

## PREFACE

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 1975-2004, except for water year 2006 information which uses the years 1976-2005. In each coming year this period will be advanced by one 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 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 multipurpose 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 Seminoe 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 2005. 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 Seminoe 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 Seminoe 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 stem reservoirs, six of which have powerplants with generating capacities totaling 237,200 kilowatts (kw). Table 11 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

Reservoir	Dead Storage <u>1/</u> Acre-feet (AF)	Active Storage <u>2/</u> (AF)	Total Storage (AF)	Minimum Storage (AF)	Minimum Elevation (feet)
Seminole	556	1,016,717	1,017,273	31,670 <u>4/</u>	6239.00 <u>4/</u>
Kortes	151	4,588	4,739	1,666 <u>4/</u>	6092.00 <u>4/</u>
Pathfinder	7	1,016,500	1,016,507	31,405 <u>4/</u>	5746.00 <u>4/</u>
Alcova	91	184,314	184,405	137,610 <u>5/</u>	5479.50 <u>5/</u>
Gray Reef	56	1,744	1,800	56 <u>6/</u>	5312.00 <u>6/</u>
Glendo	11,033	778,369	789,402 <u>3/</u>	63,148	4570.00 <u>7/</u>
Guernsey	0	45,612	45,612	0	4370.00 <u>8/</u>
Total	11,894	3,047,844	3,059,738	265,555	

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, and 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 Wyoming Area Office 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, 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 2005. Table 2 depicts A Summary of Reservoir Storage Content for water year 2005 (end of month). Table 9 depicts the Actual Reservoir Operations for water year 2005.

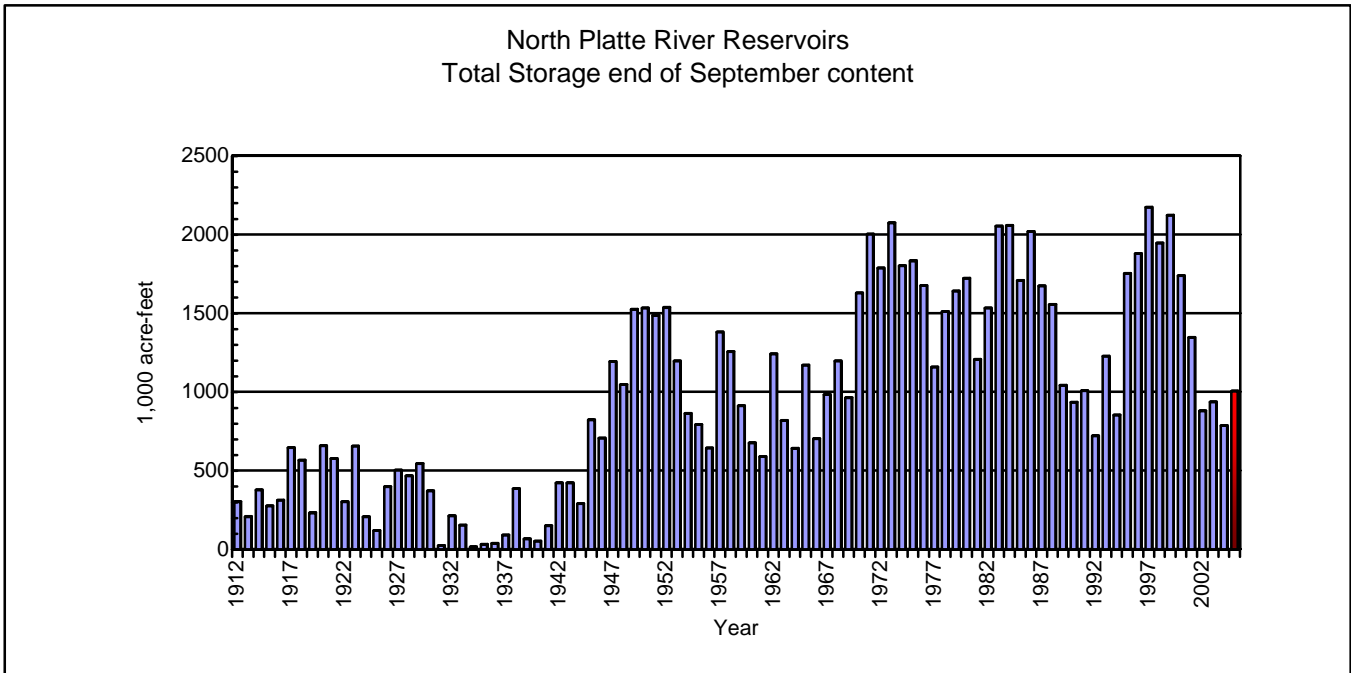
**Table 2** Summary of Reservoir Storage Content for water year 2005 (end of month)

Seminoe Reservoir			Pathfinder Reservoir			Alcova Reservoir		
Month	Storage	Record <u>1</u> /	Month	Storage	Record <u>1</u> /	Month	Storage	Record <u>1</u> /
October	277,035	3 <sup>rd</sup> lowest	October	220,593	2 <sup>nd</sup> lowest	October	158,303	<u>3</u> /
November	276,584	3 <sup>rd</sup> lowest	November	228,894	2 <sup>nd</sup> lowest	November	155,975	
December	269,960	3 <sup>rd</sup> lowest	December	234,488	2 <sup>nd</sup> lowest	December	156,088	
January	268,413	3 <sup>rd</sup> lowest	January	241,561	2 <sup>nd</sup> lowest	January	155,930	
February	267,311	4 <sup>th</sup> lowest	February	248,690	2 <sup>nd</sup> lowest	February	155,863	
March	274,489	5 <sup>th</sup> lowest	March	247,056	2 <sup>nd</sup> lowest	March	156,065	
April	344,869		April	228,150	2 <sup>nd</sup> lowest	April	180,376	
May	487,710		May	210,255	lowest	May	181,183	
June	648,743		June	231,681	lowest	June	180,620	
July	559,067		July	236,555	2 <sup>nd</sup> lowest	July	181,232	
August	480,195		August	236,486	3 <sup>rd</sup> lowest	August	180,083	
September	438,576		September	238,911	5 <sup>th</sup> lowest	September	180,254	
Glendo Reservoir			Guernsey Reservoir			Total System <u>2</u> /		
Month	Storage	Record <u>1</u> /	Month	Storage	Record <u>1</u> /	Month	Storage	Record <u>1</u> /
October	162,604		October	11,686	3 <sup>rd</sup> highest	October	836,406	2 <sup>nd</sup> lowest
November	196,936		November	13,706	highest	November	878,316	2 <sup>nd</sup> lowest
December	231,843		December	15,851	highest	December	914,417	2 <sup>nd</sup> lowest
January	267,112		January	17,853	2 <sup>nd</sup> highest	January	957,077	2 <sup>nd</sup> lowest
February	298,590		February	19,441		February	995,919	2 <sup>nd</sup> lowest
March	339,855		March	21,139		March	1,044,862	2 <sup>nd</sup> lowest
April	380,015		April	22,878		April	1,162,582	2 <sup>nd</sup> lowest
May	459,587		May	28,596	2 <sup>nd</sup> lowest	May	1,373,692	3 <sup>rd</sup> lowest
June	481,531		June	27,301	lowest	June	1,576,187	
July	317,236		July	5,110		July	1,305,545	
August	133,411		August	17,217	4 <sup>th</sup> lowest	August	1,053,668	
September	138,417		September	4,185		September	1,006,540	

1/ Record is the 30 year period from 1975-2004

2/ Total North Platte system includes storage in Seminoe, Kortez, Pathfinder, Alcova, Gray Reef, Glendo and Guernsey Reservoirs

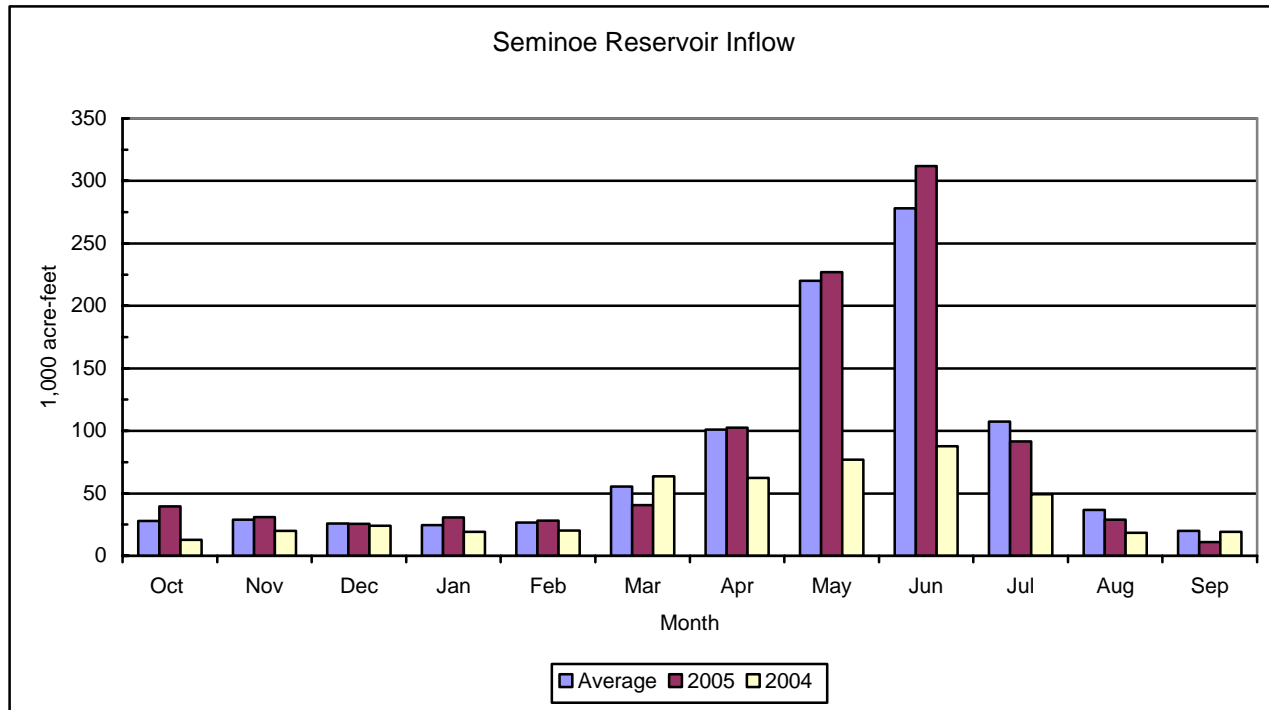
3/ Alcova Reservoir is normally maintained within either a winter operating range (between contents of 153,802 AF to 158,302 AF) or a summer operating range (between contents 177,070 AF to 181,943 AF)



**Figure 1** North Platte River Reservoirs Total Storage end of September content (1912-2005)

**SYSTEM OPERATIONS WATER YEAR 2005**  
Seminoe Reservoir Inflow

Seminoe Reservoir inflows were above or near average for most of the water year with only four months being below average. A total of 968,400 AF or 102 percent of the 30 year average entered the system above Seminoe Reservoir during the water year, which was the first annual inflow to be above average in the last six years. The monthly inflows ranged from a high of 142 percent of average in October 2004 to a low of 55 percent in September 2005. The March inflow into Seminoe Reservoir was the 5th lowest in the last 30 years. The September inflow was the 6th lowest September inflow in the last 30 years. The actual April through July inflow totaled 732,700 AF, which was 104 percent of the 30 year average of 706,800 AF. The Seminoe computed inflow peaked for the water year on June 6, 2005, at 9,324 cubic feet per second (cfs) compared to only 2,601 cfs in water year 2004. Figure 2 depicts a comparison of average, water year 2005 and water year 2004 monthly inflow.



