

**2007 Supplemental Wholesale Power Rate Case
Final Proposal**

FY 2009 LOAD RESOURCE STUDY

September 2008

WP-07-FS-BPA-09



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**LOAD RESOURCE STUDY
TABLE OF CONTENTS**

	Page
COMMONLY USED ACRONYMS	iii
1. INTRODUCTION	1
2. LOAD RESOURCE STUDY	1
2.1 Overview of Methodology	1
2.1.1 Federal System Load Obligations	2
2.1.2 Federal System Resources	3
2.1.3 Federal System Load Resource Balance	3
2.1.4 Pacific Northwest Regional Hydro Generation	4
2.1.5 Estimate of Section 4(h)(10)(C) Credit	4
2.2 Federal System Load Obligations Forecast	5
2.2.1 Overview	5
2.2.2 Public Agency Total Retail Load and Firm Requirement PSC Obligation Forecasts	6
2.2.3 Investor-Owned Utilities Sales Forecast	9
2.2.4 Direct Service Industry Sales Forecast	9
2.2.5 Other BPA Contract Obligations	11
2.3 Federal System Resource Forecast	12
2.3.1 Overview	12
2.3.2 Federal System Hydro Generation	12
2.3.2.1 Regulated Hydro Generation Forecast	13
2.3.2.2 Independent Hydro Generation Forecast	16
2.3.3 Other Federal System Generation Forecast	17
2.3.4 Other Federal System Contract Purchases	19
2.4 Federal System Load Resource Balance	20
2.4.1 Overview	20
2.4.2 Federal System Energy Load Resource Balance	20
2.5 Regional Hydro Resources	21
2.5.1 Overview	21
2.5.2 PNW Regional 50 Water Year Hydro Generation	22
2.6 Estimate of Section 4(h)(10)(C) Credit	22
2.6.1 Overview	22
2.6.2 Estimated Power Purchase Megawatts Eligible for Section 4(h)(10)(C) Credit	23

TABLES

Table 2.2.2.1 PF Sales Forecast by Product	8
Table 2.4.2.1 Loads and Resources – Federal System	21

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COMMONLY USED ACRONYMS

AC	Alternating Current
AEP	American Electric Power Company, Inc.
AER	Actual Energy Regulation
AFUDC	Allowance for Funds Used During Construction
AGC	Automatic Generation Control
aMW	Average Megawatt
Alcoa	Alcoa Inc.
AMNR	Accumulated Modified Net Revenues
ANR	Accumulated Net Revenues
AOP	Assured Operating Plan
ASC	Average System Cost
Avista	Avista Corporation
BASC	BPA Average System Cost
BiOp	Biological Opinion
BPA	Bonneville Power Administration
Btu	British thermal unit
C&R Discount	Conservation and Renewables Discount
CAISO	California Independent System Operator
CBFWA	Columbia Basin Fish & Wildlife Authority
CCCT	Combined-Cycle Combustion Turbine
CEC	California Energy Commission
CFAC	Columbia Falls Aluminum Company
Cfs	Cubic feet per second
CGS	Columbia Generating Station
COB	California-Oregon Border
COE	U.S. Army Corps of Engineers
Con Aug	Conservation Augmentation
ConMod	Conservation Modernization Program
COSA	Cost of Service Analysis
Council	Northwest Power Planning and Conservation Council
CP	Coincidental Peak
CRAC	Cost Recovery Adjustment Clause
CRC	Conservation Rate Credit
CRFM	Columbia River Fish Mitigation
CRITFC	Columbia River Inter-Tribal Fish Commission
CT	Combustion Turbine
CY	Calendar Year (Jan-Dec)
DC	Direct Current
DDC	Dividend Distribution Clause
DJ	Dow Jones
DOE	Department of Energy
DOP	Debt Optimization Program
DROD	Draft Record of Decision
DSI	Direct Service Industrial Customer or Direct Service Industry

ECC	Energy Content Curve
EIA	Energy Information Administration
EIS	Environmental Impact Statement
EN	Energy Northwest, Inc.
Energy Northwest, Inc.	Formerly Washington Public Power Supply System (Nuclear)
EPA	Environmental Protection Agency
EPP	Environmentally Preferred Power
EQR	Electric Quarterly Report
ESA	Endangered Species Act
EWEB	Eugene Water & Electric Board
F&O	Financial and Operating Reports
FB CRAC	Financial-Based Cost Recovery Adjustment Clause
FBS	Federal Base System
FCCF	Fish Cost Contingency Fund
FCRPS	Federal Columbia River Power System
FCRTS	Federal Columbia River Transmission System
FERC	Federal Energy Regulatory Commission
FERC SR	Federal Energy Regulatory Commission Special Rule
FELCC	Firm Energy Load Carrying Capability
Fifth Power Plan	Council's Fifth Northwest Conservation and Electric Power Plan
FPA	Federal Power Act
FPS	Firm Power Products and Services (rate)
FY	Fiscal Year (Oct-Sep)
GAAP	Generally Accepted Accounting Principles
GCPs	General Contract Provisions
GEP	Green Energy Premium
GI	Generation Integration
GSR	Generation Supplied Reactive and Voltage Control
GRI	Gas Research Institute
GRSPs	General Rate Schedule Provisions
GSP	Generation System Peak
GSU	Generator Step-Up Transformers
GTA	General Transfer Agreement
GWh	Gigawatthour
HLH	Heavy Load Hour
HOSS	Hourly Operating and Scheduling Simulator
ICNU	Industrial Customers of Northwest Utilities
ICUA	Idaho Consumer-Owned Utilities Association, Inc.
IOU	Investor-Owned Utility
IP	Industrial Firm Power (rate)
IP TAC	Industrial Firm Power Targeted Adjustment Charge
IPC	Idaho Power Company
ISO	Independent System Operator
JP	Joint Party

JP1	Cowlitz County Public Utility District, Northwest Requirements Utilities and Members, Western Public Agencies Group and Members, Public Power Council, Industrial Customers of Northwest Utilities
JP2	Grant County Public Utility District No. 2, Benton County Public Utility District, Eugene Water & Electric Board, Franklin County Public Utility District No. 1, Pacific Northwest Generating Cooperative and Members, Pend Oreille County Public Utility District No. 1, Seattle City Light, City of Tacoma, Western Public Agencies Group and Members, Western Public Agencies Group and Members(Grays Harbor)
JP3	Benton County Public Utility District, Eugene Water & Electric Board, Franklin County Public Utility District No. 1, Grant County Public Utilities District No. 2, Pacific Northwest Generating Cooperative and Members, Pend Oreille County Public Utility District No. 1, Seattle City Light, Western Public Agencies Group and Members (Grays Harbor)
JP4	Cowlitz County Public Utility District, Eugene Water & Electric Board, Pacific Northwest Generating Cooperative and Members, Pend Oreille County Public Utility District No. 1, Seattle City Light, City of Tacoma, Grant County Public Utility District No. 2
JP5	Benton County Public Utility District, Cowlitz County Public Utility District, Eugene Water & Electric Board, Franklin County Public Utility District No. 1, Grant County Public Utilities District No. 2, Northwest Requirements Utilities and Members, Pacific Northwest Generating Cooperative and Members, Pend Oreille County Public Utility District No. 1, Seattle City Light, City of Tacoma, specified members of WA ¹
JP6	Avista Corporation, Idaho Power Corporation, PacifiCorp, Portland General Electric Company, Puget Sound Energy, Inc.
JP7	NONE
JP8	Northwest Energy Coalition, Save Our Wild Salmon
JP9	Alcoa, Inc., Industrial Customers of Northwest Utilities, Public Power Council, Northwest Requirements Utilities and Members, Pacific Northwest Generating Cooperative and Members, PacifiCorp, Western Public Agencies Group and Members, Avista Corporation, Portland General Electric Company

¹ The members of Western Public Agencies Group and Members (WA) that are participating in the JP5 designation include: Benton REA, the cities of Ellensburg and Milton, the towns of Eatonville and Steilacoom, Washington, Alder Mutual Light Co., Elmhurst Mutual Power and Light Co., Lakeview Light and Power Co., Parkland Light and Water Co., Peninsula Light Co., the Public Utility Districts of Grays Harbor, Kittitas, Lewis and Mason Counties, the Public Utility District No. 3 of Mason County, and the Public Utility District No. 2 of Pacific County, Washington.

