

# 1996 PACIFIC NORTHWEST LOADS AND RESOURCES STUDY

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# **1996 PACIFIC NORTHWEST LOADS AND RESOURCES STUDY**

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## ***THE WHITE BOOK***

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**BONNEVILLE POWER ADMINISTRATION**  
December 1996

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## ACKNOWLEDGMENTS

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Preparation of the annual Pacific Northwest loads and resources study is a complex, multidisciplinary effort. The managers of BPA's Production Planning Group wish to acknowledge the team—BPA staff and others—whose diligence and dedication result in a reliable, high quality document.

**Marketing Analysis Group**

Forecasting and Analysis

**Production Planning Group**

Long-Term Planning

**Pacific Northwest Utilities Conference Committee**

Loads and Resources Data Collection

# 1996 Pacific Northwest Loads and Resources Study

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## I. INTRODUCTION

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### **Description of the White Book**

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The Pacific Northwest Loads and Resources Study (White Book) is published annually by BPA and establishes the planning basis for supplying electricity to customers. It serves a dual purpose.

First, the White Book presents projections of regional and Federal system load and resource capabilities, along with relevant definitions and explanations.

Second, the White Book serves as a benchmark for annual BPA determinations made pursuant to the 1981 regional power sales contracts. Specifically, BPA uses the information in the White Book for determining the notice required when customers request to increase or decrease the amount of power purchased from BPA.

Aside from these purposes, the White Book is used for input to BPA's resource planning process. The White Book compiles information obtained from several formalized resource planning reports and data submittals, including those from the Northwest Power Planning Council (Council) and the Pacific Northwest Utilities Conference Committee (PNUCC).

The White Book is not an operational planning guide. Operation of the Federal Columbia River Power System (FCRPS) is based on a set of criteria different from that used for resource planning decisions. Operational planning is dependent upon real-time or near-term knowledge of system conditions, including expectations of river flows and runoff, market opportunities, availability of reservoir storage, energy exchanges, and other factors affecting the dy-

namics of operating a power system. In contrast, the information in the White Book is based upon a different and less variable set of assumptions regarding loads, hydro capabilities, and contractual obligations.

The Administrator's Record of Decision (ROD) for the 1996 White Book is contained in Section IX, page 121.

The 1996 White Book is presented in two documents: 1) this summary of Federal system and Pacific Northwest region loads and resources; and 2) a technical appendix detailing the loads and resources for each major Pacific Northwest generating utility. Data detailing Pacific Northwest non-utility generating (NUG) resources is also available upon request. This analysis updates the 1995 Pacific Northwest Loads and Resources Study, published in December 1995.

The load forecast is derived by using regional economic planning models to predict the loads that will be placed on electric utilities in the region. It incorporates information on forecasted loads (derived from current power sales contracts and exchange agreements) and resource capabilities obtained from public agency utility customers and investor-owned utility (IOU) customers through utilities' annual data submittals to the PNUCC, BPA's Firm Resource Exhibit (FRE Exhibit I) submittals, and analysis of the Federal hydroelectric power system.

In this loads and resources study, resource availability is compared with a medium forecast of electricity consumption. The forecasted future electricity demands—firm loads—are subtracted from

the projected capability of existing and "contracted for" resources to determine whether BPA and the region will be surplus or deficit. If resources are greater than loads in any particular year or month, there is a surplus of energy and/or capacity, which BPA may use or market to increase revenues. Conversely, if firm loads exceed available resources, there is a deficit of energy and/or capacity, and BPA would add conservation, contract purchases, or generating resources as needed to meet its firm loads.

This document analyzes the Pacific Northwest's projected loads and available generating resources in two parts: 1) the loads and resources of the Federal system, for which BPA is the marketing agency; and 2) the larger Pacific Northwest regional power system, which includes loads and resources in addition to the Federal system.

The loads and resources analysis in this study simulates the operation of the power system under the Pacific Northwest Coordination Agreement (PNCA) produced by the Pacific Northwest Coordinating Group.

This study presents the Federal system and regional analyses for the medium load forecast. This analysis projects the yearly average energy consumption and resource availability for Operating Years (OY)<sup>1</sup> 1997-98 through 2006-07. The study shows the Federal system's and the region's monthly estimated maximum electricity demand, monthly energy demand, and monthly maximum generating capability—capacity—for OY 1997-98, 2001-02, and 2006-07. The Federal system and regional monthly capacity surplus/

deficit projections are summarized for 10 operating years.

To demonstrate the monthly energy variability resulting from implementing the National Marine Fisheries Service (NMFS) 1995 Biological Opinion, dated March 2, 1995, this analysis includes the monthly Federal system and regional firm energy surpluses and deficits for OYs 1998 through 2007 for each of the 50 historical water years on record. These are found in Section VIII, Exhibits 9 through 18, pages 71 through 81, and Exhibits 27 through 36, pages 109 through 119.

This monthly variability in surpluses and deficits created by the 1995 NMFS Biological Opinion, coupled with changes in the regional power marketing environment, requires that a calculation of annual average energy be adjusted to more accurately reflect today's Pacific Northwest electrical power system capabilities.

The Federal system analysis is presented in Section IV, beginning on page 16. The analysis for the Pacific Northwest region is presented in Section VI, page 36.

The glossary of terms and a list of acronyms are included in Section X, page 129.

Additional copies of this summary, along with copies of the 1996 Pacific Northwest Loads and Resources Study Technical Appendix (available March 1997) can be obtained from BPA's Public Involvement Office, toll-free, 1-800-622-4520. BPA will not publish a 1996 Non-Utility Generation Supplement. However, BPA is continuing to compile Pacific Northwest non-utility generation information.

<sup>1</sup> Operating Year (OY) is the 12-month period August 1 through July 31. For example, OY 1997-98 is August 1, 1997, through July 31, 1998.

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## II. BACKGROUND

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### **Pacific Northwest Planning Area**

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The Pacific Northwest regional planning area is defined by the Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act), enacted in December 1980. It includes Oregon, Washington, Idaho, Montana west of the Continental Divide, and portions of Nevada, Utah, and Wyoming that lie within the Columbia River drainage basin. In addition, any rural electric cooperative customers not in the geographic area described above that were served by BPA on the effective date of the Northwest Power Act are included in BPA planning for resources to meet its load.

### **The 1995 NMFS Biological Opinion**

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The 1995 NMFS Biological Opinion changed the focus of hydro system operation for fish passage to monthly flow-based targets from storage-based targets. This change emphasized monthly flows at hydro projects, thereby limiting the ability of the hydro system to shift and shape flows in any one month to meet firm system energy needs.

Implementing the 1995 NMFS Biological Opinion created significant surpluses or deficits in any given month under any given water condition. This monthly diversity demonstrates that a single annual average of energy—whether based on 8, 12, or 42 months—no longer represents the availability to the system of firm hydro power,

or surpluses and deficits, used in loads and resources planning.

This year's study continues to move away from traditional critical water planning by managing resource availability risks. This document presents the Federal system and regional firm surpluses and deficits for OYs 1998 through 2007 for each of the 50 historical water conditions on record (1929 through 1978 water conditions) in Exhibits 9 through 18, pages 71 through 81, for the Federal system and Exhibits 27 through 36, pages 109 through 119, for the region. The information presented in these tables shows the monthly variability of the surpluses and deficits over the 50 water conditions.

Traditional annual energy loads and resources studies have been produced using a specific set of assumptions and serve as the base case for calculating the load-resource balance in Sections IV and VI. For the future, there is potential to expand loads and resources studies to probabilistically capture the variability of the hydro system and resource risk management.

### **Load Forecasting**

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This loads and resources analysis used BPA's medium case load forecast from the 1996 Final Rate Filing for all but aluminum and non-aluminum direct service industries (DSIs). The DSI loads were updated in December 1996 to reflect BPA's new signed industrial contracts. Loads for each of the following customer groups were estimated separately: non-generating public

agencies, generating public agencies, aluminum DSIs, non-aluminum DSIs, IOUs, Federal agencies, and the U. S. Bureau of Reclamation (USBR). In general, BPA's load forecasts are designed to respond to and reflect factors such as employment, electricity prices, aluminum prices, smelter production costs, and planned conservation actions.

The forecast of conservation savings reflects the shift of financial responsibility for conservation, and hence savings, from BPA-funded programs to utility-funded programs and also includes the addition of a customer-funded conservation category

for savings based on the results of the Council's 1995 conservation survey. This loads and resources analysis assumes that all conservation savings from BPA programs, conservation reinvention, and additional conservation are subtracted from the regional loads during the load forecasting process (prior to the loads and resources analysis). Conservation reductions to the load forecast are shown in Table 1, page 5.

Though not part of the load forecasting process, this study reflects diversification for the public agencies from BPA's Load Commitment Exercise as discussed on page 14.

**Table 1****Conservation Savings  
Cumulative From FY 1995****Energy in Average Megawatts**

<b>FISCAL YEAR<sup>1</sup></b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
<b>BPA Programmatic Conservation</b>										
<b>Residential</b>	8.3	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
<b>Commercial</b>	37.3	43.0	47.4	51.8	51.8	51.8	51.8	51.8	51.8	51.8
<b>Industrial</b>	14.1	15.1	15.1	15.1	15.1	15.1	15.1	15.1	15.1	15.1
<b>Additional Conservation &amp; Conservation Reinvention</b>										
<b>Conservation Transfers</b>	0.0	0.0	0.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
<b>Billing Credits</b>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Competitive Acquisitions</b>	10.8	14.5	18.2	21.9	21.9	21.9	21.9	21.9	21.9	21.9
<b>Power Plants</b>	20.4	26.7	33.0	39.3	39.3	39.3	39.3	39.3	39.3	39.3
<b>Assumed Market Transformation</b>	5.5	9.5	13.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
<b>MCS &amp; Improved Building Codes</b>	41.0	51.0	61.0	71.0	71.0	71.0	71.0	71.0	71.0	71.0
<b>Adjustments for New Codes &amp; Standards</b>	25.0	31.0	37.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
<b>SUB-TOTAL</b>	<b>102.7</b>	<b>132.7</b>	<b>162.7</b>	<b>198.7</b>	<b>198.7</b>	<b>198.7</b>	<b>198.7</b>	<b>198.7</b>	<b>198.7</b>	<b>198.7</b>
<b>Customer-Funded Conservation</b>	67.7	85.6	103.5	121.4	121.4	121.4	121.4	121.4	121.4	121.4
<b>TOTAL LOAD REDUCTION FOR CONSERVATION SAVINGS</b>	<b>236.2</b>	<b>291.3</b>	<b>343.6</b>	<b>401.9</b>	<b>401.9</b>	<b>401.9</b>	<b>401.9</b>	<b>401.9</b>	<b>401.9</b>	<b>401.9</b>

<sup>1</sup> BPA's Fiscal Year is October 1 through September 30. For example, FY 1998 is October 1, 1997, through September 30, 1998.

## **Pacific Northwest Hydro and Thermal Resources**

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### **Hydro Resources**

**Energy Capability.** This study uses 1937 water conditions (the 12-month period from August 1936 through July 1937) to estimate the firm hydro capability in a historical sequence of low water conditions. The critical period represents the period of adverse water conditions during which the hydro system produced the maximum amount of firm energy by drafting the reservoirs from maximum required content to minimum required content.

**Capacity.** The monthly instantaneous capacity of hydro projects is defined as the full-gate-flow maximum available generation at each project, based on the average monthly elevation resulting from 1936-37 water reservoir levels. BPA assumes 1936-37 water levels to estimate the regional hydro capacity because that year approximates a peaking capability that is consistent with the reliability criteria set forth in the Pacific Northwest Coordination Agreement.

The monthly instantaneous capacity is limited to 10 times the project's average monthly energy production because, at low or minimum water discharge, a plant may not be allowed to release enough water to achieve maximum capacity. The region's hydro projects have constraints and storage limitations within any water condition.

BPA's planning projections reduce the estimated instantaneous hydro capacity to reflect a Federal sustained peaking level of 50 hours per week. This level provides estimated firm hydro capacity that can be maintained each day and continued for weeks at a time. This definition of firm ca-

capacity provides a better measure of resource peak capability. The hydro generation also is adjusted to allow for scheduled hydro maintenance, spinning reserves, and forced outage reserves.

**Multiple-Use Planning.** Pacific Northwest hydro projects have many uses besides power generation. The projects may provide flood control, supply irrigation for farming, assist in river navigation and recreation, and contribute to municipal water supplies. In addition, constraints also are in place to protect and enhance resident and anadromous fish populations. These non-power uses place operating requirements on the reservoirs and may reduce or increase hydroelectric power production. BPA's resource planning takes into account all presently known nonpower operating requirements in assessing regional hydro system capability.

The United States Army Corps of Engineers (COE), the USBR, and BPA have jointly prepared the System Operation Review (SOR) Environmental Impact Statement (EIS) (DOE/EIS-0170, November 1995) on the operation of the Columbia River hydropower system. This EIS will allow the three Federal agencies to make decisions on (1) adopting a System Operating Strategy (SOS), (2) renewing the Pacific Northwest Coordination Agreement, (3) renegotiating five Canadian Entitlement allocation agreements, and (4) developing a means to periodically review and update the SOS.

The Council, BPA, and other Pacific Northwest entities will continue to evaluate new ways to enhance fisheries and wildlife. Future proposals could include additional amendments to the Council's Columbia River Basin Fish and Wildlife Program, recommendations arising from the SOR, and/or implementation of additional programs in support of the Endangered Spe-

cies Act. The impacts of future proposals are unknown. These proposals, however, most likely will increase non-power requirements on the hydro system and change operating flexibility, change the monthly shape of streamflows, and change the availability of sustained Federal capacity. Future studies will incorporate any known impacts.

### **Thermal Resources**

The expected output of regional thermal resources is based on the energy and capacity capabilities submitted to BPA by the project owners. The output of all thermal plants is reduced to allow for scheduled maintenance, spinning reserves, and forced outage reserves.

### **Analysis of Federal System Firm Loads and Resources**

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BPA is a power and transmission marketing agency, responsible for acquiring and delivering sufficient power to serve the firm electric load needs of its customers. BPA does not own generating resources. BPA's customer loads and contractual obligations, combined with the Federal and non-Federal resources from which BPA acquires the power it sells, are collectively called the Federal system. BPA owns and operates the primary transmission grid—more than 14,700 circuit miles of power lines—in the Pacific Northwest.

The Federal system loads are made up of BPA's sales to other Federal agencies, its regional public agencies, and other contractual obligations to deliver power. This study also includes firm DSI contracts signed through December 31, 1996.

The hydro resources of the Federal system include 30 dams owned and operated by the USBR and the COE, plus

hydroelectric projects owned by the city of Idaho Falls, Washington Public Power Supply System (WPPSS), and Lewis County Public Utility District (PUD). BPA has the exclusive right to sell power generated by USBR and COE hydroelectric projects. BPA also markets the thermal generation from the WNP-2 nuclear plant, operated by WPPSS.

The Federal system analysis is shown in Section IV, beginning on page 16.

### **Analysis of Regional Firm Loads and Resources**

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The Pacific Northwest regional analysis contains the Federal system loads and resources, plus non-Federal regional loads, contractual obligations, and generating resources. The region has three load groups: Federal system, generating public agencies, and IOUs. The regional hydro resources are owned and operated by various Federal entities, public agencies, and IOUs. The regional thermal generating resources, fueled by biomass, coal, natural gas, oil, or nuclear power, are owned and operated by various regional entities.

The regional analysis is presented in Section VI, beginning on page 36.

### **Canadian Treaty Downstream Benefits**

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Obligations under the Columbia River Treaty will change during the study period. This treaty between the United States and Canada enhanced the use of storage in the Columbia River Basin. The treaty and treaty projects provide downstream benefits by increasing the firm power generating capability of U.S. hydro projects. Under the terms of the agreement, the downstream power benefits are shared equally between

the two countries as determined by a joint Annual Operating Plan.

### **Canadian Entitlement to Columbia Storage Power Exchange (CSPE) Through March 31, 2003**

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Canada agreed to sell its share of the downstream power benefits, called the Canadian Entitlement, for 30-year periods beginning with the completion of each of the three Canadian Treaty Projects (Mica, Duncan, and Arrow). The Canadian Entitlement was sold to the Columbia Storage Power Exchange (CSPE), a Pacific Northwest corporation that was formed to sell the Canadian benefits to participating Pacific Northwest utilities. The Canadian Entitlement sale to CSPE begins to expire April 1, 1998, 30 years after the completion of the first Treaty Project, and fully expires March 31, 2003.

### **Canadian Entitlement to Canada, Beginning April 1, 1998**

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A portion of the Canadian share of downstream power benefits will begin to return to Canada April 1, 1998, 30 years after the first Treaty Project was completed. All remaining Canadian downstream power benefits will revert to Canada by April 1, 2003, 30 years after the third Treaty Project was completed. This analysis assumes Canadian Entitlement deliveries to Canada under the long-standing Canadian Entitlement agreement between British Columbia and the United States. Last year's analysis showed the contract under the basic principles of a Memorandum of Agreement between British Columbia and the United States that BPA subsequently chose not to ratify. The Canadian Entitlement Canada delivery starting April 1, 1998, is included in each participating utility's loads and resources balance. BPA delivers the total Canadian Entitlement, shown in Table 2, page 9, and it is included as a Federal export.



**Table 2**

**Canadian Entitlement to Canada  
Energy and Capacity Obligations Beginning April 1, 1998**

**Energy in Average Megawatts**

<b>OPERATING YEAR<sup>1</sup></b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
<b>Investor-Owned Utilities</b>	2	25	53	47	47	65	93	92	83	81
<b>Public Agencies</b>	2	13	32	29	29	39	53	53	61	63
<b>Federal System</b>	12	96	215	193	193	262	371	370	368	365
<b>Other Entities</b>	1	3	7	7	7	9	13	13	13	13
<b>TOTAL ENERGY OBLIGATION</b>	<b>17</b>	<b>137</b>	<b>307</b>	<b>276</b>	<b>276</b>	<b>375</b>	<b>530</b>	<b>528</b>	<b>525</b>	<b>522</b>

**January Capacity in Megawatts**

<b>OPERATING YEAR</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
<b>Investor-Owned Utilities</b>	0	25	136	135	135	135	247	247	219	219
<b>Public Agencies</b>	0	13	85	84	84	84	152	152	180	180
<b>Federal System</b>	0	96	561	556	556	556	1,013	1,013	1,013	1,013
<b>Other Entities</b>	0	3	20	19	19	19	35	35	35	35
<b>TOTAL CAPACITY OBLIGATION</b>	<b>0</b>	<b>137</b>	<b>802</b>	<b>794</b>	<b>794</b>	<b>794</b>	<b>1,447</b>	<b>1,447</b>	<b>1,447</b>	<b>1,447</b>

<sup>1</sup> Operating Year (OY) is the 12-month period August 1 through July 31. For example, OY 1997-98 is August 1, 1997, through July 31, 1998.

## **Major Sources of Uncertainty**

### **Loads and Resources Uncertainty**

Future Federal system and regional firm surpluses/deficits are subject to a number of uncertainties over the 10-year study period. These uncertainties include:

- ◆ Changes and uncertainties regarding deregulation in the electrical power industry;
- ◆ BPA's future marketing efforts and/or revised resources acquisition, including conservation;
- ◆ Possible decreases in BPA's public agency load obligations, particularly after the power sales contracts expire in 2001;
- ◆ Deviation from the forecasted rate of load growth;

- ◆ Failure of existing or contracted generating resources to operate at anticipated times and levels; and
- ◆ Changes in existing hydro system operation in response to programs developed to address the Endangered Species Act or other environmental considerations.

These uncertainties could affect both the size of projected surpluses or deficits and the times at which they occur.

### **Contractual Uncertainty**

Given the changes in the wholesale electric utility industry that have taken place over the last several years and the resulting reductions in public agency and DSI firm requirements served by BPA, the extent of Federal obligations to these customers after the current contracts expire

appears more uncertain than it has in the past. This study assumes that the following contracts, though they are subject to change as noted, will extend throughout the 10-year study period. What occurs when these contracts expire, which will be at varying times during the 10-year study period, may affect the Federal system and regional loads and resources balances:

- ◆ BPA's power sales contracts with its public agency and IOU customers expire June 30, 2001, and with its DSI customers on September 30, 2001. Renegotiation of these contracts may result in new or different Federal obligations.

- ◆ The Pacific Northwest Coordination Agreement will expire June 30, 2003. BPA expects this agreement, which coordinates operation of the Pacific Northwest power system and that of Canada, will be replaced with a new agreement. The provisions of a new agreement may be different from the existing agreement.

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### III. CHANGES IN THE 1996 PACIFIC NORTHWEST LOADS AND RESOURCES STUDY

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This section describes the major changes in the assumptions of the 1996 Pacific Northwest Loads and Resources Study compared to the 1995 study. Other changes are reflected in the data for each utility contained in the 1996 Pacific Northwest Loads and Resources Study Technical Appendix.

#### **Firm Load Changes**

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The 1996 White Book analysis uses load projections that incorporate the following changes since last year's analysis:

- ◆ **1996 BPA Load Forecast:** This analysis uses the 1996 BPA medium load forecast of Federal agencies, public agencies, and investor-owned utilities that was used in BPA's 1996 Final Rate Filing
- ◆ **New DSI Power Sales Contracts:** This study includes BPA's new DSI power sales contracts and DSI block sales agreements signed through December 31, 1996. The new DSI contracts continue through September 30, 2001. In OY 2002 and through the remainder of the study period, the DSI load continues at the OY 2002 level.

#### **Firm Resource Changes**

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The 1996 White Book analysis reflects the following resource changes compared to last year's study:

- ◆ **The 1995 NMFS Biological Opinion From the 1996 Final Rate Filing Hydro Regulation Study:** The hydroregulation study used in this analysis incorporates the streamflow requirements of the 1995 NMFS Biological Opinion, which was incorporated in the 1996 Final Rate Filing

Figure 1, page 12, shows the monthly variation of the NMFS Biological Opinion on the Federal system hydro energy capability for OY 1996-97 assuming 1937 water conditions.

#### **Firm Contract Changes**

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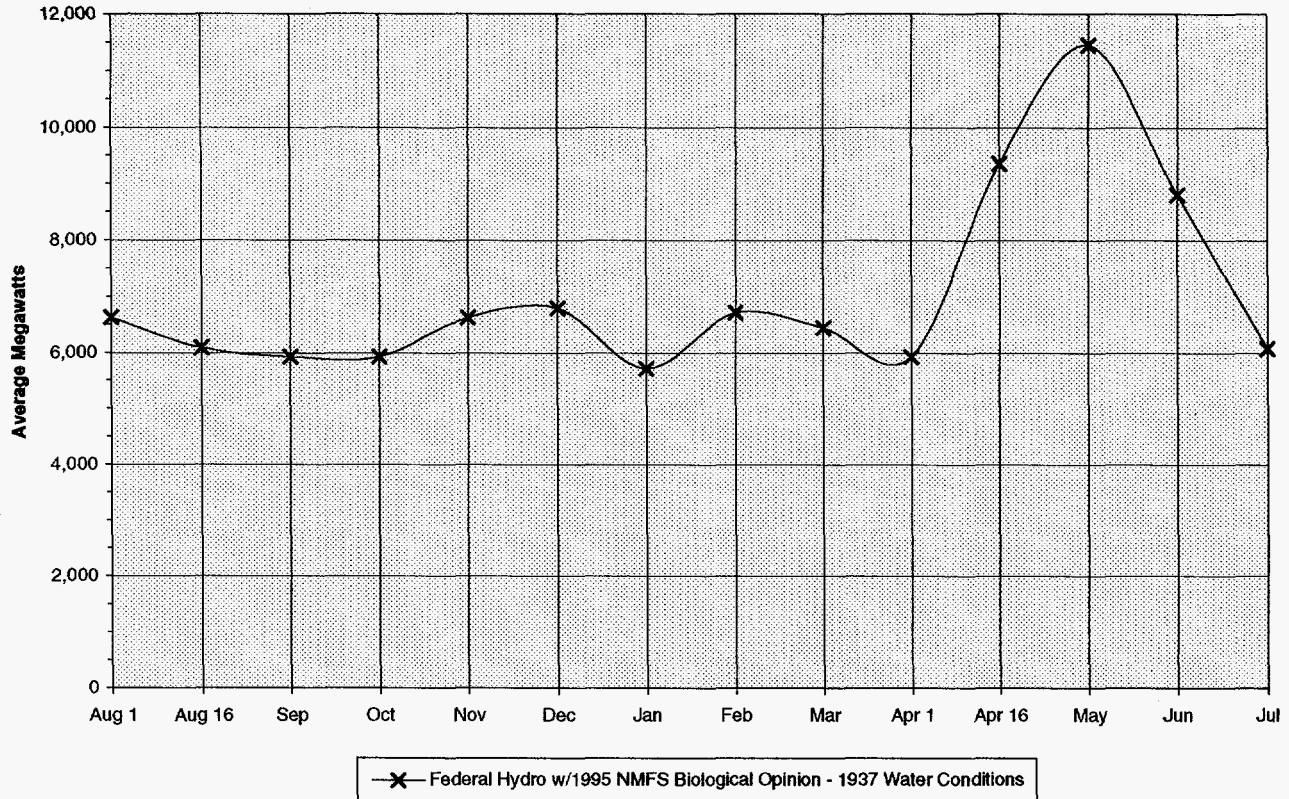
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The 1996 White Book analysis uses the following contract changes versus last year's study:

**Exports:** The 1996 White Book analysis includes the following new Federal exports: BPA to Azusa, energy sale; BPA to Azusa, power sale; BPA to Banning, energy sale; BPA to Banning, power sale; BPA to BART, power sale; BPA to Colton, energy sale; BPA to Colton, power sale; BPA to New Energy Ventures, power sale; and BPA to San Diego, power sale. BPA's power sale and capacity/energy exchange agreements with the cities of Burbank, Glendale, and Pasadena and to the Southern California Edison Company (SCE)

**Figure 1**

**Federal Firm Hydro Energy  
Monthly Variability for OY 1996-97**



are shown in power sales mode through the study horizon. BPA to SCE option capacity is shown through OY 2002.

- ◆ **Contracts Out:** This analysis has the following new or updated BPA intra-regional contracts out: BPA to Big Bend Electric Cooperative, power sale; BPA to Central Electric Cooperative, power sale; BPA to Clark Public Utility, power sale; BPA to the city of Ashland, power sale; BPA to the city of Idaho Falls, power sale; BPA to the city of Monmouth, power sale; BPA to Columbia Basin

Electric Cooperative, power sale; BPA to Columbia River PUD, power sale; BPA to Columbia Rural Electric Cooperative, power sale; BPA to Flathead Electric Cooperative, power sale; BPA to Harney Electric Cooperative, power sale; BPA to Inland Power and Light, power sale; BPA to Kootenai Electric Cooperative, power sale; BPA to Midstate Electric Cooperative, power sale; BPA to the city of Milton Freewater, power sale; BPA to Modern Electric Cooperative, power sale; BPA to Nespelem Valley

sale; BPA to Nespalem Valley Electric Cooperative, power sale; BPA to Pacific Power and Light, power sale; BPA to Port Angeles City Light, power sale; BPA to Ravalli County Electric Cooperative, power sale; BPA to Springfield Utility Board, power sale; BPA to Surprise Valley Electric Corporation, power sale; BPA to TPU, power sale; BPA to Unity Light and Power Company, power sale; BPA to Umatilla Electric Cooperative, power sale; BPA to Vigilante Electric Cooperative, power sale; and BPA to Wasco Electric Cooperative, power sale.

- ◆ **Imports:** This analysis includes the following new contracts: Azusa to BPA, return energy; Banning to

BPA, return energy; and Colton to BPA, return energy. Exchange energy from the cities of Burbank, Glendale, and Pasadena and from SCE to BPA are zero through the study horizon because the corresponding BPA export contracts are assumed to be in power sale mode. SCE to BPA, option energy is included through OY 2002. Supplemental energy from the cities of Burbank, Glendale, and Pasadena and from SCE to BPA are assumed to be contracted firm resource options and are not included in the study.

- ◆ **Contracts In:** This analysis has the following new BPA intra-regional contracts in: BPA to unspecified entities, power sale.

## **Public Agency Power Sales Contract Diversification**

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To maintain BPA revenues and improve its public utility customers' satisfaction with their BPA business relationship, the agency offered these customers a series of amendments to their 1981 power sales contract that would provide them with 5 years of rate certainty and limited access to the opportunities and risks of diversifying their power supply. Three forms of amendatory agreements were offered wherein customers could elect to either keep their total requirements service on BPA or add specific amounts of firm resources dedicated to serve a portion of requirements load and reduce their requirements service on BPA. BPA also negotiated new requirements power sales contracts with different terms and

conditions with those customers who wished to have a larger portion of their firm power load served by firm non-Federal resources than was available under the amendatory agreements. Finally, some customers elected to continue with their 1981 contracts unamended. All of the agreements—the amendatory agreements, the new contracts, and the unamended 1981 utility power sales contracts—expire September 30, 2001. In exchange for this rate certainty and market access, these customers are required to provide revenue certainty to BPA by making load commitments through September 30, 2001.

This study reflects load diversification for the public agencies from BPA's Load Commitment Exercise as a resource called Public Agency Diversification in each utility's load-resource balance, which reduces each utility's power sales contract purchase from BPA.

**Table 3**

**Public Agency Power Sales Contract Diversification**

Average Megawatts

OPERATING YEAR <sup>1</sup>	1998	1999	2000	2001	2002 <sup>2</sup>	2003 <sup>2</sup>	2004 <sup>2</sup>	2005 <sup>2</sup>	2006 <sup>2</sup>	2007 <sup>2</sup>
Clark Public Utility	135	242	257	269	269	269	269	269	269	269
Cowlitz County PUD	104	104	104	104	104	104	104	104	104	104
Douglas County PUD	0	0	0	0	0	0	0	0	0	0
EWEB	0	0	0	0	0	0	0	0	0	0
Grant County PUD	5	5	5	5	5	5	5	5	5	5
Gray's Harbor PUD	13	13	13	13	13	13	13	13	13	13
Okanogan PUD	5	5	5	5	5	5	5	5	5	5
Pend Oreille PUD	0	0	0	0	0	0	0	0	0	0
Seattle City Light	44	43	47	45	45	45	45	45	45	45
Snohomish County PUD	177	210	248	262	262	262	262	262	262	262
Springfield Utility Board	69	45	44	22	22	22	22	22	22	22
Tacoma Public Utilities	60	63	65	63	63	63	63	63	63	63
Non-Generating Public Agencies	307	352	380	405	405	405	405	405	405	405
<b>TOTAL PUBLIC AGENCY DIVERSIFICATION</b>	<b>918</b>	<b>1,083</b>	<b>1,169</b>	<b>1,194</b>	<b>1,194</b>	<b>1,194</b>	<b>1,194</b>	<b>1,194</b>	<b>1,194</b>	<b>1,194</b>

<sup>1</sup> Operating Year (OY) is the 12-month period August 1 through July 31. For example, OY 1997-98 is August 1, 1997, through July 31, 1998.

<sup>2</sup>Public agency power sales contract load diversification is assumed to continue at the OY 2001 level for OYs 2002-07. For OY 2002 and beyond, however, BPA's projected public agency load diversification levels are highly uncertain because BPA's firm contractual obligations and the impacts of deregulating the wholesale and retail electric utility industry are unknown.

**Firm Resource Exhibit (FRE) Changes**

The 1996 White Book analysis assumes all 1995 FRE resource changes approved by BPA. These include Canby Utility Board, Clark Public Utilities, EWEB, Seattle City Light, Springfield Utility Board, and Snohomish County PUD.

Because information concerning the amount, size, supplier, and type of resource was not available at the time of this publication, the following FRE resource changes were accepted but not included in this analysis: Emerald County PUD, Inland Power and Light Company, and Forest Grove Light and Power Department.

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## IV. FEDERAL SYSTEM ANALYSIS

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This study provides base case assumptions from which scenarios encompassing a wide range of uncertainties about BPA's future may be evaluated. It incorporates only load forecast uncertainty and capacity availability under extreme weather conditions.

The Federal system loads and resources analysis is based on the following assumptions:

- ◆ Capacity surplus/deficit values do not reflect potential nighttime return problems on the Federal system;
- ◆ The region experiences medium load growth;
- ◆ The Pacific Northwest Coordination Agreement, which expires June 30, 2003, is replaced with a like agreement;
- ◆ BPA's power sales contracts with Pacific Northwest Federal and public agencies and IOUs, which expire June 30, 2001, and with its DSI customers, which expire September 30, 2001, are renewed with like agreements;
- ◆ Public agency load diversity is assumed to remain the same from OY 2001 through the end of the study period;
- ◆ All existing Federal contractual arrangements not included under Pacific Northwest power sales contracts expire and are not renewed;
- ◆ Federal surplus firm power sales and capacity/energy exchange agreements with the cities of Burbank, Glendale, and Pasadena and with SCE are shown in power sales mode throughout the study period;
- ◆ BPA purchases option energy from SCE through OY 2002;
- ◆ SCE purchases option capacity from BPA through OY 2002;
- ◆ BPA's surplus firm power sale to the M-S-R Public Power Agency (M-S-R), whose members include the Modesto Irrigation District and the cities of Santa Clara and Redding, California, remains a power sale through October 31, 2009, then converts to a capacity/energy exchange until it expires;
- ◆ BPA's surplus firm power sale to Puget Sound Power and Light terminates and converts to a seasonal power exchange beginning in OY 2001-02, per the terms of the contract;
- ◆ Sustained capacity limits are 50 hours per week;
- ◆ BPA serves all of the Pacific Northwest public agencies' net firm load requirements not served by their dedicated resources;
- ◆ Extreme weather adjustments are assumed for capacity in the months of November through February. These adjustments vary monthly from 1,400 to 1,900 peak megawatts under the medium load forecast; and
- ◆ The IOUs do not make new long-term BPA purchases.



## Federal Firm Energy Loads

The Federal system firm loads include BPA's firm DSI load,<sup>1</sup> sales to Federal agencies, current obligations to regional public agencies and IOUs under their power sales contracts, less public agency diversification from BPA's Load Commitment Exercise, which reduced BPA's power sales contract obligations. The Federal system firm energy loads under the medium load forecast for OY 1997-98

<sup>1</sup> This study includes the Federal DSI firm loads through OY 2001, per contracts signed through December 31, 1996. In OY 2002 and through the remainder of the study period, the Federal DSI load continues at OY 2001 levels.