**Figure 2** Seminole Reservoir Inflow

### Seminole Reservoir Storage and Releases

Seminole 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 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 2005, Seminole Reservoir had a storage content of 270,477 AF, which was 39 percent of average and 27 percent of capacity. Seminole storage content remained below average for the entire water year. The maximum Seminole Reservoir content was reached on July 2, 2005, at 650,017 AF. At the end of water year 2005, Seminole Reservoir storage content was 438,576 AF, which was 64 percent of average and 43 percent of capacity. See Figure 3 for a comparison of average, water year 2004 and water year 2003 monthly storage.

Releases from Seminole Dam averaged approximately 520 cfs from October 2004, through April 2005. Releases were increased to approximately 2,500 cfs by the end of May and increased to approximately 2,700 cfs by the end of June. The flows were again increased to 2,800 cfs in July and then decreased to approximately 1,000 cfs by the end of August. The water release was reduced to approximately 535 cfs on October 1, 2005 which would be the flow for the winter. All releases were made through the Seminole Powerplant, except for one day (July 8, 2005), when testing required bypass releases. Table 3 depicts a summary of Seminole Reservoir information for water year 2005.

**Table 3** Seminole Reservoir Hydrologic Data for water year 2005

Reservoir Allocations	Elevation (FT)	Storage (AF)	Storage Allocation (AF)
Top of Inactive and Dead	6239.00	31,670	31,670
Top of Active Conservation	6357.00	1,017,273	985,603
Crest of Dam (without Camber)	6361.00		

Storage-Elevation Data	Elevation (FT)	Storage (AF)	Date
Beginning of water year	6299.12	270,477	Oct 1, 2004 <u>2/</u>
End of water year	6318.19	438,576	Sep 30, 2005
Annual Low	6298.54	266,213	Feb 19&22, 2005
Historic Low <u>1/</u>	6253.30	56,390	Apr 20, 1961
Annual High	6335.54	650,017	Jul 2, 2005
Historic High <u>1/</u>	6359.29	1,073,050	Jun 20, 1949

1/The daily records for this table are only available from water year 1946.

2/ Represents 0001 hours on October 1

Inflow-Outflow Data	Inflow <u>3/</u>	Date	Outflow	Date
Annual Total (AF)	968,400	Oct' 04 – Sep' 05	769,200	Oct' 04 – Sep' 05
Daily Peak (CFS)	9,324	Jun 6, 2005	2,897 <u>4/</u>	Jul 8, 2005
Daily Minimum (CFS)	17	Sep 24, 2005	437 <u>4/</u>	Mar 28, 2005
Peak Jet Flow Valve (CFS)				
Total Jet Flow Valve (CFS)				

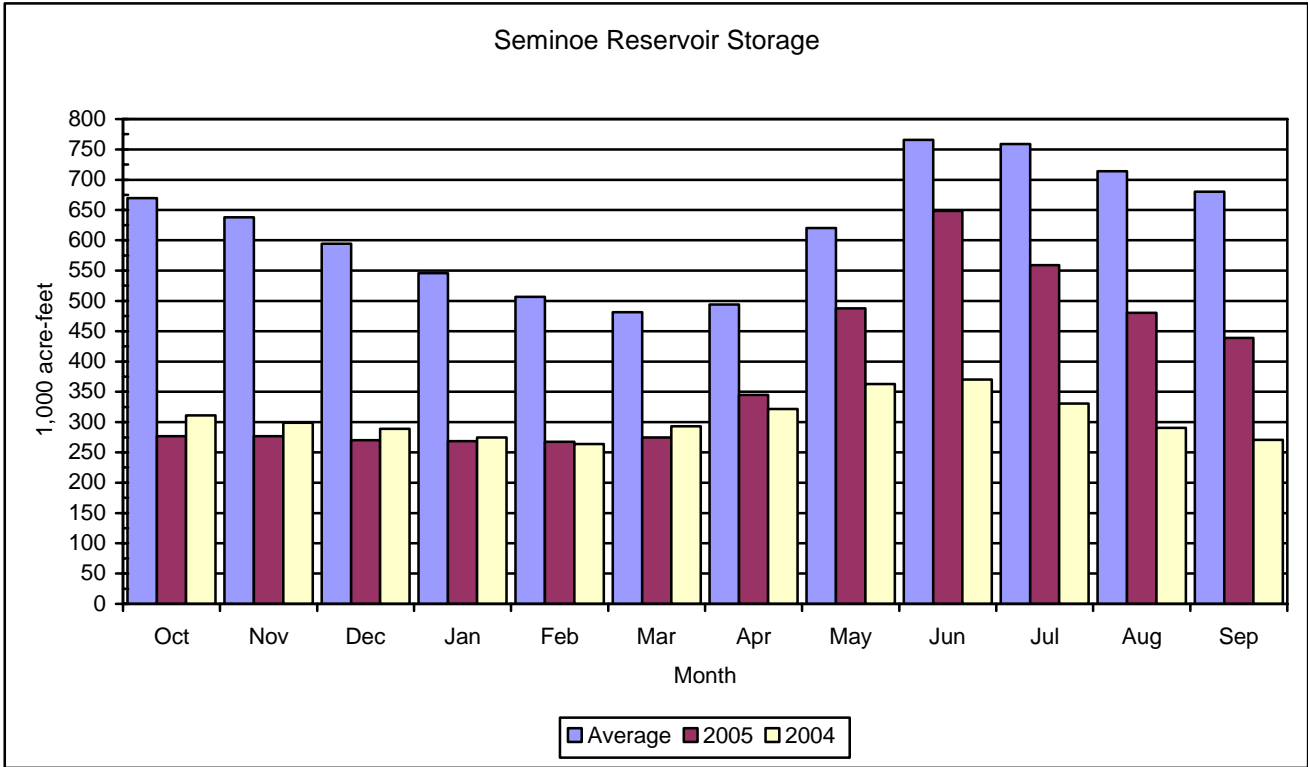
3/Inflows are a computed number.

4/Daily peak and minimum are releases to the river.

Month	Inflow		Outflow		Content <u>6/</u>	
	KAF	% of Avg. <u>5/</u>	KAF	% of Avg. <u>5/</u>	KAF	% of Avg. <u>5/</u>
October	39.6	142	32.0	59	277.0	41
November	31.0	107	30.9	53	276.6	43
December	25.7	99	31.8	46	270.0	45
January	30.8	126	31.8	44	268.4	49
February	28.1	105	28.8	44	267.3	53
March	40.7	73	32.0	41	274.5	57
April	102.5	101	30.8	36	344.9	70
May	226.9	103	80.7	90	487.7	79
June	311.8	112	144.5	116	648.7	85
July	91.5	85	173.2	164	559.1	74
August	28.8	78	103.4	139	480.2	67
September	11.0	55	49.3	102	438.6	64
Annual	968.4	102	769.2	83		

5/The 30 year average is the period (1975-2004)

6/End of month



**Figure 3** Seminoe Reservoir Storage

### 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 the 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.

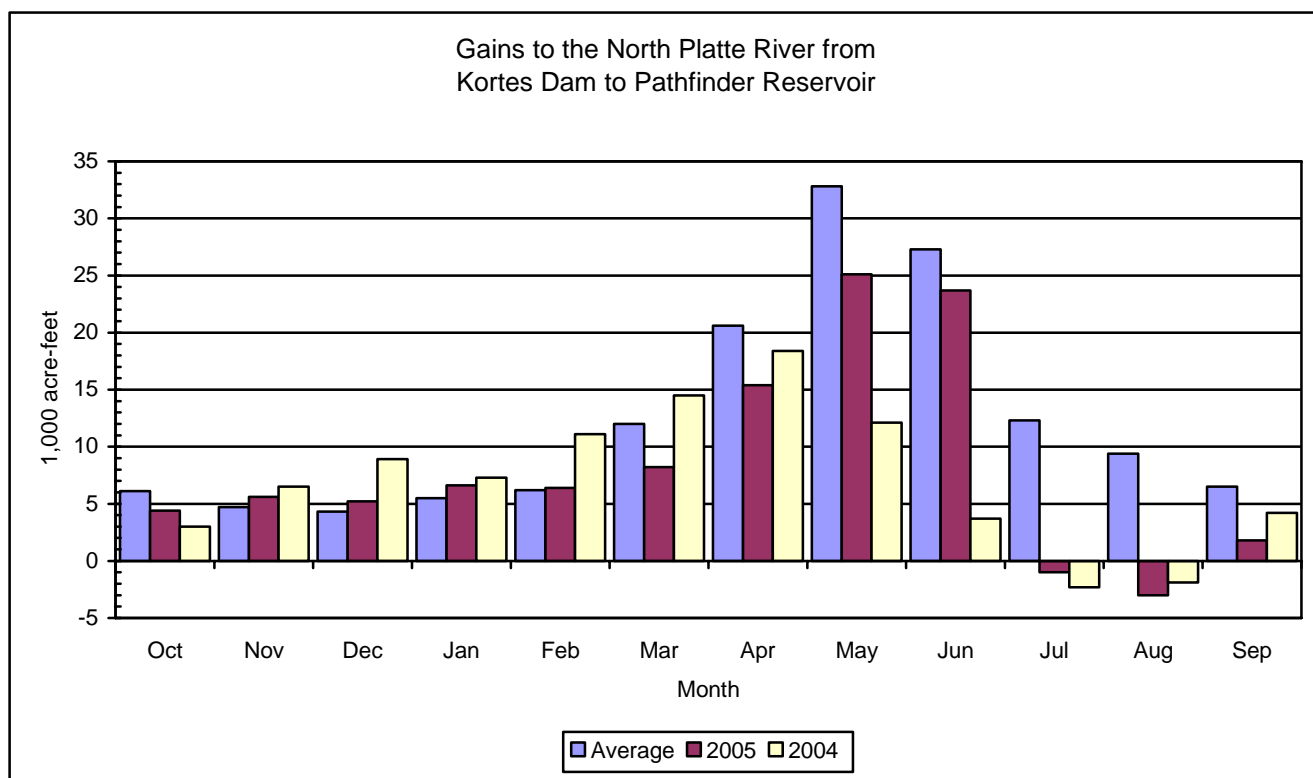
Senate Bill 2553 which was passed in the 90th Congress authorized the modification of the operation of Kortes Dam and Powerplant to provide a minimum streamflow of 500 cfs in the North Platte River between Kortes Reservoir and the normal headwaters of Pathfinder Reservoir. The minimum flow permits maintenance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



Kortes releases averaged approximately 520 cfs from October 2004 through April 2005. The Kortes releases were increased to approximately 2,500 cfs by the end of May and increased to approximately 2,700 cfs by the end of June. The Kortes flows were again increased to 2,800 cfs in July and then decreased to approximately 1,000 cfs by the end of August. The water release was reduced to approximately 535 cfs on October 1, 2005 which would be the flow for the winter. In water year 2005 most releases were made through the Kortes Powerplant, except for seven occasions, when testing or maintenance required bypass releases. The highest bypass release for the water year was made on June 3, 2005, at a peak flow of approximately 1,260 cfs.

