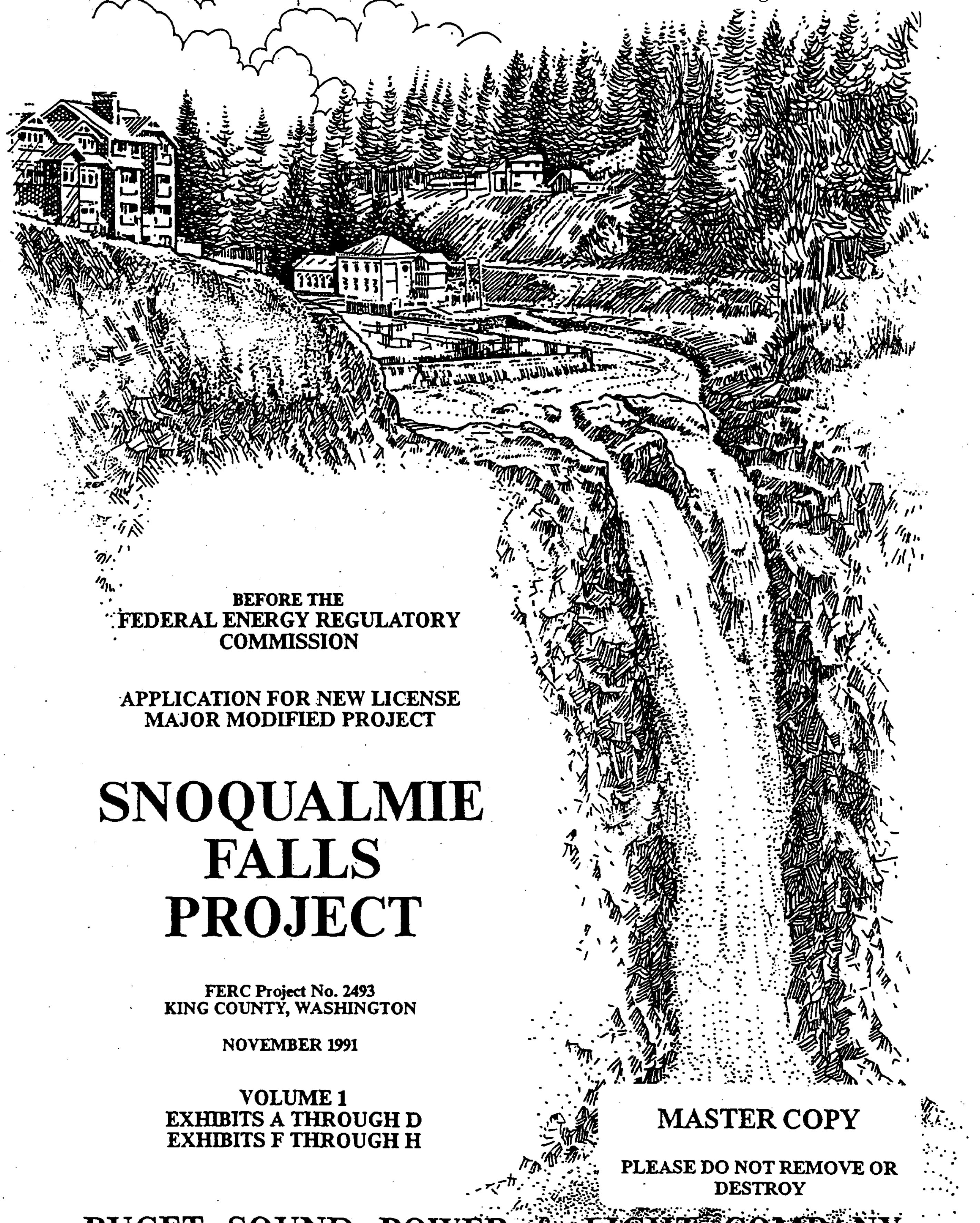
EXHIBIT NO. ___(EMM-20)
DOCKET NO. ____________
2005 POWER COST ONLY RATE CASE
WITNESS: ERIC M. MARKELL

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PUGET SOUND ENERGY, INC.,** **Respondent.**	**Docket No. UE-_______**

NINETEENTH EXHIBIT TO THE PREFILED DIRECT TESTIMONY OF
ERIC M. MARKELL (NONCONFIDENTIAL)
ON BEHALF OF PUGET SOUND ENERGY, INC.

JUNE 7, 2005



BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

APPLICATION FOR NEW LICENSE
MAJOR MODIFIED PROJECT

SNOQUALMIE FALLS PROJECT

FERC Project No. 2493
KING COUNTY, WASHINGTON

NOVEMBER 1991

VOLUME 1
EXHIBITS A THROUGH D
EXHIBITS F THROUGH H

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PUGET SOUND POWER & LIGHT COMPANY
BELLEVUE, WASHINGTON

PUGET POWER

November 25, 1991

Ms. Lois Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street N.E.
Washington, D.C. 20426

**Re: Puget Sound Power & Light Company
Application for a New License for the
Snoqualmie Falls Hydroelectric Project
FERC Project No. 2493**

Dear Ms. Cashell:

Enclosed for filing pursuant to 18 C.F.R. § 16.10(f) are the original and five copies of Volumes 1 through 5 (containing the Initial Statement and Exhibits A-H) of Puget Sound Power & Light Company's (Puget Power's) Application for New License for the Snoqualmie Falls Hydroelectric Project, FERC No. 2493. As specified in the regulations, I also certify that five copies of Volumes 1 through 5 are being hand delivered to the Director, Division of Project Review, Office of Hydropower Licensing, and one copy is being mailed to each of the following:

Mr. Arthur C. Martin
Regional Director
Federal Energy Regulatory Commission
Portland Regional Office
1120 SW Fifth Ave, Suite 1340
Portland, OR 97204

Office of the Secretary
U.S. Department of the Interior
1842 C Street, N.W.
Washington, D.C. 20240

Mr. Dean Bibles
State Director
U.S. Bureau of Land Management
P.O. Box 2965
Portland, OR 97208

[07772-0103/BA913220.025]

SNOQUALMIE FALLS PROJECT

FERC NO. 2493

APPLICATION FOR NEW LICENSE

VOLUME 1

EXHIBITS

A Through D
F Through H

NOVEMBER 1991

Puget Sound Power & Light Company
Bellevue, Washington

EXHIBIT D

PROJECT COSTS AND FINANCING

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EXHIBIT D

PROJECT COSTS AND FINANCING

1.0 ESTIMATED COSTS OF PROPOSED FACILITIES

1.1 LAND AND WATER RIGHTS

There will be no significant expenditure for acquisition of additional land or water rights.

1.2 DIRECT CONSTRUCTION COSTS

The direct construction cost for the proposed modifications and new facilities is estimated to be $ 46,553,000. The cost estimate is based on the 1991 price level and is summarized in Table D-1.

1.2.1 Total Capital Costs

The total capital cost for construction is estimated at $ 81,958,000. This total includes the direct costs presented in Exhibit D (Section 1.2), indirect costs, Puget Power overheads and Allowance for Funds Used During Construction (AFUDC). Attachment D-1 details the calculation of operation and maintenance and continued capital improvements. This attachment also details the capital cost of the existing Project and the proposed capital improvements. Total Project cost includes O&M, existing Project, and proposed improvements. All costs are presented in terms of present value in 1996 dollars (the base year for financing). The total Project cost is $144,724,000. This equates to a levelized power cost for the entire Project (based on proposed generation estimates presented in Table B-9) of approximately 40.3 mills/kWh. Puget's nominal levelized avoided cost (see Exhibit D, Section 4.3) is estimated at 87.2 mills/kWh for an equivalent amount of generation.

An estimate of the power cost of the increased generation was completed as a means of optimizing Project capacity based on the avoided cost model (see Appendix 2B, Comparison Between Avoided Cost and Project Cost). This ensures that the proposed incremental block of generation (see Table B-9) available with the new facilities is also cost effective in terms of total benefits and total costs. Attachment D-2 details the assessment of costs associated with the increased generation.

Costs of incremental power generation do not include proposed recreation facilities or diversion dam improvements. Further assumptions are that the upgrades to Units 1 and 2 at Plant 2 and replacement of Unit 5 in Plant 1 will take place as necessary improvements for continued reliable service.

The total construction costs (direct costs + indirect costs + Puget overhead + AFUDC) for incremental power generation are $42,513,000, escalated to the year of expenditure (1996). Levelizing this total at Puget's levelized fixed charge rate produces an annual cost of $7,347,000 over the life of the Project. Based on the incremental generation of 97,200 MWh, the cost of increased generation is approximately 76 mills/kWh. When operation and maintenance and continued capital improvement estimates (see Attachment D-1) are added to this, the total is approximately 85 mills/kWh.