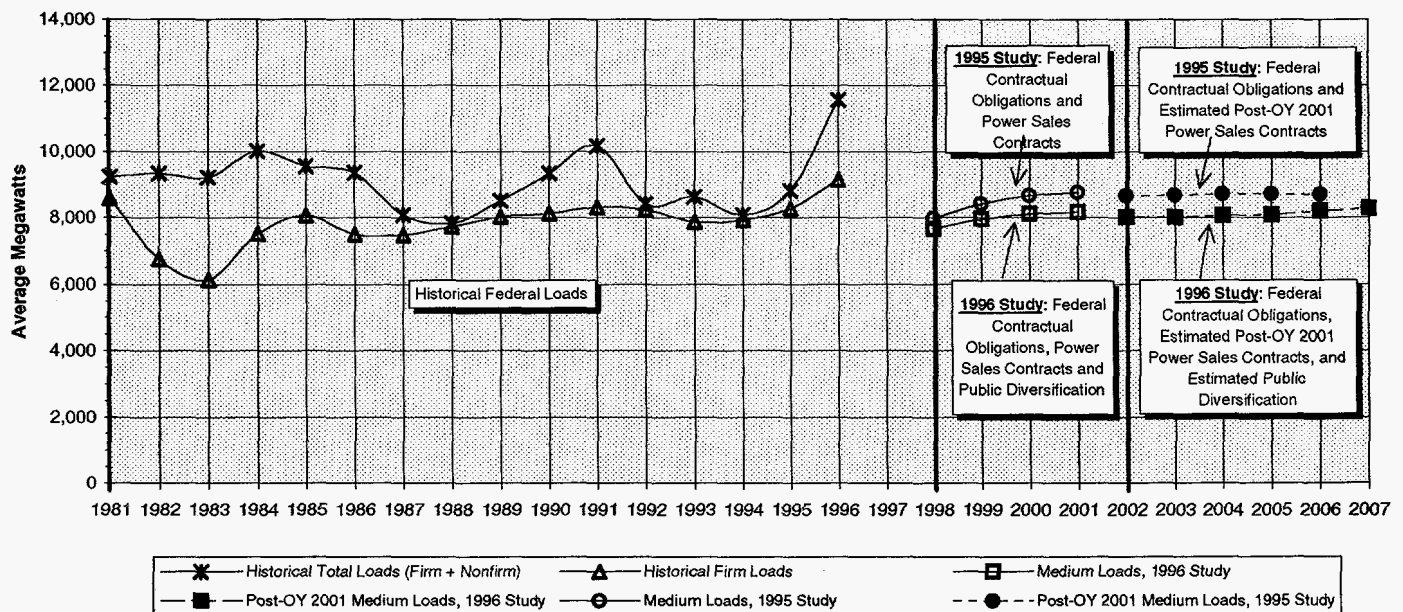
through 2006-07 are shown in Figure 2, below. The methods and assumptions used to complete this year's load forecast are discussed under Load Forecasting, page 3.

The Federal loads include all intra-regional contracts made within the Pacific Northwest, called contracts out, and inter-regional contracts or exports of firm surplus power to Southwest utilities. The Federal firm energy loads under the medium load forecast are presented on line 15 of Exhibit 1, page 47, and monthly for the medium load forecast for OY 1997-98, 2001-02, and 2006-07 assuming 1937 water conditions in Exhibits 2 through 4, pages 51 through 57.

**Figure 2**

### Federal Firm Energy Load Projections<sup>2, 3</sup> - 1996 BPA Forecast

Medium Loads



<sup>2</sup> The components of BPA's historical loads are: (1) total loads, which include both firm and nonfirm sales of electrical energy, and (2) firm loads, which include only BPA's firm electrical energy sales. BPA's future loads depicted in Figure 2, above, include only firm electrical energy obligations.

<sup>3</sup> After OY 2001, the Federal firm energy load projections assume that BPA's power sales contracts are renewed with like agreements and that public agency load diversification remains at the OY 2001 level through the remainder of the study period. For OY 2002 and beyond, however, these projections are highly uncertain because BPA's firm contractual obligations and the impacts of deregulating the wholesale and retail electric utility industry are unknown.

## **Federal Firm Peak Loads**

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Figure 3, page 19, shows the Federal firm peak loads for OY 1997-98, 2001-02, and 2006-07 under the medium load forecast. The figure shows the expected 1-hour monthly demand under the 1996 BPA load forecast, and includes extreme weather adjustments. Extreme weather conditions were assumed for the months of November through February and estimate a 5-percent probability that the actual peak load will be exceeded. The extreme weather adjustment includes possible increased obligations on BPA by the public agencies during extreme weather conditions. In the remaining months of March through October, the peak loads estimate normal weather conditions with a

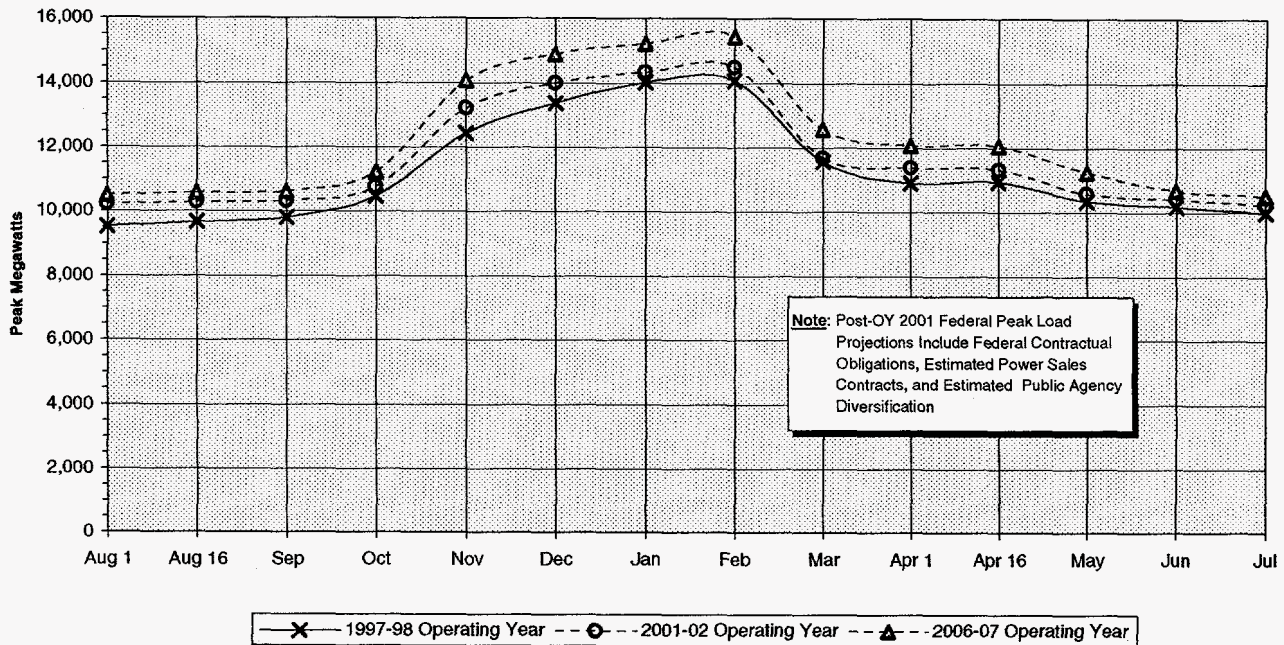
50-percent probability that the actual peak load will be exceeded. The peak load projections are reduced by a diversity component to address the fact that all peak electrical demands do not occur simultaneously throughout the region.

This study assumes that public agencies will purchase capacity from BPA under their power sales contracts to meet peak loads not served by their own resources.

The monthly Federal firm peak loads are presented on line 15, and the monthly extreme weather obligations are presented on lines 44 and 47 of Exhibits 6 through 8, pages 61 through 67, for the medium load forecast for OY 1997-98, 2001-02, and 2006-07, assuming Federal obligations under 1937 water conditions.

**Figure 3**

**Federal Monthly Firm Peak Load Projections <sup>1</sup>  
Under Extreme Weather Conditions <sup>2</sup> for OY 1997-98, 2001-02, and 2006-07  
Medium Loads**



<sup>1</sup> After OY 2001, BPA's public and DSI firm peak load projections assume that BPA's power sales contracts are renewed with like agreements and that public agency load diversification remains at the OY 2001 level through the remainder of the study period. For OY 2002 and beyond, however, these projections are highly uncertain because BPA's firm contractual obligations and the impacts of deregulating the wholesale and retail electric utility industry are unknown.

<sup>2</sup> Extreme weather conditions in November, December, January, and February assume a 5-percent probability that the peak load will be exceeded.

### **Existing Federal Firm Resources**

The Federal system hydro resources from which BPA markets power are shown in Table 4, page 20. In addition, BPA markets power purchased from non-Federally owned resources. BPA's capacity/energy exchange contracts provide energy to BPA as payment for the capacity BPA delivers.

The non-Federally owned resources, return energy associated with BPA's existing capacity/energy exchanges, contractual resources, and other BPA hydro-related contracts are shown in Table 5, page 21.

Combined, these resources represent BPA's available firm resources. A detailed listing of all Federal generating resources is contained in the 1996 Pacific Northwest Loads and Resources Technical Appendix (available March 1997).

**Table 4****Federal System Hydroelectric Projects**

<b>PROJECT</b>	<b>Initial Year of Service</b>	<b>Number of Units</b>	<b>Name-plate Rating (MW)</b>	<b>Instantaneous Generating Capacity<sup>1</sup> (peak MW)</b>	<b>Firm Energy<sup>2</sup> (aMW)</b>
<b>U.S. BUREAU OF RECLAMATION HYDROELECTRIC PROJECTS</b>					
Grand Coulee	1941	27	6,187.5	6,313	1,770
Grand Coulee Pump Gen.	1973	6	314.0	314	0
Hungry Horse	1952	4	392.0	357	76
Palisades	1957	4	142.2	122	66
Anderson Ranch	1950	2	27.0	36	16
Minidoka	1909	7	13.4	13	8
Roza	1958	1	11.3	4	6
Black Canyon	1925	2	8.0	9	8
Chandler	1956	2	12.0	10	9
<b>TOTAL U.S. BUREAU OF RECLAMATION PROJECTS</b>		<b>55</b>	<b>7,107.4</b>	<b>7,178</b>	<b>1,959</b>
<b>U.S. ARMY CORPS OF ENGINEERS HYDROELECTRIC PROJECTS</b>					
Chief Joseph	1955	27	2,069.0	2,543	1,112
John Day	1968	16	2,160.0	2,484	889
The Dalles	1957	22	1,780.0	2,074	522
Bonneville	1938	18	1,050.0	1,147	399
McNary	1953	14	980.0	1,127	649
Lower Granite	1975	6	810.0	930	220
Lower Monumental	1969	6	810.0	922	213
Little Goose	1970	6	810.0	928	205
Ice Harbor	1961	6	603.0	693	153
Libby	1975	5	525.0	566	169
Dworshak	1974	3	400.0	440	169
Lookout Point	1954	3	120.0	67	35
Detroit	1953	2	100.0	96	41
Green Peter	1967	2	80.0	79	28
Lost Creek	1975	2	49.0	18	30
Albeni Falls	1955	3	42.6	36	28
Hills Creek	1962	2	30.0	30	18
Cougar	1964	2	25.0	25	16
Foster	1968	2	20.0	22	12
Big Cliff	1954	1	18.0	21	11
Dexter	1955	1	15.0	17	9
<b>TOTAL CORPS OF ENGINEERS PROJECTS</b>		<b>149</b>	<b>12,496.6</b>	<b>14,265</b>	<b>4,928</b>
<b>HYDRO EFFICIENCY IMPROVEMENTS<sup>3</sup></b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>45</b>
<b>TOTAL USBR AND COE PROJECTS</b>		<b>204</b>	<b>19,604.0</b>	<b>21,443</b>	<b>6,932</b>

<sup>1</sup> Maximum generation under optimum conditions assuming January 1936-37 water conditions. Does not reflect reduction to the peaking capacity of the hydro system due to the drafting of reservoirs and other project constraints.

<sup>2</sup> Firm energy from a 12-month annual average assuming 1936-37 water conditions.

<sup>3</sup> Contracted hydro efficiency improvements are being completed on various hydroelectric projects. These efficiency improvements were not included in this year's hydro regulation.

**Table 5**

**Non-Federally Owned BPA Resources and Contracts**  
Capacity based on January 1998

PROJECT	Type	Operator	Date in Service	OY 1997-98 Capacity (peak MW)	OY 1997-98 Firm Energy (aMW)
<b>EXISTING NON-FEDERALLY OWNED BPA RESOURCES</b>					
WNP-2	Nuclear	WPPSS	1984	1,170 <sup>1</sup>	842 <sup>1</sup>
Packwood Lake	Hydro	WPPSS	1964	30	9
Idaho Falls Bulb Projects	Hydro	City of Idaho Falls	1982	18	19
Cowlitz Falls	Hydro	Lewis County PUD	1994	13 <sup>2</sup>	26
Big Creek Hydro Unit	Hydro	Mission Valley	1981	1	0
James River Wauna	Cogen	Clatskanie PUD; EWEB	1996	32	29
<b>TOTAL NON-FEDERALLY OWNED BPA RESOURCES</b>				<b>1,264</b>	<b>916</b>
<b>Firm Contracts</b>					
Canadian Entitlement for CSPE				110	50
Canadian Entitlement for Canada				0	5
Restoration, Columbia River Treaty with Canada				0	-26
Pacific Southwest Imports				282	180
Eastern Imports				285	155
Pacific Northwest Purchase				69	293
Non-Utility Generation				1	14
<b>TOTAL BPA FIRM CONTRACTED RESOURCES</b>				<b>747</b>	<b>671</b>
<b>TOTAL NON-FEDERALLY OWNED BPA RESOURCE CONTRACTS</b>				<b>2,011</b>	<b>1,587</b>

<sup>1</sup> Efficiency improvements will increase WNP-2 energy capability to 878 average megawatts when completed in OY 2001.

<sup>2</sup> Operational capacity is 70 MW, but is restricted in January.

Table 6, page 22, summarizes the Federal system firm energy resources and contracts available to meet Federal firm loads for OY 1997-98. Federal system firm energy

resources are comprised as follows: 82 percent from hydroelectric power, 10 percent from one nuclear power plant, and 8 percent from BPA's firm contracts.

**Table 6****Federal<sup>1</sup> Firm Resources for OY 1997-98<sup>2</sup>  
Based on 1936-37 Water Conditions**

Capacity based on January 1998

<b>PROJECT TYPE</b>	<b>Sustained Peak Capacity (MW)</b>	<b>Generating Peaking Capacity % of Total</b>	<b>Firm Energy (aMW) 12-Month Average</b>	<b>Firm Energy % of Total</b>
<b>Hydro</b>	13,901	88	7,037	82
<b>Nuclear</b>	1,170	8	842	10
<b>Firm Contracts</b>	669	4	671	8
<b>TOTAL FEDERAL RESOURCES</b>	<b>15,740</b>	<b>100</b>	<b>8,550</b>	<b>100</b>

<sup>1</sup> Includes Federally and non-Federally owned projects.<sup>2</sup> Operating Year (OY) is the 12-month period August 1 through July 31. For example, OY 1997-98 is August 1, 1997, through July 31, 1998.**Federal Firm Energy Surplus/  
Deficit Projections**

This analysis includes all operating requirements currently adopted by the hydroelectric project owners and the firm planning assumptions for assured resource capability in PNCA and from the 1995 NMFS Biological Opinion used in BPA's 1996 Final Rate Filing.

The Federal firm energy surplus/deficit projections under the medium load forecast for OY 1997-98 through 2006-07 are presented in Table 7, page 23, and graphically shown in Figure 4, page 23. Under the

medium forecast, the Federal system is energy surplus over the study period.

The components of the 10-year critical period average Federal energy loads and resources balances under the medium load scenario are presented in Exhibit 1, line 42, page 47.

To show the monthly variability of the loads and resources study, the monthly Federal system energy components assuming medium loads under 1937 water conditions for OY 1997-98, 2001-02, and 2006-07 are shown in Exhibits 2 through 4, pages 51 through 57.

**Table 7**

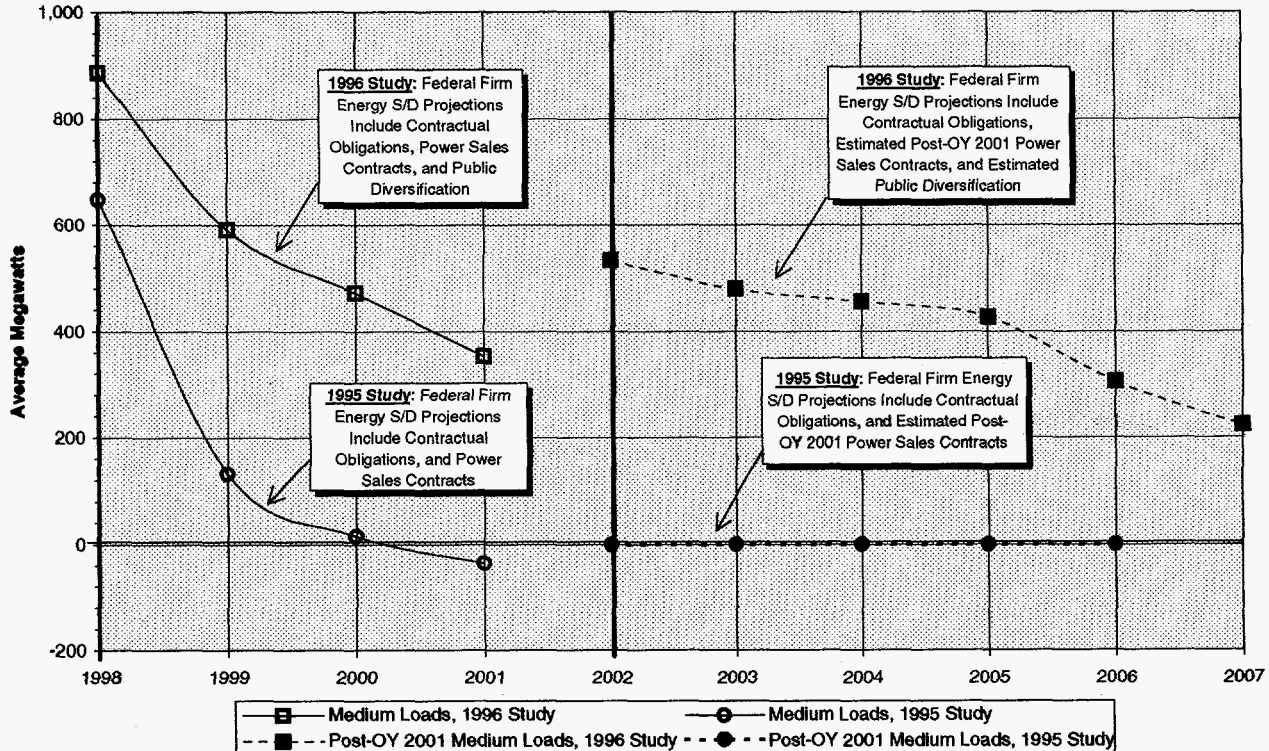
**Federal Firm Energy Surplus/Deficit Projections  
Assuming Existing Loads, Resources, and Contracts  
Under 1936-37 Water Conditions**

Energy In Average Megawatts

Medium Load Scenario	OPERATING YEAR <sup>1</sup>									
	1998	1999	2000	2001	2002 <sup>2</sup>	2003 <sup>2</sup>	2004 <sup>2</sup>	2005 <sup>2</sup>	2006 <sup>2</sup>	2007 <sup>2</sup>
	886	590	472	352	533	479	455	426	304	223

**Figure 4**

**Federal Firm Annual Energy Surplus/Deficit Projections<sup>2</sup>**



<sup>1</sup> Operating Year (OY) is the 12-month period August 1 through July 31. For example, OY 1997-98 is August 1, 1997, through July 31, 1998.

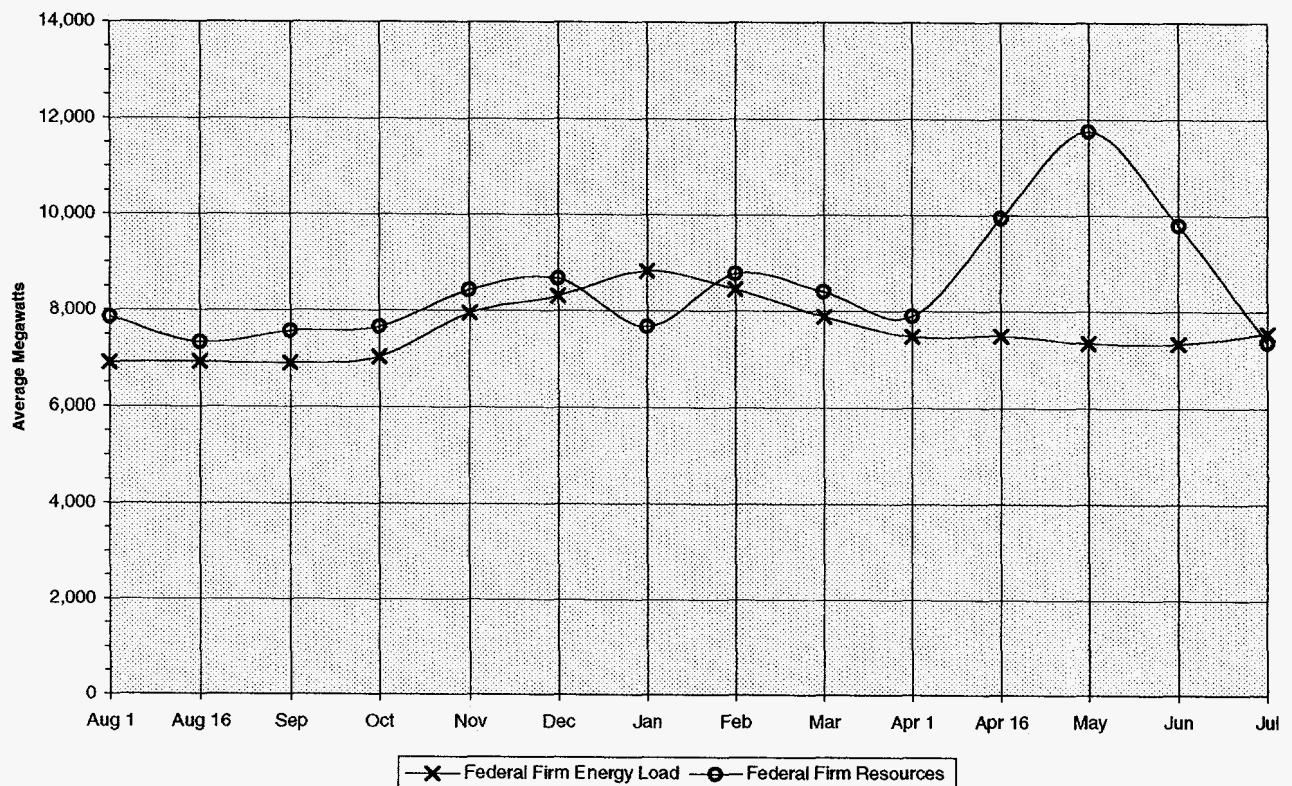
<sup>2</sup> After OY 2001, BPA's firm energy surplus/deficit projections include BPA's firm public agency and DSI load requirements assuming that BPA's power sales contracts are renewed with like agreements and that public agency load diversification remains at the OY 2001 level through the remainder of the study period. For OY 2002 and beyond, however, these projections are highly uncertain because BPA's firm contractual obligations and the impacts of deregulating the wholesale and retail electric utility industry are unknown.

Figure 5, below, shows the monthly Federal system firm energy loads and resources for OY 1997-98. This figure illustrates the timing of Federal system monthly surpluses and deficits in any operating year created by incorporating the 1995 NMFS Biological Opinion.

Federal resources are generally lower during the January through March time-frame due to the reservoirs storing water for later release in the spring to assist fish passage.

**Figure 5**

**Federal Monthly Firm Energy Loads and Resources for OY 1997-98<sup>1</sup>**  
**Assuming 1936-37 Water Conditions**  
 Medium Load Forecast



<sup>1</sup> Operating Year (OY) is the 12-month period August 1 through July 31. For example, OY 1997-98 is August 1, 1997, through July 31, 1998.



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## V. RESOURCE PLANNING ALTERNATIVES

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### **BPA's Resource Strategy**

As previously discussed, Federal hydro system operations have changed due to the 1995 NMFS Biological Opinion. In response to these changes, BPA has changed its traditional least cost resource planning approach by adopting a new resource strategy. For the immediate future, BPA's resource strategy is to rely on available power purchases, off-system storage, or exchanges to serve any incremental power needs should loads exceed resources within a month. Although BPA has planned for the possibility that additional resources might be needed to meet firm loads, that possibility is remote for the foreseeable future. Information on this resource strategy is contained in BPA's Interim Resource Strategy (September 1995). In contrast, the White Book analysis differs from BPA's resource strategy because provisions of the current utility power sales contract do not allow BPA to count "uncommitted" purchase power as a resource available to serve firm load. The following alternatives are being considered as possible means of meeting BPA's future load commitments:

**Probabilistic Analysis.** The hydro system generation varies greatly from one year to another, mainly due to the weather in the Pacific Northwest and Canada. In most years, there is an abundance of water so that hydro generation along with Pacific Northwest thermal resources and contracts can meet all regional energy needs; in other years, lack of water could create shortfalls

in some months. Implementing the stream-flow requirements of the 1995 NMFS Biological Opinion changed the shape and ability of the hydro system to meet energy needs in all months.

The region also has experienced a shift in emphasis in power marketing from being supply-driven to being price-driven. The market changes are dictating changes in resource risk management. One way to manage resource risks is to use probabilistic analyses. Using probabilistic methods in planning allows utilities to evaluate and manage resource risks by using market supply and reducing resource costs, thus helping to provide competitive prices in today's power market.

**Use the Resource Contingency Program (RCP) Option Resources.** This alternative would include the RCP resource options where BPA has contracted rights for the output of three combustion turbines, which carry a combined 854 average megawatts (911 peak megawatts). These resources can potentially be available within 3 years. Prior to acquiring the output from these projects, BPA must first conduct an administrative hearing and obtain determinations from the Council and the Administrator that the resource is needed and consistent with the Council's Plan. The RCP resources are shown in line 1, Table 8, page 27.

### **Pacific Southwest Contractual Resource Options.**

BPA has long-term firm power sale and capacity/energy exchange contracts with five Southwest utilities: Southern California

Edison (SCE); the M-S-R Public Power Agency (M-S-R) whose members include the Modesto Irrigation District and the cities of Santa Clara and Redding, California; and the cities of Burbank, Glendale, and Pasadena, California.

The above contracts contain provisions, throughout their duration, for complete or partial termination of energy deliveries if that energy is needed to serve BPA's firm requirements.

The Southwest utilities contracts allow BPA to terminate surplus firm energy deliveries and convert these contracts to capacity/energy exchange contracts under the following conditions:

- ◆ On an annual basis, following a determination by BPA under annual Pacific Northwest Coordination Agreement planning; or
- ◆ On 60-days' notice pursuant to Public Law 88-552.

These provisions relieve BPA of its energy delivery obligations and make those resources available to BPA for meeting firm energy requirements. Energy may be acquired from the following categories:

- ◆ Energy made available from the termination of energy deliveries under Southwest surplus firm energy sales;
- ◆ Exchange energy available upon conversion of the Southwest surplus firm energy sales to capacity/energy exchanges; and
- ◆ Supplemental energy available to BPA for purchase upon conversion of the Southwest surplus firm energy sales to capacity/energy exchanges.

In the event that BPA terminates energy deliveries of these Southwest surplus sales and converts them to exchanges, provisions within the contracts, except the city of

Burbank's, allow for later reversion to surplus energy sales, depending on the availability of Federal surplus firm energy and certain other conditions.

This study assumes that these contracts retain their power sale status throughout their terms (expiration dates range from OY 2007-08 to 2012-13). Should BPA terminate these sales and convert them to capacity/energy exchanges, exchange energy would become available to BPA as a firm resource. The additional resources resulting from early conversion of these surplus firm power sales to capacity/energy exchanges are shown in Table 8, lines 2 and 3, page 27.

**Supplemental Energy.** If BPA terminates Southwest sales and converts them to capacity/energy exchange contracts, BPA may elect to purchase supplemental energy in that same operating year. The amount of additional resources that would become available upon early conversion of these contracts and purchase of supplemental energy is shown in Table 8, line 4.

**Non-Treaty Storage.** On July 9, 1990, BC Hydro and BPA signed an agreement increasing United States-Canadian coordination of the Columbia River system. This agreement cooperatively manages 4.5 million acre-feet of non-treaty hydro storage through June 30, 2003. Studies on the increased coordination indicate a possible increase of 300 average megawatts in firm energy for the combined Canadian and Pacific Northwest systems. Fifty percent of the benefit, 150 average megawatts, is available to the United States. The Federal system share is 115 average megawatts. This energy, however, is not as valuable as a firm resource because non-treaty storage has a lower refill priority than primary storage reservoirs. Therefore, BPA intends to use the non-treaty storage as a resource

which will increase flexibility in operating the hydro system when needed. Since this energy may not be available in every year, BPA needs to use probability methods for its inclusion as a firm resource, but has not done so for this loads and resources study. However, it may be included as a firm resource in future studies. The Federal system share of non-treaty storage energy is shown in Table 8, line 5, below.

**Make Commitments for Short-Term Power Purchases or Options on Power Purchases.** This alternative would allow BPA to meet operational and planning deficits on the Federal system by acquiring short-term power or securing options to purchase power for those deficit months at the index market price.

**Table 8**

**Alternate Federal Contractual Resources  
Energy In Average Megawatts**

OPERATING YEAR <sup>1</sup>	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
<b>1. Resource Contingency Program (RCP) Resources<sup>2</sup></b>	0	0	0	854	854	854	854	854	854	854
<b>2. Termination of PSW Surplus Power Sales</b>	236	236	236	236	236	236	236	236	236	236
<b>3. Exchange Energy from PSW</b>	72	71	70	69	68	66	65	64	63	63
<b>4. Supplemental Energy from PSW</b>	39	40	42	43	44	45	46	47	49	49
<b>5. Non-Treaty Storage</b>	115	115	115	115	115	105	0	0	0	0
<b>TOTAL CONTRACTUAL OPTIONS</b>	<b>462</b>	<b>462</b>	<b>463</b>	<b>1,317</b>	<b>1,317</b>	<b>1,306</b>	<b>1,201</b>	<b>1,201</b>	<b>1,202</b>	<b>1,202</b>

<sup>1</sup> Operating Year (OY) is the 12-month period August 1 through July 31. For example, OY 1997-98 is August 1, 1997, through July 31, 1998.

<sup>2</sup> These resources are assumed to be available by August 2000. Resource potential is 854 average megawatts.

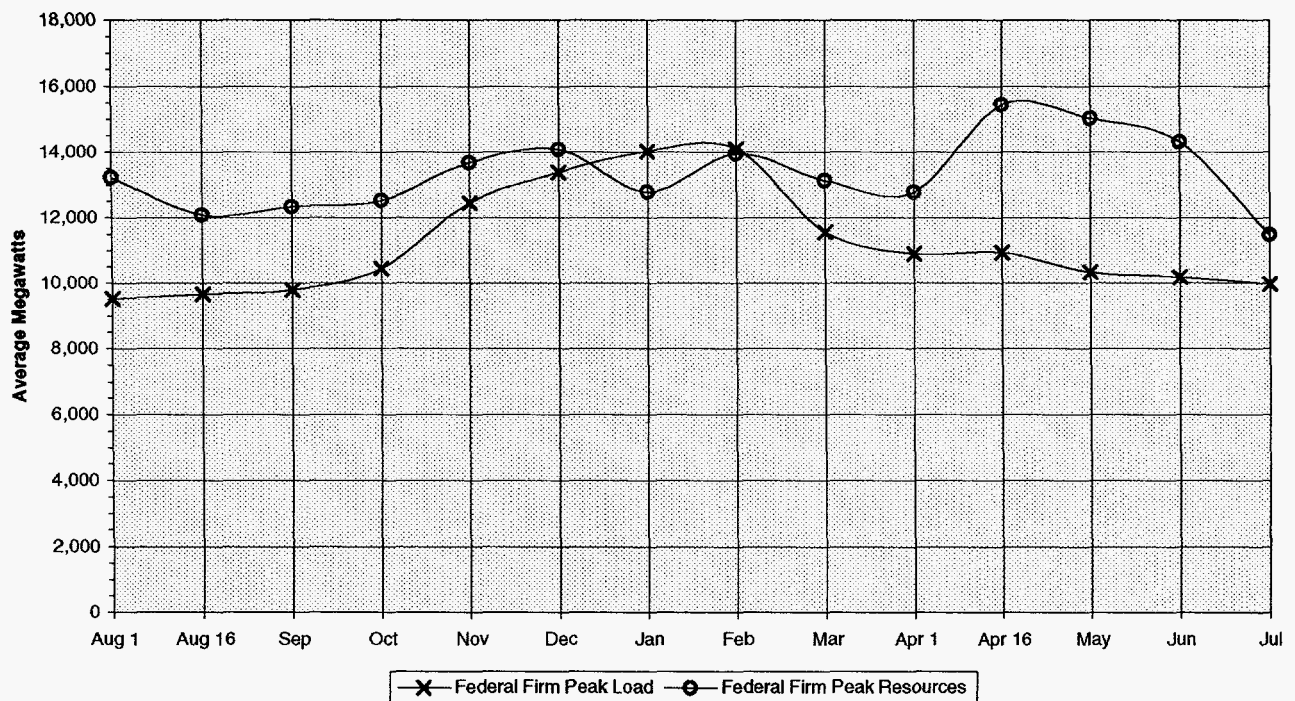
## Federal Firm Capacity Surplus/ Deficit Projections

Figure 6, below, shows the monthly Federal system peak loads and resources for OY 1997-98 under 1937 water conditions assuming extreme weather conditions dur-

ing the months of November through February. This figure illustrates the timing and magnitude of the Federal system capacity surpluses and deficits in any operating year and impacts created during extreme winter weather.

**Figure 6**

### Federal Monthly Capacity Loads and Resources Under Extreme Weather Conditions<sup>1</sup> for OY 1997-98<sup>2</sup>



<sup>1</sup> Extreme weather conditions in November, December, January, and February assume a 5-percent probability that the peak load will be exceeded.

<sup>2</sup> Operating Year (OY) is the 12-month period August 1 through July 31. For example, OY 1997-98 is August 1, 1997, through July 31, 1998.

The study assumes that there are no nighttime return problems from future capacity sales. Nighttime return problems can occur when replacement energy from capacity sales, combined with minimum hydro generation, the output from other Federal resources, and other Federal contract returns are greater than BPA's nighttime load. The following factors contribute to nighttime return problems:

- ◆ Low Federal system loads;
- ◆ Additional nonpower hydro requirements that dictate minimum streamflows; and
- ◆ The inability of WPPSS's WNP-2 nuclear resource to cycle from day to night.

These requirements restrict the ability to accept nighttime return energy, even though there is surplus generating capability during the daytime. These constraints are common in summer and fall, when BPA's nighttime loads are low. BPA's future Federal surplus capacity transactions may include provisions to:

- ◆ Limit return energy to a percentage of contract demand;
- ◆ Defer energy returns to a time more favorable to system operations; or
- ◆ Request cash payment in lieu of return energy.

