This report concerns the operation of all Bureau of Reclamation (Reclamation) facilities in the North Platte River Drainage Basin above and including Guernsey Dam as well as the four Inland Lakes near Scottsbluff, Nebraska. This area of the North Platte River Drainage Basin is simply referred to in this report as the Basin.

References to average in this document will refer to the average of the historical record for the years 1978-2007, except for water year 2009 information which uses the years 1979-2008. In each coming year this period will be advanced by 1 year to maintain a running 30-year average.

INTRODUCTION

The System of dams, reservoirs, and powerplants on the North Platte River (referred to as the "System" in this text) is monitored and in most cases operated and managed from the Wyoming Area Office (WYAO) in Mills, Wyoming. The operation and management of the System is aided by the use of a Programmable Master Supervisory Control, computerized accounting process, extensive Hydromet stations, control crest measurement weirs at gaging stations, SNOTEL stations, and a snowmelt runoff forecasting procedure which is used by the Water Management Branch. The System consists of a number of individual water resource projects that were planned and constructed by Reclamation. The individual projects and features are operated as an integrated system to achieve efficiency and to produce increased multi-purpose benefits. The drainage basin which affects the System covers an area from northern Colorado to southeastern Wyoming, encompassing 16,224 square miles. Storage reservoirs affected by the System include four off-stream reservoirs known as the Inland Lakes in western Nebraska as shown in Figure 21.

Approximately 70 to 80 percent of the annual North Platte River streamflow above Seminole Dam occurs from snowmelt runoff during the April-July period. Primary water demand is irrigation, and the period of delivery of irrigation water normally extends from May through September. Figure 20 represents historical watershed runoff above Pathfinder Reservoir from 1906 through 2008. The System furnishes irrigation water to over 440,000 acres of land in Wyoming and Nebraska.

The System includes the Kendrick Project (formerly Casper-Alcova) in Wyoming; with major features of the project being Seminole Dam and Powerplant, Alcova Dam and Powerplant, and Casper Canal. Project lands lie in an irregular pattern on the northwest side of the North Platte River between Alcova Reservoir and Casper, Wyoming. The North Platte Project in Wyoming and Nebraska consists of Pathfinder Dam and Reservoir, Guernsey Dam, Reservoir and Powerplant, Whalen Dam, Northport, Fort Laramie, and Interstate canals and four off-stream inland reservoirs on the Interstate Canal. The Kortes Unit of the Pick-Sloan Missouri Basin Program (PS-MBP) consists of Kortes Dam, Reservoir and Powerplant, in a narrow gorge of the North Platte River 2 miles below Seminole Dam. The Glendo Unit of the PS-MBP is a multiple-purpose natural resource development. It consists of Glendo Dam, Reservoir and Powerplant, Fremont Canyon Powerplant, and Gray Reef Dam, and Reservoir which is a re-regulating reservoir.
Major rivers which affect the water supply in the System are the North Platte River in Colorado, and Wyoming, and the Medicine Bow, and Sweetwater Rivers in Wyoming.

The System has seven main reservoirs, six of which have powerplants with generating capacities totaling 237,200 kilowatts (kw). Table 12 depicts a breakdown of generating units and their capacity for each North Platte Powerplant. Table 1 below depicts North Platte River Reservoir Data.

The Department of Energy, by Executive Order dated October 1, 1977, assumed the responsibility of marketing power from Federal resources and operation and maintenance of federal transmission facilities.

Western Area Power Administration (WAPA) of the Department of Energy, headquartered in Lakewood, Colorado, now operates and maintains the nearly 3,500 miles of interconnected electrical transmission lines within the System. The power generating facilities are also interconnected with other federal, public and private power facilities. Power from Reclamation Powerplants is marketed by WAPA.

**Table 1** North Platte River Reservoir Data

<table>
<thead>
<tr>
<th>Reservoir</th>
<th>Dead Storage</th>
<th>Active Storage</th>
<th>Total Storage</th>
<th>Minimum Storage</th>
<th>Minimum Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acre-feet</td>
<td>(AF)</td>
<td>(AF)</td>
<td>(AF)</td>
<td>(feet)</td>
</tr>
<tr>
<td>Seminole</td>
<td>556</td>
<td>1,016,717</td>
<td>1,017,273</td>
<td>31,670</td>
<td>6239.00</td>
</tr>
<tr>
<td>Kortes</td>
<td>151</td>
<td>4,588</td>
<td>4,739</td>
<td>1,666</td>
<td>6092.00</td>
</tr>
<tr>
<td>Pathfinder</td>
<td>7</td>
<td>1,016,500</td>
<td>1,016,507</td>
<td>31,405</td>
<td>5746.00</td>
</tr>
<tr>
<td>Alcova</td>
<td>91</td>
<td>184,314</td>
<td>184,405</td>
<td>137,610</td>
<td>5479.50</td>
</tr>
<tr>
<td>Gray Reef</td>
<td>56</td>
<td>1,744</td>
<td>1,800</td>
<td>56</td>
<td>5312.00</td>
</tr>
<tr>
<td>Glendo</td>
<td>11,033</td>
<td>778,369</td>
<td>789,402</td>
<td>63,148</td>
<td>4570.00</td>
</tr>
<tr>
<td>Guernsey</td>
<td>0</td>
<td>45,612</td>
<td>45,612</td>
<td>0</td>
<td>4370.00</td>
</tr>
<tr>
<td>Total</td>
<td>11,894</td>
<td>3,047,844</td>
<td>3,059,738</td>
<td>265,555</td>
<td></td>
</tr>
</tbody>
</table>

1. Storage capacity below elevation of lowest outlet
2. Total storage minus dead storage
3. Top of Conservation capacity 517,485 AF (Elevation 4635.00 ft) with an additional 271,917 AF allocated to Flood Control (elevation 4653.00 ft)
4. Minimum water surface elevation and capacity required for power generation
   This level is the top of inactive capacity
5. Content and minimum elevation required for power generation, however water cannot be delivered to Casper Canal when reservoir level is below 5487.00 ft (153,802 AF), the elevation of the Casper Canal Gate sill.
6. Top of dead capacity – spillway crest
7. Minimum water surface elevation for power generation
8. Elevation of the North Spillway Crest
SYSTEM PLANNING AND CONTROL

The North Platte River storage, power generation, and water delivery facilities are operated for irrigation, hydroelectric power production, municipal, and industrial water supply. The facilities provide year-round flows in the river below each North Platte Dam except for Guernsey Dam. The facilities also provide flood control, recreation, fish and wildlife preservation, and other purposes. Each project of the System must be operated under the purposes for which it was authorized and constructed. The objective of an integrated system is to obtain optimum benefits from the individual projects.

The System's integrated operation is planned and coordinated by Reclamation's WYAO in Mills, Wyoming. This office collects and analyzes information daily and makes the decisions necessary for successful operation of the System. The water management function involves coordination between Reclamation, the Department of Energy, and many other local, state, and Federal agencies. When water levels rise into the exclusive flood control pool at Glendo Reservoir, the flood control operation of Glendo Dam is directed by the U.S. Army Corps of Engineers, Omaha District, in Omaha, Nebraska.

Experience has proven that proper utilization of the available water resource in a system such as this can be achieved only through careful budgeting of the anticipated water supply. The technical end product of this budgeting process is an Annual Operating Plan (AOP).

The System is operated on a water year basis (October 1 through September 30). Early in the water year an AOP is prepared, reviewed, and presented to the public. The AOP consists of three operation studies using reasonable minimum, reasonable maximum, and most probable inflow conditions determined from statistical analysis of historical inflow conditions. The AOP, as developed and reflected in the three operation studies, provides the flexibility to adjust operations as conditions change during the water year. Reclamation makes use of computer programs to revise and adjust the operating plan each month to reflect changing conditions. A computerized process of forecasting the anticipated water supply also aids the revision process during the months of February, March, April and May. Figure 1 depicts North Platte Reservoirs Total Storage End of September Content for water years 1912 through 2008. Table 2 depicts A Summary of Reservoir Storage Content for water year 2008 (End of Month). Table 9 depicts the Actual Reservoir Operations for water year 2008.
Table 2  Summary of Reservoir Storage Content for Water Year 2008 (End of Month)

