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 system through which multiple benefits are provided.

The C-BT spreads over approximately 250 miles in the State of Colorado. It stores, regulates, and diverts water from the Colorado River west of the Rocky Mountains, providing supplemental water for irrigation of 720,000 acres of land east of the Rocky Mountains. It also provides water for municipal use, industrial use, hydroelectric power, and water-oriented recreation.

Major features of the C-BT include dams, dikes, reservoirs, powerplants, pumping plants, pipelines, tunnels, transmission lines, substations, and other associated structures (Table 1, Exhibits 1 and 2).

Historically, the C-BT has diverted approximately 230,000 acre-feet 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 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 Division of the Pick-Sloan Missouri Basin Program markets the electric power produced at the six powerplants.

The western slope collection system captures runoff from the high mountains and stores, regulates, and conveys the water to Adams Tunnel for diversion to the East Slope under the Continental Divide.

To ensure irrigation and power generation under prior rights on the Colorado River, Green Mountain Reservoir was constructed on the Blue River. Spring runoff is stored in this reservoir and later released to meet the requirements of the senior water rights holders downstream along the Colorado River and to allow East Slope diversion of water by the C-BT throughout the year.

Pursuant to authorities in Senate Document 80, (which authorized the C-BT), and the 1984 Green Mountain Operating Policy and the agreements in the September 1996 Stipulation and Agreement of the Orchard Mesa Check Case settlement (Case No. 91 CW247, Colorado Water Div. 5), the content of the Historic Users Pool (HUP) in Green Mountain Reservoir is evaluated during the summer to determine the availability of water surplus to historic beneficiaries needs. If it is determined that surplus water is available, it may be delivered based upon need, first to the federal Grand Valley powerplant and then to other uses based on a priority system or on specific agreements.

Irrigation systems on the Colorado River, above the Blue River confluence, were improved to enable continued use of existing rights. Releases are made from Lake Granby to maintain the Colorado River as a live fishing stream.

The C-BTs principal storage facilities on the West Slope are Lake Granby, Grand Lake, and Shadow Mountain Reservoir located on the Colorado River near Granby, and Willow Creek Reservoir located on Willow Creek, a tributary to the Colorado River below Lake Granby. Willow Creek Pumping Plant lifts the water 175 feet. It then flows by gravity via the Willow Creek Feeder Canal

down to Lake Granby.

Granby Pumping Plant lifts the water 99 feet from Lake Granby to Granby Pump Canal. The canal conveys the water 1.8 miles to Shadow Mountain Lake, which also intercepts North Fork flows of the Colorado River. Shadow Mountain Lake connects with Grand Lake to make a single body of water from which diversions flow to Adams Tunnel to begin the journey to the eastern slope.

Emerging from Adams Tunnel into the East Portal Reservoir, the water flows across Aspen Creek Valley in a siphon and then under Rams Horn Mountain through a tunnel. At this point, it enters a steel penstock and falls 205 feet to Marys Lake Powerplant. This powerplant is located on the west shore of Marys Lake, which provides afterbay and forebay capacity for re-regulating the flow. The water is conveyed between Marys Lake and Estes PowerPlant, on the shore of Lake Estes, through Prospect Mountain Conduit and Prospect Mountain Tunnel.

Lake Estes, which serves as an afterbay for the Estes Powerplant, is formed by Olympus Dam. The storage in Lake Estes and the forebay storage in Marys Lake enable the Estes Powerplant to meet daily variations in energy demand.

Water from Lake Estes and the Big Thompson River flows are conveyed by Olympus Siphon and Tunnel, and Pole Hill Tunnel and Canal, to a penstock through which the water drops 815 feet to Pole Hill PowerPlant. The flow is then routed through Pole Hill PowerPlant Afterbay, Rattlesnake Tunnel, Pinewood Lake, and Bald Mountain Pressure Tunnel, and eventually dropped 1,055 feet through two penstocks to Flatiron PowerPlant. This powerplant discharges into Flatiron Reservoir, which regulates the water for release to the foothills storage and distribution system. The afterbay storage in Flatiron Reservoir and the forebay storage in Pinewood Lake enable Flatiron PowerPlant to meet daily power loads.

Southward, the Flatiron reversible pump/turbine lifts water from Flatiron Reservoir, a maximum of 297 feet, and delivers it through Carter Lake Pressure Conduit and Tunnel to Carter Lake. When the flow is reversed, the unit acts as a turbine-generator and produces electrical energy.

The Saint Vrain Supply Canal delivers water from Carter Lake to the Little Thompson River, St. Vrain Creek, and Boulder Creek Supply Canal. The latter delivers water to Boulder Creek and Boulder Reservoir. The South Platte Supply Canal, diverting from Boulder Creek, delivers water to the South Platte River.

Northward, the Charles Hansen Feeder Canal transports water from Flatiron Reservoir to the Big Thompson River and Horsetooth Reservoir. The canal crosses the Big Thompson River in a siphon above the river and highway. Water from the Big Thompson River can be diverted into the canal by Dille Diversion Dam and utilized for power generation at Big Thompson PowerPlant.

C-BT water deliveries and Big Thompson River water to be returned to the river are dropped through a chute from the feeder canal ahead of the siphon crossing, or are passed through the Big Thompson PowerPlant to convert the available head to electrical energy.

Horsetooth Reservoir is located west of Fort Collins between two hogback ridges, where Horsetooth

Dam closes the gap at one end. Soldier, Dixon, and Spring Canyon Dams and Satanka Dike close the remaining gaps. An outlet at Soldier Canyon Dam supplies water to the City of Fort Collins, three rural domestic water districts, Colorado State University, and the Dixon Feeder Canal for the irrigated area cut off from its original water supply by the reservoir. The principal outlet from Horsetooth Reservoir is through Horsetooth Dam into the Charles Hansen Supply Canal. This canal delivers water to a chute discharging into the Cache la Poudre River and to a siphon crossing the river to supply the Windsor Reservoir and Canal Company. A turnout from the Supply Canal supplies the City of Greeley municipal water works. Water is delivered to the river to replace, by exchange, water diverted upstream to the North Poudre Supply Canal, which conveys it to the North Poudre Irrigation Company System.

SUMMARY OF 2004 OPERATIONS

Water year 2004 was, in general, drier over the Colorado River Basin and the Big Thompson River watershed than water year 2003. Winter over northern and central Colorado was relatively mild, with snow accumulations lower than the previous year. Temperatures in general were relatively close to average during the winter over both the West and East Slopes. As the spring season arrived, temperatures began to warm up rapidly. Snowpack totals during water year 2004 were below average, resulting in runoff peaks that were significantly lower than the previous year. But the frequent rainstorms experienced during the spring and summer kept inflows running longer than normal, and the C-BT water demands lower than initially expected. Summer temperatures were relatively mild and reservoir inflows remained above average throughout September and October.

The region which comprises the C-BT experienced relatively wet conditions during most of the spring and summer. A series of weather disturbances continued to feed the runoff keeping streams flowing strong even during late summer and early fall. With precipitation evenly distributed throughout the region during the spring and summer, East Slope demands for C-BT water dropped significantly, especially in the summer. The volume of water stored in the C-BT terminal reservoirs on the East Slope was higher than previously forecasted until early fall.

The runoff in the Green Mountain Reservoir watershed during May and June was not sufficient to allow replacement of the ring seal gate penstock number 1 in July and August. The highest inflow into Green Mountain Reservoir was observed on June 8, 2004, a 24-hour average of 763 ft^3/s. The reservoir level must reach the top of the radial gates before the work on the ring seal gates can begin. Reaching the top of the radial gates allows the water deliveries to continue uninterrupted by using the spillway gates to release water. Green Mountain reached its highest level for the year on July 21, an elevation of 7935.56 feet with a storage volume of 124,916 acre-feet, 15 feet below the top of the radial gates (with the gates completely closed).

During average weather years, peak monthly inflows at Dillon and Green Mountain reservoirs are observed in June. In water year 2004, the highest daily computed inflows, as well as the peak undepleted inflows for both reservoirs, were experienced on June 8.

Lake Granby also experienced a drop in runoff during water year 2004. The total inflow for the water year 2004 was 259,900 acre-feet, compared to 310,900 acre-feet the previous year. That includes water pumped from Willow Creek Reservoir. The highest daily computed inflow was observed on May 8, 2004, a 24-hour average of 2,273 ft^3/s. In water year 2003, the highest computed inflow was 4,251 ft^3/s. The reservoir content never reached the spillway crest during the water year, therefore, no spills were observed. Granby Reservoir began the water year on a steady decline which continued throughout the winter and early spring. Transmountain diversions began in November and continued uninterrupted until late June. Between the middle of November 2003 and late June 2004, water from the West Slope collection system was diverted at an average rate of 445 ft^3/s. By early May 2004, Lake Granby had reached its lowest water surface level for the year at 8229.98 feet above sea level. With Horsetooth and Carter reservoirs full by late June, transmountain diversions were reduced significantly. Only C-BT water needed to satisfy the requirements for water deliveries along the Charles Hansen Feeder Canal was

diverted after late June. The reservoir level began a slow but steady climb in early May, teaching elevation 8239.55 feet on September 1st.