TABLE D-1
PUGET SOUND POWER AND LIGHT COMPANY
SNOQUALMIE FALLS HYDROELECTRIC PROJECT

ESTIMATED COSTS OF PROPOSED MODIFICATIONS AND NEW FACILITIES

FERC Acct No.	Description		Amount
	HYDRAULIC PRODUCTION PLANT		
331	Structures and Improvements		$907,000
	Recreation (331.2)		$1,926,000
332	Reservoirs, Dams and Waterways		$19,984,000
	Recreation (332.2)		$866,000
333	Turbines and Generators		$15,763,000
334	Accessory Electrical Equipment		$1,119,000
335	Miscellaneous Mechanical Equipment		$580,000
336	Roads, Railroads and Bridges		$4,000
	TRANSMISSION PLANT		
353	Station Equipment		$720,000
	GENERAL PLANT		
390	Structures and Improvements		$1,036,000
397	Communication Equipment		$120,000
	SUBTOTAL DIRECT COSTS		$43,025,000
	Sales Tax	8.2%	$3,528,000
	TOTAL DIRECT COSTS		$46,553,000
	Engineering	15%	$6,983,000
	Administrative	5%	$2,328,000
	SUBTOTAL		$55,864,000
	Puget Overhead	4.5%	$2,514,000
	SUBTOTAL		$58,378,000
	AFUDC	10%	$5,838,000
	TOTAL COST ($ 1991)		$64,216,000
	ESCALATED TOTAL COST ($1996)	5% PER ANNUM	$81,958,000

1.2.2 Contingencies

The contingencies for this Project range between 20% and 40% of the direct construction costs and are included as part of the total in Exhibit D, Section 1.2. The level of contingency is specific to the design of each individual component of the proposed development.

1.3 INDIRECT CONSTRUCTION COSTS

Indirect construction costs include such subheadings as Engineering and Administration. The combined total of indirect costs is estimated at 20% of the direct construction costs (the total for each item is shown in Table D-1).

1.3.1 Puget Power Overheads

An internal construction overhead total is applied to all capital projects. This total for the Snoqualmie Falls Project is estimated at 4.5% of the total direct and indirect construction costs (see Table D-1).

1.4 INTEREST DURING CONSTRUCTION

The value of AFUDC for this Project is estimated at 10% of the total of all direct costs, indirect costs and Puget overheads.

2.0 PROJECT TAKEOVER VALUE

2.1 FAIR VALUE

The value of the Project to Puget Power is best evaluated in terms of the long-term costs to replace the electric power generated at the Project. Because much of the original cost of the existing Project has long since been depreciated, and because the Project has low operation and maintenance costs, the cost of the Project power is much lower than Puget Power's alternatives for replacing it.

The estimated present value of the cost of Project power versus replacement power costs is shown in Table D-2. The details of these calculations are included as Appendix 2B, Comparison Between Avoided Cost and Project Cost.

Table D-2

Power Cost Impact of Losing Snoqualmie Falls Project License

Present Value in 1996 ($1000)

Replacement Costs (Appendix 2B)	$313,447
Project Costs (Attachment D-1)	144,724

The replacement power cost estimate is based on the Company's latest avoided cost estimate (see Appendix 2A, Puget Power's 1991 Avoided Cost Filing with WUTC). Like the Project cost estimates, the avoided cost for Project power was evaluated over a

40-year period and converted to a present value in 1996 at the same discount rate. The replacement cost estimate is based on available energy from the proposed new facilities detailed in Exhibit A.

2.2 NET INVESTMENT

Puget Power's net investment in the Project as of December 31, 1990, is set forth in Table D-3.

Table D-3

Original Cost and Net Investment, Snoqualmie Falls Project

Balances as of 12-31-90	Book Cost	Accumulated Provision For Amortization or Depreciation	Book Value
Plant 1			
Intangible	41,094.48	(32,875.46)	8,219.02
Hydraulic Production			
Land	31,259.77	0.00	31,259.77
Other	3,491,454.18	(1,026,699.65)	2,464,754.53
Transmission	434,457.05	(245,377.07)	189,079.98
	3,998,265.48	(1,304,952.18)	2,693,313.30
Plant 2			
Intangible	41,094.48	(32,875.46)	8,219.03
Hydraulic Production			
Land	0.00	0.00	0.00
Other	3,543,858.25	(1,171,812.04)	2,372,046.21
Transmission	496,309.01	(149,946.00)	346,363.01
	4,081,261.74	(1,354,633.50)	2,726,628.25
TOTAL SNOQ. PROJECT PLANT	8,079,527.22	(2,659,585.68)	5,419,941.55

2.3 SEVERANCE DAMAGES

Although generation from the Project is particularly valuable to the Company because of its location in the heart of the Company's service territory (see Exhibit H, Section 2.4), a dollar value for severance damages to the Company resulting from a takeover is difficult to quantify, but it is real and significant.

3.0 ANNUAL COSTS

The total capital cost for the proposed facilities to be constructed at the Project is estimated at $81,958,000. This estimate includes costs inflated to the year of expenditure and AFUDC. Construction is expected to occur in the years 1994 through 1996, with improvements to Plants 1 and 2 entering ratebase at the end of 1996.

This investment is expected to be financed according to Puget Power's capital structure and cost rates. Table D-4 illustrates the estimated average cost of capital over the construction period:

Table D-4

Average Cost of Capital Over Construction Period

	Capital Structure	Marginal Cost	Weighted Forecasted Cost Rate
Short-Term Debt	4.4%	7.49%	0.33%
Long-Term Debt	46.4%	9.05%	4.20%
Preferred Equity	7.7%	8.84%	0.68%
Common Equity	41.5%	12.52%	5.20%
Estimated Cost of Capital	100.0%		10.41%

The average annual cost of power is calculated by determining the levelized annual cost, using the "Project Cost" from Table D-2, and then dividing by Project generation. This results in a levelized annual cost of 40.3 mills per kilowatt hour. This cost includes depreciation, state and federal taxes, operating and maintenance expenses, and capital costs. It also takes into account the reduced generation resulting from the proposed base daytime flow of 100 cfs and nighttime flow of 25 cfs.

4.0 VALUE OF PROJECT POWER

4.1 AVOIDED COST FORECAST

The value of the power generation from the Snoqualmie Falls Project was evaluated based upon the Company's latest avoided cost filing submitted to the Washington Utilities and Transportation Commission in May 1991 (see Appendix 2A). This forecast was developed following the Company's latest least cost plan and is consistent with the assumptions and results of the least cost planning process. However, where the least cost plan looks at a wide range of futures and develops various resource plans to address uncertainties, the avoided cost forecast requires that a single point estimate be used. The avoided cost forecast from May 1991 falls within the range of costs identified in the least cost plan.

The avoided cost forecast is divided into seasonal and firm and nonfirm energy components based upon the Company's power supply situation. Temperature dependent electricity uses, especially heating applications, create higher loads during the winter. During the summer, the relatively mild temperatures experienced in the Northwest cause air conditioning to have little overall impact on loads. Winter generation is therefore more valuable to Puget Power, and the avoided cost forecast reflects this seasonal differentiation.

Generation in the Pacific Northwest region is primarily hydroelectric. Because the annual output from hydroelectric facilities can vary widely with weather conditions, regional utilities have developed a methodology to determine the amount of energy from a hydroelectric project that should be considered available on a firm or reliable basis. The methodology involves reviewing historical streamflow data for regional projects to determine over which period the entire system would have produced the least amount of electric power. Then the amount that an individual project would have produced over that period is evaluated as firm production, and the amount on average over that level is considered nonfirm. Because nonfirm power cannot be relied upon to be available under all weather conditions, it is assigned a lower value than firm energy. Puget Power bases the nonfirm avoided cost upon the expected variable resource operating costs and spot market purchases to serve the top 100 MW of load.

The firm avoided cost forecast was derived using three distinct time periods based upon Puget Power's resource requirements and the availability and cost of generating resource alternatives. During the first period, from 1991 to 1992, Puget Power has a need for firm supply, and new utility projects are not available because of construction lead times. The avoidable resource for period 1 is a short-term utility firm purchase, the price for which is based upon BPA's latest forecast of the New Resources rate.

The second period lasts from 1993 to 1995. During this time, Puget Power is very close to load and resource balance and additional firm resources are not needed. Therefore, the avoided cost for period 2 is based on Puget Power energy-only production costs.

The third period begins in 1996 when Puget Power again needs additional firm resources. A new combined cycle combustion turbine was selected as the avoidable resource because of its cost and expected availability.

4.2 DESCRIPTION OF PROJECT OUTPUT FOR AVOIDED COST CALCULATION

Because the avoided cost forecast consists of seasonal firm and nonfirm energy and annual capacity components, the Snoqualmie Falls Project generation must be broken into these categories to compare with avoided cost. The utilities of the Pacific Northwest have agreed that the historical period of lowest streamflow that should be used to determine the amount of firm energy available from hydroelectric resources is the period from September 1928 through February 1932. The generation that the Project would have produced on average each month assuming the streamflow that occurred over that period is considered to be firm energy. The nonfirm energy (energy not considered to be reliably available from year to year) equals the difference between the average monthly energy production over the entire streamflow record and the amount of firm production.

