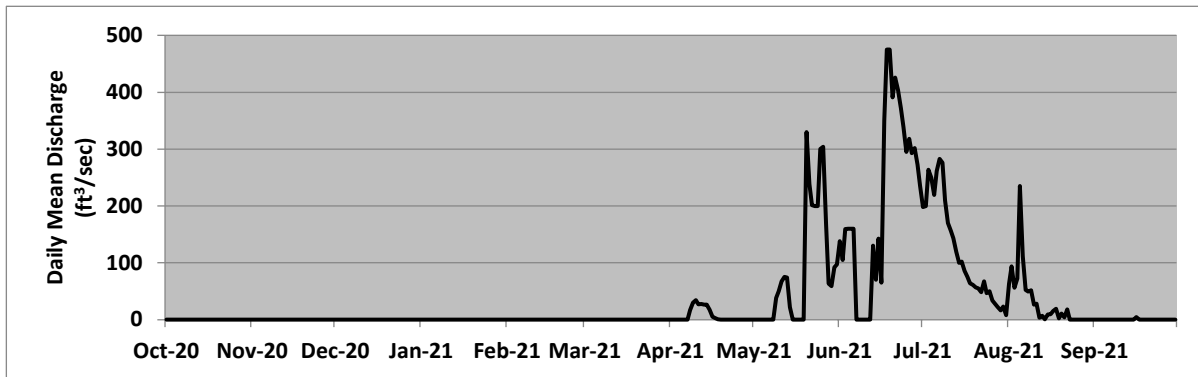
Location. --Lat 40°22'24", long 105°29'00", Larimer County, Hydrologic Unit 10190006, southeast of Estes Park, Colorado.

Gage. -- Water-stage recorder and satellite telemetry. Elevation of gage is 7460 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 cfs. 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-2020 through 30-Sep-2021. Records are complete and reliable. This record contains operational data which could be subject to future revisions and changes.

Hydropower Diversion (Skim), cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	0	0	0	0	0	0	138	198	63	0
2	0	0	0	0	0	0	0	0	105	200	94	0
3	0	0	0	0	0	0	0	0	159	264	56	0
4	0	0	0	0	0	0	0	0	160	250	73	0
5	0	0	0	0	0	0	0	0	160	220	235	0
6	0	0	0	0	0	0	0	0	160	262	112	0
7	0	0	0	0	0	0	0	0	0	283	52	0
8	0	0	0	0	0	0	17	0	0	276	49	0
9	0	0	0	0	0	0	30	38	0	210	52	0
10	0	0	0	0	0	0	35	50	0	170	27	0
11	0	0	0	0	0	0	27	68	0	157	28	0
12	0	0	0	0	0	0	28	75	0	143	3	0
13	0	0	0	0	0	0	27	74	130	119	7	0
14	0	0	0	0	0	0	27	22	70	100	1	0
15	0	0	0	0	0	0	17	0	143	102	9	0
16	0	0	0	0	0	0	5	0	65	86	10	5
17	0	0	0	0	0	0	3	0	350	75	15	0
18	0	0	0	0	0	0	1	0	475	64	19	0
19	0	0	0	0	0	0	0	0	475	61	3	0
20	0	0	0	0	0	0	0	330	391	57	11	0
21	0	0	0	0	0	0	0	238	426	55	4	0
22	0	0	0	0	0	0	0	202	404	48	18	0
23	0	0	0	0	0	0	0	200	372	67	0	0
24	0	0	0	0	0	0	0	200	339	47	0	0
25	0	0	0	0	0	0	0	300	295	50	0	0
26	0	0	0	0	0	0	0	304	318	34	0	0
27	0	0	0	0	0	0	0	169	293	28	0	0
28	0	0	0	0	0	0	0	63	302	22	0	0
29	0	0	0	0	0	0	0	59	273	16	0	0
30	0	0	0	0	0	0	0	92	235	23	0	0
31	0	0	0	0	0	0	0	97	0	8	0	0
Min	0	0	0	0	0	0	0	0	0	8	0	0
Max	0	0	0	0	0	0	35	330	475	283	235	5
Mean	0	0	0	0	0	0	7	83	208	119	30	0
ac-ft	0	0	0	0	0	0	428	5121	12373	7328	1865	10



Appendix A (22 of 38)
Olympus Tunnel, CO

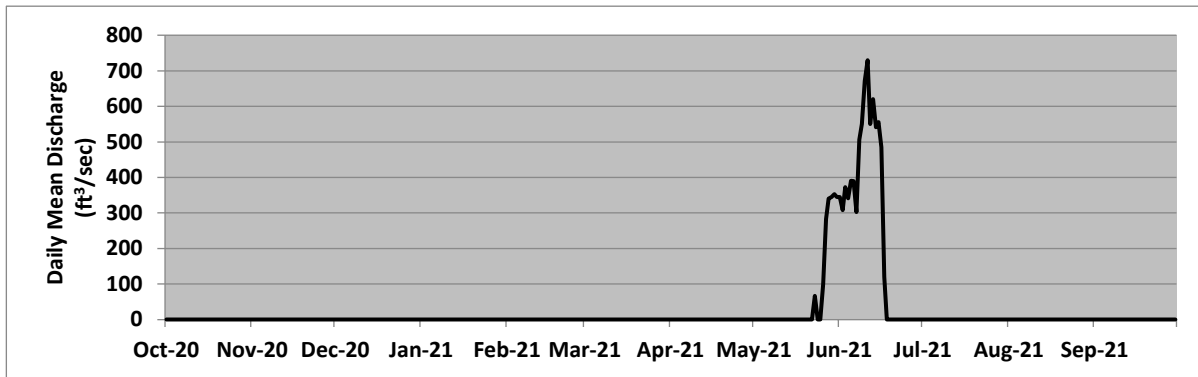
Location. --Lat 40°22'24", long 105°29'00", Larimer County, Hydrologic Unit 10190006, southeast of Estes Park, Colorado.

Gage. -- Water-stage recorder and satellite telemetry. Elevation of gage is 7460 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 cfs. The right to divert native run-off is determined by the Colorado Division of Water Resources. Period of record from 01-Oct-2020 through 30-Sep-2021. Record is complete and reliable.

Priority Diversion Flow, cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	0	0	0	0	0	0	345	0	0	0
2	0	0	0	0	0	0	0	0	308	0	0	0
3	0	0	0	0	0	0	0	0	373	0	0	0
4	0	0	0	0	0	0	0	0	341	0	0	0
5	0	0	0	0	0	0	0	0	391	0	0	0
6	0	0	0	0	0	0	0	0	390	0	0	0
7	0	0	0	0	0	0	0	0	303	0	0	0
8	0	0	0	0	0	0	0	0	507	0	0	0
9	0	0	0	0	0	0	0	0	550	0	0	0
10	0	0	0	0	0	0	0	0	672	0	0	0
11	0	0	0	0	0	0	0	0	730	0	0	0
12	0	0	0	0	0	0	0	0	550	0	0	0
13	0	0	0	0	0	0	0	0	620	0	0	0
14	0	0	0	0	0	0	0	0	541	0	0	0
15	0	0	0	0	0	0	0	0	556	0	0	0
16	0	0	0	0	0	0	0	0	485	0	0	0
17	0	0	0	0	0	0	0	0	120	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	67	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	100	0	0	0	0
27	0	0	0	0	0	0	0	283	0	0	0	0
28	0	0	0	0	0	0	0	340	0	0	0	0
29	0	0	0	0	0	0	0	345	0	0	0	0
30	0	0	0	0	0	0	0	353	0	0	0	0
31	0	0	0	0	0	0	0	345	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	353	730	0	0	0
Mean	0	0	0	0	0	0	0	59	259	0	0	0
ac-ft	0	0	0	0	0	0	0	3636	15433	0	0	0



**Appendix A (23 of 38)
Olympus Tunnel, CO**

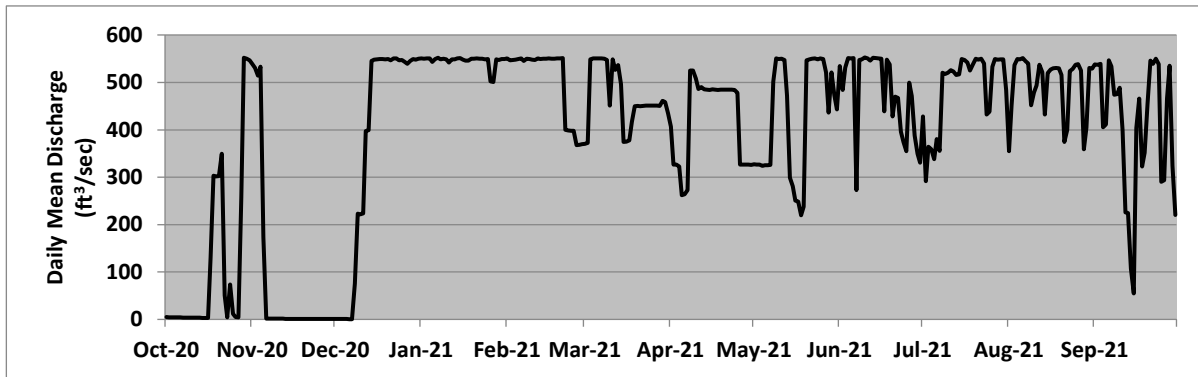
Location. --Lat 40°22'24", long 105°29'00", Larimer County, Hydrologic Unit 10190006, southeast of Estes Park, Colorado, on the Big Thompson River.

Gage. -- Water-stage recorder with satellite telemetry. Elevation of gage is 7460 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 cfs. Recorder was operated from 01-Oct-2020 to 30-Sep-2021. 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, cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	5	539	1	551	551	371	407	327	535	428	355	538
2	4	531	1	550	547	372	326	327	484	292	452	538
3	4	515	1	551	547	549	327	327	531	364	537	539
4	4	533	1	551	548	550	323	324	551	359	549	405
5	4	173	1	543	550	550	262	325	551	338	549	412
6	4	1	0	550	551	551	264	325	551	381	552	547
7	4	1	0	552	546	550	273	326	272	355	545	534
8	4	1	76	549	550	550	525	501	547	521	540	474
9	4	1	223	550	550	548	525	551	549	518	452	476
10	4	1	222	549	548	451	508	550	553	521	479	489
11	4	1	224	542	547	549	486	550	551	526	494	399
12	3	1	397	549	551	527	490	548	546	523	537	226
13	3	1	399	549	549	537	485	472	552	516	522	224
14	3	1	546	551	550	496	485	299	551	517	432	107
15	3	1	548	551	550	374	484	281	551	549	520	55
16	3	1	549	548	551	375	485	251	550	547	527	404
17	131	1	549	546	550	378	485	249	439	542	530	466
18	303	1	550	546	550	417	484	220	548	525	531	323
19	302	1	549	550	551	450	485	238	538	538	530	351
20	303	1	549	550	551	450	485	547	429	550	516	454
21	350	1	547	551	551	450	485	549	470	548	374	546
22	51	1	551	550	400	451	485	550	467	550	400	540
23	4	1	551	550	399	451	485	551	396	540	524	550
24	74	1	547	549	398	451	484	549	374	433	528	539
25	12	1	548	549	398	451	478	550	355	439	538	290
26	5	1	543	502	368	451	327	550	500	533	539	294
27	4	1	540	501	368	451	327	521	472	549	525	466
28	257	1	545	549	369	451	326	436	388	548	359	535
29	552	1	549	547		461	327	521	350	549	405	324
30	550	1	548	549		458	326	473	331	549	530	220
31	546		550	550		435		443		484	529	
Min	3	1	0	501	368	371	262	220	272	292	355	55
Max	552	539	551	552	551	551	525	551	553	550	552	550
Mean	113	77	368	546	509	470	421	427	483	488	497	409
ac-ft	6947	4595	22615	33573	28241	28872	25077	26241	28725	30013	30541	24327



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

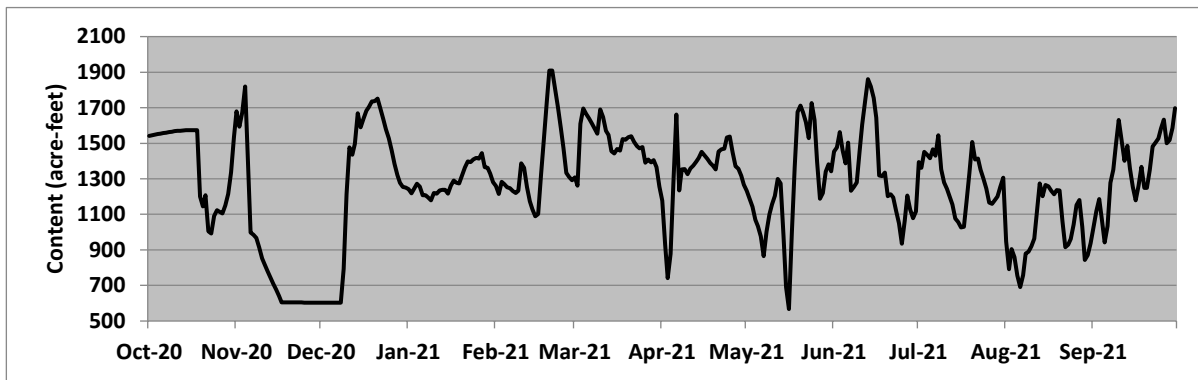
Location. --Lat 40°22', long 105°17.9', Larimer County, Hydrologic Unit 10190006, 10 miles southwest of Loveland, Colorado.

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 in 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 6555.70 feet, a content of 604 AF. Used as the forebay storage for Flatiron Powerplant. Recorder was operated from 01-Oct-2020 to 30-Sep-2021. 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	1542	1680	603	1242	1260	1308	1177	1232	1453	1394	948	1026
2	1545	1594	603	1218	1215	1262	929	1189	1478	1363	791	1118
3	1548	1675	603	1243	1283	1610	742	1143	1564	1452	904	1187
4	1552	1820	603	1272	1270	1696	878	1069	1459	1435	859	1074
5	1554	1385	603	1257	1253	1665	1287	1033	1387	1415	755	942
6	1557	998	603	1208	1247	1640	1661	977	1504	1466	692	1034
7	1560	984	603	1208	1231	1611	1235	865	1233	1431	756	1277
8	1563	968	603	1194	1221	1585	1354	1003	1254	1546	880	1351
9	1565	914	793	1178	1232	1554	1355	1100	1280	1354	889	1490
10	1568	853	1213	1220	1387	1690	1326	1156	1458	1279	920	1631
11	1570	818	1476	1216	1362	1648	1359	1205	1606	1243	964	1517
12	1571	780	1436	1235	1254	1570	1375	1299	1735	1197	1128	1401
13	1572	744	1497	1238	1173	1547	1397	1275	1861	1156	1273	1487
14	1573	709	1670	1238	1128	1455	1417	979	1819	1076	1203	1358
15	1573	677	1590	1217	1090	1442	1451	692	1755	1056	1265	1254
16	1573	640	1638	1261	1102	1467	1432	566	1644	1027	1258	1178
17	1573	604	1683	1291	1323	1458	1412	992	1318	1029	1233	1262
18	1573	604	1705	1278	1525	1523	1389	1365	1315	1169	1213	1367
19	1200	604	1735	1273	1733	1521	1374	1677	1334	1330	1236	1248
20	1145	604	1737	1319	1909	1534	1352	1712	1202	1507	1235	1249
21	1208	604	1751	1364	1910	1540	1453	1675	1212	1409	1062	1349
22	1006	604	1695	1399	1806	1507	1467	1618	1195	1414	916	1483
23	992	604	1636	1394	1701	1484	1470	1529	1119	1351	929	1503
24	1091	604	1579	1409	1585	1472	1533	1726	1051	1301	962	1527
25	1122	603	1529	1417	1476	1479	1539	1632	935	1245	1043	1583
26	1115	603	1460	1413	1334	1391	1449	1396	1063	1167	1152	1634
27	1105	603	1383	1445	1310	1408	1372	1188	1205	1159	1181	1499
28	1150	603	1321	1367	1293	1392	1357	1221	1127	1180	1029	1519
29	1214	603	1278	1362		1404	1317	1341	1079	1200	844	1587
30	1337	603	1254	1330		1367	1267	1381	1117	1256	870	1697
31	1534		1250	1281		1255		1343		1306	936	
Min	992	603	603	1178	1090	1255	742	566	935	1027	692	942
Max	1573	1820	1751	1445	1910	1696	1661	1726	1861	1546	1273	1697
Mean	1398	856	1262	1290	1379	1500	1337	1244	1359	1288	1010	1361
EOM	1534	603	1250	1281	0	1255	1267	1343	1117	1306	936	1697



Appendix A (25 of 38)
Flatiron Reservoir, CO

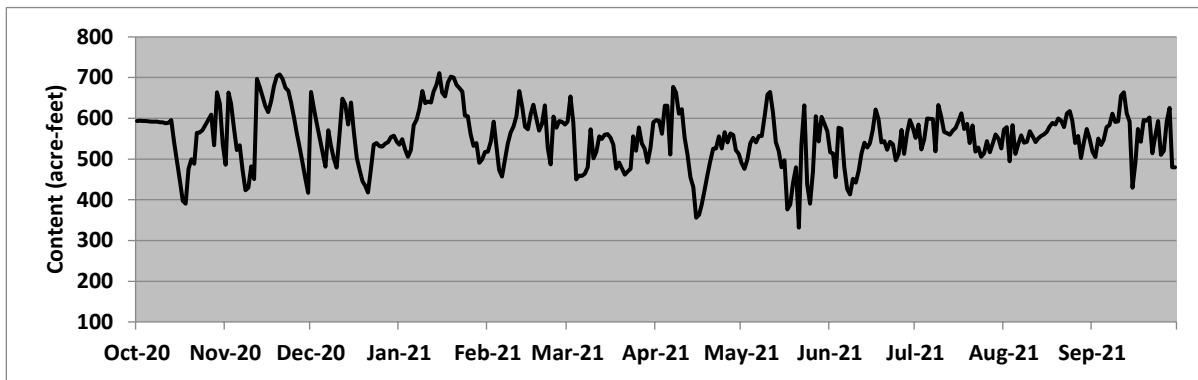
Location. --Lat 40°22.1', long 105°13.3', Larimer County, Hydrologic Unit 10190006, 8 miles southwest of Loveland, Colorado.

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-2020 to 30-Sep-2021. 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	593	486	665	536	518	592	596	490	516	552	572	518
2	594	663	624	549	543	654	594	476	513	584	579	505
3	593	636	587	524	591	589	562	499	456	524	495	550
4	593	576	552	506	528	450	631	538	577	548	583	535
5	592	522	516	522	473	459	631	552	575	599	513	547
6	592	534	482	583	457	459	511	541	480	599	537	579
7	591	473	571	597	498	464	677	557	426	598	558	583
8	592	423	534	624	538	480	663	557	414	519	540	611
9	590	430	502	667	565	573	611	606	452	633	543	591
10	590	482	479	637	580	502	622	658	442	604	568	593
11	588	451	561	642	605	518	552	664	471	566	556	655
12	589	697	648	638	667	555	510	614	514	563	542	664
13	595	676	634	666	630	549	455	542	540	560	551	612
14	541	652	585	682	579	560	431	520	528	570	556	592
15	494	631	639	711	573	561	356	480	539	576	561	429
16	447	615	565	663	611	553	363	497	572	593	566	491
17	398	642	504	653	633	536	387	376	622	612	580	574
18	390	679	472	689	601	476	422	388	598	574	589	542
19	476	704	446	703	570	492	460	442	541	586	584	596
20	500	708	435	700	586	476	495	480	544	540	599	594
21	488	697	418	682	632	461	526	332	523	582	594	602
22	565	675	474	674	528	469	526	536	542	518	578	514
23	565	668	536	666	487	476	556	632	536	528	612	556
24	571	637	540	606	605	555	526	438	497	506	618	593
25	584	602	531	605	577	520	566	391	512	514	593	511
26	597	565	531	560	593	578	541	469	572	544	539	521
27	609	530	538	532	591	539	563	605	513	517	556	592
28	534	492	542	540	584	525	559	543	563	538	502	626
29	664	453	554	490		492	522	604	595	560	541	480
30	636	417	557	499		527	512	587	578	550	574	480
31	536		543	518		590		568		526	550	
Min	390	417	418	490	457	450	356	332	414	506	495	429
Max	664	708	665	711	667	654	677	664	622	633	618	664
Mean	558	581	541	608	569	524	531	522	525	561	562	561
EOM	536	417	543	518	0	590	512	568	578	526	550	480



Appendix A (26 of 38)
Flatiron Powerplant Unit #3 Pump/Generator, CO

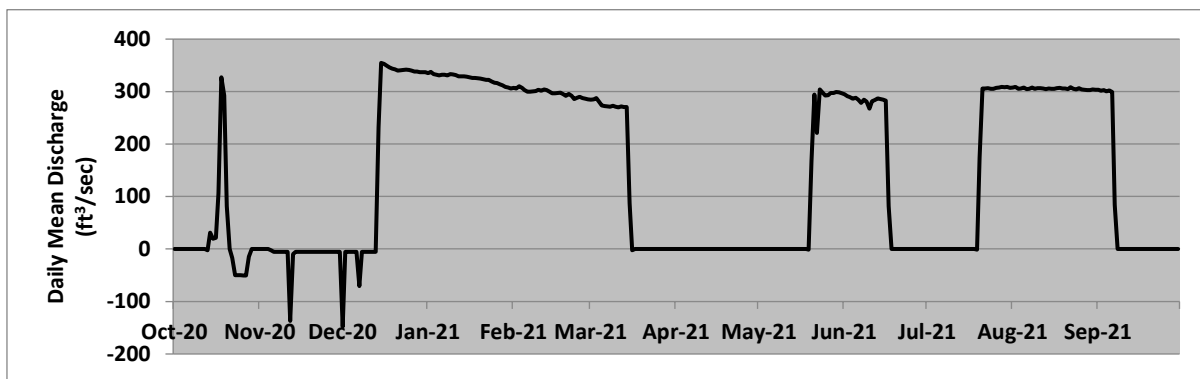
Location. --Lat 40°21'53", long 105°14'09", Larimer County, Hydrologic Unit 10190006, 9 miles west of Loveland, Colorado

Gage. -- There is a flow meter in place.

Remarks. -- Constructed between 1951 and 1953. The Powerplant consists of three generating units. Unit #3 can be used to pump water from Flatiron Reservoir to Carter Lake Reservoir, or to generate power. For the purpose of this table, any 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 cfs, 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-2020 to 30-Sep-2021. Record is complete and reliable. This record contains operational data which could be subject to future revisions and changes.

Discharge, cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	-148	335	307	285	0	0	295	0	308	303
2	0	0	-6	337	306	285	0	0	291	0	309	301
3	0	0	-6	333	310	288	0	0	289	0	305	303
4	0	0	-6	332	307	280	0	0	286	0	306	300
5	0	-3	-6	331	303	273	0	0	288	0	307	302
6	0	-5	-6	332	300	272	0	0	284	0	305	299
7	0	-5	-71	332	300	271	0	0	278	0	305	84
8	0	-5	-6	330	300	271	0	0	285	0	308	0
9	0	-5	-6	333	301	273	0	0	281	0	305	0
10	0	-5	-6	332	304	271	0	0	267	0	306	0
11	0	-5	-6	331	301	270	0	0	281	0	307	0
12	0	-137	-6	329	304	271	0	0	284	0	305	0
13	-2	-10	-6	329	303	270	0	0	287	0	304	0
14	31	-6	232	329	300	270	0	0	286	0	306	0
15	19	-6	354	328	297	87	0	0	284	0	305	0
16	21	-6	352	327	296	-2	0	0	282	0	305	0
17	106	-6	349	325	297	0	0	0	82	0	306	0
18	327	-6	346	326	298	0	0	0	0	0	307	0
19	292	-6	343	325	295	0	0	-1	0	-1	306	0
20	82	-6	342	325	291	0	0	167	0	174	306	0
21	0	-6	340	324	295	0	0	294	0	306	305	0
22	-17	-6	340	322	291	0	0	221	0	306	308	0
23	-50	-6	341	322	286	0	0	304	0	306	305	0
24	-50	-6	341	319	288	0	0	299	0	305	304	0
25	-50	-6	341	317	290	0	0	292	0	305	306	0
26	-50	-6	339	316	287	0	0	293	0	307	304	0
27	-50	-6	338	314	286	0	0	297	0	308	303	0
28	-15	-6	338	312	285	0	0	297	0	309	303	0
29	0	-6	337	309		0	0	299	0	308	302	0
30	0	-6	337	307		0	0	299	0	309	304	0
31	0		336	305		0		296		307	303	
Min	-50	-137	-148	305	285	-2	0	-1	0	-1	302	0
Max	327	0	354	337	310	288	0	304	295	309	309	303
Mean	19	-9	186	325	297	127	0	108	154	114	305	63
ac-ft	1177	-548	11439	19972	16517	7806	0	6657	9184	7037	18778	3753



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

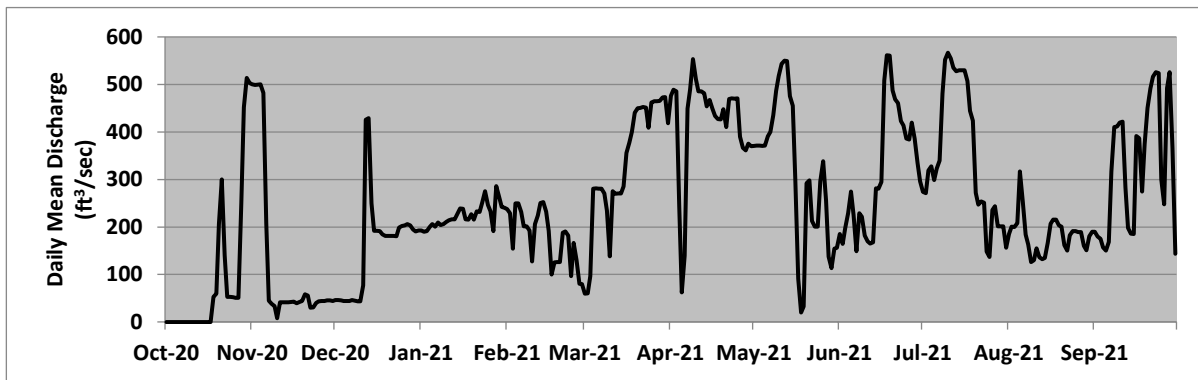
Location. --Lat 40°22'26", long 105°13'52", Larimer County, Hydrologic Unit 10190006, 8 miles southwest of Loveland, Colorado.

Gage. -- Water-stage recorder with satellite telemetry. Elevation of gage is 5470 feet from topographic map.