Inflow into Willow Creek Reservoir during water year 2004 was also significantly lower than the previous water year. The highest daily average inflow was reported on May 10, at 196 ft^3/s, compared to1,066 ft^3/s in water year 2003.

The East Slope experienced most of its precipitation in the form of rain. The precipitation occurred mainly during the spring and summer months. Inflow at Lake Estes was lower in water year 2004 than in the previous year, but more evenly distributed throughout the spring, summer and fall months. The total annual inflow dropped from 102,000 acre-feet in water year 2003 to 89,128 acre-feet in 2004. The highest computed daily inflow was 570 ft^3/s on July 1. The highest release of native inflow out of Lake Estes during the summer was 446 ft^3/s, recorded on June 9. A release of 475 ft^3/s took place on September 17, while the Charles Hansen Feeder Canal 930 Section was under maintenance. Due to the clearance at the canal, C-BT water had to be delivered to the Big Thompson River directly from Olympus Dam. The 475 ft^3/s included native water and C-BT water.

Work on all the Horsetooth Reservoir dams was completed in September of 2003. The reservoir was filled to capacity (elevation 5430.00 feet) by late March, 2004. This elevation was maintained for 30 days before normal operations resumed. After the 30-day test was completed, the reservoir elevation was dropped relatively quickly as C-BT water deliveries began to increase. The 30-day test was the last stage in the modernization project at Horsetooth.

Carter Lake reached a storage content of 92,000 acre-feet in early July, its maximum for the water year, but by the end of the summer the reservoir had dropped to less than 60,000 acre-feet. Some water from the reservoir had to be used to supply water users along the Charles Hansen Feeder Canal late in October 2004, as maintenance work was taking place at Adams Tunnel.

The Poudre River experienced higher runoff in water year 2004 than in the previous 5 years. Flows were never extremely high, but they were well distributed throughout the entire water year. The total volume for the water year 2004 was 353,700 acre-feet, compared to 325,300 acre-feet from the year before.

The initial quota declared by the Northern Colorado Water Conservancy District (NCWCD) was 50% or 155,000 acre-feet. The quota was increased in April to 60 % or 186,000 acre-feet, to be used for the allocation of C-BT water to allotment contract holders. Water diversions through Adams Tunnel totaled 243,873 acre-feet for the entire water year.

The seasonal water deliveries for the C-BT between November 2003-October 2004 totaled 174,900 acre-feet. That includes water delivered from the terminal reservoirs (Horsetooth and Carter), from Olympus Dam and through the Trifurcation into the Big Thompson River.

Total C-BT generation for the water year 2004 was below average at 593.5 giga-watt-hours (GWh), or 95% of average. This includes power generated at Green Mountain, Marys, Estes, Pole Hill, Flatiron, and the Big Thompson powerplants.

WATER YEAR 2004 OPERATIONS

Green Mountain Reservoir

Green Mountain Reservoir and Powerplant, completed in 1943, are located south of the town of Kremmling, a few miles upstream of the confluence of the Blue River and the Colorado River in North Central Colorado. The reservoir, with a total capacity of 153,639 acre-feet, provides storage water releases for power production, replacement of out-of-priority depletions, and contract water deliveries.

The powerplant has two units with a total installed capacity of 26 megawatts. The spillway, located on the left abutment, is controlled by three 25 x 22 foot radial gates and is capable of discharging 25,000 ft^3/s.

Water year 2004 began with 81% of average precipitation for the Green Mountain Reservoir watershed between the months of October and January. With the exception of a relatively wet November, the dry fall conditions of 2003 in the Upper Colorado River basin persisted into the winter months of water year 2004. Snowfall in January and February continued to be below normal, bringing the basin's snowpack to 83% of normal by March 1. An extremely warm and dry March reduced the snowpack to only 64% of average by April 1. April precipitation was near normal and cooler temperatures helped to slow the snow melting that began in March. However, the snowpack had fallen to just 55% of normal by May 1. By June 1 most of the measurable snowpack had melted, leaving only 23% of average on the ground by that date. Precipitation for the remainder of the water year was relatively low. The total precipitation for the year over Green Mountain Reservoir's watershed was 15.83 inches, which represents only 89% of average.

Summer temperatures were relatively mild over the region, which contributed to a relatively longer-than-normal runoff season. Inflows were consistently below-average during the runoff season, but higher than expected during the off-season. The highest inflow recorded during the summer was 763 ft^3/s, which was computed on June 8. The total undepleted inflow for water year 2004 at Green Mountain Reservoir was 243,000 acre-feet, significantly lower than the 30-year average of 395,600 acre-feet and a dramatic drop from the water year 2003 total of 400,400 acre-feet. Blue River, Dillon Reservoir, and Green Mountain Reservoir operations for water year 2004 are summarized in Table 2. Gross generation at the Green Mountain Powerplant totaled 27,600,000 kilowatt-hours for water year 2004, 47% of the 30-year average.

Green Mountain Reservoir began water year 2004 with a reservoir content of 117,300 acre-feet, 94% of the 30-year average. By comparison, Dillon Reservoir began the water year with a content of 245,900 acre-feet, 108% of average. With winter releases taking place, primarily for replacement of C-BT depletions, the Green Mountain Reservoir level continued to drop until the spring. The reservoir reached its lowest level by March 14, a volume of 64,939 acre-feet. After March 15, the reservoir level began to rise, reaching its maximum content on July 21. Green Mountain Reservoir's water year 2004 start-of-fill date was declared to be April 8, at which time the reservoir content was 70,103 acre-feet, higher than its start-of-fill target of 65,000 acre-feet.

The water year 2003 carryover storage in the basin's reservoirs improved from that of water year 2002. That served to alleviate some of the concern over the below-average snowpack for the year. In addition, Xcel Energy was in the process of conducting maintenance and automating the Shoshone Powerplant, resulting in it being offline between March 20 and July 16. The removal of the Shoshone call from the river allowed upstream reservoirs to store an estimated 37,000 acre-feet of water. Otherwise, that water would have been called through the reservoirs to meet the call. But, even with the improved carryover storage conditions and the additional water stored due to the Shoshone Powerplant outage, most reservoirs were not projected to fill. For that reason, the Coordinated Reservoir Operations for water year 2004 were not conducted. With the Shoshone Power Plant call being administered at a reduced level in mid-March and completely off in late March and early April, Green Mountain Reservoir was able to store approximately 5,000 acre-feet under its refill rights during the period.

Pursuant to the State Engineers Office's interim Green Mountain Reservoir Fill Policy of July 8, 2004 (Policy 2004-4), Green Mountain Reservoir achieved a "paper fill" on June 25, 2004. On that date, Denver Water and Colorado Springs Utilities (Cities) owed Green Mountain Reservoir 42,056 acre-feet of water for their out-of-priority diversions. A provision of the interim policy allowed Green Mountain Reservoir to continue storing its inflow under a 1955 exchange right after "paper filling" to reduce the amount of water owed by the Cities. Under this provision, Green Mountain Reservoir stored an additional 12,114 acre-feet between June 26 and July 15, reducing the amount owed by the Cities to 29,942 acre-feet. This water was repaid by the Cities in the form of a direct release from Dillon Reservoir and substitution releases from Williams Fork Reservoir and Wolford Mountain Reservoir between August 2 and October 31.

By taking advantage of its senior refill right, Green Mountain Reservoir was able to continue storing some of its inflow after July 15, attaining a maximum physical content for the year of 124,916 acre-feet on July 21. With the reservoir achieving a "paper fill" this year, the 52,000 acre-foot C-BT replacement pool, the 5,000 acre-foot Silt Project reservation, the 66,000 acre-foot Historic Users Pool (HUP), and the 20,000 acre-foot set aside for contracts were all fully available this year.