BPA's surplus firm capacity values take into account the following Federal system hydro constraints:

- ◆ Limitations on moving water between projects, including upstream storage;
- ◆ Pondage limitations due to hydraulic imbalance from reservoir to reservoir; and
- ◆ Navigation and recreation constraints, including restrictions on the rate of rise or fall of tailwater and forebay elevations.

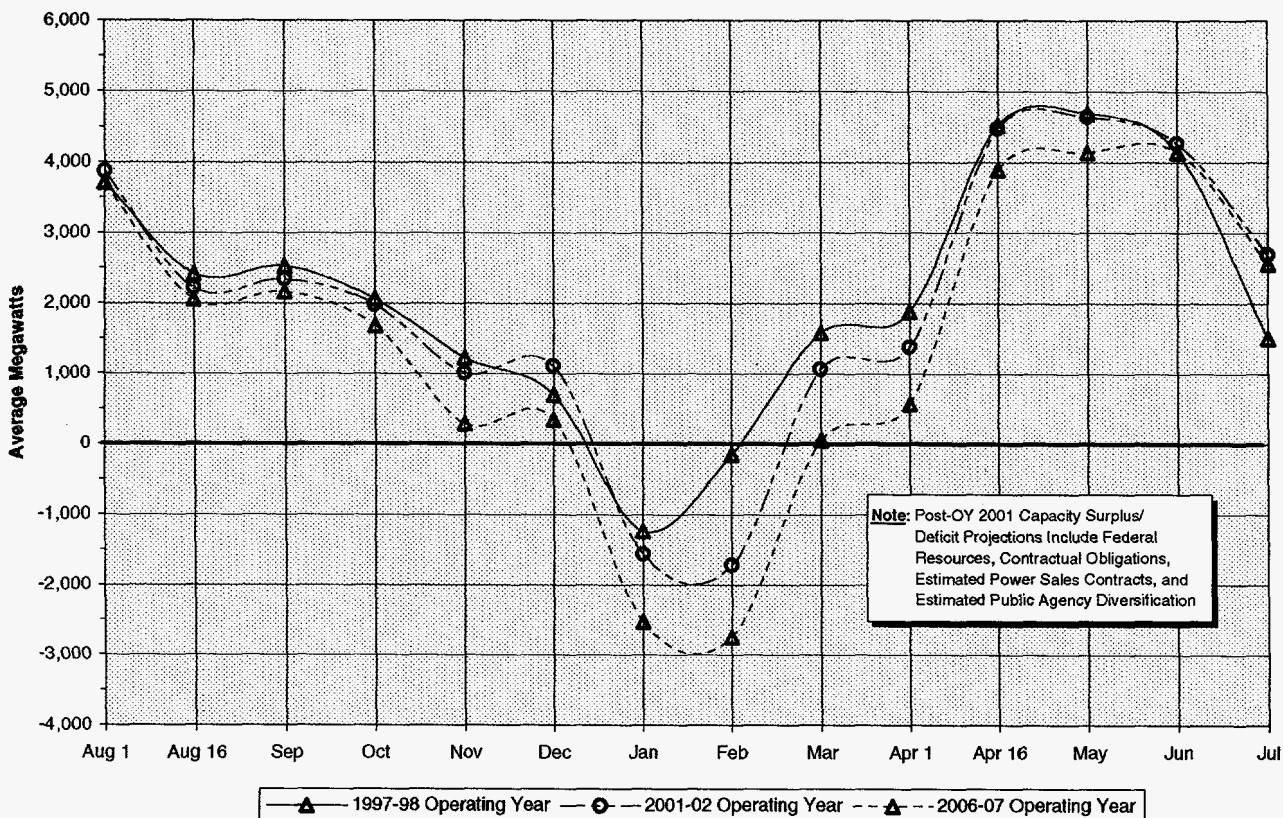
As BPA acquires future resources, the added capacity will increase capacity available to the Federal system.

Figure 7, page 30, shows the Federal firm capacity surplus/deficit projections under the medium load forecast for OY 1997-98, 2001-02, and 2006-07. This analysis incorporates all operating requirements currently adopted by the hydroelectric project owners and the firm planning assumptions from the 1995 NMFS Biological Opinion.

A 10-year summary of Federal capacity surplus/deficit projections under the medium load forecast, assuming extreme weather conditions, is presented in Exhibit 5, page 59. The monthly variability of the Federal system capacity components that comprise the loads and resources study, and assuming medium loads for extreme weather under 1937 water conditions for OY 1997-98, 2001-02, and 2006-07, are shown on line 48 in Exhibits 6 through 8, pages 61 through 67.

**Figure 7**

**Federal Monthly Capacity Surplus/Deficit Projections<sup>1</sup>  
Under Extreme Weather Conditions<sup>2</sup>**



<sup>1</sup> After OY 2001, BPA's Federal system capacity surplus/deficit projections include BPA's firm public agency and DSI load requirements assuming that BPA's power sales contracts are renewed with like agreements and that public agency load diversification remains at the OY 2001 level through the remainder of the study period. For OY 2002 and beyond, however, these projections are highly uncertain because BPA's firm contractual obligations and the impacts of deregulating the wholesale and retail electric utility industry are unknown.

<sup>2</sup> Extreme weather conditions in November, December, January, and February assume a 5-percent probability that the peak load will be exceeded.

## **Federal Loads and Resources Comparison—Energy**

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Table 9 page 33, shows changes in the energy analysis of the 1996 Pacific Northwest Loads and Resources Study compared to the 1995 Study for OY 1997-98 through 2005-06. The table lists the Federal firm energy surplus/deficit projections for the 1995 study and changes since last year to obtain the current firm energy surplus under the medium load forecast. For "Load Changes," Table 9, line 2, positive values indicate load increases and negative values show load decreases. Similarly, for "Resource Changes," Table 9, line 3, positive values indicate additional resource availability and negative values show decreases in resource availability. Federal planned resource acquisitions for which BPA has not yet contracted are not included as firm resources. In this analysis, BPA considered its Pacific Southwest contracts in power sales mode through the study horizon. This is a change from last year's study, but consistent with prior White Book studies.

Additionally, the projections for OY 2002 and beyond are highly uncertain because BPA's firm contractual obligations and the impacts of deregulating the wholesale and retail electric utility industry are unknown.

Changes were based on the following updates in loads, contracts, and resources:

### **DSI Federal Firm Loads**

This study assumes the new DSI power sales contracts and block sales signed through December 31, 1996. The DSI loads are generally higher compared to last year's study. In OY 2002 and through the remainder of the study, the Federal DSI loads are assumed to continue at OY 2002 levels. This is a change from last year's

study, which reduced the DSI loads in OY 2002 and beyond from forecasted projections to show a zero Federal system loads and resources balance.

### **Public Agencies' Power Sales Contract Purchases**

The small and non-generating public agencies' energy purchases and generating public agencies' purchases are lower than last year's study due to the reduction of BPA's obligation to the public agencies through BPA's Load Commitment Exercise, which was signed on May 13, 1996.

### **Exports**

The 1996 White Book analysis includes the following new Federal exports: BPA to Azusa, energy sale; BPA to Azusa, power sale; BPA to Banning, energy sale; BPA to Banning, power sale; BPA to BART, power sale; BPA to Colton, energy sale; BPA to Colton, power sale; BPA to New Energy Ventures, power sale; and BPA to San Diego, power sale. This analysis assumes that BPA's power sales and capacity/energy exchange agreements with the cities of Burbank, Glendale, and Pasadena and with SCE are in power sales mode through the study horizon. Last year's analysis assumed these contracts in capacity/energy exchange mode through the study horizon. This change nets an increase in exports when compared to the 1995 White Book analysis.

### **Contracts Out**

Federal contracts out are higher in all years due to new intra-regional contracts signed since last year's analysis. These include BPA to Big Bend Electric Cooperative, power sale; BPA to Central Electric Cooperative, power sale; BPA to Clark Public Utility, power sale; BPA to the city of Ashland, power sale; BPA to the

city of Idaho Falls, power sale; BPA to the city of Monmouth, power sale; BPA to Columbia Basin Electric Cooperative, power sale; BPA to Columbia River PUD, power sale; BPA to Columbia Rural Electric Cooperative, power sale; BPA to Flathead Electric Cooperative, power sale; BPA to Harney Electric Cooperative, power sale; BPA to Inland Power and Light, power sale; BPA to Kootenai Electric Cooperative, power sale; BPA to Midstate Electric Cooperative, power sale; BPA to the city of Milton Freewater, power sale; BPA to Modern Electric Cooperative, power sale; BPA to Nespelem Valley Electric Cooperative, power sale; BPA to Pacific Power and Light, power sale; BPA to Port Angeles City Light, power sale; BPA to Ravalli County Electric Cooperative, power sale; BPA to Springfield Utility Board, power sale; BPA to Surprise Valley Electric Corporation, power sale; BPA to TPU, power sale; BPA to Unity Light and Power Company, power sale; BPA to Umatilla Electric Cooperative, power sale; BPA to Vigilante Electric Cooperative, power sale; and BPA to Wasco Electric Cooperative, power sale.

### **Regulated Hydro**

This year's study assumes the 12-month annual average, consistent with PNCA monthly assured capability for Federal resources, using 1937 water conditions under the 1995 NMFS Biological Opinion when analyzing the Federal system firm hydro capability. This hydroregulation is consistent with BPA's 1996 Final Rate Filing and produces slightly less energy than the 1995 analysis over the study horizon.

### **Independent Hydro**

Independent hydro generation is generally the same between the two analyses.

### **Imports**

This analysis includes several new contracts or contract changes that increase BPA's imports versus last year's study. The 1996 study includes the following new contracts: Azusa to BPA, return energy; Banning to BPA, return energy; and Colton to BPA, return energy. This analysis assumes that BPA's power sales and capacity/energy exchange agreements with the cities of Burbank, Glendale, Pasadena, Modesto, Santa Clara, and Redding, and with SCE, are in power sales mode; therefore, it includes no exchange energy from those utilities through the end of the study period. This is a change from the 1995 analysis. In addition, this study considers supplemental energy from the cities of the Burbank, Glendale, and Pasadena and from SCE as contracted firm resource options available to meet firm loads. Last year's study counted this supplemental energy as firm Federal resources. This change nets a decrease in imports when compared to the 1995 White Book analysis.

### **Renewable Resources**

BPA under a contract agreement purchased the output of the James River Wauna cogeneration plant. This is a new resource versus the 1995 White Book study.



Table 9

**Federal Firm Energy Surplus/Deficit Projections**  
**Difference Between the 1996 Final White Book and the 1995 White Book <sup>1/</sup>**  
**Under 1937 Water Conditions**  
 Energy in Average Megawatts

Operating Year <sup>2/</sup>	1998	1999	2000	2001	2002 <sup>3/</sup>	2003 <sup>3/</sup>	2004 <sup>3/</sup>	2005 <sup>3/</sup>	2006 <sup>3/</sup>
<b>1. 1995 White Book Federal Firm Surplus/Deficit</b>	648	132	15	-36	0	0	0	0	0
<b>2. Firm Load Changes for the 1996 Final White Book</b>									
(+ Indicates Load Increase - Indicates Load Decrease)									
a) DSI Loads as of 12/31/96 <sup>4/</sup>	105	84	82	82	99	190	316	350	477
b) Small & Non-Gen Public Purchases	-568	-805	-845	-878	-779	-783	-790	-800	-805
c) Exports <sup>5/</sup>	304	379	397	374	377	287	193	191	191
d) Contracts Out	63	149	148	147	-43	-56	-57	-58	-58
e) Generating Public Agencies Purchases	-214	-274	-350	-316	-317	-312	-312	-310	-308
f) Miscellaneous	-1	-1	0	-1	0	0	0	2	1
<b>Total Load Change</b>	-311	-468	-568	-590	-663	-674	-650	-625	-502
<b>3. Resource Changes for the 1996 Final White Book</b>									
(+ Indicates Resource Increase - Indicates Resource Decrease)									
a) Regulated Hydro (1937 12-Month Average)	-129	-67	-57	-142	-142	-142	-142	-142	-142
b) Independent Hydro (1937 12-Month Average)	0	0	0	0	0	0	0	0	0
c) Canadian Entitlement for Canada	0	0	0	-7	-6	0	0	0	0
d) Imports <sup>6/</sup>	26	27	-83	-83	-12	-84	-84	-87	-87
e) Contracts In	2	1	2	1	2	2	2	2	2
f) Renewable Resources	29	29	29	29	29	29	29	29	29
g) Miscellaneous	-1	0	-2	0	-1	0	0	-1	0
<b>Total Resource Changes</b>	-73	-10	-111	-202	-130	-195	-195	-199	-198
<b>4. 1996 Final White Book Federal Firm Surplus/Deficit</b> (Line 1 - Line 2 + line 3)	886	590	472	352	533	479	455	426	304

<sup>1</sup> The 1995 and 1996 White Book analyses both assume a 12-month annual average under 1937 water conditions.

<sup>2</sup> Operating Year (OY) is the 12-month period August 1 through July 31. For example, OY 1997-98 is August 1, 1997, through July 31, 1998.

<sup>3</sup> After OY 2001, BPA's public agency and DSI firm requirements shown on lines 2a, 2b, and 2e assume that BPA's power sales contracts are renewed with like agreements and that public agency load diversification remains at the OY 2001 level through the remainder of the study period. In OY 2002 and beyond, however, these projected requirements are highly uncertain because BPA's firm contractual obligations and the impacts of deregulating the wholesale and retail electric utility industry are unknown.

<sup>4</sup> The DSI loads include contracts signed through December 31, 1996.

<sup>5</sup> Exports: power sales-capacity/energy exchange contracts with the cities of Burbank, Glendale, Pasadena, Modesto, Santa Clara, and Redding and with SCE are assumed to be in power sales mode through the study horizon.

<sup>6</sup> Imports include: option energy from SCE through OY 2002. Supplemental energy from the cities of Burbank, Glendale, and Pasadena and from SCE are considered to be BPA resource options.

## **Federal Loads and Resources Comparison—Capacity**

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Table 10, page 35, shows changes in the capacity analysis of the 1996 Pacific Northwest Loads and Resources Study compared to the 1995 Study for OY 1997-98. The table lists the Federal system firm 50-hours-per-week capacity surplus/deficit projections for the 1995 study and changes since last year to obtain the current firm 50-hours-per-week capacity surplus/deficit projections under the medium load forecast. For "Load Changes," Table 10, line 2, positive values indicate load increases and negative values show load decreases. Similarly, for "Resource Changes," Table 10, line 3, positive values indicate additional resource availability and negative values show decreases in resource availability.

Changes were based on those previously discussed in "Federal System Loads and Resources Comparison—Energy," pages 31 and 32, plus the following changes, which pertain only to the capacity analysis.

### **Federal System Diversity**

The decreases in the obligation of the Federal system to the public agencies and IOUs under their power sales contracts decreased Federal system diversity impacts.

### **Extreme Weather Adjustment**

The extreme weather adjustments changed slightly compared to the 1995 study mainly due to decreases in BPA's obligation to public agencies under their power sales contracts.

### **Sustained Peaking Adjustment**

The 50-hours-per-week sustained peaking adjustment in this year's analysis decreased the regional capacity surplus in the hydro regulation versus the 1995 study. This is due to changes in the shaping of the hydro system due to Columbia River Flow Augmentation (CRFA). By storing in the months of January through April 15, the availability of sustained peaking diminished dramatically in some months.

### **Hydro Reserves/Large Thermal Reserves/Spinning Reserves**

The change in reserves is due to variations in hydro and thermal capabilities.

Table 10

**Federal Firm Capacity Surplus/Deficit Projections**  
**Difference Between the 1996 Final White Book and the 1995 White Book <sup>1/</sup>**  
**For Operating Year 1997-98 Under 1937 Water Conditions**  
**Peak in Megawatts**

Operating Year <sup>2/</sup> 1997-98	Aug 1	Aug 2	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr1	Apr2	May	Jun	Jul
<b>1. 1995 White Book Federal Firm Capacity Surplus/Deficit</b>	2,432	2,352	2,674	1,383	1,59	1,288	-2,212	-2,283	727	1,295	1,597	4,941	5,189	1,444
<b>2. Firm Load Changes for the 1996 Final White Book</b>														
(+ Indicates Load Increase - Indicates Load Decrease)														
a) DSI Loads 12/31/96 <sup>3/</sup>	141	141	319	93	94	93	95	94	94	94	94	93	93	92
b) Small & Non-Gen Public Purchase	-672	-672	-504	-791	-786	-967	-936	-940	-839	-827	-886	-747	-593	-535
c) Exports <sup>4/</sup>	177	177	177	36	290	289	489	489	490	473	474	479	221	221
d) Contracts Out	148	148	150	122	-127	-126	-166	-165	-165	-16	-16	216	214	212
e) Gen Public Agencies Purchase	-52	110	-16	-227	-217	-248	-127	-80	167	-106	-33	-294	-35	-91
f) Federal Diversity	75	54	48	107	113	93	86	83	84	95	94	99	54	54
g) Federal Losses	0	0	0	0	0	0	0	0	0	0	0	0	0	0
h) Federal Extreme Weather Adj.	0	0	0	0	-132	-129	-149	-187	0	0	0	0	0	0
i) Miscellaneous	0	0	1	2	2	3	1	1	1	-1	-1	-1	0	0
<b>Total Load Change</b>	-183	-42	175	-658	-763	-992	-707	-705	-168	-288	-274	-155	-46	-47
<b>3. Resource Changes for the 1996 Final White Book</b>														
(+ Indicates Resource Increase - Indicates Resource Decrease)														
a) Regulated Hydro (1937 12-Month Avg.)	419	115	356	389	1,049	1,338	1,233	1067	672	203	-162	-457	223	571
b) Independent Hydro (1937 12-Month Avg.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
c) Sustained Peaking Adjustment	709	-108	-337	-368	-1,644	-2,918	-1,170	186	-244	-191	2,842	0	-1,366	-541
d) Canadian Entitlement for Canada	0	0	0	0	0	0	0	0	0	-5	-5	-5	-5	-5
e) Imports <sup>5/</sup>	0	0	0	0	7	7	237	237	273	274	1	0	0	0
f) Contracts In	0	0	0	0	0	0	0	0	0	0	0	0	0	0
g) Renewable Resources	27	27	27	28	29	21	32	31	31	30	30	27	27	27
h) Hydro Reserves	-22	-7	-19	-21	-54	-68	-63	-55	-35	-12	7	21	-13	-30
i) Large Thermal Reserves	1	1	1	0	1	0	1	1	0	0	0	0	0	0
j) Spinning Reserves	-27	0	0	0	16	40	0	-29	-10	0	-65	11	38	0
m) Miscellaneous	-1	-1	-2	-1	-2	0	-1	-1	1	-2	-1	-1	-1	0
<b>Total Resource Changes</b>	1,106	27	26	27	-598	-1,580	269	1,437	688	297	2,647	-404	-1,097	22
<b>4. 1996 Final White Book Federal Firm Capacity Surplus/Deficit (Line 1 - Line 2 + Line 3)</b>	3,721	2,421	2,525	2,068	1,224	700	-1,236	-141	1,583	1,880	4,518	4,692	4,138	1,513

<sup>1</sup> The 1995 and 1996 White Book analyses both assume 1937 water conditions.

<sup>2</sup> Operating Year (OY) is the 12-month period August 1 through July 31. For example, OY 1997-98 is August 1, 1997, through July 31, 1998.

<sup>3</sup> DSI loads include contracts signed through December 31, 1996.

<sup>4</sup> Exports: power sales-capacity/energy exchange contracts with the cities of Burbank, Glendale, Pasadena, Modesto, Santa Clara, and Redding and with SCE are assumed to be in the power sales mode through the study horizon.

<sup>5</sup> Imports include: Option energy from SCE through OY 2002. Supplemental energy from the cities of Burbank, Glendale, and Pasadena and from SCE are considered to be BPA resource options and are not included in this study.

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## VI. REGIONAL ANALYSIS

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The regional loads and resources analysis is based on the following assumptions:

- ◆ Capacity surplus/deficit values do not reflect potential nighttime return problems on regional entities;
- ◆ The region experiences medium load growth;
- ◆ The Pacific Northwest Coordination Agreement, which expires June 30, 2003, is replaced with a like agreement;
- ◆ Federal surplus firm power sales and capacity/energy exchange agreements with the cities of Burbank, Glendale, and Pasadena and with SCE are shown in power sales mode throughout the study period;
- ◆ BPA purchases option energy from SCE through OY 2002;
- ◆ SCE purchases option capacity from BPA through OY 2002;
- ◆ BPA's surplus firm power sale to the M-S-R Public Power Agency (M-S-R), whose members include the Modesto Irrigation District and the cities of Santa Clara and Redding, California, remains a power sale through October 31, 2009, then converts to a capacity/energy exchange until it expires;
- ◆ Sustained capacity limits are 50 hours per week; and
- ◆ Extreme weather adjustments are assumed for capacity in the months of November through February. These adjustments vary monthly from 3,700 to 4,300 peak megawatts under the medium load forecast.

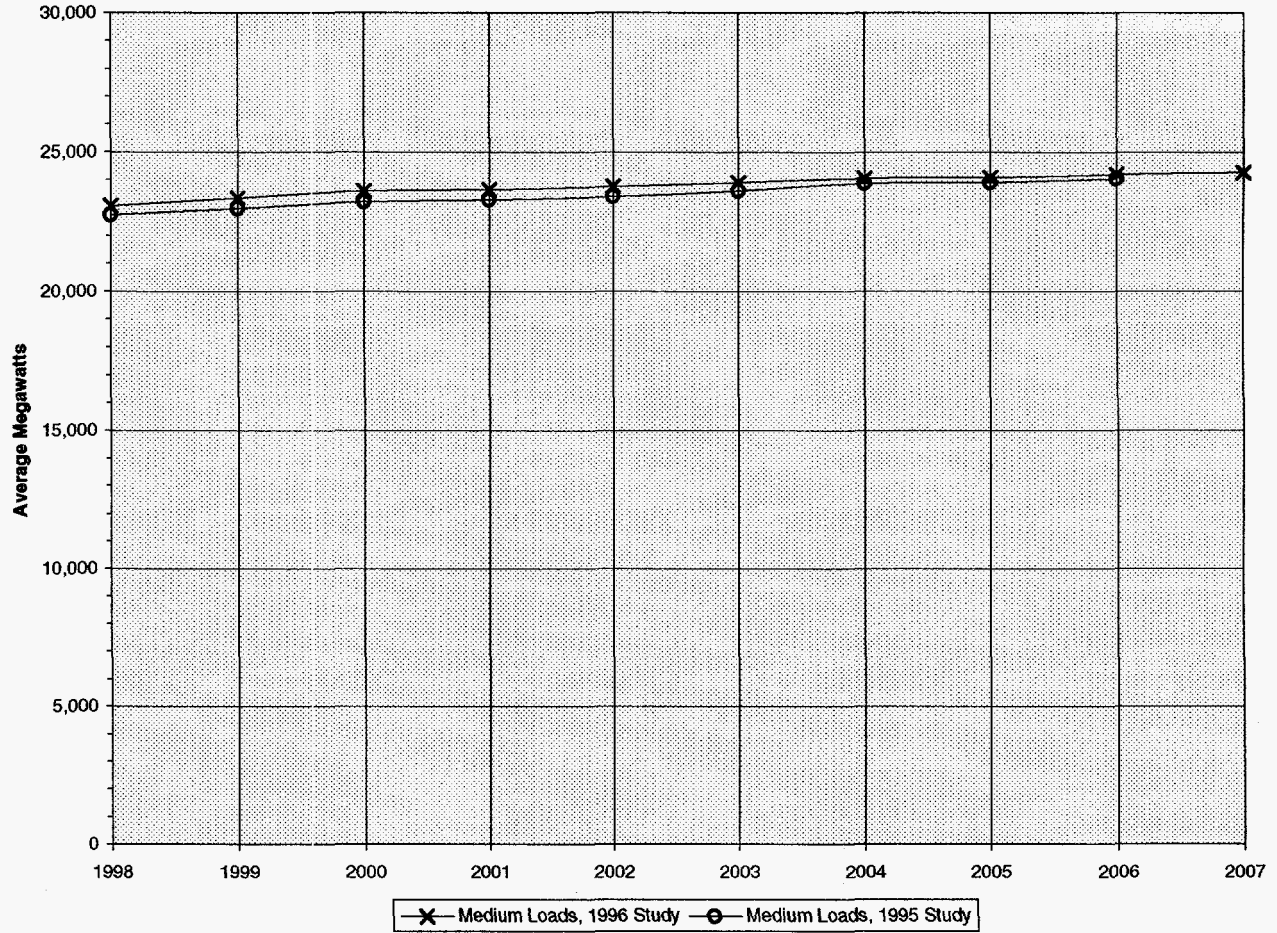
This analysis includes current operating requirements adopted by the hydroelectric project owners, and incorporates the 1995 NMFS Biological Opinion used for BPA's 1996 Final Rate Filing.

### **Regional Firm Energy Loads**

Regional firm energy loads for OY 1997-98 through 2006-07 based on BPA's 1996 medium load forecast are shown in Figure 8, page 37. The load projections also include all intra-regional contracts made by Pacific Northwest utilities and the Federal system. The regional firm energy load for the medium load forecast is presented on line 4 in Exhibit 19, page 85, and the monthly firm loads for OY 1997-98, 2001-02, and 2006-07 under the medium load forecast are presented in Exhibits 20 through 22, pages 89 through 95.

Figure 8

Regional Firm Annual Energy Loads  
1996 BPA Forecast



## Regional Firm Peak Loads

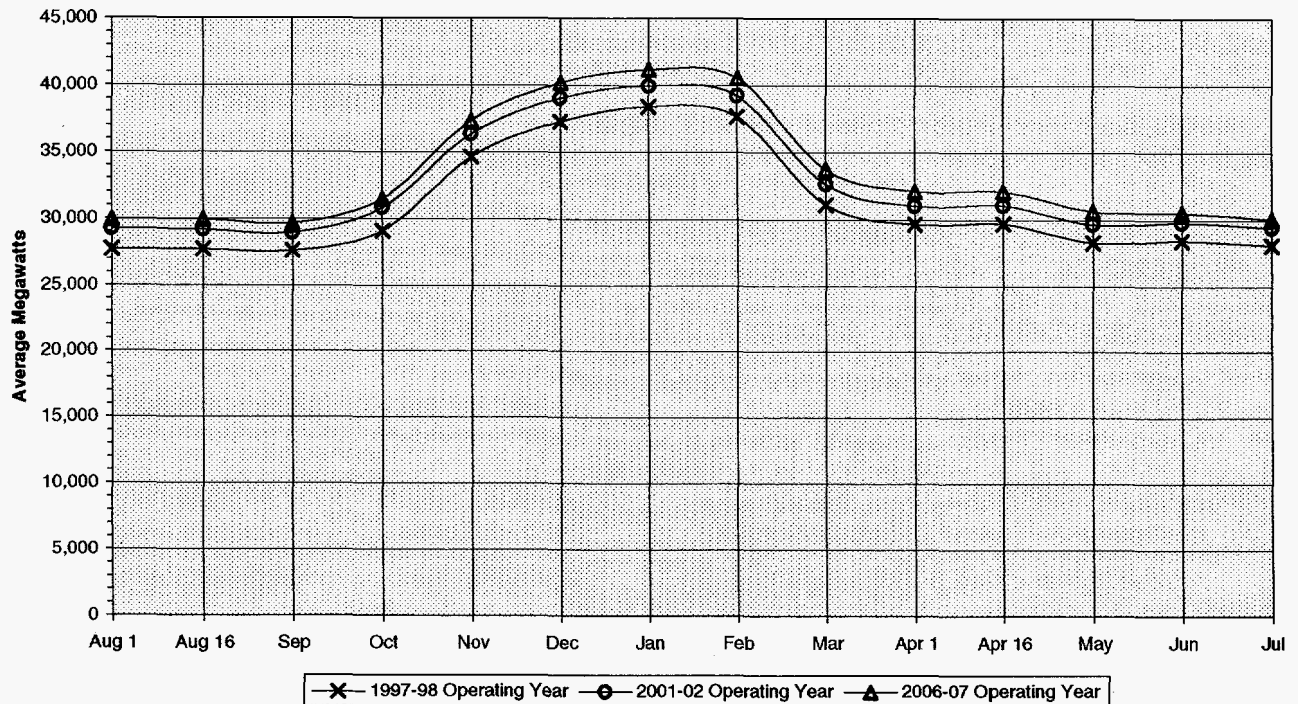
Figure 9, below, illustrates the regional firm peak loads under the medium load forecast for OY 1997-98, 2001-02, and 2006-07. The figures show the expected 1-hour monthly demand under the 1996 BPA load forecast and include extreme weather adjustments for capacity. Extreme weather conditions were assumed for the months of November through February and estimate a 5-percent probability that the forecasted peak load will be exceeded. In the months of March through October, the peak loads estimate normal weather conditions with a

50-percent probability that the forecasted peak load will be exceeded. The projected regional peak loads include all intra-regional contracts made by Pacific Northwest utilities, including the Federal system. The peak load projections are decreased by a diversity factor due to the fact that all peak electrical demands do not occur simultaneously throughout the region.

The monthly regional firm peak loads are presented on line 4 and the extreme weather adjustments to the regional peak loads are presented on line 34 of Exhibits 24 through 26, pages 99 through 105, for the medium load forecast.

**Figure 9**

**Regional Firm Peak Loads for OY 1997-98, 2001-02, and 2006-07  
Under Extreme Weather Conditions<sup>1</sup>  
Medium Loads**



<sup>1</sup> Extreme weather conditions in November, December, January, and February assume a 5-percent probability that the peak load will be exceeded.

## Regional Firm Resources

Table 11, below, summarizes the regional system resources for OY 1997-98. Hydro-electric resources make up a smaller percentage of the regional resources than of the Federal system resources because most of the thermal resources are owned by

investor-owned utilities in the region. These thermal resources are composed primarily of IOU-owned coal, gas, and oil-fired projects and WPPSS's WNP-2 nuclear plant. A detailed listing of all regional generating resources is contained in the 1996 Pacific Northwest Loads and Resources Technical Appendix (available March 1997).

**Table 11**

### **Regional Firm Resources for OY 1997-98<sup>1</sup> Based on 1936-37 Water Conditions**

Capacity based on January 1998

<b>PROJECT TYPE</b>	<b>Sustained Peak Capacity (MW)</b>	<b>Generating Peak Capacity % of Total</b>	<b>Firm Energy (aMW) 12-Month Average</b>	<b>Firm Energy % of Total</b>
Hydro	24,600	68	12,083	58
Coal	4,465	12	3,939	19
Nuclear	1,170	3	842	4
Imports	3,184	8	1,776	9
Combustion Turbines	1,670	4	721	3
Non-Utility Generation	1,145	3	1,025	5
Miscellaneous	585	2	445	2
<b>TOTAL RESOURCES</b>	<b>36,819</b>	<b>100</b>	<b>20,831</b>	<b>100</b>

<sup>1</sup>Operating Year (OY) is the 12-month period August 1 through July 31. For example, OY 1997-98 is August 1, 1997, through July 31, 1998.

## **Regional Firm Energy Surplus/ Deficit Projections**

This study includes all operating requirements currently adopted by the hydroelectric project owners and the firm planning assumptions from the 1995 NMFS Biological Opinion.

The regional firm energy surplus/deficit projections for the medium load forecast for OY 1997-98 through 2006-07 assuming 1936-37 water conditions are presented in

Table 12, below, and depicted graphically in Figure 10, page 41. The region experiences firm energy deficits in all study years under the medium load forecast.

The components of the regional energy loads and resources balances for the medium load scenario are presented on line 35 in Exhibit 19, page 85. Monthly regional firm energy loads under the medium load forecast for OY 1997-98, 2001-02, and 2006-07 are presented in Exhibits 20 through 22, on pages 89 through 95.

**Table 12**

### **Regional Firm Energy Surplus/Deficit Projections Assuming Existing Loads, Resources, and Contracts**

Energy In Average Megawatts

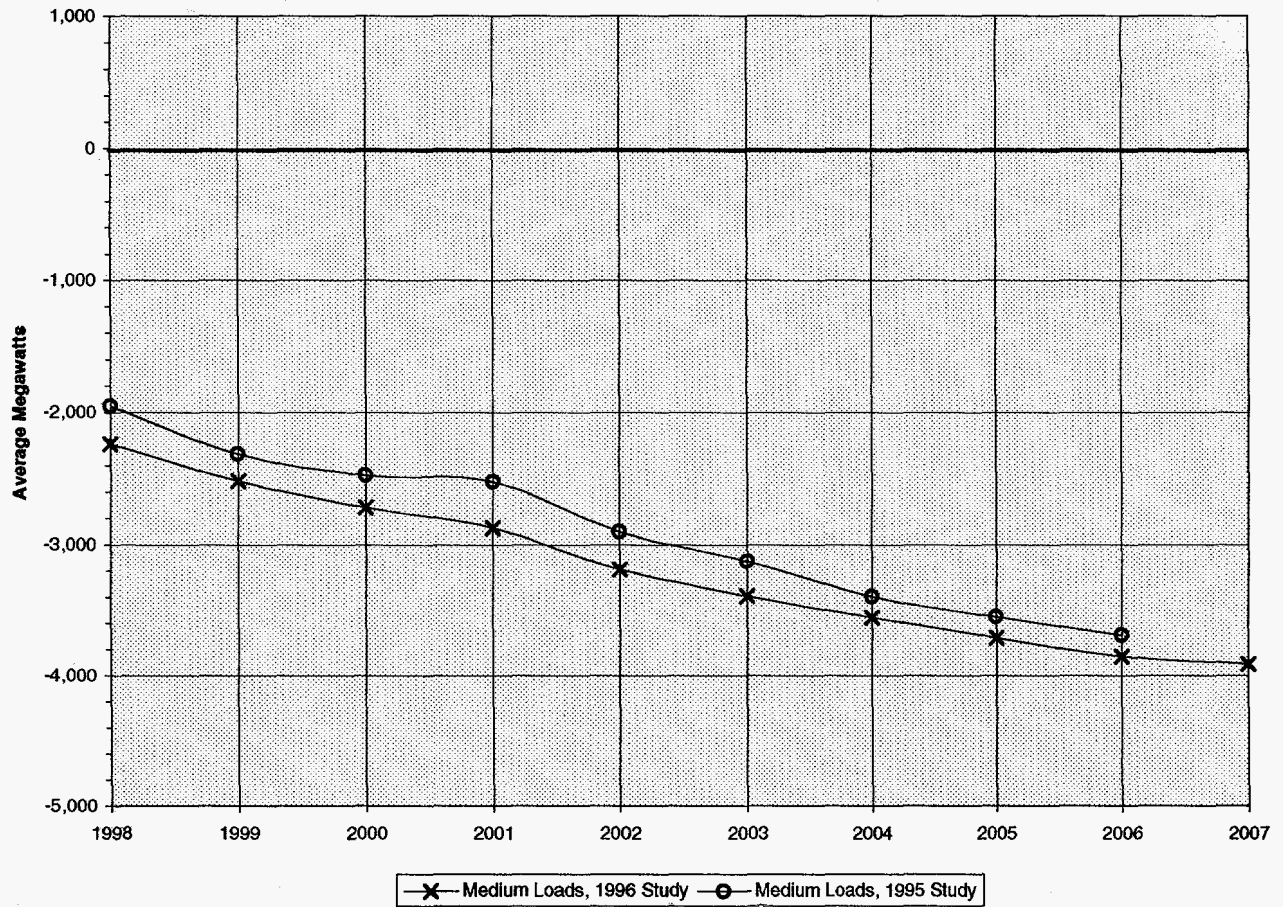
<b>Medium Load Scenario</b>	<b>OPERATING YEAR<sup>1</sup></b>									
	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
	-2,236	-2,518	-2,719	-2,876	-3,191	-3,393	-3,559	-3,712	-3,855	-3,912

<sup>1</sup>Operating Year (OY) is the 12-month period August 1 through July 31. For example, OY 1997-98 is August 1, 1997, through July 31, 1998.