Remarks. -- Constructed between 1949 and 1953. The canal is 3.8 miles long and has a maximum capacity of 930 cfs. 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-2020 to 30-Sep-2021. 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, cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	500	47	192	238	59	476	371	185	274	185	190
2	0	499	46	190	229	60	489	371	165	271	201	180
3	0	500	45	191	154	96	485	371	198	319	200	175
4	0	500	45	200	250	280	244	371	229	327	208	157
5	0	482	44	206	250	281	62	371	275	299	317	151
6	0	208	44	200	231	281	139	390	226	323	254	169
7	0	45	46	209	201	280	449	400	149	340	184	317
8	0	38	45	204	201	271	490	435	229	480	163	410
9	0	34	44	206	193	234	553	486	221	552	126	411
10	0	8	44	211	127	138	511	518	182	567	130	420
11	0	41	77	214	206	275	485	543	170	555	155	421
12	0	42	425	216	224	270	485	550	165	535	136	282
13	0	41	429	216	250	271	481	549	168	528	132	198
14	0	42	250	227	252	271	453	475	281	530	135	186
15	0	42	192	239	232	285	467	455	281	530	166	185
16	0	43	192	238	192	356	448	297	295	530	207	391
17	0	40	191	216	100	377	433	91	508	506	215	387
18	53	42	184	215	126	400	427	20	561	444	215	275
19	60	44	181	227	126	440	426	33	561	423	203	374
20	206	58	181	215	126	450	447	292	487	272	201	450
21	300	56	181	233	188	450	410	298	468	247	162	491
22	140	30	181	232	191	452	469	213	460	254	150	516
23	53	31	181	251	182	451	471	201	423	251	183	525
24	53	40	198	275	97	409	470	200	414	148	191	523
25	53	43	202	246	166	462	470	296	386	137	191	300
26	51	44	203	233	131	465	390	338	384	236	190	247
27	51	44	206	192	80	464	367	256	420	244	189	492
28	250	46	203	286	80	465	361	137	386	201	161	526
29	452	46	195	266		473	375	113	335	201	151	366
30	514	44	190	243		473	370	155	296	202	181	144
31	503		192	240		418		157		156	190	
Min	0	8	44	190	80	59	62	20	149	137	126	144
Max	514	500	429	286	252	473	553	550	561	567	317	526
Mean	88	122	158	224	179	334	420	315	317	351	183	329
ac-ft	5432	7287	9693	13745	9964	20548	25004	19348	18856	21586	11251	19556



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

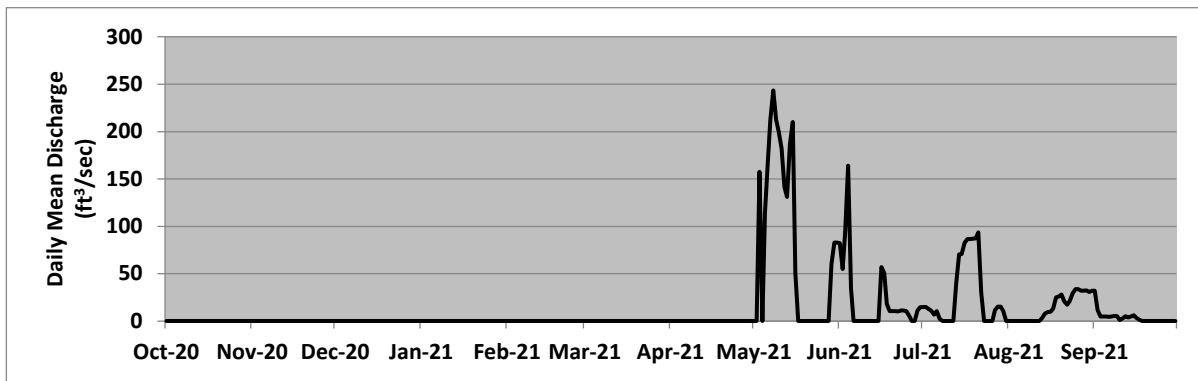
Location. --Lat 40°25'02", long 105°14'35", Larimer County, Hydrologic Unit 10190006, 11 miles west of Loveland, Colorado, on the Big Thompson River.

Gage. -- Water-stage recorder with satellite telemetry at Parshall Flume. Elevation of gage is 5520 feet (m.s.l.) from topographic map.

Remarks. -- Constructed in 1950. Maximum capacity is 600 cfs, but only 400 cfs 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), cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	0	0	0	0	0	0	82	15	0	32
2	0	0	0	0	0	0	0	0	55	15	0	12
3	0	0	0	0	0	0	0	158	95	13	0	5
4	0	0	0	0	0	0	0	0	164	11	0	5
5	0	0	0	0	0	0	0	114	35	7	0	5
6	0	0	0	0	0	0	0	168	0	11	0	4
7	0	0	0	0	0	0	0	213	0	2	0	5
8	0	0	0	0	0	0	0	243	0	0	0	5
9	0	0	0	0	0	0	0	212	0	0	0	5
10	0	0	0	0	0	0	0	200	0	0	0	1
11	0	0	0	0	0	0	0	182	0	0	0	3
12	0	0	0	0	0	0	0	142	0	0	0	5
13	0	0	0	0	0	0	0	131	0	40	4	4
14	0	0	0	0	0	0	0	187	0	71	8	5
15	0	0	0	0	0	0	0	210	0	71	10	6
16	0	0	0	0	0	0	0	51	57	83	10	4
17	0	0	0	0	0	0	0	0	51	87	13	1
18	0	0	0	0	0	0	0	0	18	86	25	0
19	0	0	0	0	0	0	0	0	11	87	26	0
20	0	0	0	0	0	0	0	0	10	87	28	0
21	0	0	0	0	0	0	0	0	10	94	21	0
22	0	0	0	0	0	0	0	0	10	31	17	0
23	0	0	0	0	0	0	0	0	11	0	21	0
24	0	0	0	0	0	0	0	0	11	0	29	0
25	0	0	0	0	0	0	0	0	10	0	34	0
26	0	0	0	0	0	0	0	0	6	0	34	0
27	0	0	0	0	0	0	0	0	0	12	32	0
28	0	0	0	0	0	0	0	0	0	15	32	0
29	0	0	0	0	0	0	0	60	11	15	32	0
30	0	0	0	0	0	0	0	83	15	11	31	0
31	0	0	0	0	0	0	0	83	0	0	32	0
Min	0	0	0	0	0	0	0	0	0	0	0	0
Max	0	0	0	0	0	0	0	243	164	94	34	32
Mean	0	0	0	0	0	0	0	79	22	28	14	4
ac-ft	0	0	0	0	0	0	0	4834	1313	1708	868	210



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

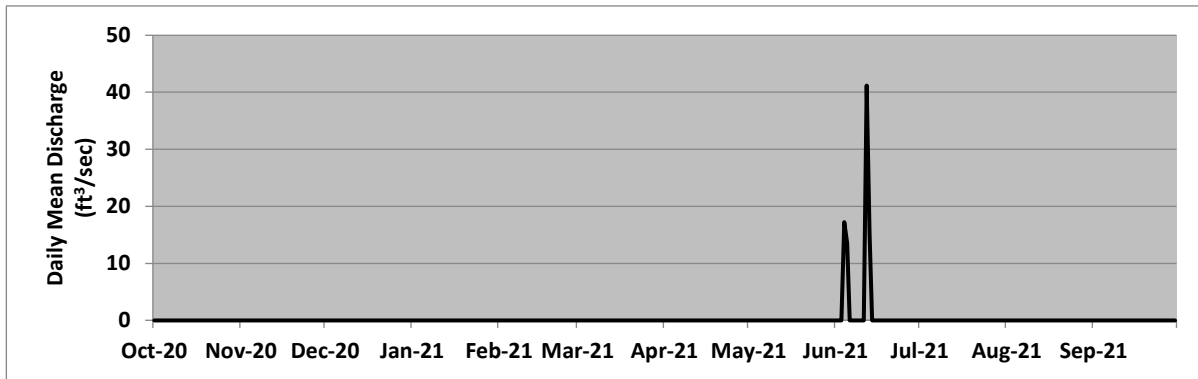
Location. --Lat 40°25'02", long 105°14'35", Larimer County, Hydrologic Unit 10190006, 11 miles west of Loveland, Colorado, on the Big Thompson River.

Gage. -- None.

Remarks. -- Constructed in 1950. Maximum capacity is 600 cfs. 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, cfs, 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	17	0	0	0
5	0	0	0	0	0	0	0	0	14	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	41	0	0	0
13	0	0	0	0	0	0	0	0	15	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	0
31	0	0	0	0	0	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	41	0	0	0
Mean	0	0	0	0	0	0	0	0	3	0	0	0
ac-ft	0	0	0	0	0	0	0	0	173	0	0	0



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

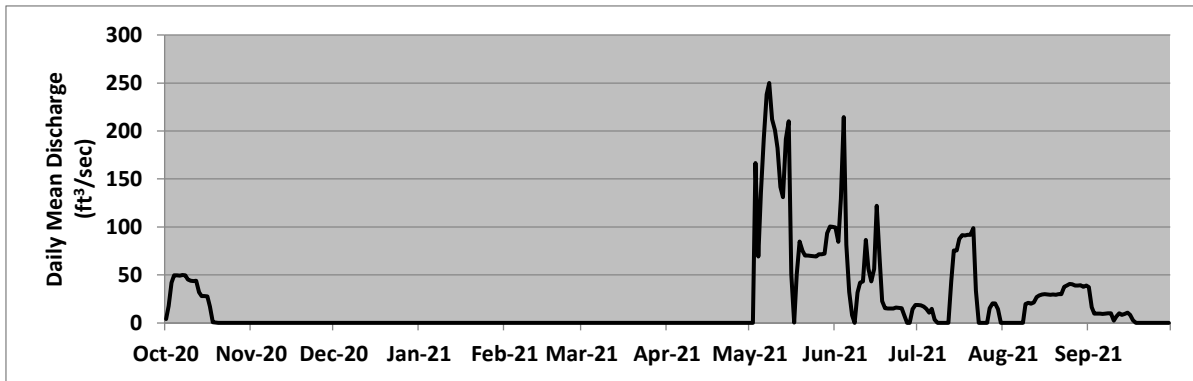
Location. --Lat 40°25'02", long 105°14'35", Larimer County, Hydrologic Unit 10190006, 11 miles west of Loveland, Colorado, on the Big Thompson River.

Gage. -- Water-stage recorder with satellite telemetry at Parshall Flume. Elevation of gage is 5520 feet from topographic map.

Remarks. — Constructed in 1950. The Dille Tunnel has a maximum capacity is 600 cfs, but only 400 cfs 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, cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	4	0	0	0	0	0	0	0	99	19	0	37
2	18	0	0	0	0	0	0	0	84	18	0	16
3	42	0	0	0	0	0	0	167	129	17	0	10
4	49	0	0	0	0	0	0	69	214	15	0	10
5	50	0	0	0	0	0	0	135	81	11	0	10
6	49	0	0	0	0	0	0	192	32	15	0	9
7	50	0	0	0	0	0	0	238	8	3	0	10
8	50	0	0	0	0	0	0	250	0	0	0	10
9	45	0	0	0	0	0	0	212	32	0	20	10
10	44	0	0	0	0	0	0	201	42	0	21	2
11	44	0	0	0	0	0	0	182	43	0	20	7
12	44	0	0	0	0	0	0	142	86	0	21	10
13	32	0	0	0	0	0	0	131	57	44	27	8
14	28	0	0	0	0	0	0	192	43	75	29	9
15	28	0	0	0	0	0	0	210	56	76	30	11
16	28	0	0	0	0	0	0	51	122	87	30	8
17	17	0	0	0	0	0	0	0	67	91	30	3
18	1	0	0	0	0	0	0	50	23	91	29	0
19	0	0	0	0	0	0	0	85	15	92	29	0
20	0	0	0	0	0	0	0	75	15	92	29	0
21	0	0	0	0	0	0	0	70	15	99	30	0
22	0	0	0	0	0	0	0	70	15	33	30	0
23	0	0	0	0	0	0	0	70	16	0	38	0
24	0	0	0	0	0	0	0	69	16	0	39	0
25	0	0	0	0	0	0	0	69	15	0	40	0
26	0	0	0	0	0	0	0	72	8	0	40	0
27	0	0	0	0	0	0	0	72	0	15	39	0
28	0	0	0	0	0	0	0	72	0	20	39	0
29	0	0	0	0	0	0	0	94	14	20	39	0
30	0	0	0	0	0	0	0	101	19	14	38	0
31	0	0	0	0	0	0	0	100	0	0	39	0
Min	0	0	0	0	0	0	0	0	0	0	0	0
Max	50	0	0	0	0	0	0	250	214	99	40	37
Mean	20	0	0	0	0	0	0	111	46	31	23	6
ac-ft	1233	0	0	0	0	0	0	6825	2715	1881	1438	357



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

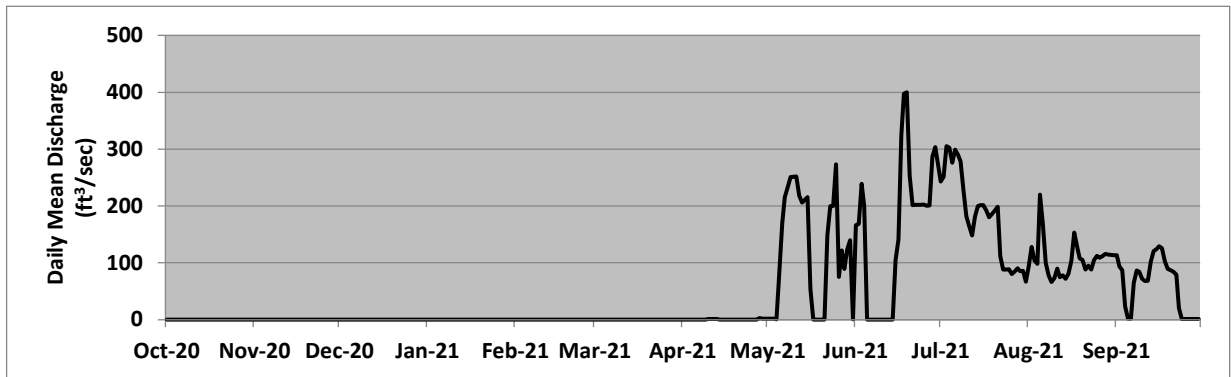
Location. --Lat 40°25'16", long 105°13'26", Larimer County, Hydrologic Unit 10190006, 9 miles west of Loveland, Colorado, on the Big Thompson River.

Gage. -- Flow meter with satellite telemetry. Elevation of gage is 5280 feet (m.s.l.) from topographic map.

Remarks. -- Initial operation in 1959. Maximum capacity is 400 cfs. Power plant returns hydropower diversions to the Big Thompson River downstream of 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-2020 and 30-Sep-2021. Record is complete and fair. This record contains operational data which could be subject to future revisions and changes.

Discharge, cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2	0	0	0	0	0	0	0	2	168	252	128	94
4	0	0	0	0	0	0	0	1	200	303	98	23
6	0	0	0	0	0	0	0	170	0	299	168	2
8	0	0	0	0	0	0	0	233	0	278	78	87
10	0	0	0	0	0	0	1	251	0	182	73	72
12	0	0	0	0	0	0	1	218	0	148	75	69
14	0	0	0	0	0	0	0	210	0	200	72	120
16	0	0	0	0	0	0	0	54	141	201	103	129
18	0	0	0	0	0	0	0	0	397	180	129	103
20	0	0	0	0	0	0	0	0	254	192	105	87
22	0	0	0	0	0	0	0	149	202	112	95	79
24	0	0	0	0	0	0	0	200	202	88	105	1
26	0	0	0	0	0	0	0	75	200	80	109	1
28	0	0	0	0	0	0	3	89	287	90	115	1
30	0	0	0	0		0	2	140	271	86	114	1
Max	0	0	0	0	0	0	3	273	400	305	220	129
ac-ft	0	0	0	0	0	0	21	7413	9261	11053	6525	3649



Appendix A (32 of 38)
CHFC Wasteway, CO

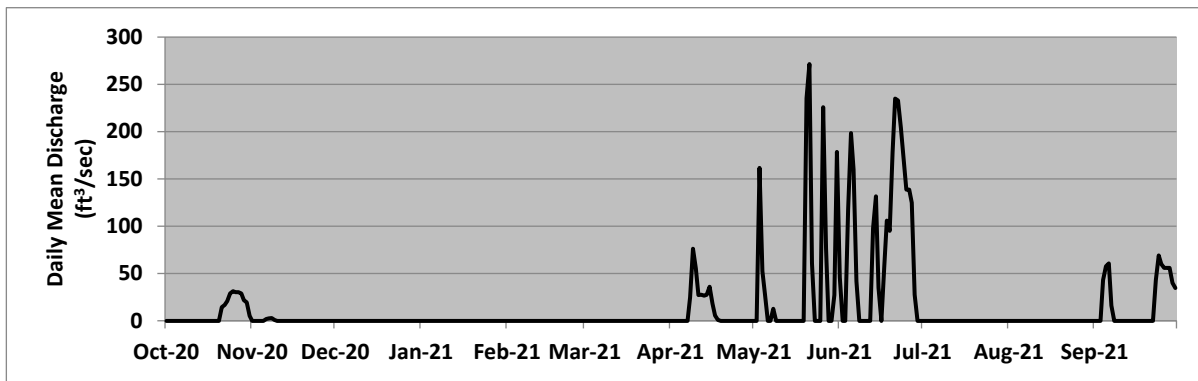
Location. --Lat 40°25'13", long 105°13'28", Larimer County, Hydrologic Unit 10190006, 9 miles west of Loveland, Colorado, on the Big Thompson River.

Gage. -- Water-stage recorder with satellite telemetry at 15 foot Parshall Flume. Elevation of gage is 5465 feet (m.s.l.) from Designer's Operating Criteria.

Remarks. -- Constructed between 1949 and 1953. Maximum capacity is 400 cfs. 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 during October 2020 and then between April 2021 and September 2021. 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, cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	0	0	0	0	0	0	0	46	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	162	0	0	0	0
4	0	0	0	0	0	0	0	53	117	0	0	43
5	0	0	0	0	0	0	0	28	198	0	0	58
6	0	2	0	0	0	0	0	0	160	0	0	61
7	0	3	0	0	0	0	0	0	42	0	0	16
8	0	3	0	0	0	0	25	13	0	0	0	0
9	0	1	0	0	0	0	76	0	0	0	0	0
10	0	0	0	0	0	0	55	0	0	0	0	0
11	0	0	0	0	0	0	27	0	0	0	0	0
12	0	0	0	0	0	0	28	0	0	0	0	0
13	0	0	0	0	0	0	27	0	98	0	0	0
14	0	0	0	0	0	0	28	0	132	0	0	0
15	0	0	0	0	0	0	36	0	35	0	0	0
16	0	0	0	0	0	0	18	0	0	0	0	0
17	0	0	0	0	0	0	6	0	57	0	0	0
18	0	0	0	0	0	0	1	0	106	0	0	0
19	0	0	0	0	0	0	0	0	95	0	0	0
20	0	0	0	0	0	0	0	235	178	0	0	0
21	14	0	0	0	0	0	0	271	235	0	0	0
22	17	0	0	0	0	0	0	61	233	0	0	0
23	21	0	0	0	0	0	0	0	204	0	0	43
24	29	0	0	0	0	0	0	0	173	0	0	69
25	31	0	0	0	0	0	0	0	139	0	0	60
26	31	0	0	0	0	0	0	226	139	0	0	56
27	31	0	0	0	0	0	0	76	125	0	0	56
28	29	0	0	0	0	0	0	0	28	0	0	56
29	22	0	0	0	0	0	0	0	0	0	0	40
30	20	0	0	0	0	0	0	27	0	0	0	35
31	6	0	0	0	0	0	0	179	0	0	0	0
Min	0	0	0	0	0	0	0	0	0	0	0	0
Max	31	3	0	0	0	0	76	271	235	0	0	69
Mean	8	0	0	0	0	0	11	43	85	0	0	20
ac-ft	495	18	0	0	0	0	648	2640	5038	0	0	1177



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

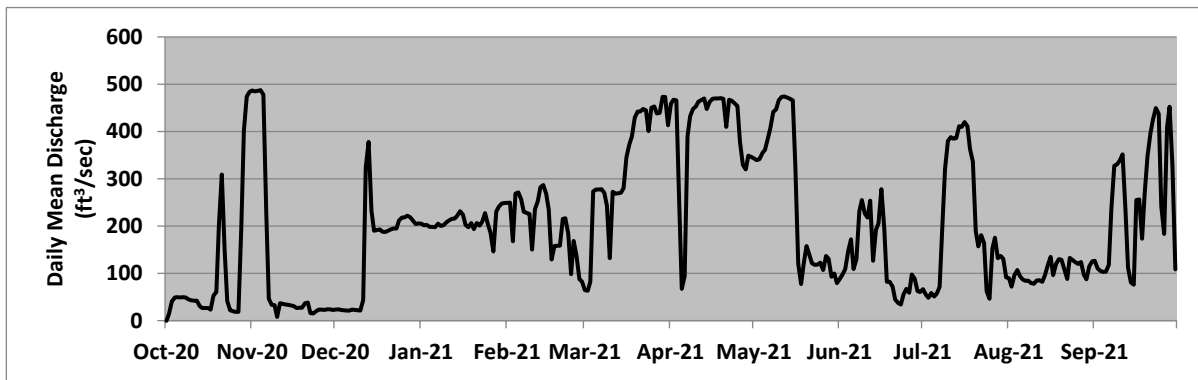
Location. --Lat 40°25'25", long 105°13'34", Larimer County, Hydrologic Unit 10190006, 9 miles west of Loveland, Colorado.

Gage. -- Water-stage recorder with satellite telemetry. Elevation of gage is 5460 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 cfs. The canal is used to move C-BT water and Big Thompson River priority water to Horsetooth Reservoir. Recorder was operated from 01-Oct-2020 to 30-Sep-2021. 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, cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0	487	24	205	249	65	458	343	89	67	90	127
2	15	485	24	202	250	63	467	340	99	56	72	111
3	41	486	23	202	168	82	466	342	109	49	96	105
4	49	487	23	198	268	274	248	354	146	59	108	103
5	50	478	22	198	271	277	67	361	172	51	94	104
6	49	229	22	198	256	277	94	385	110	57	87	118
7	50	47	23	205	230	278	390	408	130	72	85	237
8	49	34	23	201	228	270	432	442	231	206	85	327
9	45	33	22	202	225	243	448	447	255	321	79	331
10	43	8	22	208	150	132	453	466	227	380	78	338
11	42	37	44	212	236	273	463	473	218	388	85	352
12	42	36	323	215	253	269	466	474	254	384	85	235
13	31	34	378	216	282	269	470	472	127	386	82	113
14	27	34	232	222	287	271	448	469	193	411	96	81
15	27	32	190	232	269	280	462	466	206	410	116	76
16	27	31	192	224	235	345	469	327	278	420	135	255
17	24	27	193	202	130	372	470	121	195	411	97	256
18	53	28	188	198	158	389	470	78	83	363	120	173
19	60	28	187	207	159	430	470	120	82	336	131	268
20	202	37	191	194	159	442	469	158	72	190	129	348
21	309	38	193	207	216	442	410	139	45	158	108	395
22	147	16	195	201	216	448	467	121	38	181	88	425
23	42	15	195	209	184	445	465	118	34	164	133	450
24	22	20	212	228	98	401	460	119	55	63	128	437
25	20	23	218	203	169	450	454	123	67	47	123	242
26	19	24	219	187	137	453	377	107	59	153	120	183
27	19	23	222	147	88	438	329	137	98	176	124	409
28	198	24	219	231	83	439	320	131	89	133	97	452
29	401	24	211	241		473	349	93	63	137	88	325
30	474	23	204	247		473	346	100	61	131	115	109
31	484		206	249		413		80		92	126	
Min	0	8	22	147	83	63	67	78	34	47	72	76
Max	484	487	378	249	287	473	470	474	278	420	135	452
Mean	99	111	150	209	202	328	405	268	130	208	103	250
ac-ft	6077	6599	9203	12875	11218	20186	24116	16486	7708	12792	6349	14847



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

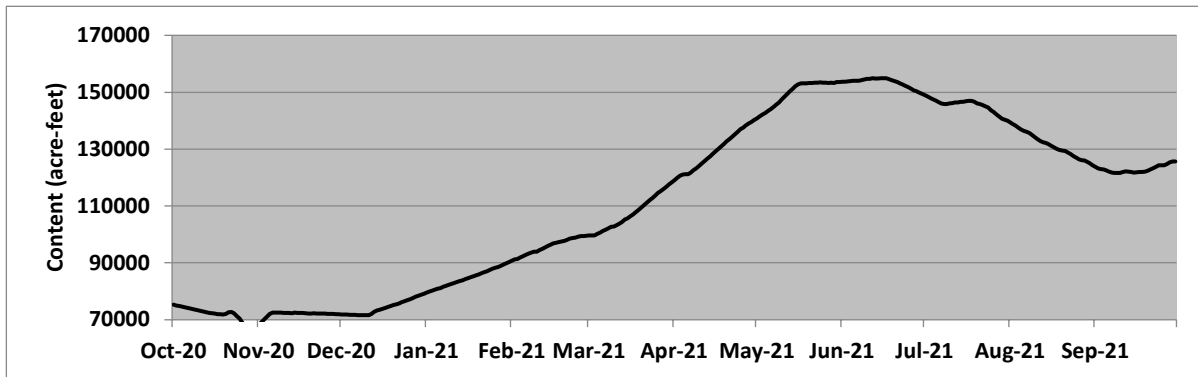
Location. --Lat 40°36'00", long 105°10'05" , Larimer County, Hydrologic Unit 10190007, at Horsetooth Dam outlet works, 4.8 miles west of Fort Collins, Colorado.

Gage. — Water level recorder with satellite telemetry. Elevation of gage is 5300 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 5430.00 ft, with 142,038 AF of active storage. Recorder was operated from 01-Oct-2020 to 30-Sep-2021. 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	75264	68206	71824	79530	90770	99614	119001	140788	153732	149049	139503	123744
2	75013	69170	71810	79860	91232	99662	119847	141538	153732	148513	138816	123206
3	74831	70112	71783	80236	91385	99694	120625	142215	153833	147999	138188	123009
4	74636	71101	71741	80597	91879	100193	121086	142775	153894	147564	137541	122831
5	74386	72042	71714	80886	92357	100677	121156	143453	154076	147052	136916	122545
6	74206	72466	71660	81176	92822	101180	121192	144095	154035	146559	136443	122028
7	73900	72521	71632	81568	93242	101682	121761	144875	154096	146049	136160	121725
8	73693	72466	71632	81889	93553	102138	122617	145637	154317	145853	135632	121654
9	73485	72480	71564	82239	93912	102642	123296	146402	154520	145872	134937	121583
10	73278	72425	71537	82575	93927	102839	124139	147446	154702	146089	134206	121672
11	73058	72370	71551	82941	94458	103280	124968	148414	154743	146245	133515	122010
12	72838	72383	72083	83249	94913	103739	125816	149445	154905	146382	132843	122242
13	72576	72288	72838	83647	95432	104363	126668	150361	154864	146481	132415	122135
14	72411	72438	73237	83853	95951	105304	127468	151300	154885	146658	132155	121939
15	72288	72356	73555	84252	96441	105750	128417	152182	154925	146697	131729	121743
16	72165	72343	73872	84621	96853	106414	129240	152866	154966	146835	131192	121814
17	71973	72343	74164	84977	97074	107046	130049	153127	154905	147032	130583	121992
18	71960	72275	74511	85274	97313	107831	130971	153127	154601	146973	130086	122010
19	71837	72206	74845	85661	97551	108636	131896	153147	154277	146658	129718	122046
20	72069	72193	75208	86004	97774	109460	132713	153248	153955	146128	129534	122385
21	72549	72234	75446	86362	98109	110286	133515	153288	153571	145843	129332	122831
22	72700	72179	75782	86691	98492	111168	134337	153389	153187	145559	128838	123314
23	72234	72124	76175	87127	98748	112020	135256	153389	152684	145129	128253	123816
24	71251	72151	76513	87517	98908	112788	136141	153450	152222	144582	127614	124283
25	70355	72097	76866	87925	99164	113646	136954	153429	151841	143706	126995	124373
26	69048	72069	77220	88302	99389	114541	137617	153349	151260	143008	126432	124355
27	67633	72028	77659	88499	99453	115232	138359	153328	150721	142272	126124	124769
28	66574	71987	78057	89000	99533	115960	138987	153369	150321	141442	125961	125329
29	66193	71946	78400	89486		116656	139599	153328	149864	140710	125527	125708
30	66403	71946	78785	89914		117598	140212	153652	149426	140384	125004	125690
31	67208		79142	90281		118211		153652		140058	124355	
Min	66193	68206	71537	79530	90770	99614	119001	140788	149426	140058	124355	121583
Max	75264	72521	79142	90281	99533	118211	140212	153652	154966	149049	139503	125708
Mean	71871	71898	74284	84714	95737	107428	129130	149809	153435	145464	131502	122959
EOM	67208	71946	79142	90281	0	118211	140212	153652	149426	140058	124355	125690



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

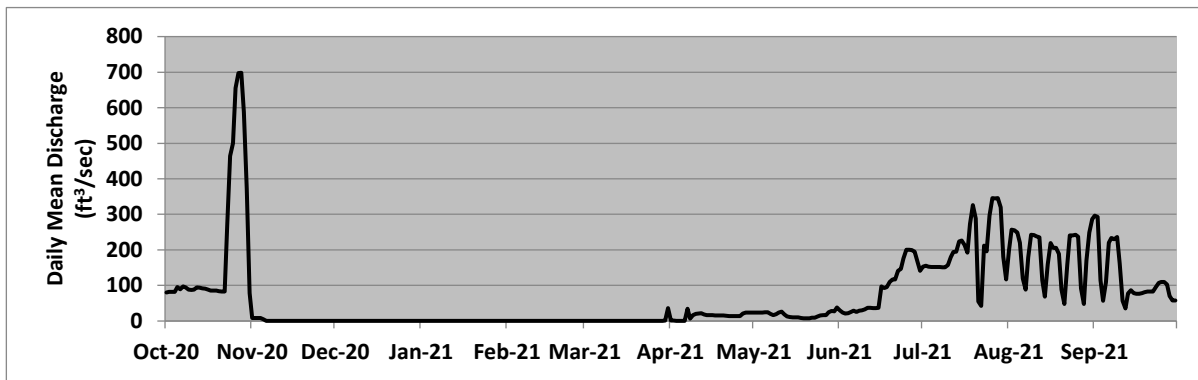
Location. --Lat 40°36'01", long 105°10'18", Larimer County, Hydrologic Unit 10190007, 4 miles west of Fort Collins, Colorado.