Releases to augment the water rights of HUP beneficiaries downstream of Green Mountain began on July 1 with a total of 14,166 acre-feet being released for that purpose between July 11 and October 31. Even with below average streamflow conditions throughout the summer, HUP releases to support the Cameo call were limited to 21,120 acre-feet through the conservation efforts of the Grand Valley irrigators. By the middle of August, the dry conditions had resulted in a heavy draw on the HUP, with the content being well below the upper band of the HUP drawdown curve and dropping rapidly. With concern that the HUP might not last through the irrigation season, the Grand Valley irrigators stepped up their conservation efforts and significantly reduced the draw on the HUP. These increased conservation efforts combined with much wetter conditions in the basin, especially during the latter half of September, brought the HUP content above the upper band of the drawdown curves by the end of September. As a result, the managing entities declared that HUP surplus was available on October 5. However, the wetter conditions that prevailed during the latter part of September continued throughout October and resulted in an HUP surplus release of just 119 acre-feet for the entire year. This

release occurred at the rate of 40 ft^3/s over a one and a half day period between October 16 and 17. All of the 119 acre-foot HUP surplus release in 2004 was released under the agreement for the Grand Valley Powerplant, with none being attributable to the Municipal/Recreation Contract. Together, the releases for HUP beneficiaries downstream of Green Mountain, the releases to support the Cameo call, and HUP surplus release totaled 35,405 acre-feet. In addition, there were 929 acre-feet of evaporation from the HUP resulting in an HUP balance of 29,665 acre-feet on October 31.

With below average snowpack runoff conditions, the amounts available to support target flows for the endangered fish were severely reduced. The total available included 20,825 acre-feet from Ruedi Reservoir (the full amount under agreements and contract), 4,555 acre-feet from Wolford Mountain Reservoir (4,555 acre-feet of the 6,000 acre-feet fish pool and none of the 5,412 West Slope mitigation water under the Programmatic Biological Opinion (PBO) for the Recovery Program), 3,788 acre-feet from Williams Fork Reservoir (30-percent reduction of the 5,412 acre-feet East Slope PBO water). In addition, 119 acre-feet was made available from the HUP as surplus deliverable to the Grand Valley Powerplant, indirectly benefiting the 15 Mile Reach or directly to the 15 Mile Reach through the Municipal/Recreational contract.

During the 2004 irrigation season, Green Mountain Reservoir, Ruedi Reservoir, and Williams Fork Reservoir made releases that directly or indirectly benefited flows in the 15-Mile Reach. Releases to benefit the endangered fish in the 15-Mile Reach are also usually made from Wolford Mountain Reservoir. However, as discussed later in this report, the United States Fish and Wildlife Service decided to save the available water in the reservoir this year and carry it over to the 2005 flow augmentation season.

A total of 21 meetings and/or conference calls were held between June 29 and November 3 to manage releases from Green Mountain, Ruedi, Williams Fork, and Wolford Mountain reservoirs, to coordinate irrigation diversions in the Grand Valley, and attempt to maintain the mean monthly target flows in the 15-Mile Reach.

In 2002, landslide concerns at Heeney, Colorado resulted in maximum drawdown rate and minimum water surface elevation limitations on Green Mountain Reservoir. In 2003, the minimum water surface elevation limitation was eliminated and the maximum drawdown rate limitation was revised. The drawdown rate limitations were to be initiated when the reservoir's water surface elevation dropped below 7880.0 feet. Green Mountain did not reach that elevation during water year 2004. Consequently, there were no restrictions imposed on the C-BT operations during the water year. Green Mountain Reservoir finished the year at elevation 7918.05 feet, with 95,400 acre-feet in storage.

Willow Creek Reservoir

Completed in 1953, Willow Creek Reservoir has a total storage capacity of 10,600 acre-feet. The uncontrolled spillway, located at the left abutment, has a maximum flow capacity of 3,200 ft^3/s. The Willow Creek Feeder Canal also begins at the left abutment and it has a capacity of 400 ft^3/s. The canal is used to transfer water to Granby Reservoir. Excess inflow into the reservoir is moved by way of the Willow Creek Feeder Canal and pumped to Lake Granby for storage.

Reservoir carryover storage coming into water year 2004 was 9,000 acre-feet, slightly higher than the 30-year average.

The winter months during water year 2004 were drier than previously anticipated. The February 1, 2003 snow-water content for the Willow Creek Reservoir watershed was reported at only 80 % of average. This resulted in an April-July most probable runoff forecast of only 35,000 acre-feet, which is 13,000 acre-feet below the average most probable forecast. The dry pattern persisted throughout the rest of the spring and most of the summer. By July, summer showers brought some relief to the area and the cumulative precipitation totals improved. The Willow Creek watershed finished the year with a total average precipitation of 101%.

But, the unexpected precipitation at the end of the water year did not improve the conditions. Inflow into the reservoir was less than half of the 30-year average for the water year. Total inflow for the entire water year was only 28,400 acre-feet, compared to 61,300 acre-feet from the previous year. The 30-year average inflow for Willow Creek Reservoir is 59,910 acre-feet. The lowest total computed inflow in the history of the reservoir was recorded in water year 2002: 15,600 acre-feet. The peak daily inflow for the water year was reported on May 10, a 24-hour average of 196 ft^3/s. By contrast, the previous year's peak inflow was reported at 1,066 ft^3/s on May 30.

With the exception of some pumping taking place in November and later in the summer, most of the pumping from Willow Creek Reservoir to Granby Reservoir took place between late March and late May. As expected, pumping from Willow Creek to Granby was also significantly lower than the previous year and only half of the 30-year average. The volume pumped to Granby during water year 2004 totaled 15,100 acre-feet.

During water year 2003, controlled releases to the river made out of Willow Creek Reservoir totaled 10,300 acre-feet. Most of those releases took place between May and July.

Granby Reservoir

Completed in 1950, Granby Reservoir on the upper Colorado River collects and stores most of the water supply for the C-BT. The reservoir stores the flow of the Colorado River as well as water pumped from Willow Creek Reservoir. The reservoir has a total storage capacity of 539,800 acre-feet. The spillway is located on the left abutment. Flows over the spillway are controlled by two radial gates, with a total release capacity of 11,500 ft^3/s. The Granby Pumping Plant has three units with a combined installed capacity of 600 ft^3/s.

Reservoir carryover storage into water year 2004 was 372,000 acre-feet, or 85 % of the 30-year average.

A total of 17.52 inches of precipitation was reported for the Granby Reservoir watershed for water year 2004. The average precipitation for the watershed is 17.35 inches. Total precipitation during the first few months of the water year was lower than average, and the March 1 runoff forecast for April-July was estimated at 132,000 acre-feet, which was 67% of the average. Dry

weather dominated the region until the middle of the summer. A series of weather systems brought some relief to the area. Precipitation totals for the year increased during the months of July, August and September.

The inflow into Granby Reservoir forecasted for the April-July period was 132,000 acre-feet. The actual runoff total was very close to the prediction in April: 128,200 acre-feet. The total inflow for the year was only 175,500 acre-feet, 77,000 acre-feet lower than the 30-year average and nearly half of the total from the previous year. The highest inflow for the season was computed May 8, a 24-hour average of 1,146 ft^3/s, one fifth of the highest inflow computed the previous year.

Granby Reservoir began the year at elevation 8254.87. During the first month and a half, the reservoir level did not drop significantly. But as diversions increased in late November, the reservoir level began to fall rapidly. The plan was to divert over 140,000 acre-feet of water to fill Horsetooth Reservoir and Carter Lake. Work at the Horsetooth dams had been completed in the early fall and it was time to refill the reservoir. The combination of low inflows into Granby and high diversions kept the reservoir content lower than normal. By the late spring, the high diversions had ended and runoff season had started. The reservoir elevation slowly climbed 9 feet between May and late August, before it began to drop once again.

Granby Reservoir never reached its maximum capacity during water year 2004. As has been the case during the last several years, there was no water spilled from Lake Granby during water year 2004. Only 15,100 acre-feet of water were pumped from Willow Creek into Granby during the water year.

Granby Reservoir ended the water year with 275,900 acre-feet in storage. This volume was 162,000 acre-feet below the 30-year average, and almost 97,000 acre-feet lower than the volume recorded on September 30, 2003.

Adams Tunnel

Total diversion through the Adams Tunnel during water year 2004 was slightly higher than the 30-year average. The total volume diverted through the tunnel was 243,800 acre-feet; 15,500 acre-feet higher, and 107% of average. Most of the water diverted between November and early July was directly delivered to Horsetooth and Carter Lake reservoirs. Water was also directly delivered to users along the Charles Hansen Feeder Canal during the summer and early fall months. As usual, the highest flows through Adams Tunnel occurred during the winter months.

Lake Estes

Completed in 1949, Lake Estes on the Big Thompson River provides regulating capacity for power generation purposes. The reservoir has a total capacity of 3,100 acre-feet. It captures the discharge of Estes Powerplant and inflow coming from the Big Thompson River, regulates river flow below the dam, and releases of water to the Foothills Power System via Olympus Tunnel (550 ft^3/s capacity). The Estes Powerplant has three hydroelectric units with a total installed capacity of 45 megawatts. The combined flow capacity for the three units is 1,300 ft^3/s. The

spillway, located on the right abutment, has five radial gates with a total discharge capacity of 21,200 ft^3/s. The center gate has been automated, and is operated remotely from the Loveland Control Center (LCC). During the winter months, C-BT water is diverted through Adams and Olympus tunnels and routed through the Foothills Power System on its journey to terminal storage at Carter and Horsetooth reservoirs. This complete operation is controlled remotely from the LCC.