The Project is a "run-of-river" facility and as such does not offer dispatchable capacity. For this type of resource, the avoided cost evaluation is performed with the capacity set equal to the average rate of firm energy generation. Shown in Table D-5 are the results of the firm and nonfirm energy and firm capacity determinations which are based on the hydrological records and the synthesis of critical period flows discussed in Exhibit E2, Section 2.2.3.

Table D-5

Firm and Nonfirm Energy Production by Month and Season

Month	Average MWh	Firm MWh	Nonfirm MWh	Capacity* MW-month
Jan	35,765	20,390	15,375	27.4
Feb	32,609	24,318	8,291	36.2
Mar	34,156	34,156	0	45.9
Apr	38,622	38,622	0	53.6
May	47,318	45,265	2,053	60.8
Jun	43,053	37,130	5,923	51.6
Jul	26,743	13,437	13,306	18.1
Aug	11,971	5,449	6,522	7.3
Sep	15,120	6,399	8,721	8.9
Oct	22,256	17,872	4,384	24.0
Nov	34,971	19,476	15,495	27.1
Dec	38,754	22,041	16,713	29.6
Total	381,338	284,555	96,783	390.5
Winter	213,631	144,652	68,979	
Summer	167,707	139,903	27,804	

* Firm capacity equals the average rate of firm energy delivery (e.g. for January: firm capacity = 20,390 MWh ÷ 744 hrs = 27.4 MW).

4.3 ESTIMATED ANNUAL VALUE OF PROJECT POWER BASED ON AVOIDED COST

The avoided cost value of the Project power was evaluated over a 40-year period beginning in 1997. The analysis, included as Appendix 2B (Comparison Between Avoided Cost and Project Cost), results in a present value avoided cost for the Project generation of $313,447,000 in 1996. Converting the present value to a nominal levelized avoided cost per unit yields a value of 87.2 mills/kWh for Project generation. Table D-6 contains the annual value of the Project generation.

Table D-6

Annual Value of Project Generation

Year	Annual Value ($000)	mills/kWh
1997	$19,876	52.1
1998	$21,073	55.3
1999	$22,428	58.8
2000	$23,855	62.6
2001	$24,862	65.2
2002	$26,152	68.6
2003	$27,363	71.8
2004	$28,580	74.9
2005	$29,698	77.9
2006	$31,019	81.3
2007	$32,432	85.0
2008	$33,859	88.8
2009	$35,355	92.7
2010	$36,923	96.8
2011	$38,575	101.2
2012	$40,307	105.7
2013	$42,136	110.5
2014	$44,082	115.6
2015	$46,128	121.0
2016	$48,214	126.4
2017	$50,397	132.2
2018	$52,700	138.2
2019	$55,116	144.5
2020	$57,648	151.2
2021	$60,315	158.2
2022	$63,106	165.5
2023	$66,043	173.2
2024	$69,121	181.3
2025	$72,358	189.7
2026	$75,759	198.7
2027	$79,323	208.0
2028	$83,067	217.8
2029	$87,001	228.1
2030	$91,131	239.0
2031	$95,466	250.3
2032	$100,016	262.3
2033	$104,793	274.8
2034	$109,818	288.0
2035	$115,086	301.8
2036	$120,619	316.3

As set forth in Appendix 2B, the avoided cost components are applied to the corresponding generation components determined for the Project. For example, in the year 1997, the avoided cost value is determined as follows:

Project Data (from Table D-6):					
Winter Firm Energy					144,652 MWh
Summer Firm Energy					139,903 MWh
Annual Capacity					390.5 MW-months
Winter Nonfirm Energy					68,979 MWh
Summer Nonfirm Energy					27,804 MWh
Avoided Cost Data (from Appendix 2A)					
Winter Firm Energy Rate					48.5 mills/kWh
Summer Firm Energy Rate					40.4 mills/kWh
Capacity Rate					7.86 $/kW-months
Winter Nonfirm Energy Rate					30.0 mills/kWh
Summer Nonfirm Energy Rate					26.0 mills/kWh
Calculations:					($000)
Winter Firm Energy Value	144,652	x	48.5	=	7,020
Summer Firm Energy Value	139,903	x	40.4	=	5,645
Capacity Value	390.5	x	7.86	=	3,069
Winter Nonfirm Energy Value	68,979	x	30.0	=	2,069
Summer Nonfirm Energy Value	27,804	x	26.0	=	723
Total Direct Avoided Costs					18,527
Gross-up for Revenue Taxes (6.79%)					19,876

These calculations are repeated for each year of analysis to establish the avoided cost value of the Project as shown in table D-6.

5.0 ALTERNATIVE ENERGY SOURCES

5.1 LEAST COST PLAN

Puget Power began formal integrated least cost planning in early 1986. Every two years, the Company produces a new least cost plan for submission to the Washington Utilities and Transportation Commission. The Company's most recent least cost plan, completed in December 1989, sets forth Puget Power's forecast power needs and identifies integrated supply and demand strategies for meeting growth under a range of possible future conditions (see Appendix 3, Puget Power's 1989 Least Cost Plan).

As part of the least cost planning process, Puget Power examines the cost and availability of generation and conservation resource alternatives. Tables D-7 and D-8 list the conservation and generation resources considered in the Company's most recent least cost plan.

Table D-7

Conservation Alternatives Considered in Least Cost Plan

RESIDENTIAL CONSERVATION
- Existing single family space heat
- Existing multi-family space heat
- New single family space heat
- New multi-family space heat
- Water heating conservation
- Refrigerators and freezers
- Heat pumps
- Energy efficient showerheads
- Clothes washers and dishwashers
- Clothes dryers
- Mechanical thermal wraps for water heating
- Hot water heat pumps and solar water heaters
- Residential lighting
- Air conditioning
- Zone space heating
- Manufactured home weatherization

COMMERCIAL CONSERVATION
- Heating, ventilation, air conditioning optimization
- Roof/floor insulation
- Windows
- Indoor lighting
- Hot water heat recovery
- Grocery refrigeration
- Outdoor lighting

INDUSTRIAL CONSERVATION
- Adjustable speed drives
- Motor controls
- Heating, ventilation, air conditioning optimization
- Indoor lighting
- Outdoor lighting
- Process specific efficiency improvements

Table D-8

Generation Alternatives Considered in Least Cost Plan

Small hydroelectric projects
Combined cycle combustion turbines
Simple cycle combustion turbines
Integrated gasification combined cycle combustion turbine
Pressurized fluidized bed combustion coal-fired
Atmospheric fluidized bed combustion coal-fired
Pulverized coal with SO_2 scrubbers
Nuclear light water reactor
Geothermal
Fuel cell
Wind turbine
Solar
Purchases from other utilities
Purchases from waste-to-energy facilities
Purchases from wood-fired facilities
Conservation purchases from other utilities
Cogeneration

The least cost plan does not develop a single set of resources to meet a fixed load over the 20-year planning horizon. Rather, the plan uses scenarios to examine uncertainties and to determine those actions that Puget Power should take over the next few years to prepare itself for what may actually happen in the future.

Puget Power developed six scenarios and analyzed each separately by asking, "If this future were to unfold, what selection of resources, both demand and supply, would provide the lowest cost for our customers and meet their expectations for a quality environment, a sound economy and a vibrant community?" The six scenarios studied were:

- Economic boom that assumed continuing high growth of the local and regional economy.
- Economic bust that assumed a downturn in the economy.
- Instability that assumed extreme business cycles over the planning period.
- Declining demands that assumed a drop in energy use per customer.
- Deregulation that assumed a greater participation by unregulated power producers in supplying electricity.
- Global warming that assumed tough environmental laws passed in response to concerns regarding air emissions.

The descriptions and assumptions for each scenario resulted in different resources being selected to meet future needs. The action plan was determined by examining the results for the scenarios and determining resources and resource decisions that were common to various scenarios and thus worked over a variety of futures.

In summary, the least cost plan concludes that Puget Power will need additional resources. Among the resources that the plan emphasizes are conservation, utility purchases, and resources acquired through competitive bidding.

5.2 COMPETITIVE BIDDING FOR RESOURCES

In addition to the least cost planning evaluation of resource alternatives, Puget Power has also conducted a competitive solicitation for resources that provided a direct measure of the availability and cost of resources from non-utility generation and conservation suppliers. In June 1989, Puget Power issued a Request for Proposals (RFP) seeking 100 aMW of electricity from commercial and industrial conservation or generation projects. In response to the RFP, Puget Power received 41 project proposals representing over 1200 aMW of potential resources.

Each bid was evaluated for compliance with the terms of the solicitation. The bids that qualified were evaluated against evaluation criteria set forth in the RFP including: the experience of the project sponsor, the bid price, the financial risk placed upon Puget Power, environmental effects, dispatchability, compatibility with Puget Power's electric system, reliability of the resource, technological feasibility, the term of the proposed contract, the seasonal and daily shape of power deliveries, and the proposed on-line date of the resource. Following the evaluation of all bids, eight projects – five conservation and three generation, totalling 167 aMW – were selected to execute contracts with Puget Power. Table D-9 shows the expected energy from these projects. (Exhibit B, Section 6.2.2 references the capacity at the generating projects.)