JP10	Alcoa, Inc., Cowlitz County Public Utility District, Industrial Customers of Northwest Utilities
JP11	Cowlitz County Public Utility District, Eugene Water & Electric Board, Grant County Public Utilities District No. 2, Pacific Northwest Generating Cooperative and Members, Pend Oreille County Public Utility District No. 1, Seattle City Light, City of Tacoma
JP12	Alcoa, Inc., Industrial Customers of Northwest Utilities, Public Power Council, Western Public Agencies Group and Members, Northwest Requirements Utilities and Members, Pacific Northwest Generating Cooperative and Members
JP13	Columbia River Inter-Tribal Fish Commission, Confederated Tribes and Bands of the Yakama Nation, Nez Perce Tribe
JP14	Benton County Public Utility District, Cowlitz County Public Utility District, Eugene Water & Electric Board, Franklin County Public Utility District No. 1, Grant County Public Utilities District No. 2, Industrial Customers of Northwest Utilities, Northwest Requirements Utilities and Members , Public Power Council, Seattle City Light, City of Tacoma, Western Public Agencies Group and Members, Springfield Utility Board, Pacific Northwest Generating Cooperative and Members
JP15	Calpine Corporation, Northwest Independent Power Producers Coalition, PPM Energy, Inc., TransAlta Centralia Generation, LLC
kAf	Thousand Acre Feet
kcfs	kilo (thousands) of cubic feet per second
ksfd	thousand second foot day
kV	Kilovolt (1000 volts)
kW	Kilowatt (1000 watts)
kWh	Kilowatt-hour
LB CRAC	Load-Based Cost Recovery Adjustment Clause
LCP	Least-Cost Plan
LDD	Low Density Discount
LLH	Light Load Hour
LOLP	Loss of Load Probability
m/kWh	Mills per kilowatt-hour
MAC	Market Access Coalition Group
MAf	Million Acre Feet
MCA	Marginal Cost Analysis
Mid-C	Mid-Columbia
MIP	Minimum Irrigation Pool
MMBtu	Million British Thermal Units
MNR	Modified Net Revenues
MOA	Memorandum of Agreement
MOP	Minimum Operating Pool

MORC	Minimum Operating Reliability Criteria
MT	Market Transmission (rate)
MVA _r	Mega Volt Ampere Reactive
MW	Megawatt (1 million watts)
MWh	Megawatt-hour
NCD	Non-coincidental Demand
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Council
NF	Nonfirm Energy (rate)
NFB Adjustment	National Marine Fisheries Service (NMFS) Federal Columbia River Power System (FCRPS) Biological Opinion (BiOp) Adjustment
NLSL	New Large Single Load
NMFS	National Marine Fisheries Service
NOAA Fisheries	National Oceanographic and Atmospheric Administration Fisheries
NOB	Nevada-Oregon Border
NORM	Non-Operating Risk Model
Northwest Power Act	Pacific Northwest Electric Power Planning and Conservation Act
NPA	Northwest Power Act
NPCC	Northwest Power and Conservation Council
NPV	Net Present Value
NR	New Resource
NR (rate)	New Resource Firm Power (rate)
NRU	Northwest Requirements Utilities
NTSA	Non-Treaty Storage Agreement
NUG	Non-Utility Generation
NWEC	Northwest Energy Coalition
NWPP	Northwest Power Pool
NWPPC	Northwest Power Planning Council
OATT	Open Access Transmission Tariff
O&M	Operation and Maintenance
OMB	Office of Management and Budget
OPUC	Oregon Public Utility Commission
ORC	Operating Reserves Credit
OY	Operating Year (Aug-Jul)
PA	Public Agency
PacifiCorp	PacifiCorp
PBL	Power Business Line
PDP	Proportional Draft Points
PF	Priority Firm Power (rate)
PFR	Power Function Review
PGE	Portland General Electric Company
PGP	Public Generating Pool
PMA	Power Marketing Agencies

PNCA	Pacific Northwest Coordination Agreement
PNGC	Pacific Northwest Generating Cooperative
PNRR	Planned Net Revenues for Risk
PNW	Pacific Northwest
POD	Point of Delivery
POI	Point of Integration/Point of Interconnection
POM	Point of Metering
PPC	Public Power Council
PPLM	PP&L Montana, LLC
Project Act	Bonneville Project Act
PSA	Power Sales Agreement
PSC	Power Sales Contract
PSE	Puget Sound Energy
PSW	Pacific Southwest
PTP	Point-to-Point Transmission
PUD	Public or People's Utility District
RAM	Rate Analysis Model (computer model)
RAS	Remedial Action Scheme
Reclamation	Bureau of Reclamation
Renewable Northwest	Renewable Northwest Project
RD	Regional Dialogue
REP	Residential Exchange Program
RFP	Request for Proposal
RiskMod	Risk Analysis Model (computer model)
RiskSim	Risk Simulation Model
RL	Residential Load (rate)
RMS	Remote Metering System
ROD	Record of Decision
RPSA	Residential Purchase and Sale Agreement
RTO	Regional Transmission Operator
SCCT	Single-Cycle Combustion Turbine
Slice	Slice of the System (product)
SME	Subject Matter Expert
SN CRAC	Safety-Net Cost Recovery Adjustment Clause
SOS	Save Our Wild Salmon
SUB	Springfield Utility Board
SUMY	Stepped-Up Multiyear
SWPA	Southwestern Power Administration
TAC	Targeted Adjustment Charge
TBL	Transmission Business Line
Tcf	Trillion Cubic Feet
TPP	Treasury Payment Probability
Transmission System Act	Federal Columbia River Transmission System Act
TRL	Total Retail Load
Tribes	Columbia River Inter-Tribal Fish Commission, Nez Perce, Yakama Nation, collectively

UAI Charge	Unauthorized Increase Charge
UAMPS	Utah Associated Municipal Power Systems
UDC	Utility Distribution Company
UP&L	Utah Power & Light
URC	Upper Rule Curve
USBR	U.S. Bureau of Reclamation
USFWS	U.S. Fish and Wildlife Service
VOR	Value of Reserves
WAPA	Western Area Power Administration
WECC	Western Electricity Coordinating Council (formally called WSCC)
WMG&T	Western Montana Electric Generating and Transmission Cooperative
WPAG	Western Public Agencies Group
WPRDS	Wholesale Power Rate Development Study
WSCC	Western Systems Coordination Council (now WECC)
WSPP	Western Systems Power Pool
WUTC	Washington Utilities and Transportation Commission
Yakama	Confederated Tribes and Bands of the Yakama Nation

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1 **1. INTRODUCTION**

2 The FY 2009 Load Resource Study (Study) represents the compilation of the load and contract
3 obligations, contract purchases, and resource data necessary for developing BPA's wholesale
4 power rates for FY 2009. The results of this Study are used to: (1) provide data to determine
5 resource costs for the FY 2009 Revenue Requirement Study, WP-07-FS-BPA-10; (2) provide
6 regional hydro data for use in the secondary revenue forecast for the FY 2009 Market Price
7 Forecast Study, WP-07-FS-BPA-11; (3) provide load and resource data for use in the FY 2009
8 Risk Analysis Study, WP-07-FS-BPA-12; and (4) provide data to derive billing determinants for
9 the revenue forecast in the FY 2009 Wholesale Power Rate Development Study,
10 WP-07-FS-BPA-13.