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

Kortes Dam to Pathfinder Dam river gains were below average for October and then above average from November 2004 through February 2005, with the remaining months during the water year being below average. The Kortes Dam to Pathfinder Dam river gains ranged from 121 percent in December 2004 to 28 percent of average in September 2005. The Kortes to Pathfinder river gains for March 2005, were the 5<sup>th</sup> lowest in the last 30 years. The actual April through July river gains were 63,200 AF, which is 68 percent of the 30 year average of 93,000 AF. The Kortes to Pathfinder river gains for September 2005, tied the lowest river gains in the last 30 years. Figure 4 depicts a comparison of average, water year 2004 and water year 2005 monthly river gains.

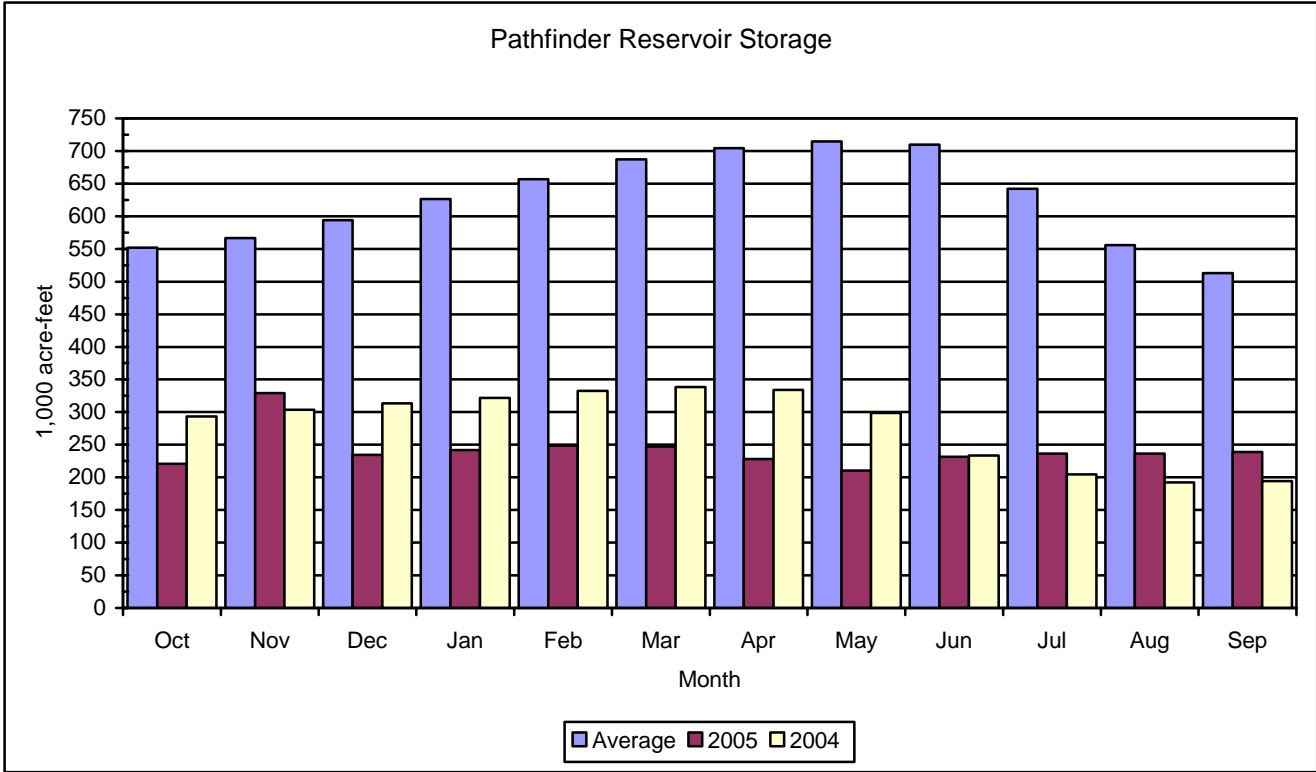


**Figure 4** Gains to the North Platte River from Kortes Dam to Pathfinder Reservoir

## 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 abutment 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 abutment 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 2005, storage in Pathfinder Reservoir was 194,164 AF, which was 37 percent of average and only 19 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 March 5, 2005, at 249,688 AF which was only 25 percent of capacity. The water year ended with 238,911 AF of water in storage in Pathfinder Reservoir, which was 47 percent of average and 24 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 2005.



**Figure 5** Pathfinder Reservoir Storage

**Table 4** Pathfinder Reservoir Hydrologic Data for water year 2005

Reservoir Allocations	Elevation (FT)	Storage (AF)	Storage Allocation (AF)
Top of Inactive and Dead	5746.00	31,405	31,405
Top of Active Conservation	5850.10	1,016,507	985,102
Crest of Dam (without Camber)	5858.10		

Storage-Elevation Data	Elevation (FT)	Storage (AF)	Date
Beginning of water year	5785.33	194,164	Oct 1, 2004 <u>3/</u>
End of water year	5792.21	238,911	Sep 30, 2005
Annual Low	5785.33	194,164	Oct 1, 2004
Historic Low <u>1/</u> <u>2/</u>	5690.00	0	Sep 9, 1958
Annual High	5793.74	249,688	Mar 5, 2005
Historic High <u>1/</u>	5853.11	1,083,755	Jul 7, 1983

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.

Inflow-Outflow Data	Inflow	Date	Outflow	Date
Annual Total (AF)	867,700	Oct, 2004 – Sep, 2005	802,600	Oct, 2004 – Sep, 2005
Daily Peak (CFS)	3,241	May 30, 2005	2,755	Jul 30, 2005
Daily Minimum (CFS)	362	Nov 16, 2004	60	Apr 13, 2005
Peak Jet Flow Valve (CFS)			100 <u>4/</u>	Jan 19, 2005
Total Jet Flow Valve (AF)			56,837	Oct, 2004 – Sep, 2005

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.

Month	Gain from Kortès		Inflow <u>6/</u>		Outflow		Content <u>8/</u>	
	KAF	% of Avg. <u>5/</u>	KAF	% of Avg. <u>5/</u>	KAF	% of Avg. <u>5/</u>	KAF	% of Avg. <u>5/</u>
October	4.4	72	36.4	61	9.0	26	220.6	40
November	5.6	119	36.5	56	27.7	59	228.9	40
December	5.2	121	37.1	51	31.0	71	234.5	39
January	6.6	120	38.3	49	30.7	70	241.6	39
February	6.4	103	35.2	49	27.7	69	248.7	38
March	8.2	68	40.2	44	40.4	70	247.1	36
April	15.4	75	46.3	44	64.0	76	228.2	32
May	25.1	77	105.7	86	121.5	115	210.3	29
June	23.7	87	168.2	110	143.4	97	231.7	33
July	-1.0	NA <u>7/</u>	172.2	146	162.9	93	236.6	37
August	-3.0	NA <u>7/</u>	100.5	120	97.9	61	236.5	43
September	1.8	64	51.1	94	46.4	50	238.9	47
Annual	98.4	67	867.7	81	802.6	78		

5/30 year average is the period (1975-2004)

6/ The inflow include the gain from Kortès 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 and accommodate recreation use, while the lower winter operating level reduces the potential for ice damage to the canal gate and boat docks.

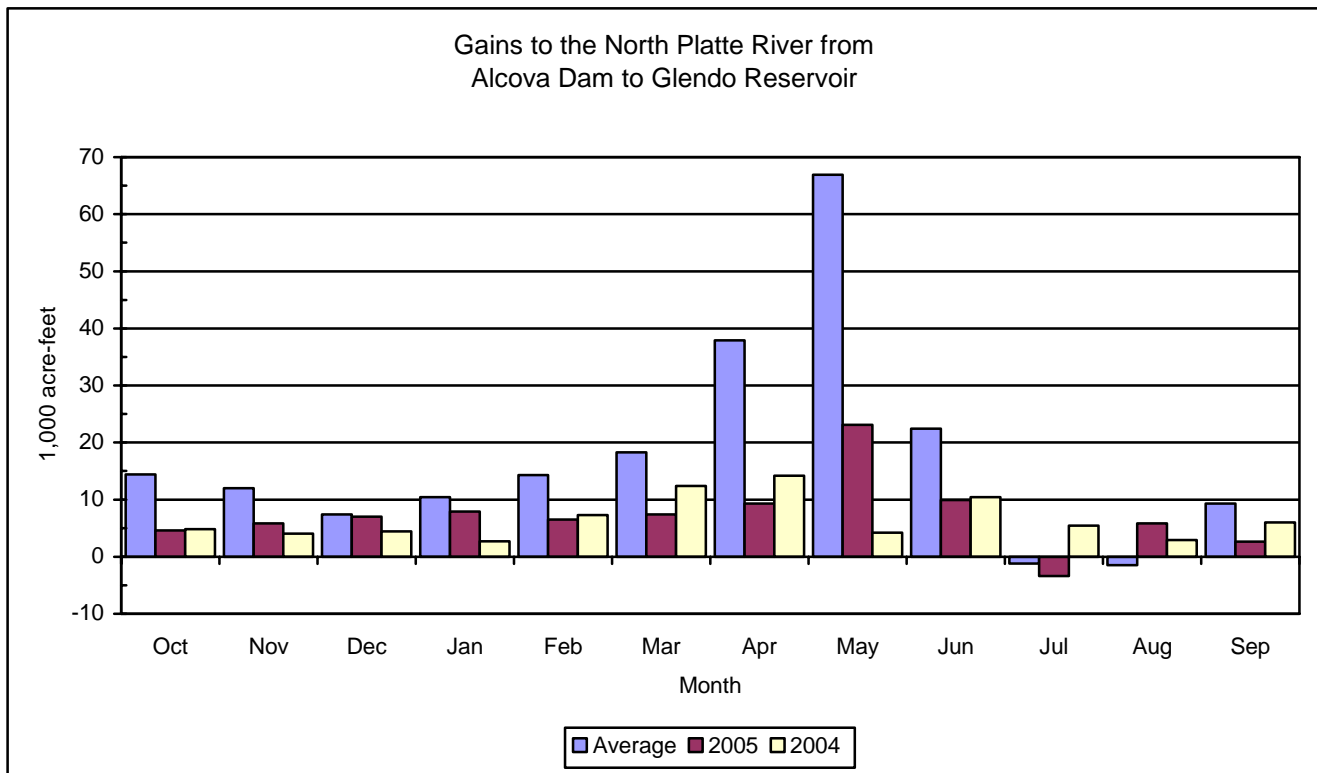
The annual drawdown of Alcova Reservoir began on October 1, 2004, and continued through October 31, 2004, when the reservoir reached its normal winter operating range of 5488 ± one foot. The refill of Alcova Reservoir was initiated on April 1, 2005. The water surface elevation was raised above 5497 feet on April 24, 2005, and the reservoir was maintained within 1 foot of elevation 5498 throughout the summer. In water year 2005 most releases were made through the Alcova Powerplant, except for four occasions, when testing or maintenance required bypass releases.