Table D-9

Projects Selected through June 1989 Request for Proposals

Company	Type	Energy
Abacus	Conservation	4.0 aMW
NW Cogeneration	Conservation	1.2 aMW
Puget Energy Svc	Conservation	3.2 aMW
Sycom Corp	Conservation	0.7 aMW
Washington State Energy Office	Conservation	0.5 aMW
Enserch Dev. Corp.	Gas cogeneration	130.0 aMW
Trans-Pac Geothermal	Geothermal	10.0 aMW
Wheelabrator Pierce	MSW	17.0 aMW
TOTAL		166.6 aMW

Although the specific prices of each bid proposal are confidential to respect the desires of the bidders and to protect the integrity of the competitive process, it can be stated that each of the winning projects is at or below Puget Power's avoided costs. The competitive bid process provided some validation of the avoided cost forecast in that most proposals were in a range around that level.

The second RFP for conservation and generation resources was issued in September 1991. Project proposals under this RFP are due January 9, 1992.

6.0 CONSEQUENCES OF LICENSE APPLICATION DENIAL

The most obvious consequence to Puget Power of the denial of this License Application would be the loss of the economical Project generation to serve the Company's growing load. This impact would be felt in two important ways:

1. It would accelerate the need to develop or acquire replacement resources.
2. The cost of such replacement resources would be higher than the cost of Project power, with the increased cost borne by Puget Power's customers in the form of higher electric rates.

The difference between the cost of Project power and Puget Power's avoided cost is set forth in Exhibit D, Section 2.1, with the details of the calculation shown in Appendix 2B, Comparison Between Avoided Cost and Project Cost. The net present value of the increased cost of replacing the power from the proposed Project over forty years would be $168,723,000.

Denial of the License Application and discontinuance of generation by the Project would have an adverse impact on the reliability of power supply not only to Puget Power but to the entire Puget Sound region. See Exhibit H, Section 2.4 for a complete discussion of this impact.

Consequences of Application denial would also include loss of many public benefits provided by the Project, most significantly the extensive recreation facilities currently provided by Puget Power and the new facilities proposed in this application. See Exhibit E7.

The discontinuance of Puget Power's Project related recreation activities would adversely affect the many people who visit the Project recreation facilities (currently about 1.5 million per year) as well as the thousands of school children who attend educational tours of the Project each year.

6.1 ALTERNATIVE USES OF PROJECT SITE

Because the Snoqualmie Falls Project is a valuable existing, operating hydroelectric project which also offers recreation facilities used by 1.5 million people per year, the idea of alternatives to its continued operation seems contrary to the overall public interest. The Snoqualmie Indians have expressed a preference that the Project not generate power and the site be returned to a natural state (see Exhibit H, Section 2.5). No other uses of the site have been suggested.

7.0 AVAILABLE SOURCES AND EXTENT OF FINANCING

Puget Power expects to finance the Project as part of its ongoing construction financing program. No specific Project related financing is planned at this time.

Funds from operations, short-term borrowings from banks and the sale of commercial paper are used to provide working capital for the construction program. Short-term debt is repaid with the proceeds from the sale of longer-term securities.

The Company expects to fund a significant portion of its estimated construction expenditures with funds provided by operations, with the balance being funded through the sale of securities, the nature, amount and timing of which will be subject to market and other relevant factors.

ATTACHMENT D-1 (Sheet 1 of 7)
SNOQUALMIE FALLS
TOTAL PROJECT COSTS ($1000)

	Present Value in 1996	
Total Project Costs:		
Capital Costs (Existing Plant & Improvements)	$113,915	see "Improvements" (page 3)
Operating & Maintenance	$21,838	see "O&M" (page 5)
Continuing Capital Improvements	$8,970	see "Continuing Expenditures" (pages 6&7)
Total Project Cost	$144,724	
Levelized Project Cost (in Mills/KWH)	40.3 mills	

ATTACHMENT D-1 (Sheet 2 of 7)

Snoqualmie Falls
Assumptions

Annual Inflation Rate	5.0%
Levelized Fixed Charge Rate	13.99%
Discount Rate (WACC)	10.41%
Average Energy	381,338 MWH
Project Cost (in 1991 $), from Table D-1	$64,216
Project Cost (in 1996 $), from Table D-1	$81,958
O&M in mills (in 1991 $ not levelized)	2.5 mills
Revenue Sensitive Taxes - Rate	6.79%
Continuing Capital Improvements (in 1991 $)	$324

ATTACHMENT D-1 (Sheet 3 of 7)

Snoqualmie Falls
Improvements ($000)

	(in 1991 $)	(in 1996 $)	
Existing Plant Balance (in 1996)		$4,452	see "Existing Plant" (page 4)
Project Cost (in 1991 $)	$64,216		
Inflation rate (1991 to 1996)	27.63%	$81,958	
Total Investment in 1996		$86,410	
Levelized Fixed Charge Rate		13.99%	
Levelized Fixed Charge (LFC)		$12,089	

Period	Year	LFC	Present Value at 10.41%
1	1997	$12,089	$10,949
2	1998	$12,089	$9,917
3	1999	$12,089	$8,982
4	2000	$12,089	$8,135
5	2001	$12,089	$7,368
6	2002	$12,089	$6,673
7	2003	$12,089	$6,044
8	2004	$12,089	$5,474
9	2005	$12,089	$4,958
10	2006	$12,089	$4,491
11	2007	$12,089	$4,067
12	2008	$12,089	$3,684
13	2009	$12,089	$3,336
14	2010	$12,089	$3,022
15	2011	$12,089	$2,737
16	2012	$12,089	$2,479
17	2013	$12,089	$2,245
18	2014	$12,089	$2,033
19	2015	$12,089	$1,842
20	2016	$12,089	$1,668
21	2017	$12,089	$1,511
22	2018	$12,089	$1,368
23	2019	$12,089	$1,239
24	2020	$12,089	$1,122
25	2021	$12,089	$1,017
26	2022	$12,089	$921
27	2023	$12,089	$834
28	2024	$12,089	$755
29	2025	$12,089	$684
30	2026	$12,089	$620
31	2027	$12,089	$561
32	2028	$12,089	$508
33	2029	$12,089	$460
34	2030	$12,089	$417
35	2031	$12,089	$378
36	2032	$12,089	$342
37	2033	$12,089	$310
38	2034	$12,089	$281
39	2035	$12,089	$254
40	2036	$12,089	$230
Total		$483,550	$113,915

ATTACHMENT D-1 (Sheet 4 of 7)