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 1500 cfs. The canal is used to deliver C-BT and Windy Gap Project water stored at Horsetooth Reservoir. Recorder was operated from 01-Oct-2020 to 30-Sep-2021 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, cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	80	8	0	0	0	0	1	24	29	152	200	296
2	82	8	0	0	0	0	1	24	23	156	257	293
3	82	8	0	0	0	0	0	24	21	153	255	114
4	82	8	0	0	0	0	0	24	22	152	249	57
5	95	4	0	0	0	0	0	25	26	152	220	109
6	89	0	0	0	0	0	0	25	29	151	119	220
7	97	0	0	0	0	0	34	20	26	151	88	233
8	95	0	0	0	0	0	7	17	29	151	179	230
9	88	0	0	0	0	0	16	19	30	151	243	236
10	87	0	0	0	0	0	20	23	33	157	242	162
11	88	0	0	0	0	0	21	26	37	179	238	57
12	95	0	0	0	0	0	22	18	37	194	235	35
13	93	0	0	0	0	0	18	13	36	195	114	77
14	91	0	0	0	0	0	17	11	36	224	68	86
15	90	0	0	0	0	0	16	10	37	226	159	78
16	88	0	0	0	0	0	16	10	97	214	219	77
17	86	0	0	0	0	0	16	10	93	192	206	77
18	85	0	0	0	0	0	15	8	96	273	205	78
19	85	0	0	0	0	0	15	8	110	326	189	81
20	84	0	0	0	0	0	15	7	117	288	88	82
21	83	0	0	0	0	0	14	7	117	55	48	83
22	83	0	0	0	0	0	14	9	141	42	157	83
23	270	0	0	0	0	0	14	9	147	212	241	95
24	465	0	0	0	0	0	14	13	176	195	241	107
25	500	0	0	0	0	0	14	16	200	296	243	109
26	655	0	0	0	0	0	14	16	201	346	238	109
27	698	0	0	0	0	0	21	16	199	344	92	103
28	699	0	0	0	0	0	23	25	195	346	48	70
29	588	0	0	0	0	0	24	28	166	319	169	58
30	373	0	0	0	0	1	24	27	141	180	249	58
31	79		0	0		36		38		117	287	
Min	79	0	0	0	0	0	0	7	21	42	48	35
Max	699	8	0	0	0	36	34	38	201	346	287	296
Mean	202	1	0	0	0	1	14	18	88	203	187	118
ac-ft	12408	73	0	0	0	73	848	1087	5248	12478	11473	7048



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

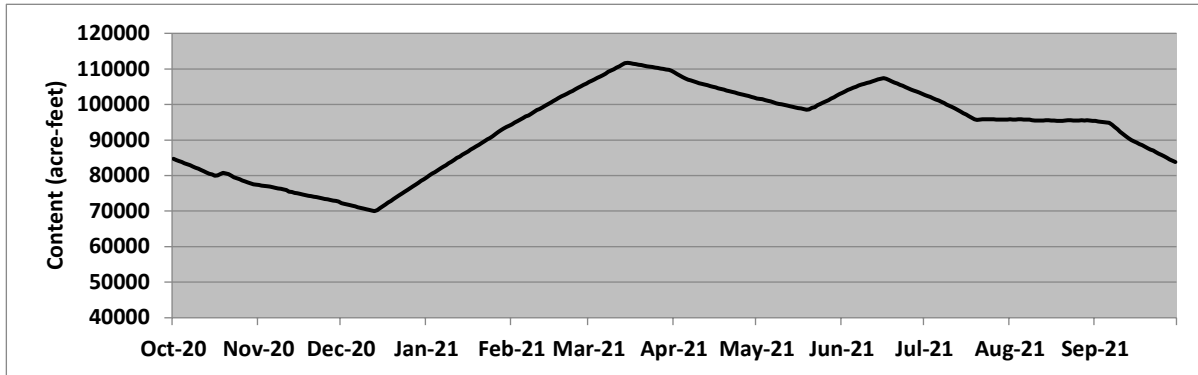
Location. --Lat 40°19' 28" , long 105°12' 41" , Larimer County, Hydrologic Unit 10190006, on Dam #1, 7 miles northwest of Berthoud, Colorado, and 10 miles west of Loveland, Colorado.

Gage. --Water level recorder with satellite telemetry. Elevation of gage is 5770 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 5759.00 feet, with 108,900 AF of active capacity. Recorder was operated from 01-Oct-2020 to 30-Sep-2021. 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	84704	77327	72207	79500	94451	106337	109042	101726	103322	102689	95813	95369
2	84392	77216	72049	80011	94926	106719	108600	101549	103700	102390	95792	95229
3	84070	77085	71882	80543	95326	107101	108161	101460	104067	102091	95781	95131
4	83800	77004	71725	80984	95760	107495	107697	101239	104391	101770	95845	95045
5	83490	76874	71558	81446	96237	107889	107293	101052	104703	101438	95803	94969
6	83179	76732	71362	81992	96639	108274	106988	100842	104993	101129	95749	94861
7	82879	76550	71067	82466	96932	108646	106808	100589	105318	100776	95716	94343
8	82590	76390	70901	82952	97357	109223	106517	100379	105598	100413	95716	93665
9	82239	76259	70715	83459	97924	109598	106292	100171	105843	100017	95597	93022
10	81930	76118	70529	83945	98481	109983	106001	100039	106057	99632	95521	92325
11	81549	75947	70334	84464	98689	110358	105832	99874	106236	99259	95521	91706
12	81251	75486	70149	84974	99138	110734	105609	99687	106517	98908	95521	91130
13	80851	75376	69964	85369	99654	111190	105419	99511	106764	98416	95510	90534
14	80533	75146	70286	85839	100105	111680	105195	99325	107022	98011	95575	89993
15	80348	74995	70793	86319	100534	111748	105004	99138	107247	97574	95543	89686
16	79970	74866	71362	86811	100964	111623	104792	98996	107439	97150	95521	89285
17	80031	74696	71872	87294	101427	111486	104591	98875	107225	96736	95510	88882
18	80431	74506	72385	87787	101847	111361	104380	98689	106898	96313	95423	88545
19	80768	74337	72898	88208	102268	111155	104178	98514	106517	95845	95412	88155
20	80584	74228	73443	88693	102667	111064	103934	98656	106169	95673	95434	87703
21	80410	74068	73919	89200	103066	110939	103745	99051	105866	95770	95521	87356
22	79980	73909	74457	89655	103477	110791	103544	99281	105564	95867	95575	87021
23	79530	73800	74946	90153	103845	110688	103378	99753	105239	95824	95543	86633
24	79214	73581	75476	90587	104279	110540	103155	100171	104904	95824	95499	86194
25	78950	73443	75937	91119	104714	110414	102933	100545	104558	95824	95478	85797
26	78583	73314	76500	91717	105127	110290	102734	100908	104234	95813	95499	85421
27	78299	73126	76964	92261	105519	110153	102601	101272	103956	95792	95543	84995
28	78035	72957	77489	92775	105911	109995	102390	101670	103689	95760	95499	84558
29	77782	72829	78025	93246		109892	102168	102013	103400	95727	95554	84173
30	77519	72690	78492	93676		109767	101958	102478	103032	95738	95499	83800
31	77418		79001	94020		109484		102900		95727	95423	
Min	77418	72690	69964	79500	94451	106337	101958	98514	103032	95673	95412	83800
Max	84704	77327	79001	94020	105911	111748	109042	102900	107439	102689	95845	95369
Mean	80816	75029	73183	86821	100259	109891	105031	100334	105349	98061	95579	89851
EOM	77418	72690	79001	94020	0	109484	101958	102900	103032	95727	95423	83600



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

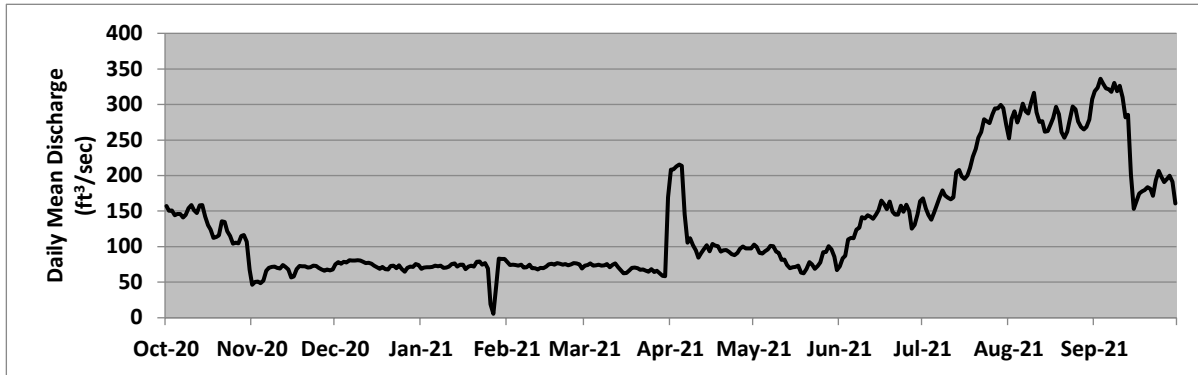
Location. --Lat 40°19'27", long 105°12'35", Larimer County, Hydrologic Unit 10190006, downstream from Carter Reservoir Dam #1, 7 miles northwest of Berthoud, Colorado, and 10 miles west of Loveland, Colorado.

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 cfs. 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-2020 to 30-Sep-2021. Record is complete and fair. This record contains operational data which could be subject to future revisions and changes.

Flow, cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	157	46	75	69	79	73	208	103	72	168	252	319
2	150	50	78	71	74	74	209	100	84	154	280	324
3	151	51	76	71	74	76	213	91	87	145	290	336
4	144	49	79	71	74	73	215	90	110	138	275	329
5	146	52	78	72	73	74	214	93	112	148	285	323
6	146	66	81	73	74	75	145	96	112	158	301	321
7	141	70	81	72	70	73	105	101	124	169	291	318
8	145	71	80	73	71	74	112	100	127	179	287	330
9	154	72	81	70	75	76	102	93	141	172	303	319
10	158	70	81	71	70	71	95	91	139	169	316	326
11	152	69	78	72	70	75	85	81	144	167	289	310
12	147	74	77	75	68	76	91	82	142	169	276	282
13	158	71	77	77	70	71	97	74	139	205	277	286
14	159	68	76	72	70	66	102	70	145	208	262	202
15	142	57	73	74	72	62	93	71	151	199	263	153
16	130	58	71	75	75	63	104	71	165	195	272	164
17	124	68	69	68	76	66	102	73	159	200	281	175
18	112	73	71	72	75	70	100	63	153	211	297	178
19	114	72	68	73	77	71	93	62	163	227	287	179
20	116	72	68	72	76	70	95	69	149	237	261	184
21	136	71	73	79	75	67	95	78	145	253	253	182
22	135	71	73	79	75	68	93	75	145	261	262	171
23	122	73	70	75	74	66	90	69	158	279	279	193
24	115	73	73	77	75	65	88	73	149	277	297	207
25	104	70	68	69	77	69	91	78	159	274	293	198
26	105	68	65	19	76	64	97	92	150	286	276	191
27	105	66	70	5	75	66	100	92	125	295	268	195
28	115	68	72	45	69	62	98	100	130	295	265	200
29	116	67	72	83		59	98	96	145	299	268	191
30	107	68	75	83		58	98	86	164	295	279	161
31	68		74	83		169		67		272	308	
Min	68	46	65	5	68	58	85	62	72	138	252	153
Max	159	74	81	83	79	169	215	103	165	299	316	336
Mean	131	66	74	69	74	72	118	83	136	216	280	242
ac-ft	8078	3914	4567	4241	4083	4450	6995	5122	8114	13295	17241	14376



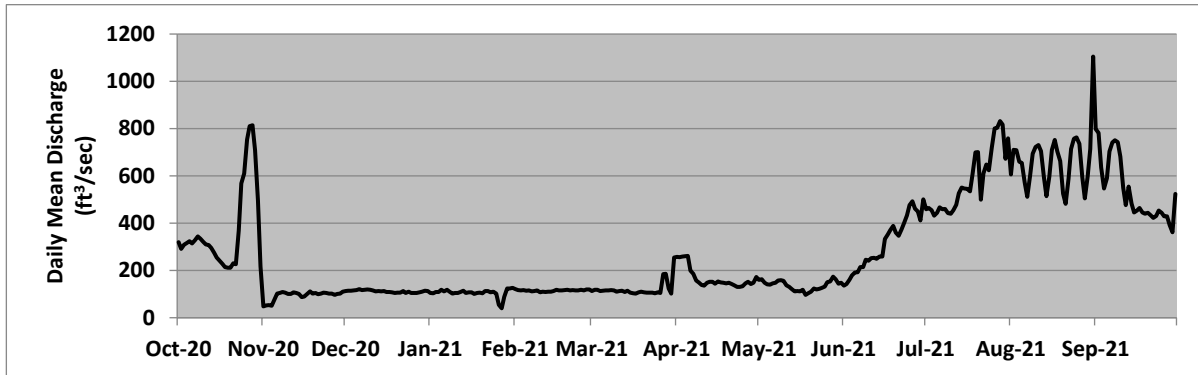
Appendix A (38 of 38)
Colorado-Big Thompson Project, CO

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 from 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-2020 and 30-Sep-2021. Data were provided by the Northern Water. Record is complete and reliable.

Total Daily Water Deliveries, cfs, Daily Mean Values

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	320	49	113	106	122	114	258	161	137	459	606	798
2	292	53	115	103	117	119	256	164	143	465	710	782
3	310	53	114	109	116	118	260	148	160	455	709	635
4	316	52	116	109	117	113	260	142	180	432	660	546
5	324	76	117	118	114	115	262	140	192	445	655	590
6	315	102	121	113	116	116	200	146	193	468	573	703
7	328	105	117	118	111	116	187	149	214	458	512	742
8	345	109	119	111	113	117	158	158	215	460	603	750
9	334	107	121	102	116	117	149	160	246	443	694	743
10	321	101	118	106	108	110	139	157	242	440	722	682
11	310	101	115	106	110	114	137	138	253	455	730	549
12	308	108	112	110	109	115	148	131	254	478	705	476
13	296	105	113	114	110	110	152	121	250	526	595	555
14	275	102	113	105	111	114	153	112	260	551	514	483
15	255	87	114	108	114	106	144	113	259	547	596	445
16	241	91	110	109	119	104	155	112	334	546	711	454
17	229	102	109	101	117	102	149	118	353	534	752	465
18	214	113	107	106	116	109	148	97	371	607	703	446
19	211	102	105	107	118	110	145	104	388	700	663	440
20	212	105	106	104	119	108	148	111	361	701	525	444
21	230	100	106	113	116	107	143	124	347	500	482	433
22	227	102	113	114	118	107	138	120	374	611	587	423
23	368	107	105	108	116	107	131	122	401	648	714	430
24	568	105	111	111	116	104	131	127	434	624	758	454
25	610	102	106	103	118	108	133	133	477	718	763	444
26	753	102	105	56	116	105	146	151	493	801	736	429
27	809	96	105	40	120	185	152	154	461	804	595	429
28	814	101	108	89	121	186	142	174	449	832	506	393
29	709	102	110	124		124	149	163	412	816	599	362
30	496	110	115	125		103	173	144	501	673	714	524
31	217		113	127		255		149		758	1104	
Min	211	49	105	40	108	102	131	97	137	432	482	362
Max	814	113	121	127	122	255	262	174	501	832	1104	798
Mean	373	95	112	106	115	121	168	137	312	579	661	535
ac-ft	22923	5655	6890	6494	6413	7412	10011	8415	18550	35611	40653	31831



APPENDIX B—TABLES

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 ¹	Active Storage ²	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 head-works
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 ³	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 cfs
Pinewood Lake	416	1,765	2,181	613	Minimum elevation for power generation
Flatiron	125	635	760	324	Minimum elevation to release 550 cfs
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	

1 Storage capacity below elevation of lowest outlet

2 Total storage minus dead storage

3 Not determined

B-2: C-BT MONTHLY SUMMARY OF BLUE RIVER OPERATIONS

C-BT MONTHLY SUMMARY OF BLUE RIVER OPERATIONS

WATER YEAR 2021

(AF)

	INITIAL	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	Total or Avg %
UNDEPLETED RUNOFF ABOVE GREEN MOUNTAIN RESERVOIR		11,588	11,906	9,718	8,198	7,587	9,116	14,053	43,133	77,240	33,138	24,120	12,433	262,231
UNDEPLETED RUNOFF ABOVE DILLON RESERVOIR.		6,267	7,076	6,358	5,081	4,821	5,565	7,602	24,813	46,624	20,443	15,420	7,276	157,344
PERCENT OF TOTAL UNDEPLETED RUNOFF ABV DILLON RESERVOIR		54.1%	59.4%	65.4%	62.0%	63.5%	61.0%	54.1%	57.5%	60.4%	61.7%	63.9%	58.5%	60.0%
DEPLETIONS BY 1929 COLORADO SPRINGS RIGHT		0	0	0	0	0	0	8	126	462	151	93	12	853
DEPLETIONS BY 1948 COLORADO SPRINGS RIGHT		0	0	0	0	0	0	6	1,187	6,059	1,777	398	10	9,437
INFLOW TO DILLON RESV.		6,178	5,947	4,957	5,081	4,821	5,565	7,602	24,025	40,110	18,524	15,139	7,270	145,218
DILLON RESERVOIR STORAGE (1,000 acre-feet)	244	235	229	221	213	207	203	206	226	259	259	244	221	---
ROBERTS TUNNEL DIVERSIONS		9,796	8,001	9,092	9,223	7,972	6,787	776	0	1,815	7,676	17,526	22,937	101,601
DILLON RESERVOIR OUTFLOW TO THE RIVER		3,804	3,477	3,570	3,525	3,044	3,450	3,267	3,402	5,107	9,699	11,426	6,010	59,781
TOTAL DEPLETIONS BY DENVER		2,374	2,470	1,388	1,556	1,777	2,115	4,335	20,623	35,003	8,826	3,713	1,260	85,437
RUNOFF BETWEEN DILLON RESERVOIR & GREEN MOUNTAIN RESERVOIR		5,338	4,829	3,360	3,114	2,766	3,436	6,451	18,319	30,700	12,714	8,496	5,149	104,672
ACTUAL INFLOW TO GREEN MOUNTAIN RESERVOIR		9,125	8,307	6,930	6,643	5,811	7,001	9,718	21,722	35,724	22,394	20,127	11,167	164,668
GREEN MOUNTAIN RESERVOIR END OF MONTH STORAGE (1,000 acre-feet)	95.0	77.2	74.8	74.0	72.3	69.9	67.0	54.2	70.8	100.9	98.6	86.9	76.3	---
TOTAL GREEN MOUNTAIN OUTFLOW		26,602	10,690	7,649	8,419	8,150	9,914	22,493	4,696	4,777	23,886	31,135	21,289	179,698

B-3: PICK-SLOAN MISSOURI BASIN PROGRAM 2021 SUMMARY ACTUAL OPERATIONS

(Part 1 of 3)

2021 Actual Operations. Water in 1,000 Acre-Feet. Energy in Giga-Watt Hours

GREEN MOUNTAIN RESERVOIR	INITIAL OR TOTAL	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Depleted Watershed Inflow	164.7	9.1	8.3	6.9	6.6	5.8	7.0	9.7	21.7	35.7	22.4	20.1	11.2
Turbine Release	169.2	26.2	10.7	7.6	8.4	7.0	9.5	22.4	0.1	1.5	23.5	31.1	21.3
Bypass	8.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	4.6	3.0	0.0	0.0	0.0
Spill	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
End of Month Content	95.0	77.2	74.8	74.0	72.3	69.9	67.0	54.2	70.8	100.9	98.6	86.9	76.3
Kwh/AF		171.0	107.7	85.5	92.2	113.4	111.8	159.8	696.5	78.6	187.0	189.3	161.9
Generation	51.9	4.5	1.2	0.7	0.8	0.8	1.1	3.6	0.0	0.1	4.4	5.9	3.4
WILLOW CREEK RESERVOIR		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Inflow	40.7	0.7	0.8	0.5	0.7	0.6	0.9	7.1	16.5	5.2	3.3	2.8	1.5
Release to River	6.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.7	1.0	0.8	0.5	0.4
Pumped to Granby	34.6	2.3	0.0	0.5	0.0	0.0	0.5	6.4	15.4	4.2	2.1	2.4	0.8
End of Month Content	9.5	7.5	7.9	7.3	7.5	7.7	7.7	7.0	7.4	7.1	7.1	6.8	6.8
Pump Energy	5.8	0.1	0.3	0.0	0.0	0.0	0.1	0.5	2.3	1.9	0.3	0.1	0.2
GRANBY - SHADOW MOUNTAIN - GRAND LAKE		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Natural Watershed Inflow	180.7	2.7	2.9	2.1	2.8	3.3	4.0	13.2	51.8	67.3	14.1	11.8	4.7
Total Inflow into Granby	201.2	5.9	3.3	4.4	3.4	2.6	3.6	13.2	61.1	73.8	13.7	10.9	5.2
Granby Fish Release	31.6	1.7	1.2	1.2	1.2	1.1	1.2	1.2	4.6	4.5	5.1	4.6	4.0
Granby Seepage	3.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.4	0.3
Granby Spill	0.8	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
Adams Tunnel	248.7	9.2	4.7	22.8	33.7	28.4	28.8	24.4	17.1	4.0	22.8	28.4	24.3
Granby End of Month content	475.5	467.2	462.7	440.8	408.3	381.8	356.1	349.4	401.4	467.1	451.8	428.7	402.7
SM-GL End of Month Content	17.4	17.3	17.7	17.8	17.8	17.9	17.8	17.8	17.4	17.6	17.3	17.5	17.5
Pumped from Granby	226.0	10.6	5.8	25.0	34.4	28.3	28.3	18.4	2.8	0.2	20.7	26.6	24.9
Granby Pump Kwh/AF		198.6	516.6	167.8	122.0	127.4	120.3	97.6	322.5	1680.6	91.7	101.5	100.6
Granby Pump Energy	30.7	2.1	3.0	4.2	4.2	3.6	3.4	1.8	0.9	0.4	1.9	2.7	2.5

(Part 2 of 3)

2021 Actual Operations. Water in 1,000 Acre-Feet. Energy in Giga-Watt Hours

MARYS LAKE – ESTES – FLATIRON	INITIAL OR TOTAL	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Adams Tunnel Water	248.7	9.2	4.7	22.8	33.7	28.4	28.8	24.4	17.1	4.0	22.8	28.4	24.3
Marys Lake Generation	37.2	2.1	3.0	4.2	4.3	3.9	3.3	2.3	2.9	2.0	3.3	3.3	2.6
Estes Generation	100.3	5.9	7.9	11.1	11.0	9.8	8.7	5.9	7.7	6.1	9.4	9.4	7.4
Divertible Big-Thompson	35.2	0.6	0.0	3.8	6.6	5.7	2.8	0.0	2.3	3.3	2.4	6.3	1.3
Diverted Big-Thompson Water	27.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	5.1	12.4	7.3	1.9	0.0
Olympus Tunnel	289.8	6.9	4.6	22.6	33.6	28.2	28.9	25.1	26.2	28.7	30.0	30.5	24.3
Pole Hill Generation	172.3	8.9	12.4	15.8	16.9	15.6	13.4	8.1	16.3	20.6	18.7	14.5	11.1
Flatiron 1 & 2 Generation	226.9	12.0	15.7	21.8	21.9	19.2	17.5	11.4	21.8	26.4	24.0	20.3	14.9
Flatiron 3 Turbine Release		0.0	0.3	0.4	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flatiron 3 Pumping	102.7	1.8	0.0	12.1	19.8	16.4	7.8	0.0	6.6	9.1	7.0	18.4	3.8
Flatiron 3 Kwh/AF Pump		0.0	0.0	0.0	333.0	350.7	362.5	0.0	351.6	357.9	344.9	0.0	0.0
Flatiron 3 Pump Energy	35.2	0.6	0.000	3.8	6.6	5.7	2.8	0.0	2.3	3.3	2.4	6.3	1.3
CARTER LAKE													
		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Pumped from Flatiron	102.7	1.8	0.0	12.1	19.8	16.4	7.8	0.0	6.6	9.1	7.0	18.4	3.8
Release to Flatiron	0.7	0.0	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Irrigation Delivery	102.7	1.8	0.0	12.1	19.8	16.4	7.8	0.0	6.6	9.1	7.0	18.4	3.8
Evaporation & Seepage	2.9	0.2	0.1	0.0	0.0	0.0	0.1	0.3	0.4	0.5	0.5	0.4	0.4
End of Month Content	85.0	77.4	72.7	79.0	94.0	105.9	109.5	102.0	102.9	103.0	95.7	95.4	83.8
BIG THOMPSON POWERPLANT													
		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Diverted Dille Tunnel Water	14.4	1.2	0.0	0.0	0.0	0.0	0.0	0.0	6.8	2.7	1.9	1.4	0.4
Irrigation Delivery	12.9	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.9	3.9	4.7
Turbine Release	37.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.4	9.3	11.1	6.5	3.6
Generation	10.9	0.4	0.2	0.1	0.0	0.0	0.0	0.3	1.8	2.7	2.6	1.9	0.9
HORSETOOTH RESERVOIR													
		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Hansen Feeder Canal Inflow	140.5	5.5	6.4	8.9	12.8	11.2	20.1	24.0	14.6	6.0	11.6	4.4	14.8
Irrigation Delivery	88.4	12.5	1.7	2.1	2.1	2.3	2.5	2.9	3.1	9.4	19.2	18.2	12.6
Evaporation	4.9	0.3	0.1	0.0	0.0	0.0	0.2	0.5	0.7	0.9	0.8	0.8	0.6
End of Month Content	75.6	67.2	71.9	79.1	90.3	99.5	118.2	140.2	153.7	149.4	140.1	124.4	125.7
TOTAL CBT DELIVERY¹	204.1	16.2	1.7	14.1	21.9	18.7	10.4	3.0	9.7	18.9	28.1	40.5	21.0

¹ May include Windy Gap and/or carriage contract water

(Part 3 of 3)