Gray Reef Dam and Reservoir is part of the Glendo Unit, Oregon Trail 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 reregulate 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 2004 until March 2005. At the request of the Wyoming Game and Fish Department, a series of flushing flows were initiated on March 7, 2005, and continued through March 11, 2005, 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 13, 2005. Releases for the remainder of the water year were adjusted to manage upstream inflows from snowmelt runoff and to meet irrigation demands below Guernsey Reservoir. The largest release of water for the water year occurred on July 31, 2005 at 2,527 cfs.

## Gains to the North Platte River from Alcova Dam to Glendo Reservoir

River gains from Alcova Dam to Glendo Reservoir were below average for the entire water year. The Alcova Dam to Glendo Reservoir river gains ranged from a high of only 95 percent in December 2004 to 24 percent of average in April 2005. The Alcova to Glendo river gains for October and November 2004, were the 2<sup>nd</sup> and 3<sup>rd</sup> lowest river gains in the last 30 years respectively. The Alcova to Glendo river gains for February and March 2005, were the 3<sup>rd</sup> and 2<sup>nd</sup> lowest river gains of record since the construction of Glendo Dam in 1958. The actual April through July gain was 38,900 AF, which was only 31 percent of average. The Alcova to Glendo river gains for April and September 2005, were both the 4th lowest river gains in the last 30 years. During the months of July and August the net river gain between Alcova Dam and Glendo Reservoir was a negative value. The maximum computed daily river gain of 1,195 cfs occurred on May 13, 2005 and the daily computed Glendo Reservoir inflow peaked on July 25, 2005, at 3,034 cfs. Figure 6 depicts a comparison of average, water year 2005 and water year 2004 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 2 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. Releases are, however, restricted to 6,600 cfs as a precautionary practice. This precautionary practice is to minimize the potential for damage to the stilling basin and training walls. In order to exceed 6,600 cfs discharge through the primary outlet works, prior approval of the Director, Denver Technical Service Center and of the Great Plains Regional Director, Billings, Montana is required. 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 127,242 AF at the beginning of water year 2005, which was 126 percent of average but only 25 percent of active conservation of 517,485. Water releases from Glendo Reservoir were initiated on May 10, 2005, in order to refill Guernsey Reservoir in preparation for irrigation releases. The reservoir reached a maximum storage for the year of 504,535 AF (elevation 4633.94 feet) on June 20, 2005. At the end of the water year, Glendo Reservoir contained 138,417 AF of water (water surface elevation 4588.84 feet) which was 134 percent of average and only 27 percent of active conservation of 517,485. Figure 7 depicts water year 2005 and water year 2004 end of month reservoir storage compared to average. Table 5 depicts a summary of Glendo Reservoir information for water year 2005.

**Table 5** Glendo Reservoir Hydrologic Data for water year 2005

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

Storage-Elevation Data	Elevation (FT)	Storage (AF)	Date
Beginning of water year	4586.53	127,242	Oct 1, 2004 <u>1/</u>
End of water year	4588.84	138,417	Sep 30, 2005
Annual Low	4583.27	112,461	Sep 7, 2005
Historic Low	4548.10	15,140	Sep 28, 1966
Annual High	4633.94	504,535	Jun 20, 2005
Historic High	4650.94	758,830	May 28, 1973

1/ Represents 0001 hours on October 1.

Inflow-Outflow Data	Inflow	Date	Outflow <u>1/</u>	Date
Annual Total (AF)	796,200	Oct, 2004 – Sep, 2005	759,200	Oct, 2004 – Sep, 2005
Daily Peak (CFS)	3,034	Jul 25, 2005	7,542	Aug 4, 2005
Daily Minimum (CFS)	-836 <u>3/</u>	Aug 29, 2005	25 <u>2/</u>	Oct, 2004 – Sep, 2005
Peak Bypass Release (CFS)			4,124	Aug 4, 2005
Total Bypass Release (AF)			137,326 <u>1/</u>	Oct, 2004 – Sep, 2005

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

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

3/ Not a true negative number but a correction. The Glendo Forebay intake at the stilling well was clogged so when the lake elevation level was measured the forebay was showing more water than what was actually there, therefore a correction to the elevation was made and there was a large overall change to the system.

Month	Gain from Alcova		Inflow <u>7/</u>		Outflow		Content <u>9/</u>	
	KAF	% of Avg. <u>5/</u>	KAF	% of Avg. <u>5/</u>	KAF	% of Avg. <u>5/</u>	KAF	% of Avg. <u>5/</u>
October	4.6	32	37.7	52	1.6	62 <u>6/</u>	162.6	62
November	5.8	48	36.3	60	1.7	106 <u>6/</u>	196.9	106
December	7.0	95	37.0	71	1.8	95 <u>6/</u>	231.8	95
January	7.9	76	37.8	71	2.0	100 <u>6/</u>	267.1	100
February	6.5	46	33.5	63	1.6	70 <u>6/</u>	298.6	70
March	7.4	40	44.7	62	1.7	8 <u>6/</u>	339.9	8
April	9.3	24	44.7	45	1.9	3 <u>8/</u>	380.0	3
May	23.1	35	122.5	78	38.8	31 <u>8/</u>	459.6	31
June	9.9	44	128.3	85	101.0	60 <u>8/</u>	481.5	60
July	-3.4	NA <u>4/</u>	141.0	92	299.6	96	317.2	96
August	5.8	NA <u>4/</u>	95.1	67	276.4	94	133.4	94
September	2.6	28	37.6	40	31.1	24 <u>8/</u>	138.4	24
Annual	86.5	41	796.2	68	759.2	67		

4/ Represents a negative number that makes the percentage meaningless.

5/ 30 year average is the period (1975-2004)

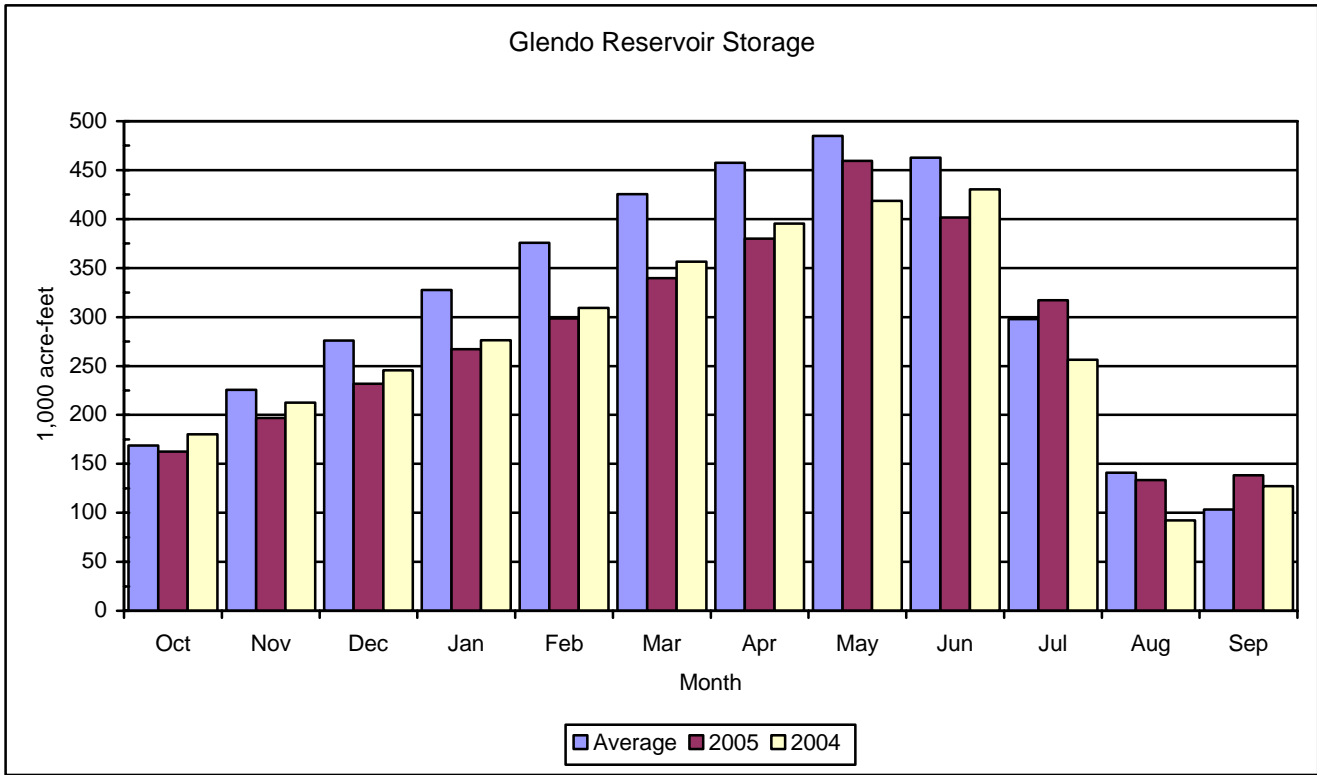
6/ 11 year average is the period (1994-2004)