Figure 10

Regional Firm Annual Energy Surplus/Deficit Projections



## **Regional Firm Capacity Surplus/Deficit Projections**

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Figure 11, page 42, shows the region's firm 50-hours-per-week capacity surplus/deficit projections under the medium load forecast for OY 1997-98, 2001-02, and 2006-07. This analysis incorporates all operating restrictions currently adopted by the hydroelectric project owners and the firm planning assumptions from the 1995 NMFS Biological Opinion.

The regional firm capacity surpluses/deficits incorporate the regional assumptions on page 36.

It is important to note that the capacity surplus values do not reflect potential nighttime return problems on the region's system. Peaking replacement energy from capacity sales is returned at night, when the output of the hydro system and other regional resources could be greater than the region's nighttime load. The following factors contribute to nighttime overgeneration:

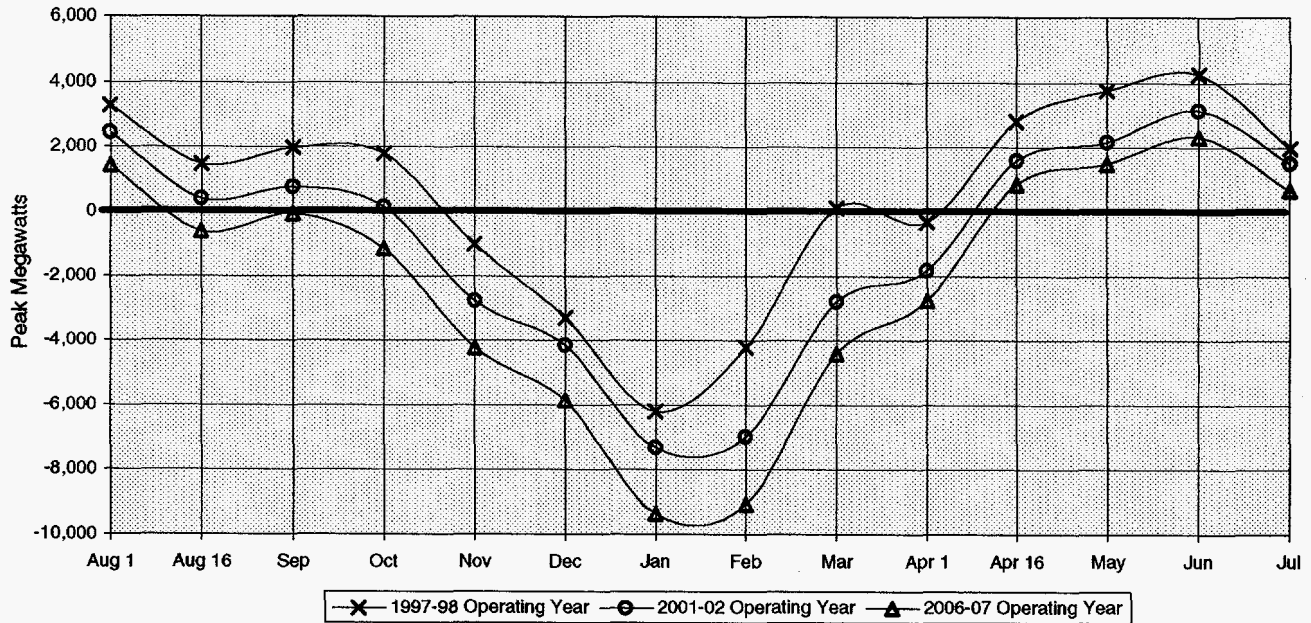
- ◆ Low regional system loads;
- ◆ Nonpower hydro requirements that dictate minimum streamflows; and
- ◆ The inability of the region's thermal resources to cycle from day to night.

These requirements restrict the ability to accept nighttime return energy, even though there is surplus generating capability during the daytime. These requirements are common in summer and fall, when the region's nighttime loads are low. Depending on water availability and economic conditions, return energy from these contracts could create low-priced forced energy sales and may reduce the region's ability to meet firm loads.

A 10-year summary of regional firm capacity surplus/deficit projections for the medium load forecast is shown in Exhibit 23, page 97. Monthly firm capacity surpluses/deficits under the medium forecast for OY 1997-98, 2001-02, and 2006-07 are presented in Exhibits 24 through 26 on pages 99 through 105.

Figure 11

### Regional Monthly Firm Capacity Surplus/Deficit Projections Under Extreme Weather Conditions<sup>1</sup>



<sup>1</sup>Extreme weather conditions in the months of November, December, January, and February assume a 5-percent probability that the peak load will be exceeded.

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**SECTION VII  
FEDERAL SYSTEM EXHIBITS**

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**EXHIBIT 1  
FEDERAL ANNUAL ENERGY ANALYSIS  
UNDER 1937 WATER CONDITIONS  
FOR 10 OPERATING YEARS**

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TABLE 2: FEDERAL SYSTEM

SUMMARY OF FEDERAL SYSTEM LOADS AND RESOURCES IN THE PACIFIC NORTHWEST REGION  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

		M E D I U M L O A D S									
		OPERATING YEAR									
		1996 FINAL WHITEBOOK: 12/31/96 RUN DATE: 12/31/96									
MEGAWATTS		1997-98	1998-99	1999- 0	2000- 1	2001- 2	2002- 3	2003- 4	2004- 5	2005- 6	2006- 7
		AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG
<b>LOADS</b>											
1	FEDERAL AGENCIES	146	147	148	149	150	151	152	152	154	154
2	FEDERAL & GEN PUBLIC LOSSES	168	169	169	171	172	173	174	175	175	176
3	USBR	67	68	68	68	68	68	68	68	68	68
4	DSI ALUMINUM FIRM	1568	1716	1779	1854	1867	1867	1867	1867	1867	1867
5	DSI NON-ALUM FIRM	308	305	305	305	305	305	305	305	305	305
6	DSI FIRM LOSSES	53	57	59	60	60	60	60	60	60	61
7	SM & NON GEN PUB PURCH 1/	2265	2269	2269	2257	2375	2401	2423	2439	2466	2488
8	FIRM SYSTEM LOAD	4576	4730	4797	4864	4997	5025	5048	5067	5095	5119
<b>TRANSFERS OUT</b>											
9	EXPORTS 2/	433	616	804	773	774	762	823	805	802	799
10	CONTRACTS OUT 3/	972	987	983	761	438	406	406	400	400	400
11	CSPE TO WEST GROUP UTIL 4/	236	178	102	98	94	61	0	0	0	0
12	GEN PUB AGEN PSC PURCH 5/	1448	1441	1418	1664	1700	1753	1786	1817	1904	1963
13	IOU PSC PURCHASE 6/	0	0	0	0	0	0	0	0	0	0
14	FED DIVERSITY 7/	0	0	0	0	0	0	0	0	0	0
15	FIRM LOADS	7664	7952	8103	8161	8003	8008	8064	8089	8201	8282
<b>NON-FIRM LOADS</b>											
16	DSI ALUM NON-FIRM 8/	0	0	0	0	0	0	0	0	0	0
17	DSI NON-ALUM NON-FIRM 8/	0	0	0	0	0	0	0	0	0	0
18	TOP QUARTILE LOSSES 8/	0	0	0	0	0	0	0	0	0	0
19	TOTAL LOADS	7664	7952	8103	8161	8003	8008	8064	8089	8201	8282
<b>HYDRO RESOURCES</b>											
20	REGULATED HYDRO	6628	6683	6725	6642	6642	6642	6642	6642	6642	6642
21	INDEPENDENT HYDRO	380	380	380	380	380	380	380	380	380	380
22	SUS. PKNG. ADJUSTMENT 9/	0	0	0	0	0	0	0	0	0	0
23	CAN. ENT. NON-FED(CSPE) 10/	50	38	23	22	21	14	0	0	0	0
24	CAN. ENT. NON-FED(CNDA) 11/	5	41	92	83	83	112	159	158	157	157
25	RESTORATION 12/	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26
26	TOTAL HYDRO	7037	7116	7194	7101	7100	7122	7155	7154	7153	7153



TABLE 2: FEDERAL SYSTEM (CONTINUED)

SUMMARY OF FEDERAL SYSTEM LOADS AND RESOURCES IN THE PACIFIC NORTHWEST REGION  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

MEGAWATTS	MEDIUM LOADS									
	OPERATING YEAR									
	1997-98 AVG	1998-99 AVG	1999- 0 AVG	2000- 1 AVG	2001- 2 AVG	2002- 3 AVG	2003- 4 AVG	2004- 5 AVG	2005- 6 AVG	2006- 7 AVG
OTHER RESOURCES										
27 SMALL THERMAL & MISC	0	0	0	0	0	0	0	0	0	0
28 COMBUSTION TURBINES	0	0	0	0	0	0	0	0	0	0
29 RENEWABLES 13/	29	29	29	29	29	29	29	29	29	29
30 COGENERATION	0	0	0	0	0	0	0	0	0	0
31 IMPORTS 14/	335	306	269	269	269	197	197	194	185	185
32 CONTRACTS IN 15/	293	235	224	221	245	245	245	245	245	245
33 LARGE THERMAL 16/	842	842	845	878	878	878	878	878	878	878
34 NON-UTILITY GENERATION 17/	14	15	15	15	15	15	15	15	15	15
35 RESOURCE ACQUISITIONS 18/	0	0	0	0	0	0	0	0	0	0
36 TOTAL RESOURCES	8550	8542	8576	8513	8536	8487	8519	8515	8505	8505
RESERVES & MAINTENANCE										
37 HYD, SM THRM & MISC RES 19/	0	0	0	0	0	0	0	0	0	0
38 LARGE THERMAL RESERVES 20/	0	0	0	0	0	0	0	0	0	0
39 SPINNING RESERVES 21/	0	0	0	0	0	0	0	0	0	0
40 FEDERAL HYDRO MAINT 22/	0	0	0	0	0	0	0	0	0	0
41 NET RESOURCES	8550	8542	8576	8513	8536	8487	8519	8515	8505	8505
SURPLUS/DEFICITS										
42 FIRM SURPLUS/DEFICIT	886	590	472	352	533	479	455	426	304	223
43 TOTAL SURPLUS/DEFICIT	886	590	472	352	533	479	455	426	304	223
44 EXTREME WEATHER ADJ. 23/	0	0	0	0	0	0	0	0	0	0
45 FIRM S/D W/EXT WEATHER ADJ.	886	590	472	352	533	479	455	426	304	223
46 TOTAL S/D W/EXT WTHR. ADJ.	886	590	472	352	533	479	455	426	304	223
47 POSS FED EXT WTHR. OBLG 24/	0	0	0	0	0	0	0	0	0	0
48 FIRM S/D W/EXT WTHR. OBLIG	886	590	472	352	533	479	455	426	304	223
49 TOTAL S/D W/EXT WTHR. OBLIG	886	590	472	352	533	479	455	426	304	223

- NOTE: 1. THE FOLLOWING CONTRACTS ARE SHOWN AS POWER SALES THROUGH THE STUDY HORIZON.  
 A. BPA TO BURBANK, PS & C/N/X                      D. BPA TO PASADENA, PS & C/N/X  
 B. BPA TO GLENDALE, PS & C/N/X                  E. BPA TO SCE, PS & C/N/X  
 C. BPA TO M-S-R, PS & C/N/X
2. BPA TO PSP&L, PS & SPX CONVERTS TO A SEASONAL POWER EXCHANGE OY 2002.  
 3. SCE TO BPA, OPTION ENERGY IS INCLUDED THROUGH OY 2002.  
 4. BPA TO SCE, OPTION CAPACITY IS INCLUDED THROUGH OY 2002.  
 5. BPA TO NEW NRG VENT, POWER SALE HAS N.E.V. OPTION TO PURCHASE UP TO AN ADDITIONAL 200 AMW WHICH CAN BE EXERCISED BEFORE DECEMBER 31, 1998.  
 6. THE FOLLOWING CONTRACTS ARE RESOURCE OPTIONS AND NOT INCLUDED THROUGH THE STUDY HORIZON.  
 A. BGP TO BPA, SUPPLEMENTAL ENERGY              B. SCE TO BPA, SUPPLEMENTAL ENERGY

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**EXHIBITS 2 - 4  
FEDERAL MONTHLY FIRM ENERGY  
SURPLUS/DEFICIT PROJECTIONS  
UNDER MEDIUM LOADS FOR 1937 WATER  
CONDITIONS**

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TABLE 2: FEDERAL SYSTEM

SUMMARY OF FEDERAL SYSTEM LOADS AND RESOURCES IN THE PACIFIC NORTHWEST REGION  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

		M E D I U M L O A D S												1996 FINAL WHITEBOOK: 12/31/96		
		1997-98 OPERATING YEAR												RUN DATE: 12/31/96		
1937 WATER YEAR		AUG	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	APR	MAY	JUN	JUL	12 MO
ENERGY IN AVERAGE MEGAWATTS		1-15	16-31								1-15	16-30				AVG
<b>LOADS</b>																
1	FEDERAL AGENCIES	144	144	137	140	149	165	159	159	152	140	140	135	133	143	146
2	FEDERAL & GEN PUBLIC LOSSES	136	136	140	170	199	224	215	196	167	154	154	140	136	139	168
3	USBR	161	161	109	42	2	2	2	2	4	50	50	117	151	168	67
4	DSI ALUMINUM FIRM	1342	1342	1488	1599	1599	1599	1599	1599	1599	1599	1599	1599	1599	1599	1568
5	DSI NON-ALUM FIRM	311	311	332	305	305	305	305	305	305	305	305	305	305	305	308
6	DSI FIRM LOSSES	43	43	47	51	55	59	59	59	55	53	53	51	52	49	53
7	SM & NON GEN PUB PURCH	1/ 2242	2240	2058	1979	2304	2505	2647	2477	2238	2182	2171	2113	2169	2277	2265
8	FIRM SYSTEM LOAD	4379	4377	4311	4286	4613	4859	4986	4797	4520	4483	4472	4460	4545	4680	4576
<b>TRANSFERS OUT</b>																
9	EXPORTS	2/ 369	369	371	289	257	224	426	413	414	460	497	631	673	646	433
10	CONTRACTS OUT	3/ 711	711	749	931	1237	1329	1271	1200	1049	866	866	750	764	805	972
11	CSPE TO WEST GROUP UTIL	4/ 246	246	246	246	246	246	246	246	246	216	216	216	216	216	236
12	GEN PUB AGEN PSC PURCH	5/ 1206	1229	1219	1287	1598	1657	1908	1799	1653	1447	1437	1278	1130	1187	1448
13	IOU PSC PURCHASE	6/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	FED DIVERSITY	7/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	FIRM LOADS	6911	6932	6896	7039	7951	8314	8837	8454	7882	7471	7487	7335	7328	7534	7664
<b>NON-FIRM LOADS</b>																
16	DSI ALUM NON-FIRM	8/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	DSI NON-ALUM NON-FIRM	8/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	TOP QUARTILE LOSSES	8/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	TOTAL LOADS	6911	6932	6896	7039	7951	8314	8837	8454	7882	7471	7487	7335	7328	7534	7664
<b>HYDRO RESOURCES</b>																
20	REGULATED HYDRO	6180	5655	5551	5533	6295	6539	5515	6496	6142	5472	8827	10737	8047	5619	6628
21	INDEPENDENT HYDRO	410	408	345	371	297	226	168	189	267	420	499	685	720	425	380
22	SUS. PKNG. ADJUSTMENT	9/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	CAN. ENT. NON-FED(CSPE)	10/ 52	52	52	52	52	52	52	52	52	45	45	45	45	45	50
24	CAN. ENT. NON-FED(CNDA)	11/ 0	0	0	0	0	0	0	0	0	15	15	15	15	15	5
25	RESTORATION	12/ -26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26
26	TOTAL HYDRO	6616	6089	5922	5930	6618	6791	5709	6711	6435	5926	9360	11456	8801	6078	7037

TABLE 2: FEDERAL SYSTEM (CONTINUED)

SHEET 2 OF 2

SUMMARY OF FEDERAL SYSTEM LOADS AND RESOURCES IN THE PACIFIC NORTHWEST REGION  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

1937 WATER YEAR ENERGY IN AVERAGE MEGAWATTS	M E D I U M L O A D S														12 MO AVG
	1997-98 OPERATING YEAR														
	AUG 1-15	AUG 16-31	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR 1-15	APR 16-30	MAY	JUN	JUL	
OTHER RESOURCES															
27 SMALL THERMAL & MISC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28 COMBUSTION TURBINES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 RENEWABLES	13/	27	27	27	28	29	31	32	31	31	30	30	27	27	29
30 COGENERATION		0	0	0	0	0	0	0	0	0	0	0	0	0	0
31 IMPORTS	14/	101	101	252	334	406	476	559	657	568	569	181	75	93	125
32 CONTRACTS IN	15/	98	98	349	349	349	349	349	349	349	349	349	176	349	98
33 LARGE THERMAL	16/	1010	1010	1010	1010	1010	1010	1010	1010	1010	1010	0	0	505	1010
34 NON-UTILITY GENERATION	17/	7	7	7	12	15	18	19	18	16	12	11	15	15	13
35 RESOURCE ACQUISITIONS	18/	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36 TOTAL RESOURCES	7859	7332	7568	7663	8427	8675	7678	8776	8410	7896	9931	11749	9791	7351	8550
RESERVES & MAINTENANCE															
37 HYD, SM THRM & MISC RES	19/	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38 LARGE THERMAL RESERVES	20/	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39 SPINNING RESERVES	21/	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40 FEDERAL HYDRO MAINT	22/	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 NET RESOURCES	7859	7332	7568	7663	8427	8675	7678	8776	8410	7896	9931	11749	9791	7351	8550
SURPLUS/DEFICITS															
42 FIRM SURPLUS/DEFICIT	948	400	672	625	476	361	-1159	322	528	425	2444	4414	2463	-183	886
43 TOTAL SURPLUS/DEFICIT	948	400	672	625	476	361	-1159	322	528	425	2444	4414	2463	-183	886
44 EXTREME WEATHER ADJ.	23/	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45 FIRM S/D W/EXT WEATHER ADJ.	948	400	672	625	476	361	-1159	322	528	425	2444	4414	2463	-183	886
46 TOTAL S/D W/EXT WTHR. ADJ.	948	400	672	625	476	361	-1159	322	528	425	2444	4414	2463	-183	886
47 POSS FED EXT WTHR. OBLG	24/	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48 FIRM S/D W/EXT WTHR. OBLIG	948	400	672	625	476	361	-1159	322	528	425	2444	4414	2463	-183	886
49 TOTAL S/D W/EXT WTHR. OBLIG	948	400	672	625	476	361	-1159	322	528	425	2444	4414	2463	-183	886

- NOTE: 1. THE FOLLOWING CONTRACTS ARE SHOWN AS POWER SALES THROUGH THE STUDY HORIZON.  
 A. BPA TO BURBANK, PS & C/N/X      D. BPA TO PASADENA, PS & C/N/X  
 B. BPA TO GLENDALE, PS & C/N/X      E. BPA TO SCE, PS & C/N/X  
 C. BPA TO M-S-R, PS & C/N/X
2. BPA TO PSP&L, PS & SPX CONVERTS TO A SEASONAL POWER EXCHANGE OY 2002.  
 3. SCE TO BPA, OPTION ENERGY IS INCLUDED THROUGH OY 2002.  
 4. BPA TO SCE, OPTION CAPACITY IS INCLUDED THROUGH OY 2002.  
 5. BPA TO NEW NRG VENT, POWER SALE HAS N.E.V. OPTION TO PURCHASE UP TO AN ADDITIONAL 200 AMW WHICH CAN BE EXERCISED BEFORE DECEMBER 31, 1998.  
 6. THE FOLLOWING CONTRACTS ARE RESOURCE OPTIONS AND NOT INCLUDED THROUGH THE STUDY HORIZON.  
 A. BGP TO BPA, SUPPLEMENTAL ENERGY      B. SCE TO BPA, SUPPLEMENTAL ENERGY

TABLE 2: FEDERAL SYSTEM

SUMMARY OF FEDERAL SYSTEM LOADS AND RESOURCES IN THE PACIFIC NORTHWEST REGION  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

## M E D I U M L O A D S

1996 FINAL WHITEBOOK: 12/31/96

2001- 2 OPERATING YEAR

RUN DATE: 12/31/96

1937 WATER YEAR		AUG	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	APR	MAY	JUN	JUL	12 MO
ENERGY IN AVERAGE MEGAWATTS		1-15	16-31								1-15	16-30				AVG
<b>LOADS</b>																
1	FEDERAL AGENCIES	148	148	140	144	152	169	163	164	156	143	143	138	136	146	150
2	FEDERAL & GEN PUBLIC LOSSES	139	139	141	175	206	231	221	198	172	159	159	143	139	142	172
3	USBR	162	162	109	41	2	2	2	2	4	50	50	117	152	169	68
4	DSI ALUMINUM FIRM	1867	1867	1867	1867	1867	1867	1867	1867	1867	1867	1867	1867	1867	1867	1867
5	DSI NON-ALUM FIRM	305	305	305	305	305	305	305	305	305	305	305	305	305	305	305
6	DSI FIRM LOSSES	54	54	54	58	63	67	67	67	63	61	61	59	59	54	60
7	SM & NON GEN PUB PURCH 1/	2200	2198	2020	2043	2364	2562	2698	2531	2291	2228	2219	2446	2501	2620	2375
8	FIRM SYSTEM LOAD	4875	4873	4636	4633	4959	5203	5323	5134	4858	4813	4804	5075	5159	5303	4997
<b>TRANSFERS OUT</b>																
9	EXPORTS 2/	809	809	814	782	751	717	720	707	707	704	741	825	875	855	774
10	CONTRACTS OUT 3/	282	282	310	153	799	854	827	784	449	452	452	100	118	134	438
11	CSPE TO WEST GROUP UTIL 4/	95	95	95	95	95	95	95	95	95	92	92	92	92	92	94
12	GEN PUB AGEN PSC PURCH 5/	1432	1445	1465	1608	1905	1991	2150	2076	1916	1768	1664	1449	1328	1353	1700
13	IOU PSC PURCHASE 6/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	FED DIVERSITY 7/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	FIRM LOADS	7493	7504	7320	7271	8509	8860	9115	8797	8025	7829	7753	7541	7571	7737	8003
<b>NON-FIRM LOADS</b>																
16	DSI ALUM NON-FIRM 8/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	DSI NON-ALUM NON-FIRM 8/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	TOP QUARTILE LOSSES 8/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	TOTAL LOADS	7493	7504	7320	7271	8509	8860	9115	8797	8025	7829	7753	7541	7571	7737	8003
<b>HYDRO RESOURCES</b>																
20	REGULATED HYDRO	6357	5411	5870	5545	6554	6945	4798	5067	5908	5737	9588	11000	8339	6128	6642
21	INDEPENDENT HYDRO	410	408	345	371	297	226	168	189	267	420	499	685	720	425	380
22	SUS. PKNG. ADJUSTMENT 9/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	CAN. ENT. NON-FED(CSPE) 10/	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
24	CAN. ENT. NON-FED(CNDA) 11/	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83
25	RESTORATION 12/	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26
26	TOTAL HYDRO	6845	5897	6293	5994	6929	7249	5044	5334	6253	6235	10165	11763	9137	6631	7100

TABLE 2: FEDERAL SYSTEM (CONTINUED)

SHEET 2 OF 2

SUMMARY OF FEDERAL SYSTEM LOADS AND RESOURCES IN THE PACIFIC NORTHWEST REGION  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

1937 WATER YEAR ENERGY IN AVERAGE MEGAWATTS	M E D I U M   L O A D S														12 MO AVG	
	2001- 2 OPERATING YEAR															
	AUG 1-15	AUG 16-31	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR 1-15	APR 16-30	MAY	JUN	JUL		
1996 FINAL WHITEBOOK: 12/31/96 RUN DATE: 12/31/96																
OTHER RESOURCES																
27 SMALL THERMAL & MISC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
28 COMBUSTION TURBINES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
29 RENEWABLES	13/	27	27	27	28	29	31	32	31	31	30	27	27	27	29	
30 COGENERATION		0	0	0	0	0	0	0	0	0	0	0	0	0	0	
31 IMPORTS	14/	110	110	164	206	279	348	465	563	474	475	169	75	93	125	269
32 CONTRACTS IN	15/	150	150	401	401	251	251	251	251	250	250	78	251	150	245	
33 LARGE THERMAL	16/	1054	1054	1054	1054	1054	1054	1054	1054	1054	1054	0	0	527	1054	878
34 NON-UTILITY GENERATION	17/	12	12	13	13	16	19	19	18	16	12	11	15	15	13	15
35 RESOURCE ACQUISITIONS	18/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36 TOTAL RESOURCES		8198	7250	7952	7696	8558	8952	6865	7251	8079	8056	10625	11958	10051	8000	8536
RESERVES & MAINTENANCE																
37 HYD, SM THRM & MISC RES	19/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38 LARGE THERMAL RESERVES	20/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39 SPINNING RESERVES	21/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40 FEDERAL HYDRO MAINT	22/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 NET RESOURCES		8198	7250	7952	7696	8558	8952	6865	7251	8079	8056	10625	11958	10051	8000	8536
SURPLUS/DEFICITS																
42 FIRM SURPLUS/DEFICIT		705	-254	632	425	49	92	-2250	-1546	54	227	2872	4417	2479	263	533
43 TOTAL SURPLUS/DEFICIT		705	-254	632	425	49	92	-2250	-1546	54	227	2872	4417	2479	263	533
44 EXTREME WEATHER ADJ.	23/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45 FIRM S/D W/EXT WEATHER ADJ.		705	-254	632	425	49	92	-2250	-1546	54	227	2872	4417	2479	263	533
46 TOTAL S/D W/EXT WTHR. ADJ.		705	-254	632	425	49	92	-2250	-1546	54	227	2872	4417	2479	263	533
47 POSS FED EXT WTHR. OBLG	24/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48 FIRM S/D W/EXT WTHR. OBLIG		705	-254	632	425	49	92	-2250	-1546	54	227	2872	4417	2479	263	533
49 TOTAL S/D W/EXT WTHR. OBLIG		705	-254	632	425	49	92	-2250	-1546	54	227	2872	4417	2479	263	533

- NOTE: 1. THE FOLLOWING CONTRACTS ARE SHOWN AS POWER SALES THROUGH THE STUDY HORIZON.
- |                                |                                |
|--------------------------------|--------------------------------|
| A. BPA TO BURBANK, PS & C/N/X  | D. BPA TO PASADENA, PS & C/N/X |
| B. BPA TO GLENDALE, PS & C/N/X | E. BPA TO SCE, PS & C/N/X      |
| C. BPA TO M-S-R, PS & C/N/X    |                                |
2. BPA TO PSP&L, PS & SPX CONVERTS TO A SEASONAL POWER EXCHANGE OY 2002.  
3. SCE TO BPA, OPTION ENERGY IS INCLUDED THROUGH OY 2002.  
4. BPA TO SCE, OPTION CAPACITY IS INCLUDED THROUGH OY 2002.  
5. BPA TO NEW NRG VENT, POWER SALE HAS N.E.V. OPTION TO PURCHASE UP TO AN ADDITIONAL 200 AMW WHICH CAN BE EXERCISED BEFORE DECEMBER 31, 1998.  
6. THE FOLLOWING CONTRACTS ARE RESOURCE OPTIONS AND NOT INCLUDED THROUGH THE STUDY HORIZON.
- |                                    |                                    |
|------------------------------------|------------------------------------|
| A. BGP TO BPA, SUPPLEMENTAL ENERGY | B. SCE TO BPA, SUPPLEMENTAL ENERGY |
|------------------------------------|------------------------------------|

TABLE 2: FEDERAL SYSTEM

SUMMARY OF FEDERAL SYSTEM LOADS AND RESOURCES IN THE PACIFIC NORTHWEST REGION  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

		M E D I U M   L O A D S														
		2006- 7 OPERATING YEAR												1996 FINAL WHITEBOOK: 12/31/96 RUN DATE: 12/31/96		
1937 WATER YEAR		AUG	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	APR	MAY	JUN	JUL	12 MO
ENERGY IN AVERAGE MEGAWATTS		1-15	16-31								1-15	16-30				AVG
<b>LOADS</b>																
1	FEDERAL AGENCIES	152	152	144	148	157	175	168	169	160	148	148	142	140	151	154
2	FEDERAL & GEN PUBLIC LOSSES	143	143	145	178	210	235	226	202	176	162	162	147	143	144	176
3	USBR	162	162	109	42	2	2	2	2	4	50	50	118	152	170	68
4	DSI ALUMINUM FIRM	1867	1867	1867	1867	1867	1867	1867	1867	1867	1867	1867	1867	1867	1867	1867
5	DSI NON-ALUM FIRM	305	305	305	305	305	305	305	305	305	305	305	305	305	305	305
6	DSI FIRM LOSSES	55	55	54	59	63	67	67	67	63	61	61	59	59	54	61
7	SM & NON GEN PUB PURCH 1/	2358	2356	2180	2153	2463	2645	2782	2627	2393	2339	2334	2563	2624	2737	2488
8	FIRM SYSTEM LOAD	5042	5040	4804	4752	5067	5296	5417	5239	4968	4932	4927	5201	5290	5428	5119
<b>TRANSFERS OUT</b>																
9	EXPORTS 2/	844	844	848	826	794	761	764	750	750	747	747	811	852	844	799
10	CONTRACTS OUT 3/	88	88	117	153	800	854	827	784	449	452	452	75	93	109	400
11	CSPE TO WEST GROUP UTIL 4/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	GEN PUB AGEN PSC PURCH 5/	1678	1697	1711	1866	2180	2270	2427	2357	2207	1982	1925	1715	1587	1599	1963
13	IOU PSC PURCHASE 6/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	FED DIVERSITY 7/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	FIRM LOADS	7652	7669	7480	7597	8840	9181	9435	9131	8374	8113	8051	7801	7822	7980	8282
<b>NON-FIRM LOADS</b>																
16	DSI ALUM NON-FIRM 8/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	DSI NON-ALUM NON-FIRM 8/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	TOP QUARTILE LOSSES 8/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	TOTAL LOADS	7652	7669	7480	7597	8840	9181	9435	9131	8374	8113	8051	7801	7822	7980	8282
<b>HYDRO RESOURCES</b>																
20	REGULATED HYDRO	6357	5411	5870	5545	6554	6945	4798	5067	5908	5737	9588	11000	8339	6128	6642
21	INDEPENDENT HYDRO	410	408	345	371	297	226	168	189	267	420	499	685	720	425	380
22	SUS. PKNG. ADJUSTMENT 9/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	CAN. ENT. NON-FED(CSPE) 10/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	CAN. ENT. NON-FED(CNDA) 11/	157	157	157	157	157	157	157	157	157	157	157	157	157	157	157
25	RESTORATION 12/	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26	-26
26	TOTAL HYDRO	6898	5950	6346	6047	6982	7302	5097	5387	6306	6288	10218	11816	9190	6684	7153



TABLE 2: FEDERAL SYSTEM (CONTINUED)

SHEET 2 OF 2

SUMMARY OF FEDERAL SYSTEM LOADS AND RESOURCES IN THE PACIFIC NORTHWEST REGION  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

1937 WATER YEAR ENERGY IN AVERAGE MEGAWATTS	MEDIUM LOADS														1996 FINAL WHITEBOOK: 12/31/96 RUN DATE: 12/31/96		
	2006- 7 OPERATING YEAR																
	AUG 1-15	AUG 16-31	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR 1-15	APR 16-30	MAY	JUN	JUL	12 MO AVG		
OTHER RESOURCES																	
27 SMALL THERMAL & MISC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28 COMBUSTION TURBINES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 RENEWABLES 13/	27	27	27	28	29	31	32	31	31	30	30	27	27	27	29	29	29
30 COGENERATION	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31 IMPORTS 14/	104	104	158	206	257	311	285	241	189	190	169	75	93	125	185	185	
32 CONTRACTS IN 15/	150	150	401	401	251	251	251	251	250	251	251	78	251	150	245	245	
33 LARGE THERMAL 16/	1054	1054	1054	1054	1054	1054	1054	1054	1054	1054	0	0	527	1054	878	878	
34 NON-UTILITY GENERATION 17/	12	12	13	13	16	19	19	18	16	12	11	15	15	13	15	15	
35 RESOURCE ACQUISITIONS 18/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
36 TOTAL RESOURCES	8245	7297	7999	7749	8589	8968	6738	6982	7847	7825	10679	12011	10104	8053	8505	8505	
RESERVES & MAINTENANCE																	
37 HYD, SM THRM & MISC RES 19/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38 LARGE THERMAL RESERVES 20/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39 SPINNING RESERVES 21/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40 FEDERAL HYDRO MAINT 22/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41 NET RESOURCES	8245	7297	7999	7749	8589	8968	6738	6982	7847	7825	10679	12011	10104	8053	8505	8505	8505
SURPLUS/DEFICITS																	
42 FIRM SURPLUS/DEFICIT	593	-372	519	152	-251	-213	-2697	-2148	-527	-288	2628	4210	2282	73	223	223	223
43 TOTAL SURPLUS/DEFICIT	593	-372	519	152	-251	-213	-2697	-2148	-527	-288	2628	4210	2282	73	223	223	223
44 EXTREME WEATHER ADJ. 23/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45 FIRM S/D W/EXT WEATHER ADJ.	593	-372	519	152	-251	-213	-2697	-2148	-527	-288	2628	4210	2282	73	223	223	223
46 TOTAL S/D W/EXT WTHR. ADJ.	593	-372	519	152	-251	-213	-2697	-2148	-527	-288	2628	4210	2282	73	223	223	223
47 POSS FED EXT WTHR. OBLG 24/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48 FIRM S/D W/EXT WTHR. OBLIG	593	-372	519	152	-251	-213	-2697	-2148	-527	-288	2628	4210	2282	73	223	223	223
49 TOTAL S/D W/EXT WTHR. OBLIG	593	-372	519	152	-251	-213	-2697	-2148	-527	-288	2628	4210	2282	73	223	223	223