<table>
<thead>
<tr>
<th></th>
<th>Seminoe Reservoir</th>
<th>Pathfinder Reservoir</th>
<th>Alcova Reservoir</th>
<th>Glendo Reservoir</th>
<th>Guernsey Reservoir</th>
<th>Total System 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Month</td>
<td>Storage</td>
<td>Record 1</td>
<td>Month</td>
<td>Storage</td>
<td>Record 1</td>
<td>Month</td>
</tr>
<tr>
<td>October</td>
<td>221,924</td>
<td>lowest</td>
<td>October</td>
<td>188,901</td>
<td>lowest</td>
<td>October</td>
</tr>
<tr>
<td>November</td>
<td>214,255</td>
<td>lowest</td>
<td>November</td>
<td>195,010</td>
<td>lowest</td>
<td>November</td>
</tr>
<tr>
<td>December</td>
<td>208,498</td>
<td>lowest</td>
<td>December</td>
<td>200,020</td>
<td>lowest</td>
<td>December</td>
</tr>
<tr>
<td>January</td>
<td>195,422</td>
<td>lowest</td>
<td>January</td>
<td>206,760</td>
<td>2nd lowest</td>
<td>January</td>
</tr>
<tr>
<td>February</td>
<td>184,934</td>
<td>lowest</td>
<td>February</td>
<td>213,662</td>
<td>2nd lowest</td>
<td>February</td>
</tr>
<tr>
<td>March</td>
<td>192,444</td>
<td>lowest</td>
<td>March</td>
<td>213,145</td>
<td>lowest</td>
<td>March</td>
</tr>
<tr>
<td>April</td>
<td>220,579</td>
<td>2nd lowest</td>
<td>April</td>
<td>191,282</td>
<td>lowest</td>
<td>April</td>
</tr>
<tr>
<td>May</td>
<td>395,412</td>
<td>2nd lowest</td>
<td>May</td>
<td>246,843</td>
<td>3rd lowest</td>
<td>May</td>
</tr>
<tr>
<td>June</td>
<td>645,073</td>
<td></td>
<td>June</td>
<td>349,456</td>
<td></td>
<td>June</td>
</tr>
<tr>
<td>July</td>
<td>630,282</td>
<td></td>
<td>July</td>
<td>354,239</td>
<td></td>
<td>July</td>
</tr>
<tr>
<td>August</td>
<td>560,699</td>
<td></td>
<td>August</td>
<td>346,631</td>
<td></td>
<td>August</td>
</tr>
<tr>
<td>September</td>
<td>534,527</td>
<td></td>
<td>September</td>
<td>348,178</td>
<td></td>
<td>September</td>
</tr>
</tbody>
</table>

1 Record is the 30 year period from 1978-2007
2 Total North Platte system includes storage in Seminoe, Kortes, Pathfinder, Alcova, Gray Reef, Glendo and Guernsey Reservoirs
3 Alcova Reservoir is normally maintained within either a winter operating range (between contents of 153,802 AF to 158,302 AF) or a summer operating range (between contents 177,070 AF to 181,943 AF)
Seminoe Reservoir inflows were above average for the months April through September when most of the runoff is likely to occur. A total of 1,197,399 acre-feet (AF) or 126 percent of the 30 year average entered the system above Seminoe Reservoir during the water year. The monthly inflows ranged from a high of 146 percent of average in June 2008 to a low of 75 percent in March 2008. The actual April through July inflow totaled 955,825 AF, which was 136 percent of the 30 year average of 703,800 AF. The Seminoe computed inflow peaked for the water year on June 7, 2008, at 10,904 cubic feet per second (cfs) compared to 4,339 cfs in water year 2007. Figure 2 depicts a comparison of average, water year 2008 and water year 2007 monthly inflow.
Seminoe Reservoir Storage and Releases

Seminoe Dam and Reservoir, on the North Platte River, is the main storage facility for the Kendrick Project. Construction of the dam was completed in 1939, providing a storage capacity of 1,017,273 AF. The powerplant contains three electrical generating units with a total capacity of 51 mega-watts (MW) at a full release capability of about 4,050 cfs.

The spillway consists of a concrete-lined tunnel through the right abutment controlled by three fixed-wheel gates with a release capability of close to 48,000 cfs. Two 60 inch jet flow valves provide a low level river outlet with a flow capacity of 3,420 cfs.

At the start of water year 2008, Seminoe Reservoir had a storage content of 226,388 AF, which was 36 percent of average and 22 percent of capacity. Seminoe storage content remained below average for the entire water year. The maximum Seminoe Reservoir content was reached on July 10, 2008, at 664,021 AF. At the end of water year 2008, Seminoe Reservoir storage content was 534,527 AF, which was 84 percent of average and 53 percent of capacity. See Figure 3 for a comparison of average, water year 2007 and water year 2008 monthly storage.

Releases from Seminoe Dam averaged approximately 545 cfs from October 2007 through March 2008. The releases were increased to approximately 2,240 cfs by the end of April then flows increased to 2,425 cfs by the end of May and then decreased again to approximately 1,500 cfs by the beginning of August. The water release was reduced to approximately 530 cfs on September 25, 2008, which would be the flow for the winter.

Table 3 depicts a summary of Seminoe Reservoir information for water year 2008.
Table 3  Seminole Reservoir Hydrologic Data for Water Year 2008

<table>
<thead>
<tr>
<th>Reservoir Allocations</th>
<th>Elevation (FT)</th>
<th>Storage (AF)</th>
<th>Storage Allocation (AF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top of Inactive and Dead</td>
<td>6239.00</td>
<td>31,670</td>
<td>31,670</td>
</tr>
<tr>
<td>Top of Active Conservation</td>
<td>6357.00</td>
<td>1,017,273</td>
<td>985,603</td>
</tr>
<tr>
<td>Crest of Dam (without Camber)</td>
<td>6361.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Storage-Elevation Data</th>
<th>Elevation (FT)</th>
<th>Storage (AF)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning of water year</td>
<td>6292.78</td>
<td>226,388</td>
<td>Oct 1, 2007 (^2)</td>
</tr>
<tr>
<td>End of water year</td>
<td>6326.73</td>
<td>534,527</td>
<td>Sep 30, 2008</td>
</tr>
<tr>
<td>Annual Low (^1)</td>
<td>6285.78</td>
<td>183,974</td>
<td>March 15, 2008</td>
</tr>
<tr>
<td>Historic Low (^1)</td>
<td>6253.30</td>
<td>56,390</td>
<td>Apr 20, 1961</td>
</tr>
<tr>
<td>Annual High</td>
<td>6336.50</td>
<td>663,732</td>
<td>July 9, 2008</td>
</tr>
<tr>
<td>Historic High (^1)</td>
<td>6359.29</td>
<td>1,073,050</td>
<td>Jun 20, 1949</td>
</tr>
</tbody>
</table>

\(^1\) The daily records for this table are only available from water year 1946.
\(^2\) Represents 0001 hours on October 1

<table>
<thead>
<tr>
<th>Inflow-Outflow Data</th>
<th>Inflow (^3)</th>
<th>Date</th>
<th>Outflow</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Total (AF)</td>
<td>1,197,399</td>
<td>Oct’ 07 – Sep’ 08</td>
<td>852,300</td>
<td>Oct’ 07 – Sep’ 08</td>
</tr>
<tr>
<td>Daily Peak (CFS)</td>
<td>10,904</td>
<td>June 7, 2008</td>
<td>2,532 (^4)</td>
<td>Jul 8, 2008</td>
</tr>
<tr>
<td>Peak Jet Flow Valve (CFS)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Jet Flow Valve (CFS)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^3\) Inflows are a computed number.
\(^4\) Daily peak and minimum are releases to the river.

<table>
<thead>
<tr>
<th>Month</th>
<th>Inflow</th>
<th>Outflow</th>
<th>Content (^6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>October</td>
<td>KAF 0.8</td>
<td>KAF 3</td>
<td>221.9 (^5)</td>
</tr>
<tr>
<td>November</td>
<td>24.8</td>
<td>31.5</td>
<td>214.3 (^5)</td>
</tr>
<tr>
<td>December</td>
<td>26.9</td>
<td>32.5</td>
<td>208.5 (^5)</td>
</tr>
<tr>
<td>January</td>
<td>19.8</td>
<td>32.5</td>
<td>195.4 (^5)</td>
</tr>
<tr>
<td>February</td>
<td>22.7</td>
<td>33.0</td>
<td>184.9 (^5)</td>
</tr>
<tr>
<td>March</td>
<td>42.9</td>
<td>34.8</td>
<td>192.4 (^5)</td>
</tr>
<tr>
<td>April</td>
<td>104.8</td>
<td>75.3</td>
<td>220.6 (^5)</td>
</tr>
<tr>
<td>May</td>
<td>318.6</td>
<td>141.4</td>
<td>395.4 (^5)</td>
</tr>
<tr>
<td>June</td>
<td>403.6</td>
<td>147.6</td>
<td>645.1 (^5)</td>
</tr>
<tr>
<td>July</td>
<td>128.9</td>
<td>133.9</td>
<td>630.3 (^5)</td>
</tr>
<tr>
<td>August</td>
<td>41.9</td>
<td>103.9</td>
<td>560.7 (^5)</td>
</tr>
<tr>
<td>September</td>
<td>31.7</td>
<td>52.7</td>
<td>534.5 (^5)</td>
</tr>
<tr>
<td>Annual</td>
<td>1197.4</td>
<td>852.4</td>
<td>92</td>
</tr>
</tbody>
</table>

\(^5\) The 30 year average is the period (1978-2007)
\(^6\) End of Month
Kortes Reservoir Storage and Releases

Completed in 1951, Kortes Dam, Reservoir, and Powerplant of the Kortes Unit (Pick-Sloan Missouri Basin Project) are located about 2 miles below Seminoe Dam. It was the first unit initiated by the Bureau of Reclamation under the Missouri River Basin Project. Kortes Reservoir provides a maximum storage capacity of 4,739 AF at elevation 6165.7 feet. Kortes Powerplant has three electrical generating units with a total capacity of 36 MW and a release capability of approximately 3,000 cfs. Water released from Seminoe Dam to Pathfinder Reservoir passes through the Kortes turbines to generate power. Maximum benefits are obtained when Kortes Reservoir remains full and power releases are coordinated with those from Seminoe powerplant to maintain a full reservoir.