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

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

9/ End of month

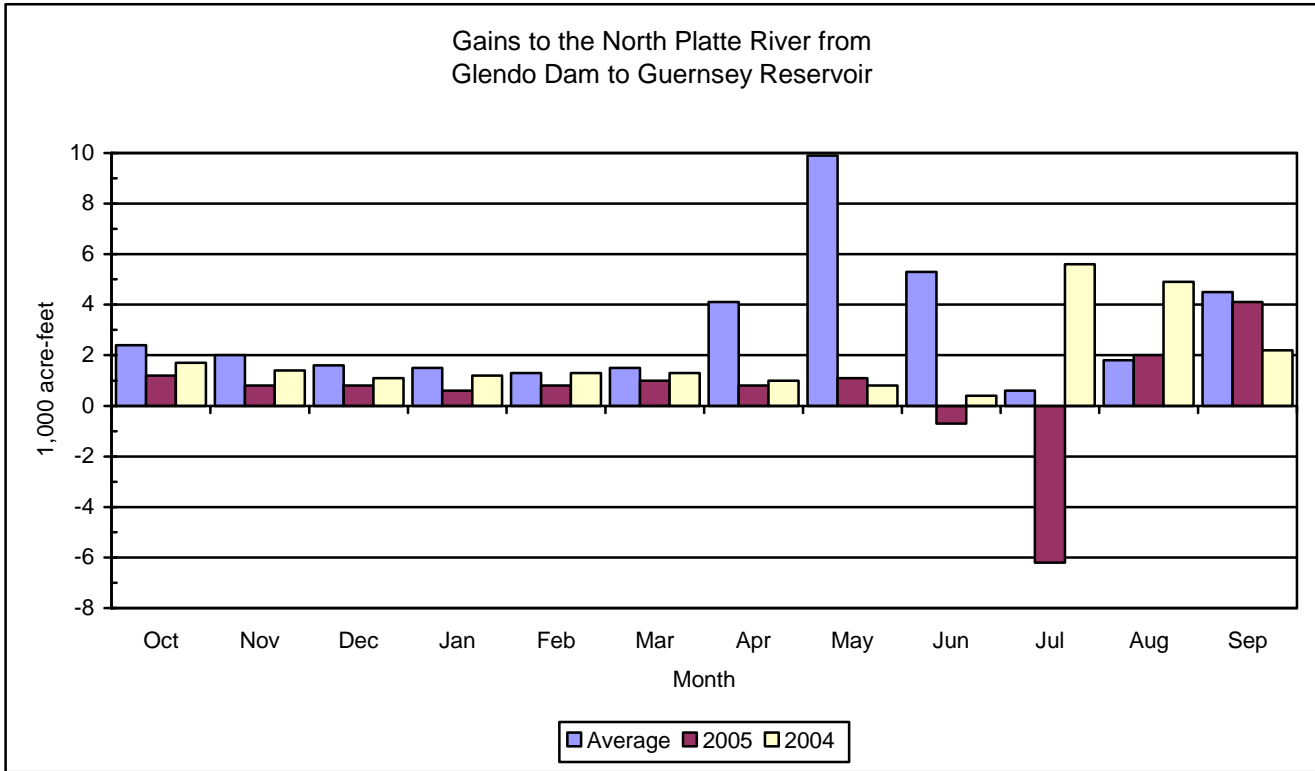




**Figure 7** Glendo Reservoir Storage

### Gains to the North Platte River from Glendo Dam to Guernsey Reservoir

The river gains between Glendo Dam and Guernsey Dam during water year 2005 were below average for eleven months with only the month of July 2005 being above average. The Glendo Dam to Guernsey Reservoir river gains ranged from a high of 111 percent in August 2005 to only 11 percent of average in May 2005, with the months of June and July having a negative value making a percentage value meaningless. The Glendo to Guernsey river gains for December 2004, was the lowest December river gain in the last 30 years. The Glendo to Guernsey river gains for January and February 2005, were the 2<sup>nd</sup> and 4<sup>th</sup> lowest river gains in the last 30 years respectively. On August 4, 2005, daily computed inflow to Guernsey Reservoir peaked at 7,582 cfs. Figure 8 depicts a comparison of average, water year 2005 and water year 2004 monthly river gains.



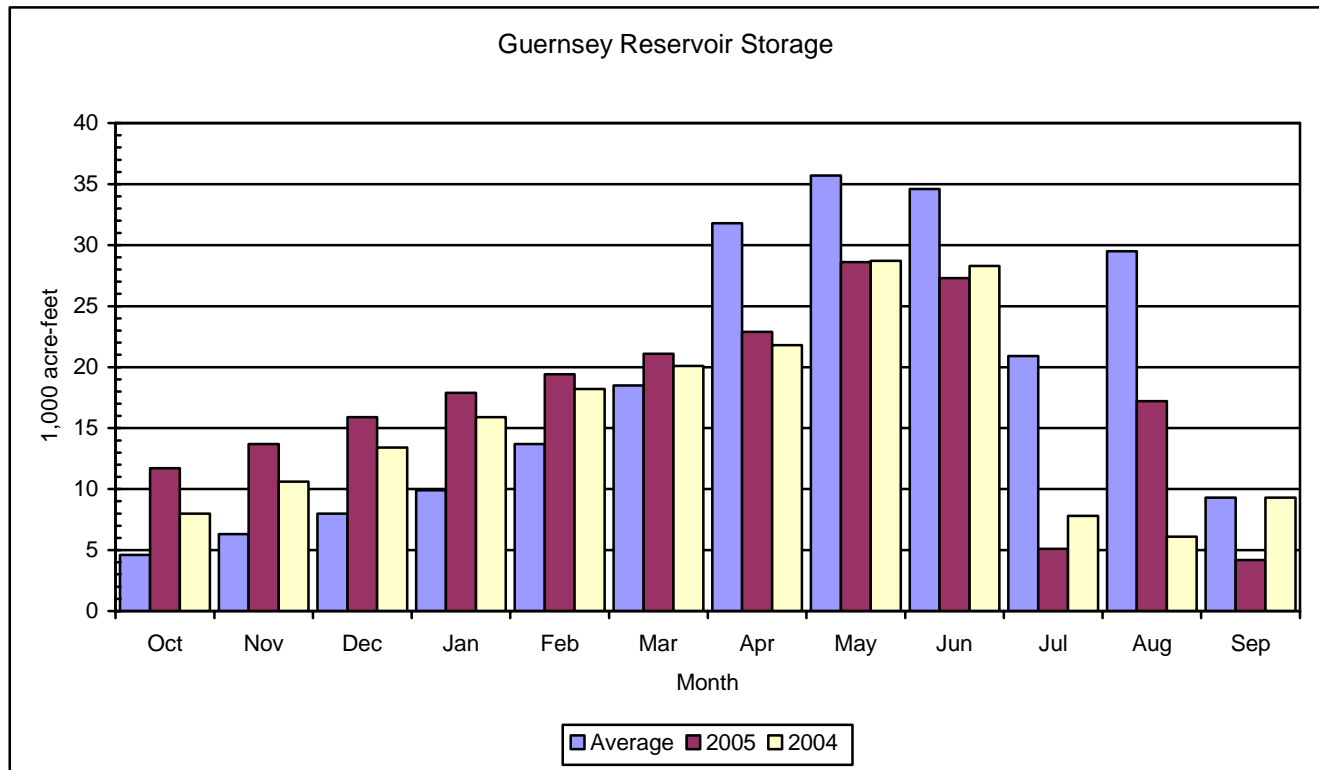
**Figure 8** Gains to the North Platte River from Glendo Dam to Guernsey Reservoir

### Guernsey Reservoir Storage and Releases

Guernsey Dam located about 25 miles below Glendo Dam, again stores and reregulates 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.

At the beginning of water year 2005, storage in Guernsey Reservoir was at 9,251 AF. Releases from Guernsey Reservoir were started on May 15, 2005, as water was moved into the Inland Lakes. The annual "silt run" from the reservoir was initiated on July 10 and continued for 21 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 588 AF occurred on July 30, 2005. Following the "silt run," the reservoir was refilled to 26,202 AF by August 4, 2005 again making the reservoir suitable for recreation. At the end of the irrigation season, September 30, 2005, Guernsey Reservoir contained 4,185 AF. See Figure 9 for water year 2005 and water year 2004 storage compared to average.



**Figure 9** Guernsey Reservoir Storage

### Precipitation summary for water year 2005

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

In the Seminoe watershed, precipitation at the Elk Mountain, Wyoming, weather station recorded the highest October precipitation in the last 30 years.

In the Seminoe watershed, precipitation data was available from only two of the three weather stations for November. One recorded the 4<sup>th</sup> lowest November precipitation in the last 30 years and the other

tied the 7<sup>th</sup> highest November precipitation combining for an average of 110 percent for the month of November.

In the Glendo watershed, precipitation at the Pathfinder Dam, Wyoming, weather station tied the lowest December precipitation in the last 30 years, and the Casper, Wyoming, weather station tied the third lowest December precipitation of record back to water year 1916. The Pathfinder Dam weather station is used as an indicator in both the Pathfinder and Glendo watersheds. In the Guernsey watershed, precipitation at the Guernsey Dam, Wyoming, weather station tied the third lowest December precipitation in the last 30 years.

In the Seminoe watershed, precipitation at the Elk Mountain, Wyoming, weather station was the third highest January precipitation in the last 30 years. In the Pathfinder watershed, precipitation at the Pathfinder Dam, and Lander, Wyoming, weather stations recorded the second and fourth highest January precipitation in the last 30 years respectively. In the Glendo watershed, precipitation at the Casper, Wyoming, weather station was the fourth lowest January precipitation in the last 30 years.

In the Glendo watershed, precipitation at the Casper, Wyoming, weather station was the second lowest February precipitation of record back to water year 1916.

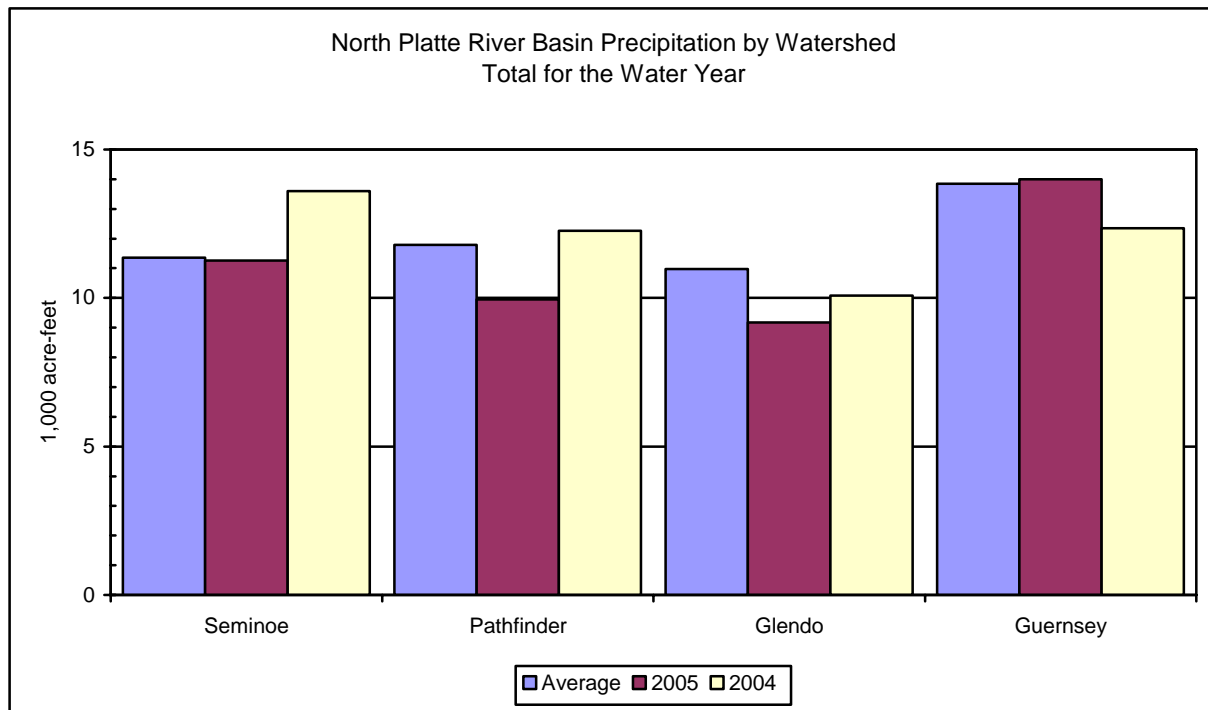
In the Seminoe watershed, precipitation at the Walden, Colorado, weather station was the fourth lowest March precipitation in the last 30 years.