- NOTE: 1. THE FOLLOWING CONTRACTS ARE SHOWN AS POWER SALES THROUGH THE STUDY HORIZON.
- |                                |                                |
|--------------------------------|--------------------------------|
| A. BPA TO BURBANK, PS & C/N/X  | D. BPA TO PASADENA, PS & C/N/X |
| B. BPA TO GLENDALE, PS & C/N/X | E. BPA TO SCE, PS & C/N/X      |
| C. BPA TO M-S-R, PS & C/N/X    |                                |
2. BPA TO PSP&L, PS & SPX CONVERTS TO A SEASONAL POWER EXCHANGE OY 2002.  
3. SCE TO BPA, OPTION ENERGY IS INCLUDED THROUGH OY 2002.  
4. BPA TO SCE, OPTION CAPACITY IS INCLUDED THROUGH OY 2002.  
5. BPA TO NEW NRG VENT, POWER SALE HAS N.E.V. OPTION TO PURCHASE UP TO AN ADDITIONAL 200 AMW WHICH CAN BE EXERCISED BEFORE DECEMBER 31, 1998.  
6. THE FOLLOWING CONTRACTS ARE RESOURCE OPTIONS AND NOT INCLUDED THROUGH THE STUDY HORIZON.
- |                                    |                                    |
|------------------------------------|------------------------------------|
| A. BGP TO BPA, SUPPLEMENTAL ENERGY | B. SCE TO BPA, SUPPLEMENTAL ENERGY |
|------------------------------------|------------------------------------|

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**EXHIBIT 5  
FEDERAL MONTHLY 50-HOUR CAPACITY  
SURPLUS/DEFICIT PROJECTIONS  
UNDER MEDIUM LOADS  
FOR 1937 WATER CONDITIONS**

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TABLE F-1: FEDERAL 50-HOUR SUSTAINED PEAKING

BASE CASE: EXISTING FEDERAL CONTRACTS

FEDERAL SYSTEM FIRM 50-HOUR CAPACITY SURPLUS/DEFICIT  
INCLUDING EXTREME WEATHER ADJUSTMENTS DURING NOVEMBER THROUGH FEBRUARY

## 10 YEAR MONTHLY SUMMARY

ASSUMING NO NIGHTTIME RETURN CONSTRAINTS,  
EXISTING FEDERAL CONTRACTS, AND NO NEW RESOURCE ACQUISITIONS

## M E D I U M   L O A D S

1996 FINAL WHITEBOOK: 12/31/96  
RUN DATE: 12/31/96

1937 WATER YEAR

	AUG 1-15	AUG 16-31	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR 1-15	APR 16-30	MAY	JUN	JUL
PEAK IN MEGAWATTS														
1997-98	3721	2421	2525	2068	1224	700	-1236	-141	1583	1880	4518	4692	4138	1513
1998-99	2426	2377	2373	1373	625	1177	-1549	-877	1092	1744	4192	4348	4526	1016
1999-00	3419	1720	1866	1086	529	552	-1926	-2015	637	1190	4021	4255	5030	1254
2000-01	3575	1921	2075	1251	884	978	-1697	-1854	764	1220	4243	4424	4059	2290
2001-02	3872	2218	2346	1981	1012	1107	-1563	-1722	1065	1380	4476	4632	4264	2687
2002-03	4196	2542	2663	2176	951	1031	-1655	-1978	932	877	4239	4416	4310	2769
2003-04	3997	2342	2460	1992	729	792	-2100	-2280	637	833	4194	4378	4302	2750
2004-05	3950	2295	2407	1932	656	706	-2183	-2372	422	871	4183	4406	4342	2794
2005-06	3929	2270	2383	1905	367	418	-2453	-2657	276	501	3958	4200	4204	2625
2006-07	3711	2052	2161	1678	287	347	-2525	-2741	59	576	3890	4135	4149	2568

- NOTE: 1. THE FOLLOWING CONTRACTS ARE SHOWN AS POWER SALES THROUGH THE STUDY HORIZON.  
A. BPA TO BURBANK, PS & C/N/X                      D. BPA TO PASADENA, PS & C/N/X  
B. BPA TO GLENDALE, PS & C/N/X                  E. BPA TO SCE, PS & C/N/X  
C. BPA TO M-S-R, PS & C/N/X
2. BPA TO PSP&L, PS & SPX CONVERTS TO A SEASONAL POWER EXCHANGE OY 2002.  
3. SCE TO BPA, OPTION ENERGY IS INCLUDED THROUGH OY 2002.  
4. BPA TO SCE, OPTION CAPACITY IS INCLUDED THROUGH OY 2002.  
5. BPA TO NEW NRG VENT, POWER SALE HAS N.E.V. OPTION TO PURCHASE UP TO AN ADDITIONAL 200 AMW WHICH CAN BE EXERCISED BEFORE DECEMBER 31, 1998.  
6. THE FOLLOWING CONTRACTS ARE RESOURCE OPTIONS AND NOT INCLUDED THROUGH THE STUDY HORIZON.  
A. BGP TO BPA, SUPPLEMENTAL ENERGY            B. SCE TO BPA, SUPPLEMENTAL ENERGY

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**EXHIBITS 6 - 8**  
**FEDERAL MONTHLY CAPACITY ANALYSIS**  
**UNDER MEDIUM LOADS FOR 1937 WATER**  
**CONDITIONS**

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TABLE 2: FEDERAL SYSTEM

SUMMARY OF FEDERAL SYSTEM LOADS AND RESOURCES IN THE PACIFIC NORTHWEST REGION  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

		M E D I U M   L O A D S													
		1997-98 OPERATING YEAR										1996 FINAL WHITEBOOK: 12/31/96			
1937 WATER YEAR												RUN DATE: 12/31/96			
PEAK IN MEGAWATTS		AUG	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	APR	MAY	JUN	JUL
		1-15	16-31								1-15	16-30			
<b>LOADS</b>															
1	FEDERAL AGENCIES	193	193	184	194	202	232	216	223	212	197	197	187	188	189
2	FEDERAL & GEN PUBLIC LOSSES	199	199	233	293	339	378	384	361	309	278	278	241	207	200
3	USBR	199	199	157	76	7	4	4	3	9	99	99	169	197	204
4	DSI ALUMINUM FIRM	1362	1362	1511	1623	1623	1623	1623	1623	1623	1623	1623	1623	1623	1623
5	DSI NON-ALUM FIRM	345	345	369	339	339	339	339	339	339	339	339	339	339	339
6	DSI FIRM LOSSES	50	50	56	63	69	72	77	75	71	67	67	64	59	57
7	SM & NON GEN PUB PURCH	1/ 3219	3219	3201	3290	3661	3907	4085	4185	3755	3638	3639	3446	3269	3238
8	FIRM SYSTEM LOAD	5567	5567	5711	5878	6240	6555	6728	6809	6318	6241	6242	6069	5882	5850
<b>TRANSFERS OUT</b>															
9	EXPORTS	2/ 1085	1085	1085	929	516	516	716	716	716	826	878	1120	1377	1377
10	CONTRACTS OUT	3/ 2369	2369	2418	2760	3135	3301	3246	3173	2897	2519	2519	2403	2413	2451
11	CSPE TO WEST GROUP UTIL	4/ 472	472	472	472	472	472	472	472	472	416	416	416	416	416
12	GEN PUB AGEN PSC PURCH	5/ 982	1143	1099	1423	1638	1761	1972	2081	2118	1780	1752	1287	1062	824
13	IOU PSC PURCHASE	6/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	FED DIVERSITY	7/ -966	-987	-989	-1012	-945	-704	-726	-735	-976	-883	-880	-958	-982	-951
15	FIRM LOADS	9509	9649	9795	10451	11057	11902	12408	12516	11545	10899	10927	10337	10168	9967
<b>NON-FIRM LOADS</b>															
16	DSI ALUM NON-FIRM	8/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	DSI NON-ALUM NON-FIRM	8/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	TOP QUARTILE LOSSES	8/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	TOTAL LOADS	9509	9649	9795	10451	11057	11902	12408	12516	11545	10899	10927	10337	10168	9967
<b>HYDRO RESOURCES</b>															
20	REGULATED HYDRO	19196	18908	19611	19738	20732	20849	20904	20945	20376	19388	18560	18178	19000	19179
21	INDEPENDENT HYDRO	709	721	703	718	693	651	615	741	801	819	818	847	849	726
22	SUS. PKNG. ADJUSTMENT	9/ -3379	-4808	-5323	-5394	-5246	-5782	-7728	-6167	-6504	-5814	-1169	-1200	-2866	-5678
23	CAN. ENT. NON-FED(CSPE)	10/ 110	110	110	110	110	110	110	110	110	96	96	96	96	96
24	CAN. ENT. NON-FED(CNDA)	11/ 0	0	0	0	0	0	0	0	0	33	33	33	33	33
25	RESTORATION	12/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	TOTAL HYDRO	16636	14931	15101	15172	16289	15828	13901	15629	14783	14522	18338	17954	17112	14356

TABLE 2: FEDERAL SYSTEM (CONTINUED)

SHEET 2 OF 2

SUMMARY OF FEDERAL SYSTEM LOADS AND RESOURCES IN THE PACIFIC NORTHWEST REGION  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

1937 WATER YEAR PEAK IN MEGAWATTS	MEDIUM LOADS													
	1997-98 OPERATING YEAR													
	AUG 1-15	AUG 16-31	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR 1-15	APR 16-30	MAY	JUN	JUL
1996 FINAL WHITEBOOK: 12/31/96 RUN DATE: 12/31/96														
<b>OTHER RESOURCES</b>														
27 SMALL THERMAL & MISC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28 COMBUSTION TURBINES	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 RENEWABLES	13/ 27	27	27	28	29	21	32	31	31	30	30	27	27	27
30 COGENERATION	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31 IMPORTS	14/ 88	88	213	330	390	444	567	523	531	534	165	75	93	109
32 CONTRACTS IN	15/ 69	69	69	69	69	69	69	69	69	69	69	69	69	69
33 LARGE THERMAL	16/ 1170	1170	1170	1170	1170	1170	1170	1170	1170	1170	0	0	0	1170
34 NON-UTILITY GENERATION	17/ 0	0	0	0	0	0	1	1	1	1	1	1	1	1
35 RESOURCE ACQUISITIONS	18/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0
36 TOTAL RESOURCES	17990	16285	16580	16769	17947	17532	15740	17423	16585	16326	18603	18126	17302	15732
<b>RESERVES &amp; MAINTENANCE</b>														
37 HYD, SM THRM & MISC RES	19/ -996	-983	-1017	-1024	-1073	-1076	-1077	-1086	-1060	-1012	-970	-953	-994	-997
38 LARGE THERMAL RESERVES	20/ -175	-175	-175	-175	-175	-175	-175	-175	-175	-175	0	0	0	-175
39 SPINNING RESERVES	21/ -325	-296	-297	-299	-324	-337	-302	-329	-307	-297	-383	-387	-366	-295
40 FEDERAL HYDRO MAINT	22/ -3263	-2761	-2770	-2752	-2705	-1866	-1408	-1883	-1915	-2061	-1805	-1756	-1635	-2785
41 NET RESOURCES	13230	12070	12321	12519	13667	14077	12778	13949	13128	12780	15445	15030	14306	11480
<b>SURPLUS/DEFICITS</b>														
42 FIRM SURPLUS/DEFICIT	3721	2421	2525	2068	2610	2175	371	1433	1583	1880	4518	4692	4138	1513
43 TOTAL SURPLUS/DEFICIT	3721	2421	2525	2068	2610	2175	371	1433	1583	1880	4518	4692	4138	1513
44 EXTREME WEATHER ADJ.	23/ 0	0	0	0	-4	-5	-4	-5	0	0	0	0	0	0
45 FIRM S/D W/EXT WEATHER ADJ.	3721	2421	2525	2068	2606	2170	367	1428	1583	1880	4518	4692	4138	1513
46 TOTAL S/D W/EXT WTHR. ADJ.	3721	2421	2525	2068	2606	2170	367	1428	1583	1880	4518	4692	4138	1513
47 POSS FED EXT WTHR. OBLG	24/ 0	0	0	0	-1382	-1471	-1602	-1569	0	0	0	0	0	0
48 FIRM S/D W/EXT WTHR. OBLIG	3721	2421	2525	2068	1224	700	-1236	-141	1583	1880	4518	4692	4138	1513
49 TOTAL S/D W/EXT WTHR. OBLIG	3721	2421	2525	2068	1224	700	-1236	-141	1583	1880	4518	4692	4138	1513

- NOTE: 1. THE FOLLOWING CONTRACTS ARE SHOWN AS POWER SALES THROUGH THE STUDY HORIZON.
- A. BPA TO BURBANK, PS & C/N/X
  - B. BPA TO GLENDALE, PS & C/N/X
  - C. BPA TO M-S-R, PS & C/N/X
  - D. BPA TO PASADENA, PS & C/N/X
  - E. BPA TO SCE, PS & C/N/X
2. BPA TO PSP&L, PS & SPX CONVERTS TO A SEASONAL POWER EXCHANGE OY 2002.
3. SCE TO BPA, OPTION ENERGY IS INCLUDED THROUGH OY 2002.
4. BPA TO SCE, OPTION CAPACITY IS INCLUDED THROUGH OY 2002.
5. BPA TO NEW NRG VENT, POWER SALE HAS N.E.V. OPTION TO PURCHASE UP TO AN ADDITIONAL 200 AMW WHICH CAN BE EXERCISED BEFORE DECEMBER 31, 1998.
6. THE FOLLOWING CONTRACTS ARE RESOURCE OPTIONS AND NOT INCLUDED THROUGH THE STUDY HORIZON.
- A. BGP TO BPA, SUPPLEMENTAL ENERGY
  - B. SCE TO BPA, SUPPLEMENTAL ENERGY

TABLE 2: FEDERAL SYSTEM

SUMMARY OF FEDERAL SYSTEM LOADS AND RESOURCES IN THE PACIFIC NORTHWEST REGION  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

		M E D I U M   L O A D S													
		2001- 2 OPERATING YEAR													
		1996 FINAL WHITEBOOK: 12/31/96 RUN DATE: 12/31/96													
1937 WATER YEAR PEAK IN MEGAWATTS		AUG 1-15	AUG 16-31	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR 1-15	APR 16-30	MAY	JUN	JUL
<b>LOADS</b>															
1	FEDERAL AGENCIES	198	198	188	199	207	238	222	229	218	202	202	192	193	194
2	FEDERAL & GEN PUBLIC LOSSES	193	193	219	288	337	376	380	348	304	273	273	233	200	194
3	USBR	200	200	157	76	7	4	4	3	9	100	100	170	198	205
4	DSI ALUMINUM FIRM	1895	1895	1895	1895	1895	1895	1895	1895	1895	1895	1895	1895	1895	1895
5	DSI NON-ALUM FIRM	339	339	339	339	339	339	339	339	339	339	339	339	339	339
6	DSI FIRM LOSSES	62	62	65	72	78	83	87	85	80	76	76	74	67	62
7	SM & NON GEN PUB PURCH	1/ 3220	3220	3211	3440	3794	4039	4212	4332	3902	3775	3776	3878	3687	3660
8	<b>FIRM SYSTEM LOAD</b>	<b>6107</b>	<b>6107</b>	<b>6074</b>	<b>6309</b>	<b>6657</b>	<b>6974</b>	<b>7139</b>	<b>7231</b>	<b>6747</b>	<b>6660</b>	<b>6661</b>	<b>6781</b>	<b>6579</b>	<b>6549</b>
<b>TRANSFERS OUT</b>															
9	EXPORTS	2/ 2012	2012	2012	1969	1547	1547	1547	1547	1547	1547	1598	1778	2063	2077
10	CONTRACTS OUT	3/ 1400	1400	1433	1265	2110	2164	2138	2094	1561	1554	1554	1202	1220	1236
11	CSPE TO WEST GROUP UTIL	4/ 186	186	186	186	186	186	186	186	186	166	166	166	166	166
12	GEN PUB AGEN PSC PURCH	5/ 1353	1433	1470	1908	2159	2255	2310	2404	2511	2280	2143	1515	1249	1023
13	IOU PSC PURCHASE	6/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	FED DIVERSITY	7/ -851	-862	-872	-874	-879	-648	-661	-672	-868	-825	-811	-862	-873	-842
15	<b>FIRM LOADS</b>	<b>10207</b>	<b>10276</b>	<b>10303</b>	<b>10763</b>	<b>11780</b>	<b>12478</b>	<b>12659</b>	<b>12791</b>	<b>11684</b>	<b>11381</b>	<b>11310</b>	<b>10580</b>	<b>10405</b>	<b>10210</b>
<b>NON-FIRM LOADS</b>															
16	DSI ALUM NON-FIRM	8/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	DSI NON-ALUM NON-FIRM	8/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	TOP QUARTILE LOSSES	8/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	<b>TOTAL LOADS</b>	<b>10207</b>	<b>10276</b>	<b>10303</b>	<b>10763</b>	<b>11780</b>	<b>12478</b>	<b>12659</b>	<b>12791</b>	<b>11684</b>	<b>11381</b>	<b>11310</b>	<b>10580</b>	<b>10405</b>	<b>10210</b>
<b>HYDRO RESOURCES</b>															
20	REGULATED HYDRO	19230	18859	19611	19730	20737	20915	20783	20796	20322	19496	18779	18291	19000	19264
21	INDEPENDENT HYDRO	709	721	703	718	693	651	615	741	801	819	818	847	849	726
22	SUS. PKNG. ADJUSTMENT	9/ -2976	-4762	-5323	-5387	-4601	-4719	-7613	-7224	-6846	-5917	-1100	-1200	-2573	-4693
23	CAN. ENT. NON-FED(CSPE)	10/ 42	42	42	42	42	42	42	42	42	37	37	37	37	37
24	CAN. ENT. NON-FED(CNDA)	11/ 238	238	238	238	238	238	238	238	238	238	238	238	238	238
25	RESTORATION	12/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	<b>TOTAL HYDRO</b>	<b>17243</b>	<b>15098</b>	<b>15271</b>	<b>15341</b>	<b>17109</b>	<b>17127</b>	<b>14065</b>	<b>14593</b>	<b>14557</b>	<b>14673</b>	<b>18772</b>	<b>18213</b>	<b>17551</b>	<b>15572</b>

EXHIBIT 7



TABLE 2: FEDERAL SYSTEM (CONTINUED)

SHEET 2 OF 2

SUMMARY OF FEDERAL SYSTEM LOADS AND RESOURCES IN THE PACIFIC NORTHWEST REGION  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

1937 WATER YEAR PEAK IN MEGAWATTS	MEDIUM LOADS													
	2001- 2 OPERATING YEAR										1996 FINAL WHITEBOOK: 12/31/96 RUN DATE: 12/31/96			
	AUG 1-15	AUG 16-31	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR 1-15	APR 16-30	MAY	JUN	JUL
OTHER RESOURCES														
27 SMALL THERMAL & MISC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28 COMBUSTION TURBINES	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 RENEWABLES	13/ 27	27	27	28	29	21	32	31	31	30	30	27	27	27
30 COGENERATION	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31 IMPORTS	14/ 110	110	139	153	213	267	471	427	435	438	165	75	93	109
32 CONTRACTS IN	15/ 300	300	300	300	0	0	0	0	0	0	0	0	0	300
33 LARGE THERMAL	16/ 1170	1170	1170	1170	1170	1170	1170	1170	1170	1170	0	0	0	1170
34 NON-UTILITY GENERATION	17/ 1	1	1	1	1	1	1	1	1	1	1	1	1	1
35 RESOURCE ACQUISITIONS	18/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0
36 TOTAL RESOURCES	18851	16706	16908	16993	18522	18586	15739	16222	16194	16312	18968	18316	17672	17179
RESERVES & MAINTENANCE														
37 HYD, SM THRM & MISC RES	19/ -998	-980	-1017	-1024	-1073	-1079	-1071	-1078	-1058	-1017	-981	-958	-994	-1001
38 LARGE THERMAL RESERVES	20/ -175	-175	-175	-175	-175	-175	-175	-175	-175	-175	0	0	0	-175
39 SPINNING RESERVES	21/ -336	-296	-297	-299	-342	-364	-302	-300	-297	-297	-397	-389	-373	-321
40 FEDERAL HYDRO MAINT	22/ -3263	-2761	-2770	-2752	-2705	-1866	-1408	-1883	-1915	-2061	-1805	-1756	-1635	-2785
41 NET RESOURCES	14079	12494	12649	12744	14226	15101	12783	12786	12749	12761	15786	15212	14669	12897
SURPLUS/DEFICITS														
42 FIRM SURPLUS/DEFICIT	3872	2218	2346	1981	2446	2623	124	-5	1065	1380	4476	4632	4264	2687
43 TOTAL SURPLUS/DEFICIT	3872	2218	2346	1981	2446	2623	124	-5	1065	1380	4476	4632	4264	2687
44 EXTREME WEATHER ADJ.	23/ 0	0	0	0	-4	-5	-5	-5	0	0	0	0	0	0
45 FIRM S/D W/EXT WEATHER ADJ.	3872	2218	2346	1981	2442	2618	119	-10	1065	1380	4476	4632	4264	2687
46 TOTAL S/D W/EXT WTHR. ADJ.	3872	2218	2346	1981	2442	2618	119	-10	1065	1380	4476	4632	4264	2687
47 POSS FED EXT WTHR. OBLG	24/ 0	0	0	0	-1430	-1511	-1682	-1712	0	0	0	0	0	0
48 FIRM S/D W/EXT WTHR. OBLIG	3872	2218	2346	1981	1012	1107	-1563	-1722	1065	1380	4476	4632	4264	2687
49 TOTAL S/D W/EXT WTHR. OBLIG	3872	2218	2346	1981	1012	1107	-1563	-1722	1065	1380	4476	4632	4264	2687

- NOTE: 1. THE FOLLOWING CONTRACTS ARE SHOWN AS POWER SALES THROUGH THE STUDY HORIZON.
- |                                |                                |
|--------------------------------|--------------------------------|
| A. BPA TO BURBANK, PS & C/N/X  | D. BPA TO PASADENA, PS & C/N/X |
| B. BPA TO GLENDALE, PS & C/N/X | E. BPA TO SCE, PS & C/N/X      |
| C. BPA TO M-S-R, PS & C/N/X    |                                |
2. BPA TO PSP&L, PS & SPX CONVERTS TO A SEASONAL POWER EXCHANGE OY 2002.  
3. SCE TO BPA, OPTION ENERGY IS INCLUDED THROUGH OY 2002.  
4. BPA TO SCE, OPTION CAPACITY IS INCLUDED THROUGH OY 2002.  
5. BPA TO NEW NRG VENT, POWER SALE HAS N.E.V. OPTION TO PURCHASE UP TO AN ADDITIONAL 200 AMW WHICH CAN BE EXERCISED BEFORE DECEMBER 31, 1998.  
6. THE FOLLOWING CONTRACTS ARE RESOURCE OPTIONS AND NOT INCLUDED THROUGH THE STUDY HORIZON.
- |                                    |                                    |
|------------------------------------|------------------------------------|
| A. BGP TO BPA, SUPPLEMENTAL ENERGY | B. SCE TO BPA, SUPPLEMENTAL ENERGY |
|------------------------------------|------------------------------------|

TABLE 2: FEDERAL SYSTEM

SUMMARY OF FEDERAL SYSTEM LOADS AND RESOURCES IN THE PACIFIC NORTHWEST REGION  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

		M E D I U M   L O A D S												1996 FINAL WHITEBOOK: 12/31/96			
		2006- 7 OPERATING YEAR												RUN DATE: 12/31/96			
1937 WATER YEAR	PEAK IN MEGAWATTS	AUG 1-15	AUG 16-31	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR 1-15	APR 16-30	MAY	JUN	JUL		
<b>LOADS</b>																	
1	FEDERAL AGENCIES	204	204	194	205	213	246	228	237	224	208	208	198	198	200		
2	FEDERAL & GEN PUBLIC LOSSES	195	195	222	293	341	381	386	353	309	277	277	239	203	197		
3	USBR	200	200	158	77	7	4	4	3	9	100	100	170	199	205		
4	DSI ALUMINUM FIRM	1895	1895	1895	1895	1896	1895	1895	1895	1895	1895	1895	1895	1895	1895		
5	DSI NON-ALUM FIRM	339	339	339	339	339	339	339	339	339	339	339	339	339	339		
6	DSI FIRM LOSSES	63	63	64	71	78	83	87	85	80	76	76	74	67	62		
7	SM & NON GEN PUB PURCH	1/ 3450	3450	3460	3620	3950	4171	4351	4493	4071	3955	3956	4065	3868	3831		
8	FIRM SYSTEM LOAD	6346	6346	6332	6500	6824	7119	7290	7405	6927	6850	6851	6980	6769	6729		
<b>TRANSFERS OUT</b>																	
9	EXPORTS	2/ 2154	2154	2154	2139	1994	1994	1994	1994	1994	1994	1994	2154	2154	2154		
10	CONTRACTS OUT	3/ 1116	1116	1145	1181	2026	2080	2054	2010	1477	1480	1480	1103	1121	1137		
11	CSPE TO WEST GROUP UTIL	4/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0		
12	GEN PUB AGEN PSC PURCH	5/ 1757	1842	1886	2313	2574	2662	2791	2911	3090	2599	2580	1900	1536	1339		
13	IOU PSC PURCHASE	6/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0		
14	FED DIVERSITY	7/ -874	-885	-898	-913	-910	-668	-687	-700	-917	-852	-850	-901	-900	-872		
15	FIRM LOADS	10500	10573	10619	11219	12507	13187	13442	13620	12571	12071	12055	11236	10679	10488		
<b>NON-FIRM LOADS</b>																	
16	DSI ALUM NON-FIRM	8/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0		
17	DSI NON-ALUM NON-FIRM	8/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0		
18	TOP QUARTILE LOSSES	8/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0		
19	TOTAL LOADS	10500	10573	10619	11219	12507	13187	13442	13620	12571	12071	12055	11236	10679	10488		
<b>HYDRO RESOURCES</b>																	
20	REGULATED HYDRO	19230	18859	19611	19730	20737	20915	20783	20796	20322	19496	18779	18291	19000	19264		
21	INDEPENDENT HYDRO	709	721	703	718	693	651	615	741	801	819	818	847	849	726		
22	SUS. PKNG. ADJUSTMENT	9/ -2976	-4762	-5323	-5387	-4601	-4719	-7613	-7224	-6846	-5917	-1100	-1200	-2573	-4693		
23	CAN. ENT. NON-FED(CSPE)	10/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0		
24	CAN. ENT. NON-FED(CNDA)	11/ 434	434	434	434	434	434	434	434	434	434	434	434	434	434		
25	RESTORATION	12/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0		
26	TOTAL HYDRO	17397	15252	15425	15495	17263	17281	14219	14747	14711	14832	18931	18372	17710	15731		

TABLE 2: FEDERAL SYSTEM (CONTINUED)

SUMMARY OF FEDERAL SYSTEM LOADS AND RESOURCES IN THE PACIFIC NORTHWEST REGION  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

1937 WATER YEAR PEAK IN MEGAWATTS	M E D I U M   L O A D S													
	2006- 7 OPERATING YEAR													
	AUG 1-15	AUG 16-31	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR 1-15	APR 16-30	MAY	JUN	JUL
1996 FINAL WHITEBOOK: 12/31/96 RUN DATE: 12/31/96														
OTHER RESOURCES														
27 SMALL THERMAL & MISC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28 COMBUSTION TURBINES	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 RENEWABLES	13/ 27	27	27	28	29	21	32	31	31	30	30	27	27	27
30 COGENERATION	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31 IMPORTS	14/ 88	88	117	153	206	260	234	190	162	165	165	75	93	109
32 CONTRACTS IN	15/ 300	300	300	300	0	0	0	0	0	0	0	0	0	300
33 LARGE THERMAL	16/ 1170	1170	1170	1170	1170	1170	1170	1170	1170	1170	0	0	0	1170
34 NON-UTILITY GENERATION	17/ 1	1	1	1	1	1	1	1	1	1	1	1	1	1
35 RESOURCE ACQUISITIONS	18/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0
36 TOTAL RESOURCES	18983	16838	17040	17147	18669	18733	15656	16139	16075	16198	19127	18475	17831	17338
RESERVES & MAINTENANCE														
37 HYD, SM THRM & MISC RES	19/ -998	-980	-1017	-1024	-1073	-1079	-1071	-1078	-1058	-1017	-981	-958	-994	-1001
38 LARGE THERMAL RESERVES	20/ -175	-175	-175	-175	-175	-175	-175	-175	-175	-175	0	0	0	-175
39 SPINNING RESERVES	21/ -336	-296	-297	-299	-342	-364	-302	-300	-297	-297	-397	-389	-373	-321
40 FEDERAL HYDRO MAINT	22/ -3263	-2761	-2770	-2752	-2705	-1866	-1408	-1883	-1915	-2061	-1805	-1756	-1635	-2785
41 NET RESOURCES	14211	12626	12781	12898	14373	15248	12700	12703	12630	12647	15945	15371	14828	13056
SURPLUS/DEFICITS														
42 FIRM SURPLUS/DEFICIT	3711	2052	2161	1678	1866	2062	-742	-917	59	576	3890	4135	4149	2568
43 TOTAL SURPLUS/DEFICIT	3711	2052	2161	1678	1866	2062	-742	-917	59	576	3890	4135	4149	2568
44 EXTREME WEATHER ADJ.	23/ 0	0	0	0	-4	-5	-5	-5	0	0	0	0	0	0
45 FIRM S/D W/EXT WEATHER ADJ.	3711	2052	2161	1678	1862	2057	-747	-922	59	576	3890	4135	4149	2568
46 TOTAL S/D W/EXT WTHR. ADJ.	3711	2052	2161	1678	1862	2057	-747	-922	59	576	3890	4135	4149	2568
47 POSS FED EXT WTHR. OBLG	24/ 0	0	0	0	-1575	-1710	-1779	-1818	0	0	0	0	0	0
48 FIRM S/D W/EXT WTHR. OBLIG	3711	2052	2161	1678	287	347	-2525	-2741	59	576	3890	4135	4149	2568
49 TOTAL S/D W/EXT WTHR. OBLIG	3711	2052	2161	1678	287	347	-2525	-2741	59	576	3890	4135	4149	2568
NOTE:	1. THE FOLLOWING CONTRACTS ARE SHOWN AS POWER SALES THROUGH THE STUDY HORIZON.													
	A. BPA TO BURBANK, PS & C/N/X			D. BPA TO PASADENA, PS & C/N/X										
	B. BPA TO GLENDALE, PS & C/N/X			E. BPA TO SCE, PS & C/N/X										
	C. BPA TO M-S-R, PS & C/N/X													
	2. BPA TO PSP&L, PS & SPX CONVERTS TO A SEASONAL POWER EXCHANGE OY 2002.													
	3. SCE TO BPA, OPTION ENERGY IS INCLUDED THROUGH OY 2002.													
	4. BPA TO SCE, OPTION CAPACITY IS INCLUDED THROUGH OY 2002.													
	5. BPA TO NEW NRG VENT, POWER SALE HAS N.E.V. OPTION TO PURCHASE UP TO AN ADDITIONAL 200 AMW WHICH CAN BE EXERCISED BEFORE DECEMBER 31, 1998.													
	6. THE FOLLOWING CONTRACTS ARE RESOURCE OPTIONS AND NOT INCLUDED THROUGH THE STUDY HORIZON.													
	A. BGP TO BPA, SUPPLEMENTAL ENERGY			B. SCE TO BPA, SUPPLEMENTAL ENERGY										

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## FEDERAL SYSTEM FOOTNOTES

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### For Exhibits 1 through 8

1. BPA's small and nongenerating public agencies' purchases are requirements these agencies place on BPA under their power sales contracts and BPA's partnership program. BPA's obligation is each agency's net firm load requirement not served by its own dedicated resources. These contracts actually expire June 30, 2001; however, they are assumed to remain in effect through the study period.
2. BPA's exports include: BPA to Anaheim, capacity sale and capacity/energy exchange; BPA to Azusa, seasonal exchange, exchange energy, energy sale and power sale; BPA to Banning, energy sale and power sale; BPA to BART, power sale; BPA to Burbank, power sale; BPA to Colton, energy sale and power sale; BPA to Glendale, power sale; BPA to Imperial, diversity exchange; BPA to M-S-R, power sale; BPA to New Energy Ventures, power sale; BPA to Palo Alto, capacity sale and seasonal energy; BPA to Pasadena, capacity/energy exchange and power sale; BPA to Riverside, capacity/energy exchange, capacity sale and diversity exchange; BPA to SDG&E power exchange and power sale; BPA to SMUD, power exchange; BPA to SCE, power sale, environmental storage, and option capacity; BPA to Vernon, seasonal exchange; BPA to BC Hydro for Canadian Entitlement beginning April 1, 1998; and BPA's Northwest-Southwest Intertie losses. This analysis assumes that BPA's power sales and capacity/energy exchange agreements with the cities of Burbank, Glendale, Pasadena, Modesto, Santa Clara and Redding and with SCE are in power sales mode throughout the study period.
3. BPA's contracts out include Canadian Entitlement capacity and supplemental capacity to Pacific Northwest public agencies and IOUs, which expire March 31, 2003; BPA to Big Bend Electric Cooperative, power sale; BPA to Central Electric Cooperative, power sale; BPA to Clark Public Utility, Packwood Lake and power sale; BPA to the city of Ashland, power sale; BPA to the city of Idaho Falls, power sale; BPA to the city of Monmouth, power sale; BPA to Columbia Basin Electric Cooperative, power sale; BPA to Columbia River PUD, power sale; BPA to Columbia Rural Electric Cooperative, power sale; BPA to Cowlitz County PUD, power sale; BPA to EWEB, power sale; BPA to Flathead Electric Cooperative, power sale; BPA to Harney Electric Cooperative, power sale; BPA to IPC, for Harney and Wells; BPA to Inland Power and Light, power sale; BPA to Kootnai Electric Cooperative, power sale; BPA to Lewis County PUD, Packwood Lake and power sale; BPA to Lower Valley, power sale; BPA to Mason County PUD #3, power sale; BPA to Midstate Electric Cooperative, power sale; BPA to the city of Milton-Freewater, power sale; BPA to Modern Electric Cooperative, power sale; BPA to MPC, capacity/energy exchange; BPA to Nespelem Valley Electric Cooperative, power sale; BPA to PP&L, capacity sale, power sale, Southern Idaho exchange and WNP-3 settlement; BPA to PGE, capacity sale, power sale and WNP-3 settlement; BPA to Port Angeles City Light, power sale; BPA to PSP&L, Baker head loss, power sale, power exchange and WNP-3 settlement; BPA to Ravalli County Electric Cooperative, power sale; BPA to Springfield Utility Board, power sale; BPA to Surprise Valley Electric Corporation, power sale; BPA to TPU,

power sale; BPA to Unity Light and Power Company, power sale; BPA to Umatilla Electric Cooperative, power sale; BPA to Vigilante Electric Cooperative, power sale; BPA to Wasco Electric Cooperative, power sale; BPA to West Oregon Cooperative, power sale; and BPA to WWP, capacity sale, deferred power exchange, three power sales and WNP-3 settlement.