The winter season of water year 2004 was significantly drier over the Big Thompson River watershed than the previous year. Snowpack was lower than the previous year, which reflected on the peak runoff. By early April, the April-to-July most probable forecast was only 42,000 acre-feet, or 59% of average for the Big Thompson River above Lake Estes.

The runoff for the water year presented a peculiar pattern which created three very similar peaks between early June and early July. Those three peaks were less than one half of the peak from water year 2003. By the time spring arrived, a series of weather systems began to move in bringing frequent showers that improved the runoff conditions. A combination of numerous showers and mild summer temperatures prolonged the runoff season well into the summer, creating multiple peak inflows. These sporadic weather systems continued throughout the summer months and into the early fall. The maximum computed 24-hour inflow into Lake Estes for the water year was only 570 day-second-feet, recorded on July 1. But the actual total inflow for the period April-to-July was significantly higher than the forecasts predicted. The computed native inflow into Lake Estes for that period was 64,476 acre-feet, and the total for the water year was 89,130 acre-feet or 95% of the 30-year average.

The skim operation benefited from the prolonged runoff season. Given the lower- than-normal but consistent runoff conditions, the skim operation was able to capture most of the available water at Lake Estes, as well as at the Dille Tunnel throughout the late spring, summer and even the early fall. The total volume skimmed through the Olympus Tunnel was 29,700 acre-feet, or 87% of the 30-year average.

Foothills System

The Big Thompson River natural inflow into Lake Estes in excess of the minimum outflow required by the State of Colorado below Olympus Dam was diverted as skim water through Olympus Tunnel. Skim operations began on April 9. Diversions through the Adams Tunnel were relatively low during the summer months. That allowed skim operations to begin early and continue throughout the summer months, sometimes at almost maximum capacity. Water diverted was used for power generation at Pole Hill, Flatiron and the Big Thompson Powerplants, and eventually returned to the river below the Big Thompson Canyon. The total volume skimmed through the Olympus Tunnel during water year 2004 was 28,700 acre-feet, compared to only 48,100 acre-feet the previous year. Skim operations for Olympus Tunnel continued uninterrupted from April through September.

Dille Tunnel operations diverted a total of 35,200 acre-feet between the months of May and September. That was 11,100 acre-feet higher than the 30-year average of 24,100. Water diverted through this tunnel serves three purposes; 1) it supplies the City of Loveland and other users with

their priority water from the Big Thompson River; 2) it can also be used as skim water and passed through the Big Thompson Powerplant to generate electricity; 3) in addition, it is used as exchange to supply the Town of Berthoud their priority water. Skim water is returned to the river below the Trifurcation of the Charles Hansen Feeder Canal at the Big Thompson Canyon mouth. River water for the City of Loveland, the Town of Berthoud and for other users in the canal continues to travel north from the Trifurcation. Skim operations through Olympus Tunnel limited the volume of water skimmed through Dille Tunnel. There was no East Slope priority water diverted from the river during water year 2004.

Although skim operations through Olympus and Dille tunnels bypass a significant volume of water, the stream gage at the mouth of the Big Thompson Canyon measured a total of 158,400 acre-feet of water during the water year, the highest in 5 years. The flow at the mouth of the canyon includes water releases from Olympus Dam, native flow from the North Fork of the Big Thompson River and local runoff. The majority of the flow occurred between May and September.

Demands for C-BT water were low during the summer months of 2004. A significant part of the power generated by the powerplants in the Foothills System came from the Skim operations. Water conservation practices across the state, whether voluntary or mandatory, were reflected in the lower demands for C-BT water during June, July and August. The five powerplants in the Foothills System produced 565.6 GWh of power during the water year 2004, which represents over 100% of the 30-year average.

Carter Lake

Completed in 1952 with three dams, Carter Lake has a total storage capacity of 112,200 acre-feet. Inflow of C-BT water to Carter Lake is from the Flatiron Pumping Plant with a capacity of up to 400 ft^3/s.

Carter Lake storage content was 52,600 acre-feet at the beginning of water year 2004, 3,000 acre-feet lower than the 30-year average, and 4,500 acre-feet lower than the year before.

Pumping from Flatiron Reservoir to Carter Lake began in February, before it was interrupted to continue filling Horsetooth. Due to the Safety of Dams tests scheduled for Horsetooth Reservoir, it was urgent to have the reservoir full before the spring runoff. Pumping to Carter Lake resumed in late March, as Horsetooth Reservoir approached its maximum level. The reservoir reached its highest level for the water year on July 1 climbing up to 5740.69 feet, with a storage volume of 91,972 acre-feet. A total of 80,800 acre-feet of water was pumped into Carter Lake during the water year 2004, 1,550 acre-feet more than the 30-year average. This activity required a total of 25,000,000 kilowatt-hours of energy, 98 % of the 30-year average. After July, the pump was kept off-line for the remainder of the water year. Immediately after reaching its maximum elevation, the reservoir level began to drop steadily, as water demands increased. Water deliveries to the Saint Vrain Supply Canal for water year 2004 totaled 65,900 acre-feet. The 30-year annual average water delivery total is 70,150 acre-feet. The month of August had the highest volume delivered, with 11,600 acre-feet. Flatiron Unit 3 was not used for hydropower generation during water year 2004. Carter Lake ended the water year at elevation 5707.89 feet,

with a content of 59,271 acre-feet.

Horsetooth Reservoir

Completed in 1949, with four dams, Horsetooth Reservoir has a total constructed capacity of 156,700 acre-feet. Inflow of C-BT water comes from Flatiron Reservoir via the Charles Hansen Feeder Canal.

Horsetooth began the water year 2004 at elevation 5365.01 feet, with 52,859 acre-feet of water in storage. Since calendar year 2000, ongoing Safety of Dams work has limited the reservoir elevation to a maximum of 5360.00 feet above sea level. This restriction was lifted early fall of 2003 when construction work was completed. Once the restrictions were lifted, the task of re-filling the reservoir began. The operation began in the fall but was interrupted by maintenance schedules and structures under clearance. The operation resumed in late November, 2003 and continued until late March, 2004, with only a 3 week interruption in February. The reservoir was declared full on March 29, 2004, as it reached elevation 5430.00 feet. Horsetooth Reservoir finally reached its highest elevation of the water year on April 10, 2004 with an elevation of 5430.16 feet, a storage volume of 157,063 acre-feet. Water deliveries made through the Charles Hansen Supply Canal totaled 62,600 acre-feet for the year. The highest delivery flows were observed in August, with a total of 18,900 acre-feet. The highest flow through the Charles Hansen Supply Canal was 609 ft^3/s on August 17, 2004. Horsetooth ended the water year at an elevation of 5403.79 feet, with a storage content of 108,099 acre-feet.

FLOOD BENEFITS

Precipitation over the upper Colorado River Basin was evenly distributed throughout the Water Year 2004. While Water Year 2004 was not as dry as 2002, there was enough precipitation during the water year to keep the streams flowing all year. But the area never saw the high runoffs of Water Year 2003. The snowpack was, in general, below average. The highest runoff flows were observed earlier than normal in the water year.

Based on the data collected from the Colorado River Basin, and according to figures provided by the U.S. Army Corps of Engineers, C-BT reservoirs over the west slope did not prevent any flood damages during Water Year 2004.

Runoff along the Big Thompson watershed was also evenly distributed over the late spring through the summer months, and well into the fall. The C-BT reservoirs in the Big Thompson watershed did not face any significant flooding conditions during Water Year 2004. Therefore, there were no flood protection benefits attributed to the C-BT East Slope reservoir during the water year.

Since construction, the C-BT has prevented flood damages totaling $374,900.

C-BT PLANNING AND CONTROL

The C-BT is operated to provide supplemental municipal and industrial water supply, irrigation water supplies, hydroelectric power production, flood control, recreation, fish and wildlife preservation, and other purposes. The C-BT is operated for the purposes for which it was authorized and constructed.

The integrated operation of the C-BT is planned and coordinated by the Bureau of Reclamation, Water Scheduling and Control Group, Eastern Colorado Area Office in Loveland, Colorado. Staff at this office 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 Northern Colorado Water Conservancy District, Upper Colorado and Great Plains Regions of Reclamation, the Department of Energy, and many other local, state, and Federal agencies.