The Walden, Colorado, weather station in the Seminoe watershed recorded the highest June precipitation of record back to water year 1938.

The Saratoga, Wyoming, weather station in the Seminoe watershed recorded the 2<sup>nd</sup> lowest July precipitation of record back to water year 1906 with only water Year 1955 being lower. The Glendo Dam, Wyoming, weather station in the Guernsey watershed recorded the highest July precipitation of record back to water year 1958.

The Casper, Wyoming, weather station in the Glendo watershed recorded the 4<sup>th</sup> highest August precipitation of record back to water year 1916.

The Casper, Wyoming, weather station in the Glendo watershed tied the 5<sup>th</sup> lowest September precipitation in the last 30 years. The Glendo Dam, Wyoming, weather station in the Guernsey watershed was the 3<sup>rd</sup> lowest September precipitation in the last 30 years. See Figure 10 for a comparison of average, water year 2005, and water year 2004 total precipitation.



**Figure 10** North Platte River Basin Precipitation by Watershed Total for water year

### Snow pack summary for water year 2005

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 area above Seminoe Reservoir and the watershed between Alcova Dam and Glendo Reservoir were below average for the entire water year with only the Sweetwater River watershed into Pathfinder Reservoir being above average. Table 6 shows a summary of snowpack for water year 2005.

Snow pack SWE for February was below average at 91 percent for the watershed above Seminoe Reservoir, above average at 120 percent for the Sweetwater River watershed which flows into Pathfinder Reservoir and well below average at 75 percent for the Alcova to Glendo watershed.

Snow pack on March 1, 2005 had dropped slightly, with SWE at 87 percent of average for the watershed above Seminoe Reservoir, at 115 percent of average for the Sweetwater River watershed which flows into Pathfinder Reservoir and at 68 percent of average for the Alcova to Glendo watershed.

Snow pack for April 1, 2005 continued to decline slightly with SWE at 84 percent of average for the watershed above Seminoe Reservoir, at 108 percent of average for the Sweetwater River watershed which flows into Pathfinder Reservoir and at 77 percent of average for the Alcova to Glendo watershed, which was an improvement from March 1 snow.

Snow pack for May 1, 2005 again declined slightly with SWE at 75 percent of average for the watershed above Seminoe Reservoir, improving to 114 percent average for the Sweetwater River watershed which flows into Pathfinder Reservoir and dropping to 60 percent of average for the Alcova to Glendo watershed.

**Table 6** North Platte Snowpack Water Content for 2005

Watershed	Feb 1		Mar 1		Apr 1		May 1	
	SWE <u>1/</u>	% of Avg. <u>2/</u>	SWE <u>1/</u>	% of Avg. <u>2/</u>	SWE <u>1/</u>	% of Avg. <u>2/</u>	SWE <u>1/</u>	% of Avg. <u>2/</u>
Seminole Reservoir	12.1	91	15.0	87	17.8	84	16.4	75
Pathfinder Reservoir	11.5	120	14.0	115	15.6	108	16.5	114
Glendo Reservoir	4.9	75	5.8	68	8.5	77	6.3	60

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 2005

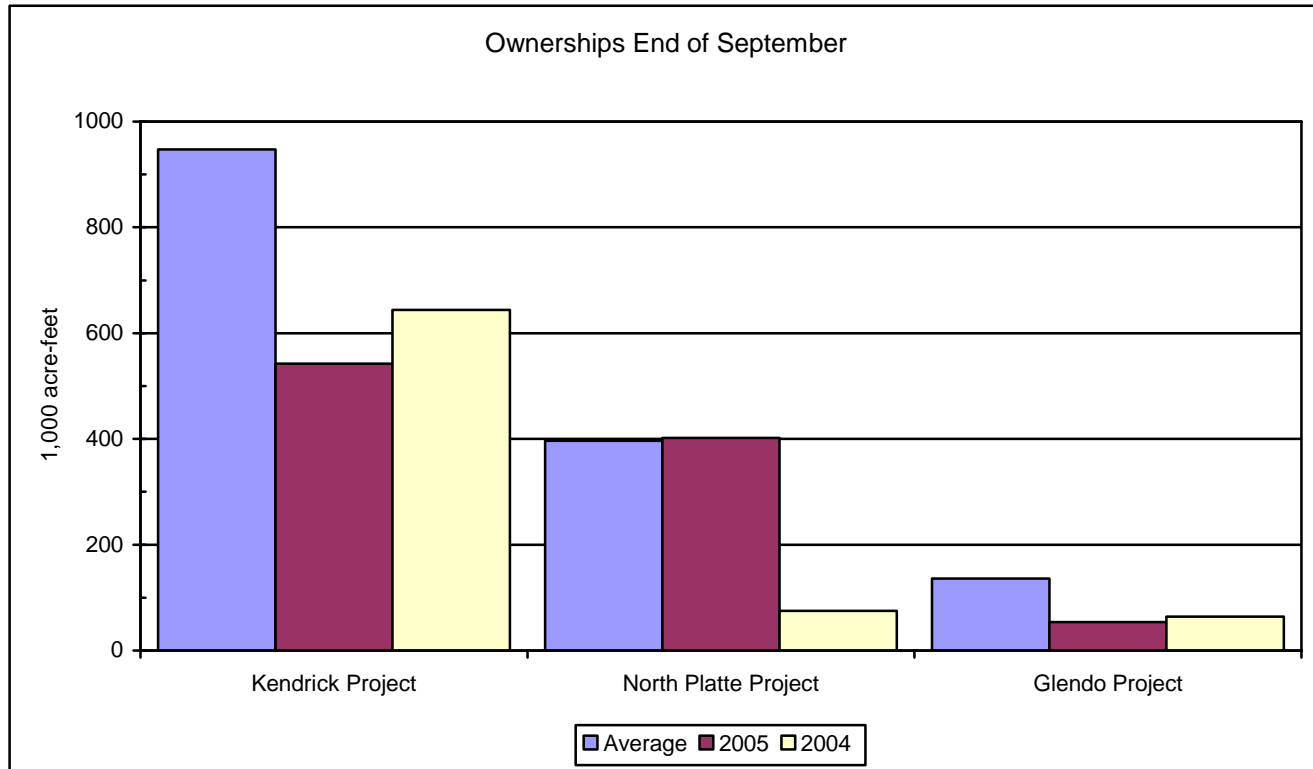
For the fourth year in a row, because of low carryover storage, and continued drought conditions, an allocation of storage water was required. The allocation, which was put into effect on June 29, 2005, applied to the four Government Districts; Pathfinder Irrigation District (ID), Goshen ID, Gering-Fort Laramie ID and Northport ID and to the nine Warren Act Contractors; Farmers ID, Gering ID, Lingle Water Users Assoc., Hill ID, Rock Ranch ID, Central ID, Chimney Rock ID, Browns Creek ID, and Beerline Irrigation Canal Co. In an effort to conserve water and improve carryover storage, all releases from Guernsey Reservoir for allocation districts were discontinued by midnight, on September 9, 2005. On September 30, 2005, the North Platte ownership contained 402,054 AF for use in water year 2006, which was the largest carryover since water year 2000. The most consecutive allocation years historically are 1953, 54, 55, 56, and 1957.

#### Ownerships for water year 2005

Stored water which is held in accounts for various entities is referred to as their ownership. At the beginning of water year 2005, the North Platte Project ownership (includes North Platte Pathfinder and North Platte Guernsey), contained only 75,242 AF of water, which is only 18 percent of average. The Kendrick ownership contained 643,796 AF of water, which is 67 percent of average; and the Glendo ownership contained 64,301 AF of water, which is 46 percent of average. Only the Guernsey ownership filled to its permitted amount during water year 2005, which occurred on May 13, 2005.

The total amount of water stored at the end of water year 2004 in the mainstem reservoirs for use in water year 2005 was 787,700 AF which was 52 percent of average. This total does not include 7,928 AF of water remaining in the four Inland Lakes in Nebraska.

At the end of water year 2005, the North Platte Project ownership (includes North Platte Pathfinder and North Platte Guernsey), contained 402,055 AF of water which is 101 percent of average. The Glendo ownership contained 53,981 AF of water which is 40 percent of average. The Kendrick ownership contained 542,546 AF, which is 57 percent of average and the operational/re-regulation water account contained 1,667 AF. Also stored in the North Platte storage system was 4,291 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 2005.



**Figure 11** Ownership End of September

## North Platte River Forecast 2005

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 judgement 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 2005.

**Table 7** Summary of Forecasts of April-July runoff for water year 2005

Forecast Points	Feb 1		Mar 1		Apr 1		May 1		Actual April-July KAF	% of Apr-Jul Avg. <u>1/</u>
	KAF	% of Avg.	KAF	% of Avg.	KAF	% of Avg.	KAF	% of Avg.		
Seminoe Reservoir	575	81	470	66	490	69	403 <u>2/</u>	57	733	104
Sweetwater River	65	102	60	94	70	109	63 <u>3/</u>	98	66	102
Alcova to Glendo	60	48	55	44	60	48	39 <u>4/</u>	31	39	31

1/ Average is based on the 1975-2004 period.

2/ The May 1 forecast includes an actual April inflow of 103,000 AF.

3/ The May 1 forecast includes an actual April inflow of 13,000 AF.

4/ The May 1 forecast includes an actual April inflow of 9,000 AF.