11
12 This Study provides a synopsis of BPA's load resource analysis, and illustrates how each
13 component of the analysis is completed, how components relate to each other, and how each
14 component fits into the rate development process. Details and results supporting this Study are
15 contained in the FY 2009 Load Resource Study Documentation (Documentation),
16 WP-07-FS-BPA-09A.

17 **2. LOAD RESOURCE STUDY**

18 **2.1 Overview of Methodology**

19 This Study includes the following interrelated components: (1) a forecast of the Federal system
20 load obligations comprised of BPA's firm requirements power sales contract (PSC) obligations
21 and other additional BPA contract obligations; (2) Federal system resource estimates that include
22 the output from hydro and other generating resources purchased by BPA and other BPA contract

1 purchases; (3) the Federal system load resource balance that relates Federal system sales, loads,
2 and contract obligations to the Federal system generating resources and contract purchases;
3 (4) total Pacific Northwest (PNW) regional hydro resources; and (5) estimated power purchases,
4 in megawatts (MW), that are eligible for section 4(h)(10)(C) credit.

6 **2.1.1 Federal System Load Obligations**

7 The Federal system load obligation forecast estimates the firm energy load that BPA expects to
8 serve during the FY 2009 period under firm requirements PSCs and other BPA contract
9 obligations.

10
11 The Federal system firm requirements PSC forecast is composed of load obligation forecasts for
12 public body and cooperative utilities and Federal agencies (collectively called “Public
13 Agencies”), direct service industrial customers (DSIs), investor-owned utilities (IOUs), and other
14 BPA PSC obligations, such as the U.S. Bureau of Reclamation (Reclamation). These obligations
15 are forecast monthly over the period for the generation system peak (GSP) in MW, energy in
16 average megawatts (aMW), heavy load hour energy in megawatthours (HLH MWh), and light
17 load hour energy in megawatthours (LLH MWh). This forecast is provided to the FY 2009
18 Risk Analysis Study, WP-07-FS-BPA-12.

19
20 BPA also has other contract obligations that are comprised of contracts other than those under
21 BPA’s firm requirements PSC obligations. These other contract obligations include contract
22 sales to utilities, marketers, and power commitments under the Columbia River Treaty. These
23 contract obligations are estimated for monthly energy in aMW, HLH MWh, and LLH MWh.
24 These contract estimates are provided to the FY 2009 Risk Analysis Study, WP-07-FS-BPA-12.

1 **2.1.2 Federal System Resources**

2 The forecast of Federal system resources includes hydro and non-hydro generation estimates plus
3 power deliveries from BPA contract purchases and exchanges.

4
5 BPA markets power from generating resources that include Federal and non-Federal hydro
6 projects, other contracted generating projects, and other BPA hydro-related contracts. The
7 combined output from these projects represents most of the Federal system's firm generating
8 resource capability. The Federal system hydro generation is forecast monthly for energy in
9 average megawatts, and is input to the FY 2009 Risk Analysis Study, WP-07-FS-BPA-12. The
10 Federal system hydro energy estimate is apportioned to HLH and LLH in the FY 2009 Risk
11 Analysis Study, WP-07-FS-BPA-12. Other non-hydro Federal generation is estimated in this
12 Study for monthly energy in aMW, HLH MWh, and LLH MWh and used as input to the
13 FY 2009 Risk Analysis Study, WP-07-FS-BPA-12.

14
15 In addition, BPA has other Federal system resources that are comprised of contract purchases
16 and exchanges, return energy associated with BPA's capacity contracts, return and exchange
17 energy associated with capacity-for-energy exchanges, power purchases, and power
18 commitments delivered to BPA under the Columbia River Treaty. These contract purchases are
19 estimated for monthly energy in aMW, HLH MWh, and LLH MWh. BPA's current resource
20 estimates are incorporated in this Study and are detailed in the Documentation,
21 WP-07-FS-BPA-09A. This data is provided to the FY 2009 Risk Analysis Study,
22 WP-07-FS-BPA-12.

23
24 **2.1.3 Federal System Load Resource Balance**

25 The Federal load resource balance completes BPA's load and resource picture by comparing
26 Federal system load obligations to Federal system resource output for FY 2009. Federal system

1 load obligations include BPA's firm requirement PSC obligations and other Federal contract
2 obligations. Federal system resources include BPA's regulated and independent hydro resources
3 under 1937 critical water conditions, power deliveries from contract purchases and exchanges,
4 and other non-hydro and non-utility generating (NUG) projects. The result of the Federal system
5 resources less loads yields BPA's estimated Federal system monthly firm energy surplus or
6 deficit. The Federal system surplus/deficit is provided for monthly energy in average megawatts
7 to the FY 2009 Risk Analysis Study, WP-07-FS-BPA-12.

8 9 **2.1.4 Pacific Northwest Regional Hydro Generation**

10 Pacific Northwest (PNW) regional hydro resource generation estimates are used for the secondary
11 revenue analysis in the FY 2009 Market Price Forecast Study, WP-07-FS-BPA-11. The regional hydro
12 data includes all PNW regional hydro, plus NUG hydro for FY 2009. The larger set of regional
13 regulated and independent hydro generation is estimated for each of the 50 historical water years of
14 record (October 1928 through September 1978). The regional NUG hydro generation forecast does not
15 vary by water year. The forecast of PNW regional hydro generation is presented for monthly energy in
16 average megawatts for each of the 50 water years.

17 18 **2.1.5 Estimate of Section 4(h)(10)(C) Credit**

19 BPA funds actions to protect, mitigate, and enhance fish and wildlife affected by Federal hydro
20 operations, as directed by the Pacific Northwest Electric Power Planning and Conservation Act,
21 16 U.S.C. §§ 839-839h (Northwest Power Act). These program costs are then allocated to hydro
22 project purposes, both for power and non-power uses. The Northwest Power Act directs BPA to
23 annually recoup its funding of non-power purposes via credits, known as "section 4(h)(10)(C)
24 credits" in reference to the authorizing statutory provisions, so that ratepayers pay only their
25 power share of the fish and wildlife costs. 16 U.S.C. § 839b(h)(10)(C). BPA uses a specific

1 methodology for annually determining the amount of section 4(h)(10)(C) credits that may be
2 available, further discussed in the FY 2009 Revenue Requirement Study, WP-07-FS-BPA-10.