2021 Actual Operations. Water in 1,000 Acre-Feet. Energy in Giga-Watt Hours

	INITIAL OR TOTAL	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
BASE GENERATION													
Green Mountain	51.9	4.7	2.9	3.0	3.0	2.5	2.7	2.8	3.0	5.9	7.4	7.6	6.4
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
Big Thompson	10.9	0.4	0.2	0.1	0.0	0.0	0.0	0.3	1.8	2.7	2.6	1.9	0.9
TOTAL	62.8	5.1	3.1	3.1	3.0	2.5	2.7	3.1	4.8	8.6	10.0	9.5	7.3
LOAD FOLLOWING GENERATION													
		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Marys Lake	37.2	2.1	3.0	4.2	4.3	3.9	3.3	2.3	2.9	2.0	3.3	3.3	2.6
Estes	100.3	5.9	7.9	11.1	11.0	9.8	8.7	5.9	7.7	6.1	9.4	9.4	7.4
Pole Hill	172.3	8.9	12.4	15.8	16.9	15.6	13.4	8.1	16.3	20.6	18.7	14.5	11.1
Flatiron 1 & 2	226.9	12.0	15.7	21.8	21.9	19.2	17.5	11.4	21.8	26.4	24.0	20.3	14.9
TOTAL	536.7	28.9	39.0	52.9	54.1	48.5	42.9	27.7	48.7	55.1	55.4	47.5	36.0
PUMP ENERGY													
		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Willow Creek	5.8	0.1	0.3	0.0	0.0	0.0	0.1	0.5	2.3	1.9	0.3	0.1	0.2
Granby	30.7	2.1	3.0	4.2	4.2	3.6	3.4	1.8	0.9	0.4	1.9	2.7	2.5
Flatiron 3	26.7	1.8	3.1	3.9	4.0	3.4	2.8	1.8	1.6	1.7	0.9	0.8	0.9
TOTAL	63.2	4.0	6.4	8.1	8.2	7.0	6.3	4.1	4.8	4.0	3.1	3.6	3.6
TOTAL GENERATION	599.5	34.0	42.1	56.0	57.1	51.0	45.6	30.8	53.5	63.7	65.4	57.0	43.3
TOTAL GENERATION MINUS PUMP	536.3	30.0	35.7	47.9	48.9	44.0	39.3	26.7	48.7	59.7	62.3	53.4	39.7

B-4: 2022 FLOOD DAMAGE PREVENTED

**C-BT
FLOOD DAMAGE PREVENTED IN WATER YEAR 2021**

	Cumulative Total Prior to WY 2021	WY 2021	Cumulative Total Current
Granby, Willow Creek, Shadow Mountain and Grand Lake	\$686,574	\$53,743	\$740,317
Green Mountain	\$322,407	\$33,210	\$355,617
Total	\$1,008,981	\$86,953	\$1,095,934

B-5: C-BT OCTOBER 2021 MOST PROBABLE PLAN FOR WATER YEAR 2022



**BUREAU OF
RECLAMATION**

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

CBT October 2021 Most Probable: 01-OCT-2021

HYDROLOGY OPERATIONS

Dillon Reservoir

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Dillon Inflow	kaf	4.8	4.3	3.9	3.5	2.9	3.3	6.0	35.8	67.0	28.5	11.8	7.7	179.5
DL to GM Gain	kaf	3.6	3.5	3.2	2.8	2.4	3.2	6.7	24.5	43.9	20.6	10.1	6.4	130.9

Green Mountain Reservoir

Init Cont: 76.00 kaf **Maximum Cont:** 154.60 kaf **Minimum Cont:** 8.00 kaf
Elev: 7904.4 ft **Elev:** 7950.4 ft **Elev:** 7804.7 ft

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Depletion	kaf	-1.4	1.0	0.5	0.1	-0.2	-0.1	0.1	28.6	49.0	11.9	6.9	1.8	98.2
Depleted Inflow	kaf	9.9	6.7	6.5	6.2	5.5	6.6	12.7	32.3	65.0	39.0	16.3	12.4	219.1
Turbine Release	kaf	20.4	10.9	11.3	11.8	10.7	11.8	7.5	4.6	5.5	17.8	23.2	23.9	159.4
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	331	184	184	192	192	192	126	75	92	289	378	402	
Total River Release	kaf	20.4	10.9	11.3	11.8	10.7	11.8	7.5	4.6	5.5	17.8	23.2	23.9	159.4
Evaporation	kaf	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.3	0.5	0.7	0.6	0.4	3.0
End-Month Targets	kaf	65.6	56.6	56.6	40.4	40.4	40.4	50.0	95.0	132.0	152.5	145.0	133.0	
End-Month Contents	kaf	65.6	61.4	56.6	51.0	45.8	40.6	45.6	73.0	132.0	152.5	145.0	133.0	
End-Month Elevation	ft	7895.60	7891.82	7887.29	7881.63	7875.93	7869.85	7875.65	7901.76	7939.30	7949.46	7945.85	7939.82	

Willow Creek Reservoir

Init Cont: 7.00 kaf **Maximum Cont:** 10.20 kaf **Minimum Cont:** 7.20 kaf
Elev: 8118.9 ft **Elev:** 8128.8 ft **Elev:** 8116.9 ft

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Native Inflow	kaf	1.2	1.1	1.0	0.9	0.8	1.0	3.8	20.0	14.9	3.5	1.7	1.2	51.1
Minimum 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
5412.5 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
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	0.0	0.0	0.0	0.0	0.0	0.0	5.4	18.9	14.9	2.9	1.2	0.8	44.1
Evaporation	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.6
End-Month Targets	kaf	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	
End-Month Contents	kaf	7.6	8.2	8.7	9.2	9.7	10.2	8.2	8.8	8.2	8.2	8.2	8.2	
End-Month Elevation	ft	8118.52	8121.23	8123.51	8125.44	8126.96	8128.88	8121.32	8123.63	8121.32	8121.32	8121.32	8121.32	



COLORADO - BIG THOMPSON MONTHLY OPERATIONS
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CBT October 2021 Most Probable: 01-OCT-2021

Granby Reservoir		Init Cont: 403.00 kaf Elev: 8259.8 ft			Maximum Cont: 539.80 kaf Elev: 8280.0 ft			Minimum Cont: 76.50 kaf Elev: 8186.9 ft						
		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Native Inflow	kaf	1.9	1.9	1.7	1.6	1.3	1.5	4.0	21.8	35.6	13.2	5.4	3.2	93.1
Release from Shadow Mtn	kaf	2.2	2.7	2.8	1.2	1.1	1.2	2.4	11.7	32.5	6.6	2.5	2.6	69.5
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	0.0	0.0	0.0	0.0	0.0	0.0	5.4	18.9	14.9	2.9	1.2	0.8	44.1
Total Inflow	kaf	4.1	4.6	4.5	2.8	2.4	2.8	11.7	52.4	83.0	22.7	9.0	6.5	206.5
Minimum 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
5412.5 Release	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	2.2	2.1	5.5
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	1.2	1.2	1.2	1.2	1.1	1.2	1.2	4.6	4.5	7.0	6.8	5.4	36.6
Pumped to Shadow Mtn	kaf	19.7	1.9	23.0	29.4	29.9	8.0	0.6	2.5	0.0	13.1	26.3	16.3	170.7
Evaporation	kaf	1.4	0.6	0.0	0.0	0.0	0.7	1.3	2.0	2.8	2.7	2.1	1.8	15.4
Seepage loss	kaf	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.5
End-Month Contents	kaf	384.2	384.7	364.7	336.6	307.7	300.2	308.6	351.7	427.2	426.9	400.5	383.4	
End-Month Elevation	ft	8256.86	8256.95	8253.65	8248.87	8243.76	8242.40	8243.92	8251.46	8263.67	8263.63	8259.49	8256.73	

Shadow Mountain Reservoir		Init Cont: 17.00 kaf Elev: 8366.6 ft			Maximum Cont: 18.40 kaf Elev: 8367.0 ft			Minimum Cont: 16.60 kaf Elev: 8366.0 ft						
		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Native Inflow	kaf	2.6	2.5	2.3	2.1	1.7	2.0	5.3	28.3	47.0	18.8	7.1	4.2	123.9
Pumped from Granby	kaf	19.7	1.9	23.0	29.4	29.9	8.0	0.6	2.5	0.0	13.1	26.3	16.3	170.7
Total Inflow	kaf	22.2	4.4	25.3	31.4	31.7	10.1	5.9	30.7	47.0	31.8	33.3	20.5	294.3
Minimum River Release	kaf	2.2	2.7	2.8	1.2	1.1	1.2	1.2	1.2	3.0	3.0	2.5	2.1	24.2
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	1.2	2.4	11.7	32.5	6.6	2.5	2.6	69.5
Adams Tunnel Flow	kaf	19.6	1.6	22.5	30.2	30.5	8.6	3.1	18.3	13.6	24.5	30.3	17.3	220.1
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	16.9	16.9	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-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Maximum Tunnel Capacity	kaf	32.8	10.4	26.2	30.2	30.5	33.8	32.7	33.8	32.7	29.1	30.3	17.3	339.8
Actual Diversion	kaf	19.6	1.6	22.5	30.2	30.5	8.6	3.1	18.3	13.6	24.5	30.3	17.3	220.1
% Maximum Delivery	%	60	15	86	100	100	25	9	54	42	84	100	100	



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

CBT October 2021 Most Probable: 01-OCT-2021

Lake Estes

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Big Thompson Inflow	kaf	1.7	1.1	0.6	0.3	0.2	0.8	3.7	12.2	22.1	14.0	6.4	3.9	67.0
Minimum River Release	kaf	3.1	1.5	1.5	1.5	1.4	1.5	2.2	6.9	7.4	7.7	6.9	3.7	45.3
Actual River Release	kaf	1.7	1.1	0.6	0.3	0.2	0.8	2.2	6.9	7.4	8.4	6.2	3.4	39.2
Max Diversion Available	kaf	0.0	0.0	0.0	0.0	0.0	0.0	1.5	5.3	14.6	6.3	0.2	0.4	28.3
Priority Water Diverted	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.7
Skim Water Diverted	kaf	0.0	0.0	0.0	0.0	0.0	0.0	1.5	5.2	13.9	5.6	0.2	0.4	26.8
% Maximum Diversion	%	0	0	0	0	0	0	100	100	100	90	100	101	
Irrigation Demand	kaf	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.4	0.3	0.2	1.7
Irrigation Delivery	kaf	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.4	0.3	0.1	1.5
Total River Release	kaf	1.7	1.1	0.6	0.3	0.2	0.8	2.2	6.9	7.4	8.4	6.2	3.4	39.2

Olympus Tunnel

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	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	19.5	1.5	22.4	30.2	30.5	8.5	4.5	23.5	28.0	29.7	30.3	17.6	246.2
% Maximum Delivery	%	58	5	66	89	100	25	14	69	86	88	89	54	
Inflow to Flatiron	kaf	19.5	2.4	22.4	30.2	30.5	8.5	4.5	23.5	28.0	29.7	30.3	21.5	251.0

Carter Lake

Init Cont: 84.00 kaf Maximum Cont: 112.20 kaf Minimum Cont: 6.00 kaf
 Elev: 5732.9 ft Elev: 5759.0 ft Elev: 5626.8 ft

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Pumped from Flatiron	kaf	0.0	0.0	12.5	19.9	16.3	5.5	0.0	12.5	0.0	12.5	18.5	3.0	100.7
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	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	4.8
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	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	2.0
End-Month Targets	kaf	112.0	11.2	112.0	112.0	112.0	11.2	11.2	11.2	11.2	112.2	112.2	112.2	
End-Month Contents	kaf	71.7	67.2	76.6	93.7	107.5	109.5	104.6	110.2	101.0	97.6	95.4	76.4	
End-Month Elevation	ft	5721.00	5716.30	5725.85	5741.73	5754.31	5756.64	5752.25	5757.24	5748.99	5745.32	5743.33	5725.71	
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	11.3	2.8	2.2	2.0	2.0	2.6	4.2	5.8	7.5	14.4	19.4	17.0	91.2
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	11.7	3.5	3.0	2.6	2.4	3.1	4.5	6.3	8.6	15.4	20.2	17.6	98.9
Total Delivery	kaf	11.7	3.5	3.0	2.6	2.4	3.1	4.5	6.3	8.6	15.4	20.2	17.6	98.9
% 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



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

CBT October 2021 Most Probable: 01-OCT-2021

Hansen Canal 930

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Minimum Flow	kaf	0.0	2.4	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6
Maximum Flow	kaf	57.2	55.3	57.2	57.2	51.6	57.2	55.3	57.2	55.3	57.2	57.2	55.3	673.2
Actual Flow	kaf	19.5	2.4	9.9	10.3	14.2	3.0	4.5	11.0	28.0	17.2	11.7	18.5	150.2

Dille Tunnel

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Big Thompson River Below Lake Estes	kaf	1.7	1.1	0.6	0.3	0.2	0.8	2.2	6.9	7.4	8.4	6.2	3.4	39.2
North Fork Big Thompson River at Drake	kaf	0.9	0.5	0.4	0.3	0.2	0.2	0.3	1.5	2.8	1.8	1.1	0.7	10.7
Dille Skim Water Diverted	kaf	0.3	0.0	0.0	0.0	0.0	0.0	0.5	6.0	7.9	7.7	4.9	1.7	29.0
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	2.6	1.6	1.0	0.6	0.4	1.0	2.5	8.5	10.2	10.2	7.3	4.1	50.0
water diverted	kaf	0.3	0.0	0.0	0.0	0.0	0.0	0.5	6.0	7.9	7.7	4.9	1.7	29.0
% Diverted	%	5	0	0	0	0	0	9	111	145	142	90	32	
Big T @ Canyon Mouth	kaf	2.3	1.6	1.0	0.6	0.4	1.0	2.0	2.5	2.4	2.5	2.5	2.4	21.2

Trifurcation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Release from Flatiron	kaf	19.5	2.4	9.9	10.3	14.2	3.0	4.5	11.0	28.0	17.2	11.7	18.5	150.2
Release to 550 Canal	kaf	13.6	2.4	9.8	10.2	14.2	3.0	2.8	5.2	13.7	10.1	7.4	12.0	104.4
Dille Tunnel	kaf	0.3	0.0	0.0	0.0	0.0	0.0	0.5	6.0	7.9	7.7	4.9	1.7	29.0
Total release to river	kaf	5.3	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	1.1	3.6	5.2	15.7
Irrigation demand	kaf	5.3	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	1.0	3.5	5.1	15.4
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	5.3	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	1.1	3.6	5.2	15.7
Total delivery	kaf	5.3	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	1.1	3.6	5.2	15.7
% 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



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

CBT October 2021 Most Probable: 01-OCT-2021

Hansen Canal 550

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Inflow from Flatiron	kaf	13.6	2.4	9.8	10.2	14.2	3.0	2.8	5.2	13.7	10.1	7.4	12.0	104.4
Maximum flow	kaf	15.5	29.1	30.1	30.1	27.2	3.0	2.9	5.5	13.9	33.8	33.8	32.7	257.6
Irrigation demand	kaf	1.2	0.0	0.1	0.1	0.0	0.0	0.2	0.3	0.2	0.4	0.5	0.8	3.8
Irrigation delivery	kaf	0.6	0.0	0.1	0.1	0.0	0.0	0.2	0.3	0.2	0.4	0.5	0.8	3.2
Minimum flow	kaf	3.1	2.4	2.8	3.1	2.8	3.1	3.0	3.1	3.0	3.1	3.1	3.0	35.6
Rels to Horsetooth	kaf	13.6	2.4	9.8	10.2	14.2	3.0	2.8	5.2	13.7	10.1	7.4	12.0	104.4

Horsetooth Reservoir

Init Cont: 126.00 kaf
 Elev: 5413.9 ft
 Maximum Cont: 157.00 kaf
 Elev: 5430.0 ft
 Minimum Cont: 13.00 kaf
 Elev: 5316.8 ft

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Inflow	kaf	13.6	2.4	9.8	10.2	14.2	3.0	2.8	5.2	13.7	10.1	7.4	12.0	104.4
Total irrigation delivery	kaf	13.4	2.4	2.6	2.4	2.2	2.3	2.9	5.6	7.2	15.9	23.0	14.8	94.7
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	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.4
End-Month Targets	kaf	156.0	15.6	156.0	156.0	156.0	156.0	15.6	156.0	156.0	156.0	156.0	156.0	
End-Month Content	kaf	125.3	124.9	132.0	139.6	151.5	151.8	151.0	149.8	155.2	148.5	132.1	128.6	
End-Month Elevation	ft	5413.64	5413.42	5417.29	5421.35	5427.41	5427.55	5427.18	5426.55	5429.26	5425.90	5417.36	5415.47	
Priority water diverted to Horsetooth	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.6
Irrigation demand	kaf	10.0	0.0	0.0	0.0	0.0	0.0	0.2	1.4	2.0	9.7	17.0	9.4	49.7
Metered Demand	kaf	2.9	2.0	2.2	2.1	1.9	1.9	2.2	3.6	4.5	5.4	4.9	4.6	38.2
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	13.4	2.4	2.6	2.4	2.2	2.3	2.9	5.6	7.2	15.9	23.0	14.8	94.7
% 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-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Total CBT Delivery	kaf	30.2	4.9	4.6	4.2	3.9	4.7	6.9	11.5	14.6	31.4	45.7	36.9	199.5



CBT October 2021 Most Probable: 01-OCT-2021

Windy Gap

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	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	0.9	1.0	1.1	0.9	0.7	0.8	0.8	1.0	1.9	1.7	1.9	1.6	14.3
Account Balance	kaf	-0.9	-1.9	-3.0	-4.0	-4.6	-5.5	-6.3	-7.3	-9.2	-10.9	-12.8	-14.4	



CBT October 2021 Most Probable: 01-OCT-2021

PUMPING AND GENERATION OPERATIONS

Green Mountain Generation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	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	3.400	1.800	1.800	1.800	1.600	1.700	1.100	0.700	1.000	3.700	4.900	4.900	28.400
% Maximum Generation	%	18	10	10	10	9	9	6	4	6	20	26	27	
Average	kwh/af	166	161	157	154	150	145	144	156	186	211	210	206	

Willow Creek Pumping

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Maximum Pumping	kaf	24.6	11.9	0.0	0.0	0.0	0.0	23.8	24.6	23.8	24.6	24.6	23.8	181.7
Actual Pumping	kaf	0.0	0.0	0.0	0.0	0.0	0.0	5.4	18.9	14.9	2.9	1.2	0.8	44.1
Pump Energy	gwh	0.000	0.000	0.000	0.000	0.000	0.000	1.100	4.000	3.200	0.600	0.200	0.200	9.300
% Maximum Pumping	%	0	0	0	0	0	0	23	77	63	12	5	3	183
Average	kwh/af	0	0	0	0	0	0	213	213	213	213	213	213	

Lake Granby Pumping

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	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	19.7	1.9	23.0	29.4	29.9	8.0	0.6	2.5	0.0	13.1	26.3	16.3	170.7
Pump Energy	gwh	2.900	0.300	3.400	4.400	4.600	1.300	0.100	0.400	0.000	1.900	3.800	2.400	25.500
% Maximum Pumping	%	53	5	62	80	90	22	2	7	0	35	71	46	
Average	kwh/af	148	149	149	151	154	157	157	156	0	145	146	148	



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

CBT October 2021 Most Probable: 01-OCT-2021

Marys Lake Generation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Adams Tunnel Flow	kaf	19.6	1.6	22.5	30.2	30.5	8.6	3.1	18.3	13.6	24.5	30.3	17.3	220.1
Maximum Generation	gwh	6.400	0.000	0.200	6.400	5.800	6.400	6.200	6.400	6.200	6.400	6.400	6.200	63.000
Generation	gwh	3.200	0.000	0.200	5.600	5.800	1.100	0.000	3.200	2.200	4.300	5.600	3.200	34.400
% Maximum Generation	%	16	0	1	19	19	13	0	17	16	18	19	19	
Average	kwh/af	163	0	9	186	189	134	0	174	158	177	185	186	

Lake Estes Generation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Adams Tunnel Flow	kaf	19.6	1.6	22.5	30.2	30.5	8.6	3.1	18.3	13.6	24.5	30.3	17.3	220.1
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	8.900	0.200	10.400	14.400	14.500	3.200	0.500	8.200	6.200	11.300	14.200	8.200	100.200
% Maximum Generation	%	55	1	65	90	100	20	3	51	40	71	89	53	
Average	kwh/af	452	130	462	476	473	375	170	446	453	462	469	474	

Pole Hill Generation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	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	25.800	0.000	18.300	25.800	23.300	25.800	25.000	25.800	25.000	25.800	25.800	25.000	271.400
Generation	gwh	12.900	0.000	16.100	23.100	23.300	4.600	0.000	17.300	21.400	22.500	23.000	13.100	177.300
% Maximum Generation	%	0	0	0	0	0	0	0	0	0	0	89	0	
Average	kwh/af	381	0	477	682	762	135	0	512	653	666	681	401	



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

CBT October 2021 Most Probable: 01-OCT-2021

Flatiron Units 1 and 2 Generation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Inflow to Flatiron	kaf	19.5	2.4	22.4	30.2	30.5	8.5	4.5	23.5	28.0	29.7	30.3	21.5	251.0
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	17.100	0.600	20.600	26.800	29.000	6.200	2.700	19.600	24.700	27.100	27.000	15.500	216.900
% Maximum Generation	%	53	2	64	83	100	19	9	61	79	84	84	50	
Average	kwh/af	879	255	917	890	952	732	587	837	880	910	891	723	

Flatiron Unit 3 Pump/Generation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Maximum Pumping	kaf	0.0	0.0	13.2	19.9	16.3	16.9	16.7	17.0	16.9	18.4	18.5	10.4	164.2
Pump from Flatiron	kaf	0.0	0.0	12.5	19.9	16.3	5.5	0.0	12.5	0.0	12.5	18.5	3.0	100.7
Pump Energy	gwh	0.000	0.000	3.900	6.600	5.700	2.000	0.000	4.500	0.000	4.300	6.400	1.000	34.400
% Maximum Pumping	%	0	0	95	100	100	32	0	73	0	68	100	29	
Average	kwh/af	0	0	314	331	351	363	0	361	0	345	345	344	
Maximum Turbine release	kaf	0.0	23.3	9.2	0.0	0.0	0.0	0.0	0.0	0.0	25.9	25.8	24.5	108.7
Carter to Flatiron	kaf	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	4.8
Maximum Generation	gwh	0.000	4.700	1.800	0.000	0.000	0.000	0.000	0.000	0.000	5.600	5.600	5.200	22.900
Actual Generation	gwh	0.000	0.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.800	1.000
% Maximum Generation	%	0	0	0	0	0	0	0	0	0	0	0	0	
Average	kwh/af	0	203	0	0	0	0	0	0	0	0	0	211	

Big Thompson Generation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Total release	kaf	5.5	0.0	0.0	0.0	0.0	0.0	2.1	11.5	21.9	14.4	8.7	7.4	71.5
Turbine release	kaf	5.5	0.0	0.0	0.0	0.0	0.0	2.1	11.5	21.9	14.4	8.7	7.4	71.5
Wasteway 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
Maximum Generation	gwh	3.800	0.000	0.000	0.000	0.000	0.000	3.700	3.800	3.700	3.800	3.800	3.700	26.300
Generation	gwh	0.500	0.000	0.000	0.000	0.000	0.000	0.100	1.600	3.500	2.200	1.100	0.900	9.900
% Maximum Generation	%	14	0	0	0	0	0	2	43	94	57	29	24	
Average	kwh/af	98	0	0	0	0	0	39	143	159	153	129	121	



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

CBT October 2021 Most Probable: 01-OCT-2021

Project Generation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Total Generation	gwh	46.000	2.800	49.100	71.700	74.100	16.900	4.300	50.700	58.900	71.200	75.800	46.700	568.200
Total Max Generation	gwh	102.900	69.400	87.200	99.100	89.500	99.100	99.600	102.900	99.600	108.500	108.500	104.800	1171.100

Project Pump Energy

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Granby	gwh	2.900	0.300	3.400	4.400	4.600	1.300	0.100	0.400	0.000	1.900	3.800	2.400	25.500
Willow Creek	gwh	0.000	0.000	0.000	0.000	0.000	0.000	1.100	4.000	3.200	0.600	0.200	0.200	9.300
Flatiron Unit 3	gwh	0.000	0.000	3.900	6.600	5.700	2.000	0.000	4.500	0.000	4.300	6.400	1.000	34.400
Total Pump Energy	gwh	2.900	0.300	7.300	11.000	10.300	3.200	1.200	8.900	3.200	6.900	10.500	3.600	69.300

B-6: C-BT OCTOBER 2021 MINIMUM REASONABLE PLAN FOR WATER YEAR 2022



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United States Bureau of Reclamation
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CBT October 2021 Min Reasonable: 01-OCT-2021

HYDROLOGY OPERATIONS

Dillon Reservoir

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Dillon Inflow	kaf	4.8	4.1	3.8	3.4	2.8	2.9	3.4	18.3	34.2	14.1	6.9	5.1	103.8
DL to GM Gain	kaf	3.4	3.1	2.9	2.8	2.3	2.6	4.4	14.5	23.1	10.9	5.9	4.4	80.3

Green Mountain Reservoir

Init Cont: 76.00 kaf Maximum Cont: 154.60 kaf Minimum Cont: 8.00 kaf
Elev: 7904.4 ft Elev: 7950.4 ft Elev: 7804.7 ft

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Depletion	kaf	-1.5	0.8	0.4	0.0	-0.2	-0.5	0.3	15.8	32.1	8.0	0.8	-0.9	55.1
Depleted Inflow	kaf	9.7	6.4	6.3	6.1	5.4	6.0	7.6	17.9	26.6	17.1	12.0	10.3	131.4
Turbine Release	kaf	20.2	10.6	11.0	10.9	9.8	10.9	7.1	4.6	4.5	12.7	17.0	16.4	135.7
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	328	179	179	177	177	177	119	75	75	206	276	276	
Total River Release	kaf	20.2	10.6	11.0	10.9	9.8	10.9	7.1	4.6	4.5	12.7	17.0	16.4	135.7
Evaporation	kaf	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.4	0.4	0.4	0.3	2.2
End-Month Targets	kaf	65.6	56.6	56.6	40.4	40.4	40.4	50.0	85.0	85.0	70.0	70.0	70.0	
End-Month Contents	kaf	65.6	61.3	56.6	51.9	47.4	42.5	42.9	56.0	77.7	81.7	76.3	70.0	
End-Month Elevation	ft	7895.60	7891.73	7887.29	7882.51	7877.68	7871.98	7872.51	7886.68	7905.47	7908.43	7904.40	7899.33	

Willow Creek Reservoir

Init Cont: 7.00 kaf Maximum Cont: 10.20 kaf Minimum Cont: 7.20 kaf
Elev: 8118.9 ft Elev: 8128.8 ft Elev: 8116.9 ft

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Native Inflow	kaf	1.2	1.0	0.9	0.9	0.8	0.8	1.6	6.5	3.5	1.6	1.1	0.8	20.7
Minimum 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
5412.5 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
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	0.0	0.0	0.0	0.0	0.0	0.0	2.7	6.0	3.0	1.0	0.5	0.4	13.6
Evaporation	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.6
End-Month Targets	kaf	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	
End-Month Contents	kaf	7.5	8.1	8.6	9.1	9.4	9.8	8.2	8.2	8.2	8.2	8.2	8.2	
End-Month Elevation	ft	8118.47	8120.86	8122.95	8124.71	8126.14	8127.49	8121.32	8121.32	8121.32	8121.32	8121.32	8121.32	