Snoqualmie Falls
Existing Plant

BOOK COST:	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**
Snoqualmie Plant #1:							
Intangible	$41,094.48	$41,094.48	$41,094.48	$41,094.48	$41,094.48	$41,094.48	$41,094.48
Hydraulic Production							
Land	$31,259.77	$31,259.77	$31,259.77	$31,259.77	$31,259.77	$31,259.77	$31,259.77
Other	$3,491,454.18	$3,491,454.18	$3,491,454.18	$3,491,454.18	$3,491,454.18	$3,491,454.18	$3,491,454.18
Transmission	$434,457.05	$434,457.05	$434,457.05	$434,457.05	$434,457.05	$434,457.05	$434,457.05
Total	$3,998,265.48	$3,998,265.48	$3,998,265.48	$3,998,265.48	$3,998,265.48	$3,998,265.48	$3,998,265.48
Snoqualmie Plant #2:							
Intangible	$41,094.48	$41,094.48	$41,094.48	$41,094.48	$41,094.48	$41,094.48	$41,094.48
Hydraulic Production							
Land	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Other	$3,543,858.25	$3,543,858.25	$3,543,858.25	$3,543,858.25	$3,543,858.25	$3,543,858.25	$3,543,858.25
Transmission	$496,309.01	$496,309.01	$496,309.01	$496,309.01	$496,309.01	$496,309.01	$496,309.01
Total	$4,081,261.74	$4,081,261.74	$4,081,261.74	$4,081,261.74	$4,081,261.74	$4,081,261.74	$4,081,261.74
Project Total	$8,079,527.22	$8,079,527.22	$8,079,527.22	$8,079,527.22	$8,079,527.22	$8,079,527.22	$8,079,527.22
ACCUM. AMORT. & DEPR:							
Snoqualmie Plant #1:							
Intangible	$32,875.46	$35,615.18	$38,354.90	$41,094.48	$41,094.48	$41,094.48	$41,094.48
Hydraulic Production							
Land	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Other	$1,026,699.65	$1,064,756.50	$1,102,813.35	$1,140,870.20	$1,178,927.05	$1,216,983.90	$1,255,040.75
Transmission	$245,377.07	$249,374.07	$253,371.08	$257,368.08	$261,365.09	$265,362.09	$269,359.10
Total	$1,304,952.18	$1,349,745.76	$1,394,539.33	$1,439,332.77	$1,481,386.62	$1,523,440.48	$1,565,494.33
Snoqualmie Plant #2:							
Intangible	$32,875.46	$35,615.18	$38,354.90	$41,094.48	$41,094.48	$41,094.48	$41,094.48
Hydraulic Production							
Land	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Other	$1,171,812.04	$1,277,419.02	$1,383,025.99	$1,488,632.97	$1,594,239.94	$1,699,846.92	$1,805,453.90
Transmission	$149,946.00	$160,815.17	$171,684.33	$182,553.50	$193,422.67	$204,291.84	$215,161.00
Total	$1,354,633.50	$1,473,849.36	$1,593,065.23	$1,712,280.95	$1,828,757.09	$1,945,233.24	$2,061,709.38
Project Total	$2,659,585.68	$2,823,595.12	$2,987,604.56	$3,151,613.72	$3,310,143.71	$3,468,673.71	$3,627,203.71
NET BOOK VALUE:							
Snoqualmie Plant #1:							
Intangible	$8,219.02	$5,479.30	$2,739.58	$0.00	$0.00	$0.00	$0.00
Hydraulic Production							
Land	$31,259.77	$31,259.77	$31,259.77	$31,259.77	$31,259.77	$31,259.77	$31,259.77
Other	$2,464,754.53	$2,426,697.68	$2,388,640.83	$2,350,583.98	$2,312,527.13	$2,274,470.28	$2,236,413.43
Transmission	$189,079.98	$185,082.98	$181,085.97	$177,088.97	$173,091.96	$169,094.96	$165,097.95
Total	$2,693,313.30	$2,648,519.72	$2,603,726.15	$2,558,932.71	$2,516,878.86	$2,474,825.00	$2,432,771.15
Snoqualmie Plant #2:							
Intangible	$8,219.02	$5,479.30	$2,739.58	$0.00	$0.00	$0.00	$0.00
Hydraulic Production							
Land	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Other	$2,372,046.21	$2,266,439.23	$2,160,832.26	$2,055,225.28	$1,949,618.31	$1,844,011.33	$1,738,404.35
Transmission	$346,363.01	$335,493.84	$324,624.68	$313,755.51	$302,886.34	$292,017.17	$281,148.01
Total	$2,726,628.24	$2,607,412.38	$2,488,196.51	$2,368,980.79	$2,252,504.65	$2,136,028.50	$2,019,552.36
Project Total	$5,419,941.54	$5,255,932.10	$5,091,922.66	$4,927,913.50	$4,769,383.51	$4,610,853.51	$4,452,323.51 in thousands $4,452
ANNUAL AMORT OR DEPR:		Depr Rates					
Snoqualmie Plant #1:							
Intangible	$2,739.72	$2,739.72	$2,739.72	$2,739.58	$0.00	$0.00	$0.00
Hydraulic Production							
Land	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Other	1.09%	$38,056.85	$38,056.85	$38,056.85	$38,056.85	$38,056.85	$38,056.85
Transmission	0.92%	$3,997.00	$3,997.00	$3,997.00	$3,997.00	$3,997.00	$3,997.00
Total		$44,793.58	$44,793.58	$44,793.44	$42,053.86	$42,053.86	$42,053.86
Snoqualmie Plant #2:							
Intangible	$2,739.72	$2,739.72	$2,739.72	$2,739.58	$0.00	$0.00	$0.00
Hydraulic Production							
Land	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Other	2.98%	$105,606.98	$105,606.98	$105,606.98	$105,606.98	$105,606.98	$105,606.98
Transmission	2.19%	$10,869.17	$10,869.17	$10,869.17	$10,869.17	$10,869.17	$10,869.17
Total		$119,215.86	$119,215.86	$119,215.72	$116,476.14	$116,476.14	$116,476.14

ATTACHMENT D-1 (Sheet 5 of 7)

Snoqualmie Falls
O&M ($000)

O&M in mills (in 1991 $)	2.5 mills
Inflation (1991 to 1996)	27.63%
O&M in mills (in 1996 $)	3.2 mills
Revenue Sensitive Taxes - Rate	6.79%
O&M in mills grossed up	3.4 mills
Annual Inflation Rate	5.00%

#	Year	Inflated Mills	Generation	Annual O&M	Present Value at 10.41%
1	1997	3.6 mills	381,338 MWH	$1,364	$1,236
2	1998	3.8 mills	381,338 MWH	$1,433	$1,175
3	1999	3.9 mills	381,338 MWH	$1,504	$1,118
4	2000	4.1 mills	381,338 MWH	$1,579	$1,063
5	2001	4.3 mills	381,338 MWH	$1,658	$1,011
6	2002	4.6 mills	381,338 MWH	$1,741	$961
7	2003	4.8 mills	381,338 MWH	$1,828	$914
8	2004	5.0 mills	381,338 MWH	$1,920	$869
9	2005	5.3 mills	381,338 MWH	$2,016	$827
10	2006	5.6 mills	381,338 MWH	$2,117	$786
11	2007	5.8 mills	381,338 MWH	$2,222	$748
12	2008	6.1 mills	381,338 MWH	$2,333	$711
13	2009	6.4 mills	381,338 MWH	$2,450	$676
14	2010	6.7 mills	381,338 MWH	$2,573	$643
15	2011	7.1 mills	381,338 MWH	$2,701	$612
16	2012	7.4 mills	381,338 MWH	$2,836	$582
17	2013	7.8 mills	381,338 MWH	$2,978	$553
18	2014	8.2 mills	381,338 MWH	$3,127	$526
19	2015	8.6 mills	381,338 MWH	$3,283	$500
20	2016	9.0 mills	381,338 MWH	$3,448	$476
21	2017	9.5 mills	381,338 MWH	$3,620	$452
22	2018	10.0 mills	381,338 MWH	$3,801	$430
23	2019	10.5 mills	381,338 MWH	$3,991	$409
24	2020	11.0 mills	381,338 MWH	$4,191	$389
25	2021	11.5 mills	381,338 MWH	$4,400	$370
26	2022	12.1 mills	381,338 MWH	$4,620	$352
27	2023	12.7 mills	381,338 MWH	$4,851	$335
28	2024	13.4 mills	381,338 MWH	$5,094	$318
29	2025	14.0 mills	381,338 MWH	$5,348	$303
30	2026	14.7 mills	381,338 MWH	$5,616	$288
31	2027	15.5 mills	381,338 MWH	$5,897	$274
32	2028	16.2 mills	381,338 MWH	$6,191	$260
33	2029	17.0 mills	381,338 MWH	$6,501	$248
34	2030	17.9 mills	381,338 MWH	$6,826	$235
35	2031	18.8 mills	381,338 MWH	$7,167	$224
36	2032	19.7 mills	381,338 MWH	$7,526	$213
37	2033	20.7 mills	381,338 MWH	$7,902	$202
38	2034	21.8 mills	381,338 MWH	$8,297	$193
39	2035	22.8 mills	381,338 MWH	$8,712	$183
40	2036	24.0 mills	381,338 MWH	$9,147	$174
Total					$21,838

ATTACHMENT D-1 (Sheet 6 of 7)

oqualmie Falls
ntinuing Expenditures ($000)

iount in 1991 $	$324
lation (91 to 96)	27.63%
iount in 1996 $	$414
nual Inflation	5.00%

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
nual Expenditure Inflated		$434	$456	$479	$503	$528	$554	$582	$611	$641	$674	$707	$743	$780	$819	$860	$903	$948	$995	$1,045	$1,097	$1,152
elized Fixed Charge Rate		13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%
1	1997	$61																				
2	1998	$61	$64																			
3	1999	$61	$64	$67																		
4	2000	$61	$64	$67	$70																	
5	2001	$61	$64	$67	$70	$74																
6	2002	$61	$64	$67	$70	$74	$78															
7	2003	$61	$64	$67	$70	$74	$78	$81														
8	2004	$61	$64	$67	$70	$74	$78	$81	$85													
9	2005	$61	$64	$67	$70	$74	$78	$81	$85	$90												
10	2006	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94											
11	2007	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99										
12	2008	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104									
13	2009	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109								
14	2010	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115							
15	2011	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115	$120						
16	2012	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115	$120	$126					
17	2013	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115	$120	$126	$133				
18	2014	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115	$120	$126	$133	$139			
19	2015	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115	$120	$126	$133	$139	$146		
20	2016	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115	$120	$126	$133	$139	$146	$153	
21	2017	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115	$120	$126	$133	$139	$146	$153	$161
22	2018	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115	$120	$126	$133	$139	$146	$153	$161
23	2019	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115	$120	$126	$133	$139	$146	$153	$161
24	2020	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115	$120	$126	$133	$139	$146	$153	$161
25	2021	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115	$120	$126	$133	$139	$146	$153	$161
26	2022	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115	$120	$126	$133	$139	$146	$153	$161
27	2023	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115	$120	$126	$133	$139	$146	$153	$161
28	2024	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115	$120	$126	$133	$139	$146	$153	$161
29	2025	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115	$120	$126	$133	$139	$146	$153	$161
30	2026	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115	$120	$126	$133	$139	$146	$153	$161
31	2027	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115	$120	$126	$133	$139	$146	$153	$161
32	2028	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$101	$109	$115	$120	$126	$133	$139	$146	$153	$161
33	2029	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115	$120	$126	$133	$139	$146	$153	$161
34	2030	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115	$120	$126	$133	$139	$146	$153	$161
35	2031	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115	$120	$126	$133	$139	$146	$153	$161
36	2032	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115	$120	$126	$133	$139	$146	$153	$161
37	2033	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115	$120	$126	$133	$139	$146	$153	$161
38	2034	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115	$120	$126	$133	$139	$146	$153	$161
39	2035	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115	$120	$126	$133	$139	$146	$153	$161
40	2036	$61	$64	$67	$70	$74	$78	$81	$85	$90	$94	$99	$104	$109	$115	$120	$126	$133	$139	$146	$153	$161

sent Value at 10.41%

ATTACHMENT D-1 (Sheet 7 of 7)

qualmie Falls
tinuing Expenditures ($000)

ount in 1991 $	$324
ation (91 to 96)	27.63%
ount in 1996 $	$414
ual Inflation	5.00%