3 4 **2.2 Federal System Load Obligations Forecast**

5 6 **2.2.1 Overview**

7 The Federal System Load Obligations forecast includes BPA's projected firm requirement PSC
8 obligations to Public Agencies, IOUs, and DSIs; contractual obligations to Reclamation;
9 contractual obligations outside the Pacific Northwest region (exports); and contractual
10 obligations within the Pacific Northwest region (intra-regional transfers-out). The total Federal
11 system load obligation is provided to the FY 2009 Risk Analysis Study, WP-07-FS-BPA-12.

12 Summaries of BPA's forecast of the Public Agency, IOU, and DSI firm requirements PSC
13 obligations are presented in Section 2.2.2 of this Study. BPA's estimates of Federal system PSC
14 obligations and other contract sales components for FY 2009 are summarized in the
15 Documentation, WP-07-FS-BPA-09A, Section 2.3, Table 2.3.1, *Loads and Resources – Federal*
16 *System*.

17
18 The policies and procedures guiding BPA's firm energy sales in the FY 2009 rate period are
19 presented in BPA's Power Subscription Strategy Administrator's Record of Decision
20 (Subscription Strategy) published December 1998, and BPA's Policy for Power Supply Role for
21 FY 2007-2011, Administrator's Record of Decision (Near-Term ROD) published February 2005.
22 The Subscription Strategy and Near-Term ROD provide the basis for the forecasts of Public
23 Agency, IOU, and DSI firm requirements PSC obligations presented in this Study.

1 **2.2.2 Public Agency Total Retail Load and Firm Requirement PSC Obligation**
2 **Forecasts**

3 For FY 2009, the total retail load and firm requirement PSC obligation forecast was not changed
4 from the WP-07 Supplemental Initial Proposal, WP-07-E-BPA-45. The methods used in
5 producing the total retail load and firm requirement PSC obligation forecasts are as follows.

6
7 The Public Agencies' monthly energy firm requirements PSC obligation forecast for utilities that
8 purchased full or partial service products is based on the sum of the utility-specific firm
9 requirements PSC obligation forecasts, which are customarily produced by BPA analysts in the
10 following manner. The monthly total retail load forecasts for the Public Agencies are produced
11 for each utility using linear trend models based on historical annual energy total retail loads. To
12 provide monthly total retail load estimates, each utility's annual total retail load projections are
13 prorated using monthly utility-specific historical relationships. Using the monthly total retail
14 load forecast as a base, each utility's monthly peak total retail load is estimated using utility-
15 specific average historical load factor relationships of energy to peak. Additionally, the monthly
16 utility energy estimates are further split into HLH and LLH segments using historical
17 relationships.

18 BPA's firm requirement PSC obligation is calculated for each utility by subtracting its dedicated
19 resource generation and contract purchase estimates from its total retail load forecast. The
20 forecast of each utility's firm requirement PSC obligation provides the basis for the Full and
21 Partial products sales projections incorporated in BPA ratemaking. For those utilities purchasing
22 Block and Slice Block products, their firm requirement PSC forecast includes the contracted
23 amount split into appropriate HLH and LLH segments. For customers purchasing Slice Block,
24 the PSC obligation estimates were reduced by non-Priority Firm agreements such as the
25 Irrigation Rate Mitigation product.

1 Slice is a PSC product that provides firm requirements power and secondary energy to a
2 customer based on its net requirements load for the 10-year period October 1, 2001, through
3 September 30, 2011. It differs from traditional power products in that it is comprised of the
4 following components: (1) firm power deliveries based on the level and shape of the Slice
5 resource stack; and (2) surplus power deliveries on a monthly or seasonal basis as they occur.
6 The Slice product is combined with a sale of a fixed amount of power sold as a Block product.
7 Slice contracts for power deliveries are based on 22.63 percent of the Slice resource stack. The
8 Slice resource stack is comprised of a set of specific Federal resources and contract purchases,
9 net of a specific set of Federal obligations. This particular set of resources and obligations is
10 used only for the Slice product and is not the same as the Federal system resource stack.

11
12 Since the Slice resource stack incorporates forecasts of specific Federal system hydro and other
13 generating resources, and contract purchases, less contract obligations, any changes to those
14 components will change the Slice resource stack. For this Study, BPA updated the regulated
15 hydro generation forecast (Section 2.3.2.1, *Regulated Hydro Generation Forecast*) and
16 incorporated generating estimates for the Bonneville Fishway (Section 2.3.2.2, *Independent*
17 *Hydro Generation Forecast*), necessitating updates to the Slice resource stack and BPA's Slice
18 obligation. For FY 2009, these generating resource updates increased the Slice resource stack by
19 103 aMW and accordingly increased BPA's Slice obligation by 23 aMW under 1937 critical
20 water conditions.

21
22 The aggregate Priority Firm (PF) sales forecast is comprised of the sum of projected PSC
23 obligations for customers purchasing Subscription products. The PF sales forecast was reduced
24 to reflect conservation savings from bilateral contracts. The conservation savings from bilateral
25 contracts is forecast to be a 20 aMW load reduction beginning in FY 2007, with incremental load
26 reductions of 20 aMW per year thereafter, through FY 2013. The conservation savings forecast

was not changed from the WP-07 Supplemental Initial Proposal, WP-07-E-BPA-45. For FY 2009, the PF sales forecast is reduced by a cumulative 60 aMW for estimated conservation savings from bilateral contracts forecast. Table 2.2.2.1, below, presents the FY 2009 PF sales by product and total PF sales adjusted for conservation savings.

Table 2.2.2.1
PF Sales Forecast by Product
Energy in aMW

	Full	Partial	Block	Slice Block	Slice	TOTAL	Adjusted Total
FY2009	2,110	1,555	616	1,157	1,633	7,071	7,011

BPA also has other PSC obligations that are not subject to the PF rate schedule. BPA's pre-Subscription contract obligations are not subject to the PF rate schedule and therefore are not included in the PF sales forecasts presented above in Table 2.2.2.1. These contracts do represent BPA PSC obligations and are removed from BPA's resource inventories.

The monthly sales forecasts for energy in aMW, HLH MWh, LLH MWh, and peak demand for the Full Service, Partial Service, Slice/Block, and Block customer groups are presented in the Documentation, WP-07-FS-BPA-09A, section 2.2, Table 2.2.1, *PF Full and Partial Service Sales Forecast* and Table 2.2.2, *Block/Slice Block Sales Forecast*. The customers purchasing each product (Full Service, Partial Service, Slice/Block, and Block) are listed in the Documentation, WP-07-FS-BPA-09A, section 2.2, Table 2.2.3, *Full Service Customers*, Table 2.2.4, *Partial Service Customers*, Table 2.2.5, *Slice/Slice Block Customers*, and Table 2.2.6, *PF Block Service Customers*.