**Table 8** Summary of North Platte River System Ownership for water year 2005

Page 1 of 3

	MONTHS	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
<b><u>PATHFINDER OWNERSHIP</u></b>															
ACCUAL <u>A/</u>		46185	37157	29612	35941	32966	44102	110284	237590	237398	104	0	12771		824110
EVAPORATION		608	439	395	468	355	1563	1484	3985	9183	11948	5740	3503		39671
DELIVERY <u>B/</u>		0	0	0	0	0	0	0	0	0	181333	226778	41753		449864
OWNERSHIP	67479	113056	149774	178991	214464	247075	289614	398414	632019	860234	667057	434539	402054		
<b><u>KENDRICK OWNERSHIP</u></b>															
ACCUAL		0	0	0	0	0	0	0	0	0	0	0	28 D/		28
EVAPORATION		1825	1100	912	1006	698	2689	2124	4401	5962	7312	4416	3651		36096
DELIVERY <u>B/</u>		0	0	0	0	0	0	0	7922	16241	18165	10903	11951		65182
OWNERSHIP	643796	641971	640871	639959	638953	638255	635566	633442	621119	598916	573439	558120	542546		
<b><u>GLENDO OWNERSHIP</u></b>															
ACCUAL		0	0	0	0	0	0	0	10690	0	0	0	2834		13524
EVAPORATION		636	160	95	261	290	752	1629	1456	784	711	1136	1012		8922
DELIVERY & LOSS <u>B/</u>		0	0	0	0	0	0	427	170	36	7630	3367	3291		14921
OWNERSHIP	64301	63665	63505	63410	63149	62859	62107	60051	69115	68295	59954	55451	53982		
<b><u>PACIFIC POWER &amp; LIGHT</u></b>															
ACCUAL		0	0	0	0	0	0	0	56	24	29	26	27		162
DELIVERY <u>B/</u>		0	0	0	0	0	0	0	0	0	0	0	0		0
EVAPORATION		8	1	0	2	1	9	14	21	24	29	26	27		162
IN STORAGE	2000	1992	1991	1991	1989	1988	1979	1965	2000	2000	2000	2000	2000		
<b><u>GUERNSEY OWNERSHIP</u></b>															
ACCUAL		0	0	7399	8034	6613	7756	0	9711	0	0	0	0		39513
EVAPORATION		124	46	42	114	109	444	589	833	988	250	0	0		3539
DELIVERY <u>B/</u>		0	0	0	0	0	0	0	0	1357	42380	0	0		43737
OWNERSHIP	7763	7639	7593	14950	22870	29374	36686	36097	44975	42630	0	0	0		

**Table 8** (continued) Summary of North Platte River System Ownership for water year 2005

Page 2 of 3

	MONTHS	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
<b><u>INLAND LAKES OWNERSHIP</u></b>															
ACCUAL		5608	6234	0	0	0	0	0	9693	0	0	0	0	0	21535
EVAPORATION		12	7	0	10	9	51	114	108	0	0	0	0	0	311
TRANSFER C/		0	0	0	0	0	0	0	21224	0	0	0	0	0	21224
OWNERSHIP	0	5596	11823	11823	11813	11804	11753	21332	0	0	0	0	0	0	
<b><u>CITY OF CHEYENNE</u></b>															
ACCUAL		139	275	537	550	896	2661	1930	469	1619	1014	842	1282		12214
EVAPORATION		4	3	3	4	2	32	38	62	0	24	26	27		225
DELIVERY B/		0	0	0	0	169	36	363	7654	1678	75	75	0		10050
OWNERSHIP	2352	2487	2759	3293	3839	4564	7157	8686	1439	1380	2295	3036	4291		
<b><u>OPERATIONAL</u></b>															
ACCUAL		0	0	0	0	0	0	0	387	0	0	0	1669		2056
EVAPORATION		0	0	0	0	0	0	0	0	0	0	0	2		2
RELEASED		0	0	0	0	0	0	0	0	0	387	0	0		387
OWNERSHIP	0	0	0	0	0	0	0	0	387	387	0	0	1667		
<b><u>RE-REGULATION</u></b>															
ACCUAL		0	0	0	0	0	0	141 F/	58 F/	9 F/	0	0	0		208
EVAPORATION		0	0	0	0	0	0	0	0	0	0	0	0		0
RELEASED		0	0	0	0	0	0	0	0	208 F/	0	0	0		208
OWNERSHIP	0	0	0	0	0	0	0	141	199	0	0	0	0		
<b><u>WWDC Water (In Glendo)</u></b>															
TRANSFERRED G/		0	0	0	0	0	0	2458	9	0	0	0	0		2467
EVAPORATION		0	0	0	0	0	0	4	24	26	26	0	0		80
RELEASED		0	0	0	0	0	0	0	0	68	1519	345	455 I/		2387
OWNERSHIP	0	0	0	0	0	0	0	2454	2439	2345	800	455	0		

**Table 8** (continued) Summary of North Platte River System Ownership for water year 2005

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MONTHS	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
<b>WWDC Water (In Seminoe)</b>														
<b>TRANSFERRED H/</b>	0	0	0	0	0	0	0	0	0	0	0	84	0	84
<b>EVAPORATION</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>RELEASED</b>	0	0	0	0	0	0	0	0	0	0	0	17	67 I/	84
<b>OWNERSHIP</b>	0	0	0	0	0	0	0	0	0	0	0	67	0	

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, 2005 until July 3, 2005, 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 May 21,224 AF was transferred to the Inland Lakes.

D/ Not an actual accrual but a 28 AF correction for evaporation which was corrected on September 29, 2005 for a miscalculated number for September 1, 2005.

F/ Water diverted under temporary Glendo contact 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.

G/ Wyoming Water Development Commission (WWDC) contracted with the Bureau of Reclamation for storage space of 2,600 AF in Glendo Reservoir for a one water year period to store non-project water for irrigation purposes.

H/ Wyoming Water Development Commission (WWDC) contracted with the Bureau of Reclamation for storage space of 95 AF in Seminoe Reservoir for a one water year period to store water purchased from the City of Cheyenne for municipal and industrial use.

I/ On September 30, 2005, water remaining in the WWDC account of 244 AF from Glendo Rservoir and 64 AF from Seminoe Reservoir was returned to the City of Cheyenne.

**Table 9** Actual Reservoir Operations for water year 2005

**NORTH PLATTE RIVER ACTUAL RESERVOIR OPERATIONS**  
Year Beginning Oct 2004

**HYDROLOGY OPERATIONS**

Seminoe Reservoir Operations		Initial Content 270.5 Kaf					Operating Limits: Max 1017.3 Kaf, 6357.00 Ft. Min 31.7 Kaf, 6239.02 Ft.						
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Total Inflow	kaf	39.6	31.0	25.7	30.8	28.1	40.7	102.5	226.9	311.8	91.5	28.8	11.0
Total Inflow	cfs	644.	521.	418.	501.	505.	662.	1723.	3690.	5240.	1487.	469.	185.
Turbine Release	kaf	32.0	30.9	31.8	31.8	28.8	32.0	30.8	80.7	144.5	173.2	103.4	49.3
Jetflow Release	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.4
Spillway Release	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Release	kaf	32.0	30.9	31.8	31.8	28.8	32.0	30.8	80.7	144.5	173.2	103.4	49.3
Total Release	cfs	521.	519.	517.	517.	518.	520.	518.	1313.	2428.	2817.	1682.	829.
Evaporation	kaf	1.1	0.7	0.5	0.6	0.4	1.5	1.3	3.4	6.3	7.9	4.3	3.3
End-month content	kaf	277.0	276.6	270.0	268.4	267.3	274.5	344.9	487.7	648.7	559.1	480.2	438.6
End-month elevation	ft	6300.0	6299.9	6299.0	6298.8	6298.7	6299.7	6308.4	6322.7	6335.4	6328.7	6322.0	6318.2
Kortes Reservoir Operations		Initial Content 4.7 Kaf					Operating Limits: Max 4.8 Kaf, 6142.73 Ft. Min 1.7 Kaf, 6092.73 Ft.						
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Total Inflow	kaf	32.0	30.9	31.8	31.8	28.8	32.0	30.8	80.7	144.5	173.2	103.4	49.3
Total Inflow	cfs	521.	519.	517.	517.	518.	520.	518.	1313.	2428.	2817.	1682.	829.
Turbine Release	kaf	31.9	30.6	31.8	31.8	28.8	30.9	30.6	76.5	131.7	173.2	103.4	47.9
Spillway Release	kaf	0.1	0.3	0.0	0.0	0.0	1.1	0.2	4.2	12.8	0.0	0.0	1.4
Total Release	kaf	32.0	30.9	31.8	31.8	28.8	32.0	30.8	80.7	144.5	173.2	103.4	49.3
Total Release	cfs	521.	519.	517.	517.	518.	520.	518.	1313.	2428.	2817.	1682.	829.
Pathfinder Reservoir Operations		Initial Content 194.2 Kaf					Operating Limits: Max 1016.5 Kaf, 5850.10 Ft. Min 31.4 Kaf, 5746.00 Ft.						
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Sweetwater Inflow	kaf	3.5	5.0	3.2	3.2	3.7	3.8	12.5	22.0	23.7	7.3	2.6	1.3
Kortes-Path Gain	kaf	4.4	5.6	5.2	6.6	6.4	8.2	15.4	25.1	23.7	-1.0	-3.0	1.8
Inflow from Kortes	kaf	36.4	36.5	37.1	38.3	35.2	40.2	46.3	105.7	168.2	172.2	100.5	51.1
Total Inflow	kaf	36.4	36.5	37.1	38.3	35.2	40.2	46.3	105.7	168.2	172.2	100.5	51.1
Total Inflow	cfs	591.	613.	603.	623.	634.	653.	777.	1720.	2826.	2800.	1634.	859.
Turbine Release	kaf	4.4	23.2	26.5	26.0	23.6	35.7	59.5	116.7	138.8	158.3	93.0	41.9
Jetflow Release	kaf	4.6	4.5	4.5	4.7	4.1	4.7	4.5	4.8	4.6	4.6	4.9	4.5
Spillway Release	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Release	kaf	9.0	27.7	31.0	30.7	27.7	40.4	64.0	121.5	143.4	162.9	97.9	46.4
Total Release	cfs	146.	465.	505.	500.	499.	657.	1076.	1976.	2409.	2650.	1593.	780.
Evaporation	kaf	1.0	0.5	0.5	0.5	0.4	1.4	1.2	2.1	3.4	4.4	2.7	2.3
End-month content	kaf	220.6	228.9	234.5	241.6	248.7	247.1	228.2	210.3	231.7	236.6	236.5	238.9
End-month elevation	ft	5789.5	5790.8	5791.6	5792.6	5793.6	5793.4	5790.6	5787.9	5791.2	5791.9	5791.9	5792.2
Alcova Reservoir Operations		Initial Content 180.4 Kaf					Operating Limits: Max 184.4 Kaf, 5500.00 Ft. Min 145.3 Kaf, 5483.12 Ft.						
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Total Inflow	kaf	9.0	27.7	31.0	30.7	27.7	40.4	64.0	121.5	143.4	162.9	97.9	46.4
Total Inflow	cfs	146.	465.	505.	500.	499.	657.	1076.	1976.	2409.	2650.	1593.	780.
Turbine Release	kaf	30.7	29.8	30.8	30.7	27.3	34.0	39.4	112.0	126.4	142.6	87.3	33.5
Spillway Release	kaf	0.0	0.0	0.0	0.0	0.4	5.7	0.0	0.0	0.0	0.0	0.0	0.1
Casper Canal Release	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.9	16.2	18.2	10.9	12.0
Total Release	kaf	30.7	29.8	30.8	30.7	27.7	39.7	39.4	119.9	142.6	160.8	98.2	45.5
Total Release	cfs	499.	501.	500.	500.	499.	657.	661.	1950.	2396.	2615.	1597.	765.
Evaporation	kaf	0.4	0.1	0.2	0.2	0.0	0.5	0.3	0.8	1.4	1.5	0.8	0.7
End-month content	kaf	158.3	156.0	156.1	155.9	155.9	156.1	180.4	181.2	180.6	181.2	180.1	180.3
End-month elevation	ft	5489.0	5488.0	5488.0	5488.0	5487.9	5488.0	5498.4	5498.7	5498.5	5498.7	5498.2	5498.3