The spillway on the right abutment consists of an uncontrolled crest with a concrete-lined tunnel and has a capacity of 50,000 cfs.

Senate Bill 2553 which was passed in the 90th Congress authorized the modification of the operation of Kortes Dam and Powerplant to provide a minimum streamflow of 500 cfs in the North Platte River between Kortes Reservoir and the normal headwaters of Pathfinder Reservoir. The minimum flow permits maintenance of a fishery in a stretch of the North Platte River commonly referred to as the "Miracle Mile".

**Figure 3** Seminoe Reservoir Storage
Kortes releases averaged approximately 545 cfs from October 2007 through March 2008. Releases were increased to approximately 2,250 cfs by the end of April and decreased to approximately 2,000 cfs by the end of July. The water release was reduced to approximately 530 cfs on September 25, 2008, which would be the flow for the winter. In water year 2008 most releases were made through the Kortes Powerplant, except for occasions when testing or maintenance required bypass releases.

Gains to the North Platte River from Kortes Dam to Pathfinder Dam

Kortes Dam to Pathfinder Dam, river gains were below average for October 2007 through September 2008. The Kortes Dam to Pathfinder Dam, river gains ranged from 98 percent in January 2008 to 6 percent of average in July 2008. The Kortes to Pathfinder, river gains for August and September 2008 were the third and second lowest in the last 30 years. The actual April through July river gains was 55,337 AF, which is 63 percent of the 30 year average of 87,200 AF. Figure 4 depicts a comparison of average, water year 2007 and water year 2008 monthly river gains.

**Figure 4** Gains to the North Platte River from Kortes Dam to Pathfinder Reservoir
Pathfinder Reservoir Storage and Releases

Pathfinder Dam and Reservoir, a major storage facility of the North Platte Project, has a total capacity of 1,016,507 AF at elevation 5850.10 feet. Construction of the dam was completed in 1909. Operationally, this structure is a bottleneck in the system with its restricted release capability of approximately 6,000 cfs. The rated capacity of the left butment outlet works through the two 60-inch jet flow gates is 2,928 cfs at elevation 5850.10 feet. The flow capacity range of the 30-inch jet flow gate is from approximately 50 to 450 cfs. Depending on the elevation of the reservoir, as much as 2,900 cfs can be released through the Fremont Canyon Power conduit and discharged from the Fremont Canyon turbines at the powerplant 3 miles downstream. Fremont Canyon Powerplant has been reconditioned to a generation capacity of 66.8 MWs under full reservoir operating head. The uncontrolled spillway is a flat-crested weir of natural rock over the left butment of the dam and any time the reservoir water surface exceeds 5850.10 feet a spill occurs. The calculated discharge capacity of the spillway is 33,940 cfs at reservoir elevation 5858.10 feet.

At the start of water year 2008, storage in Pathfinder Reservoir was 171,126 AF, which was 35 percent of average and only 17 percent of capacity. Pathfinder storage remained below average for the entire water year. (See Figure 5). The maximum Pathfinder Reservoir content for the water year was reached on July 14, 2008, at 362,834 AF which was only 36 percent of capacity. The water year ended with 348,178 AF of water in storage in Pathfinder Reservoir, which was 72 percent of average and 34 percent of capacity. A continual release of water from Pathfinder Reservoir during October was maintained during the gradual drawdown of Alcova Reservoir to its winter operating range. At the request of the Wyoming Game and Fish Department a year round flow of 75 cfs was provided through the Pathfinder Reservoir 30 inch Jet-Flow Valve to the river below Pathfinder Dam. Table 4 depicts a summary of Pathfinder Reservoir information for water year 2008.
Figure 5 Pathfinder Reservoir Storage
Table 4 Pathfinder Reservoir Hydrologic Data for Water Year 2008

<table>
<thead>
<tr>
<th>Reservoir Allocations</th>
<th>Elevation (FT)</th>
<th>Storage (AF)</th>
<th>Storage Allocation (AF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top of Inactive and Dead</td>
<td>5746.00</td>
<td>31,405</td>
<td>31,405</td>
</tr>
<tr>
<td>Top of Active Conservation</td>
<td>5850.10</td>
<td>1,016,507</td>
<td>985,102</td>
</tr>
<tr>
<td>Crest of Dam (without Camber)</td>
<td>5858.10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Storage-Elevation Data</th>
<th>Elevation (FT)</th>
<th>Storage (AF)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning of water year</td>
<td>5781.38</td>
<td>171,126</td>
<td>Sep 30, 2007*</td>
</tr>
<tr>
<td>End of water year</td>
<td>5805.92</td>
<td>348,178</td>
<td>Sep 30, 2008</td>
</tr>
<tr>
<td>Annual Low</td>
<td>5781.52</td>
<td>171,917</td>
<td>Oct 1, 2008</td>
</tr>
<tr>
<td>Historic Low 2, 3</td>
<td>5690.00</td>
<td>0</td>
<td>Sep 9, 1958</td>
</tr>
<tr>
<td>Annual High</td>
<td>5807.50</td>
<td>362,834</td>
<td>Jul 14, 2008</td>
</tr>
<tr>
<td>Historic High 1</td>
<td>5853.11</td>
<td>1,083,755</td>
<td>Jul 7, 1983</td>
</tr>
</tbody>
</table>

1 Daily records for this table are only available from water year 1946
2 From September 1958 through January 1959, Pathfinder Reservoir was drained for construction of Fremont Canyon tunnel.
3 Represents 0001 hours on October 1.

<table>
<thead>
<tr>
<th>Inflow-Outflow Data</th>
<th>Inflow</th>
<th>Date</th>
<th>Outflow</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Jet Flow Valve (CFS)</td>
<td>84</td>
<td>Oct 26, 2007</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4 At the request of the Wyoming Game and Fish Department a yearly flow of 75 cfs will be provided through the Pathfinder Reservoir 30 inch Jet-Flow Valve to the river below Pathfinder Dam.

<table>
<thead>
<tr>
<th>Month</th>
<th>Gain from Kortes</th>
<th>Inflow 6</th>
<th>Outflow</th>
<th>Content 8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>KAF</td>
<td>% of Avg. 7</td>
<td>KAF</td>
<td>% of Avg. 7</td>
</tr>
<tr>
<td>October</td>
<td>5.0</td>
<td>84.7</td>
<td>38.3</td>
<td>71</td>
</tr>
<tr>
<td>November</td>
<td>3.5</td>
<td>76.1</td>
<td>35.0</td>
<td>62</td>
</tr>
<tr>
<td>December</td>
<td>3.8</td>
<td>90.5</td>
<td>36.3</td>
<td>55</td>
</tr>
<tr>
<td>January</td>
<td>5.5</td>
<td>98.2</td>
<td>38.0</td>
<td>54</td>
</tr>
<tr>
<td>February</td>
<td>3.2</td>
<td>52.5</td>
<td>36.2</td>
<td>53</td>
</tr>
<tr>
<td>March</td>
<td>6.3</td>
<td>51.7</td>
<td>41.0</td>
<td>46</td>
</tr>
<tr>
<td>April</td>
<td>8.7</td>
<td>43.7</td>
<td>83.8</td>
<td>78</td>
</tr>
<tr>
<td>May</td>
<td>28.7</td>
<td>90.8</td>
<td>170.2</td>
<td>134</td>
</tr>
<tr>
<td>June</td>
<td>17.3</td>
<td>68.4</td>
<td>164.9</td>
<td>104</td>
</tr>
<tr>
<td>July</td>
<td>0.7</td>
<td>6.8</td>
<td>134.6</td>
<td>108</td>
</tr>
<tr>
<td>August</td>
<td>-2.6</td>
<td>NA 7</td>
<td>101.3</td>
<td>115</td>
</tr>
<tr>
<td>September</td>
<td>0.8</td>
<td>13.6</td>
<td>53.4</td>
<td>99</td>
</tr>
<tr>
<td>Annual</td>
<td>58.8</td>
<td>42</td>
<td>932.9</td>
<td>88</td>
</tr>
</tbody>
</table>