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

The C-BT is operated on a water year basis (October 1 through September 30). The AOP is prepared in January of each year, following the plan's review and necessary public meetings. AOPs are prepared for reasonable maximum and reasonable minimum conditions of water supply and requirements as well as for the most probable runoff conditions. The C-BT is operated to optimize the most probable water supply without jeopardizing operational position should either the reasonable maximum or the reasonable minimum water supply conditions occur. The plan is reviewed and revised as necessary during the year as new information or changing conditions occur. Flexibility is a keynote and a necessity of the plan. Computer programs and models are used by Reclamation to develop the AOP's and water supply forecasts.

OPERATING CRITERIA FOR GREEN MOUNTAIN RESERVOIR

Paragraph 6 of the October 5, 1955, Stipulation and Decree (as amended on October 12, 1955, and filed with the United States District Court for the District of Colorado in civil action Nos. 2782, 5016, and 5017) calls for the development and submission of operating plans for Green Mountain Reservoir and are included as a part of this report. Paragraph 3.e.(1) of the Green Mountain Historic Users Pool (HUP) Operating Criteria, developed pursuant to Paragraph 5.a. of the Stipulation and Agreement of the Orchard Mesa Check Case (case No. 91CW247, Colo. Water Div. 5) calls for the annual development of an HUP Operating Plan which is included in the following criteria.

The provisions that relate to the operation of Green Mountain Reservoir are contained in the:

October 12, 1955, Stipulation and Decree
April 16, 1964, Stipulation and Decree
November 2, 1977, Memorandum Opinion and Order
February 9, 1978, Supplemental Judgment and Decree
Consolidated Case Nos. 2782, 5016, and 5017
Senate Document No. 80, 75th Congress, 1st Session
December 22, 1983, Federal Register, Operating Policy as amended September 11, 1987
September 4, 1996, Stipulation and Agreement of the Orchard Mesa Check Case, Colorado Water Div. 5, 91CW247 and attached HUP Operating Criteria.

Operations will be consistent with these provisions.

The criteria are listed below.

1. Winter operation (November-March)

   a. Bypass inflow to supply downstream vested rights.

   b. Replace water withheld by the C-BT, as required.

   c. Make required releases for West Slope natural flow domestic water users depletions per Green Mountain Operating Policy and Orchard Mesa Check case Settlement.

   d. Make required releases for contract water depletions.

   e. Maximize power generation, while maintaining:

      (1) Adequate storage to meet the anticipated requirements of Senate Document No. 80 and the agreements under the Stipulation and Agreement of the Orchard Mesa Check Case.

(2) A minimum power head, which is consistent with the integrated system power operations.

2. Operation during snowmelt period (April-July)

a. Bypass inflow, as required, to supply downstream vested rights.

b. Replace water withheld by the C-BT, as required.

c. Make required releases for West Slope natural flow irrigation and domestic water users depletions.

d. Reduce releases from traditional levels before and after the peak flow enhancement for the Coordinated Reservoir Operations effort. During peak flow enhancement, release the lesser of inflows or turbine capacity (approx. 1500 ft3/s) for approximately a ten-day period.

e. On or before June 30, each year, assess availability of surplus water in the Historic Users Pool (HUP), on a regular basis, in consultation with the Managing Entities established under the settlement of the Orchard Mesa Check Case.

f If a surplus condition is declared in the HUP, make releases, under agreement, to the Grand Valley PowerPlant to the lesser of the amount of the surplus or the capacity of the Grand Valley PowerPlant canal system or the amount needed to generate power at the Grand Valley PowerPlant.

g. Release surplus amounts to other needs downstream.

h. Make required releases for contract water depletions.

i. Fill without spilling.

j. Maximize power operation consistent with 1.e.

k. Make releases as outlined in the above referenced documents.)

3. Operation after snowmelt period (August-October)

a. Bypass inflow as required, to supply downstream vested rights.

1 By the use of these criteria for current operating purposes, the United States does not intend to imply any definition of rights and obligations. The order in which these criteria are listed does not reflect any intended priority.

b. Replace water withheld by the C-BT, as required.

c. Make required releases for West Slope natural flow irrigation and domestic water users depletions.

d. Assess availability of surplus water in the Historic Users Pool (HUP), on a regular basis, in consultation with the Managing Entities established under the settlement of the Orchard Mesa Check Case.

e. If a surplus condition is declared in the HUP, make releases, under agreement, to the Grand Valley PowerPlant to the lesser of the amount of the surplus or the capacity of the Grand Valley PowerPlant canal system or the amount 'needed to generate power at the Grand Valley PowerPlant.

f. Make required releases for contract water depletions.

g. Release to other surplus amounts.

h. Maximize power operation consistent with I.e.

i. Make releases as outlined in the above referenced documents.

[1] By the use of these criteria for current operating purposes, the United States does not intend to imply any definition of rights and obligations. The order in which these criteria are listed does not reflect any intended priority.

GREEN MOUNTAIN HISTORIC USERS POOL AND THE ORCHARD MESA CHECK CASE SETTLEMENT

Background and Authority

The Orchard Mesa Check (Check) is a structure below the common afterbay of the Orchard Mesa Irrigation District (OMID) Pumping Plant and the federal Grand Valley PowerPlant in the Grand Valley of Colorado. The operation of the Check provides the ability to raise the water level in the common afterbay to a level, which causes water to flow through the bypass channel and return to the Colorado River upstream of the Grand Valley Irrigation Company (GVIC) diversion dam.

Operation of the Check was determined to constitute an 'exchange' of water whereby water destined for the senior GVIC irrigation water rights is borrowed for pumping and hydroelectric power generation purposes and returned to GVIC for irrigation use. Operation of the Check influences the supply of water available to Grand Valley irrigation systems; to the Grand Valley PowerPlant for power production; Green Mountain Reservoir releases; and the flow in the 15-Mile Reach of the Colorado River. The 15-Mile Reach is that section of the Colorado River from the GVIC diversion dam to the confluence of the Gunnison River and has been designated critical habitat by the Upper Colorado River Endangered Fish Recovery Program.

The Check has been operated on an informal basis without a decreed right since approximately 1926 to manage flows in the Colorado River for the benefit of the United States, Grand Valley Water Users Association (GVWUA), and OMID (Co-applicants). In the late 1980's, a hydropower development was proposed in a reach of the Colorado River between the Grand Valley Diversion Dam, the point where the exchange water is diverted, and the GVIC diversion dam where the exchange water is returned. The Co-applicants were concerned that a water right awarded for this development would have the ability to interfere with the exchange of water. In response to this potential threat to the continued operation of the exchange, the Co-applicants filed an application in State Water Court on December 30, 1991, for approval of an exchange of water. This case (Water Division 5, Case No. 91CW247) was informally known as the Orchard Mesa Check Case. Resolution of the case resulted in a negotiated Stipulation and Agreement entered into the District Court, Water Division No. 5, State of Colorado, on September 4, 1996.

Overview of the Stipulated Settlement

The settlement contains two major components: the Stipulation and Agreement and the Green Mountain Reservoir Historic Users Pool Operating Criteria (Operating Criteria). The Operating Criteria further defines operation of the Green Mountain Reservoir Historic Users Pool (HUP) consistent with Senate Document 80 and the 1984 Operating Policy. The parts of the Stipulation and Agreement pertinent to the operation of the HUP are summarized below:

As part of the Stipulation and Agreement the Co-applicants and GVIC agree not to exercise their irrigation rights against any upstream HUP beneficiary provided that the Check is physically operable; there is at least 66,000 acre-feet of water in storage in the Green Mountain Reservoir HUP, or approved substitute storage reservoir, when Green Mountain Reservoir storage rights cease to be

in priority; and the water rights for the Shoshone PowerPlant continue to be exercised in a manner consistent with their historical operation. (Section 3.b. of the Stipulation and Agreement)

The Stipulation and Agreement also provides that Reclamation will declare surplus water which is in excess of the needs of HUP beneficiaries for a given water year. Water declared surplus might be delivered through agreements to beneficial uses in Western Colorado. This is to be done in accordance with the provisions of the HUP Operating Criteria, which are summarized below:

Management of the HUP Under the Operating Criteria

The management of the HUP is accomplished through the process defined in Sections 3.d. and 3.e. of the Operating Criteria. This process requires the development of this Annual HUP Operating Plan on or before June 30 of each year.

The Annual HUP Operating Plan is developed by the Bureau of Reclamation, in consultation with the Grand Valley Water Users Association, the Orchard Mesa Irrigation District, the Grand Valley Irrigation Company, the Division 5 Engineer, the Colorado Water Conservation Board and, Fish and Wildlife Service. These entities are collectively known as the 'Managing Entities'. The Managing Entities agree to make a good faith effort to develop an Annual HUP Operating Plan that is unanimously supported. However, the Bureau of Reclamation reserves the right to establish a release schedule, should unanimous consent be unattainable.