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

CBT October 2021 Min Reasonable: 01-OCT-2021

Granby Reservoir		Init Cont: 403.00 kaf Elev: 8259.8 ft			Maximum Cont: 539.80 kaf Elev: 8280.0 ft			Minimum Cont: 76.50 kaf Elev: 8186.9 ft						
		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Native Inflow	kaf	1.9	1.7	1.6	1.5	1.2	1.3	2.0	10.1	18.2	6.4	3.3	2.1	51.3
Release from Shadow Mtn	kaf	2.2	2.7	2.8	1.2	1.1	1.2	1.2	1.2	8.6	3.2	2.5	1.8	29.7
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	0.0	0.0	0.0	0.0	0.0	0.0	2.7	6.0	3.0	1.0	0.5	0.4	13.6
Total Inflow	kaf	4.0	4.4	4.4	2.7	2.4	2.6	5.9	17.3	29.9	10.6	6.3	4.3	94.8
Minimum 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
5412.5 Release	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	2.2	2.1	5.5
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	1.2	1.2	1.2	1.2	1.1	1.2	1.2	4.6	4.5	5.8	4.6	3.3	31.1
Pumped to Shadow Mtn	kaf	19.8	2.6	23.0	29.5	30.0	6.8	5.7	19.2	0.3	24.1	29.0	16.7	206.7
Evaporation	kaf	1.4	0.6	0.0	0.0	0.0	0.7	1.3	1.9	2.4	2.2	1.7	1.4	13.6
Seepage loss	kaf	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	3.4
End-Month Contents	kaf	384.0	383.8	363.6	335.3	306.3	299.8	297.2	288.6	311.0	289.3	260.0	242.6	
End-Month Elevation	ft	8256.84	8256.80	8253.47	8248.66	8243.52	8242.33	8241.86	8240.25	8244.36	8240.38	8234.77	8231.25	

Shadow Mountain Reservoir		Init Cont: 17.00 kaf Elev: 8366.6 ft			Maximum Cont: 18.40 kaf Elev: 8367.0 ft			Minimum Cont: 16.60 kaf Elev: 8366.0 ft						
		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Native Inflow	kaf	2.5	2.3	2.1	2.0	1.6	1.8	2.6	13.3	24.4	8.5	4.4	2.8	68.3
Pumped from Granby	kaf	19.8	2.6	23.0	29.5	30.0	6.8	5.7	19.2	0.3	24.1	29.0	16.7	206.7
Total Inflow	kaf	22.2	4.8	25.1	31.4	31.7	8.6	8.3	32.5	24.7	32.6	33.3	19.6	274.8
Minimum River Release	kaf	2.2	2.7	2.8	1.2	1.1	1.2	1.2	1.2	3.0	3.0	2.5	1.5	23.6
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	1.2	1.2	1.2	8.6	3.2	2.5	1.8	29.7
Adams Tunnel Flow	kaf	19.6	2.0	22.3	30.2	30.5	7.1	6.7	30.6	15.3	28.7	30.3	17.3	240.6
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	16.9	16.9	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-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Maximum Tunnel Capacity	kaf	32.8	8.3	26.2	30.2	30.5	33.8	32.7	33.8	32.7	29.1	30.3	17.3	337.7
Actual Diversion	kaf	19.6	2.0	22.3	30.2	30.5	7.1	6.7	30.6	15.3	28.7	30.3	17.3	240.6
% Maximum Delivery	%	60	24	85	100	100	21	21	91	47	98	100	100	



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

CBT October 2021 Min Reasonable: 01-OCT-2021

Lake Estes

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Big Thompson Inflow	kaf	1.3	0.7	0.4	0.2	0.1	0.2	1.7	7.5	10.9	6.0	2.8	1.4	33.2
Minimum River Release	kaf	3.1	1.5	1.5	1.5	1.4	1.5	2.2	6.9	7.4	7.7	6.9	3.7	45.3
Actual River Release	kaf	1.3	0.7	0.4	0.2	0.1	0.2	1.7	5.7	7.4	5.9	2.8	1.4	27.8
Max Diversion Available	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	3.5	0.1	0.0	0.0	5.4
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	0.0	1.8	3.5	0.1	0.0	0.0	5.4
% Maximum Diversion	%	0	0	0	0	0	0	98	100	100	100	0	0	
Irrigation Demand	kaf	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.3	0.4	0.3	0.2	1.9
Irrigation Delivery	kaf	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.3	0.4	0.3	0.1	1.8
Total River Release	kaf	1.3	0.7	0.4	0.2	0.1	0.2	1.7	5.7	7.4	5.9	2.8	1.4	27.8

Olympus Tunnel

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	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	19.5	2.0	22.3	30.2	30.5	7.1	6.7	32.1	18.4	28.4	30.0	17.2	244.4
% Maximum Delivery	%	58	6	66	89	100	21	20	95	56	84	89	53	
Inflow to Flatiron	kaf	19.5	3.1	22.3	30.2	30.5	7.1	6.7	32.1	18.4	28.5	30.6	20.9	249.9

Carter Lake

Init Cont: 84.00 kaf Maximum Cont: 112.20 kaf Minimum Cont: 6.00 kaf
Elev: 5732.9 ft Elev: 5759.0 ft Elev: 5626.8 ft

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Pumped from Flatiron	kaf	0.0	0.0	12.4	19.7	16.2	4.0	2.3	17.0	3.8	15.1	19.2	10.7	120.4
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	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	3.7	5.4
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	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	2.0
End-Month Targets	kaf	112.0	11.2	112.0	112.0	112.0	11.2	112.0	112.0	11.2	112.2	112.2	112.2	
End-Month Contents	kaf	71.7	67.9	77.8	94.8	108.8	109.6	106.5	111.2	99.6	94.1	88.1	78.6	
End-Month Elevation	ft	5721.00	5717.00	5727.04	5742.79	5755.52	5756.67	5753.47	5757.66	5747.74	5742.07	5737.03	5727.82	
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	11.3	1.9	1.6	1.9	1.6	2.5	4.5	11.3	13.7	19.1	23.3	15.4	108.1
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	11.7	2.5	2.4	2.5	2.0	2.9	4.9	11.8	14.8	20.0	24.1	16.0	115.6
Total Delivery	kaf	11.7	2.5	2.4	2.5	2.0	2.9	4.9	11.8	14.8	20.0	24.1	16.0	115.6
% 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



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

CBT October 2021 Min Reasonable: 01-OCT-2021

Hansen Canal 930

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Minimum Flow	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 Flow	kaf	57.2	55.3	57.2	57.2	51.6	57.2	55.3	57.2	55.3	57.2	57.2	55.3	673.2
Actual Flow	kaf	19.5	3.1	9.9	10.4	14.3	3.0	4.4	15.1	14.6	13.4	11.4	10.2	129.3

Dille Tunnel

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Big Thompson River Below Lake Estes	kaf	1.3	0.7	0.4	0.2	0.1	0.2	1.7	5.7	7.4	5.9	2.8	1.4	27.8
North Fork Big Thompson River at Drake	kaf	0.8	0.4	0.3	0.3	0.2	0.2	0.2	0.8	1.0	0.7	0.5	0.3	5.7
Dille Skim Water Diverted	kaf	0.1	0.0	0.0	0.0	0.0	0.0	0.2	4.1	6.1	4.1	0.8	0.0	15.4
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	2.1	1.1	0.7	0.5	0.3	0.4	1.9	6.5	8.4	6.6	3.2	1.7	33.4
water diverted	kaf	0.1	0.0	0.0	0.0	0.0	0.0	0.2	4.1	6.1	4.1	0.8	0.0	15.4
% Diverted	%	2	0	0	0	0	0	4	75	112	77	15	0	
Big T @ Canyon Mouth	kaf	2.0	1.1	0.7	0.5	0.3	0.4	1.7	2.5	2.4	2.5	2.4	1.7	18.2

Trifurcation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Release from Flatiron	kaf	19.5	3.1	9.9	10.4	14.3	3.0	4.4	15.1	14.6	13.4	11.4	10.2	129.3
Release to 550 Canal	kaf	13.6	3.0	9.7	10.2	14.1	2.8	4.0	12.1	9.1	10.3	6.0	4.7	99.6
Dille Tunnel	kaf	0.1	0.0	0.0	0.0	0.0	0.0	0.2	4.1	6.1	4.1	0.8	0.0	15.4
Total release to river	kaf	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.4	2.2	4.2	4.6	18.2
Irrigation demand	kaf	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.4	2.2	4.2	4.5	18.1
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	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.4	2.2	4.2	4.6	18.2
Total delivery	kaf	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.4	2.2	4.2	4.6	18.2
% 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



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

CBT October 2021 Min Reasonable: 01-OCT-2021

Hansen Canal 550

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Inflow from Flatiron	kaf	13.6	3.0	9.7	10.2	14.1	2.8	4.0	12.1	9.1	10.3	6.0	4.7	99.6
Maximum flow	kaf	16.1	29.1	30.1	30.1	27.2	3.0	4.4	12.8	12.5	33.8	33.8	30.5	263.4
Irrigation demand	kaf	1.2	0.1	0.2	0.2	0.2	0.3	0.4	0.7	0.6	0.8	1.2	0.9	6.8
Irrigation delivery	kaf	0.6	0.1	0.2	0.2	0.2	0.3	0.4	0.7	0.6	0.8	1.2	0.9	6.2
Minimum flow	kaf	3.1	3.0	3.1	3.1	2.8	3.1	3.0	3.1	3.0	3.1	3.1	3.0	36.5
Rels to Horsetooth	kaf	13.6	3.0	9.7	10.2	14.1	2.8	4.0	12.1	9.1	10.3	6.0	4.7	99.6

Horsetooth Reservoir

Init Cont: 126.00 kaf
Elev: 5413.9 ft
Maximum Cont: 157.00 kaf
Elev: 5430.0 ft
Minimum Cont: 13.00 kaf
Elev: 5316.8 ft

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Inflow	kaf	13.6	3.0	9.7	10.2	14.1	2.8	4.0	12.1	9.1	10.3	6.0	4.7	99.6
Total irrigation delivery	kaf	13.4	1.9	1.9	2.4	2.3	2.5	4.6	12.3	16.4	25.3	25.8	9.4	118.2
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	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.4
End-Month Targets	kaf	156.0	15.6	156.0	156.0	156.0	156.0	156.0	156.0	156.0	156.0	156.0	156.0	
End-Month Content	kaf	125.3	126.0	133.6	141.3	153.0	152.8	151.6	150.5	142.2	126.3	105.8	100.4	
End-Month Elevation	ft	5413.64	5414.04	5418.17	5422.19	5428.14	5428.07	5427.45	5426.93	5422.69	5414.18	5402.36	5399.08	
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	10.0	0.1	0.0	0.0	0.0	0.0	1.1	7.2	9.2	16.9	18.1	3.9	66.5
Metered Demand	kaf	2.9	1.4	1.5	2.1	2.0	2.1	3.0	4.5	6.5	7.6	6.6	4.7	44.9
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	13.4	1.9	1.9	2.4	2.3	2.5	4.6	12.3	16.4	25.3	25.8	9.4	118.2
% 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

CBT Project Summary

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Total CBT Delivery	kaf	30.2	3.6	3.4	4.3	3.9	4.9	9.1	24.5	31.6	46.9	53.7	29.5	245.6



CBT October 2021 Min Reasonable: 01-OCT-2021

Windy Gap

Table with 14 columns: Category, Unit, Oct-21, Nov-21, Dec-21, Jan-22, Feb-22, Mar-22, Apr-22, May-22, Jun-22, Jul-22, Aug-22, Sep-22, Total. Rows include Pumping, Losses, Spill, Total Delivery, and Account Balance.



CBT October 2021 Min Reasonable: 01-OCT-2021

PUMPING AND GENERATION OPERATIONS

Green Mountain Generation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	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	3.300	1.700	1.700	1.700	1.500	1.600	1.000	0.700	0.700	2.200	2.900	2.800	21.800
% Maximum Generation	%	18	9	9	9	9	9	6	4	4	12	16	15	
Average	kwh/af	166	161	157	154	151	147	144	149	164	174	172	168	

Willow Creek Pumping

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Maximum Pumping	kaf	24.6	11.9	0.0	0.0	0.0	0.0	23.8	24.6	23.8	24.6	24.6	23.8	181.7
Actual Pumping	kaf	0.0	0.0	0.0	0.0	0.0	0.0	2.7	6.0	3.0	1.0	0.5	0.4	13.6
Pump Energy	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.600	1.300	0.600	0.200	0.100	0.100	2.900
% Maximum Pumping	%	0	0	0	0	0	0	11	24	13	4	2	1	55
Average	kwh/af	0	0	0	0	0	0	213	213	213	213	213	213	

Lake Granby Pumping

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	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	19.8	2.6	23.0	29.5	30.0	6.8	5.7	19.2	0.3	24.1	29.0	16.7	206.7
Pump Energy	gwh	2.900	0.400	3.400	4.500	4.600	1.100	0.900	3.000	0.000	3.800	4.700	2.800	32.100
% Maximum Pumping	%	54	7	62	80	90	19	16	52	1	65	79	47	
Average	kwh/af	148	149	149	151	154	157	157	158	158	157	161	167	



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

CBT October 2021 Min Reasonable: 01-OCT-2021

Marys Lake Generation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Adams Tunnel Flow	kaf	19.6	2.0	22.3	30.2	30.5	7.1	6.7	30.6	15.3	28.7	30.3	17.3	240.6
Maximum Generation	gwh	6.400	0.000	0.200	6.400	5.800	6.400	6.200	6.400	6.200	6.400	6.400	6.200	63.000
Generation	gwh	3.200	0.000	0.200	5.600	5.800	0.800	0.800	5.700	2.400	5.300	5.600	3.200	38.600
% Maximum Generation	%	16	0	1	19	19	11	11	19	16	18	19	19	
Average	kwh/af	163	0	9	186	189	112	113	186	158	184	185	186	

Lake Estes Generation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Adams Tunnel Flow	kaf	19.6	2.0	22.3	30.2	30.5	7.1	6.7	30.6	15.3	28.7	30.3	17.3	240.6
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	8.900	0.400	10.300	14.400	14.500	2.500	2.400	14.400	6.700	13.400	14.200	8.200	110.300
% Maximum Generation	%	55	2	64	90	100	16	15	90	43	83	89	53	
Average	kwh/af	452	184	460	475	473	352	355	471	442	466	469	475	

Pole Hill Generation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	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	25.800	0.000	18.300	25.800	23.300	25.800	25.000	25.800	25.000	25.800	25.800	25.000	271.400
Generation	gwh	12.900	0.000	16.100	23.100	23.300	3.200	3.100	24.500	12.400	21.500	22.900	13.100	176.100
% Maximum Generation	%	50	0	88	89	100	12	13	95	50	84	89	52	
Average	kwh/af	381	0	477	682	762	94	96	724	379	637	676	400	



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

CBT October 2021 Min Reasonable: 01-OCT-2021

Flatiron Units 1 and 2 Generation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Inflow to Flatiron	kaf	19.5	3.1	22.3	30.2	30.5	7.1	6.7	32.1	18.4	28.5	30.6	20.9	249.9
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	17.100	1.000	20.500	26.800	29.000	4.900	5.000	29.400	15.700	25.000	26.700	15.500	216.600
% Maximum Generation	%	53	3	63	83	100	15	16	91	50	78	83	50	
Average	kwh/af	879	310	917	889	952	699	741	913	853	877	873	741	

Flatiron Unit 3 Pump/Generation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Maximum Pumping	kaf	0.0	0.0	13.2	19.7	16.2	16.8	16.7	17.0	16.7	18.7	19.2	10.7	164.9
Pump from Flatiron	kaf	0.0	0.0	12.4	19.7	16.2	4.0	2.3	17.0	3.8	15.1	19.2	10.7	120.4
Pump Energy	gwh	0.000	0.000	3.900	6.600	5.700	1.500	0.800	6.200	1.400	5.200	6.500	3.600	41.400
% Maximum Pumping	%	0	0	95	100	100	24	13	100	23	81	100	100	
Average	kwh/af	0	0	315	333	353	364	358	362	365	343	338	336	
Maximum Turbine release	kaf	0.0	8.6	9.3	0.0	0.0	0.0	0.0	0.0	0.0	25.7	25.5	24.4	93.5
Carter to Flatiron	kaf	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	3.7	5.4
Maximum Generation	gwh	0.000	1.700	1.900	0.000	0.000	0.000	0.000	0.000	0.000	5.600	5.500	5.200	19.900
Actual Generation	gwh	0.000	0.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.100	0.800	0.800	1.100
% Maximum Generation	%	0	13	0	0	0	0	0	0	0	2	15	15	
Average	kwh/af	0	203	0	0	0	0	0	0	0	219	216	212	

Big Thompson Generation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Total release	kaf	5.4	0.0	0.0	0.0	0.0	0.0	0.3	6.4	10.9	6.4	5.0	4.6	39.0
Turbine release	kaf	5.4	0.0	0.0	0.0	0.0	0.0	0.3	6.4	10.9	6.4	5.0	4.6	39.0
Wasteway 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
Maximum Generation	gwh	3.800	0.000	0.000	0.000	0.000	0.000	3.700	3.800	3.700	3.800	3.800	3.700	26.300
Generation	gwh	0.500	0.000	0.000	0.000	0.000	0.000	0.700	0.700	1.600	0.700	0.400	0.400	4.300
% Maximum Generation	%	13	0	0	0	0	0	19	19	42	18	11	10	
Average	kwh/af	95	0	0	0	0	0	0	116	143	109	87	84	



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

CBT October 2021 Min Reasonable: 01-OCT-2021

Project Generation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Total Generation	gwh	45.900	3.300	48.800	71.600	74.000	13.000	12.300	75.400	39.500	68.100	72.800	43.900	568.600
Total Max Generation	gwh	102.900	66.400	87.200	99.100	89.500	99.100	99.600	102.900	99.600	108.500	108.400	104.800	1168.000

Project Pump Energy

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Granby	gwh	2.900	0.400	3.400	4.500	4.600	1.100	0.900	3.000	0.000	3.800	4.700	2.800	32.100
Willow Creek	gwh	0.000	0.000	0.000	0.000	0.000	0.000	0.600	1.300	0.600	0.200	0.100	0.100	2.900
Flatiron Unit 3	gwh	0.000	0.000	3.900	6.600	5.700	1.500	0.800	6.200	1.400	5.200	6.500	3.600	41.400
Total Pump Energy	gwh	2.900	0.400	7.300	11.000	10.300	2.500	2.300	10.500	2.100	9.200	11.300	6.400	76.200

B-7: C-BT OCTOBER 2021 MAXIMUM REASONABLE PLAN FOR WATER YEAR 2022



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

CBT October 2021 Max Reasonable: 01-OCT-2021

HYDROLOGY OPERATIONS

Dillon Reservoir

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Dillon Inflow	kaf	5.7	5.0	4.1	3.6	3.1	4.7	12.7	57.4	108.3	67.1	23.6	12.8	308.1
DL to GM Gain	kaf	4.4	4.2	3.5	3.1	2.8	4.9	11.4	42.3	68.0	54.0	19.0	11.3	228.9

Green Mountain Reservoir

Init Cont: 76.00 kaf **Maximum Cont:** 154.60 kaf **Minimum Cont:** 8.00 kaf
Elev: 7904.4 ft **Elev:** 7950.4 ft **Elev:** 7804.7 ft

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Depletion	kaf	-0.5	1.8	0.6	-2.5	-5.3	-10.6	-6.5	28.2	41.7	24.8	15.7	6.8	94.2
Depleted Inflow	kaf	10.7	7.4	6.9	9.2	11.1	20.3	30.7	73.9	139.4	98.3	28.1	17.3	453.3
Turbine Release	kaf	21.2	11.5	11.9	20.7	18.7	20.7	17.7	43.6	88.9	75.1	35.1	28.9	394.0
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	344	193	193	336	336	337	297	710	1493	1222	570	485	
Total River Release	kaf	21.2	11.5	11.9	20.7	18.7	20.7	17.7	43.6	88.9	75.1	35.1	28.9	394.0
Evaporation	kaf	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.3	0.5	0.7	0.6	0.4	2.9
End-Month Targets	kaf	65.6	56.6	56.6	40.4	40.4	40.4	50.0	80.0	130.0	152.5	145.0	133.0	
End-Month Contents	kaf	65.6	61.5	56.6	45.2	37.6	37.1	50.0	80.0	130.0	152.5	145.0	133.0	
End-Month Elevation	ft	7895.60	7891.95	7887.29	7875.14	7865.84	7865.23	7880.54	7907.20	7938.26	7949.46	7945.85	7939.82	

Willow Creek Reservoir

Init Cont: 7.00 kaf **Maximum Cont:** 10.20 kaf **Minimum Cont:** 7.20 kaf
Elev: 8118.9 ft **Elev:** 8128.8 ft **Elev:** 8116.9 ft

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Native Inflow	kaf	1.6	1.4	1.1	1.0	0.9	2.3	10.4	44.7	39.7	7.0	3.0	2.0	115.1
Minimum 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
5412.5 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
Spill/Bypass	kaf	0.0	0.0	0.0	0.0	0.0	1.5	0.0	38.2	39.3	6.5	0.6	0.0	86.1
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	0.0	0.3	0.0	0.0	0.0	0.0	11.0	4.8	0.0	0.0	3.2	2.6	21.9
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 Targets	kaf	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	
End-Month Contents	kaf	8.0	8.6	9.3	9.8	10.3	10.6	9.5	10.8	10.7	10.6	9.3	8.2	
End-Month Elevation	ft	8120.38	8122.97	8125.60	8127.57	8129.30	8130.17	8126.53	8130.93	8130.39	8130.18	8125.81	8121.32	



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

CBT October 2021 Max Reasonable: 01-OCT-2021

Granby Reservoir		Init Cont: 403.00 kaf Elev: 8259.8 ft			Maximum Cont: 539.80 kaf Elev: 8280.0 ft			Minimum Cont: 76.50 kaf Elev: 8186.9 ft						
		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Native Inflow	kaf	1.8	2.2	1.9	1.6	1.4	2.8	9.5	38.0	65.6	33.2	8.9	4.9	171.8
Release from Shadow Mtn	kaf	2.2	2.8	2.8	1.2	1.1	1.6	9.0	44.5	75.2	19.4	2.5	3.8	166.1
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	0.0	0.3	0.0	0.0	0.0	0.0	11.0	4.8	0.0	0.0	3.2	2.6	21.9
Total Inflow	kaf	4.0	5.3	4.6	2.8	2.5	4.4	29.5	87.2	140.8	52.6	14.5	11.3	359.5
Minimum 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
5412.5 Release	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	2.2	2.1	5.5
Spill/Bypass	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.3	44.4	0.5	0.0	58.2
Total River Release	kaf	1.2	1.2	1.2	1.2	1.1	1.2	1.2	4.6	4.5	5.8	4.6	3.3	31.1
Pumped to Shadow Mtn	kaf	19.3	1.9	22.6	29.3	24.6	5.6	0.0	0.0	0.0	0.7	16.9	14.2	135.1
Evaporation	kaf	1.4	0.6	0.0	0.0	0.0	0.8	1.3	2.2	3.1	3.0	2.3	2.1	16.8
Seepage loss	kaf	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.5
End-Month Contents	kaf	384.4	385.7	366.3	338.3	314.8	311.4	338.2	418.3	538.0	536.4	526.4	517.9	
End-Month Elevation	ft	8256.90	8257.11	8253.91	8249.17	8245.05	8244.43	8249.14	8262.30	8279.75	8279.54	8278.15	8276.96	

Shadow Mountain Reservoir		Init Cont: 17.00 kaf Elev: 8366.6 ft			Maximum Cont: 18.40 kaf Elev: 8367.0 ft			Minimum Cont: 16.60 kaf Elev: 8366.0 ft						
		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Native Inflow	kaf	2.9	3.0	2.5	2.1	1.8	3.7	12.5	47.6	80.1	41.2	13.3	7.5	218.2
Pumped from Granby	kaf	19.3	1.9	22.6	29.3	24.6	5.6	0.0	0.0	0.0	0.7	16.9	14.2	135.1
Total Inflow	kaf	22.2	4.8	25.1	31.4	26.4	9.2	12.5	47.6	80.1	41.9	30.2	21.7	353.1
Minimum River Release	kaf	2.2	2.7	2.8	1.2	1.1	1.2	1.2	1.2	3.0	3.0	2.5	1.5	23.6
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	2.8	2.8	1.2	1.1	1.6	9.0	44.5	75.2	19.4	2.5	3.8	166.1
Adams Tunnel Flow	kaf	19.6	1.9	22.3	30.2	25.3	7.4	3.1	2.4	4.1	21.7	27.1	17.4	182.5
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	16.9	16.9	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-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Maximum Tunnel Capacity	kaf	32.8	10.4	26.2	30.2	30.5	33.8	32.7	17.8	18.8	29.6	27.1	17.4	307.3
Actual Diversion	kaf	19.6	1.9	22.3	30.2	25.3	7.4	3.1	2.4	4.1	21.7	27.1	17.4	182.5
% Maximum Delivery	%	60	18	85	100	83	22	9	14	22	73	100	100	



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

CBT October 2021 Max Reasonable: 01-OCT-2021

Lake Estes

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Big Thompson Inflow	kaf	2.8	1.9	1.3	0.9	0.8	4.8	13.3	31.5	44.9	29.2	12.7	5.6	149.7
Minimum River Release	kaf	3.1	1.5	1.5	1.5	1.4	1.5	2.2	6.9	7.4	7.7	6.9	3.7	45.3
Actual River Release	kaf	2.7	1.9	1.3	0.9	0.8	4.8	2.5	7.5	16.0	18.0	7.5	3.7	67.6
Max Diversion Available	kaf	0.1	0.4	0.0	0.0	0.0	3.2	11.1	24.6	37.5	21.5	5.9	1.9	106.2
Priority Water Diverted	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.7	18.4	0.0	0.0	0.0	26.1
Skim Water Diverted	kaf	0.1	0.0	0.0	0.0	0.0	0.0	10.8	16.4	10.5	11.2	5.3	1.9	56.2
% Maximum Diversion	%	101	0	0	0	0	0	97	98	77	52	90	99	
Irrigation Demand	kaf	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.4	0.1	1.6
Irrigation Delivery	kaf	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.3	0.4	0.1	1.5
Total River Release	kaf	2.7	1.9	1.3	0.9	0.8	4.8	2.5	7.5	16.0	18.0	7.5	3.7	67.6

Olympus Tunnel

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	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	19.6	1.9	22.3	30.2	25.3	7.4	13.8	26.4	32.6	32.5	32.0	19.3	263.3
% Maximum Delivery	%	58	6	66	89	83	22	42	78	100	96	95	59	
Inflow to Flatiron	kaf	19.6	3.0	22.3	30.2	25.3	7.4	13.8	26.4	32.6	32.7	32.1	22.6	268.0

Carter Lake

Init Cont: 84.00 kaf Maximum Cont: 112.20 kaf Minimum Cont: 6.00 kaf
 Elev: 5732.9 ft Elev: 5759.0 ft Elev: 5626.8 ft

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Pumped from Flatiron	kaf	0.0	0.0	12.5	19.8	16.2	4.3	0.0	8.4	6.2	11.3	16.9	2.8	98.4
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	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	3.3	4.6
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	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.1
End-Month Targets	kaf	112.0	11.2	112.0	112.0	112.0	11.2	11.2	112.0	111.1	112.2	112.2	112.2	
End-Month Contents	kaf	71.7	67.7	77.6	94.8	108.6	109.9	105.6	109.3	109.0	111.1	109.1	87.4	
End-Month Elevation	ft	5721.00	5716.89	5726.89	5742.72	5755.36	5756.99	5753.11	5755.91	5755.64	5757.55	5755.76	5736.40	
Priority Water Diverted to Carter	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	5.1	0.0	0.0	0.0	12.1
Irrigation & Metered Demand	kaf	11.3	2.0	1.7	1.9	1.7	2.2	3.6	3.6	4.8	7.4	17.6	19.9	77.7
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	11.7	2.7	2.4	2.5	2.2	2.7	4.0	4.1	5.9	8.3	18.4	20.6	85.5
Total Delivery	kaf	11.7	2.7	2.4	2.5	2.2	2.7	4.0	4.1	5.9	8.3	18.4	20.6	85.5
% 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