		22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
		2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	
ual Expenditure Inflated		$1,210	$1,270	$1,334	$1,400	$1,470	$1,544	$1,621	$1,702	$1,787	$1,877	$1,970	$2,069	$2,172	$2,281	$2,395	$2,515	$2,640	$2,773	$2,911	
elized Fixed Charge Rate		13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	Total
1	1997																				$61
2	1998																				$125
3	1999																				$191
4	2000																				$262
5	2001																				$336
6	2002																				$413
7	2003																				$495
8	2004																				$580
9	2005																				$670
10	2006																				$764
11	2007																				$863
12	2008																				$967
13	2009																				$1,076
14	2010																				$1,190
15	2011																				$1,311
16	2012																				$1,437
17	2013																				$1,570
18	2014																				$1,709
19	2015																				$1,855
20	2016																				$2,009
21	2017																				$2,170
22	2018	$169																			$2,339
23	2019	$169	$178																		$2,517
24	2020	$169	$178	$187																	$2,703
25	2021	$169	$178	$187	$196																$2,899
26	2022	$169	$178	$187	$196	$206															$3,105
27	2023	$169	$178	$187	$196	$206	$216														$3,321
28	2024	$169	$178	$187	$196	$206	$216	$227													$3,548
29	2025	$169	$178	$187	$196	$206	$216	$227	$238												$3,786
30	2026	$169	$178	$187	$196	$206	$216	$227	$238	$250											$4,036
31	2027	$169	$178	$187	$196	$206	$216	$227	$238	$250	$263										$4,298
32	2028	$169	$178	$187	$196	$206	$216	$227	$238	$250	$263	$276									$4,574
33	2029	$169	$178	$187	$196	$206	$216	$227	$238	$250	$263	$276	$289								$4,863
34	2030	$169	$178	$187	$196	$206	$216	$227	$238	$250	$263	$276	$289	$304							$5,167
35	2031	$169	$178	$187	$196	$206	$216	$227	$238	$250	$263	$276	$289	$304	$319						$5,486
36	2032	$169	$178	$187	$196	$206	$216	$227	$238	$250	$263	$276	$289	$304	$319	$335					$5,821
37	2033	$169	$178	$187	$196	$206	$216	$227	$238	$250	$263	$276	$289	$304	$319	$335	$352				$6,173
38	2034	$169	$178	$187	$196	$206	$216	$227	$238	$250	$263	$276	$289	$304	$319	$335	$352	$369			$6,543
39	2035	$169	$178	$187	$196	$206	$216	$227	$238	$250	$263	$276	$289	$304	$319	$335	$352	$369	$388		$6,931
40	2036	$169	$178	$187	$196	$206	$216	$227	$238	$250	$263	$276	$289	$304	$319	$335	$352	$369	$388	$407	$7,338
ent Value at 10.41%																					$8,970

ATTACHMENT D-2

SNOQUALMIE FALLS HYDROELECTRIC PROJECT ADDITIONS 10/30/91

POWER COST ESTIMATE snopower.wk1

ITEM		CONSTRUCTION COSTS ($1000'S) (INCLUDING CONTINGENCIES)
PLANT 2 INTAKE		$5,555
PLANT 2 POWERHOUSE		
Civil:		
Structure (Incl. Tailrace)		$1,640
Mechanical:		
Turbine(s)/Gates		$8,280
Bypass Facility		$2,503
Miscellaneous Equip/Equip Relocation		$306
Electrical:		
Generator(s)		incl*
Switchgear		incl*
Accessory		$637
Substation		$720
TOTAL PLANT 2 POWERHOUSE		$14,086
PLANT 2 FLOWLINE		
Intake Shaft		$454
Tunnel		$3,457
Surge Shaft		$122
Surge Chamber		$418
Penstock		$3,476
TOTAL FLOWLINE		$7,927
SUBTOTAL DIRECT CONST COST		$27,568
Sales Tax	8.2%	$2,261
TOTAL DIRECT CONSTRUCTION COST		$29,829
INDIRECT COSTS		
Engineering @	15.0%	$4,474
Administrative @	5.0%	$1,491
SUBTOTAL (incl. direct costs)		$35,794
Puget Overhead @	4.5%	$1,611
SUBTOTAL (incl. direct costs)		$37,405
AFUDC @	10.0%	$3,741
TOTAL INDIRECT COSTS		$11,317
TOTAL CONSTRUCTION COST (1/91)		$41,146
TOTAL CONSTRUCTION COST (1/91)		$41,146
ESCALATION 1991 TO 1996 @ i=	5.0%	$52,513
NET ANNUAL CONST. COST 1996 TO 2035 AT	13.99%	$7,347
AVERAGE ANNUAL ENERGY (MWHR)**		97,200
ENERGY COST		
1996 (mills/KWH)		76
O & M (mills/KWH)		9
TOTAL ENERGY COST		
1996 (mills/KWH)		

BEFORE THE
FEDERAL ENERGY REGULATORY
COMMISSION

APPLICATION FOR NEW LICENSE
MAJOR MODIFIED PROJECT

SNOQUALMIE FALLS PROJECT

FERC Project No. 2493
KING COUNTY, WASHINGTON

NOVEMBER 1991

VOLUME 3
APPENDICES

PUGET SOUND POWER & LIGHT COMPANY
BELLEVUE, WASHINGTON

APPENDIX 2

Avoided Cost Information

APPENDIX 2A

Puget Power's 1991 Avoided Cost Filing
with WUTC

PUGET SOUND POWER & LIGHT COMPANY
Forecast of Avoided Cost
May 1991

1. General

This document sets forth the forecast of avoided costs of Puget Sound Power & Light Company ("Puget" or the "Company"), as required by:

1. Regulations under the Public Utility Regulatory Policies Act ("PURPA", 18 CFR 292.302), and

2. The Commission's rules concerning "Purchases of Electricity from Qualifying Facilities and Independent Power Producers and Purchases of Electrical Savings from Conservation Suppliers" (Chapter 480-107 WAC).

Capitalized terms in this document shall have the same meaning as set forth in Chapter 480-107 WAC unless otherwise defined herein.

The assumptions and analyses used in the development of this forecast are consistent with Puget's least cost planning process. Puget has developed the avoided cost based upon the definition of "Avoided Costs" set forth in WAC 480-107-005 and information received through Puget's recent pilot competitive bid, the RFP for which was issued in June 1989. The mission of least cost planning is to develop a strategy for meeting forecast loads using demand- and supply-side resources that will have the lowest cost impact on Puget customers. The Company submitted its first Least Cost Plan to the Commission in November 1987 and its second plan in February 1990. The third plan is currently being developed for a scheduled submittal date in November 1991.

Section 2 below set forth Puget's forecast of avoided energy-only production costs over a five-year period. These are the rates which the Company expects to pay for energy supplied to the Company under Schedule 91 and any Short-run Prototype Contracts entered pursuant to WAC 480-107-010(2). Energy-only production costs are not directly addressed in the least cost planning process, which focuses on firm loads and resources.

Section 3 below describes the method used to determine the long-term costs of energy and capacity the utility would incur absent purchases from Qualifying Facilities, Independent Power Producers or Conservation Suppliers. These rates were developed considering the results of the Company's pilot competitive bid solicitation. As such, these rate shall apply to Qualifying Facilities of design capacity of one megawatt or less choosing to sell power under Prototype Contract B as defined in WAC 480-107-010(3)(b).