The Annual HUP Operating Plan is based upon actual HUP storage conditions; projected runoff forecasts; operational and climatological conditions; projected irrigation demands; and, 15-Mile Reach flow needs. It is expressly recognized, however, that in some years, release of the entire HUP by the end of the irrigation season will not be necessary or possible.

On or before June 30 of each year, the Bureau of Reclamation assembles initial information on storage in the HUP and comparative runoff years. Based upon the information assembled, a meeting is held with the other Managing Entities. During this meeting, a review of the forecasts is analyzed, and initial determinations of the level of "checking" required to preserve water in the HUP, as well as any determination of water surplus to HUP beneficiaries needs are made.

The HUP operations are reviewed and modified by the Managing Entities as necessary to respond to changing conditions. Subsequent meetings or conference calls are held on an as needed basis to reexamine HUP storage conditions, runoff forecasts, climatological conditions, irrigation demands, 15-Mile Reach flow needs, and other operational conditions. Based upon this information, the Managing Entities adjust the checking. They also determine the water surplus for HUP beneficiary needs, as well as the release of such water. During periods of below average river flows, review meetings or conference calls may be held as frequently as every week.

This mechanism provides a way to integrate management of releases from the HUP with operation of the Check to accomplish the purposes of the Operating Criteria. The mechanism is also used to integrate releases from the HUP with releases for the endangered fish from other reservoirs including Ruedi and Wolford Mountain.

OPERATION SKIM

Big Thompson River water in excess of the minimum requirements, as recommended by the State of Colorado Division of Wildlife and the United States Fish and Wildlife Service, is diverted at Lake Estes into the Foothills System to be used for power generation. This operation is known as operation "skim." The amount diverted depends on the flow at the Big Thompson River and the tributaries above Lake Estes, C-BT water imported through the Adams Tunnel, and the capacity of the Foothills System.

The water taken from the Big Thompson River can be used for power generation immediately. It can also be held in storage and replaced to the river with water from other sections of the system, depending on the power requirements. In general, water taken from the Big Thompson River at a variable rate, on a given date, is returned to the river at a flat rate, on the following day.

Operation "skim" and storage of surplus water from the Big Thompson River in C-BT reservoirs are managed according to the AOP and as prescribed by the ECAO Water Scheduling staff.

During water year 2004, a total of 28,700 acre-feet of water was diverted through Olympus Tunnel for "skim" operations. Skim operations through Olympus Tunnel took place between April and September. Dille Tunnel diversions totaled 35,200 acre-feet for water year 2004.

TABLE I

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	9,779	10,553	6,675	Elevation of pump canal head-works
Lake 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	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 ft^3/s
Pinewood Lake	416	1,765	2,181	613	Minimum elevation for power generation
Flatiron	125	635	760	324	Minimum elevation to release 550 ft^3/s
Carter Lake	3,306	108,924	112,230	306	Lowest outlet elevation
	7,003	149,732	156,735	17,600	Elevation on highest delivery works
Total	94,343	903,373	998,220	167,970	

1/ Storage capacity below elevation of lowest outlet
2/ Total storage minus dead storage
3/ Not determined

COLORADO-BIG THOMPSON PROJECT

WATER YEAR 2004 — MONTHLY SUMMARY OF BLUE RIVER OPERATIONS — (ACRE-FEET)

	INI	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
UNDEPLETED RUNOFF ABOVE GREEN MTN. RESERVOIR		13,700	9,600	8,800	9,000	8200	12,700	16,800	43,500	53,600	34,500	17,800	15,100	243,300
UNDEPLETED RUNOFF ABOVE DILLON RES.		7,500	5500	4,800	5,000	4,500	8200	8500	28,100	28,700	17,100	9,700	8200	131,800
PERCENT OF TOTAL UN-DEPLETED RUNOFF ORI. GINATING ABOVE DILLON		0.547	0.573	0.545	0.556	0.549	0 488	0.506	0.600	0.535	0.496	0.545	0.543	0.542
DEPLETIONS BY 1929 COLORADO SPRINGS RIGHT		0	0	0	0	0	0	28	152	253	193	46	19	691
DEPLETIONS BY 1948 COLORADO SPRINGS RIGHT		45	-199	0	0	0	0	161	1535	3311	1426	0	-16	6263
INFLOW TO DILLON		7,500	5,700	4,800	5,000	4,500	6,200	8,300	24,400	25,100	15,500	9600	8,200	124,800
DILLON STORAGE (1000 AF)	245.9	231.3	226.2	223.6	221.6	217.5	211.8	209.6	223.1	230.5	232.9	228.2	218.5	
ROBERTS TUNNEL DIVERSIONS		14,800	5,800	2,800	2,500	4,400	7,900	7,500	7,200	14,000	7,200	7,600	9,300	91,000
DILLON OUTFLOW TO THE RIVER		6,100	4,200	4,500	4,500	4,200	4,000	3,000	3,100	3,000	4,800	5,600	7,500	54,500
TOTAL DEPLETIONS BY DENVER		1,300	1,500	300	500	300	2,200	5,200	21,100	22,000	10,600	4,000	600	69,600
RUNOFF ORIGINATING BETWEEN DILLON AND GREEN MTN RESERVOIR		6,300	4,200	4,100	4,100	3,700	6,500	8,500	17,700	25,400	17,600	8,300	7,000	113,400
ACTUAL INFLOW TO GREEN MTN RESERVOIR		12,300	8,300	8,600	8500	7,900	10,400	11,400	20,600	28,100	22,200	13,700	14,500	166,500
GREEN MTN RESERVOIR STORAGE (1000 AF)	117 3	76.0	74.3	71.9	69.0	66.3	68.6	75.8	92.0	115.9	123.3	105.3	95.4	
TOTAL GREEN MTN OUTFLOW		53,300	9,900	11,000	11,400	10,500	8,100	3,900	3,900	3,600	14,000	31,000	23,900	184,500

PICK-SLOAN MISSOURI BASIN PROGRAM
WESTERN DIVISION WATER AND POWER SYSTEM

COLORADO-BIG THOMPSON PROJECT

2004 ACTUAL OPERATIONS

WATER IN 1000 ACRE-FEET ... ... ENERGY IN GW-I

	INITIAL OR TOTAL	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
GREEN MOUNTAIN RESERVOIR													
Depleted Watershed Inflow	166.5	12.3	8.3	8.6	8.5	7.9	10.4	11.4	206	28 1	22.2	13.7	14 5
Turbine Release	158.2	42.4	9.8	11.0	11.4	10.5	6.2	0.0	0.0	0.0	12.5	30.5	23.9
Bypass	26.5	10.9	0.1	0.0	0.0	00	1.9	3.9	3.9	36	1.6	06	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	117.3	76.0	743	71.9	69.0	66.3	68.6	75.8	92.0	115.9	123.3	105.3	95.4
Kwh/AF		209.9	132.6	118.2	114 0	114.3	112.9	00.0	00.0	00.0	184.0	200.0	188.3
Generation	276	8.9	1.3	1.3	1.3	1 2	0.7	0.0	0.0	0.0	2.3	6.1	4.5
WILLOW CREEK RESERVOIR													
Inflow	28.4	1.0	1.0	0.9	0.9	0.8	1.7	3.5	8.2	4.5	2.8	1.6	1.5
Release to River	10.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	1 7	2.8	2.2	0.4	0.4
Pumped to Granby	15.1	0.0	2.4	0	0	0	24	2.6	5.4	0.2	05	0.6	1.0
End of Month Content	9 0	9.4	7.5	60	8.4	8.8	7.5	7.8	8.4	9.5	9.4	92	9.6
Pump Energy	3.0	0.0	0.5	0.0	0.0	0.0	0.5	0.5	1.1	0.0	0.1	0.1	0.2
GRANBY - SHADOW MOUNTAIN - GRAND LAKE													
Natural Watershed Inflow	175.5	4.2	3.8	39	4.1	3.2	7.3	14.1	41 3	47.9	24.9	11.0	9.8
Total Inflow into Granby	1312	4.0	6.4	4.2	34	26	6.9	105	29.9	29.1	19.6	7.8	6.8
Granby Fish Release	24.2	1.2	1 2	1.2	1.2	1.2	1 2	1,3	4.3	3.9	4 1	2 1	1.3
Granby Seepage	1.7	02	02	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0 1	0.1
Granby Spill	00	0.0	0.0	00	0.0	a o	00	00	0.0	0.0	0.0	0.0	0.0
Adams Tunnel	243.8	2.5	22.7	305	306	302	27.2	253	23.5	24.5	52	55	16.1
Granby End of Month content	372.0	3705	3523	324.2	296.2	268.0	2488	237.7	254.3	2704	283.7	284.7	2759
SM-GL End of Month Content	177	17.8	17.8	178	17.9	17.7	17.8	178	174	17.9	17.9	17.7	17.9
Pumped from Granby	189.1	2.7	230	30.8	30.0	29.5	24.6	194	68	6.9	0.2	2.4	12.8
Granby Pump Kwh/AF		148.2	160.9	165.6	1700	1763	182.9	185.6	191.2	173.9	000.0	1667	179.7
Granby Pump Energy	32.8	04	37	5.1	5.1	5.2	4.5	3.6	1.3	1.2	0.0	0.4	23