Table 9 (Continued) Actual Reservoir Operations for water year 2005

NORTH PLATTE RIVER ACTUAL RESERVOIR OPERATIONS  
Year Beginning Oct 2004

Gray Reef Reservoir Operations		Initial Content		1.5 Kaf		Operating Limits: Max		1.8 Kaf, 5332.00 Ft.		0.0 Kaf, 5306.00 Ft.			
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Total Inflow	kaf	30.7	29.8	30.8	30.7	27.7	39.7	39.4	112.0	126.4	142.6	87.3	33.5
Total Inflow	cfs	500.	501.	500.	500.	498.	646.	661.	1821.	2125.	2319.	1420.	563.
Total Release	kaf	30.7	29.7	30.8	30.7	27.8	39.5	39.3	111.9	126.4	142.5	87.3	33.6
Total Release	cfs	500.	500.	500.	500.	500.	643.	660	1820.	2125.	2318.	1420.	564.
Glendo Reservoir Operations		Initial Content		127.2 Kaf		Operating Limits: Max		789.4 Kaf, 4653.00 Ft.		63.2 Kaf, 4570.02 Ft.			
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Alcova-Glendo Gain	kaf	7.0	6.6	6.2	7.1	5.7	5.2	5.4	10.6	1.9	-1.5	7.8	4.0
Infl from Gray Reef	kaf	30.7	29.7	30.8	30.7	27.8	39.5	39.3	111.9	126.4	142.5	87.3	33.6
Total Inflow	kaf	37.7	36.3	37.0	37.8	33.5	44.7	44.7	122.5	128.3	141.0	95.1	37.6
Total Inflow	cfs	613.	610.	601.	614.	603.	727.	751.	1992.	2156.	2293.	1547.	632.
Turbine Release	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.8	101.0	299.6	276.4	31.1
Low Flow Release	kaf	1.6	1.7	1.8	2.0	1.6	1.7	1.9	1.8	1.5	1.5	1.5	1.8
Spillway Release	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Irrigation Release	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.6	57.4	0.0
Total Release	kaf	1.6	1.7	1.8	2.0	1.6	1.7	1.9	38.8	101.0	299.6	276.4	31.1
Total Release	cfs	25.	28.	29.	32.	28.	28.	31.	631.	1697.	4873.	4495.	521.
Evaporation	kaf	0.7	0.3	0.3	0.5	0.4	1.7	2.7	4.1	5.4	5.7	2.5	1.5
End-month content	kaf	162.6	196.9	231.8	267.1	298.6	339.9	380.0	459.6	481.5	317.2	133.4	138.4
End-month elevation	ft	4593.4	4599.2	4604.4	4609.1	4613.1	4617.9	4622.3	4630.0	4632.0	4615.3	4587.8	4588.8
Guernsey Reservoir Operations		Initial Content		9.3 Kaf		Operating Limits: Max		45.6 Kaf, 4419.99 Ft.		0.0 Kaf, 4370.00 Ft.			
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Glendo-Guerns Gain	kaf	1.2	0.8	0.8	0.6	0.8	1.0	0.8	1.1	-0.6	-6.2	2.0	4.1
Inflow from Glendo	kaf	1.6	1.7	1.8	2.0	1.6	1.7	1.9	38.8	101.0	299.6	276.4	31.1
Total Inflow	kaf	2.8	2.5	2.6	2.6	2.4	2.7	2.7	39.9	100.4	293.4	278.4	35.2
Total Inflow	cfs	45.	41.	43.	43.	42.	45.	45.	650.	1686.	4772.	4528.	591.
Turbine Release	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.7	59.1	19.7	62.6	9.3
Seepage	kaf	0.2	0.4	0.4	0.5	0.6	0.7	0.5	0.0	0.0	0.0	0.0	0.0
Spillway Release	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	41.7	295.6	202.9	38.7
Total Release	kaf	0.2	0.4	0.4	0.5	0.6	0.7	0.5	33.5	100.8	315.3	265.5	48.0
Total Release	cfs	3.	6.	7.	8.	11.	11.	8.	546.	1694.	5127.	4318.	807.
Evaporation	kaf	0.2	0.1	0.0	0.1	0.3	0.3	0.4	0.7	0.9	0.3	0.8	0.2
End-month content	kaf	11.7	13.7	15.9	17.9	19.4	21.1	22.9	28.6	27.3	5.1	17.2	4.2
End-month elevation	ft	4401.8	4403.4	4404.9	4406.2	4407.2	4408.2	4409.2	4412.2	4411.6	4394.6	4405.8	4393.1

## Flood Benefits for water year 2005

Because of the existence of dams on the North Platte River, The Corps of Engineers, Omaha District, estimates that in water year 2005 flood damages of \$6,854,600 were prevented. Table 10 is a breakdown of flood damage prevented by Dams.

**Table 10** Flood Damage Prevented by Dams for water year 2005 (on the North Platte River Basin System)

DAMS	WATER YEAR 2005	PRIOR TO 2005 <u>2/</u>	ACCUMULATED TOTAL <u>1/</u>
SEMINOE	\$1,682,400	\$27,846,200	\$29,528,600
PATHFINDER	\$104,100	\$8,760,200	\$8,864,300
ALCOVA	\$146,500	\$481,100	\$627,600
GLENDO	4,921,600	\$69,386,500	\$74,308,100
GUERNSEY	\$0	\$439,000	\$439,000
<b>TOTAL</b>	<b>\$6,854,600</b>	<b>\$106,913,000</b>	<b>\$113,767,600</b>

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 2004 except for Glendo Dam, which is 1965 through 2004

## Generation for water year 2005

Power generation was well below average for all powerplants on the North Platte River Basin in water year 2005. See Table 11 for a breakdown of generation by powerplant.

**Table 11** Power Generation water year 2005

Powerplant	Gross generation <u>1/</u> (GWh)	Percent of Average <u>2/</u>
Seminole	108.9	81
Kortes	125.9	89
Fremont Canyon	176.7	72
Alcova	90.3	75
Glendo	56.9	70
Guernsey	12.3	62
Total Basin	571.0	77

1/ Generation is reported in giga-watt hours (GWh).

2/ 30 year average (1975-2004)

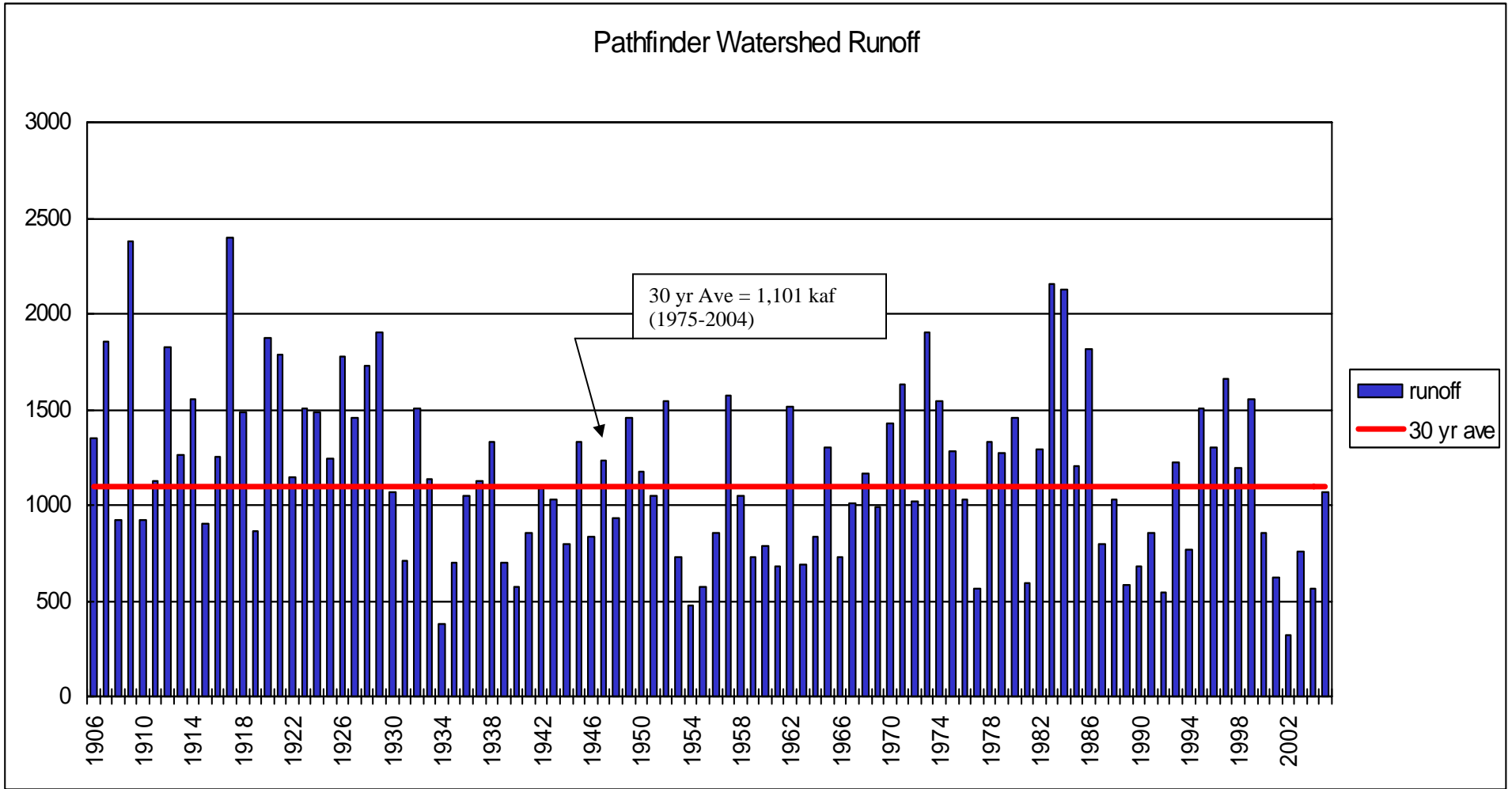
The number of generation units at each powerplant, their capacity and output at rated head is shown in Table 12.

**Table 12** North Platte River Powerplant Data

Powerplant	Number of Units	Capacity Each Unit (kw)	Total <u>2/</u> Installed Capacity (kw)	Normal Operating Head (feet)	Output At rated Head (cfs)	30 year Average <u>1/</u> (GWh)
Seminole	3	17,000	51,000	97-227	4,050	134.4
Kortes	3	12,000	36,000	192-204	2,910	142.2
Fremont Canyon	2	33,400	66,800	247-363	3,080	244.0
Alcova	2	19,500	39,000	153-165	4,100	119.9
Glendo	2	19,000	38,000	73-156	3,400	81.1
Guernsey	2	3,200	6,400	89-91	1,340	19.8
Total	14	---	237,200	---	---	741.4

1/1975-2004

2/Installed capacity from Monthly Report of Power Operations-Powerplant (Form PO&M 59)



**Figure 20** Pathfinder Watershed Runoff 1906-2005