These Federal system firm requirements PSC obligations are summarized in the Documentation, WP-07-FS-BPA-09A, section 2.3, Table 2.3.1, *Loads and Resources – Federal System*, (*Federal*

1 *Agencies 2002 PSC), (USBR 2002 PSC), (NGP 2002 PSC), and (GPU 2002 PSC).* These
2 Federal system Slice resource obligations are summarized in the Documentation,
3 WP-07-FS-BPA-09A, section 2.3, Tables 2.3.1 through 2.3.3, *Loads and Resources – Federal*
4 *System, (NGP Slice Sale) and (GPU Slice Sale).* These PSC obligation forecast estimates are
5 used as inputs for the FY 2009 Risk Analysis Study, WP-07-FS-BPA-12.
6

7 **2.2.3 Investor-Owned Utilities Sales Forecast**

8 Based on BPA’s current PSCs with the six regional IOUs, BPA forecasts no net requirements
9 PSC deliveries to regional IOUs for FY 2009. This forecast was not changed from the
10 WP-07 Supplemental Initial Proposal, WP-07-E-BPA-45. The six IOUs in the PNW region are:
11 Avista Corporation, Idaho Power Company, NorthWestern Energy Division of NorthWestern
12 Corporation (formerly Montana Power Company), PacifiCorp, Portland General Electric
13 Company, and Puget Sound Energy, Inc. BPA will meet any net requirements service of IOUs at
14 the NR-07 rate. This Study does not contain any New Resource (NR) sales to the IOUs.
15

16 For FY 2009, the IOU benefits for this Study were calculated using the Average System Cost
17 Methodology described in the FY 2009 Wholesale Power Rate Development Study,
18 WP-07-FS-BPA-13, chapter 8, Average System Cost Forecast.
19

20 **2.2.4 Direct Service Industry Sales Forecast**

21 BPA’s PSC obligations to the DSIs were not changed from the WP-07 Supplemental Initial
22 Proposal, WP-07-E-BPA-45, and follow the policies adopted in BPA’s “*Service to Direct*
23 *Service Industrial (DSI) Customers for Fiscal Years 2007-2011, Administrator’s Record of*
24 *Decision,*” dated June 30, 2005, and the “*Supplement to Administrator’s Record of Decision on*
25 *Bonneville Power Administration’s Service to Direct Service Industrial (DSI) Customers for*

1 *Fiscal Years 2007-2011,*” dated May 31, 2006, (Supplemental DSI ROD). Key points in this
2 Record of Decision are:

- 3 1) The Northwest Power Act permits BPA to offer contracts to meet the DSI loads,
4 but there is no requirement that it do so;
- 5 2) There is a high likelihood that service benefit contracts with DSI smelters will be
6 monetized; and
- 7 3) This Study models the benefit of BPA’s only non-aluminum DSI customer, Port
8 Townsend Paper Corporation, as a BPA surplus power sale delivery of 17 aMW
9 to Clallam County PUD for Port Townsend Paper Corporation service through
10 September 30, 2011. This delivery is shown as an intra-regional transfer from
11 BPA to Clallam County PUD and is not included as a DSI PSC load obligation.

12
13 BPA will provide financial benefits to the DSI aluminum smelters for up to 560 aMW for market
14 purchases such that the DSI’s resultant power cost is not less than the PF rate. This assumption
15 is consistent with the Supplemental DSI ROD.

16
17 The Clallam County PUD contract for Port Townsend Paper Corporation is included as a Federal
18 system contract obligation. This contract is included monthly for energy in average megawatts
19 in the Documentation, WP-07-FS-BPA-09A, section 2.3, Table 2.3.1, *Loads and Resources –*
20 *Federal System, (Intra-Regional Transfers (Out))*. The details of this delivery are presented
21 monthly for energy in aMW, HLH MWh, and LLH MWh in the Documentation,
22 WP-07-FS-BPA-09A, sections 2.4 through 2.6, Table A-16, *Intra-Regional Transfers (Out)* for
23 the rate period.

1 **2.2.5 Other BPA Contract Obligations**

2 BPA provides Federal power to customers under a variety of contract arrangements not included
3 in the Public Agency, IOU, and DSI PSC load obligation forecasts. These contracts are
4 categorized as: (1) power sales; (2) power or energy exchanges; (3) capacity sales or
5 capacity-for-energy exchanges; (4) power payments for services; and (5) power commitments
6 under the Columbia River Treaty. These arrangements are collectively called “Other Contract
7 Obligations,” and each can have differing rate structures.

8
9 BPA’s Other Contract Obligations are assumed to be served by the Federal system firm
10 resources regardless of weather, water, or economic conditions. These Other Contract
11 Obligations are modeled individually and are specified or estimated for monthly energy in aMW,
12 HLH MWh, and LLH MWh.

13
14 BPA’s Other Contract Obligations for FY 2009 were updated to include several new contracts
15 that increased BPA’s obligations annually by 49 aMW from the WP-07 Supplemental Initial
16 Proposal, WP-07-E-BPA-45.

17
18 Other Contract Obligations are summarized for monthly energy in average megawatts in the
19 Documentation, WP-07-FS-BPA-09A, section 2.3, Table 2.3.1, *Loads and Resources – Federal*
20 *System, (Exports) and (Intra-Regional Transfers (Out))* and are detailed for monthly energy
21 in aMW, HLH MWh, and LLH MWh in the Documentation, WP-07-FS-BPA-09A, sections 2.4
22 through 2.6, Table A-2, *Federal Exports* and Table A-16, *Federal Intra-Regional Transfers*
23 *(Out)* for the rate period. These estimates are provided to the FY 2009 Risk Analysis Study,
24 WP-07-FS-BPA-12.

1 **2.3 Federal System Resource Forecast**

2
3 **2.3.1 Overview**

4 Federal system resources are comprised of Federal system regulated and independent hydro
5 projects, non-Federally owned independent hydro projects, other non-Federally owned resources
6 (renewable, thermal, wind, and NUG projects), and other Federal contract purchases.

7
8 The Federal system regulated hydro resource estimates are derived from BPA’s hydro regulation
9 model (HYDSIM), which estimates project generation for each of the 50 water years.

10 Generation estimates for Federal system independent hydro projects are not provided by
11 HYDSIM; rather, they are provided by each project’s owner for the 50 water years. Other
12 Federal system resources include non-Federally owned projects from which BPA has acquired
13 the output. These generation estimates are provided either by BPA or by the project’s owners.
14 In addition, BPA has signed contracts that are considered Federal system resources. These
15 contracts are comprised of the following: (1) contract purchases and exchanges; (2) return
16 energy associated with BPA’s capacity contracts; (3) return and exchange energy associated with
17 BPA’s capacity-for-energy exchanges; and (4) power commitments delivered to BPA under the
18 Columbia River Treaty. Detailed Federal system generating resource and contract purchase
19 estimates used in this Study are shown in the Documentation, WP-07-FS-BPA-09A, sections 2.4
20 through 2.6. These estimates are also provided to the FY 2009 Risk Analysis Study,
21 WP-07-FS-BPA-12.

22
23 **2.3.2 Federal System Hydro Generation**

24 Federal system hydro resources are comprised of the generation from regulated and independent
25 hydro projects. The process used for estimating the generation of regulated hydro projects is

1 detailed in Section 2.3.2.1, *Regulated Hydro Generation Forecast*. The methodology for
2 forecasting the generation of independent hydro projects is described in Section 2.3.2.2,
3 *Independent Hydro Generation Forecast*. The Federal system also purchases the output from
4 several small NUG hydro projects. The generation estimates from the NUG hydro projects are
5 provided by the projects' owners and do not vary by water year. The NUG hydro projects are
6 described in Section 2.3.3, *Other Federal System Generation Forecast*.