PICK-SLOAN MISSOURI BASIN PROGRAM
WESTERN DIVISION WATER AND POWER SYSTEM
COLORADO-BIG THOMPSON PROJECT

2004 ACTUAL OPERATIONS

WATER IN 1000 ACRE-FEET ENERGY IN GWH

	INITIAL OR TOTAL	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MARYS LAKE - ESTES - FLATIRON													
Adams Tunnel Water	243.8	2.5	22.7	30.5	30.6	30.2	27.2	25.3	23.5	24.5	5.2	5.5	16.1
Marys Lake Generation	38.7	0.2	4.0	5.4	as	5.4	47	4.5	4.1	4.4	0.5	00	0.0
Estes Generation	107.7	1.0	9.9	13.2	132	140	12.4	11.3	10.6	11.0	2.2	2.0	6.9
Divertible Big-Thompson	44.8	0.0	04	0.3	0.0	0.0	0.2	2.2	91	16.5	12.8	2.1	1.2
Diverted Big-Thompson Water	29.7	0.0	0.0	00	0.0	0.0	0.0	1.1	7.9	7.5	11.3	1.6	0.3
Olympus Tunnel	262.2	0.1	19.8	30.9	30.7	30.1	27.4	26.7	31.6	32.5	17.2	7.5	7.7
Pole Hill Generation	180.1	0.0	13.5	22.1	22.0	21.7	17.2	19.0	22.6	23.4	10.9	3.8	3.9
Flatiron 1 & 2 Generation	229.1	0.3	17.0	28.3	27.5	27.7	23.6	23.4	27.6	28.5	13.9	5.7	5.6
Flatiron 3 Turbine Release	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flatiron 3 Kwh/AF Gen.		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 Generation	0.0	0.0	0.0	00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flatiron 3 Pumping	808	0.0	0.0	0.0	O./	17.6	0.3	21.9	20.9	190	0.8	0.0	0.2
Flatiron 3 Kwh/AF Pump		0.0	0.0	0.0	0.0	284 1	333.3	301.4	315.8	331.6	375.0	0.0	500.0
Flatiron 3 Pump Energy	25.0	0.0	0.0	0.0	0.0	5.0	0.1	6.6	66	6.3	0.3	0.0	0.1
CARTER LAKE													
Pumped from Flatiron	80.8	0.0	0.0	0.0	0.1	17.6	0.3	21.9	20.9	19.0	0.8	0.0	0.2
Release to Flatiron	0.0	0.0	0.0	0.0	0.0	0.0	0.0	00	0.0	0.0	0.0	0.0	0.0
Irrigation Delivery	64.7	9.6	1.3	1.3	1.4	1.1	1.6	4.6	9.1	6.3	7.1	11.3	10.0
Evaporation & Seepage	1,7	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.2	0.2	0.3	0.2
End of Month Content	52.6	42.5	40.8	394	37.8	54.0	52.6	69.1	80.3	91.5	83.5	70.5	59.3
BIG THOMPSON POWERPLANT													
Diverted Dille Tunnel Water	35.2	0.6	0.1	0.0	0 0	0.0	0.0	0.0	5.4	11.0	7.6	7.8	2.7
Irrigation Delivery	27.8	2.3	3.2	0.2		0.0	0.0	0.2	0.2	0.5	2.9	1.0	4.2	13.1
Turbine Release	67.2	0.0	0.0	0.0		00	0.0	0.0	0.0	12.1	19.9	19.3	11.0	4.9
Generation	10.0	0.0	00	0.0		0.0	0.0	0.0	0.0	1.8	3.0	3.0	1 5	0.7
HORSETOOTH RESERVOIR													
Hansen Feeder Canal Inflow	134.4	1.1	18.7	30.6		30. 0	11.7	26.9	2.4	2.0	31	2.5	2.3	2.3
Irrigation Delivery	62.6	47	1.2	1.1		1.4	1.2	1.4	2.5	12.3	5.8	8.2	18.9	3.9
Evaporation	3.8	0.3	0.1	0.0		0.0	00	0 1	0.4	0.8	0.6	0.7	0.5	0.3
End of Month Content	52.9	47.8	64.7	93.7		122.1	132.0	156.7	155.7	143.0	137.9	130.4	111.2	108.1
TOTAL CBT DELIVERY	155.3	16.6	5.8	27		28	2.3	3.2	7.3	21.8	15.0	16.3	34.5	27.0

PICK-SLOAN MISSOURI BASIN PROGRAM
WESTERN DIVISION WATER AND POWER SYSTEM
COLORADO-BIG THOMPSON PROJECT

2004 ACTUAL OPERATIONS

WATER IN 1000 ACRE-FEET ENERGY IN GWh

	INITIAL OR TOTAL	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
BASE GENERATION													
Green Mountain	276	8.9	1.3	1 3	1.3	1.2	0.7	00	0.0	0.0	2.3	6.1	4.5
Flatiron 3	00	0.0	0.0	0.0	0.0	00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Big Thompson	10.0	0.0	0.0	0.0	0.0	0.0	0.0	00	1.8	3.0	30	1 5	0.7
TOTAL	37.6	8.9	1.3	1.3	1.3	1.2	0.7	0.0	1.8	3.0	5.3	76	52
LOAD FOLLOWING GENERATION													
Marys Lake	38.7	0.2	4.0	54	5.5	54	4.7	4.5	4.1	44	0.5	0.0	0.0
Estes	107.7	1.0	9.9	13.2	13.2	14.0	12.4	11.3	10.6	11.0	2.2	2.0	6.9
Pole Hill	180.1	0.0	13.5	22.1	22.0	21.7	17.2	19.0	22.6	23.4	10.9	38	3.9
Flatiron 1 82	229.1	0.3	17.0	28.3	27.5	27.7	23.6	23.4	27.6	26.5	13.9	5.7	5.6
TOTAL	555.6	1.5	44.4	69.0	68.2	68.8	5T9	58.2	64.9	67.3	27.5	11.5	16.4
PUMP ENERGY													
Willow Creek	38	0.0	0.5	0.0	0.0	0.0	0.5	as	1.1	00	0.1	0.1	az
Granby	32.8	0.4	37	5.1	5.1	5.2	45	3.6	1.3	1.2	0.0	04	2.3
Flatiron 3	25.0	00	00	00	0.0	5.0	0.1	6.6	6.6	6.3	0.3	0.0	0.1
TOTAL	60.8	0.4	42	5.1	5.1	10.2	5.1	107	9.0	7.5	0.4	0.5	2.6
TOTAL GENERATION	593.2	I 04	45.7	70.3	69.5	70.0	58.6	58.2	66.7	70.3	32.8	19.1	21.6
TOTAL GENERATION MINUS PUMP	5374	100	41.5	652	64.4	59.8	53.5	47.5	577	628	32.4	18.6	190

COLORADO-BIG THOMPSON PROJECT

FLOOD DAMAGE PREVENTED IN WATER YEAR 2004

	Cumulative Total Prior to WY2003	WY2004	Cumulative Total Current
Granby	$228,000	$0.00	$284,700
Green Mountain	$92,000	$0.00	$94,200
Total	$320,000	$0.00	$378,900

WESTERN DIVISION POWER SYSTEM
WATER YEAR 2004 — GENERATION AND PUMP ENERGY

The Western Division Power System (System) boundaries are illustrated in Exhibit 1. Hydropower generation was above average across the East Slope system of the Colorado-Big Thompson Project (C-BT). Green Mountain Powerplant generation was limited to the water delivered to the Colorado River. Green Mountain produced 27.6 gigawatt-hours (GWh) during water year 2004, 47% of its average yearly production, and 16% higher than the previous year.

During water year 2004, the Western Division System's total gross generation for load was 1802.8 GWh, 65% of the 30-year average of 2768.8 GWh. Dry conditions limited the water available for generation at many of the powerplants. The C-BT system had sufficient water throughout the water year to keep its powerplants running consistently. The total of 593.2 GWh during WY2005 represented over 95% of the 30-year average for the six powerplants. After subtracting pumping energy from the gross Western Division System generation for load, the net generation for load during the water year 2004 was 1209.6 GWh, 48% of the 30-year average of 2525.6 GWh. The total generation for load is the gross generation less the total C-BT pumping; gross generation includes one-half of the Yellowtail generation. The total Western Division System load includes firm energy deliveries, C-BT use energy, support energy, plant station service, and an estimate of transmission system losses. Table 1 includes the totals for every powerplant in the system. Table 3 shows monthly generation and pumping energy, by plant, as well as monthly System loads forwater year 2003. The total energy that was required to operate the pumps in the System (Table 2) during water year 2004 was 517.8, compared to 513.9 GWh the previous year.