5 30 year average is the period (1978-2007)
6 The inflow includes the gain from Kortes Dam to Pathfinder Dam.
7 Represents a negative number that makes the percentage meaningless.
8 End of Month
Alcova and Gray Reef Reservoirs Storage and Releases

Alcova Dam and Reservoir is part of the Kendrick Project. The dam serves as a diversion dam for the Casper Canal and the reservoir as a forebay for the Alcova Powerplant. The dam, located about 10 miles downstream from Pathfinder Dam, was completed in 1938. Reservoir storage capacity is about 184,405 AF at elevation 5500 feet, of which only the top 30,600 AF is active capacity available for irrigation of the Kendrick Project. The powerplant consists of two electrical generating units with a total installed capacity of 36 MW at a full release capability of about 4,100 cfs. The spillway is a concrete lined open channel in the left abutment of the dam controlled by three 25 by 40 foot gates with a capacity of 55,000 cfs at a reservoir level of 5500 feet. The reservoir is operated within a 2 foot range during summer and winter but at levels 10 feet apart. A higher operating level is maintained during the summer months to provide adequate head on the Casper Canal, while the lower winter operating level reduces the potential for ice damage to the canal gate.

The annual drawdown of Alcova Reservoir began on October 1, 2007, and continued through October 31, 2007, when the reservoir reached its normal winter operating range of 5488 ± one foot. The refill of Alcova Reservoir was initiated on April 1, 2008. The water surface elevation was raised above 5497 feet on April 27, 2008, and the reservoir was maintained within 1 foot of elevation 5498 throughout the summer.

Gray Reef Dam and Reservoir is part of the Glendo Unit, Oregon Rail Division, Pick-Sloan Missouri Basin Program. The dam which was completed in 1961 is a three-zoned rock and earthfill structure located about 2.5 miles below Alcova Dam. The reservoir has an active capacity of 1,744 AF. Gray Reef Reservoir is operated to regulate widely fluctuating water releases from the Alcova Powerplant, and provide stable flow for irrigation, municipal, industrial, and fish and wildlife interests along the 147 miles of river between Alcova and Glendo Dams.

The Gray Reef releases were maintained at 500 cfs from October 2007 until March 16, 2008. At the request of the Wyoming Game and Fish Department, a series of flushing flows were initiated on March 17, 2008, and continued through March 21, 2008, during which the flows were varied each day from 500 cfs to 4,000 cfs, for the purpose of flushing silt from spawning gravels used by trout. At the completion of the flushing flows, releases from Gray Reef were again set at 500 cfs until April 1, 2008. Releases for the remainder of the water year were adjusted to meet irrigation demands below Guernsey Reservoir. The largest daily release of water for the water year occurred on May 20, 2008 at 2,337 cfs.
River gains from Alcova Dam to Glendo Reservoir were below average for the water year except for May and June, which were above average due to heavy unexpected runoff. The Alcova Dam to Glendo Reservoir river gains ranged from highs of 238 percent in May 2008 and 200 percent of average in June 2008. The Alcova to Glendo river gains for October and November 2007 were the lowest river gains in the last 50 years. The actual April through July gain was 209,300 AF, which was 172 percent of average. The maximum computed daily river gain of 8,124 cfs occurred on May 24, 2008 and the daily computed Glendo Reservoir inflow peaked on May 24, 2008, at 11,068 cfs. Figure 6 depicts a comparison of average, water year 2008 and water year 2007 monthly river gains.

Figure 6 Gains to the North Platte River from Alcova Dam to Glendo Reservoir
Glendo Reservoir Storage and Releases

Glendo Dam and Reservoir is the only storage facility for the Glendo Unit. The reservoir has a storage capacity of 789,402 AF, including 271,917 AF allocated to flood control. Glendo Powerplant consists of two electrical generating units, with a total installed capacity of 38 MW. With both generating units operating at capacity and the reservoir water surface at elevation 4635.0 feet, approximately 3,920 cfs can be released through Glendo Powerplant. The reinforced concrete spillway has an ungated ogee crest. The spillway capacity at elevation 4669.0 feet (6 feet below the crest of the dam), is 10,335 cfs.

The outlet works from Glendo Dam consist of the primary outlet works which discharge at the powerplant, and the low-flow outlet which discharges to the river immediately below the dam. The three primary outlet gates can release a combined discharge of 13,000 cfs with the powerplant shut down. During normal operation when the reservoir elevation is below the top of conservation storage (4635 feet), outlet works discharges should typically remain below 5,500 cfs. This precautionary practice is to minimize the potential for damage to the stilling basin and training walls. The low-flow outlet works are operated to maintain a continuous release of approximately 25 cfs. This provides a reliable water source for the downstream wetland area and results in associated fish and wildlife benefits.

Glendo Reservoir storage was 119,254 AF at the beginning of water year 2008, which was 110 percent of average but only 23 percent of active conservation of 517,485 AF. Water releases from Glendo Reservoir were initiated on April 21, 2008, in order to move water to the Inland Lakes. The reservoir reached a maximum storage for the year of 558,615 AF (elevation 4638.21 feet) on June 12, 2008. On May 22, 2008, the snowpack combined with warm rain increased the inflow from 6,500 cfs to 10,352 cfs in just 24 hours, although the high flows only lasted seven days the total gain for May was the fourth highest in 30 years. At the end of the water year, Glendo Reservoir contained 119,888 AF of water (water surface elevation 4584.94 feet) which was 110 percent of average and only 23 percent of active conservation of 517,485 AF. Figure 7 depicts water year 2008 and water year 2007 end of month reservoir storage compared to average. Table 5 depicts a summary of Glendo Reservoir information for water year 2008.
### Table 5 Glendo Reservoir Hydrologic Data for Water Year 2008

<table>
<thead>
<tr>
<th>Reservoir Allocations</th>
<th>Elevation (FT)</th>
<th>Storage (AF)</th>
<th>Storage Allocation (AF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top of Inactive and Dead</td>
<td>4570.00</td>
<td>63,148</td>
<td>63,148</td>
</tr>
<tr>
<td>Top of Active Conservation</td>
<td>4635.00</td>
<td>517,485</td>
<td>454,337</td>
</tr>
<tr>
<td>Top of Exclusive Flood Control</td>
<td>4653.00</td>
<td>789,402</td>
<td>271,917</td>
</tr>
<tr>
<td>Maximum water surface(surcharge)</td>
<td>4669.00</td>
<td>1,118,653</td>
<td>329,251</td>
</tr>
<tr>
<td>Crest of Dam (without Camber)</td>
<td>4675.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Storage-Elevation Data

<table>
<thead>
<tr>
<th>Elevation (FT)</th>
<th>Storage (AF)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>4584.80</td>
<td>119,254</td>
<td>Oct 1, 2007</td>
</tr>
<tr>
<td>4584.94</td>
<td>119,888</td>
<td>Sep 30, 2008</td>
</tr>
<tr>
<td>4577.61</td>
<td>89,486</td>
<td>Sep 8, 2008</td>
</tr>
<tr>
<td>4548.10</td>
<td>15,140</td>
<td>Sep 28, 1966</td>
</tr>
<tr>
<td>4638.21</td>
<td>15,140</td>
<td>Jun 12, 2008</td>
</tr>
<tr>
<td>4675.94</td>
<td>758,830</td>
<td>May 28, 1973</td>
</tr>
</tbody>
</table>

1 Represents 0001 hours on October 1.

### Inflow-Outflow Data

<table>
<thead>
<tr>
<th>Inflow-Outflow Data</th>
<th>Inflow</th>
<th>Date</th>
<th>Outflow</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily Peak (CFS)</td>
<td>11,068</td>
<td>May 24, 2008</td>
<td>7,480</td>
<td>Jul 25, 2008</td>
</tr>
<tr>
<td>Daily Minimum (CFS)</td>
<td>16</td>
<td>September 3, 2008</td>
<td>18 ³</td>
<td>March 18, 2008</td>
</tr>
<tr>
<td>Peak Bypass Release (CFS)</td>
<td></td>
<td></td>
<td>4,051</td>
<td>Jul 27, 2008</td>
</tr>
</tbody>
</table>