8 **2.3.2.1 Regulated Hydro Generation Forecast**

9 BPA markets the generation from the Federal system regulated hydro projects. The projects
10 themselves are owned and operated by either the Bureau of Reclamation (Reclamation) or the
11 U.S. Army Corps of Engineers (COE).

12
13 BPA used the HYDSIM model to estimate the Federal system energy production that can be
14 expected from regulated hydroelectric power projects in the PNW Columbia River Basin. The
15 hydro energy production is maximized by coordinating hydro operations while continuing to
16 meet power and non-power requirements for the 50 historical water years of record
17 (October 1928 through September 1978). Physical characteristics of each hydro project are
18 provided by annual Pacific Northwest Coordination Agreement (PNCA) data submittals from
19 regional utilities and government agencies involved in the coordination and operation of regional
20 hydro projects. For FY 2009, the hydro regulation study presented in this Study was updated
21 from the WP-07 Supplemental Initial Proposal, WP-07-E-BPA-45. Details of the process of
22 producing the regulated hydro generation estimates for use in this Study are shown in Section
23 2.3.2.1.1, *PNCA and Fish Requirements*, and Section 2.3.2.1.2, *Modified Streamflows*.

1 Additionally, BPA estimates expected hydro improvement generation increases due to:
2 (1) hydro optimization; (2) turbine runner replacement; and (3) reliability increases through
3 BPA's capital improvement programs at specific Federal regulated hydro projects. These
4 generation increases are not captured in the hydro regulation studies. Hydro improvement
5 generation increases are calculated by multiplying the project's generation estimate by a hydro
6 improvement generation factor specific to that project. The hydro improvement forecast varies
7 by fiscal year and water year. For FY 2009, the hydro improvement estimates were updated
8 from the WP-07 Supplemental Initial Proposal, WP-07-E-BPA-45.

9
10 The regulated hydro generation forecast for FY 2009 increased annually by 82 aMW under
11 1937 critical water conditions from the WP-07 Supplemental Initial Proposal, WP-07-E-BPA-45.

12
13 The Federal system regulated hydro generation for this Study is summarized in the
14 Documentation, WP-07-FS-BPA-09A, section 2.3, Table 2.3.1, *Loads and Resources – Federal*
15 *System (Regulated Hydro)*. The monthly energy in average megawatts for the regulated hydro
16 projects is detailed in the Documentation, WP-07-FS-BPA-09A, section 2.4, Table A-3, *Federal*
17 *Regulated Hydro Projects*. The combined Federal system regulated and independent hydro
18 energy is provided to the FY 2009 Risk Analysis Study, WP-07-FS-BPA-12, which apportions
19 the Federal system hydro energy estimate into HLH and LLH.

20 21 **2.3.2.1.1 PNCA and Fish Requirements**

22 The BPA HYDSIM studies incorporate the power and non-power operating requirements BPA
23 expects to be effective during the rate period, including those described by the National
24 Oceanographic and Atmospheric Administration Fisheries (NOAA Fisheries) 2008 Biological
25 Opinion (BiOp), the United States Fish and Wildlife Service 2006 (USFWS) BiOp, operations

1 described in the Northwest Power and Conservation Council's Fish and Wildlife Program, and
2 other fish mitigation measures. Each hydro regulation study specifies particular hydroelectric
3 project operations for fish, such as seasonal flow augmentation, minimum flow levels for fish,
4 spill for juvenile fish passage, reservoir drawdown limitations, and turbine operation efficiency
5 requirements.

6
7 Additionally, HYDSIM uses hydro plant operating characteristics in combination with the power
8 and non-power requirements to simulate the coordinated operation of the hydro system. These
9 operating requirements include, but are not limited to, storage content limits determined by rule
10 curves; maximum project draft rates determined by each project; and flow and spill objectives
11 determined by the BiOps, as provided by the 2008 PNCA data submittals. Deviations from the
12 PNCA data submittals occur when specific operating decisions are made subsequent to the date
13 of submission in order to implement the BiOps.

14
15 Specific HYDSIM hydro regulation study assumptions are detailed for FY 2009 in the
16 Documentation, WP-07-FS-BPA-09A, section 2.9, HYDSIM Hydro Regulation Study
17 Assumptions, Table 2.9.1, *HYDSIM Assumptions for FY 2009*.

18 19 **2.3.2.1.2 Modified Streamflows**

20 The HYDSIM model used streamflows from historical years as the basis for estimating power
21 production of the hydroelectric system. The Actual Energy Regulation (AER) and Operational
22 HYDSIM studies were developed using the 2000 level of modified historical streamflows.
23 Historic streamflows are modified to account for the changes over time of the effects of
24 irrigation and consumptive diversion demand, return flow, and changes in contents of upstream
25 reservoirs and lakes. These modified streamflows were developed under a BPA contract funded

1 by the PNCA parties. The modified streamflows are also adjusted to include updated estimates
2 of Grand Coulee irrigation pumping and resulting downstream return flows, using data provided
3 by Reclamation in its 2008 PNCA data submittal. Grand Coulee pumping provides water to the
4 Columbia Basin Project for irrigation.

5
6 There are two modes of operation for the HYDSIM hydro regulation studies: refill and
7 continuous. Both modes estimate the energy production of the hydro system; however, each
8 treats a project's initial reservoir conditions differently. Continuous hydro regulation studies
9 operate from one water year to another, using the previous water year's final reservoir elevations
10 as the initial reservoir elevations for the next water year. Refill hydro regulation studies operate
11 each water year, independent of all other water years, using the reservoir's initial storage
12 elevation for each water year. Continuous studies are typically used in BPA mid- to long-range
13 planning to provide expected generation estimates for future years. Refill studies are generally
14 incorporated in short-term planning when information on initial reservoir elevations is known.
15 Hydro regulation studies used in this Study were run in continuous mode.

17 **2.3.2.2 Independent Hydro Generation Forecast**

18 Independent hydro projects are dams that are not modeled or regulated in the HYDSIM model.
19 BPA markets the power from independent hydro projects that are owned and operated by
20 Reclamation, the COE, and/or other project owners. Federal system independent hydro
21 generation estimates are provided by individual project owners for the 50 water years
22 (August 1928 through July 1978). Although the independent hydro generation forecasts are
23 submitted to BPA in operating years, they are presented in fiscal-year format for consistency
24 within this Study. These include power purchased from hydro projects owned by Lewis County
25 Public Utility District (Cowlitz Falls), Mission Valley (Big Creek), and Idaho Falls Power (Idaho

1 Falls-Upper Plant, Idaho Falls-City Plant, and Idaho Falls-Lower Plant).

2
3 For FY 2009, the independent hydro generation estimates for this Study were updated to include
4 the Bonneville Fishway. In the WP-07 Supplemental Initial Proposal, WP-07-E-BPA-45,
5 Bonneville Fishway generation estimates were assumed to be included in the total Bonneville
6 dam generation. BPA discovered that this generation was not included, and added the
7 Bonneville Fishway project generation estimates to the independent hydro generation forecast.
8 The inclusion of this project increased Federal system independent hydro generation estimates by
9 21 aMW annually under 1937 critical water conditions.