The Western Area Power Administration's Loveland Area Office sold 2,717,357 MegaWatt-Hours (MWh) of power during water year 2004, with the price of $66,135,770. Energy deficits were covered by a combination of scheduled interchange energy, use of the Mount Elbert pumped storage plant, and power purchases. The Western Area Power Administration's Loveland Area Office power purchases totaled $54,967,000 for water year 2004, a total of 1,239,077 MWh.

WESTERN DIVISION SYSTEM
GROSS GENERATION - WATER YEAR 2004
(Energy in GWh)

Powerplant	Accumulated Gross Generation		1/
	WY 2004	Yearly Avg.2/	Percent of Avg.
Green Mountain	27.6	59.0	47
Marys Lake	38.7	38.5	101
Estes	107.7	101.5	106
Pole Hill	180.1	178.5	101
Flatiron 1 & 2	229.1	232.5	99
Big Thompson	10.0	12.2	82
Seminoe	63.5	148.0	43
Kortes	84.0	155.0	54
Fremont Canyon	144.7	261.8	55
Alcova	70.3	130.1	54
Glendo	46.4	89.5	52
Guernsey	10.2	22.4	46
Boysen	30.1	80.7	37
Heart Mountain	9.1	13.1 3/	69
Buffalo Bill	47.7	82.6 3/	58
Shoshone	18.5	21.7 3/	85
Spirit Mountain	17.0	13.7 4/	124
Mt. Elbert	355.2	169.0 5/	210
Yellowtail4/	322.6	959.0 6/	34
Total	1812.8	2768.8	65

1/ October-September
2/ 30-year average
3/ 1993-2000 average
4/ 1995-2000 average
5/ 1990-1999 average
6/ 1971-1990 average; one-half of the Yellowtail energy is marketed through the Western Division System. The other half is marketed through the Eastern Division System.

TABLE 2

WESTERN DIVISION SYSTEM
PUMP ENERGY-WATER YEAR 2004

Pumping Plant	October-September Pump Energy		
	WY2004 (GWh)	Avg. 1/ (GWh)	Percent of Avg.
Willow Greek	3.0	5.7	53.0
Granby (Farr Plant)	32.8	29.8	110.0
Flatiron 3	25.0	25.6	98.0
Mt. Elbert	457.0	182.1 2/	251.0

1/ 30-year average
2/ 1990-1999 average

TABLE 3

WATER YEAR END

FY03 ACTUAL WESTERN DIVISION POWER SYSTEM GROSS GENERATION LESS

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Mt. Elbert *	3.7	1.3	0.3	0.0	1.7	1.6	1.4	6.2	6.5	2.5	0.4	0.5	26.4
Green Mtn.	0.5		0.8	0.8	1.0	0.9	0.2	0.0	0.0	1.2	4.5	6.5	18.1
Willow Cr. pump	0.3	0.0	0.0	0.0	0.0	0.0	0.9	3.4	3.3	0.4	0.2	0.3	8.8
Parr pump	0.1	4.5	5.6	5.3	3.0	2.1	0.0	0.0	0.0	0.4	3.7	3.1	27.8
Marys Lake	0.0	4.0	4.9	4.6	2.4	0.3	0.0	0.0	0.0	0.0	0.0	0.1	16.3
Estes	0.0	9.9	12.2	11.7	6.2	4.3	0.3	0.6	3.0	5.4	12.4	10.0	76.0
Pole Hill	0.6	15.0	19.5	18.5	9.0	6.5	1.3	8.3	20.7	16.3	20.9	17.0	153.6
Flatiron 162	1.7	17.4	24.0	22.8	12.3	8.3	2.3	11.9	25.8	20.3	25.8	20.3	192.9
Flatiron 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flatiron 3 pump	0.0	4.1	6.7	6.4	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.5
Big Thompson	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	3.4	2.2	1.4	1.3	10.1
Seminoe	4.2	4.2	4.2	3.8	3.4	3.6	3.7	11.4	15.7	16.5	6.9	3.8	81.4
Kortes	5.5	5.6	5.8	5.3	5.1	5.4	5.4	14.3	17.0	17.7	8.2	5.2	100.5
Fremont Canyon	0.5	4.5	4.6	4.5	4.0	8.2	15.7	13.7	29.9	40.7	19.1	6.9	152.3
Alcova	3.6	2.9	2.8	2.9	2.5	3.9	5.7	5.7	14.5	20.7	8.6	2.7	76.5
Glendo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	8.5	22.5	14.7	0.0	46.7
Guernsey	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	0.4	4.5
Pilot Butte *[1]	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.0	0.2	2.2
Boysen	0.3	0.6	0.8	0.8	0.7	0.9	1.8	3.3	5.0	5.1	3.8	2.3	25.4
Shoshone	0.6	0.9	0.0	0.1	0.7	1.0	1.4	2.0	2.2	2.2	2.1	1.9	15.1
Buffalo Bill	0.7	0.0	0.0	0.0	0.0	0.0	1.6	4.7	10.7	11.9	9.5	5.4	44.5
Spirit Mtn.	0.8	0.0	0.0	0.0	0.0	0.0	0.0	1.4	3.2	3.3	3.2	3.0	14.9
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.	0.8	0.0	0.0	0.0	0.0	0.0	1.4	3.6	3.2	3.2	3.0	3.0	18.2
Yellowtail/2	8.6	10.1	12.2	13.1	12.1	12.8	11.0	10.0	15.8	20.8	17.7	13.1	157.0
Fry-Ark	3.7	1.3	0.3	0.0	1.7	1.6	1.4	6.2	6.5	2.5	0.4	0.5	26.4
CDT	2.4	39.4	49.1	46.7	25.6	18.2	3.2	19.2	49.6	44.6	61.1	51.8	410.9
North Platte	13.8	17.2	17.4	16.5	15.0	21.1	30.5	46.1	85.6	118.1	61.6	19.0	461.9
Bighorn	12.3	11.7	13.0	14.0	13.5	14.7	17.2	25.0	40.1	46.9	40.3	28.9	277.3
TOTAL GEN	32.2	69.6	79.8	77.2	55.8	55.6	52.3	96.5	181.8	212.1	163.3	100.2	1176.5
TOTAL LOAD	162.8	162.6	177.5	173.2	137.3	149.9	171.5	179.6	205.6	255.8	206.3	152.7	2134.8
SURPLUS/DEFICIT	-130.6	-93.0	-97.7	-96.1	-81.5	-94.3	-119.2	-83.1	-23.8	-43.7	-43.0	-52.5	-958.3

WESTERN DIVISION - PICK-SLOAN MISSOURI BASIN PROGRAM

POWERPLANT DATA

Facility	No. Units	Capacity Each Unit	Total Installed Capacity	Normal Operating Head (ft)	Output at Rated Head (ft3/s)
Green Mountain	2	13,000	26,000	192-262	1,660
Marys Lake	1	8,100	8,100	202-217	550
Estes	3	16,500	49,500	551-571	1,300
Pole Hill	1	33,250	33,250	830-838	550
Flatiron	2	43,000	86,000	1,096- 1,118	1,070
(Flatiron 1/)	1	8,500	8,500	158-287	440
Big Thompson	1	5,300	5,300	183- 184	350
Seminoe	3	15,000	45,000	97-227	2,850
Kortes	3	12,000	36,000	192-204	2,700
Fremont Canyon	2	33,000	66,000	247-363	2,200
Alcova	2	18,000	36,000	153-165	2,200
Glendo	2	19,000	38,000	73-156	2,800
Guernsey	2	2,400	4,800	89-91	820
Pilot Butte2/	2	800	1,600	-- --	---
Boysen	2	7,500	15,000	72-112	2,415
Shoshone3/	1	3,000	3,000	-- --	---
Buffalo Bill3/	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		

TABLE 7

WESTERN DIVISION - PICK-SLOAN MISSOURI BASIN PROGRAM

PUMPING PLANT DATA

	Pumping Units		Plant Rating		
Facilities	No	Capacity (ft3/s)	Normal Operating Head (ft)	Installed (Hp)	Kwh to Pump 1-Acre-ft at Maximum Head
Granby	3	600	92-186	18,000	227
Willow Creek	2	400	167-169	18,000	227
Flatiron	11/	440	173-287	13,000	391
Mt. Elbert	2	5,690	447-477	340,000	620

LAP GROSS GENERATION LESS PUMPING
WATER YEAR 2004