2 Includes the average daily release of approximately 25 cfs from the low flow outlet works.

3 A low flow outlet works was completed in 1993 and an average release of 25 cfs is maintained all year.

### Month Gain from Alcova

<table>
<thead>
<tr>
<th>Month</th>
<th>Gain from Alcova</th>
<th>Inflow</th>
<th>Outflow</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>KAF</td>
<td>% of Avg. 5</td>
<td>KAF</td>
<td>% of Avg. 5</td>
</tr>
<tr>
<td>October</td>
<td>2.7</td>
<td>21</td>
<td>45.2</td>
<td>66</td>
</tr>
<tr>
<td>November</td>
<td>3.4</td>
<td>29</td>
<td>35.4</td>
<td>63</td>
</tr>
<tr>
<td>December</td>
<td>1.3</td>
<td>18</td>
<td>31.9</td>
<td>65</td>
</tr>
<tr>
<td>January</td>
<td>6.3</td>
<td>62</td>
<td>36.2</td>
<td>71</td>
</tr>
<tr>
<td>February</td>
<td>9.1</td>
<td>68</td>
<td>37.2</td>
<td>75</td>
</tr>
<tr>
<td>March</td>
<td>7.7</td>
<td>43</td>
<td>48.5</td>
<td>69</td>
</tr>
<tr>
<td>April</td>
<td>14.6</td>
<td>40</td>
<td>85.7</td>
<td>86</td>
</tr>
<tr>
<td>May</td>
<td>153.3</td>
<td>238</td>
<td>273.0</td>
<td>173</td>
</tr>
<tr>
<td>June</td>
<td>43.0</td>
<td>200</td>
<td>80.8</td>
<td>53</td>
</tr>
<tr>
<td>July</td>
<td>-1.6</td>
<td>NA ⁴</td>
<td>102.2</td>
<td>66</td>
</tr>
<tr>
<td>August</td>
<td>-0.6</td>
<td>NA ⁴</td>
<td>89.0</td>
<td>65</td>
</tr>
<tr>
<td>September</td>
<td>4.1</td>
<td>44</td>
<td>46.2</td>
<td>53</td>
</tr>
<tr>
<td>Annual</td>
<td>243.1</td>
<td>120</td>
<td>911.2</td>
<td>80</td>
</tr>
</tbody>
</table>

4 Represents a negative number that makes the percentage meaningless.

5 30 year average is the period (1978-2007)

6 14 year average is the period (1994-2007) In 1993 a low flow valve was installed at Glendo Dam which allowed the release of 25 cfs during the non irrigation season. Therefore, a 13 year average is used for the months of October through March. The March average is skewed high due to evacuation of space in the upper system to allow for snow melt run off. The higher March average caused the percent of average to be lower than normal.

7 Inflow include the gain from Alcova Dam to Glendo Dam.

8 Irrigation districts in an effort to conserve their water supply delayed irrigation deliveries until June and discontinued their irrigation deliveries in early September.

9 End of Month
Gains to the North Platte River from Glendo Dam to Guernsey Reservoir

The river gains between Glendo Dam and Guernsey Dam during water year 2008 were below average for 7 months with only the months of May, June, and September 2008 being above average. With the snowpack levels above 100 percent and with fast warming days for the month of May the average inflow for the month was 2,800 cfs. The Glendo Dam to Guernsey Reservoir river gains ranged from a high of 475 percent in May 2008 to only 31 percent of average in December 2007, with the month of July having a negative value making a percentage value meaningless. On May 23, 2008, daily computed inflow to Guernsey Reservoir peaked at 7,241 cfs. Figure 8 depicts a comparison of average, water year 2008 and water year 2007 monthly river gains.
Guernsey Reservoir Storage and Releases

Guernsey Dam located about 25 miles below Glendo Dam, again stores and re-regulates the flow of the river prior to delivery of storage water to project lands of the North Platte Project and Glendo Unit. Guernsey Powerplant, located on the right abutment of the dam, has two 3.2 MW electrical generating units with a combined release capability of about 1,340 cfs. The windings of both units have been replaced resulting in the rating of 3.2 MW per unit. The north spillway gate, with a capacity of 50,000 cfs at a reservoir level of 4420 feet, is utilized for irrigation releases to supplement the maximum powerplant releases.

The original capacity of the reservoir was 73,800 AF, but this has been greatly reduced by deposition of silt. Utilizing data from the 1980 Sedimentation Survey of Guernsey Reservoir, the March 1982 - Area Capacity Tables and Curves shows about 45,600 AF of available storage.

Figure 8 Gains to the North Platte River from Glendo Dam to Guernsey Reservoir
At the beginning of water year 2008, storage in Guernsey Reservoir was at 3,649 AF. Releases from Guernsey Reservoir were started on April 22, 2008, as water was moved into the Inland Lakes. The annual "silt run" from the reservoir was initiated on July 11 and continued for 14 days. Reservoir storage was reduced to initiate the "silt run" and was maintained at a low level throughout the period. The minimum reservoir content during the "silt run" of 1,506 AF occurred on July 22, 2008. Following the "silt run," the reservoir was refilled to 25,916 AF by July 28, 2008, again making the reservoir suitable for recreation. At the end of the irrigation season, September 30, 2008, Guernsey Reservoir contained 5,632 AF. See Figure 9 for water year 2008 and water year 2007 storage compared to average.

![Guernsey Reservoir Storage](image)

**Figure 9** Guernsey Reservoir Storage

**Precipitation Summary for Water Year 2008**

Although the precipitation was quite variable from month to month throughout the North Platte River Basin, all watersheds had above average total precipitation for the water year. Watershed precipitation is an average of the precipitation readings using several stations as indicators for each watershed.

In the Seminole watershed, precipitation at the Elk Mountain and Saratoga, Wyoming, weather stations, both recorded the highest December precipitation on record of 293 percent. The Seminole watershed precipitation was over 100 percent cumulative for all of the 2008 water year which was very much needed moisture after a 9 year period of below average runoff.
In the Pathfinder watershed, precipitation at the Lander, Wyoming, weather stations recorded the lowest April precipitation in the last 30 years. In the Pathfinder watershed, precipitation at the Pathfinder, Wyoming, weather stations recorded the second highest December precipitation in the last 30 years. The Pathfinder watershed precipitation data recorded a tie for the lowest precipitation combining for an average of 14 percent for the month of November.

In the Glendo watershed, precipitation at the Glenrock, Wyoming, weather stations had no precipitation for the month of November which was the lowest on record in the last 30 years. The Glendo watershed precipitation data recorded the highest May precipitation combining for an average of 261 percent for the month. The Pathfinder Dam weather station is used as an indicator in both the Pathfinder and Glendo watersheds.

In the Guernsey watershed, the Guernsey Dam, Wyoming, weather station had the second highest May precipitation in the last 30 years and the Glendo Dam, Wyoming, weather station had the greatest May precipitation in 50 years. The Guernsey watershed precipitation data recorded the lowest precipitation combining for an average of 29 percent for the month of November.

See Figure 10 for a comparison of an average, water year 2008, and water year 2007 total precipitation.

Figure 10 North Platte River Basin Precipitation by Watershed Total for Water Year
Reclamation relies on the Natural Resources Conservation Service (NRCS) to provide snow water equivalent (SWE) information for the three drainage areas in which Reclamation forecasts snowmelt runoff. The watershed above Seminoe Reservoir was above average for February, March, April, and May. The Sweetwater River and the watershed between Alcova Dam and Glendo Reservoir were below average for the February, March, April, and May. Table 6 shows a summary of snowpack for water year 2008.

Snowpack SWE for February was above average at 101 percent for the watershed above Seminoe Reservoir; below average at 82 percent for the Sweetwater River watershed which flows into Pathfinder Reservoir and below average at 78 percent for the Alcova to Glendo watershed.

Snowpack on March 1, 2008, had risen slightly, with SWE at 107 percent of average for the watershed above Seminoe Reservoir; it decreased slightly to 81 percent of average for the Sweetwater River watershed which flows into Pathfinder Reservoir and increased to 86 percent of average for the Alcova to Glendo watershed.

Snowpack for April 1, 2008, declined slightly with SWE at 102 percent of average for the watershed above Seminoe Reservoir, and improving to 94 percent of average for the Alcova to Glendo watershed; 76 percent of average for the Sweetwater River watershed which flows into Pathfinder Reservoir.

Snowpack for May 1, 2008, improved with SWE at 105 percent of average for the watershed above Seminoe Reservoir; 80 percent of average for the Sweetwater River watershed which flows into Pathfinder Reservoir; and 99 percent of average for the Alcova to Glendo watershed.
Table 6 North Platte Snowpack Water Content for 2008

<table>
<thead>
<tr>
<th>Watershed</th>
<th>Feb 1 SWE</th>
<th>% of Avg.</th>
<th>Mar 1 SWE</th>
<th>% of Avg.</th>
<th>Apr 1 SWE</th>
<th>% of Avg.</th>
<th>May 1 SWE</th>
<th>% of Avg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seminoe Reservoir</td>
<td>13.4</td>
<td>101</td>
<td>18.7</td>
<td>107</td>
<td>21.8</td>
<td>102</td>
<td>22.8</td>
<td>105</td>
</tr>
<tr>
<td>Pathfinder Reservoir</td>
<td>7.9</td>
<td>82</td>
<td>9.9</td>
<td>81</td>
<td>11.1</td>
<td>76</td>
<td>11.6</td>
<td>80</td>
</tr>
<tr>
<td>Glendo Reservoir</td>
<td>5.7</td>
<td>78</td>
<td>7.9</td>
<td>86</td>
<td>11.3</td>
<td>94</td>
<td>10.8</td>
<td>99</td>
</tr>
</tbody>
</table>

1 SWE (Snow Water Equivalent is the amount of water in the snowpack expressed in inches).
2 Average is based on the 1971-2000 period.