10
11 The Federal system independent hydro generation energy estimates used in this Study are
12 summarized in the Documentation, WP-07-FS-BPA-09A, section 2.3, Table 2.3.1, *Loads and*
13 *Resources – Federal System (Independent Hydro)*. The monthly energy in average megawatts
14 for the independent hydro projects is detailed in the Documentation, WP-07-FS-BPA-09A,
15 section 2.4, Table A-4, *Federal Independent Hydro Projects*. The Federal system regulated and
16 independent hydro generation energy is combined and passed to the FY 2009 Risk Analysis
17 Study, WP-07-FS-BPA-12, where the HLH/LLH splits for the Federal system regulated and
18 independent hydro generation are calculated.

19 20 **2.3.3 Other Federal System Generation Forecast**

21 Other Federal system generation includes the purchased output from non-Federally owned
22 projects and project generation directly assigned to BPA.

23
24 For FY 2009, the other Federal system generation projections were not changed from the
25 WP-07 Supplemental Initial Proposal, WP-07-E-BPA-45. For this Study, however, BPA did

1 change the table presentation for BPA-acquired wind generation (Federal system shares of Foote
2 Creek 1, 2, and 4 wind projects; Stateline wind project, Condon wind project, and
3 Klondike I and III wind projects) from Table A-24, *Federal Non-Utility Generating Resources*
4 *by Project*, to Table A-8, *Federal Renewable Resources* from the WP-07 Supplemental Initial
5 Proposal, WP-07-E-BPA-45. This change did not affect Federal system generation totals and
6 allows for the consistent treatment and presentation of renewable resource generation whether
7 owned by BPA, regional utilities, or independent power producers.

8
9 The expected other Federal system generation estimates are detailed for monthly energy
10 in aMW, HLH MWh, and LLH MWh and include the following: (1) Georgia Pacific Wauna
11 cogeneration and wind (Federal system shares of Foote Creek 1, 2, and 4 wind projects, Stateline
12 wind project, Condon wind project, and Klondike I and III wind projects (these projects are
13 detailed in the Documentation, WP-07-FS-BPA-09A, sections 2.4 through 2.6, Table A-8,
14 *Federal Renewable Resources*); (2) CGS, which incorporates facility improvements and a
15 two-year refueling cycle (CGS details are shown in the Documentation, WP-07-FS-BPA-09A,
16 sections 2.4 through 2.6, Table A-10, *Federal Large Thermal*); and (3) other projects which
17 include small hydro (Elwha Hydro through January 2, 2012, and Glines Hydro through
18 February 13, 2012, and Dworshak/Clearwater Small Hydropower) and a small amount of solar
19 resources (Ashland Solar Project and White Bluffs Solar). These projects are detailed in the
20 Documentation, WP-07-FS-BPA-09A, sections 2.4 through 2.6, Table A-24, *Federal Non-Utility*
21 *Generating Resources by Project*.

22
23 The other Federal system generation estimates are summarized for monthly energy in average
24 megawatts, in the Documentation, WP-07-FS-BPA-09A, Tables 2.3.1, *Loads and Resources –*
25 *Federal System, (Renewables), (Large Thermal), and (Non-Utility Generation)*.

1 **2.3.4 Other Federal System Contract Purchases**

2 BPA purchases power from sellers under a variety of contractual arrangements to meet Federal
3 load obligations. The contracts are categorized as: (1) power purchases; (2) power or energy
4 exchange purchases; (3) capacity sales or capacity-for-energy exchange contracts; and (4) power
5 purchased or assigned to BPA under the Columbia River Treaty. These arrangements are
6 collectively called “Other Contract Purchases.” BPA’s Other Contract Purchases are considered
7 firm resources that are delivered to the Federal system regardless of weather, water, or economic
8 conditions.

9
10 For FY 2009, BPA’s Other Contract Purchases were updated to include 12.7 aMW of BPA
11 trading floor contract purchases from the WP-07 Supplemental Initial Proposal,
12 WP-07-E-BPA-45.

13
14 This Study continues to include for FY 2009 BPA’s purchase of 13.4 aMW under the Excess
15 Requirements Energy (ERE) from some Slice customers in BPA’s Other Contract Purchases.
16 This contract purchase resulted from a Letter Agreement that settled the implementation of
17 Exhibit N of the Block and Slice Power Sales Agreement for FYs 2008-2011. This contract
18 expires September 30, 2011.

19
20 BPA’s expected Other Contract Purchases are summarized for monthly energy in average
21 megawatts, in the Documentation, WP-07-FS-BPA-09A, section 2.3, Table 2.3.1, *Loads and*
22 *Resources – Federal System, (Imports), (Non-Federal Canadian Entitlement Return for*
23 *Canada), and (Intra-Regional Transfers (In))*. The monthly energy in aMW, HLH MWh, and
24 LLH MWh is detailed in the Documentation, WP-07-FS-BPA-09A, sections 2.4 through 2.6,
25 Table A-5, *Federal Imports*, Table A-15, *Canadian Entitlement Return for Canada*, and Table

1 A-16, *Federal Intra-Regional Transfers (In)* for the rate period. This data is provided to the
2 FY 2009 Risk Analysis Study, WP-FS-BPA-12.

3 4 **2.4 Federal System Load Resource Balance**

5 6 **2.4.1 Overview**

7 The Federal system load resource balance combines the supporting loads, contracts and
8 resources data used in this Study. The load resource balance compiles the monthly energy
9 amounts of BPA's resources, which include hydro, non-hydro resources, and contract purchases;
10 less BPA's load obligations, which are comprised of BPA's PSC obligations and Other Contract
11 Obligations. This determines BPA's monthly and annual energy load resource balance. If
12 BPA's resources are greater than load obligations under 1937 critical water conditions, BPA has
13 firm surplus energy. Conversely, if BPA's resources are less than load obligations, BPA can
14 purchase power or otherwise secure resources to meet Federal system energy deficits.

15 16 **2.4.2 Federal System Energy Load Resource Balance**

17 Table 2.4.2.1 shows that for FY 2009, the Federal system is expected to be in firm energy load
18 resource balance, under 1937 critical water conditions. This includes forecasted annual
19 augmentation purchases of 299 aMW. FY 2009 includes several previously discussed contract
20 obligations, contract purchases, and resource updates that were incorporated in this Study.

Table 2.4.2.1
Loads and Resources - Federal System
Federal Firm Energy Surplus/Deficit
Including Estimated Augmentation Purchases
Under 1937 Critical Water Conditions

Energy in aMW	FY 2009
Loads	
Firm Obligations	8,550
Resources	
Resources less Transmission Losses	8,251
Augmentation Purchases	299
Net Total Resources	8,550
Surplus/Deficit	
Firm Surplus/Deficit	0

The components of the Federal system load resource balance are shown in the Documentation, WP-07-FS-BPA-09A, section 2.3, Table 2.3.1, *Loads and Resources – Federal System, (Total Firm Surplus/Deficit)*. Specific augmentation purchase estimates are detailed in the Documentation, WP-07-FS-BPA-09A, section 2.3, Table 2.3.1, *Loads and Resources – Federal System (Augmentation Purchases)*. The supporting data for the Federal system hydro resources, non-hydro resources, and contracts is shown in tables in the Documentation, WP-07-FS-BPA-09A, sections 2.4 through 2.6. The Federal load resource balance and supporting tables are input into the FY 2009 Risk Analysis Study, WP-07-FS-BPA-12.