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

CBT October 2021 Max Reasonable: 01-OCT-2021

Hansen Canal 930

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Minimum Flow	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 Flow	kaf	57.2	55.3	57.2	57.2	51.6	57.2	55.3	57.2	55.3	57.2	57.2	55.3	673.2
Actual Flow	kaf	19.6	3.0	9.8	10.4	9.1	3.0	13.8	18.0	26.4	21.4	15.2	19.8	169.5

Dille Tunnel

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Big Thompson River Below Lake Estes	kaf	2.7	1.9	1.3	0.9	0.8	4.8	2.5	7.5	16.0	18.0	7.5	3.7	67.6
North Fork Big Thompson River at Drake	kaf	0.8	0.4	0.3	0.3	0.2	0.4	1.2	4.4	7.6	5.7	3.2	1.7	26.2
Dille Skim Water Diverted	kaf	1.0	0.0	0.0	0.0	0.0	0.0	1.0	7.5	13.0	13.2	8.1	3.0	46.8
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	3.4	2.3	1.6	1.2	1.0	5.2	3.7	11.8	23.6	23.7	10.7	5.4	93.6
water diverted	kaf	1.0	0.0	0.0	0.0	0.0	0.0	1.0	7.5	13.3	13.2	8.1	3.0	47.1
% Diverted	%	18	0	0	0	0	0	18	138	245	243	150	56	
Big T @ Canyon Mouth	kaf	2.5	2.3	1.6	1.2	1.0	5.2	2.7	4.4	10.3	10.5	2.6	2.4	46.7

Trifurcation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Release from Flatiron	kaf	19.6	3.0	9.8	10.4	9.1	3.0	13.8	18.0	26.4	21.4	15.2	19.8	169.5
Release to 550 Canal	kaf	13.6	3.0	9.8	10.4	9.1	3.0	2.9	1.6	16.1	9.9	7.3	13.2	99.9
Dille Tunnel	kaf	1.0	0.0	0.0	0.0	0.0	0.0	1.0	7.5	13.3	13.2	8.1	3.0	47.1
Total release to river	kaf	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.3	4.5	12.2
Irrigation demand	kaf	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.3	4.5	12.2
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	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.3	4.5	12.2
Total delivery	kaf	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.3	4.5	12.2
% 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



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

CBT October 2021 Max Reasonable: 01-OCT-2021

Hansen Canal 550

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Inflow from Flatiron	kaf	13.6	3.0	9.8	10.4	9.1	3.0	2.9	1.6	16.1	9.9	7.3	13.2	99.9
Maximum flow	kaf	15.5	29.1	30.1	30.1	15.7	3.0	2.9	6.0	17.7	33.8	33.8	32.7	250.4
Irrigation demand	kaf	1.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.3	0.2	2.1
Irrigation delivery	kaf	0.6	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.3	0.2	1.5
Minimum flow	kaf	3.1	3.0	3.1	3.1	2.8	3.1	3.0	3.1	3.0	3.1	3.1	3.0	36.5
Rels to Horsetooth	kaf	13.6	3.0	9.8	10.4	9.1	3.0	2.9	1.6	16.1	9.9	7.3	13.2	99.9

Horsetooth Reservoir

Init Cont: 126.00 kaf
 Elev: 5413.9 ft
 Maximum Cont: 157.00 kaf
 Elev: 5430.0 ft
 Minimum Cont: 13.00 kaf
 Elev: 5316.8 ft

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Inflow	kaf	13.6	3.0	9.8	10.4	9.1	3.0	2.9	1.6	16.1	9.9	7.3	13.2	99.9
Total irrigation delivery	kaf	13.4	2.7	2.2	2.2	2.1	2.3	2.7	3.2	5.3	7.8	20.7	16.4	81.0
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	0.6	5.0
Seepage loss	kaf	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.4
End-Month Targets	kaf	156.0	15.6	156.0	156.0	156.0	156.0	156.0	156.0	156.0	156.0	156.0	156.0	
End-Month Content	kaf	125.3	125.3	132.7	140.8	147.7	148.0	147.6	145.1	154.9	156.0	141.8	137.9	
End-Month Elevation	ft	5413.64	5413.62	5417.67	5421.96	5425.50	5425.66	5425.42	5424.15	5429.08	5429.63	5422.48	5420.44	
Priority water diverted to Horsetooth	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	13.5	0.0	0.0	0.0	14.2
Irrigation demand	kaf	10.0	0.6	0.0	0.0	0.0	0.0	0.1	0.5	0.2	2.6	15.4	12.1	41.5
Metered Demand	kaf	2.9	1.7	1.9	1.9	1.8	2.0	2.2	2.1	4.3	4.4	4.2	3.4	32.8
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	13.4	2.7	2.2	2.2	2.1	2.3	2.7	3.2	5.3	7.8	20.7	16.4	81.0
% 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-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Total CBT Delivery	kaf	30.2	4.3	3.5	3.7	3.6	4.2	6.0	6.5	9.7	15.1	40.1	40.2	167.1



CBT October 2021 Max Reasonable: 01-OCT-2021

Windy Gap

Table with 14 columns: Category, Unit, Oct-21, Nov-21, Dec-21, Jan-22, Feb-22, Mar-22, Apr-22, May-22, Jun-22, Jul-22, Aug-22, Sep-22, Total. Rows include Pumping, Losses, Spill, Total Delivery, and Account Balance.



CBT October 2021 Max Reasonable: 01-OCT-2021

PUMPING AND GENERATION OPERATIONS

Green Mountain Generation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	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	3.500	1.800	1.900	3.100	2.700	2.900	2.500	6.900	16.800	15.700	7.400	5.900	71.100
% Maximum Generation	%	19	10	10	17	16	16	14	37	93	84	40	33	
Average	kwh/af	166	161	157	151	144	140	144	158	189	208	211	206	

Willow Creek Pumping

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Maximum Pumping	kaf	24.6	11.9	0.0	0.0	0.0	0.0	11.9	4.8	0.0	0.0	3.2	21.8	78.2
Actual Pumping	kaf	0.0	0.3	0.0	0.0	0.0	0.0	11.0	4.8	0.0	0.0	3.2	2.6	21.9
Pump Energy	gwh	0.000	0.100	0.000	0.000	0.000	0.000	2.300	1.000	0.000	0.000	0.700	0.600	4.700
% Maximum Pumping	%	0	2	0	0	0	0	92	100	0	0	100	12	306
Average	kwh/af	0	213	0	0	0	0	213	213	0	0	213	213	

Lake Granby Pumping

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	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	19.3	1.9	22.6	29.3	24.6	5.6	0.0	0.0	0.0	0.7	16.9	14.2	135.1
Pump Energy	gwh	2.900	0.300	3.400	4.400	3.800	0.900	0.000	0.000	0.000	0.100	2.400	2.000	20.200
% Maximum Pumping	%	52	5	61	79	74	15	0	0	0	2	46	40	
Average	kwh/af	148	148	149	151	153	156	0	0	0	140	140	141	



CBT October 2021 Max Reasonable: 01-OCT-2021

Marys Lake Generation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Adams Tunnel Flow	kaf	19.6	1.9	22.3	30.2	25.3	7.4	3.1	2.4	4.1	21.7	27.1	17.4	182.5
Maximum Generation	gwh	6.400	0.000	0.200	6.400	5.800	6.400	6.200	6.400	6.200	6.400	6.400	6.200	63.000
Generation	gwh	3.200	0.000	0.200	5.600	4.700	0.900	0.000	0.000	0.700	3.500	5.000	3.200	27.000
% Maximum Generation	%	16	0	1	19	19	12	0	0	16	16	18	19	
Average	kwh/af	163	0	9	186	185	117	0	0	161	160	183	186	

Lake Estes Generation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Adams Tunnel Flow	kaf	19.6	1.9	22.3	30.2	25.3	7.4	3.1	2.4	4.1	21.7	27.1	17.4	182.5
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	8.900	0.300	10.300	14.400	11.700	2.700	0.500	0.600	1.700	9.900	12.400	8.300	81.700
% Maximum Generation	%	55	2	64	90	81	17	3	4	11	62	77	53	
Average	kwh/af	452	169	460	476	461	362	163	251	425	455	458	476	

Pole Hill Generation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	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	25.800	0.000	18.300	25.800	23.300	25.800	25.000	25.800	25.000	25.800	25.800	25.000	271.400
Generation	gwh	12.900	0.000	16.100	23.100	18.900	3.500	7.600	19.600	24.900	24.800	24.400	13.900	189.700
% Maximum Generation	%	50	0	88	90	81	13	30	76	100	96	95	56	
Average	kwh/af	381	0	477	683	620	102	232	580	760	734	721	426	



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

CBT October 2021 Max Reasonable: 01-OCT-2021

Flatiron Units 1 and 2 Generation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Inflow to Flatiron	kaf	19.6	3.0	22.3	30.2	25.3	7.4	13.8	26.4	32.6	32.7	32.1	22.6	268.0
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	17.200	0.900	20.400	26.900	22.800	5.200	10.600	23.500	31.000	30.400	29.700	17.500	236.100
% Maximum Generation	%	53	3	63	83	78	16	34	73	99	94	92	56	
Average	kwh/af	878	303	918	890	902	705	768	891	951	929	926	776	

Flatiron Unit 3 Pump/Generation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Maximum Pumping	kaf	0.0	0.0	13.2	19.8	16.2	16.8	16.6	17.5	7.1	11.4	16.9	17.4	152.9
Pump from Flatiron	kaf	0.0	0.0	12.5	19.8	16.2	4.3	0.0	8.4	6.2	11.3	16.9	2.8	98.4
Pump Energy	gwh	0.000	0.000	3.900	6.600	5.700	1.600	0.000	3.000	2.300	4.100	6.100	1.000	34.300
% Maximum Pumping	%	0	0	95	100	100	26	0	48	88	99	100	16	
Average	kwh/af	0	0	315	333	352	364	0	358	364	364	363	361	
Maximum Turbine release	kaf	0.0	23.3	9.3	0.0	0.0	0.0	0.0	0.0	0.0	26.8	26.8	25.3	111.5
Carter to Flatiron	kaf	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	3.3	4.6
Maximum Generation	gwh	0.000	4.700	1.900	0.000	0.000	0.000	0.000	0.000	0.000	6.000	5.900	5.500	24.000
Actual Generation	gwh	0.000	0.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.700	0.900
% Maximum Generation	%	0	5	0	0	0	0	0	0	0	1	0	13	
Average	kwh/af	0	203	0	0	0	0	0	0	0	222	222	217	

Big Thompson Generation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Total release	kaf	6.4	0.0	0.0	0.0	0.0	0.0	11.8	23.9	23.5	24.5	15.7	9.5	115.3
Turbine release	kaf	6.4	0.0	0.0	0.0	0.0	0.0	11.8	23.9	23.5	24.5	15.7	9.5	115.3
Wasteway 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
Maximum Generation	gwh	3.800	0.000	0.000	0.000	0.000	0.000	3.700	3.800	3.700	3.800	3.800	3.700	26.300
Generation	gwh	0.700	0.000	0.000	0.000	0.000	0.000	1.700	3.700	3.700	3.800	2.400	1.300	17.300
% Maximum Generation	%	18	0	0	0	0	0	46	97	99	100	63	35	
Average	kwh/af	109	0	0	0	0	0	145	156	156	156	154	136	



CBT October 2021 Max Reasonable: 01-OCT-2021

Project Generation

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Total Generation	gwh	46.400	3.300	48.900	73.100	60.800	15.100	22.900	54.300	78.700	88.100	81.300	51.000	623.900
Total Max Generation	gwh	102.900	69.400	87.200	99.100	89.500	99.100	99.600	102.900	99.600	108.800	108.800	105.100	1172.000

Project Pump Energy

		Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Total
Granby	gwh	2.900	0.300	3.400	4.400	3.800	0.900	0.000	0.000	0.000	0.100	2.400	2.000	20.200
Willow Creek	gwh	0.000	0.100	0.000	0.000	0.000	0.000	2.300	1.000	0.000	0.000	0.700	0.600	4.700
Flatiron Unit 3	gwh	0.000	0.000	3.900	6.600	5.700	1.600	0.000	3.000	2.300	4.100	6.100	1.000	34.300
Total Pump Energy	gwh	2.900	0.300	7.300	11.000	9.500	2.400	2.300	4.000	2.300	4.200	9.200	3.600	59.000

B-8: WATER YEAR 2022 PLAN SUMMARY CHARTS

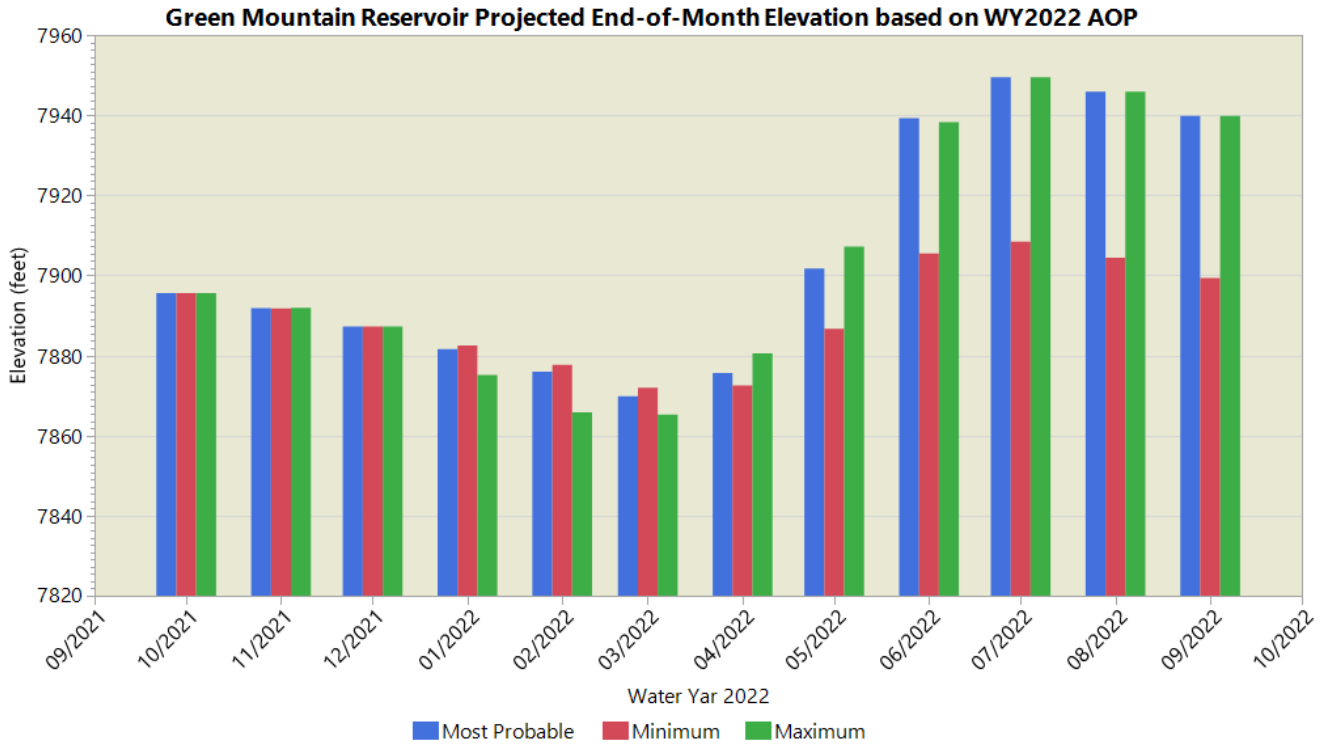


Figure B-8A: Water Year 2022 Operation Plan, Green Mountain Reservoir Elevations

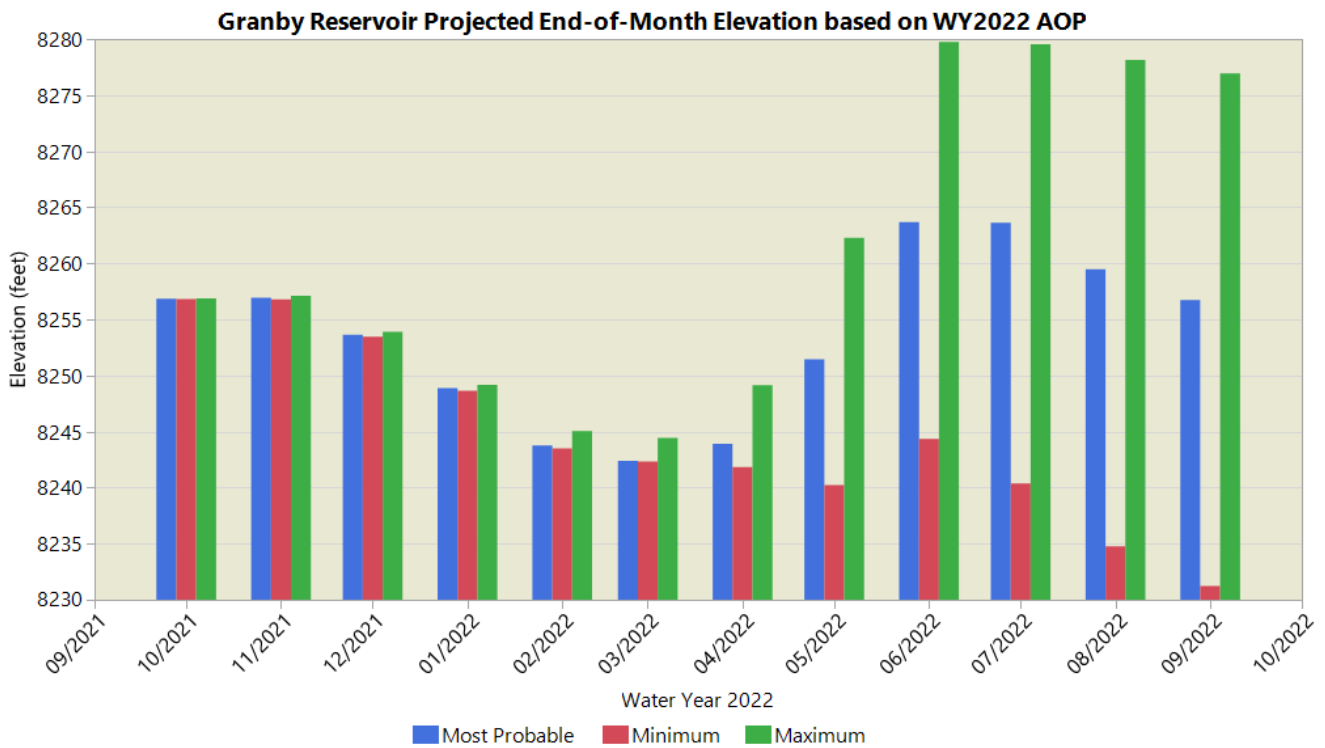


Figure B-8B: Water Year 2022 Operation Plan, Granby Reservoir Elevations

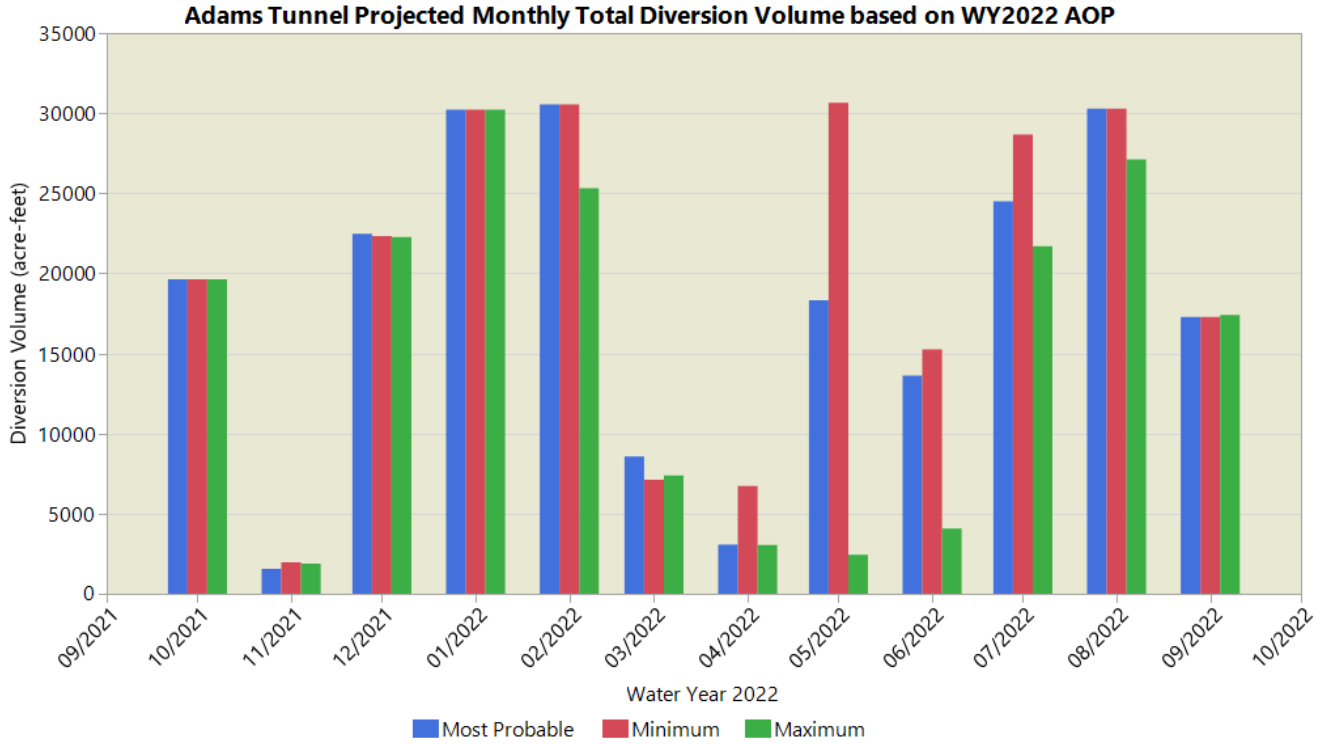


Figure B-8C: Water Year 2022 Operation Plan, Adams Tunnel Diversions

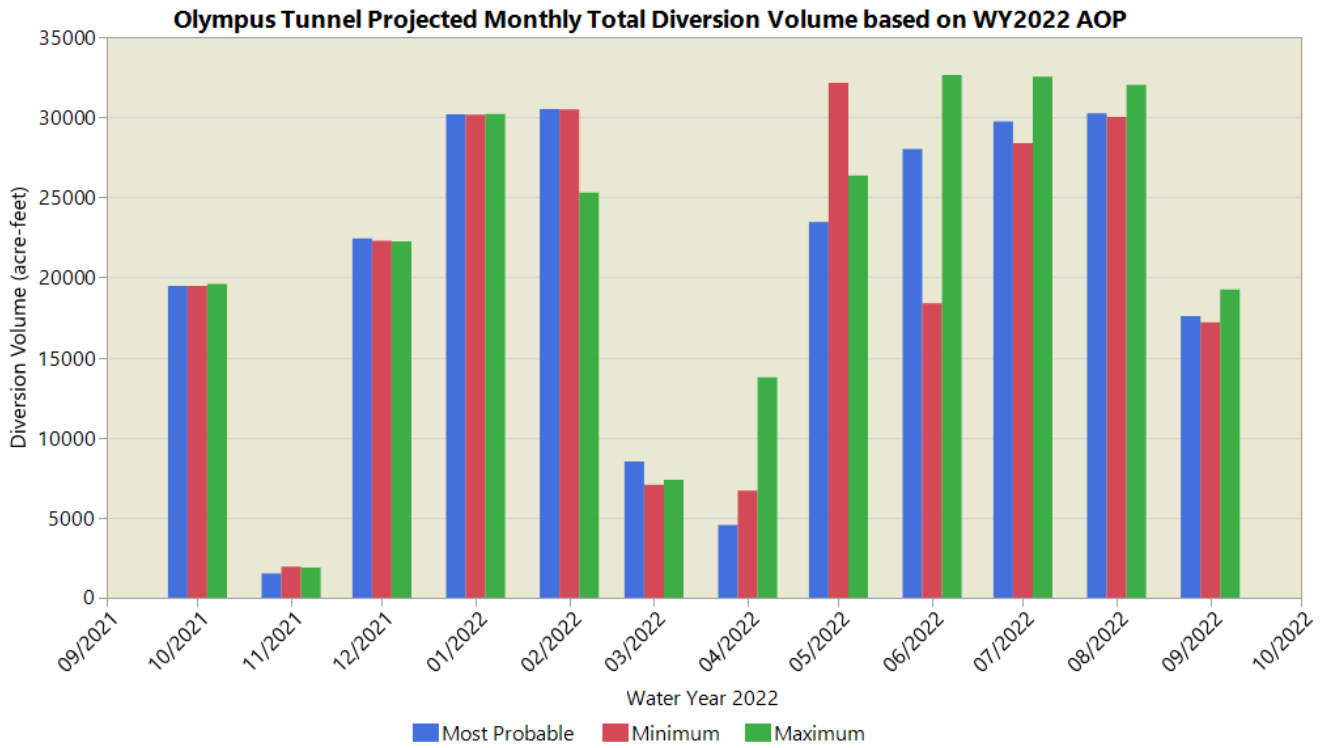


Figure B-8D: Water Year 2022 Operation Plan, Olympus Tunnel Diversions

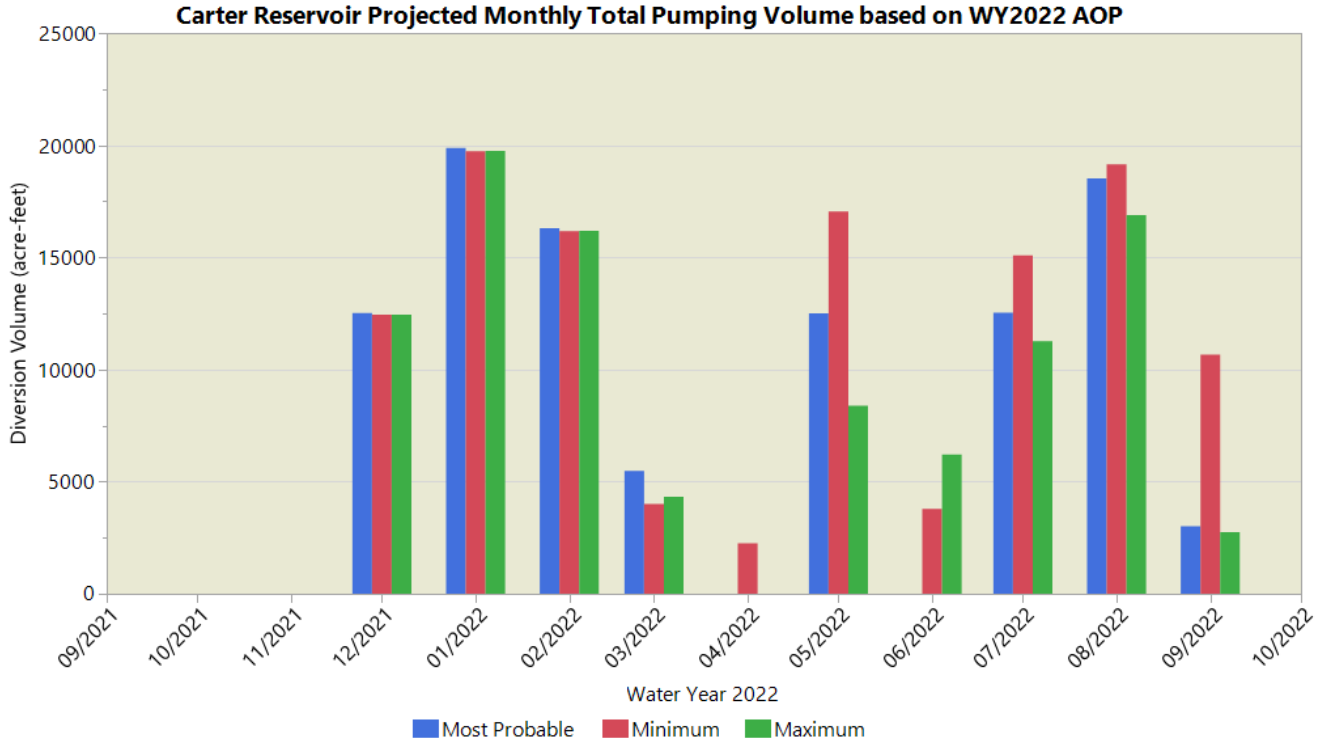


Figure B-8E: Water Year 2022 Operation Plan, Flatiron Unit #3 Pump Volume to Carter Lake Reservoir.