Allocation for Water Year 2008

No allocation of storage water was required in water year 2008. The most consecutive allocation years historically are now 2002, 03, 04, 05, 06, and 2007, with 1953, 54, 55, 56, and 1957, being the second longest consecutive allocation years.

Ownerships for Water Year 2008

Stored water which is held in accounts for various entities is referred to as their ownership. At the beginning of water year 2008, the North Platte Project ownership (includes North Platte Pathfinder and North Platte Guernsey), contained only 286,249 AF of water, which is 72 percent of average. The Kendrick ownership contained 359,306 AF of water, which is 41 percent of average; and the Glendo ownership contained 53,566 AF of water, which is 42 percent of average. Guernsey ownership filled to its permitted amount during water year 2008.

The total amount of water stored at the end of water year 2007 in the mainstem reservoirs for use in water year 2008 was 706,338 AF which was 50 percent of average. This total does not include 19,383 AF of water remaining in the four Inland Lakes in Nebraska.

At the end of water year 2008, the North Platte Project ownership (includes North Platte Pathfinder and North Platte Guernsey), contained 572,718 AF of water which is 144 percent of average. The Glendo ownership contained 85,417 AF of water which is 68 percent of average. The Kendrick ownership contained 530,788 AF, which is 60 percent of average; and the operational/re-regulation water account contained 1,536 AF. Also stored in the North Platte storage system was 3,369 AF for the city of Cheyenne and 2,000 AF for Pacific Power. See Figure 11 for the last two water years ownership carryover compared with average. Table 8 shows a summary of ownership for water year 2008.
Figure 11 Ownerships End of September
North Platte River Forecast 2008

Reservoir inflow forecasts are prepared at the first of February, March, April, and May, to estimate the inflows expected for the April through July runoff period.

Runoff forecasts for the Seminoe Reservoir watershed, the Sweetwater River above Pathfinder Reservoir, and the North Platte River from Alcova Dam to Glendo Reservoir are based on snow telemetry (SNOTEL) and/or snow course sites, precipitation sites, and calculated November inflow. Reclamation maintains a database consisting of historic monthly data for reservoir inflows, snow and precipitation stations. WYAO staff coordinates with NRCS Portland Office staff to exchange forecasted numbers. Reclamation forecasts and NRCS forecasts are then reviewed by WYAO management. All the information available is considered and judgment is applied to result in a final forecast of reservoir inflow. The forecasted information is then made available to the public through a news release and is used in updating monthly reservoir operating plans. Table 7 depicts a summary of the monthly forecasts for water year 2008.

Table 7 Summary of Forecasts of April-July Runoff for Water Year 2008

<table>
<thead>
<tr>
<th>Forecast Points</th>
<th>Feb 1 KAF</th>
<th>% of Avg.</th>
<th>Mar 1 KAF</th>
<th>% of Avg.</th>
<th>Apr 1 KAF</th>
<th>% of Avg.</th>
<th>May 1 KAF</th>
<th>% of Avg.</th>
<th>Actual April-July KAF</th>
<th>% of Apr-Jul Avg.¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seminoe Reservoir</td>
<td>700</td>
<td>99</td>
<td>700</td>
<td>99</td>
<td>750</td>
<td>107</td>
<td>850</td>
<td>121</td>
<td>955.9</td>
<td>136</td>
</tr>
<tr>
<td>Sweetwater River</td>
<td>40</td>
<td>65</td>
<td>40</td>
<td>65</td>
<td>50</td>
<td>81</td>
<td>50</td>
<td>81</td>
<td>51.7</td>
<td>84</td>
</tr>
<tr>
<td>Alcova to Glendo</td>
<td>75</td>
<td>62</td>
<td>80</td>
<td>66</td>
<td>100</td>
<td>83</td>
<td>100</td>
<td>83</td>
<td>209.3</td>
<td>172</td>
</tr>
</tbody>
</table>

¹ Average is based on the 1978-2007 period.
² The May 1 forecast includes an actual April inflow of 104,800 AF.
³ The May 1 forecast includes an actual April inflow of 5,300 AF.
⁴ The May 1 forecast includes an actual April inflow of 14,600 AF.
Table 8  Summary of North Platte River System Ownership for Water Year 2008

<table>
<thead>
<tr>
<th>MONTHS</th>
<th>PATHFINDER OWNERSHIP</th>
<th>KENDRICK OWNERSHIP</th>
<th>GLENDO OWNERSHIP</th>
<th>PACIFIC POWER &amp; LIGHT</th>
<th>GUERNSEY OWNERSHIP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ACCRUAL A/</td>
<td>EVAPORATION</td>
<td>DELIVERY B/</td>
<td>EVAPORATION</td>
<td>DELIVERY B/</td>
</tr>
<tr>
<td>SEP</td>
<td>38332</td>
<td>2159</td>
<td>2</td>
<td>783</td>
<td>0</td>
</tr>
<tr>
<td>OCT</td>
<td>29866</td>
<td>1454</td>
<td>0</td>
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### Table 8 (Continued) Summary of North Platte River System Ownership for Water Year 2008

#### SUMMARY OF NORTH PLATTE RIVER SYSTEM OWNERSHIPS FOR WATER YEAR 2008 (Acre-feet)

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A/ In 1992 the Wyoming State Engineer granted an exchange which allows Pacific Power to exchange direct flows in the winter months (Oct-Apr) for direct flow in the summer months. During the winter months some direct flows which are available for storage under Pathfinder's storage right are not stored but instead are allowed to pass downstream for use by Pacific Power. In exchange starting on May 1, Pacific Power allows some of its available direct flow to pass downstream to Glendo Reservoir to be stored as Pathfinder ownership. The exchange water was returned to Pathfinder at a rate of 26 AF daily starting on May 1, 2008, until June 17, 2008, when the last 6 AF of the exchange water was returned.

B/ Amounts shown as delivery are storage water only. Natural flow which was delivered is not shown in this table.

C/ Transfer refers to Inland Lakes ownership water which was delivered from storage in Glendo or Guernsey Reservoirs. In April and May 21, 227 AF was transferred to the Inland Lakes.

D/ Not an actual accrual but a 2 AF correction for water used which was corrected on October 2, 2007, for a miscalculated number for September 2007.

E/ Water diverted under temporary Glendo contract by exchange from Glendo Reservoir shall comply with the November 13, 2001, modified North Platte Decree, Article 17d., which provides that for each 2 AF of Glendo storage water diverted above Glendo Reservoir 1 additional AF shall be contracted at the same time for release from Glendo Reservoir and passed through Guernsey Reservoir to the North Platte River.

F/ Wyoming Water Development Commission (WWDC) contracted with the Bureau of Reclamation for storage space of 7,000 AF in Glendo Reservoir for a one water year period to store non-project water for irrigation purposes.
### Table 9: Actual Reservoir Operations for Water Year 2008

#### NORTH PLATTE RIVER OPERATING PLAN
Year Beginning Oct 2007

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<tbody>
<tr>
<td></td>
<td>4.7 Kaf</td>
<td>1016.5 Kaf, 5850.10 Ft.</td>
<td>4.7 Kaf, 6142.73 Ft.</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>171.1 Kaf</td>
<td>1016.5 Kaf, 5850.10 Ft.</td>
<td>31.4 Kaf, 5746.00 Ft.</td>
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</tr>
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<td>1016.5 Kaf, 5850.10 Ft.</td>
<td>145.3 Kaf, 5483.12 Ft.</td>
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#### RAW TEXT

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<th>Max</th>
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<td>1016.5 Kaf, 5850.10 Ft.</td>
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### Table 9 (Continued) Actual Reservoir Operations for Water Year 2008

**NORTH PLATTE RIVER OPERATING PLAN**

**Year Beginning Oct 2007**

#### Gray Reef Reservoir Operations

<table>
<thead>
<tr>
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</tr>
<tr>
<td>Oct</td>
<td>39.6</td>
<td>Min 0.0 Kaf, 5306.00 Ft.</td>
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<tr>
<td>Nov</td>
<td>29.6</td>
<td></td>
</tr>
<tr>
<td>Dec</td>
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<tr>
<td>Jan</td>
<td>30.7</td>
<td></td>
</tr>
<tr>
<td>Feb</td>
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<td></td>
</tr>
<tr>
<td>Apr</td>
<td>81.6</td>
<td></td>
</tr>
<tr>
<td>May</td>
<td>110.2</td>
<td></td>
</tr>
<tr>
<td>Jun</td>
<td>47.0</td>
<td></td>
</tr>
<tr>
<td>Jul</td>
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</tr>
<tr>
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#### Guernsey Reservoir Operations