2.5 Regional Hydro Resources

2.5.1 Overview

This Study produced total PNW regional hydro resource estimates for FY 2009 to provide input into the AURORA Model for the FY 2009 Market Price Forecast Study, WP-07-FS-BPA-11.

2.5.2 PNW Regional 50 Water Year Hydro Generation

PNW regional hydro resource estimates are one of the inputs into the AURORA Model and are comprised of generation forecasts of the regulated and independent hydro, plus non-utility hydro generation. Regulated hydro generation estimates for this Study were developed, by month, for each of the 50 water years of record (October 1928 through September 1978) using HYDSIM. Independent hydro generation estimates were provided by the project owners for the 50 water years (August 1928 through July 1978). The independent hydro data was formatted in fiscal years to be consistent within the Study. Generation estimates for the NUG hydro projects are provided by the individual project owners and do not vary by water year. The regional hydro project resource estimates for FY 2009 were updated from the WP-07 Supplemental Initial Proposal, WP-07-E-BPA-45, incorporating changes in the power and non-power requirements as described in Section 2.3.2, *Federal System Hydro Generation*.

For FY 2009, the regional regulated, independent, and NUG hydro generation estimates are summarized for the 50 water years, and are shown in the Documentation, WP-07-FS-BPA-09A, section 2.7, *Total PNW Regional Hydro Resources*, Table 2.7.1, *FY 2009 Total PNW Regional Hydro*.

2.6 Estimate of Section 4(h)(10)(C) Credit

2.6.1 Overview

The Northwest Power Act directs BPA to make expenditures to protect, mitigate, and enhance fish and wildlife affected by the development and operation of Federal hydroelectric projects in the Columbia River Basin and its tributaries in a manner consistent with the Power Plan and Fish and Wildlife Program developed by the Council and other purposes of the Northwest Power Act. BPA recovers, through rates, the power costs for the Federal dams from which BPA markets

1 power. However, BPA ratepayers are not required to pay for costs allocated to non-power uses
2 of the dams. These non-power uses include flood control, irrigation, recreation, and fish and
3 wildlife. The Northwest Power Act provides a methodology for BPA to annually recoup the
4 portion of costs associated with fish measures that should be allocated to other non-power uses
5 of the dams via section 4(h)(10)(C) credits against BPA's Treasury payment. There are three
6 types of section 4(h)(10)(C) credits:

- 7 (1) Direct fish and wildlife program expenditures;
- 8 (2) Capital expenditures for fish and wildlife; and
- 9 (3) Replacement power purchase expenditures resulting from changes in hydro
10 system operations to benefit fish and wildlife.

11 The non-power purpose portion of these costs is currently calculated at 22.3 percent. In this
12 Study, the estimated non-power portion of the section 4(h)(10)(C) credit is included as BPA
13 revenue. The calculation of the replacement power purchase expenditures resulting from
14 changes in hydro system operations to benefit fish and wildlife are described in Section 2.6.2.

16 **2.6.2 Estimated Power Purchase Megawatts Eligible for Section 4(h)(10)(C) Credit**

17 BPA receives a section 4(h)(10)(C) credit for any portion of additional power purchases it must
18 make to implement fish and wildlife actions. This is done by comparing power purchase
19 estimates between two HYDSIM hydro regulation studies. The first hydro regulation study,
20 termed "With Fish," models hydro system operations using current requirements for fish
21 mitigation and wildlife enhancement for each of the 50 historical water years of record
22 (October 1928 through September 1978). The second hydro regulation study, called "Without
23 Fish," models the hydro system assuming no operational changes were made to benefit fish and
24 wildlife using the same 50 water years. BPA receives a section 4(h)(10)(C) credit for a portion
25 of additional power purchases it must make in order to implement the "With Fish" alternative as

1 compared to the “Without Fish” alternative. For FY 2009, the section 4(h)(10)(C) credit
2 calculations were changed from the WP-07 Supplemental Initial Proposal, WP-07-E-BPA-45,
3 incorporating updated hydro generation estimates described in Section 2.3.2, *Federal System*
4 *Hydro Generation*.

5
6 A fundamental principle of the section 4(h)(10)(C) credit is that it should not be affected by
7 BPA’s marketing decisions. In order for BPA’s surplus/deficit situation to not be a function of
8 BPA marketing decisions, BPA uses the load that could have been served with certainty under
9 the “Without Fish” measure operations under the worst energy-producing water condition
10 (1937 critical water conditions). The load BPA can serve with certainty under the worst energy-
11 producing conditions is also known as the Firm Energy Load Carrying Capability (FELCC) of
12 the hydro system in the Pacific Northwest Coordination Agreement planning process. Therefore,
13 it is also the amount of firm load that BPA would have been entitled to sell and is used as a
14 surrogate for load in the section 4(h)(10)(C) power purchases analysis. The Federal load less
15 generation produces Federal surplus/deficit energy amounts under the “Without Fish” and “With
16 Fish” alternatives. Energy deficits result in power purchases. The instances where power
17 purchases are increased from the “Without Fish” alternative in the “With Fish” alternative result
18 in the additional power purchases available for section 4(h)(10)(C) credit.

19
20 BPA’s period-by-period surplus/deficit situation using the FELCC load obligation assumption
21 for each of the 50 water year streamflow scenarios in the “Without Fish” hydro study was
22 compared to BPA’s surplus/deficit situation using the “With Fish” hydro study. The six possible
23 scenarios for each period and water condition are as follows:

- 24 (1) “Without Fish” study is deficit and “With Fish” study is more deficit:
25 Leads to more purchases in the “With Fish” study.

- 1 (2) “Without Fish” study is deficit and “With Fish” study is less deficit:
2 Leads to fewer purchases in the “With Fish” study.
- 3 (3) “Without Fish” study is surplus and “With Fish” study is more surplus:
4 Leads to more revenues in the “With Fish” study.
- 5 (4) “Without Fish” study is surplus and “With Fish” study is less surplus:
6 Leads to fewer revenues in the “With Fish” study.
- 7 (5) “Without Fish” study is surplus and “With Fish” study is deficit:
8 Leads to fewer revenues and more purchases in the “With Fish” study.
- 9 (6) “Without Fish” study is deficit and “With Fish” study is surplus:
10 Leads to fewer purchases and more revenues in the “With Fish” study.

11 Scenarios 1, 2, 5, and 6 result in changing the amount of expected power purchases between the
12 “Without Fish” and “With Fish” hydro study alternatives. The monthly increases and decreases
13 in energy purchase amounts, in average megawatts, between these hydro studies are calculated
14 for each monthly period and water condition. They are shown in the Documentation,
15 WP-07-FS-BPA-09A, section 2.8, *Estimated Purchase MW Eligible For 4(h)(10)C Credit*,
16 Table 2.8.1, *4(h)(10)(C) Power Purchase Amounts*. These amounts are used as inputs to the
17 FY 2009 Risk Analysis Study, WP-07-FS-BPA-12, where the AURORA market prices from the
18 2009 Market Power Study, WP-07-FS-BPA-11, are applied to the monthly power purchase
19 amounts for each of the 50 water years to calculate the monthly power purchase amounts in
20 dollars. The monthly power purchase amounts are summed for each water year to get an annual
21 total. The average dollar amount of the annual totals for each of the 50 water years is considered
22 the section 4(h)(10)(C) credit for Federal hydro system fish operations.

23