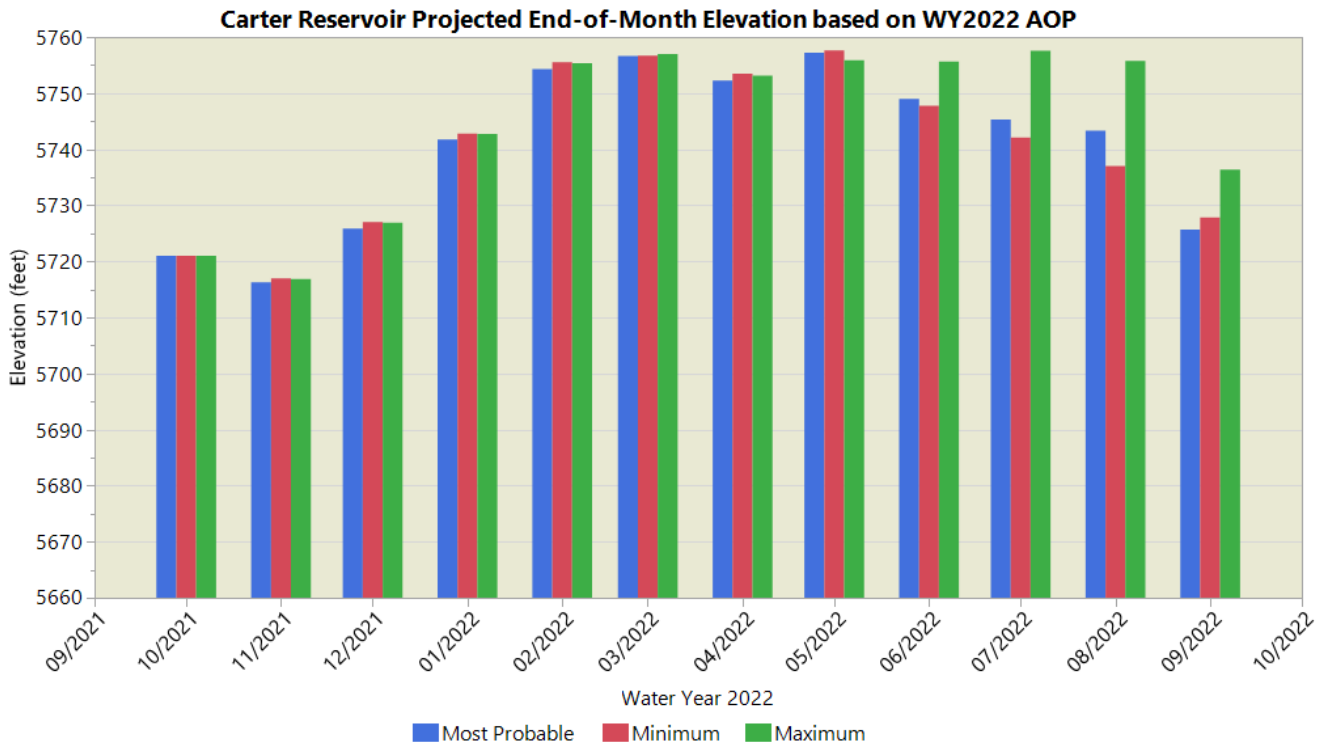


Figure B-8F: Water Year 2022 Operation Plan, Carter Lake Reservoir Elevations

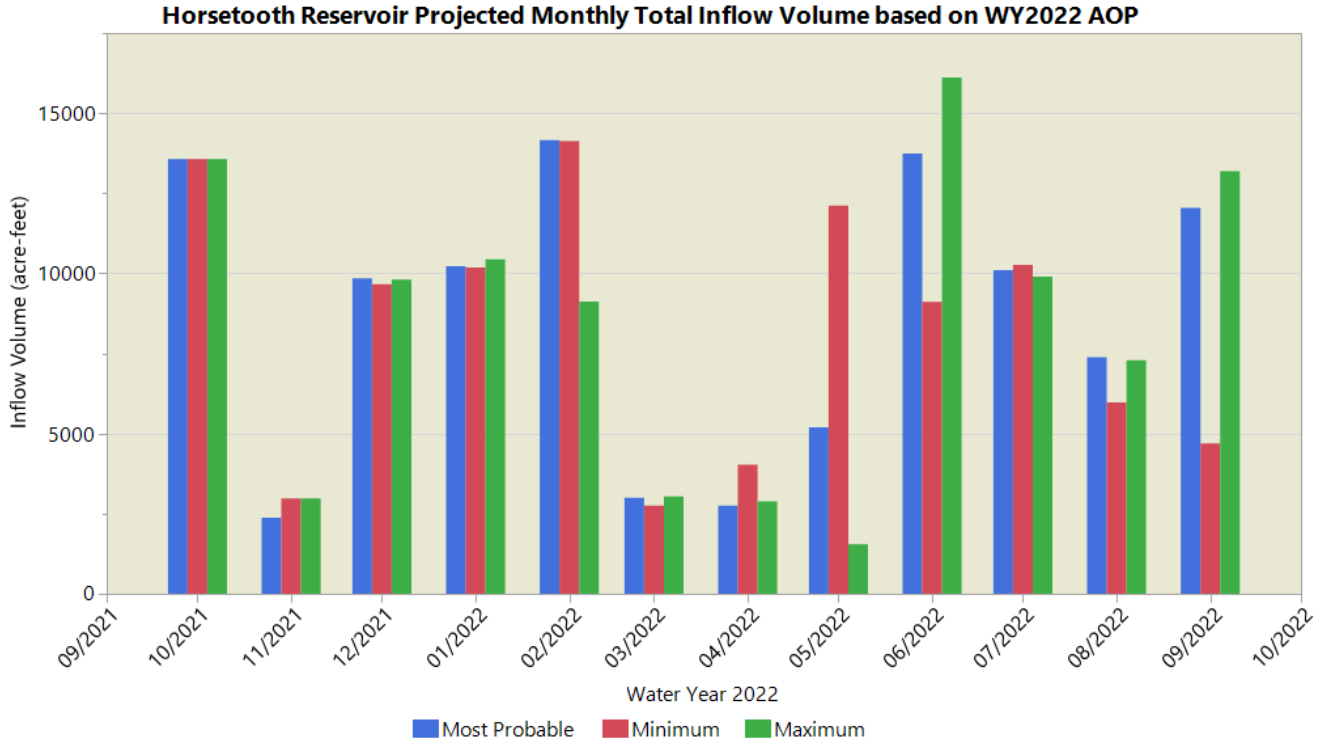


Figure B-8G: Water Year 2022 Operation Plan, Hansen Feeder Canal Inflow to Horsetooth Reservoir.

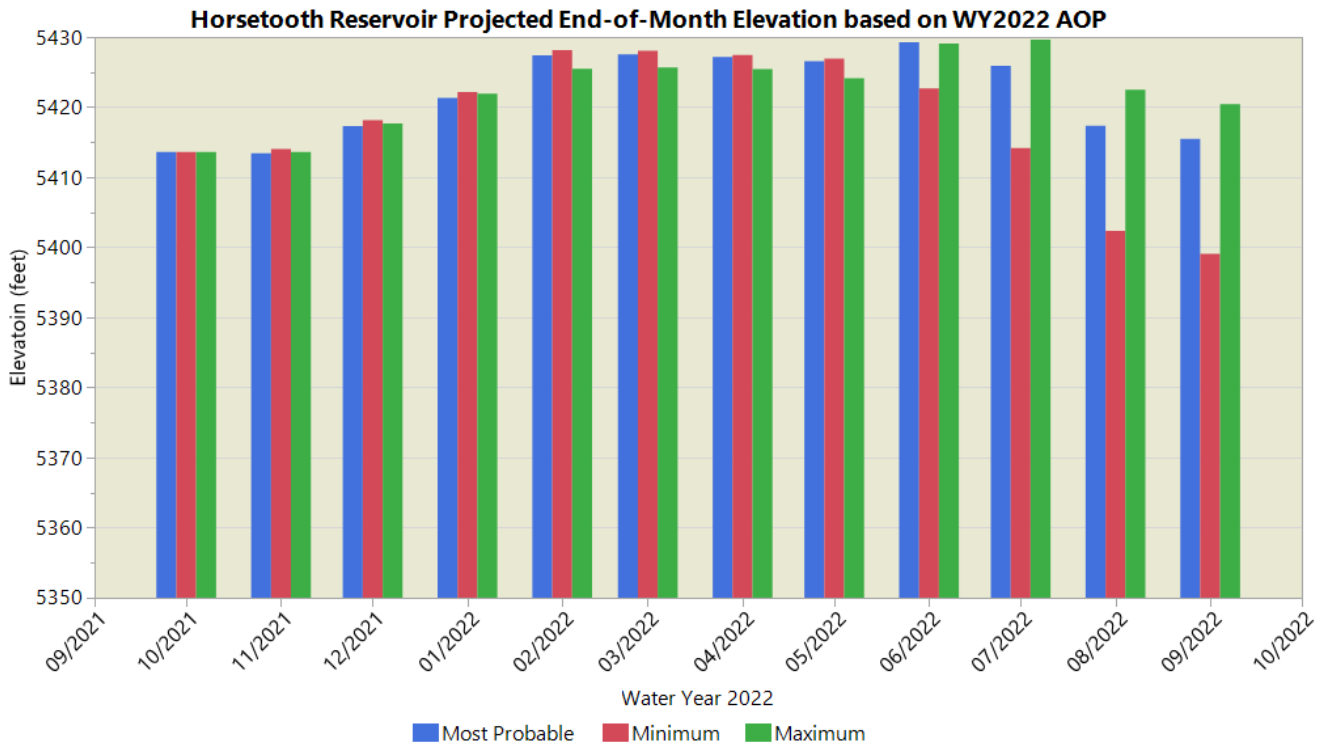


Figure B-8H: Water Year 2022 Operation Plan, Horsetooth Reservoir Elevations.

C-BT Deliveries Projected Monthly Total Volume based on WY2022 AOP

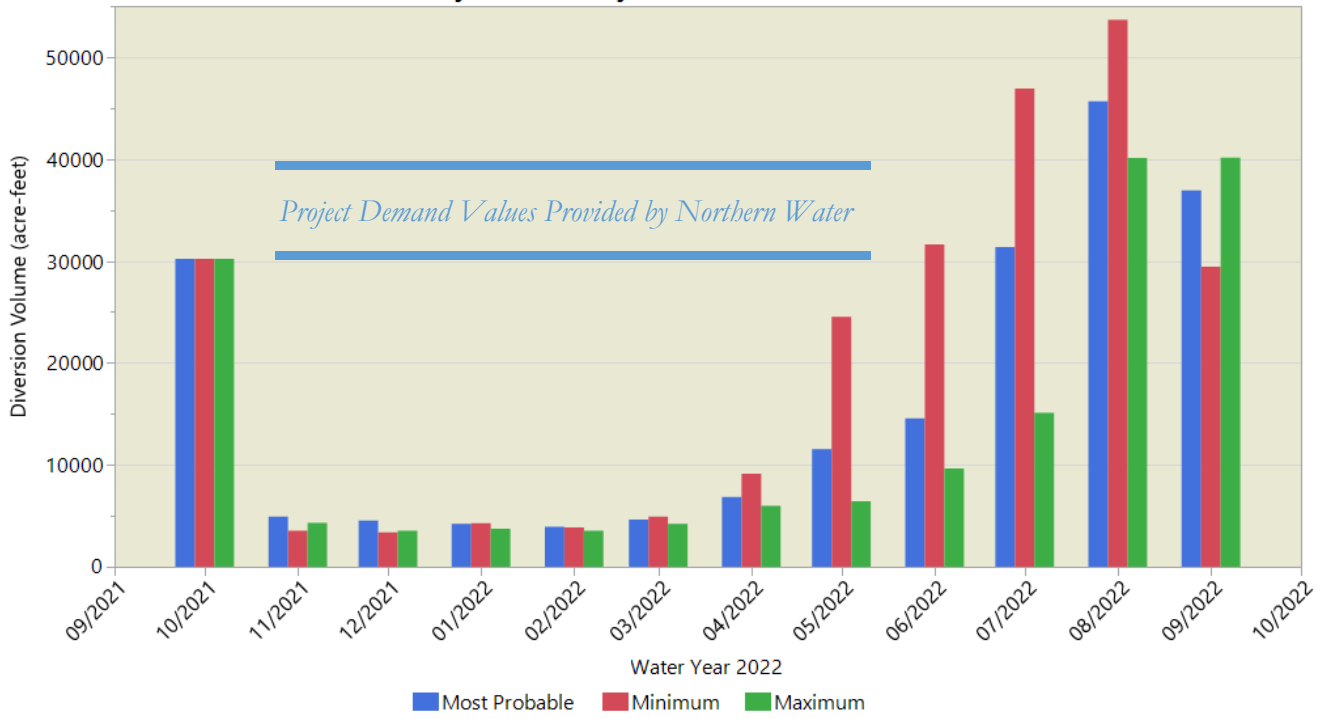


Figure B-8I: Water Year 2022 Operation Plan, C-BT Monthly Delivery Volumes.

APPENDIX C—EXHIBITS

C-1: PUBLICITY MAP, EXTENTS, FACTS AND CONNECTIVITY SCHEMATIC OF THE COLORADO-BIG THOMPSON PROJECT

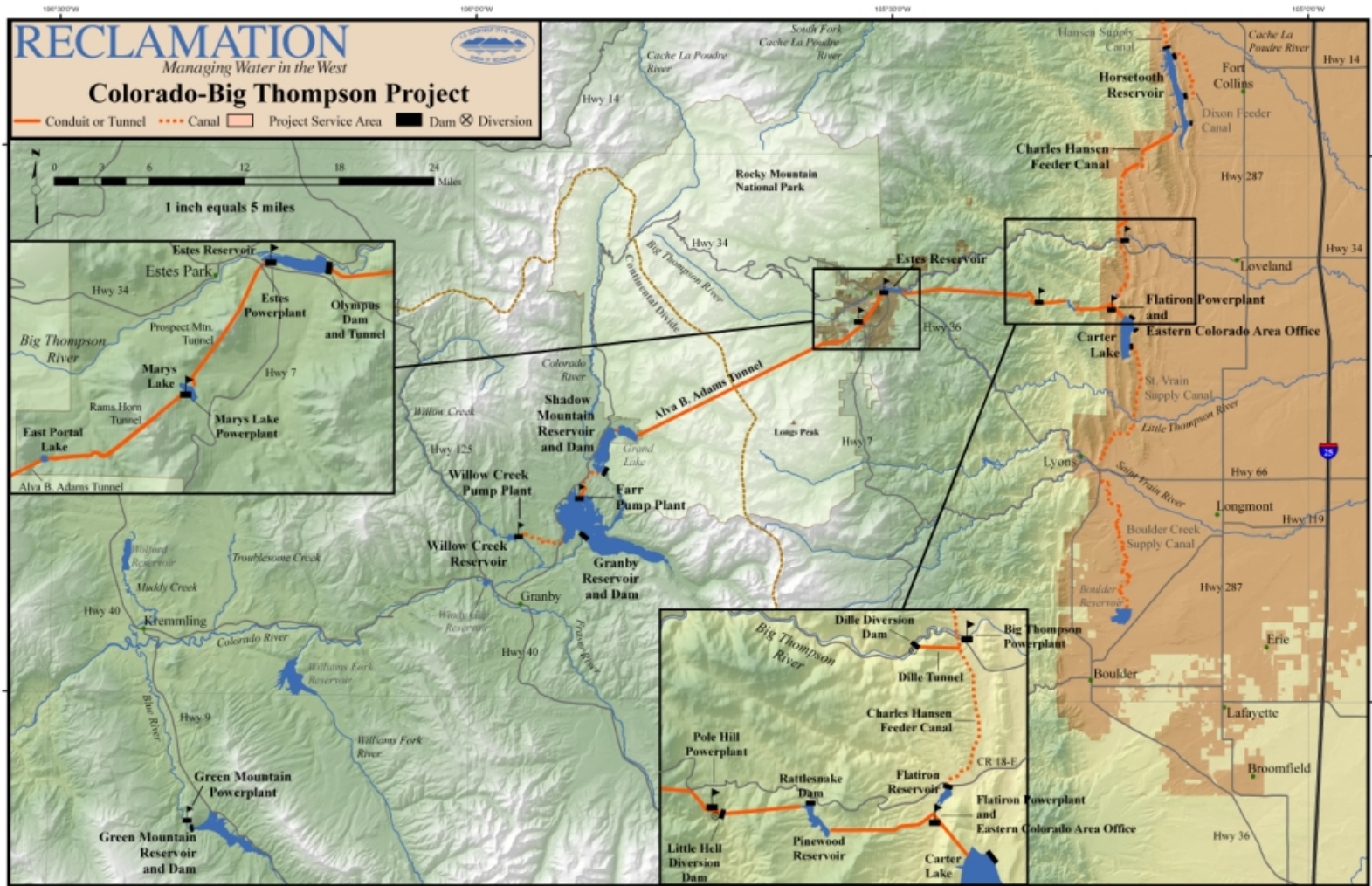
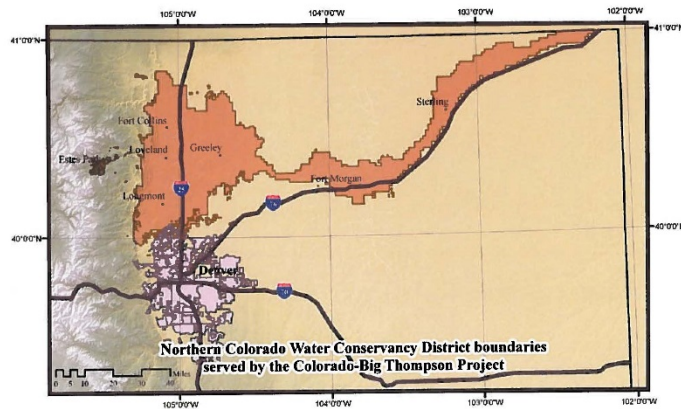


Figure C-1A: Map showing overview of C-BT Project

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

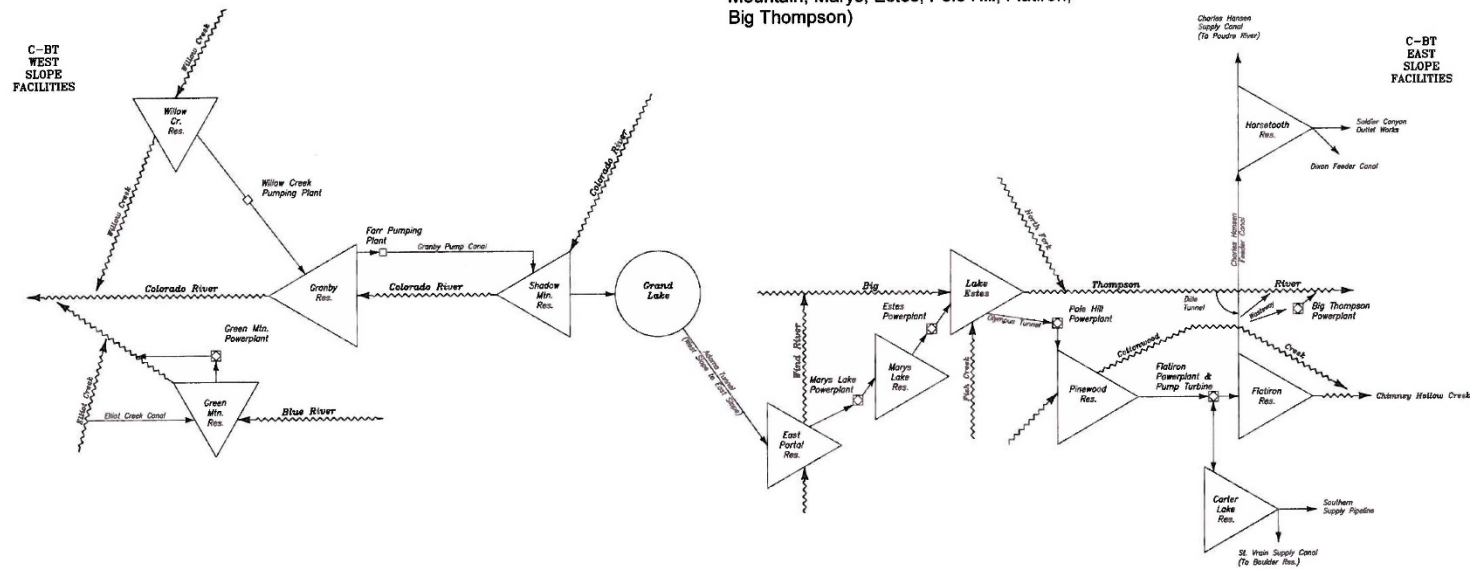


Figure C-1B: Schematic of C-BT Project

C-2: PROFILE VIEW OF THE COLORADO-BIG THOMPSON PROJECT

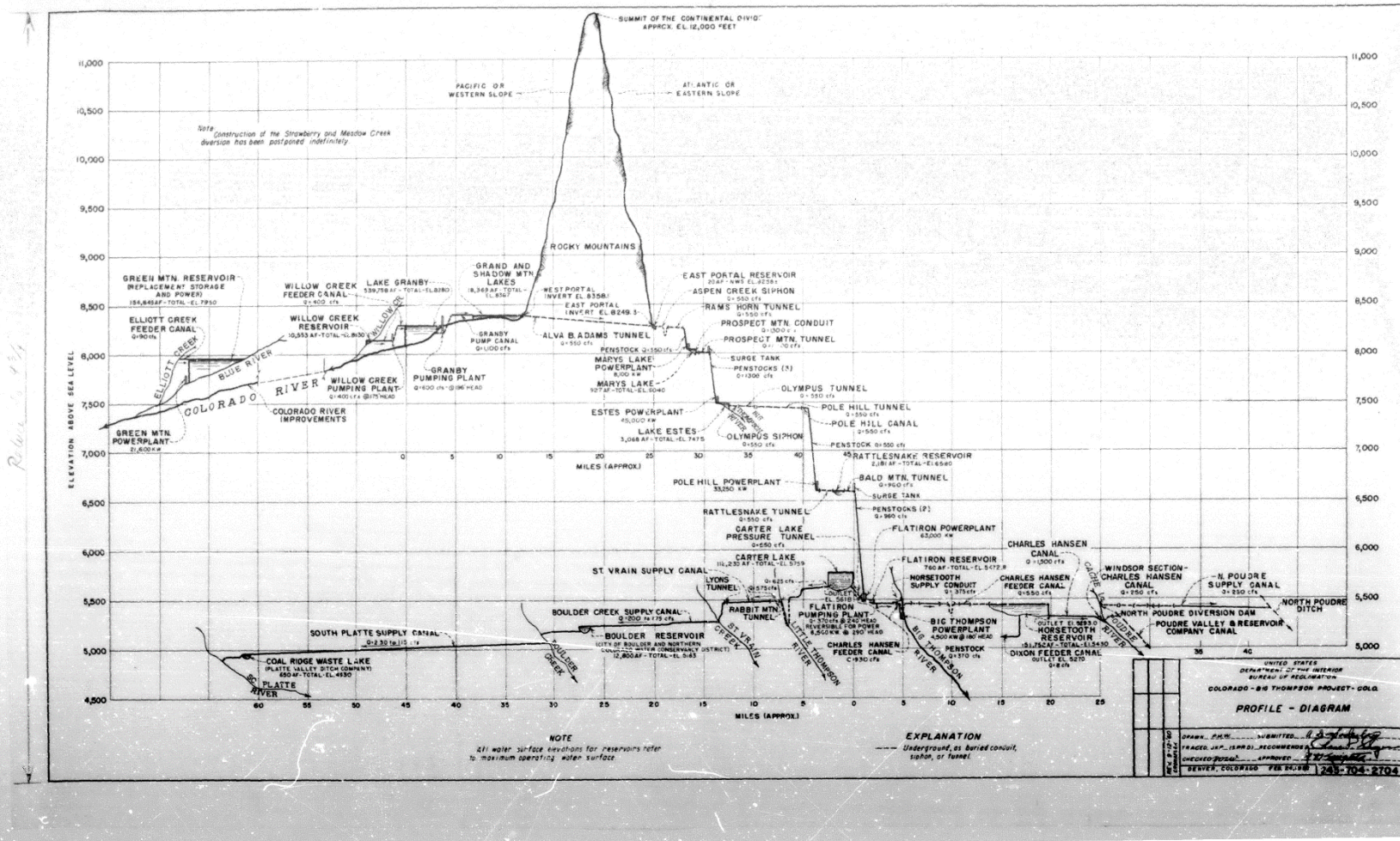


Figure C-2: Profile view of C-BT Project

SEVENTIETH ANNUAL REPORT OF THE WESTERN DIVISION SYSTEM POWER OPERATIONS

PREFACE

This is the seventieth 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 2021 (WY 2021) and the second part presents the plan of generation and pumping operations for WY 2022.

WATER YEAR 2021—GENERATION AND PUMP ENERGY SUMMARY

Power generation for the C-BT was above average compared to the thirty-year average. The Fry-Ark was also above the thirty-year average for WY 2021 but less than both WY 2020 and WY 2019. The North Platte project was less than the thirty-year average and the Big Horn project was less than average. Overall, WD System power generation during WY 2021 was less than average. All power arm powerplants in the C-BT produced greater than average power, while Green Mountain and the Big Thompson powerplants were about half of their average. The Fry-Ark produced greater than average power, while most of the plants in Wyoming and Montana were less than average in production. The exception was Spirit Mountain Powerplant which was greater than its thirty-year average for the water year.

In the case of the C-BT, demands for water were slightly less than average for WY 2021. The declared quota was 70 percent by April of 2021, which was average for the water year. Adams Tunnel diversions were greater than average, but a significant portion of those diversions went to refill Horsetooth Reservoir whose Soldier Canyon Dam work at the end of WY 2020 substantially reduced the storage there for the start of WY 2021. Precipitation events in May and early June pushed the crop planting date out further than average and a couple of timely precipitation events during the summer monsoon season also impacted demands on the storage in the C-BT terminal reservoirs. Snowpack on the east slope of the C-BT was mildly greater than average. Those factors combined to produce a slightly greater than average total generation for the C-BT.

From the generation data in Table A-1, the C-BT powerplants produced an accumulated gross generation total of 641.6 gigawatt-hours (GWh) of electricity representing 107 percent of its thirty-year average and 30.0 percent of gross WD System generation. The gross generation produced by the entire WD System was 1,876.8 GWh or 86.6 percent of the thirty-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 WY 2020 was 1,540.4 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 WY 2021, the Willow Creek Pumping Station pumped to Granby Reservoir slightly more than the total volume pumped during WY 2020. The Willow Creek Pumping Station used 7.0 GWh of power during its WY 2021 operation. Meanwhile, the Farr Pumping Plant and the Flatiron Powerplant Unit 3 required 34.3 and 34.5 GWh, respectively. The Farr Pumping Plant required slightly above average energy, while Flatiron Powerplant Unit 3 operations required more than the thirty-year average. The three pump's combined power requirement was 75.9 GWh, 120 percent of the thirty-year average, 4.0 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 2,244.0 GWh during WY 2021, with a revenue of \$68,760,702 a slight decrease from the previous year. 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 697.4 GWh during WY 2021 for which WAPA paid a total of \$30,731,068 a notable increase from the previous water year. The increase is due in part to the Polar Vortex in late February 2021 and its impact on pricing, as well as increases in pricing during certain months of WY 2021.