Table 2
Avoided Cost Schedule

	Firm Power			Secondary Energy	
Year	Winter Sep-Mar (mills/KWh)	Summer Apr-Aug (mills/KWh)	Capacity ($/KW-month)	Winter Sep-Mar (mills/KWh)	Summer Apr-Aug (mills/KWh)
1991	18.30	13.76	4.36	22.16	19.01
1992	20.59	15.61	4.79	22.95	20.20
1993	14.14	11.92	0.00	23.36	21.14
1994	15.58	13.50	0.00	25.09	23.01
1995	16.65	13.98	0.00	26.51	23.84
1996	35.43	27.73	7.40	28.05	25.19
1997	37.88	29.70	7.86	29.99	26.02
1998	40.57	31.86	8.37	31.20	26.71
1999	43.51	34.23	8.92	32.90	28.26
2000	46.73	36.82	9.52	34.16	29.67
2001	48.37	38.08	9.88	36.61	31.47
2002	50.15	39.46	10.27	42.26	32.57
2003	51.98	40.87	10.68	46.20	34.36
2004	53.91	42.36	11.10	49.66	36.19
2005	55.93	43.92	11.54	51.31	37.68
2006	58.05	45.55	12.01	54.94	39.55
2007	60.31	47.30	12.50	58.82	41.53
2008	62.74	49.18	13.04	61.76	43.60
2009	65.30	51.15	13.60	64.85	45.78
2010	67.98	53.22	14.18	68.09	48.07
2011	70.80	55.39	14.80	71.50	50.47
2012	73.76	57.68	15.45	75.07	53.00
2013	76.87	60.08	16.14	78.83	55.65
2014	80.21	62.66	16.87	82.77	58.43
2015	83.72	65.37	17.64	86.91	61.35
2016	87.27	68.11	18.42	91.25	64.42
2017	91.00	70.98	19.23	95.82	67.64
2018	94.92	74.01	20.09	100.61	71.02
2019	99.03	77.18	21.00	105.64	74.57
2020	103.34	80.51	21.94	110.92	78.30
2021	107.88	84.01	22.94	116.46	82.22
2022	112.63	87.68	23.98	122.29	86.33
2023	117.63	91.54	25.08	128.40	90.65
2024	122.88	95.58	26.23	134.82	95.18
2025	128.39	99.84	27.44	141.56	99.94
2026	134.18	104.31	28.71	148.64	104.93
2027	140.25	108.99	30.04	156.07	110.18
2028	146.63	113.91	31.44	163.88	115.69
2029	153.33	119.08	32.91	172.07	121.47
2030	160.36	124.51	34.45	180.68	127.54

Variable Firm Avoided Costs
1991 8.63 (mills/KWH)

Puget may accept levelized variations of the avoided cost forecast that offer higher front-end rates than would otherwise be available. In such cases, the project sponsor will be required to include adequate measures to mitigate the risk to Puget's customers of any higher amounts which, as a results of levelizing, are paid in the early years.

4. Planned Additions

Plant Name	Est. On-line Date	Plant Type	Capacity (MW)	Purchase Price ¢/KWh	Contract Term (yrs)
City of Spokane	8/91	MSW	23	22.9 \1	20
Dalles Fishway	7/91	Hydro	5	35.6 \1	20
Sumas Energy	12/91	Cogen	50	25.4 \1	20
March Pt. Cogen #1	10/91	Cogen	80	52.3 \1	20
Abacus	ramp	Cons	4	\2	Var.
Encogen N.W.	1/93	Cogen	160	\2	15
N.W. Cogen	ramp	Cons	1	\2	Var.
PESI	ramp	Cons	3	\2	Var.
Sycom	ramp	Cons	1	\2	Var.
Trans-Pac Geo.	7/93	Geo	10	\2	30
WSEO	ramp	Cons	1	\2	Var.
Wheelabrator Pierce	1/94	MSW	23	\2	20
March Pt. Cogen #2	1/93	Cogen	60	\3	19
Tenaska/Continental	10/93	Cogen	245	\3	17

Notes:

\1 Average forecast rate for first year of commercial operation. Future years determined by contract rate adjusted for inflation.

\2 The purchase rates for competitive bid resources are confidential to retain the integrity of the solicitation process. The rates payable under contracts signed through the pilot competitive bid range between 85% and 92.5% of Puget's 1989 avoided cost.

\3 The purchase rates for contracts signed after the pilot competitive bid are confidential. The rates payable under contracts signed after the pilot competitive bid are within the same range as a percentage of avoided cost as those signed during the bid.

In addition, Puget has requested to contract for the following amounts of power from BPA under the Power Sales Contract.

Period	Peak (MW)	Energy (Average MW)
1990-91	0	106
1991-92	0	86
1992-93	0	50
1993-94	0	50
1994-95	0	50
1995-96	0	50
1996-97	0	50

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PUGET SOUND POWER & LIGHT COMPANY

BELLEVUE, WASHINGTON

APPENDIX 2B

Comparison Between Avoided Cost and Project Cost

APPENDIX 2B

COMPARISON BETWEEN AVOIDED COST AND PROJECT COST

This appendix contains the calculations of the replacement cost of power (the avoided cost) and the present value of the total project cost.

Attached are the following documents:

Avoided Cost of Project (3 pages)

Total Project Cost (7 pages)

Snoqualmie Falls Hydroelectric Project
Avoided Cost Evaluation of Upgraded Project

	Winter Firm Energy			Summer Firm Energy			Firm Capacity		
Year	Energy MWH	Avoided Cost mills	Value $000	Energy MWH	Avoided Cost mills	Value $000	Capacity MW-months	Avoided Cost $/KW-mons	Value $000
1997	144,652	48.5	$7,020	139,903	40.4	$5,645	391	7.86	$3,069
1998	144,652	51.7	$7,471	139,903	42.9	$6,007	391	8.37	$3,268
1999	144,652	55.1	$7,963	139,903	45.8	$6,403	391	8.92	$3,483
2000	144,652	58.8	$8,501	139,903	48.9	$6,836	391	9.52	$3,718
2001	144,652	61.0	$8,822	139,903	50.7	$7,093	391	9.88	$3,858
2002	144,652	63.4	$9,171	139,903	52.7	$7,374	391	10.27	$4,010
2003	144,652	65.9	$9,530	139,903	54.8	$7,662	391	10.68	$4,171
2004	144,652	68.5	$9,907	139,903	56.9	$7,966	391	11.10	$4,335
2005	144,652	71.2	$10,304	139,903	59.2	$8,285	391	11.54	$4,506
2006	144,652	74.1	$10,717	139,903	61.6	$8,617	391	12.01	$4,690
2007	144,652	77.2	$11,161	139,903	64.2	$8,975	391	12.50	$4,881
2008	144,652	80.5	$11,637	139,903	66.9	$9,358	391	13.04	$5,092
2009	144,652	83.9	$12,138	139,903	69.8	$9,760	391	13.60	$5,311
2010	144,652	87.5	$12,663	139,903	72.8	$10,182	391	14.18	$5,537
2011	144,652	91.4	$13,215	139,903	76.0	$10,626	391	14.80	$5,779
2012	144,652	95.4	$13,794	139,903	79.3	$11,092	391	15.45	$6,033
2013	144,652	99.6	$14,404	139,903	82.8	$11,583	391	16.14	$6,303
2014	144,652	104.1	$15,058	139,903	86.6	$12,109	391	16.87	$6,588
2015	144,652	108.9	$15,745	139,903	90.5	$12,661	391	17.64	$6,888
2016	144,652	113.7	$16,441	139,903	94.5	$13,221	391	18.42	$7,193
2017	144,652	118.7	$17,170	139,903	98.7	$13,806	391	19.23	$7,509
2018	144,652	124.0	$17,938	139,903	103.1	$14,424	391	20.09	$7,845
2019	144,652	129.6	$18,743	139,903	107.7	$15,070	391	21.00	$8,201
2020	144,652	135.4	$19,587	139,903	112.6	$15,750	391	21.94	$8,568
2021	144,652	141.6	$20,477	139,903	117.7	$16,465	391	22.94	$8,958
2022	144,652	148.0	$21,407	139,903	123.0	$17,214	391	23.98	$9,364
2023	144,652	154.8	$22,386	139,903	128.7	$18,001	391	25.08	$9,794
2024	144,652	161.9	$23,413	139,903	134.6	$18,825	391	26.23	$10,243
2025	144,652	169.3	$24,492	139,903	140.8	$19,694	391	27.44	$10,715
2026	144,652	177.2	$25,627	139,903	147.3	$20,606	391	28.71	$11,211
2027	144,652	185.4	$26,816	139,903	154.1	$21,562	391	30.04	$11,731
2028	144,652	194.0	$28,064	139,903	161.3	$22,565	391	31.44	$12,277
2029	144,652	203.1	$29,376	139,903	168.8	$23,620	391	32.91	$12,851
2030	144,652	212.6	$30,753	139,903	176.8	$24,728	391	34.45	$13,453
2031	144,652	222.6	$32,198	139,903	185.1	$25,890	391	36.07	$14,085
2032	144,652	233.1	$33,715	139,903	193.8	$27,110	391	37.77	$14,749
2033	144,652	244.1	$35,310	139,903	202.9	$28,392	391	39.55	$15,444
2034	144,652	255.7	$36,985	139,903	212.6	$29,739	391	41.43	$16,178
2035	144,652	267.8	$38,741	139,903	222.7	$31,151	391	43.40	$16,948
2036	144,652	280.6	$40,588	139,903	233.3	$32,635	391	45.46	$17,752