4. Columbia Storage Power Exchange (CSPE) is the sale of the Canadian share of downstream benefits under the Columbia River Treaty with Canada to a group of Northwest utilities, expiring April 1, 2003.
5. BPA's generating public agencies' purchases are requirements which these agencies place on BPA under their power sales contracts and BPA's partnership program. BPA's obligation is each agency's net firm load requirement not served by its own dedicated resources. These contracts actually expire June 30, 2001; however, they are assumed to remain in effect through the study period.
6. Currently, there are no investor-owned utility power sales contract purchases through the 10-year study period.
7. Federal diversity is a percentage reduction applied to the Federal system non-coincidental peak utility requirements. This is due to the fact that all peaking electrical loads do not occur simultaneously throughout the region.
8. This study uses new DSI contracts which do not contain non-firm loads and are zero through the 10-year study period.
9. Sustained peaking adjustment is a percentage reduction applied to the Federal hydro system to meet a capacity load of 50 hours per week. This adjustment also includes reductions for Federal hydro maintenance, spinning reserves, forced outage reserves, and summer flow augmentation on the Lower Snake River and John Day hydro projects.
10. Canadian Entitlement Return non-Federal to the Columbia River Storage Exchange (CSPE) reflects the public agencies' and IOUs' obligation of Canadian Entitlement allocation to the Northwest entities of the CSPE, which expires March 31, 2003.
11. Canadian Entitlement Return non-Federal to Canada reflects the Federal system, public agencies', and IOUs' obligation of Canadian Entitlement allocation to Canada, which begins April 1, 1998.
12. Restoration adjusts for the losses and gains of the hydro system due to Canadian storage under the terms of the Pacific Northwest Coordination Agreement. It is an obligation to those utilities that gained generation from the addition of Canadian storage, and a resource gain to utilities that lost generation from Canadian storage.
13. Federal renewable resources includes James River Wauna.
14. BPA's imports include: Anaheim to BPA, exchange energy; Azusa to BPA, seasonal exchange and return energy; Banning to BPA, return energy; Burbank to BPA, exchange energy; Colton to BPA, return energy; Glendale to BPA, exchange energy; Imperial to BPA, exchange energy and seasonal exchange; Pasadena to BPA, two exchange energy contracts and a seasonal exchange; Riverside to BPA; two exchange energy contracts and a seasonal exchange; SMUD to BPA, deferred energy return; SDG&E to BPA, exchange energy and deferred energy return; Sierra to BPA, for Harney and Wells; SCE to BPA, exchange energy, supplemental energy, option energy, and environmental storage; Vernon to BPA, seasonal exchange; Basin Electric to BPA, power sale; BC Hydro to BPA, for PGE ICP; PP&L (Wyoming) to BPA, Southern

Idaho transfer; PowerEx to BPA, replacement energy; and Trans Alta to BPA, power sale. This analysis assumes that BPA's power sales and capacity/energy exchange agreements with the cities of Burbank, Glendale, Pasadena, Modesto, Santa Clara, and Redding and with SCE are in power sales mode, so exchange and supplemental energy with these utilities are zero through the study horizon.

15. Federal contracts include: MPC to BPA, exchange energy and power sale; Other Entities to BPA, power sale; PP&L to BPA, WNP-3 settlement; PGE to BPA, WNP-3 settlement; PSP&L to BPA, power sale, seasonal power exchange, and WNP-3 settlement; and WWP to BPA, deferred power exchange and WNP-3 settlement.
16. Federal large thermal includes the generation from WNP-2, operated by WPPSS.
17. Non-utility generation (NUG) resources include generation provided to BPA by Independent power producers and resources included under the Public Utility Regulatory Policies Act (PURPA).
18. Resource acquisitions are resources BPA has identified and contracted for future purchase. When new Federal resource acquisitions are contracted for and/or on-line, they will be included in the loads and resources balance.
19. Hydro, small thermal and miscellaneous resources, and combustion turbine reserve requirements are estimated at 5 percent of the Federal capacity of these resources.
20. Large thermal reserve requirements are estimated at 15 percent of the WNP-2 nuclear project.
21. Federal spinning reserve is the reserve generating capacity maintained to provide a regulating margin for the automatic generation and frequency control of power generation.
22. Hydro maintenance is the sum of all Federal hydro project maintenance based on the mean of the 1983-84 through 1988-89 schedules submitted to the Northwest Power Pool.
23. Extreme weather adjustment for BPA's directly served loads.
24. Possible Federal extreme weather adjustment is the possible load on BPA by public agencies customers having the right to place this obligation on BPA in the months of November through February.

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**EXHIBITS 9-18  
FEDERAL MONTHLY ENERGY SURPLUS/DEFICIT  
PROJECTIONS UNDER 50 HISTORICAL WATER  
CONDITIONS**

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## FEDERAL SYSTEM ENERGY ANALYSIS

FEDERAL SYSTEM ENERGY SURPLUS/DEFICIT  
FOR THE 50 HISTORICAL WATER YEARS ON RECORD

1996 FINAL WHITEBOOK: 12/31/96

RUN DATE: 12/31/96

ENERGY IN AVERAGE MEGAWATTS	2001- 2 OPERATING YEAR												1996 FINAL WHITEBOOK: 12/31/96			
	AUG 1-15	AUG 16-31	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR 1-15	APR 16-30	MAY	JUN	JUL	12 MO AVG	
1929 FEDERAL ENERGY S/D	1063	-113	888	767	-438	-171	-1263	-957	-424	2764	3460	2535	3078	28	636	
1930 FEDERAL ENERGY S/D	-1043	-899	427	591	207	386	-1565	-500	-436	1143	3932	4308	1246	48	523	
1931 FEDERAL ENERGY S/D	-1127	-759	116	743	233	293	-2014	-1785	-747	2566	2857	4632	1110	282	386	
1932 FEDERAL ENERGY S/D	-793	-377	494	458	-28	-1210	-2071	-1734	3239	9259	5964	6938	5893	3350	1863	
1933 FEDERAL ENERGY S/D	1411	1033	1010	733	168	865	3655	1888	3792	4374	2714	4624	9773	7043	3193	
1934 FEDERAL ENERGY S/D	3827	4222	2378	2238	2343	5155	9471	7066	7780	9949	7364	7394	1567	602	4890	
1935 FEDERAL ENERGY S/D	-529	-927	369	230	10	717	2543	2915	3008	4774	2753	3882	4413	3975	2091	
1936 FEDERAL ENERGY S/D	2476	-763	641	283	-164	77	-1944	-1787	1390	2648	8436	8258	4502	1585	1603	
1937 FEDERAL ENERGY S/D	705	-254	632	425	49	92	-2250	-1546	54	227	2872	4417	2479	263	533	
1938 FEDERAL ENERGY S/D	-1209	-816	411	519	-357	271	1252	1472	5655	5589	6190	7545	5860	3811	2610	
1939 FEDERAL ENERGY S/D	601	-39	705	446	-431	-236	-1850	528	3517	5288	4430	5288	2511	946	1380	
1940 FEDERAL ENERGY S/D	932	-526	434	671	42	-103	-1414	904	5456	4960	4554	3866	2289	789	1491	
1941 FEDERAL ENERGY S/D	-1282	-934	653	717	152	-63	-1683	448	1477	1182	3104	3853	4020	-348	855	
1942 FEDERAL ENERGY S/D	-1901	-986	512	733	-137	2053	2082	1768	1979	1303	2882	4024	5651	4125	1953	
1943 FEDERAL ENERGY S/D	3662	2152	945	682	-252	502	1772	3842	5807	10028	8080	7274	7308	4474	3693	
1944 FEDERAL ENERGY S/D	4420	1013	858	700	-397	-77	-1144	-1512	-178	2798	3359	3652	1800	-171	777	
1945 FEDERAL ENERGY S/D	-1117	-948	431	598	-165	-901	-1857	-903	-419	372	2073	4277	4252	2781	690	
1946 FEDERAL ENERGY S/D	-506	-268	579	559	-124	790	1036	2206	5844	7039	6845	8502	5856	3867	2973	
1947 FEDERAL ENERGY S/D	1812	-148	1486	1009	232	3145	5320	4748	5959	6225	4970	6784	5916	3135	3680	
1948 FEDERAL ENERGY S/D	1136	-113	1325	3882	1915	1040	5173	2967	5522	4635	5350	9690	12170	5756	4579	
1949 FEDERAL ENERGY S/D	4124	4301	2452	1396	-54	-37	-165	1696	7695	6963	8025	7245	5365	1669	3247	
1950 FEDERAL ENERGY S/D	-469	-1282	62	291	-857	379	2479	4117	7820	8154	5715	6019	10181	5546	3508	
1951 FEDERAL ENERGY S/D	3478	3667	1997	2311	2439	4145	6205	6665	7070	8898	6653	8458	5133	4903	5056	
1952 FEDERAL ENERGY S/D	4659	3026	2128	3195	676	1648	3335	3287	4339	8861	8229	9189	6502	3582	4189	
1953 FEDERAL ENERGY S/D	1143	80	622	459	-156	103	-459	4353	4239	3228	2883	5833	8402	4224	2607	
1954 FEDERAL ENERGY S/D	4737	2066	1244	1162	335	474	3482	5491	4999	6213	4771	7395	8657	6740	4073	
1955 FEDERAL ENERGY S/D	5479	4473	5230	2039	1237	425	1998	-740	424	3817	3844	4015	8262	7603	3275	
1956 FEDERAL ENERGY S/D	4169	3361	1600	2129	1548	4044	6941	4272	7637	8899	9160	9914	9858	4473	5434	
1957 FEDERAL ENERGY S/D	4835	2783	1400	1472	-68	1177	1671	935	5011	10809	3568	9801	8252	1886	3545	
1958 FEDERAL ENERGY S/D	583	-314	651	568	-430	-43	2389	2920	4853	6268	5092	8854	6799	1947	2860	
1959 FEDERAL ENERGY S/D	230	-75	836	1261	959	1831	6270	4934	5981	7461	4993	6637	8579	3801	3949	
1960 FEDERAL ENERGY S/D	4946	1372	4510	4970	2762	2282	3357	2091	5371	11656	4778	4908	5570	3836	4253	
1961 FEDERAL ENERGY S/D	1972	-683	793	805	437	-277	2849	5541	5721	8360	3238	6603	9331	3142	3449	
1962 FEDERAL ENERGY S/D	839	260	635	1017	-261	-115	1006	793	2011	9650	7412	5258	5243	3159	2319	
1963 FEDERAL ENERGY S/D	2119	54	869	1815	1238	1842	3120	3970	2392	3411	4126	4003	5808	4055	2831	
1964 FEDERAL ENERGY S/D	1599	545	1625	587	-85	-211	1360	1217	2186	8543	3563	4309	10030	4978	2760	
1965 FEDERAL ENERGY S/D	4890	3018	2227	2377	633	4086	7494	6677	6569	6546	7887	7953	8233	3298	5060	
1966 FEDERAL ENERGY S/D	3983	2175	1453	1793	738	334	3772	1638	2388	7751	4402	4469	3775	2941	2705	
1967 FEDERAL ENERGY S/D	936	-584	926	699	-289	640	4411	5530	5329	4669	2048	4587	9769	3941	3256	
1968 FEDERAL ENERGY S/D	4880	2763	1479	1351	480	410	2863	3824	5202	2702	4630	3499	4983	3382	2913	
1969 FEDERAL ENERGY S/D	3388	2152	3218	2508	1689	1383	6624	4851	6105	9817	7702	9210	7010	3767	4825	
1970 FEDERAL ENERGY S/D	919	-161	737	1325	-158	-94	1856	2600	3485	4278	2509	5053	7560	2334	2373	
1971 FEDERAL ENERGY S/D	9	-64	450	487	-396	1101	5180	7311	6973	9522	6315	9737	9546	5527	4484	
1972 FEDERAL ENERGY S/D	4581	4300	1942	1459	272	704	5523	7174	12515	9549	4028	9395	9780	7642	5636	
1973 FEDERAL ENERGY S/D	5005	5402	2038	1714	49	1145	1509	1480	1202	-96	4531	2604	1962	-306	1735	
1974 FEDERAL ENERGY S/D	-1230	-1058	219	524	-8	3287	9399	7732	8828	9382	8748	8565	11177	8051	5475	
1975 FEDERAL ENERGY S/D	4504	5021	2275	842	-428	388	1981	3353	6283	4857	4161	6092	8508	6875	3787	
1976 FEDERAL ENERGY S/D	2546	1681	1227	1764	1822	5147	6549	4670	6516	9854	6841	8992	5022	5575	4812	
1977 FEDERAL ENERGY S/D	5266	4757	6008	1886	-367	187	-1000	-1730	-329	3204	3541	2861	1482	-1038	1362	
1978 FEDERAL ENERGY S/D	-1090	-1072	-12	391	-330	-294	-101	1020	5654	7614	4647	5383	4623	3332	2060	

EXHIBIT 13













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**SECTION VIII**  
**PACIFIC NORTHWEST REGIONAL EXHIBITS**

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**EXHIBIT 19**  
**REGIONAL CRITICAL PERIOD ENERGY ANALYSIS**  
**FOR 10 OPERATING YEARS**

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TABLE 1: PACIFIC NORTHWEST REGIONAL AREA

SUMMARY OF PACIFIC NORTHWEST REGIONAL LOADS AND RESOURCES  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

		M E D I U M   L O A D S									
		O P E R A T I N G   Y E A R									
		1996 FINAL WHITEBOOK: 12/31/96 RUN DATE: 12/31/96									
MEGAWATTS		1997-98	1998-99	1999- 0	2000- 1	2001- 2	2002- 3	2003- 4	2004- 5	2005- 6	2006- 7
		AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG
<b>FIRM LOADS</b>											
1	SYSTEM FIRM LOADS	1/ 21468	21564	21672	21777	21892	22025	22168	22326	22511	22610
2	EXPORTS	3/ 1587	1771	1916	1868	1870	1855	1885	1756	1689	1644
3	FED DIVERSITY	4/ 0	0	0	0	0	0	0	0	0	0
4	FIRM LOADS	23055	23335	23587	23644	23762	23879	24053	24082	24200	24254
<b>NON-FIRM LOADS</b>											
5	REGIONAL NON-FIRM LOADS	2/ 0	0	0	0	0	0	0	0	0	0
6	TOTAL LOADS	23055	23335	23587	23644	23762	23879	24053	24082	24200	24254
<b>HYDRO RESOURCES</b>											
7	REGULATED HYDRO	5/ 10992	11040	11130	11000	10996	10996	10996	10996	10996	10996
8	INDEPENDENT HYDRO	6/ 1091	1090	1090	1089	1085	1084	1085	1084	1084	1084
9	SUS. PKNG. ADJUSTMENT	7/ 0	0	0	0	0	0	0	0	0	0
10	TOTAL HYDRO	12083	12131	12219	12089	12081	12080	12080	12080	12080	12080
<b>OTHER RESOURCES</b>											
11	SMALL THERMAL & MISC	8/ 85	85	85	84	80	80	80	80	80	80
12	COMBUSTION TURBINES	9/ 721	778	779	779	774	777	778	774	777	778
13	RENEHABLES	10/ 74	75	75	75	75	75	75	75	75	75
14	COGENERATION	11/ 287	287	287	287	287	287	287	266	251	251
15	IMPORTS	12/ 1776	1675	1641	1642	1562	1518	1484	1380	1374	1378
16	CENTRALIA	1273	1273	1273	1273	1231	1183	1253	1233	1268	1227
17	JIM BRIDGER	616	616	610	610	596	629	600	629	594	629
18	COLSTRIP 1 & 2	342	341	341	339	332	332	332	331	331	332
19	BOARDMAN	386	386	386	386	386	386	386	386	386	386
20	VALMY	195	194	195	195	195	195	194	195	195	195
21	COLSTRIP 3	504	503	503	502	496	496	497	496	496	496
22	WNP 2	842	842	845	878	878	878	878	878	878	878
23	COLSTRIP 4	623	623	623	623	623	623	623	623	623	623
24	FED RESOURCE ACQUIS	13/ 0	0	0	0	0	0	0	0	0	0
25	NON-UTILITY GENERATION	14/ 1025	1019	1019	1018	985	960	960	957	949	946
26	TOTAL RESOURCES	20831	20829	20881	20781	20583	20499	20507	20383	20357	20355

TABLE 1: PACIFIC NORTHWEST REGIONAL AREA

SHEET 2 OF 2

SUMMARY OF PACIFIC NORTHWEST REGIONAL LOADS AND RESOURCES  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

		M E D I U M   L O A D S									
		OPERATING YEAR									
		1996 FINAL WHITEBOOK: 12/31/96 RUN DATE: 12/31/96									
MEGAWATTS		1997-98	1998-99	1999- 0	2000- 1	2001- 2	2002- 3	2003- 4	2004- 5	2005- 6	2006- 7
		AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG
RESERVES & MAINTENANCE											
27	HYD,SM THRM & MISC RES 15/	0	0	0	0	0	0	0	0	0	0
28	LARGE THERMAL RESERVES 16/	0	0	0	0	0	0	0	0	0	0
29	BPA SPINNING RESERVES 17/	0	0	0	0	0	0	0	0	0	0
30	HYDRO MAINTENANCE 18/	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12
31	NET RESOURCES	20819	20817	20868	20769	20571	20486	20495	20371	20345	20342
SURPLUS/DEFICITS											
32	FIRM SURPLUS/DEFICIT	-2236	-2518	-2719	-2876	-3191	-3393	-3559	-3712	-3855	-3912
33	TOTAL SURPLUS/DEFICIT	-2236	-2518	-2719	-2876	-3191	-3393	-3559	-3712	-3855	-3912
34	EXTREME WEATHER ADJ. 19/	0	0	0	0	0	0	0	0	0	0
35	FIRM S/D W/EXT WEATHER ADJ.	-2236	-2518	-2719	-2876	-3191	-3393	-3559	-3712	-3855	-3912
36	TOTAL S/D W/EXT WTHR. ADJ.	-2236	-2518	-2719	-2876	-3191	-3393	-3559	-3712	-3855	-3912

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**EXHIBITS 20 - 22  
REGIONAL MONTHLY ENERGY ANALYSIS  
FOR MEDIUM LOADS  
USING 1937 WATER CONDITIONS**

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TABLE 1: PACIFIC NORTHWEST REGIONAL AREA

SUMMARY OF PACIFIC NORTHWEST REGIONAL LOADS AND RESOURCES  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

		M E D I U M   L O A D S														
		1997-98 OPERATING YEAR												1996 FINAL WHITEBOOK: 12/31/96 RUN DATE: 12/31/96		
1937 WATER YEAR ENERGY IN AVERAGE MEGAWATTS		AUG 1-15	AUG 16-31	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR 1-15	APR 16-30	MAY	JUN	JUL	12 MO AVG
<b>FIRM LOADS</b>																
1	SYSTEM FIRM LOADS	1/ 20132	20132	19801	20270	22264	23809	24477	23407	22054	20778	20778	20160	20136	20326	21468
2	EXPORTS	3/ 1847	1847	1804	1327	1272	1226	1404	1350	1375	1455	1479	1641	2149	2182	1587
3	FED DIVERSITY	4/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	FIRM LOADS	21979	21979	21605	21597	23536	25035	25881	24757	23429	22233	22257	21801	22285	22508	23055
<b>NON-FIRM LOADS</b>																
5	REGIONAL NON-FIRM LOADS	2/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	TOTAL LOADS	21979	21979	21605	21597	23536	25035	25881	24757	23429	22233	22257	21801	22285	22508	23055
<b>HYDRO RESOURCES</b>																
7	REGULATED HYDRO	5/ 10208	9076	8989	9170	10367	11474	9154	10964	9977	9354	13816	16475	14247	9861	10992
8	INDEPENDENT HYDRO	6/ 1059	1077	1009	996	925	980	801	815	962	1228	1282	1548	1576	1152	1091
9	SUS. PKNG. ADJUSTMENT	7/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	TOTAL HYDRO	11267	10153	9998	10166	11292	12454	9955	11779	10939	10582	15098	18023	15823	11013	12083
<b>OTHER RESOURCES</b>																
11	SMALL THERMAL & MISC	8/ 101	102	87	87	94	91	92	91	87	95	99	73	28	96	85
12	COMBUSTION TURBINES	9/ 586	586	586	586	865	866	867	868	833	833	833	540	395	822	721
13	RENEWABLES	10/ 76	76	76	77	78	80	82	81	81	80	80	33	77	77	74
14	COGENERATION	11/ 305	305	305	294	294	287	294	294	294	305	305	235	240	298	287
15	IMPORTS	12/ 1534	1534	1251	1492	2033	2114	2274	2419	2036	1730	1343	1382	1559	1678	1776
16	CENTRALIA	1300	1300	1300	1300	1300	1300	1300	1300	1300	819	1133	1300	1300	1300	1273
17	JIM BRIDGER	642	642	642	642	643	643	642	643	622	482	461	518	642	642	616
18	COLSTRIP 1 & 2	386	387	358	358	359	353	355	353	357	187	320	242	356	374	342
19	BOARDMAN	403	403	403	403	403	403	403	403	403	403	349	221	403	403	386
20	VALMY	211	211	211	211	211	211	211	211	169	116	101	161	211	211	195
21	COLSTRIP 3	548	549	527	527	528	524	526	524	527	539	327	314	527	540	504
22	WNP 2	1010	1010	1010	1010	1010	1010	1010	1010	1010	1010	0	0	505	1010	842
23	COLSTRIP 4	657	657	657	657	657	657	657	657	657	656	394	381	657	657	623
24	FED RESOURCE ACQUIS	13/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	NON-UTILITY GENERATION	14/ 1163	1163	1076	984	952	941	928	956	982	1111	1113	843	1152	1212	1025
26	TOTAL RESOURCES	20189	19078	18487	18794	20719	21934	19596	21589	20297	18947	21956	24266	23876	20332	20831

TABLE 1: PACIFIC NORTHWEST REGIONAL AREA

SUMMARY OF PACIFIC NORTHWEST REGIONAL LOADS AND RESOURCES  
 UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

		M E D I U M   L O A D S															
		1997-98 OPERATING YEAR												1996 FINAL WHITEBOOK: 12/31/96			
		1997-98 OPERATING YEAR												RUN DATE: 12/31/96			
1937 WATER YEAR	ENERGY IN AVERAGE MEGAWATTS	AUG 1-15	AUG 16-31	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR 1-15	APR 16-30	MAY	JUN	JUL	12 MO AVG	
RESERVES & MAINTENANCE		-----															
27	HYD, SM THRM & MISC RES 15/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
28	LARGE THERMAL RESERVES 16/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
29	BPA SPINNING RESERVES 17/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
30	HYDRO MAINTENANCE 18/	-31	-26	-9	-9	-4	0	0	0	-5	-7	-8	-20	-15	-50	-12	
31 NET RESOURCES		20158	19052	18479	18785	20715	21934	19596	21589	20292	18940	21948	24246	23861	20282	20819	
SURPLUS/DEFICITS		-----															
32	FIRM SURPLUS/DEFICIT	-1821	-2927	-3126	-2812	-2821	-3101	-6285	-3168	-3137	-3293	-309	2446	1576	-2226	-2236	
33	TOTAL SURPLUS/DEFICIT	-1821	-2927	-3126	-2812	-2821	-3101	-6285	-3168	-3137	-3293	-309	2446	1576	-2226	-2236	
34	EXTREME WEATHER ADJ. 19/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
35	FIRM S/D W/EXT WEATHER ADJ.	-1821	-2927	-3126	-2812	-2821	-3101	-6285	-3168	-3137	-3293	-309	2446	1576	-2226	-2236	
36	TOTAL S/D W/EXT WTHR. ADJ.	-1821	-2927	-3126	-2812	-2821	-3101	-6285	-3168	-3137	-3293	-309	2446	1576	-2226	-2236	

TABLE 1: PACIFIC NORTHWEST REGIONAL AREA

SHEET 1 OF 2

SUMMARY OF PACIFIC NORTHWEST REGIONAL LOADS AND RESOURCES  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

		M E D I U M   L O A D S														
		2001- 2 OPERATING YEAR										1996 FINAL WHITEBOOK: 12/31/96 RUN DATE: 12/31/96				
1937 WATER YEAR ENERGY IN AVERAGE MEGAWATTS		AUG 1-15	AUG 16-31	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR 1-15	APR 16-30	MAY	JUN	JUL	12 MO AVG
<b>FIRM LOADS</b>																
1	SYSTEM FIRM LOADS	1/ 20516	20516	20021	20711	22712	24266	24938	23868	22507	21216	21216	20599	20575	20775	21892
2	EXPORTS	3/ 2194	2194	2154	1787	1724	1677	1657	1602	1627	1657	1681	1792	2260	2295	1870
3	FED DIVERSITY	4/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	FIRM LOADS	22710	22710	22175	22498	24435	25943	26595	25470	24134	22873	22897	22391	22834	23069	23762
<b>NON-FIRM LOADS</b>																
5	REGIONAL NON-FIRM LOADS	2/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	TOTAL LOADS	22710	22710	22175	22498	24435	25943	26595	25470	24134	22873	22897	22391	22834	23069	23762
<b>HYDRO RESOURCES</b>																
7	REGULATED HYDRO	5/ 10205	8708	9490	9211	10836	11294	8615	9271	9878	9551	14874	16761	14564	10362	10996
8	INDEPENDENT HYDRO	6/ 1053	1071	1003	990	920	974	796	809	956	1221	1276	1541	1570	1147	1085
9	SUS. PKNG. ADJUSTMENT	7/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	TOTAL HYDRO	11258	9779	10493	10201	11756	12268	9411	10080	10834	10772	16150	18302	16134	11509	12081
<b>OTHER RESOURCES</b>																
11	SMALL THERMAL & MISC	8/ 96	96	81	82	89	86	86	85	81	88	93	67	28	91	80
12	COMBUSTION TURBINES	9/ 818	818	822	828	861	862	859	860	825	825	825	532	388	814	774
13	RENEWABLES	10/ 77	77	77	78	79	81	82	81	81	80	80	33	77	77	75
14	COGENERATION	11/ 305	305	305	294	294	287	294	294	294	305	305	235	240	298	287
15	IMPORTS	12/ 1427	1427	1046	1233	1571	1887	2085	2190	1685	1514	1208	1188	1486	1589	1562
16	CENTRALIA	1300	1300	1300	1300	1300	1300	1300	1300	824	651	1257	1300	1300	1300	1231
17	JIM BRIDGER	642	642	642	642	642	642	642	642	559	450	225	482	642	642	596
18	COLSTRIP 1 & 2	375	375	347	347	349	343	345	342	346	180	310	234	346	365	332
19	BOARDMAN	403	403	403	403	403	403	403	403	403	403	349	221	403	403	386
20	VALMY	202	202	202	202	202	202	202	202	150	128	202	202	202	211	195
21	COLSTRIP 3	540	541	519	520	521	517	518	516	519	529	322	309	519	533	496
22	HNP 2	1054	1054	1054	1054	1054	1054	1054	1054	1054	1054	0	0	527	1054	878
23	COLSTRIP 4	657	657	657	657	657	657	657	657	657	656	394	381	657	656	623
24	FED RESOURCE ACQUIS	13/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	NON-UTILITY GENERATION	14/ 1158	1158	1071	974	941	931	858	885	911	1041	1042	795	1105	1149	985
26	TOTAL RESOURCES	20312	18834	19018	18814	20718	21520	18796	19591	19223	18675	22762	24281	24054	20691	20583

EXHIBIT 21

TABLE 1: PACIFIC NORTHWEST REGIONAL AREA

SUMMARY OF PACIFIC NORTHWEST REGIONAL LOADS AND RESOURCES  
 UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

M E D I U M L O A D S

1996 FINAL WHITEBOOK: 12/31/96  
 RUN DATE: 12/31/96

1937 WATER YEAR  
 ENERGY IN AVERAGE MEGAWATTS

2001- 2 OPERATING YEAR

	AUG 1-15	AUG 16-31	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR 1-15	APR 16-30	MAY	JUN	JUL	12 MO AVG
RESERVES & MAINTENANCE															
27 HYD, SM THRM & MISC RES 15/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28 LARGE THERMAL RESERVES 16/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 BPA SPINNING RESERVES 17/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30 HYDRO MAINTENANCE 18/	-31	-26	-9	-9	-4	0	0	0	-5	-7	-8	-20	-15	-50	-12
31 NET RESOURCES	20281	18808	19009	18805	20714	21520	18796	19591	19218	18668	22754	24261	24039	20641	20571
SURPLUS/DEFICITS															
32 FIRM SURPLUS/DEFICIT	-2429	-3902	-3165	-3693	-3721	-4423	-7799	-5879	-4917	-4205	-143	1870	1205	-2429	-3191
33 TOTAL SURPLUS/DEFICIT	-2429	-3902	-3165	-3693	-3721	-4423	-7799	-5879	-4917	-4205	-143	1870	1205	-2429	-3191
34 EXTREME WEATHER ADJ. 19/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35 FIRM S/D W/EXT WEATHER ADJ.	-2429	-3902	-3165	-3693	-3721	-4423	-7799	-5879	-4917	-4205	-143	1870	1205	-2429	-3191
36 TOTAL S/D W/EXT WTHR. ADJ.	-2429	-3902	-3165	-3693	-3721	-4423	-7799	-5879	-4917	-4205	-143	1870	1205	-2429	-3191

TABLE 1: PACIFIC NORTHWEST REGIONAL AREA

SHEET 1 OF 2

SUMMARY OF PACIFIC NORTHWEST REGIONAL LOADS AND RESOURCES  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

		M E D I U M   L O A D S															
		2006- 7 OPERATING YEAR												1996 FINAL WHITEBOOK: 12/31/96 RUN DATE: 12/31/96			
1937 WATER YEAR ENERGY IN AVERAGE MEGAWATTS		AUG 1-15	AUG 16-31	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR 1-15	APR 16-30	MAY	JUN	JUL	12 MO AVG	
<b>FIRM LOADS</b>																	
1	SYSTEM FIRM LOADS	1/	21173	21173	20678	21371	23383	24947	25727	24655	23273	21949	21949	21332	21311	21523	22610
2	EXPORTS	3/	2017	2017	1949	1560	1507	1471	1451	1399	1433	1469	1456	1520	1970	1992	1644
3	FED DIVERSITY	4/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	FIRM LOADS		23190	23190	22627	22931	24890	26418	27178	26054	24706	23418	23405	22852	23281	23515	24254
<b>NON-FIRM LOADS</b>																	
5	REGIONAL NON-FIRM LOADS	2/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	TOTAL LOADS		23190	23190	22627	22931	24890	26418	27178	26054	24706	23418	23405	22852	23281	23515	24254
<b>HYDRO RESOURCES</b>																	
7	REGULATED HYDRO	5/	10199	8702	9490	9211	10836	11301	8623	9276	9878	9552	14874	16761	14565	10349	10996
8	INDEPENDENT HYDRO	6/	1040	1058	1002	990	919	981	803	817	955	1220	1276	1541	1570	1137	1084
9	SUS. PKNG. ADJUSTMENT	7/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	TOTAL HYDRO		11239	9760	10492	10201	11755	12282	9426	10093	10833	10772	16150	18302	16135	11486	12080
<b>OTHER RESOURCES</b>																	
11	SMALL THERMAL & MISC	8/	84	85	81	81	88	92	93	92	81	88	93	67	28	81	80
12	COMBUSTION TURBINES	9/	821	821	825	831	864	865	863	864	828	828	828	536	391	817	778
13	RENEWABLES	10/	77	77	77	78	79	81	82	81	81	80	80	33	77	77	75
14	COGENERATION	11/	269	269	269	258	258	251	258	258	258	269	269	200	204	262	251
15	IMPORTS	12/	1351	1351	982	1088	1564	1625	1678	1681	1339	1152	1131	1196	1388	1503	1378
16	CENTRALIA		1300	1300	1300	1300	1300	1300	1300	1214	649	1027	1300	1300	1300	1300	1227
17	JIM BRIDGER		642	642	642	642	642	642	642	642	565	482	642	642	642	642	629
18	COLSTRIP 1 & 2		352	353	346	346	348	355	358	356	346	180	310	235	346	346	332
19	BOARDMAN		403	403	403	403	403	403	403	403	403	403	349	221	403	403	386
20	VALMY		202	202	202	202	202	202	202	202	150	128	203	202	202	211	195
21	COLSTRIP 3		524	524	518	519	520	526	528	526	519	529	322	309	519	518	496
22	HNP 2		1054	1054	1054	1054	1054	1054	1054	1054	1054	1054	0	0	527	1054	878
23	COLSTRIP 4		657	657	657	657	657	657	657	657	657	657	394	381	657	657	623
24	FED RESOURCE ACQUIS	13/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	NON-UTILITY GENERATION	14/	1082	1082	1002	905	871	861	847	874	893	1024	1025	779	1088	1130	946
26	TOTAL RESOURCES		20057	18580	18849	18565	20604	21196	18390	18997	18656	18673	23096	24402	23907	20487	20355

TABLE 1: PACIFIC NORTHWEST REGIONAL AREA

SHEET 2 OF 2

SUMMARY OF PACIFIC NORTHWEST REGIONAL LOADS AND RESOURCES  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

		M E D I U M   L O A D S															
		2006- 7 OPERATING YEAR												1996 FINAL WHITEBOOK: 12/31/96 RUN DATE: 12/31/96			
1937 WATER YEAR		AUG	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	APR	MAY	JUN	JUL	12 MO	
ENERGY IN AVERAGE MEGAWATTS		1-15	16-31								1-15	16-30				AVG	
RESERVES & MAINTENANCE																	
27	HYD, SM THRM & MISC RES	15/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	LARGE THERMAL RESERVES	16/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	BPA SPINNING RESERVES	17/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	HYDRO MAINTENANCE	18/	-31	-25	-9	-9	-4	0	0	0	-5	-7	-8	-20	-15	-50	-12
31 NET RESOURCES			20026	18554	18841	18556	20601	21196	18390	18997	18651	18665	23089	24382	23893	20437	20342
SURPLUS/DEFICITS																	
32	FIRM SURPLUS/DEFICIT		-3164	-4636	-3786	-4376	-4290	-5221	-8788	-7057	-6055	-4752	-316	1530	612	-3078	-3912
33	TOTAL SURPLUS/DEFICIT		-3164	-4636	-3786	-4376	-4290	-5221	-8788	-7057	-6055	-4752	-316	1530	612	-3078	-3912
34	EXTREME WEATHER ADJ.	19/	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	FIRM S/D W/EXT WEATHER ADJ.		-3164	-4636	-3786	-4376	-4290	-5221	-8788	-7057	-6055	-4752	-316	1530	612	-3078	-3912
36	TOTAL S/D W/EXT WTHR. ADJ.		-3164	-4636	-3786	-4376	-4290	-5221	-8788	-7057	-6055	-4752	-316	1530	612	-3078	-3912