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<th>Operating Limits:</th>
</tr>
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<tr>
<td></td>
<td>3.6 Kaf</td>
<td>Max 45.6 Kaf, 4419.99 Ft.</td>
</tr>
<tr>
<td></td>
<td>0.0 Kaf</td>
<td>Min 0.0 Kaf, 4370.00 Ft.</td>
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</table>

### Alcova-Glendo Gain

<table>
<thead>
<tr>
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<th>Total Release</th>
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<tr>
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<td>3.0</td>
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<tr>
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<td>3.4</td>
<td>0.0</td>
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</tr>
<tr>
<td>Aug</td>
<td>1.3</td>
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<tr>
<td>Sep</td>
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### Infl from Gray Reef

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<th>Total Release</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jun</td>
<td>81.6</td>
<td>81.6</td>
</tr>
<tr>
<td>Jul</td>
<td>110.2</td>
<td>110.2</td>
</tr>
<tr>
<td>Aug</td>
<td>47.0</td>
<td>47.0</td>
</tr>
<tr>
<td>Sep</td>
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<td>86.9</td>
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### Guernsey-Glendo Gain

<table>
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<th>Turbine Release</th>
<th>Total Release</th>
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<td>1.2</td>
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<tr>
<td>July</td>
<td>0.8</td>
<td>0.0</td>
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<tr>
<td>Aug</td>
<td>0.6</td>
<td>0.0</td>
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<tr>
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### End-month content

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<tr>
<th>Month</th>
<th>Kaf</th>
<th>Ft.</th>
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</thead>
<tbody>
<tr>
<td>June</td>
<td>1.1</td>
<td>161.7</td>
</tr>
<tr>
<td>July</td>
<td>0.7</td>
<td>8.4</td>
</tr>
<tr>
<td>Aug</td>
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<td>8.4</td>
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<tr>
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### End-month elevation

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<th>Ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>4396.1</td>
</tr>
<tr>
<td>July</td>
<td>4398.7</td>
</tr>
<tr>
<td>Aug</td>
<td>4400.9</td>
</tr>
<tr>
<td>Sep</td>
<td>4403.6</td>
</tr>
</tbody>
</table>

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### NORTH PLATTE RIVER OPERATING PLAN

**Year Beginning Oct 2007**

<table>
<thead>
<tr>
<th>Reservoir</th>
<th>Initial Content</th>
<th>Operating Limits:</th>
<th>Total Inflow</th>
<th>Total Release</th>
<th>Evaporation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray Reef</td>
<td>1.7 Kaf</td>
<td>Max 1.1 Kaf, 5327.42 Ft.</td>
<td>39.6</td>
<td>29.6</td>
<td>0.0</td>
</tr>
<tr>
<td>Glendo</td>
<td>119.3 Kaf</td>
<td>Max 789.4 Kaf, 4653.00 Ft.</td>
<td>78.9</td>
<td>63.2</td>
<td>1.1</td>
</tr>
<tr>
<td>Guernsey</td>
<td>3.6 Kaf</td>
<td>Max 45.6 Kaf, 4419.99 Ft.</td>
<td>2.9</td>
<td>2.5</td>
<td>1.2</td>
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</tbody>
</table>

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### Total Inflow

<table>
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<tr>
<th>Month</th>
<th>Total Inflow</th>
<th>Total Release</th>
<th>Evaporation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jun</td>
<td>81.6</td>
<td>81.6</td>
<td>0.0</td>
</tr>
<tr>
<td>Jul</td>
<td>110.2</td>
<td>110.2</td>
<td>1.1</td>
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<tr>
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<td>47.0</td>
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<tr>
<td>Sep</td>
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### Total Release

<table>
<thead>
<tr>
<th>Month</th>
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<tbody>
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<tr>
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### Evaporation

<table>
<thead>
<tr>
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<th>Kaf</th>
<th>Ft.</th>
</tr>
</thead>
<tbody>
<tr>
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<td>161.7</td>
</tr>
<tr>
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<td>8.4</td>
</tr>
<tr>
<td>Sep</td>
<td>0.0</td>
<td>8.4</td>
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### End-month content

<table>
<thead>
<tr>
<th>Month</th>
<th>Kaf</th>
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</tr>
</thead>
<tbody>
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### End-month elevation

<table>
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<tr>
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<th>Ft.</th>
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</thead>
<tbody>
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<td>June</td>
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<tr>
<td>July</td>
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<tr>
<td>Aug</td>
<td>4400.9</td>
</tr>
<tr>
<td>Sep</td>
<td>4403.6</td>
</tr>
</tbody>
</table>

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### NORTH PLATTE RIVER OPERATING PLAN

**Year Beginning Oct 2007**

<table>
<thead>
<tr>
<th>Reservoir</th>
<th>Initial Content</th>
<th>Operating Limits:</th>
<th>Total Inflow</th>
<th>Total Release</th>
<th>Evaporation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray Reef</td>
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<td>39.6</td>
<td>29.6</td>
<td>0.0</td>
</tr>
<tr>
<td>Glendo</td>
<td>119.3 Kaf</td>
<td>Max 789.4 Kaf, 4653.00 Ft.</td>
<td>78.9</td>
<td>63.2</td>
<td>1.1</td>
</tr>
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<td>Guernsey</td>
<td>3.6 Kaf</td>
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<td>2.5</td>
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### Total Inflow

<table>
<thead>
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<th>Month</th>
<th>Total Inflow</th>
<th>Total Release</th>
<th>Evaporation</th>
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<tbody>
<tr>
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### Total Release

<table>
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<tr>
<th>Month</th>
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<tbody>
<tr>
<td>Jun</td>
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### Evaporation

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<tr>
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<td>8.4</td>
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<tr>
<td>Sep</td>
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<td>8.4</td>
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### End-month content

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</thead>
<tbody>
<tr>
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</tr>
<tr>
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<tbody>
<tr>
<td>June</td>
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<tr>
<td>July</td>
<td>4398.7</td>
</tr>
<tr>
<td>Aug</td>
<td>4400.9</td>
</tr>
<tr>
<td>Sep</td>
<td>4403.6</td>
</tr>
</tbody>
</table>
Flood Benefits for Water Year 2008

Because of the existence of dams on the North Platte River, the Corps of Engineers, Omaha District, estimates that in water year 2008 flood damages of $2,382,500 were prevented. Table 10 is a breakdown of flood damage prevented by dams.

Table 10 Flood Damage Prevented by Dams for Water Year 2008 (on the North Platte River Basin System)

<table>
<thead>
<tr>
<th>DAMS</th>
<th>WATER YEAR 2008</th>
<th>PRIOR TO 2008</th>
<th>ACCUMULATED TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMINOE</td>
<td>$858,900</td>
<td>$30,105,100</td>
<td>$30,964,000</td>
</tr>
<tr>
<td>PATHFINDER</td>
<td>$329,700</td>
<td>$8,874,800</td>
<td>$9,204,500</td>
</tr>
<tr>
<td>ALCOWA</td>
<td>$0</td>
<td>$547,900</td>
<td>$547,900</td>
</tr>
<tr>
<td>GLENDO</td>
<td>$1,193,900</td>
<td>$81,641,800</td>
<td>$82,835,700</td>
</tr>
<tr>
<td>GUERNSEY</td>
<td>$0</td>
<td>$434,000</td>
<td>$434,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$2,382,500</td>
<td>$121,603,600</td>
<td>$123,986,100</td>
</tr>
</tbody>
</table>

1 This data is received from the Army Corps of Engineers, Omaha District Office, and is revised every October.
2 The period of assessment is 1970 through 2007 except for Glendo Dam, which is 1965 through 2007.
Generation for Water Year 2008

Power generation was well below average for all powerplants except Kortes powerplant on the North Platte River Basin in water year 2008. See Table 11 for a breakdown of generation by powerplant.

Table 11 Power Generation Water Year 2008

<table>
<thead>
<tr>
<th>Powerplant</th>
<th>Gross generation (^1) (GWh)</th>
<th>Percent of Average (^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seminoe</td>
<td>115.6</td>
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</tr>
<tr>
<td>Kortes</td>
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<td>100</td>
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<tr>
<td>Fremont Canyon</td>
<td>162.1</td>
<td>69</td>
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<td>Alcova</td>
<td>82.5</td>
<td>69</td>
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<tr>
<td>Glendo</td>
<td>68</td>
<td>71</td>
</tr>
<tr>
<td>Guernsey</td>
<td>17.4</td>
<td>86</td>
</tr>
<tr>
<td>Total Basin</td>
<td>586.4</td>
<td>81</td>
</tr>
</tbody>
</table>

\(^1\) Generation is reported in giga-watt hours (GWh).
\(^2\) 30 year average (1978-2007)

The number of generation units at each powerplant, their capacity and output at rated head is shown in Table 12.