SNOQUALMIE FALLS
TOTAL PROJECT COSTS ($000)

	Present Value in 1996	
Total Project Costs:		
Capital Costs (Existing Plant & Improvements)	$113,915	see "Improvements" (page 3)
Operating & Maintenance	$21,838	see "O&M" (page 5)
Continuing Capital Improvements	$8,970	see "Continuing Expenditures" (pages 6&7)
Total Project Cost	$144,724	
Levelized Project Cost (in Mills/KWH)	40.3 mills	

Snoqualmie Falls
Improvements ($000)

	(in 1991 $)	(in 1996 $)	
Existing Plant Balance (in 1996)		$4,452	see "Existing Plant" (page 4)
Project Cost (in 1991 $)	$64,216		
Inflation rate (1991 to 1996)	27.63%	$81,958	
Total Investment in 1996		$86,410	
Levelized Fixed Charge Rate		13.99%	
Levelized Fixed Charge (LFC)		$12,089	

Period	Year	LFC	Present Value at 10.41%
1	1997	$12,089	$10,949
2	1998	$12,089	$9,917
3	1999	$12,089	$8,982
4	2000	$12,089	$8,135
5	2001	$12,089	$7,368
6	2002	$12,089	$6,673
7	2003	$12,089	$6,044
8	2004	$12,089	$5,474
9	2005	$12,089	$4,958
10	2006	$12,089	$4,491
11	2007	$12,089	$4,067
12	2008	$12,089	$3,684
13	2009	$12,089	$3,336
14	2010	$12,089	$3,022
15	2011	$12,089	$2,737
16	2012	$12,089	$2,479
17	2013	$12,089	$2,245
18	2014	$12,089	$2,033
19	2015	$12,089	$1,842
20	2016	$12,089	$1,668
21	2017	$12,089	$1,511
22	2018	$12,089	$1,368
23	2019	$12,089	$1,239
24	2020	$12,089	$1,122
25	2021	$12,089	$1,017
26	2022	$12,089	$921
27	2023	$12,089	$834
28	2024	$12,089	$755
29	2025	$12,089	$684
30	2026	$12,089	$620
31	2027	$12,089	$561
32	2028	$12,089	$508
33	2029	$12,089	$460
34	2030	$12,089	$417
35	2031	$12,089	$378
36	2032	$12,089	$342
37	2033	$12,089	$310
38	2034	$12,089	$281
39	2035	$12,089	$254
40	2036	$12,089	$230
Total		$483,550	$\boxed{\$113,915}$

Snoqualmie Falls
O&M ($000)

O&M in mills (in 1991 $)	2.5 mills
Inflation (1991 to 1996)	27.63%
O&M in mills (in 1996 $)	3.2 mills
Revenue Sensitive Taxes - Rate	6.79%
O&M in mills grossed up	3.4 mills
Annual Inflation Rate	5.00%

#	Year	Inflated Mills	Generation	Annual O&M	Present Value at 10.41%
1	1997	3.6 mills	381,338 MWH	$1,364	$1,236
2	1998	3.8 mills	381,338 MWH	$1,433	$1,175
3	1999	3.9 mills	381,338 MWH	$1,504	$1,118
4	2000	4.1 mills	381,338 MWH	$1,579	$1,063
5	2001	4.3 mills	381,338 MWH	$1,658	$1,011
6	2002	4.6 mills	381,338 MWH	$1,741	$961
7	2003	4.8 mills	381,338 MWH	$1,828	$914
8	2004	5.0 mills	381,338 MWH	$1,920	$869
9	2005	5.3 mills	381,338 MWH	$2,016	$827
10	2006	5.6 mills	381,338 MWH	$2,117	$786
11	2007	5.8 mills	381,338 MWH	$2,222	$748
12	2008	6.1 mills	381,338 MWH	$2,333	$711
13	2009	6.4 mills	381,338 MWH	$2,450	$676
14	2010	6.7 mills	381,338 MWH	$2,573	$643
15	2011	7.1 mills	381,338 MWH	$2,701	$612
16	2012	7.4 mills	381,338 MWH	$2,836	$582
17	2013	7.8 mills	381,338 MWH	$2,978	$553
18	2014	8.2 mills	381,338 MWH	$3,127	$526
19	2015	8.6 mills	381,338 MWH	$3,283	$500
20	2016	9.0 mills	381,338 MWH	$3,448	$476
21	2017	9.5 mills	381,338 MWH	$3,620	$452
22	2018	10.0 mills	381,338 MWH	$3,801	$430
23	2019	10.5 mills	381,338 MWH	$3,991	$409
24	2020	11.0 mills	381,338 MWH	$4,191	$389
25	2021	11.5 mills	381,338 MWH	$4,400	$370
26	2022	12.1 mills	381,338 MWH	$4,620	$352
27	2023	12.7 mills	381,338 MWH	$4,851	$335
28	2024	13.4 mills	381,338 MWH	$5,094	$318
29	2025	14.0 mills	381,338 MWH	$5,348	$303
30	2026	14.7 mills	381,338 MWH	$5,616	$288
31	2027	15.5 mills	381,338 MWH	$5,897	$274
32	2028	16.2 mills	381,338 MWH	$6,191	$260
33	2029	17.0 mills	381,338 MWH	$6,501	$248
34	2030	17.9 mills	381,338 MWH	$6,826	$235
35	2031	18.8 mills	381,338 MWH	$7,167	$224
36	2032	19.7 mills	381,338 MWH	$7,526	$213
37	2033	20.7 mills	381,338 MWH	$7,902	$202
38	2034	21.8 mills	381,338 MWH	$8,297	$193
39	2035	22.8 mills	381,338 MWH	$8,712	$183
40	2036	24.0 mills	381,338 MWH	$9,147	$174
Total					$21,838

Snoqualmie Falls
Continuing Expenditures ($000)

Amount in 1991 $	$324
Inflation (91 to 96)	27.63%
Amount in 1996 $	$414
Annual Inflation	5.00%

		22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
		2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	
Annual Expenditure Inflated		$1,210	$1,270	$1,334	$1,400	$1,470	$1,544	$1,621	$1,702	$1,787	$1,877	$1,970	$2,069	$2,172	$2,281	$2,395	$2,515	$2,640	$2,773	$2,911	
Levelized Fixed Charge Rate		13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	13.99%	Total
1	1997																				$61
2	1998																				$125
3	1999																				$191
4	2000																				$262
5	2001																				$336
6	2002																				$413
7	2003																				$495
8	2004																				$580
9	2005																				$670
10	2006																				$764
11	2007																				$863
12	2008																				$967
13	2009																				$1,076
14	2010																				$1,190
15	2011																				$1,311
16	2012																				$1,437
17	2013																				$1,570
18	2014																				$1,709
19	2015																				$1,855
20	2016																				$2,009
21	2017																				$2,170
22	2018	$169																			$2,339
23	2019	$169	$178																		$2,517
24	2020	$169	$178	$187																	$2,703
25	2021	$169	$178	$187	$196																$2,899
26	2022	$169	$178	$187	$196	$206															$3,105
27	2023	$169	$178	$187	$196	$206	$216														$3,321
28	2024	$169	$178	$187	$196	$206	$216	$227													$3,548
29	2025	$169	$178	$187	$196	$206	$216	$227	$238												$3,786
30	2026	$169	$178	$187	$196	$206	$216	$227	$238	$250											$4,036
31	2027	$169	$178	$187	$196	$206	$216	$227	$238	$250	$263										$4,298
32	2028	$169	$178	$187	$196	$206	$216	$227	$238	$250	$263	$276									$4,574
33	2029	$169	$178	$187	$196	$206	$216	$227	$238	$250	$263	$276	$289								$4,863
34	2030	$169	$178	$187	$196	$206	$216	$227	$238	$250	$263	$276	$289	$304							$5,167
35	2031	$169	$178	$187	$196	$206	$216	$227	$238	$250	$263	$276	$289	$304	$319						$5,486
36	2032	$169	$178	$187	$196	$206	$216	$227	$238	$250	$263	$276	$289	$304	$319	$335					$5,821
37	2033	$169	$178	$187	$196	$206	$216	$227	$238	$250	$263	$276	$289	$304	$319	$335	$352				$6,173
38	2034	$169	$178	$187	$196	$206	$216	$227	$238	$250	$263	$276	$289	$304	$319	$335	$352	$369			$6,543
39	2035	$169	$178	$187	$196	$206	$216	$227	$238	$250	$263	$276	$289	$304	$319	$335	$352	$369	$388		$6,931
40	2036	$169	$178	$187	$196	$206	$216	$227	$238	$250	$263	$276	$289	$304	$319	$335	$352	$369	$388	$407	$7,338
Present Value at 10.41%																					$8,970