EXHIBIT 22 (continued)

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**EXHIBIT 23**  
**REGIONAL MONTHLY 50-HOUR CAPACITY**  
**SURPLUS/DEFICIT PROJECTIONS UNDER MEDIUM**  
**LOADS USING 1937 WATER CONDITIONS**

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TABLE R-1: REGIONAL 50-HOUR SUSTAINED PEAKING  
 BASE CASE: EXISTING REGIONAL CONTRACTS

REGIONAL FIRM 50-HOUR CAPACITY SURPLUS/DEFICIT  
 INCLUDING EXTREME WEATHER ADJUSTMENTS DURING NOVEMBER THROUGH FEBRUARY  
 10 YEAR MONTHLY SUMMARY

ASSUMING NO NIGHTTIME RETURN CONSTRAINTS,  
 EXISTING REGIONAL CONTRACTS, AND NO NEW RESOURCE ACQUISITIONS

M E D I U M L O A D S

1996 FINAL WHITEBOOK: 12/31/96  
 RUN DATE: 12/31/96

1937 WATER YEAR

AUG 1-15	AUG 16-31	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR 1-15	APR 16-30	MAY	JUN	JUL
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PEAK IN MEGAWATTS

1997-98	3283	1475	1974	1792	-1023	-3311	-6206	-4220	111	-318	2793	3755	4252	1986
1998-99	1991	1870	1428	553	-2180	-3035	-6213	-4959	-771	-809	2237	2937	4214	944
1999-00	2741	839	1284	321	-2516	-4060	-6951	-6505	-1768	-1388	1790	2410	4573	973
2000-01	2543	482	916	293	-2433	-4021	-7115	-6803	-1691	-1555	2067	2621	3306	1785
2001-02	2451	390	746	141	-2781	-4153	-7315	-6972	-2796	-1835	1587	2165	3140	1502
2002-03	2442	382	1007	135	-2550	-4443	-7588	-7808	-3159	-2876	1156	1935	2764	1161
2003-04	1806	-254	185	-514	-3217	-5114	-8773	-8398	-3554	-2742	995	1678	2686	920
2004-05	1618	-443	-22	-1291	-4319	-5679	-8966	-8620	-4279	-2346	1179	1808	2675	961
2005-06	1537	-522	197	-1147	-4210	-5840	-9084	-8668	-3928	-3022	909	1246	2405	1666
2006-07	1434	-626	-91	-1149	-4243	-5868	-9363	-9056	-4424	-2773	854	1487	2318	665

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**EXHIBITS 24 - 26  
REGIONAL MONTHLY CAPACITY ANALYSIS  
UNDER MEDIUM LOADS FOR 1937 WATER  
CONDITIONS**

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TABLE 1: PACIFIC NORTHWEST REGIONAL AREA

SUMMARY OF PACIFIC NORTHWEST REGIONAL LOADS AND RESOURCES  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

1937 WATER YEAR PEAK IN MEGAWATTS	M E D I U M   L O A D S														
	1997-98 OPERATING YEAR														
	AUG 1-15	AUG 16-31	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR 1-15	APR 16-30	MAY	JUN	JUL	
1996 FINAL WHITEBOOK: 12/31/96 RUN DATE: 12/31/96															
<b>FIRM LOADS</b>															
1 SYSTEM FIRM LOADS	1/	25697	25697	25664	27949	30159	32359	33144	32547	30228	28532	28532	26932	26144	25726
2 EXPORTS	3/	3007	3007	2955	2120	1705	1693	1898	1872	1848	2001	2053	2332	3294	3340
3 FED DIVERSITY	4/	-966	-987	-989	-1012	-945	-704	-726	-735	-976	-883	-880	-958	-982	-951
4 FIRM LOADS		27738	27717	27630	29057	30919	33348	34316	33684	31100	29650	29705	28307	28455	28115
<b>NON-FIRM LOADS</b>															
5 REGIONAL NON-FIRM LOADS	2/	111	111	103	77	126	66	153	100	150	120	120	94	134	120
6 TOTAL LOADS		27848	27828	27733	29134	31045	33414	34469	33784	31250	29770	29825	28400	28589	28235
<b>HYDRO RESOURCES</b>															
7 REGULATED HYDRO	5/	29793	28764	29943	30173	31048	31235	30631	30990	30274	29460	28376	28547	29717	29904
8 INDEPENDENT HYDRO	6/	1841	1826	1800	1792	1777	1748	1697	1809	1888	1921	1936	2008	2022	1895
9 SUS. PKNG. ADJUSTMENT	7/	-3379	-4808	-5323	-5394	-5246	-5782	-7728	-6167	-6504	-5814	-1169	-1200	-2866	-5678
10 TOTAL HYDRO		28255	25782	26420	26571	27579	27201	24600	26632	25658	25567	29143	29355	28873	26121
<b>OTHER RESOURCES</b>															
11 SMALL THERMAL & MISC	8/	85	85	75	77	173	170	171	167	77	78	73	39	39	86
12 COMBUSTION TURBINES	9/	965	965	965	965	1667	1669	1670	1668	1212	1212	1212	558	670	1201
13 RENEWABLES	10/	79	79	79	80	81	73	85	84	84	83	83	33	80	80
14 COGENERATION	11/	340	340	340	329	329	309	329	329	329	340	340	340	340	320
15 IMPORTS	12/	1907	1907	1555	2193	3007	2966	3184	3207	2711	1893	1524	1910	2061	1963
16 CENTRALIA		1340	1340	1340	1340	1340	1340	1340	1340	1340	670	1340	1340	1340	1340
17 JIM BRIDGER		693	693	692	693	693	693	693	693	693	520	520	520	693	693
18 COLSTRIP 1 & 2		408	408	389	394	403	397	399	392	394	198	386	197	400	412
19 BOARDMAN		507	507	507	507	507	507	507	507	507	507	507	507	507	507
20 VALMY		242	242	242	242	242	242	242	242	242	0	0	242	242	242
21 COLSTRIP 3		570	570	557	560	566	562	564	559	560	561	555	560	565	572
22 WNP 2		1170	1170	1170	1170	1170	1170	1170	1170	1170	1170	0	0	0	1170
23 COLSTRIP 4		720	720	720	720	720	720	720	720	720	720	720	720	720	720
24 FED RESOURCE ACQUIS	13/	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25 NON-UTILITY GENERATION	14/	1400	1400	1307	1216	1172	1158	1145	1173	1207	1351	1348	907	1305	1440
26 TOTAL RESOURCES		38681	36208	36358	37057	39649	39177	36819	38883	36904	34870	37751	37228	37835	36867

TABLE 1: PACIFIC NORTHWEST REGIONAL AREA

SHEET 2 OF 2

SUMMARY OF PACIFIC NORTHWEST REGIONAL LOADS AND RESOURCES  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

		M E D I U M   L O A D S												1996 FINAL WHITEBOOK: 12/31/96				
		1997-98 OPERATING YEAR												RUN DATE: 12/31/96				
1937 WATER YEAR	PEAK IN MEGAWATTS	AUG 1-15	AUG 16-31	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR 1-15	APR 16-30	MAY	JUN	JUL			
RESERVES & MAINTENANCE		-----																
	27 HYD, SM THRM & MISC RES	15/	-1723	-1671	-1724	-1730	-1812	-1817	-1784	-1809	-1752	-1721	-1666	-1620	-1708	-1744		
	28 LARGE THERMAL RESERVES	16/	-1007	-1007	-945	-970	-1008	-986	-989	-993	-1002	-768	-721	-800	-851	-1005		
	29 BPA SPINNING RESERVES	17/	-325	-296	-297	-299	-326	-337	-302	-329	-307	-297	-383	-387	-366	-295		
	30 HYDRO MAINTENANCE	18/	-4604	-4042	-3787	-3208	-2935	-2037	-1561	-2288	-2631	-2751	-2483	-2360	-2202	-3721		
	31 NET RESOURCES		31021	29192	29604	30849	33567	34000	32183	33464	31211	29332	32497	32062	32708	30101		
SURPLUS/DEFICITS																		
	32 FIRM SURPLUS/DEFICIT		3283	1475	1974	1792	2648	652	-2133	-221	111	-318	2793	3755	4252	1986		
	33 TOTAL SURPLUS/DEFICIT		3172	1364	1871	1715	2522	586	-2286	-321	-39	-438	2672	3661	4118	1866		
	34 EXTREME WEATHER ADJ.	19/	0	0	0	0	-3671	-3963	-4073	-3999	0	0	0	0	0	0		
	35 FIRM S/D W/EXT WEATHER ADJ.		3283	1475	1974	1792	-1023	-3311	-6206	-4220	111	-318	2793	3755	4252	1986		
	36 TOTAL S/D W/EXT WTHR. ADJ.		3172	1364	1871	1715	-1149	-3377	-6359	-4320	-39	-438	2672	3661	4118	1866		

TABLE 1: PACIFIC NORTHWEST REGIONAL AREA

SUMMARY OF PACIFIC NORTHWEST REGIONAL LOADS AND RESOURCES  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

1937 WATER YEAR PEAK IN MEGAWATTS	M E D I U M L O A D S														
	2001- 2 OPERATING YEAR														
	AUG		SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR		MAY	JUN	JUL	
	1-15	16-31								1-15	16-30				
1996 FINAL WHITEBOOK: 12/31/96 RUN DATE: 12/31/96															
<b>FIRM LOADS</b>															
1 SYSTEM FIRM LOADS	1/	26224	26224	26045	28576	30759	32980	33759	33179	30862	29154	29154	27554	26799	26333
2 EXPORTS	3/	3824	3824	3771	3113	2675	2664	2672	2644	2621	2666	2717	2932	3871	3924
3 FED DIVERSITY	4/	-851	-862	-872	-874	-879	-648	-661	-672	-868	-825	-811	-862	-873	-842
4 FIRM LOADS		29196	29186	28944	30814	32554	34996	35769	35152	32615	30995	31060	29624	29797	29415
<b>NON-FIRM LOADS</b>															
5 REGIONAL NON-FIRM LOADS	2/	110	110	103	77	130	61	155	100	153	120	120	90	146	119
6 TOTAL LOADS		29306	29295	29047	30892	32684	35057	35924	35251	32768	31115	31180	29714	29943	29534
<b>HYDRO RESOURCES</b>															
7 REGULATED HYDRO	5/	29809	28890	29978	30240	31098	31312	31161	31015	30312	29475	28659	28639	29705	29825
8 INDEPENDENT HYDRO	6/	1860	1845	1822	1809	1795	1766	1717	1827	1906	1943	1956	2028	2043	1914
9 SUS. PKNG. ADJUSTMENT	7/	-2976	-4762	-5323	-5387	-4601	-4719	-7613	-7224	-6846	-5917	-1100	-1200	-2573	-4693
10 TOTAL HYDRO		28693	25973	26477	26662	28292	28359	25265	25618	25372	25501	29515	29467	29175	27046
<b>OTHER RESOURCES</b>															
11 SMALL THERMAL & MISC	8/	95	95	86	89	184	181	182	179	88	91	85	52	39	97
12 COMBUSTION TURBINES	9/	1197	1197	1201	1207	1663	1665	1662	1660	1204	1204	1204	550	663	1193
13 RENEWABLES	10/	80	80	80	81	82	74	86	85	85	84	84	34	81	81
14 COGENERATION	11/	340	340	340	329	329	309	329	329	329	340	340	340	340	320
15 IMPORTS	12/	1839	1839	1295	1928	2140	2688	2988	3009	2295	1699	1426	1474	1990	1876
16 CENTRALIA		1340	1340	1340	1340	1340	1340	1340	1340	670	670	1340	1340	1340	1340
17 JIM BRIDGER		693	693	693	693	692	693	692	692	519	520	173	520	693	693
18 COLSTRIP 1 & 2		429	429	411	417	426	419	421	415	416	211	409	209	424	433
19 BOARDMAN		507	507	507	507	507	507	507	507	507	507	507	507	507	507
20 VALMY		242	242	242	242	242	242	242	242	242	121	242	242	242	242
21 COLSTRIP 3		585	585	572	576	582	578	579	575	575	579	571	577	581	587
22 WNP 2		1170	1170	1170	1170	1170	1170	1170	1170	1170	1170	0	0	0	1170
23 COLSTRIP 4		720	720	720	720	720	720	720	720	720	720	720	720	720	720
24 FED RESOURCE ACQUIS	13/	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25 NON-UTILITY GENERATION	14/	1394	1394	1302	1211	1167	1152	1079	1107	1142	1287	1283	867	1265	1388
26 TOTAL RESOURCES		39324	36604	36436	37172	39536	40097	37262	37648	35334	34704	37899	36899	38059	37693

TABLE 1: PACIFIC NORTHWEST REGIONAL AREA

SHEET 2 OF 2

SUMMARY OF PACIFIC NORTHWEST REGIONAL LOADS AND RESOURCES  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

1937 WATER YEAR PEAK IN MEGAWATTS	M E D I U M   L O A D S												1996 FINAL WHITEBOOK: 12/31/96 RUN DATE: 12/31/96		
	2001- 2 OPERATING YEAR														
	AUG 1-15	AUG 16-31	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR 1-15	APR 16-30	MAY	JUN	JUL	
RESERVES & MAINTENANCE															
27 HYD, SM THRM & MISC RES	15/ -1736	-1690	-1739	-1747	-1815	-1821	-1809	-1808	-1753	-1720	-1678	-1624	-1706	-1739	
28 LARGE THERMAL RESERVES	16/ -998	-998	-922	-962	-909	-976	-978	-982	-832	-775	-695	-737	-841	-994	
29 BPA SPINNING RESERVES	17/ -336	-296	-297	-299	-342	-364	-302	-300	-297	-297	-397	-389	-373	-321	
30 HYDRO MAINTENANCE	18/ -4607	-4044	-3787	-3208	-2935	-2037	-1561	-2289	-2632	-2751	-2483	-2360	-2202	-3721	
31 NET RESOURCES	31647	29575	29690	30955	33534	34899	32612	32269	29819	29160	32646	31789	32937	30917	
SURPLUS/DEFICITS															
32 FIRM SURPLUS/DEFICIT	2451	390	746	141	980	-97	-3158	-2882	-2796	-1835	1587	2165	3140	1502	
33 TOTAL SURPLUS/DEFICIT	2341	280	643	64	850	-159	-3313	-2982	-2949	-1955	1467	2075	2994	1382	
34 EXTREME WEATHER ADJ.	19/ 0	0	0	0	-3761	-4055	-4157	-4090	0	0	0	0	0	0	
35 FIRM S/D W/EXT WEATHER ADJ.	2451	390	746	141	-2781	-4153	-7315	-6972	-2796	-1835	1587	2165	3140	1502	
36 TOTAL S/D W/EXT WTHR. ADJ.	2341	280	643	64	-2911	-4214	-7470	-7072	-2949	-1955	1467	2075	2994	1382	

TABLE 1: PACIFIC NORTHWEST REGIONAL AREA

SUMMARY OF PACIFIC NORTHWEST REGIONAL LOADS AND RESOURCES  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

		M E D I U M   L O A D S													
		2006- 7 OPERATING YEAR											1996 FINAL WHITEBOOK: 12/31/96 RUN DATE: 12/31/96		
1937 WATER YEAR PEAK IN MEGAWATTS		AUG 1-15	AUG 16-31	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR 1-15	APR 16-30	MAY	JUN	JUL
<b>FIRM LOADS</b>															
1	SYSTEM FIRM LOADS	1/ 27108	27108	26936	29508	31655	33907	34847	34287	31926	30184	30184	28578	27822	27302
2	EXPORTS	3/ 3703	3703	3617	2889	2728	2751	2756	2729	2725	2752	2752	2922	3574	3622
3	FED DIVERSITY	4/ -874	-885	-898	-913	-910	-668	-687	-700	-917	-852	-850	-901	-900	-872
4	FIRM LOADS	29937	29926	29655	31483	33472	35990	36916	36316	33734	32084	32086	30599	30495	30052
<b>NON-FIRM LOADS</b>															
5	REGIONAL NON-FIRM LOADS	2/ 109	109	102	92	127	45	154	141	153	120	120	90	145	122
6	TOTAL LOADS	30046	30035	29757	31575	33599	36035	37070	36457	33887	32204	32206	30689	30640	30174
<b>HYDRO RESOURCES</b>															
7	REGULATED HYDRO	5/ 29795	28876	29978	30240	31097	31321	31171	31024	30312	29475	28660	28640	29705	29811
8	INDEPENDENT HYDRO	6/ 1843	1828	1821	1807	1794	1776	1727	1838	1908	1945	1957	2028	2044	1900
9	SUS. PKNG. ADJUSTMENT	7/ -2976	-4762	-5323	-5387	-4601	-4719	-7613	-7224	-6846	-5917	-1100	-1200	-2573	-4693
10	TOTAL HYDRO	28662	25942	26476	26660	28290	28378	25285	25638	25374	25503	29517	29468	29176	27018
<b>OTHER RESOURCES</b>															
11	SMALL THERMAL & MISC	8/ 86	86	86	88	183	187	188	185	89	92	85	52	39	88
12	COMBUSTION TURBINES	9/ 1200	1200	1204	1210	1666	1668	1666	1664	1207	1207	1207	554	666	1196
13	RENEWABLES	10/ 81	81	81	82	83	75	86	85	85	84	84	34	81	81
14	COGENERATION	11/ 295	295	295	284	284	264	284	284	284	295	295	295	295	275
15	IMPORTS	12/ 1718	1718	1273	1401	1850	2136	2214	2224	1707	1316	1316	1714	1903	1776
16	CENTRALIA	1340	1340	1340	1340	1340	1340	1340	1340	670	1340	1340	1340	1340	1340
17	JIM BRIDGER	692	692	693	692	693	693	693	693	692	519	693	692	693	693
18	COLSTRIP 1 & 2	411	411	411	416	424	431	433	428	417	212	410	210	425	416
19	BOARDMAN	507	507	507	507	507	507	507	507	507	507	507	507	507	507
20	VALMY	242	242	242	242	242	242	242	242	242	121	242	242	242	242
21	COLSTRIP 3	572	572	572	575	581	586	587	583	576	580	571	578	581	575
22	WNP 2	1170	1170	1170	1170	1170	1170	1170	1170	1170	1170	0	0	0	1170
23	COLSTRIP 4	720	720	720	720	720	720	720	720	720	720	720	720	720	720
24	FED RESOURCE ACQUIS	13/ 0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	NON-UTILITY GENERATION	14/ 1319	1319	1231	1140	1094	1080	1066	1093	1122	1268	1264	849	1246	1369
26	TOTAL RESOURCES	39015	36295	36301	36527	39127	39478	36481	36856	34862	34934	38251	37255	37913	37466



TABLE 1: PACIFIC NORTHWEST REGIONAL AREA

SHEET 2 OF 2

SUMMARY OF PACIFIC NORTHWEST REGIONAL LOADS AND RESOURCES  
UNDER THE PACIFIC NORTHWEST ELECTRIC POWER PLANNING AND CONSERVATION ACT

1937 WATER YEAR PEAK IN MEGAWATTS	M E D I U M   L O A D S												1996 FINAL WHITEBOOK: 12/31/96 RUN DATE: 12/31/96				
	2006- 7 OPERATING YEAR																
	AUG 1-15	AUG 16-31	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR 1-15	APR 16-30	MAY	JUN	JUL			
RESERVES & MAINTENANCE																	
27 HYD,SM THRM & MISC RES	15/	-1731	-1684	-1735	-1743	-1811	-1819	-1809	-1809	-1752	-1719	-1678	-1623	-1704	-1737		
28 LARGE THERMAL RESERVES	16/	-972	-972	-917	-942	-927	-957	-960	-964	-871	-856	-754	-796	-821	-969		
29 BPA SPINNING RESERVES	17/	-336	-296	-297	-299	-342	-364	-302	-300	-297	-297	-397	-389	-373	-321		
30 HYDRO MAINTENANCE	18/	-4605	-4042	-3787	-3208	-2935	-2037	-1561	-2289	-2632	-2751	-2483	-2360	-2202	-3721		
31 NET RESOURCES		31371	29300	29564	30335	33112	34300	31848	31493	29310	29311	32940	32086	32813	30717		
SURPLUS/DEFICITS																	
32 FIRM SURPLUS/DEFICIT		1434	-626	-91	-1149	-361	-1690	-5068	-4823	-4424	-2773	854	1487	2318	665		
33 TOTAL SURPLUS/DEFICIT		1325	-735	-193	-1241	-488	-1735	-5222	-4963	-4577	-2893	734	1397	2173	543		
34 EXTREME WEATHER ADJ.	19/	0	0	0	0	-3882	-4178	-4295	-4233	0	0	0	0	0	0		
35 FIRM S/D W/EXT WEATHER ADJ.		1434	-626	-91	-1149	-4243	-5868	-9363	-9056	-4424	-2773	854	1487	2318	665		
36 TOTAL S/D W/EXT WTHR. ADJ.		1325	-735	-193	-1241	-4370	-5913	-9517	-9197	-4577	-2893	734	1397	2173	543		

EXHIBIT 26 (continued)

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## REGIONAL FOOTNOTES

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### For Exhibits 9 through 16

1. Firm loads for the region include the sum of the estimated firm loads of Federal agencies, public agencies, Direct Service Industries (DSIs), Investor-Owned Utilities (IOUs), and associated transmission losses. Peak loads represent non-coincidental capacity demands adjusted to account for Federal system diversity; they are based on the prediction of normal weather and have a 50-percent chance of being exceeded.
2. Total loads for the region include system firm loads plus Utah Power Company's interruptible load.
3. Regional exports include: BPA to Anaheim, capacity sale and capacity/energy exchange; BPA to Azusa, seasonal exchange, exchange energy, energy sale and power sale; BPA to Banning, energy sale and power sale; BPA to BART, power sale; BPA to Burbank, power sale; BPA to Colton, energy sale and power sale; BPA to Glendale, power sale; BPA to Imperial, diversity exchange; BPA to M-S-R, power sale; BPA to New Energy Ventures, power sale; BPA to Palo Alto, capacity sale and seasonal energy; BPA to Pasadena, capacity/energy exchange and power sale; BPA to Riverside, capacity/energy exchange, capacity sale and diversity exchange; BPA to SDG&E, power exchange and power sale; BPA to SMUD, power exchange; BPA to SCE, power sale, environmental storage, and option capacity; BPA to Vernon, seasonal exchange; BPA to BC Hydro for Canadian Entitlement beginning April 1, 1998; BPA's Northwest-Southwest Intertie losses; city of Idaho Falls to UPC, Gem State Hydro; IPC to Sierra Pacific, two power sales and for Harney and Wells; IPC to UAMPS, power sale; IPC to Azusa, Banning and Clinton, power sale; IPC to the city of Washington, Utah, power sale; MPC to LADWP, power sale; MPC to PP&L (east) power sale; PP&L to CDWR, power sale; PP&L to PG&E, power sale; PP&L to PP&L (Northern California), transfer to PP&L's Northern California load; PP&L to Redding, power sale; PP&L to SDG&E, power sale; PP&L to SMUD, power sale; PP&L to SCE, power sale; PP&L to WAPA, power sale; PGE to Burbank, power sale, PGE to Glendale, power sale and seasonal power exchange; PGE to Modesto, power sale; PGE to SCE, power sale and seasonal power exchange; PGE to WAPA, power sale; PSP&L to PG&E, seasonal power exchange; SCL to PG&E, seasonal power exchange; SCL to NCPA, seasonal power exchange; Snohomish County PUD to SMUD, power sale, TPU to WAPA, power sale; WWP to Modesto, capacity sale; and WWP to Riverside, power sale.

Also included in exports are resources purchased by utilities outside the region. These include Longview Fibre to WAPA, 14.2 percent of the Boardman coal plant sold to San Diego Gas and Electric and 10.2 percent of the Boardman coal plant sold to the City of Turlock, CA.

This analysis assumes that BPA's power sales and capacity/energy exchange agreements with the cities of Burbank, Glendale, Pasadena, Modesto, Santa Clara and Redding and with SCE are in power sales mode throughout the study period.

4. Federal diversity is a percentage reduction applied to the Federal system non-coincidental peak utility allocation requirements. This is because all peaking electrical loads do not occur simultaneously throughout the region.
5. Regulated hydro includes those hydro dams where the firm energy generation of the dam is affected by the release of stored water from upstream reservoirs. Regulated hydro generation is determined by completing a hydro regulation study of the Pacific Northwest hydro system.
6. Independent hydro includes those hydro dams where no reservoirs exist upstream to release stored water and the firm energy is based on fixed historical flows. Hydro independents are not changed as a part of the hydro regulation study.
7. Sustained peaking adjustment is a percentage reduction applied to the Federal hydro system to meet a capacity load of 50 hours per week. This adjustment also includes reductions for Federal hydro maintenance, spinning reserves, forced outage reserves, and summer flow augmentation on the Lower Snake River and John Day hydro projects.
8. Small thermal and miscellaneous resources include: IPC: Energy Management Systems; MPC: regional Bird and Corette; PGE: Summit 1 and 2; PSP&L: Crystal Mountain and Shuffleton; SCL: Boundary; and TPU: Steam Plant 2.
9. Combustion turbines include: Clark: River Road (Cogentrix); IPC: Wood River; PGE: Bethel and Beaver; PSP&L: Whidbey Island, Whitehorn, Fredrickson, and Fredonia units 1 and 2; and WWP: Northeast units 1 and 2.
10. Renewables include: BPA: James River Wauna; Consumers: Coffin Butte; Emerald County PUD: Short Mountain; and WWP: Kettle Falls.
11. Cogeneration includes: EWEB: WEYCO Energy Center; Snohomish: County PUD Scott Paper; and PGE: Coyote Springs. Longview Fibre output is sold outside the region to WAPA.
12. Regional imports include: Anaheim to BPA, exchange energy; Azusa to BPA, seasonal exchange and return energy; Banning to BPA, return energy; Burbank to BPA, exchange energy; Colton to BPA, return energy; Glendale to BPA, exchange energy; Imperial to BPA, exchange energy and seasonal exchange; M-S-R to BPA, exchange energy; Pasadena to BPA, two exchange energy contracts and a seasonal exchange; Riverside to BPA; two exchange energy contracts and a seasonal exchange; SMUD to BPA, deferred energy return; SDG&E to BPA, exchange energy and deferred energy return; Sierra to BPA, for Harney and Wells; SCE to BPA, exchange energy, supplemental energy, option energy, and environmental storage; Vernon to BPA, seasonal exchange; Basin Electric to BPA, power sale; BC Hydro to BPA, for PGE ICP; PP&L (Wyoming) to BPA, Southern Idaho transfer; Trans Alta to BPA, power sale; PowerEx to BPA, replacement energy; PowerEx to EWEB, power sale; SCE to PP&L, power sale; Glendale to PGE, seasonal power exchange; SCE to PGE, seasonal power exchange; BC Hydro to PSP&L, power sale; PG&E to PSP&L, seasonal power exchange; BC Hydro to SCL, Ross replacement; PG&E to SCL, seasonal power exchange; and NCPA to SCL, seasonal power exchange.

In addition, imports includes the following intra-company transfers: PP&L (Wyoming) to PP&L and Utah Power Company.

This analysis assumes that BPA's power sales and capacity/energy exchange agreements with the cities of Burbank, Glendale, Pasadena, Modesto, Santa Clara, and

Redding and with SCE are in power sales mode, so exchange and supplemental energy with these utilities are zero through the study horizon.

13. Resource acquisitions are resources BPA has identified and contracted for future purchase. When new Federal resource acquisitions are contracted for and/or on-line, they will be included in the loads and resources balance.
14. Non-utility generation (NUG) resources include generation provided to utilities by independent power producers and resources included under the Public Utility Regulatory Policies Act (PURPA). This study included 180 Individual NUGs.
15. Hydro, small thermal and miscellaneous resources, and combustion turbine reserve requirements are estimated at 5 percent of the capacity of these resources for all utilities in the region.
16. Large thermal reserves requirements are estimated at 15 percent of the total capacity of the Pacific Power and Light thermal import into the region plus the large thermal resources owned by utilities in the region.
17. Federal spinning reserves equal the reserve generating capacity maintained to provide a regulating margin for the automatic generation and frequency control of power generation.
18. Hydro maintenance is the sum of individual Federal system, public agency, and IOU hydro project maintenance, based on the average of the 1983-84 through 1988-89 schedules submitted to the Northwest Power Pool.
19. Extreme weather adjustment is the sum of all utility load responses with Pacific Northwest cold weather, and has a 5 percent chance of being exceeded in the months of November through February.

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**EXHIBITS 27 - 36  
REGIONAL ENERGY SURPLUS/DEFICIT  
PROJECTIONS FOR 50 HISTORICAL WATER  
CONDITIONS**

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## REGIONAL ENERGY ANALYSIS

REGIONAL ENERGY SURPLUS/DEFICIT  
FOR THE 50 HISTORICAL WATER YEARS ON RECORD

1996 FINAL WHITEBOOK: 12/31/96

RUN DATE: 12/31/96

ENERGY IN AVERAGE MEGAWATTS	1997-98 OPERATING YEAR												MAY	JUN	JUL	12 MO AVG
	AUG 1-15	AUG 16-31	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR 1-15	APR 16-30					
1929 REGIONAL ENERGY S/D	-1243	-2465	-2226	-1796	-2666	-3008	-4482	-2470	-2065	-1554	1637	-44	2323	-2309	-1713	
1930 REGIONAL ENERGY S/D	-2662	-3296	-3422	-2422	-2886	-3542	-7503	-1870	-2349	-1202	2871	370	498	-2330	-2300	
1931 REGIONAL ENERGY S/D	-3140	-3670	-3434	-2723	-2850	-3056	-7382	-3451	-2933	-2327	-442	1805	1045	-2346	-2510	
1932 REGIONAL ENERGY S/D	-2221	-3638	-3180	-2730	-2754	-3954	-7289	-5643	-89	9902	6463	5913	7099	3520	-321	
1933 REGIONAL ENERGY S/D	-2170	-2026	-2350	-1747	-919	-1165	1731	2967	1547	2413	1246	2649	11145	9072	1888	
1934 REGIONAL ENERGY S/D	3046	2869	-32	895	1863	4828	10183	6867	8245	11285	9224	7199	2035	-2466	4402	
1935 REGIONAL ENERGY S/D	-1936	-2560	-3321	-2829	-2566	-1582	668	2550	1447	4189	1253	1969	4283	4130	435	
1936 REGIONAL ENERGY S/D	-523	-3501	-2895	-2938	-2850	-3027	-6162	-3405	-1713	1485	7509	7991	5156	-541	-658	
1937 REGIONAL ENERGY S/D	-1821	-2927	-3126	-2812	-2821	-3101	-6285	-3168	-3137	-3293	-309	2446	1576	-2226	-2236	
1938 REGIONAL ENERGY S/D	-2181	-3340	-3144	-2561	-1711	-3116	2543	-60	3750	3968	5591	8235	6330	3342	1302	
1939 REGIONAL ENERGY S/D	-2194	-2645	-3081	-2165	-2569	-3242	-5209	-1398	848	4084	3472	3682	2631	-790	-828	
1940 REGIONAL ENERGY S/D	-1689	-2620	-3274	-2424	-2818	-2906	-3438	-588	3001	3930	3273	2594	1294	-2280	-783	
1941 REGIONAL ENERGY S/D	-2394	-3301	-2985	-2373	-2679	-2970	-4919	-2267	-2190	-1295	1514	1389	1367	-3159	-1959	
1942 REGIONAL ENERGY S/D	-4128	-3828	-2866	-2452	-2643	246	-799	-645	-794	-1100	1622	2660	5737	4322	-79	
1943 REGIONAL ENERGY S/D	-1085	-2166	-2500	-2099	-2314	-1144	1568	3488	4487	10513	9074	7940	8682	4971	2604	
1944 REGIONAL ENERGY S/D	3234	-1229	-2412	-2016	-2513	-2766	-4429	-2274	-2020	-2134	1328	246	-363	-2937	-1740	
1945 REGIONAL ENERGY S/D	-3444	-3957	-2619	-2718	-3283	-4306	-6622	-3811	-3247	-2796	-780	3305	5276	1707	-1817	
1946 REGIONAL ENERGY S/D	-2156	-3185	-3225	-2411	-2348	-1879	845	2508	4300	5287	6459	9357	7354	4090	1816	
1947 REGIONAL ENERGY S/D	829	-2684	-1672	-1532	-1016	3158	4123	5806	4876	6384	4987	6103	6843	2491	2828	
1948 REGIONAL ENERGY S/D	-1741	-2373	-2171	3309	1336	-178	3954	3911	3884	3217	4690	9446	14554	6664	3884	
1949 REGIONAL ENERGY S/D	3374	3858	60	-905	-1817	-2637	-1683	-581	7110	6523	8667	8316	6325	467	2155	
1950 REGIONAL ENERGY S/D	-2234	-3517	-3497	-2468	-2463	-1698	1585	4511	6383	8007	6408	6729	12470	6731	2718	
1951 REGIONAL ENERGY S/D	2954	2556	-248	1050	2697	4821	5279	10519	6386	10187	8576	9903	6110	4316	5247	
1952 REGIONAL ENERGY S/D	3484	1791	-453	2249	-531	965	2722	4581	2216	8404	7895	10312	7368	2846	3588	
1953 REGIONAL ENERGY S/D	-1534	-2119	-2991	-2379	-2683	-2992	290	3556	1968	1510	2837	5737	9662	4662	1265	
1954 REGIONAL ENERGY S/D	3278	2	-1827	-1308	-1088	-288	1848	5788	4278	5957	4001	7082	11190	7858	3346	
1955 REGIONAL ENERGY S/D	5164	4230	4268	7	415	-1085	-99	-1214	-3321	1382	3052	1932	9444	9195	2205	
1956 REGIONAL ENERGY S/D	3408	1735	-1246	918	1471	4336	5752	5766	7691	9356	10222	11979	13163	5385	5631	
1957 REGIONAL ENERGY S/D	4043	1240	-1399	-309	-1661	548	-618	2902	3621	10523	2422	9556	10785	626	2764	
1958 REGIONAL ENERGY S/D	-2205	-2564	-3235	-1899	-2519	-2154	754	4661	3014	4569	3799	9266	8199	364	1521	
1959 REGIONAL ENERGY S/D	-1682	-2243	-2889	-1505	217	1597	4706	5840	5210	7245	5167	5941	10407	4455	3185	
1960 REGIONAL ENERGY S/D	4146	-814	3526	5017	2707	1652	1532	3211	3787	12179	5869	4594	5929	3794	3870	
1961 REGIONAL ENERGY S/D	-265	-3207	-2770	-1999	-997	-2663	965	6612	4406	8670	3108	5520	11029	2568	2235	
1962 REGIONAL ENERGY S/D	-2123	-2332	-2962	-1485	-2419	-2566	250	228	-1606	8823	7816	4502	5832	2664	711	
1963 REGIONAL ENERGY S/D	-775	-2736	-2459	-158	389	1559	1507	4565	-116	2668	3436	3087	5783	3357	1568	
1964 REGIONAL ENERGY S/D	-1235	-2044	-1435	-2092	-1742	-2547	-27	2247	-1787	7082	2229	3506	11950	7222	1526	
1965 REGIONAL ENERGY S/D	4848	1662	-354	528	-818	4477	7138	9234	4481	6515	9622	8715	9340	3465	4794	
1966 REGIONAL ENERGY S/D	2319	178	-1285	-370	-812	-1278	1974	285	-621	7445	3277	4535	4602	2072	1309	
1967 REGIONAL ENERGY S/D	-1694	-2818	-2432	-2051	-2388	-275	3251	4900	3986	3961	1127	3934	11089	6168	2206	
1968 REGIONAL ENERGY S/D	4106	1128	-1584	-526	-852	-1048	1185	5226	4202	402	3137	2795	5691	3249	1894	
1969 REGIONAL ENERGY S/D	1466	57	1300	867	1141	543	4886	6137	5602	10721	8061	10726	8745	3796	4491	
1970 REGIONAL ENERGY S/D	-1720	-2531	-2800	-1291	-2199	-2271	2096	1061	564	2930	1284	4106	9004	1705	830	
1971 REGIONAL ENERGY S/D	-1715	-2677	-3160	-2345	-2301	-1234	4965	9518	5921	8765	6968	11977	11966	6812	3982	
1972 REGIONAL ENERGY S/D	4131	3201	-632	-726	-1054	-513	4940	7668	13885	12289	4942	11551	12814	9491	5809	
1973 REGIONAL ENERGY S/D	4803	5510	-335	-645	-1766	523	364	-1190	-1939	-1973	3928	-290	-231	-2292	-139	
1974 REGIONAL ENERGY S/D	-2722	-3396	-3165	-2378	-2237	2708	9894	10365	8669	10147	9264	10665	14256	10642	5505	
1975 REGIONAL ENERGY S/D	4103	4234	-149	-1936	-2485	-831	2551	2407	4685	2939	3159	6002	9936	8797	3016	
1976 REGIONAL ENERGY S/D	867	-516	-1542	63	1720	4884	6706	6830	6707	10706	6571	9855	6358	6834	4769	
1977 REGIONAL ENERGY S/D	4907	4779	4942	-236	-2656	-2848	-3961	-2336	-2308	-2479	1321	-872	-1302	-4134	-954	
1978 REGIONAL ENERGY S/D	-4961	-3346	-3231	-2761	-3073	-3237	-3286	1564	4690	7956	3803	5415	3864	3415	424	