Table 12 North Platte River Powerplant Data

<table>
<thead>
<tr>
<th>Powerplant</th>
<th>Number of Units</th>
<th>Capacity Each Unit (kw)</th>
<th>Total (^2) Installed Capacity (kw)</th>
<th>Normal Operating Head (feet)</th>
<th>Output At rated Head (cfs)</th>
<th>30 year Average (^1) (GWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seminoe</td>
<td>3</td>
<td>17,000</td>
<td>51,000</td>
<td>97-227</td>
<td>4,050</td>
<td>132.6</td>
</tr>
<tr>
<td>Kortes</td>
<td>3</td>
<td>12,000</td>
<td>36,000</td>
<td>192-204</td>
<td>2,910</td>
<td>141.5</td>
</tr>
<tr>
<td>Fremont Canyon</td>
<td>2</td>
<td>33,400</td>
<td>66,800</td>
<td>247-363</td>
<td>3,080</td>
<td>234.3</td>
</tr>
<tr>
<td>Alcova</td>
<td>2</td>
<td>19,500</td>
<td>39,000</td>
<td>153-165</td>
<td>4,100</td>
<td>116.4</td>
</tr>
<tr>
<td>Glendo</td>
<td>2</td>
<td>19,000</td>
<td>38,000</td>
<td>73-156</td>
<td>3,400</td>
<td>79</td>
</tr>
<tr>
<td>Guernsey</td>
<td>2</td>
<td>3,200</td>
<td>6,400</td>
<td>89-91</td>
<td>1,340</td>
<td>18.7</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>---</td>
<td>237,200</td>
<td>---</td>
<td>---</td>
<td>722.5</td>
</tr>
</tbody>
</table>

\(^1\) 1978-2007
\(^2\) Installed capacity from Monthly Report of Power Operations-Powerplant (Form PO&M 59)
Glossary

Annual Operating Plan (AOP) - An annual publication which is prepared, reviewed, and presented to the public, with a summary of the actual operations and outlook for the coming water year.

Acre-Foot (AF) - A measure of volume of water equal to an area of 1 acre covered with water 1 foot deep. (43,560 cubic feet)

Basin - The watershed from which overland runoff flows into the North Platte River. When used alone in this report it refers to the North Platte River Drainage Basin upstream of Guernsey Dam.

Bypass - That amount of water released from a reservoir other than through the powerplant for those reservoirs which have a powerplant connected to them.

Cubic foot per second (cfs) - The rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second and is equivalent to approximately 7.48 gallons per second or 448.8 gallons per minute. The volume of water represented by a flow of 1 cubic foot per second for 24 hours is equivalent to 86,400 cubic feet, approximately 1.983 AF, or 646,272 gallons.

Evaporation Pool - A volume of water set aside in the accounting process from which reservoir evaporation is subtracted as it occurs. (Used in Glendo storage accounting).

Flood Pool - A physical space in the reservoir which is to be occupied only by water from flood events. In Glendo Reservoir, the volume between reservoir elevations 4635.0 feet and 4653.0 feet is reserved exclusively for flood control.

Gains - Water which enters a river in a defined reach from a source other than an upstream release. When flow released into a reach is greater than the river flow exiting the lower end of the reach, the net gain is negative (loss of water in the reach).

Giga Watt hour (GWh) - A unit of power equal to one billion watt hours.

Head - The difference in elevation between the reservoir water surface and the power generating turbines at a powerplant which is connected to a reservoir.

Hydromet - Computer software designed for the acquisition, processing, storage and retrieval of hydrological and meteorological data which is gathered via satellite from remote sites.

Inflow - As used in this report is any water which enters a reservoir irrespective of whether it originated in the reach or was released from an upstream storage reservoir.
Glossary (continued)

Inland Lakes - A series of four off-stream storage reservoirs on the Interstate Canal system in Nebraska which are used to store and re-release irrigation water. (Lake Alice, Lake Minatare, Little Lake Alice, and Lake Winters Creek)

Megawatt (MW) – A unit of power equal to one million watts.

Natural Flow - River flow which has originated from a source other than reservoir storage.

NRCS. – The Natural Resources Conservation Service which is a government agency under the Department of Agriculture.

Power Pool - That space in a reservoir which must be full in order to efficiently generate electrical power through an associated turbine generator.

Precipitation - A deposit on the earth of hail, mist, rain, sleet, or snow.

Runoff - That part of precipitation on the Basin which appears as flow in the North Platte River.

Silt Run - The name given to the practice of flushing silt from Guernsey Reservoir into the North Platte River downstream where the silt laden water is diverted by irrigators. The silt tends to settle in the slower moving water of canals and laterals helping to seal the wetted perimeter and reduce seepage losses.

SNOTEL - Snowpack telemetry network. A network of NRCS automated sites which continually monitor snowpack and weather conditions and transmit data to a data retrieval center in Portland, Oregon.

System - As used in the report the System includes all storage, delivery, and power generating facilities on the mainstem of the North Platte River in Wyoming.

SWE – Snow Water Equivalent is the amount of water in the snowpack expressed in inches.

Water Year - October 1 through September 30
Figure 20  Pathfinder Watershed Runoff 1906-2008

30 yr Ave = 1,091 kaf (1979-2008)
A. General:

Dam design and reservoir operation utilize reservoir capacity and water surface elevation data. To insure uniformity in establishment, use, and publication of these data the following standard definitions of water surface elevations and reservoir capacities shall be used.

B. Water Surface Elevation Definitions:

**Maximum Water Surface** - the highest acceptable water surface elevation with all factors affecting the safety of the structure considered. Normally it is the highest water surface elevation resulting from a computed routing of the inflow design flood through the reservoir on the basis of established operating criteria. It is the top of surcharge capacity.

**Top of Exclusive Flood Control Capacity** - the reservoir water surface elevation at the top of the reservoir capacity allocated for exclusive use for the regulating of flood inflows to reduce damage downstream.

**Maximum Controllable Water Surface Elevation** - the highest reservoir water surface elevation at which gravity flows from the reservoir can be completely shut off.

**Top of Joint Use Capacity** - the reservoir water surface elevation at the top of the reservoir capacity allocated to joint use, i.e., flood control and conservation purposes.

**Top of Active Conservation Capacity** - the reservoir water surface elevation at the top of the capacity allocated to the storage of water for conservation purposes only.

**Top of Inactive Capacity** - the reservoir water surface elevation below which the reservoir will not be evacuated under normal conditions.

**Top of Dead Capacity** - the lowest elevation in the reservoir from which water can be drawn by gravity.

**Streambed at the Dam Axis** - the elevation of the lowest point in the streambed at the axis of the dam prior to construction. This elevation normally defines the zero for the area-capacity tables.
C. Capacity Definitions:

Surcharge Capacity - the reservoir capacity provided for use in passing the inflow design flood through the reservoir. It is the reservoir capacity between the maximum water surface elevation and the highest of the following elevations:

a) Top of exclusive flood control capacity

b) Top of joint use capacity

c) Top of active conservation capacity

Total Capacity - the reservoir capacity below the highest of the elevations representing the top of exclusive flood control capacity, the top of joint use capacity, or the top of active conservation capacity. In the case of a natural lake which has been enlarged, the total capacity includes the dead capacity of the lake. Total capacity is used to express the total quantity of water which can be impounded and is exclusive of surcharge capacity.

Live Capacity - the part of the total capacity from which water can be withdrawn by gravity. It is equal to the total capacity less the dead capacity.

Active Capacity - the reservoir capacity normally usable for storage and regulation of reservoir inflows to meet established reservoir operating requirements. Active capacity extends from the highest of the top of exclusive flood control capacity, the top of joint use capacity, or the top of active conservation capacity to the top of inactive capacity. It is the total capacity less the sum of the inactive and dead capacities.

Exclusive Flood Control Capacity - the reservoir capacity assigned to the sole purpose of regulating flood inflows to reduce flood damage downstream.

Joint Use Capacity - the reservoir capacity assigned to flood control purposes during certain periods of the year and to conservation purposes during other periods of the year.

Active Conservation Capacity - the reservoir capacity assigned to regulate reservoir inflows for irrigation, power, municipal, industrial, fish and wildlife, navigation, recreation, water quality, and other purposes. It does not include exclusive flood control or joint use capacity. The active conservation capacity extends from the top of the active conservation capacity to the top of the inactive capacity.
Figure 21 North Platte River Basin Map