WATER YEAR 2022—GENERATION AND PUMP ENERGY FORECAST

Under the most-probable runoff condition plan (2022 AOP), the gross generation for the C-BT powerplants is projected to be 658.1 GWh during WY 2022 (Table A-4), while pump energy requirements from the C-BT Power System are expected to reach 74.2 GWh. The total generation for the entire WD System is expected to be 2,037.9 GWh, with a total load of 2,162.5 GWh, leaving a power deficit of 124.6 GWh for WY 2022. 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 WY 2022. 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.

APPENDICES

APPENDIX A—TABLES

A-1: WESTERN DIVISION SYSTEM GENERATION FOR WATER YEAR 2021

WESTERN DIVISION SYSTEM GENERATION FOR WY 2021

Powerplant	Accum. Gross Generation		
	WY 2021 (GWH)	Avg ¹ (GWH)	Percent of Avg
Green Mtn.	27.0	51.9	52
Marys Lake	42.6	37.2	114
Estes	113.8	100.3	113
Pole Hill	202.9	172.3	118
Flatiron 1&2	250.7	226.9	110
Big Thompson	4.7	10.9	43
Seminole	103.4	132.5	78
Kortes	132.4	140.4	94
Freemont C.	177.1	239.6	74
Alcova	89.7	118.0	76
Glendo	70.8	80.1	88
Guernsey	15.0	19.4	77
Boysen	47.7	69.3	69
Heart Mtn. ²	15.2	15.8	96
Buffalo Bill ²	61.7	68.3	90
Shoshone ²	18.2	20.2	90
Spirit Mtn. ²	16.4	14.7	112
Mt. Elbert ³	220.7	169	131
Yellowtail ⁴	533.8	959	56
Total	1876.8	2166.3	87

1 1976-2005 average unless noted otherwise

2 Average gross generation for 1995-2012

3 Gross pump/storage generation reported. Average is for 1990-1999

4 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.

A-2: PUMP ENERGY USED DURING WATER YEAR 2021

Pumping Plant	October 2020-September 2021 Pump Energy		
	WY2021 (GWH)	Avg ¹ (GWH)	Percent of Avg
Willow Cr	7.0	5.8	121
Farr	34.3	30.7	112
Flatiron Unit #3	34.5	26.7	129
Mt. Elbert ²	260.6	182.1	143
Total	336.5	245.3	137

1 1976-2005 average unless noted otherwise

2 Average pump energy for 1990-1999

A-3: GROSS GENERATION LESS PUMPING FOR WATER YEAR 2021

PICK-SLOAN MISSOURI BASIN PROGRAM WESTERN DIVISION POWER SYSTEM WATER YEAR 2021 OPERATIONS GROSS GENERATION LESS PUMPING IN GIGAWATT-HOURS

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Mt. Elbert ¹	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 Mtn.	4.5	1.2	0.7	0.8	0.8	1.1	3.6	0.0	0.1	4.4	5.9	3.4	26.3
Willow Cr. pump	-0.5	0.0	-0.1	0.0	0.0	-0.1	-1.3	-3.2	-0.8	-0.4	-0.5	-0.1	-7.0
Farr pump	-1.6	-1.0	-4.0	-5.4	-4.6	-4.7	-3.1	-0.5	-0.1	-3.0	-4.0	-3.8	-36.0
Marys Lake	1.4	0.8	3.6	6.0	5.1	5.1	4.3	2.9	0.0	3.7	5.1	4.3	42.1
Estes	3.9	1.9	9.9	15.9	13.1	13.3	11.1	7.6	1.4	10.3	13.2	11.1	112.9
Pole Hill	4.2	3.2	14.7	24.3	20.3	20.6	17.4	18.4	20.5	21.2	21.7	15.9	202.3
Flatiron 1&2	5.4	4.4	18.0	30.0	24.6	25.7	22.3	23.3	25.2	24.8	26.0	19.8	249.6
Flatiron 3	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Flatiron 3 pump	0.0	0.0	-3.6	-6.6	-5.8	-2.8	0.0	-2.3	-3.3	-2.4	-6.4	-1.3	-34.5
Big Thompson	0.4	0.2	0.1	0.0	0.0	0.0	0.3	1.8	2.7	2.6	1.9	0.9	10.9
Seminole	4.1	3.7	6.1	4.7	3.4	3.6	14.3	24.3	19.1	14.3	5.4	0.0	103.2
Kortes	5.0	4.5	7.1	5.8	4.4	4.7	17.0	28.3	22.6	18.0	8.9	5.0	131.2
Fremont Canyon	-0.1	-0.1	-0.1	7.8	6.6	6.2	13.1	9.8	36.6	47.6	35.2	13.4	176.0
Alcova	11.4	3.2	3.5	3.2	2.7	2.5	2.6	2.6	16.6	22.4	14.5	3.3	88.6
Glendo	0.0	0.0	-0.1	-0.1	-0.1	-0.1	1.1	14.6	14.1	21.2	17.9	1.6	70.0
Guernsey	0.0	0.0	0.0	0.0	0.0	-0.1	1.4	4.2	3.0	1.9	4.2	0.1	14.7
Pilot Butte ²	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	2.3	2.9	2.8	2.7	2.4	2.7	2.7	4.6	6.6	6.3	5.3	5.0	46.4
Shoshone	1.6	0.7	0.8	1.7	1.6	1.7	1.6	1.7	1.8	1.7	1.5	1.4	17.9
Buffalo Bill	2.3	-0.1	-0.1	-0.1	-0.1	0.4	9.0	10.6	11.7	11.9	8.4	6.9	60.9
Spirit Mtn.	1.7	0.0	0.0	0.0	0.0	0.0	0.2	2.4	2.9	3.2	3.1	2.7	16.2
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 Mtn.	1.7	0.0	0.0	0.0	0.0	0.0	0.4	3.6	2.4	2.3	2.3	2.3	14.8
Yellowtail ³	25.3	21.3	21.3	21.7	18.9	20.8	26.9	27.1	21.3	24.6	19.2	17.0	265.5
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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	21.9	12.8	54.7	89.0	74.2	73.4	63.4	60.0	54.1	72.8	84.7	60.7	721.7
North Platte	20.4	11.3	16.4	21.3	17.0	16.8	49.6	84.0	112.0	125.3	86.1	23.5	583.8
Bighorn	22.2	14.2	14.1	15.2	13.4	15.2	27.4	36.4	36.0	37.7	30.2	26.8	288.8
	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
TOTAL GEN	64.5	38.2	92.8	132.6	111.2	106.5	142.4	188.0	206.5	238.3	204.7	114.7	1640.4
TOTAL LOAD	162.4	162.2	177	172.8	137	149.7	176.1	184.5	211.2	262.5	211.6	156.8	2163.8
SURPLUS/DEFICIT	-97.9	-124.0	-84.2	-40.2	-25.8	-43.2	-33.7	3.5	-4.7	-24.2	-6.9	-42.1	-523.4

1 Flow through energy reported, not pump/storage energy as reported in Table A-1

2 Marketed energy

3 Total Yellowtail reported in row but only half of total generation of Yellowtail used for Bighorn and Total Gen 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.

A-4: MOST PROBABLE INFLOW PROJECTED GROSS GENERATION AND PUMPING FOR WATER YEAR 2022

PICK-SLOAN MISSOURI BASIN PROGRAM WESTERN DIVISION POWER SYSTEM

WATER YEAR 2022 FORECASTED OPERATIONS

MOST PROBABLE WATER SUPPLY CONDITION

GROSS GENERATION AND PUMPING IN GIGAWATT-HOURS

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Mt. Elbert ¹	1.3	2.4	2.4	2.5	3.1	2.5	3.5	3.9	4.7	4.4	2.0	1.0	33.7
Green Mtn.	3.4	1.8	1.8	1.8	1.6	1.7	1.1	0.7	1.0	3.7	4.9	4.9	28.3
Willow Cr. pump	0.0	0.0	0.0	0.0	0.0	0.0	1.1	4.0	3.2	0.6	0.2	0.2	7.5
Farr pump	2.9	0.3	3.4	4.4	4.6	1.3	0.1	0.4	0.0	1.9	3.8	2.4	29.6
Marys Lake	3.2	0.0	0.2	5.6	5.8	1.1	0.0	3.2	2.2	4.3	5.6	3.2	45.9
Estes	8.9	0.2	10.4	14.4	14.5	3.2	0.5	8.2	6.2	11.3	14.2	8.2	119.5
Pole Hill	12.9	0.0	16.1	23.1	23.3	4.6	0.0	17.3	21.4	22.5	23.0	13.1	201.7
Flatiron 1&2	17.1	0.6	20.6	26.8	29.0	6.2	2.7	19.6	24.7	27.1	27.0	15.5	252.9
Flatiron 3	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.0
Flatiron 3 pump	0.0	0.0	3.9	6.6	5.7	2.0	0.0	4.5	0.0	4.3	6.4	1.0	37.1
Big Thompson	0.5	0.0	0.0	0.0	0.0	0.0	0.1	1.6	3.5	2.2	1.1	0.9	8.8
Seminole	0.0	1.5	4.5	4.5	4.0	4.5	4.5	10.4	20.8	17.2	12.3	11.7	164
Kortes	5.6	5.4	5.6	5.6	5.1	5.6	5.4	11.6	21.5	17.4	12.5	12.1	166.7
Fremont Canyon	0.0	6.1	6.3	6.3	5.7	12.3	12.6	18.0	34.8	35.8	25.1	9.6	218.9
Alcova	4.0	3.6	3.8	3.8	3.4	6.7	3.7	8.4	16.5	16.3	11.4	4.2	123
Glendo	0.0	0.0	0.0	0.0	0.0	0.0	2.4	7.3	17.2	24.1	18.4	0.8	88.1
Guernsey	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	3.7	3.8	3.8	2.6	19.1
Pilot Butte ²	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	3.7	3.8	3.8	3.4	5.4	11.2	11.5	11.5	11.0	7.5	7.2	86.7
Shoshone	1.1	1.1	1.1	1.1	1.0	1.1	1.1	2.0	2.2	2.2	1.2	1.1	12.5
Buffalo Bill	4.0	1.6	1.6	1.6	1.5	1.6	2.5	13.4	13.0	13.4	13.3	13.0	97.3
Spirit Mtn.	2.0	0.0	0.0	0.0	0.0	0.0	2.4	2.6	2.8	3.2	3.4	3.2	17.3
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
Heart Mtn.	3.1	0.0	0.0	0.0	0.0	0.0	4.3	4.5	4.3	4.5	1.6	0.2	13.6
Yellowtail ³	27.2	24.1	24.7	24.5	21.9	28.8	35.2	53.2	55.1	39.2	43.8	40.7	418.2
	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Fry-Ark	1.3	2.4	2.4	2.5	3.1	2.5	3.5	3.9	4.7	4.4	2.0	1.0	33.7
CBT	43.1	2.3	41.8	60.7	63.9	13.5	3.2	41.7	55.8	64.3	65.4	42.2	582.9
North Platte	9.5	16.7	20.2	20.1	18.2	29.0	28.7	59.5	114.4	114.7	83.4	40.9	779.8
Bighorn	42.0	30.3	31.2	31.0	27.7	36.9	56.6	87.2	88.9	73.6	70.7	65.4	641.5
	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
TOTAL GEN	95.9	51.7	95.6	114.3	112.9	81.9	92.0	192.3	263.8	257.0	221.6	149.5	2037.9
TOTAL LOAD	156.6	162.4	162.2	177.1	172.6	137.0	149.3	176.4	184.7	211.0	262.0	211.2	2162.5
SURPLUS/DEFICIT	-60.7	-110.7	-66.6	-62.8	-59.7	-55.1	-57.3	15.9	79.1	46.0	-40.4	-61.7	-124.6

1 Project values are historic average flow through energy.

2 Projected values are marketed energy

3 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.

A-5: ESTIMATED MAINTENANCE SCHEDULE FOR WATER YEAR 2022—COLORADO-BIG THOMPSON AND FRYINGPAN-ARKANSAS PROJECTS

COLORADO-BIG THOMPSON AND FRYINGPAN-ARKANSAS PROJECTS ESTIMATED MAINTENANCE SCHEDULE FOR WATER YEAR 2022¹

Feature	Task Name	Start	Finish
Big T Unit 1	2022 Annual Maintenance	Mon 1/3/22	Thu 2/3/22
Big T XFMR KW1A	2022 Annual Maintenance	Mon 1/10/22	Thu 1/27/22
Adams Tunnel	2021 Annual Inspection	Mon 11/8/21	Thu 11/18/21
Adams Tunnel	2022 East Portal Repairs	Sun 9/18/22	Mon 12/19/22
Marys Powerplant	2021 Annual Maintenance	Mon 11/1/21	Thu 12/30/21
Estes Blackstart	2022 Capability Test	TBD	TBD
Estes Unit 1	2022 Annual Maintenance	Tue 1/4/22	Fri 2/4/22
Estes Unit 2	2022 Annual Maintenance	Mon 2/14/22	Fri 3/18/22
Estes Unit 3	2022 Annual Maintenance	Mon 3/28/22	Fri 4/29/22
Bald Mtn Tunnel	Bulkhead Dry Test	Mon 4/4/22	Tue 4/5/22
Bald Mtn Tunnel	Chimney Hollow Interconnect	Mon 9/19/22	Mon 11/28/22
Flatiron Unit 1	2022 Annual Maintenance	Mon 2/14/22	Thu 3/24/22
Flatiron XFMR KW1A	2022 Annual Maintenance	Tue 2/22/22	Thu 3/10/22
Flatiron Unit 2	2022 Annual Maintenance	Mon 4/11/22	Thu 5/19/22
Flatiron XFMR KW2A	2022 Annual Maintenance	Mon 4/19/22	Thu 5/6/22
Flatiron Unit 3	Exciter Modifications	Mon 11/15/21	Thu 11/18/21
Flatiron Unit 3	2021 Annual Maintenance	Tues 9/7/21	Thu 10/14/21
Flatiron Unit 3	2022 Annual Maintenance	Tues 9/6/22	Wed 9/15/22
Flatiron Unit 3	WECC Model Validation Testing	Mon 4/4/22	Wed 4/6/22
Green Mtn. Unit 1	2022 Annual Maintenance	Mon 1/10/22	Thu 2/17/22
Green Mtn. SWYD KZ1A	2022 Annual Maintenance	Mon 1/31/22	Thu 2/3/22
Green Mtn. Unit 2	2022 Annual Maintenance	Mon 2/28/22	Thu 4/7/22
Green Mtn. SWYD KZ2A	2021 Annual Maintenance	Mon 3/21/22	Thu 3/24/22
Pole Hill Unit G1	2021 Annual Maintenance	Mon 11/1/21	Thu 12/9/21
Pole Hill XFMR K1A	2021 Annual Maintenance	Mon 11/1/21	Mon 11/8/21
Pole Hill Unit G1	2022 Annual Maintenance	Mon 10/24/22	Thu 12/1/22
Pole Hill XFMR K1A	2022 Annual Maintenance	Mon 10/31/22	Thu 11/17/22
Mt Elbert Unit 1	2022 Annual Maintenance	Mon 9/14/20	Unavailable until further notice
Mt Elbert Unit 2	2021 Annual Maintenance	Tue 9/7/21	Fri 11/12/21
Mt Elbert Units 1 and 2	PASCO Work Replacing Malta Substatn Breakers	Tue 9/7/21	Tue 10/26/21
Mt Elbert Unit 2	2022 Annual Maintenance	Mon 9/12/22	Fri 11/18/22
CHFC 930 Section	2022 Northern Water Inspectn & Repairs	Mon 4/4/22	Fri 4/15/22

¹ Maintenance schedule information accurate as of December 30, 2021

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 (cfs)
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 ¹	1	8,500	8,500	158-287	440
Big Thompson	1	5,300	5,300	183- 184	350
Seminole	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	-----	-----

¹ Pumping plant which may be operated in reverse to generate energy

A-7: PUMPING PLANT DATA

WESTERN DIVISION - PICK-SLOAN MISSOURI BASIN PROGRAM

PUMPING PLANT DATA

Facilities	Number	Capacity (cfs)	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 ¹	1	440	173-287	13,000	391
Mt. Elbert	2	5,690	447-477	340,000	620

1 Pumping plant which may be operated in reverse to generate energy

APPENDIX B—EXHIBITS

B-1: WESTERN DIVISION WATER RESOURCE MAP

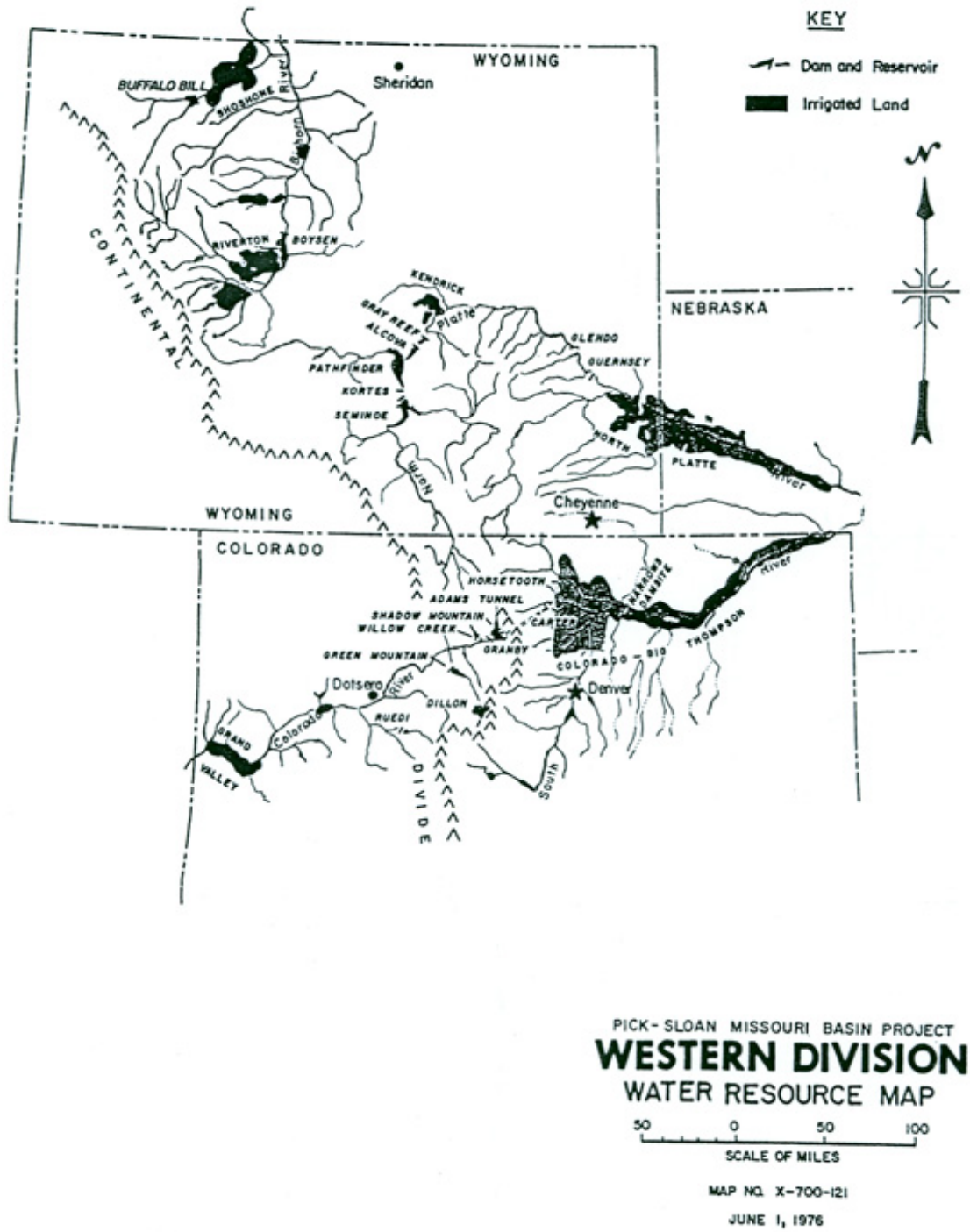


Figure B-1: Water Resource Map of Irrigated Land and Dam/Reservoirs of the Western Division serving them.

B-2: LAP GROSS GENERATION LESS PUMPING FOR WATER YEAR 2021

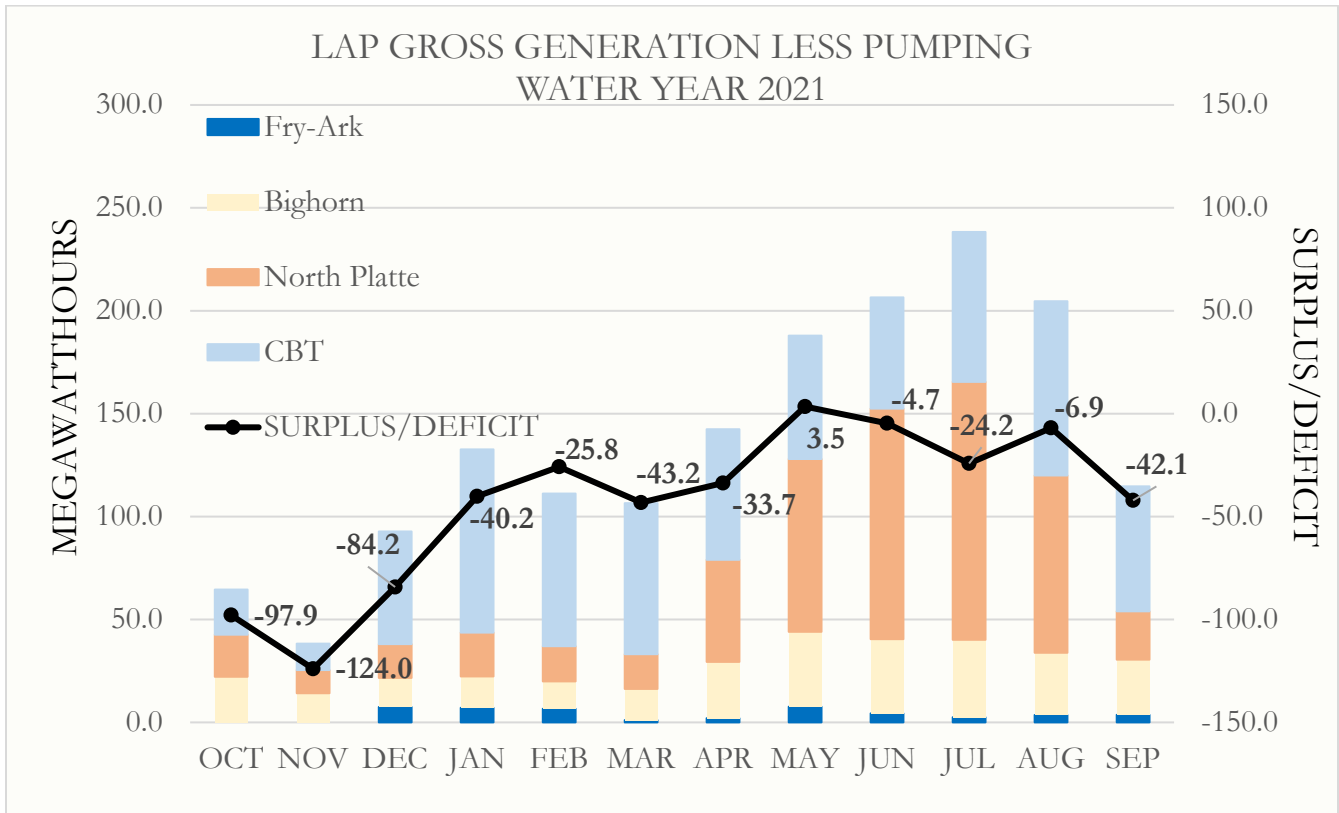


Figure B-2: Monthly Loveland Area Power (LAP) Generation Less Pumping for WY 2021 by Reclamation projects in Western Division System. Monthly surplus and deficits are shown as overlay plot.

B-3: MOST PROBABLE INFLOW PROJECTED LAP GROSS GENERATION LESS PUMPING FOR WATER YEAR 2022

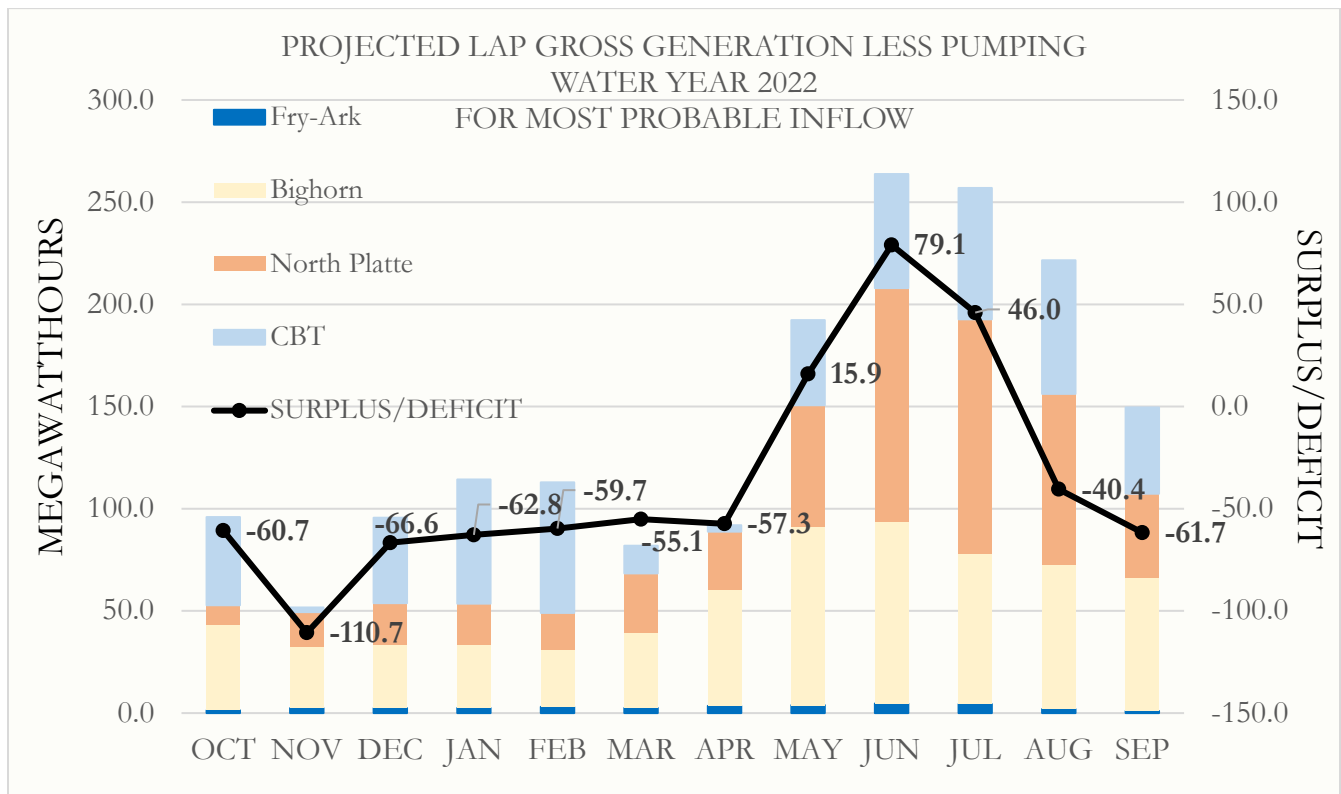


Figure B-3: Monthly Loveland Area Power (LAP) Generation Less Pumping for WY 2022 from October 2021 AOP Most Probable Scenario by Reclamation projects in Western Division System. Monthly surplus and deficits are shown as overlay plot.