EXHIBIT 27



## REGIONAL ENERGY ANALYSIS

REGIONAL ENERGY SURPLUS/DEFICIT  
FOR THE 50 HISTORICAL WATER YEARS ON RECORD-1996 FINAL WHITEBOOK: 12/31/96  
RUN DATE: 12/31/96

ENERGY IN AVERAGE MEGAWATTS	1999- 0 OPERATING YEAR														12 MO AVG
	AUG 1-15	AUG 16-31	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR 1-15	APR 16-30	MAY	JUN	JUL	
1929 REGIONAL ENERGY S/D	-1374	-2834	-2806	-2126	-3158	-4369	-4251	-5725	-4788	-1206	1645	1676	2098	-3157	-2374
1930 REGIONAL ENERGY S/D	-5478	-4512	-3505	-3099	-3315	-4240	-7466	-4259	-4013	-3494	2875	2487	954	-3397	-2930
1931 REGIONAL ENERGY S/D	-4558	-5246	-3552	-3328	-3279	-4582	-7816	-5867	-4916	-2346	1082	1735	635	-2364	-3239
1932 REGIONAL ENERGY S/D	-4153	-4312	-3182	-3332	-3181	-5184	-8072	-6413	-1461	9025	6468	5100	6641	3196	-1031
1933 REGIONAL ENERGY S/D	-2540	-2300	-3036	-2293	-1513	-2142	-1201	-358	2213	3171	2441	2926	10504	8750	1186
1934 REGIONAL ENERGY S/D	2691	2947	-610	425	1038	3928	9419	4145	7202	10997	9573	6977	1731	-2490	3739
1935 REGIONAL ENERGY S/D	-3101	-4528	-3536	-3463	-2915	-2204	-1994	1882	1825	2308	960	1588	3791	3689	-293
1936 REGIONAL ENERGY S/D	-674	-4226	-3362	-3339	-3327	-4440	-6819	-5351	-1357	-1119	7380	6851	5021	-114	-1296
1937 REGIONAL ENERGY S/D	-2187	-3713	-3376	-3221	-3332	-4162	-7366	-5536	-4615	-3588	1334	2704	3390	-3038	-2719
1938 REGIONAL ENERGY S/D	-3303	-4875	-3314	-3163	-3245	-4329	-627	-821	3950	3797	4908	7584	5958	3046	442
1939 REGIONAL ENERGY S/D	-2575	-3783	-3379	-3031	-3308	-4273	-6101	-2765	804	3913	3221	3567	3737	-2755	-1426
1940 REGIONAL ENERGY S/D	-2579	-3777	-3469	-3135	-3242	-4049	-5632	-2046	3940	2441	3027	1735	2546	-2769	-1380
1941 REGIONAL ENERGY S/D	-4347	-4661	-3354	-3174	-3135	-4390	-6698	-2634	-2382	-2824	2568	1694	756	-3912	-2655
1942 REGIONAL ENERGY S/D	-5028	-4209	-3375	-3148	-3607	-1075	-1688	-1220	-1775	-2044	1962	2603	5298	2553	-841
1943 REGIONAL ENERGY S/D	-1541	-2736	-3256	-2568	-3056	-1908	-1129	2788	4292	10615	8788	7174	8325	4615	1903
1944 REGIONAL ENERGY S/D	3113	-1616	-2982	-2512	-3270	-3866	-4308	-5018	-4797	361	2153	705	286	-3699	-2288
1945 REGIONAL ENERGY S/D	-5657	-4800	-3606	-3084	-4143	-5187	-7392	-4555	-4142	-3377	-2037	1973	4759	1494	-2652
1946 REGIONAL ENERGY S/D	-2461	-3746	-3240	-3083	-3054	-2627	-1321	833	4106	5310	6767	9493	6337	3494	1156
1947 REGIONAL ENERGY S/D	-485	-3084	-2140	-1998	-2086	1864	2118	2599	5020	6819	5559	6814	5194	2563	2029
1948 REGIONAL ENERGY S/D	-1849	-3308	-2299	2866	513	-1372	2795	-531	3542	3746	5792	10240	14040	5703	3141
1949 REGIONAL ENERGY S/D	3017	3843	-517	-1378	-2637	-3216	-1918	7293	5944	8258	7487	5873	125	1489	
1950 REGIONAL ENERGY S/D	-2606	-4005	-3631	-3069	-3062	-2360	-1849	3890	7059	7402	6586	5905	11896	6364	2069
1951 REGIONAL ENERGY S/D	2814	2419	-1043	580	1847	3928	3700	5871	8010	10649	8977	8964	5624	4239	4512
1952 REGIONAL ENERGY S/D	3319	1469	-863	1775	-1381	-335	262	1864	3729	8813	8032	9566	6957	2493	2907
1953 REGIONAL ENERGY S/D	-1415	-3234	-3285	-2728	-3229	-4174	-2228	4190	1798	99	2695	4965	9244	4364	666
1954 REGIONAL ENERGY S/D	2788	-394	-2416	-1776	-1905	-1476	938	2905	3484	5351	4716	7623	10372	7601	2632
1955 REGIONAL ENERGY S/D	4754	3847	3747	-465	-405	-2370	-2188	-4122	-2755	2324	1419	2103	9368	9252	1528
1956 REGIONAL ENERGY S/D	3061	1853	-1816	492	513	3066	4706	2548	7248	9506	10130	11272	12320	5301	4827
1957 REGIONAL ENERGY S/D	3867	1131	-1981	-780	-2479	-709	-2910	-1422	4300	10707	3457	9967	9514	1016	2008
1958 REGIONAL ENERGY S/D	-2575	-3764	-3321	-2534	-3290	-2729	-2741	2555	3756	4764	4456	9559	6586	533	818
1959 REGIONAL ENERGY S/D	-1891	-3271	-3206	-1687	-700	297	3643	2493	4826	7198	5164	6733	9338	4331	2472
1960 REGIONAL ENERGY S/D	3868	-834	2980	4532	1882	384	-505	-121	4374	12341	6245	3900	5475	3229	3078
1961 REGIONAL ENERGY S/D	873	-3757	-2928	-2407	-1830	-3826	227	3272	4174	7591	2287	7132	10033	2585	1661
1962 REGIONAL ENERGY S/D	-2386	-2701	-3450	-1748	-3217	-3278	-3016	-1075	-540	8895	7064	3748	5390	2326	48
1963 REGIONAL ENERGY S/D	-629	-3105	-3018	-774	-311	264	-652	2689	638	2471	3291	2575	4647	3069	845
1964 REGIONAL ENERGY S/D	651	-2523	-1941	-2535	-2582	-3720	-2316	-1559	-315	7623	2650	3104	11649	7046	919
1965 REGIONAL ENERGY S/D	4421	1539	-944	57	-1639	3307	5181	5697	6126	7201	9450	7955	8890	2935	4073
1966 REGIONAL ENERGY S/D	3036	449	-1876	-841	-1632	-2546	137	-1919	199	7084	3144	3564	4866	1685	708
1967 REGIONAL ENERGY S/D	-1649	-3800	-2848	-2325	-2730	-1406	2567	2077	2881	3539	801	4822	10011	6212	1559
1968 REGIONAL ENERGY S/D	3739	759	-2165	-1012	-1674	-2174	-1131	2590	4013	1580	2459	1923	5735	2688	1088
1969 REGIONAL ENERGY S/D	2786	584	883	528	318	-618	4258	2440	5080	10301	8664	10696	7072	3648	3789
1970 REGIONAL ENERGY S/D	-1927	-3157	-3162	-1651	-3000	-3385	110	44	1029	2358	1918	3863	7575	1404	202
1971 REGIONAL ENERGY S/D	-1925	-3504	-3290	-2887	-3100	-1864	2539	7137	6745	8611	7602	11024	11524	6595	3318
1972 REGIONAL ENERGY S/D	3780	3370	-1217	-1193	-1874	-1793	4302	4711	13434	11055	4449	11327	12060	9494	5048
1973 REGIONAL ENERGY S/D	4373	5134	-916	-1114	-2586	-760	-1640	-1642	-2372	-3790	1813	618	2496	-3453	-634
1974 REGIONAL ENERGY S/D	-4974	-5039	-3272	-2984	-2999	2067	7353	8342	9501	9673	9010	10058	13700	10253	4696
1975 REGIONAL ENERGY S/D	3795	4305	-724	-2468	-2424	-1832	-874	1490	5439	2927	2334	5219	9485	8439	2369
1976 REGIONAL ENERGY S/D	508	-398	-1885	-407	659	4436	4886	3503	6344	10304	7737	9775	5753	5635	3981
1977 REGIONAL ENERGY S/D	4953	4410	5073	-1424	-3266	-3896	-4614	-5495	-5292	-292	540	1220	-1483	-4036	-1534
1978 REGIONAL ENERGY S/D	-4976	-4685	-3649	-3145	-3463	-4183	-4208	-784	3789	7207	3266	4675	3423	3070	-339

















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**SECTION IX  
ADMINISTRATOR'S RECORD OF DECISION ON THE  
1995 PACIFIC NORTHWEST LOADS AND RESOURCES  
STUDY (THE WHITE BOOK)**

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# 1996 Pacific Northwest Loads and Resources Study Administrator's Record Of Decision

## I. Introduction

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The 1996 Pacific Northwest Loads and Resources Study (White Book) establishes the Bonneville Power Administration's (BPA) long range planning basis for supplying electric power to BPA customers. The White Book includes Federal system loads and resources and regional loads and resources with detailed technical appendices. This White Book updates the 1995 Pacific Northwest Loads and Resources Study, published in February 1996. The 1996 White Book is being published as a projection of regional and Federal system load and resource capabilities to be used as input to BPA's resource planning process and as a benchmark for annual determinations under BPA's requirements power sales contracts.

Following the past year's execution by BPA's public agency customers of either amendatory agreements to the 1981 power sales contract or new contracts, BPA's firm power requirements obligations have been reduced and this White Book accounts for those reductions. In these amendatory agreements and contracts BPA agreed to permit such customers to diversify or add to the firm resources dedicated to serving their firm loads and purchasing for the rest of their firm load from BPA through 2001. This reduced the total amount of firm power regional loads for which BPA is obligated to deliver firm power to its utility customers under their 1981 metered and computed requirements contracts, as amended.

## II. Statutory Background

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With the passage of the Northwest Power Act in December 1980, Congress directed BPA to assure the Pacific Northwest an adequate, efficient, economic and reliable power supply. *16 U.S.C. 839(2)*. In order to carry out this mandate, BPA was directed by Congress to offer new power sales contracts to its regional firm power customers and to plan and acquire firm resources sufficient to meet these firm power loads. *16 U.S.C. 839e(9)*.

Sections 5(b) and 5(d) of the Northwest Power Act obligate BPA to serve, in accordance with the terms of its contracts, the net firm power load requirements of utilities in the Pacific Northwest, including public bodies, cooperatives, and investor-owned utilities (IOUs), and authorize BPA to serve up to a defined amount of the firm power requirements of its existing direct-service industrial (DSI) customers. *16 U.S.C. 839c(b) and (d)*. Under section 5(b), BPA is to provide firm power from the Federal system to meet firm regional loads of a customer in excess of the firm resources, if any, which the customer has dedicated to serve its own regional firm loads under the terms of its contract with BPA. *16 U.S.C 839c(b)(1)(A) and (B)*. BPA is also to provide electric power for those loads which were served by a customer's dedicated resources if a customer's dedicated resource is no longer available to serve loads due to obsolescence, retirement or loss of the resource, or loss of contract rights.

Customers were required to dedicate any firm resources which they used or had planned to use in the year prior to enactment of the Act on December 5, 1980. However, customers were not required to dedicate other, newly acquired, resources. Because the Northwest Power Act requires that the Administrator meet all of the firm regional peak and energy loads of its utility customers in excess of the customer's firm resources dedicated to serve such loads, BPA must have a high degree of certainty regarding its projected firm load obligations to efficiently and reliably plan the use of its own resources and anticipate any resource additions that may be needed to meet its obligations.

Section 6(a)(2) of the Northwest Power Act obligates BPA to acquire sufficient resources on a planning basis to meet its firm load obligations, including its section 5(b) contract obligations. BPA's obligations to provide firm electric power to its utility customers for their regional firm loads and its contract obligations to provide firm power to its DSI customers comprise the largest portion of BPA's firm obligations. *16 U.S.C. 839c(b); 839c(d)*. BPA's contracts with utility and DSI customers contain provisions which implement the above statutory directives.

### **III. The 1981 Utility Power Sales Contract and the White Book**

#### **A. The White Book**

The White Book provides projections of regional and Federal system loads and resource capabilities that BPA uses to calculate the firm load obligations it must serve over the planning period and those Federal system resources that are or will be available to meet those loads. Technically, it is a loads and resources forecast document derived from regional economic planning models. It incorporates information on forecasted loads and resource capability obtained from (1) public agency and investor-owned utility (IOU) customers through their annual data submittals to the Pacific Northwest Utilities Conference; (2) the Pacific Northwest Coordination Agreement (PNCA) Operating Committee; and (3) analysis of the Federal hydroelectric power system. Verifiable changes to individual utility service obligations, as evidenced by the annual submissions to BPA of a utility Firm Resource Exhibit (FRE) under section 12 of the power sales contract with BPA, are also included. The White Book also serves as the referenced load-resource document under certain BPA contracts with extraregional purchasers.

#### **B. The 1981 Utility Power Sales Contract**

In 1981, BPA and its utility, Federal agency and DSI customers entered into 20-year power sales contracts. Section 5(b)(1) of the Northwest Power Act directed BPA to sell electric power for the firm load requirements under contracts with its public utility, electric cooperative, and IOU customers. *16 U.S.C. 839c(b)(1)*. BPA also entered into requirements power sales contracts with its DSI customers under section 5(d). *16 U.S.C. 839c(d)(1)*.

Certain provisions of the utility power sales contract address BPA's load obligation planning. Sections 10(a) and (d) require BPA and its customers to exchange long-term planning and load information with each other. Customers are to provide BPA with any planned changes in their firm power loads. Section 8 of the contract requires a customer to inform BPA of any new large single loads planned to be served by the customer. Section 5(a) of the contract restates BPA's statutory obligation to plan and acquire sufficient resources in order to meet the firm power load obligations of its customers.

BPA's contractual obligation to provide electric power to serve its customers' loads is not contingent upon any specific action taken by its customers to provide resources.

Section 12 of the utility contract addresses the statutory need for BPA and the customer to identify those firm resources, if any, which the customer will dedicate to serve its firm load for a rolling 7-year period. It also identifies the conditions for adding to, removing, or modifying dedicated firm resources and the terms for notice. These provisions enable both BPA and its customer to know the resources each will use to serve the customer's firm load and their respective service obligations, thus creating certainty for load and resource planning.

Under section 12 of the contract the customer must submit an FRE, which BPA reviews and either changes or accepts. The FRE declares the utility's resources dedicated to serve its regional firm load over the stated 7-year period. The customer must update the declaration and may make deletions or additions in the amounts of firm energy resources the customer will use to serve its firm load in the intervening 6 years and in the seventh year only to the extent such changes are consistent with the terms and notice periods required under section 12.

### **C. BPA and its Public Utility Customers Amend the 1981 Utility Power Sales Contract or Execute a New Contract**

The 1981 utility requirements power sales contracts establish the terms and conditions for BPA's sales of electric power to meet its Pacific Northwest utility customers' firm power loads in excess of their dedicated resources. This contract was negotiated during market circumstances that differ from today's utility environment. In May 1996, in response to requests to provide greater flexibility to add firm resources or purchases, BPA offered its public agency customers a series of amendments to their 1981 power sales contract, or as an alternative, offered to negotiate a new power sales contract. Three forms of amendatory agreements were offered wherein customers could elect to either keep their total requirements service on BPA or add specific amounts of firm resources dedicated to serve a portion of requirements load, reducing an amount of their requirements service and leaving the remainder of it on BPA. BPA also negotiated new requirements power sales contracts with different terms and conditions with those customers who wished to have a larger portion of their firm power load served by dedicated firm non-Federal resources than was available under the amendatory agreements. Finally, some customers elected to continue with their 1981 contracts unamended. All of the agreements—the amendatory agreements, the new contracts, and the unamended 1981 utility power sales contracts—expire September 30, 2001.

BPA's 1996 White Book estimates the change in Federal firm loads and obligations resulting from the amendatory agreements and new contracts and also shows projections of Federal firm regional load obligations and resources for the 10-year period ending September 30, 2006. The firm load obligations projected for the years October 1, 2001, to October 1, 2006, are not based on any current firm contract obligations, but are estimates based on assumptions regarding the amount of load obligation BPA will have after expiration of the above agreements and negotiation of new agreements.

The 1996 Pacific Northwest Loads and Resources Study incorporates the following assumptions:

- ◆ BPA's current utility power sales contracts are re-executed with similar requirements service terms and conditions, and they continue through OY 2006-07, the end of the study period;<sup>1</sup>
- ◆ The total public agency power diversification achieved in OY 2000-01 (1,194 average megawatts) will continue at that same level through OY 2006-07;
- ◆ Total public agency firm resources dedicated to serve firm regional load will continue to be available in OY 2000-01 and through OY 2006-07; and
- ◆ BPA serves all public agency load growth beyond OY 2000-01.<sup>2</sup>

BPA believes these assumptions are based on the best known terms and conditions for its regional obligations at this time and it is reasonable to use them. BPA recognizes that its firm requirements obligation to its public agency customers, under new contracts could range from zero to as much as 5,646 average megawatts in OY 2007 if no public agency diversification occurs after OY 2001. BPA may also serve firm nonrequirements obligations through sales of excess Federal power in the region under new contracts. BPA's firm regional obligations may be a combination of both requirements and excess Federal power in the next contracts. Table R-1, page 127, shows BPA's potential public agency firm obligations using a comparative range of possible requirements service. Under the existing utility power sales contract and with public agency diversification at the 1,194 average megawatt level, BPA's obligation ranges from 4,075 to 4,452 average megawatts over the OY 2001 through OY 2006 period.

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<sup>1</sup> Requirements service provisions are well understood and, for purposes of this study, we continue to use them with the recognition that replacement contracts may modify or alter some of those provisions. It is too speculative to attempt to define in this study what may result from the renegotiation of the power sales contracts with customers. To the extent new terms or provisions for requirements service become known, a later study may make adjustments to the assumptions used here.

<sup>2</sup> This assumption is consistent with the current terms of the power sales contract, under which BPA is the provider for firm load which is not met by dedicated resources. This obligation may change and is proposed to be changed in the next contract, but the form of load growth obligation is not presently known. To the extent the different terms for load growth become known, they will be accounted for in a later study.

**Table R-1**

**Range of Possible BPA Utility Power Sales Contract Obligations  
Beyond OY 2001**

**Energy in Average Megawatts**

<b>OPERATING YEAR <sup>3</sup></b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
<b>MINIMUM BPA PSC OBLIGATION: Assuming No Power Sales Contract <sup>4</sup></b>	0	0	0	0	0	0
<b>1996 WHITE BOOK BPA PSC OBLIGATION: 1981 Amendatory Agreement With Public Agency Diversification <sup>5</sup></b>	4,075	4,155	4,209	4,256	4,370	4,452
<b>MAXIMUM BPA PSC OBLIGATION: 1981 Amendatory Agreement With No Public Agency Diversification <sup>6</sup></b>	5,269	5,249	5,403	5,450	5,564	5,646

#### **IV. Excess Federal Power**

In October 1995, Congress passed the Energy and Water Development Act of 1996 giving BPA new authority to market a class of power denominated "excess Federal power." *P.L. No. 104-46, §508(a) and (b), 109 Stat. 402, 419-420 (1995) (codified at 16 U.S.C. 832m)*. This new authority is intended to ensure continued BPA revenues for BPA's financial obligations including repayment to the Treasury, and to provide BPA with increased flexibility to market Federal power that becomes available due to reductions in BPA's firm obligations to serve regional load and which is "abandoned" by BPA's regional customers. Excess Federal power also includes a calculated amount of Federal power generated as a result of operations on the hydrosystem to benefit fish and wildlife. Excess Federal power represents a new class of firm power service which may be sold for up to 7 years on a more competitive basis. The legislation did not add to the total amount of Federal generating resources but does redefine the terms and conditions under which a portion or all of the surplus Federal power BPA may have available beyond its firm Northwest obligations may be sold in or outside of the region under the new excess Federal power category.

Before making such sales, however, BPA must first make such excess Federal power available for purchase by its Pacific Northwest customers. The amount of power which may

<sup>3</sup> Operating Year (OY) is the 12-month period August 1 through July 31. For example, OY 1997-98 is August 1, 1997, through July 31, 1998.

<sup>4</sup> No BPA public utility power sales contract obligation after OY 2001.

<sup>5</sup> Assumes: (1) BPA obligations to public agencies under the amendatory agreement to the 1981 utility power sales contract continue in OY 2002 and beyond, (2) public agency dedicated resources remain dedicated from OY 2001 through OY 2006, and (3) the same amount of public agency power sales contract diversification achieved in OY 2001—1,194 average megawatts—occurs in OY 2002 and each year thereafter through OY 2006.

<sup>6</sup> Assumes: (1) BPA obligations to its public agency customers under the amendatory agreement to the 1981 utility power sales contract continue in effect in OY 2002 and beyond, (2) public agency dedicated resources remain dedicated from OY 2001 through OY 2006, and (3) no public agency power sales contract diversification occurs.

be sold as excess Federal power by BPA is directly related to BPA's firm load obligations under sections 5(b) and 5(d) of the Northwest Power Act. Therefore, the reduction in BPA's obligations under sections 5(b) and 5(d) resulting from the public agency customers' recent changes to their firm regional load purchase obligations from BPA (sometimes called load diversification) constitutes part of BPA's calculation of the amount of excess Federal power available to BPA for marketing under 16 U.S.C. 832m.<sup>7</sup>


On September 25, 1996, BPA published its implementation policy for sales of excess Federal power in the Federal Register. The policy explains the methodology BPA will use in calculating the amount of excess Federal power, the notices to be provided to Northwest customers, and how sales outside the Northwest region will be conducted. BPA published a Record of Decision addressing numerous issues raised by parties in the public process on the adoption of the excess Federal power policy. This White Book is not a recalculation of or change in BPA's earlier published calculations of the amount of excess Federal power that may be sold by BPA.

However, this White Book does provide a calculation of an amount of firm power in excess of BPA's firm obligations over a 10-year planning period that is expected to be available as surplus firm power under section 5(f) of the Northwest Power Act. This power may be sold as either excess Federal power under P.L. 104-46, consistent with BPA's calculations of excess Federal power, or as surplus power under P.L. 88-552 and section 9(c) of P.L. 96-501 (Northwest Power Act). To the extent that BPA has annual amounts of planned firm power that are surplus to its firm contract obligations, BPA may market all or a portion of that surplus power as excess Federal power. The duration of these sales will be as stated in BPA's Excess Federal Power Policy. For purposes of this White Book, a sale of excess Federal power with delivery occurring for a year or more is considered a firm obligation on BPA and is included as a firm obligation in Federal loads.

#### CONCLUSION:

For the foregoing reasons the methodology and the assumptions are approved.

Issued in Portland, Oregon on April 21, 1997.

  
FOR Randall W. Hardy  
Administrator and  
Chief Executive Officer

<sup>7</sup> As BPA stated in its Excess Federal Power Record of Decision (Sept. 18, 1996), P.L. 104-46 identifies two bases for the calculation of excess Federal power: 1) the amount of power "abandoned" by customers through reductions in their firm obligations under section 5(b) and 5(d) requirements contracts in comparison to a base year, and 2) an amount of excess Federal power which results from changes in hydrosystem operations for the benefit of fish and wildlife. The amount of excess Federal power based on changes in BPA's firm load obligations under its requirements contracts is only one part of the calculation.



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**SECTION X**  
**GLOSSARY AND ACRONYMS**

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## GLOSSARY

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- Average Megawatts** - A unit of electrical consumption or production over a year. It is equivalent to the energy produced by the continuous use of 1 megawatt of capacity served over a period of 1 year. (Equivalent to 8.76 gigawatt hours, 8,760 megawatt hours, or 8,760,000 kilowatt hours.)
- Bonneville Power Administration (BPA)** - BPA is a power marketing agency, responsible for acquiring and delivering sufficient power to meet its contractual obligations to serve the electrical needs of its customers. BPA does not own generating resources.
- Capacity** - The maximum power that an electrical system or machine such as a hydro powered or thermal powered generating plant can produce under specified conditions.
- Capacity Factor** - The ratio of the average load on a machine or piece of equipment over a given period to the maximum power rating of the machine or equipment.
- Cogeneration** - The simultaneous production of electricity and useful heat energy from a fuel source. Often this is accomplished by the recovery of waste energy caused by various industrial and commercial operations. This is typically used for industrial processes or space heating applications.
- Conservation** - Any reduction in electrical power consumption as a result of increases in the efficiency of energy use, production, or distribution.
- Critical Period** - That portion of the historical streamflow record during which the recorded streamflows, combined with all available reservoir storage, produced the least amount of energy.
- Dedicated Resources** - Generating resources owned by a utility and used to serve its firm loads. These resources are declared for a rolling 7-year period in Exhibit I of the utilities' power sales contracts with BPA.
- Direct Service Industries (DSI)** - A group of industrial customers that purchase electric power directly from BPA. Most DSIs are aluminum and other primary metal smelting plants.
- Energy Load** - The demand for power averaged over a specified period of time.
- Federal Columbia River Power System (FCRPS)** - The FCRPS consists of 30 Federal hydroelectric projects constructed and operated by the U.S. Army Corps of Engineers (COE), U.S. Bureau of Reclamation (USBR), plus BPA's transmission facilities.
- Federal System** - The Federal system is a combination of BPA's customer loads and contractual obligations, and resources from which BPA acquires the power it sells. The resources include plants operated by the U.S. Army Corps of Engineers (COE), U.S. Bureau of Reclamation (USBR), and hydroelectric projects owned by the city of Idaho Falls and WPPSS. BPA markets the thermal generation from WNP-2, operated by WPPSS.
- 50-Hour Peak Capacity** - The amount of capacity that can be sustained for 10 hours a day during peak-load hours for a 5-day week.
- Firm Capacity** - Maximum on-peak electrical energy which is considered assurable to the customer to meet all contractual peak load requirements over a defined period.
- Firm Energy** - Electric power which is considered assurable to the customer to meet all contractual energy load requirements over a defined period.

**Fiscal Year** - In this study, fiscal year (FY) is the 12 month period October 1 to September 30. For example FY 1997-98 is October 1, 1997 to September 30, 1998.

**Forced Outage Reserve** - Capacity that is held in reserve, for use in case a generating unit malfunctions.

**Forced Energy Sale (Spill)** - Electrical energy that cannot be accepted into the system and must either be sold or spilled due to constraints and limitations of hydro projects.

**Forebay** - The portion of the reservoir at a hydroelectric plant that is immediately upstream of the generating station.

**Historical Streamflow Record** - The unregulated streamflow database of the 50 years from August 1928 to July 1978.

**Hydroregulation** - A study simulating operation of the Pacific Northwest electric power system that incorporates the historical streamflow record, monthly loads, thermal and other non-hydro resources, hydroelectric plant data for each project, and the constraints limiting each project's operation.

**Interruptible Loads** - Loads that can be interrupted in the event of a power deficiency on the supplying system.

**Load Diversity** - An adjustment applied to peak loads to reflect the fact that all peaking electrical demands do not occur simultaneously across the region.

**Megawatts** - A unit of electrical power equal to 1 million watts or 1,000 kilowatts.

**Model Conservation Standards (MCS)** - A set of energy-efficient building standards for new electrically heated commercial and residential buildings. It also includes standards for residential and commercial buildings that have been changed to electric space heating.

**Nonfirm Energy** - Electrical power produced by the hydro system that is available with water conditions better than those of the critical period without appreciably jeopardizing reservoir refill. It is available in varying amounts depending upon season and weather conditions.

**Nonfirm Energy Loads** - Loads that are served with nonfirm energy whenever it is available.

**Obligation** - Capacity and energy the Federal system is required to provide to public agencies and IOUs under their power sales contracts with BPA.

**Operating Year** - For this study, operating year (OY) is the 12-month period August 1 through July 31. For example, OY 1997-98 is August 1, 1997 through July 31, 1998.

**Peak Load** - The maximum demand for power during a specified period of time.

**PURPA Resources** - Resources declared by utilities according to the Public Utility Regulatory Policies Act of 1978 (Public Law 95-617).

**Region** - The geographic area defined by the Pacific Northwest Electric Power Planning and Conservation Act. It includes Oregon, Washington, Idaho, Montana west of the Continental Divide, portions of Nevada, Utah, and Wyoming that lie within the Columbia River drainage basin, and any rural electric cooperative customer not in the geographic area described above but served by BPA on the effective date of the Northwest Power Planning Act.

**Resource Acquisitions** - Conservation or generating resources acquired in order to meet projected firm energy deficits.

**Spinning Reserves** - Reserve generating capacity which is maintained for immediate response to load variations. This provides a regulating margin for controlling the automatic generation and frequency of power in the Federal system.

**Surplus Firm Capacity** - The maximum amount of assured electrical power above the firm peak loads served by the power system.

**Surplus Firm Energy** - The amount of assured electrical energy above the firm energy loads served by the power system.

**Sustained Peak** - The peaking capacity necessary to sustain a load for a given period of time.

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## ACRONYMS

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<b>aMW</b>	Average megawatt
<b>BPA</b>	Bonneville Power Administration
<b>CDWR</b>	California Department of Water Resources
<b>COE</b>	United States Army Corps of Engineers
<b>CRFA</b>	Columbia River Flow Augmentation
<b>CSPE</b>	Columbia Storage Power Exchange
<b>DOE</b>	United States Department of Energy
<b>DSI</b>	Direct service industry
<b>EIS</b>	Environmental Impact Statement
<b>EPAct</b>	Energy Policy Act of 1992
<b>EWEB</b>	Eugene Water and Electric Board
<b>FCRPS</b>	Federal Columbia River Power System
<b>FERC</b>	Federal Energy Regulatory Commission
<b>FRE</b>	Firm Resource Exhibit
<b>FY</b>	Fiscal Year
<b>ICP</b>	Intercompany Pool (PGE)
<b>IOU</b>	Investor-owned utility
<b>IPC</b>	Idaho Power Company
<b>IPP</b>	Independent power producer
<b>LADWP</b>	Los Angeles Department of Water and Power
<b>MPC</b>	Montana Power Company
<b>M-S-R</b>	M-S-R Public Power Agency, whose members include the Modesto Irrigation District and the cities of Santa Clara and Redding, California
<b>MW</b>	Megawatt
<b>NCPA</b>	Northern California Power Agency
<b>NMFS</b>	National Marine Fisheries Service
<b>NUG</b>	Non-utility generating resource
<b>OY</b>	Operating Year
<b>PGE</b>	Portland General Electric
<b>PG&amp;E</b>	Pacific Gas and Electric Company
<b>PNCA</b>	Pacific Northwest Coordination Agreement
<b>PNUCC</b>	Pacific Northwest Utilities Conference Committee
<b>PP&amp;L</b>	Pacific Power and Light Company
<b>PSP&amp;L</b>	Puget Sound Power and Light Company
<b>PUD</b>	Public Utility District
<b>PURPA</b>	Public Utility Regulatory Policies Act
<b>RCP</b>	Resource Contingency Program
<b>SCE</b>	Southern California Edison Company
<b>SCL</b>	Seattle City Light Company
<b>SDG&amp;E</b>	San Diego Gas and Electric Company
<b>SMUD</b>	Sacramento Municipal Utility District

<b>SOR</b>	System Operation Review
<b>SOS</b>	System Operating Strategy
<b>TPU</b>	Tacoma Public Utilities
<b>UPC</b>	Utah Power Company
<b>USBR</b>	United States Bureau of Reclamation
<b>WAPA</b>	Western Area Power Administration
<b>WNP</b>	Washington Nuclear Power
<b>WPPSS</b>	Washington Public Power Supply System
<b>WWP</b>	Washington Water Power