

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

DOCKET NO. UE-16_____

DIRECT TESTIMONY OF

TARA L. KNOX

REPRESENTING AVISTA CORPORATION

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I. INTRODUCTION

Q. Please state your name, business address and present position with Avista Corporation.

A. My name is Tara L. Knox and my business address is 1411 East Mission Avenue, Spokane, Washington. I am employed as a Senior Regulatory Analyst in the State and Federal Regulation Department.

Q. Would you briefly describe your duties?

A. Yes. I am responsible for preparing the electric regulatory cost of service model for the Company, as well as providing support for the preparation of results of operations reports.

Q. What is your educational background and professional experience?

A. I am a graduate of Washington State University with a Bachelor of Arts degree in General Humanities in 1982, and a Master of Accounting degree in 1990. As an employee in the State and Federal Regulation Department at Avista since 1991, I have attended several ratemaking classes, including the EEI Electric Rates Advanced Course that specializes in cost allocation and cost of service issues. I am also a member of the Cost of Service Working Group and the Northwest Pricing and Regulatory Forum, which are discussion groups made up of technical professionals from regional utilities and utilities throughout the United States and Canada concerned with cost of service issues.

Q. What is the scope of your testimony in this proceeding?

A. My testimony and exhibits will cover the Company's electric revenue normalization adjustments and the electric cost of service study performed for this proceeding. A table of contents for my testimony is as follows:

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7 **Q. Are you sponsoring any exhibits in this case?**

8 A. Yes. I am sponsoring Exhibit No.__(TLK-2) which includes a narrative of
9 the electric cost of service study process, and Exhibit No.__(TLK-3) presents the electric
10 cost of service study summary results.

11 **Q. Were these exhibits prepared by you or under your direction?**

12 A. Yes, they were.

13
14 **II. SUMMARY**

15 **Q. Please briefly summarize your testimony related to the electric cost of**
16 **service study.**

17 A. I believe the Base Case cost of service study presented in this case is a fair
18 representation of the costs to serve each customer group. The Base Case study shows
19 Residential Service Schedule 1, Pumping Service Schedules 31/32 and Street and Area
20 Lighting Service Schedules 41 - 48 provide less than the overall rate of return under present
21 rates. General Service Schedules 11/12 and Large General Service Schedules 21/22 provide
22 more than the overall rate of return under present rates. Extra Large General Service
23 Schedule 25 provides very close to the overall rate of return under present rates. Table No.

1 below shows the rate of return and the relationship of the customer class return to the overall return (relative return ratio) at present rates for each rate schedule:

Table No. 1

<u>Customer Class</u>	<u>Rate of Return</u>	<u>Return Ratio</u>
Residential Service Schedule 1	3.30%	0.55
General Service Schedules 11/12	11.92%	1.98
Large General Service Schedules 21/22	8.96%	1.49
Extra Large General Service Schedule 25	6.23%	1.03
Pumping Service Schedules 31/32	5.01%	0.83
Lighting Service Schedules 41 - 48	<u>5.32%</u>	<u>0.88</u>
Total Washington Electric System	<u>6.02%</u>	<u>1.00</u>

III. ELECTRIC REVENUE NORMALIZATION

Q. Would you please describe the electric revenue normalization adjustments included in Company witness Ms. Andrews Attrition Study?

A. Yes. Similar to the natural gas revenue normalization adjustment, sponsored by Company witness Mr. Miller, there are three separate adjustments that normalize revenue as part of the electric Attrition Study:

1 Weather Normalization: The Commission Basis Results of Operations in column [A] of Exhibit No. ____ (EMA-2), page 4, includes a Commission Basis weather normalization adjustment. Revenues for this adjustment are based on rates that were in effect during the October 2014 through September 2015 test period, and the adjustment adjusts kWh sales and revenues to reflect normal weather conditions.

1 **2 Eliminate Adder Schedules:** In addition to the weather normalization
2 adjustment, the Commission Basis Results of Operations in column [A] of Exhibit
3 No.____(EMA-2), page 4, also includes an Eliminate Adder Schedules adjustment which
4 removes the impact of adder schedule revenues and related expenses during the October
5 2014 through September 2015 test period.

6 **3 Pro Forma Revenue:** The Pro Forma Revenue Normalization Adjustment in
7 column [D] of Exhibit No.____(EMA-2), page 4, adjusts October 2014 through September
8 2015 test period customers and usage for any known and measurable (pro forma) changes.
9 In addition, the adjustment re-prices billed, unbilled, and weather adjusted usage at the base
10 tariff rates approved for 2016, as if the January 11, 2016 base tariff rates were effective for
11 the full 12-months of the test year.

12 **Weather Normalization**

13 **Q. Please begin with the first revenue normalizing adjustment in the**
14 **Attrition Study. What is the Commission Basis weather normalization adjustment?**

15 A. Weather normalization is a required element of Commission Basis reporting
16 pursuant to WAC 480-100-257. The intent of this adjustment is for Commission Basis
17 adjusted revenues (and power supply costs) to reflect operations under normal temperature
18 conditions during the reporting period.

19 **Q. Please briefly summarize the electric weather normalization process.**

20 A. The Company's electric weather normalization adjustment calculates the
21 change in kWh usage required to adjust actual loads during the twelve months ended
22 September 2015 test period to the amount expected if weather had been normal. This
23 adjustment incorporates the effect of both heating and cooling on weather-sensitive

1 customer groups. The weather adjustment is developed from regression analysis of ten
2 years of billed usage per customer and billing period heating and cooling degree-day data.
3 The resulting seasonal weather sensitivity factors (use-per-customer-per-heating-degree day
4 and use-per-customer-per-cooling-degree day) are applied to monthly test period customers
5 and the difference between normal heating/cooling degree-days and monthly test period
6 observed heating/cooling degree-days.

7 **Q. Have the seasonal weather sensitivity factors been updated since the last**
8 **rate case?**

9 A. Yes. The factors used in the weather adjustment are based on regression
10 analysis of monthly billed usage per customer from January 2005 through December 2014
11 which is the most recent completed analysis. Autoregressive terms were included in the
12 regressions in order to correct for autocorrelation in the data.

13 **Q. What data did you use to determine “normal” heating and cooling**
14 **degree days?**

15 A. Normal heating and cooling degree days are based on a rolling 30-year
16 average of heating and cooling degree-days reported for each month by the National
17 Weather Service for the Spokane Airport weather station. Each year the normal values are
18 adjusted to capture the most recent year with the oldest year dropping off, thereby reflecting
19 the most recent information available at the end of each calendar year. The calculation
20 includes the 30-year period from 1986 through 2015.

21 **Q. Is this proposed weather adjustment methodology consistent with the**
22 **methodology utilized in the Company’s last general rate case in Washington?**

1 A. Yes. The process for determining the weather sensitivity factors and the
2 monthly adjustment calculation are consistent with the methodology presented in Docket
3 No. UE-150204. This methodology has been used in every case and Commission Basis
4 Report since it was introduced in Docket No. UE-070804.

5 **Q. What was the change in kWhs resulting from weather normalization for**
6 **the twelve months ended September 2015 test year?**

7 A. Weather was warmer than normal throughout the test year. An
8 extraordinarily mild February through May was followed by an extraordinarily hot June,
9 July and August. Since electric usage is impacted by both heating and cooling, weather
10 normalization required an increase to usage for warm weather during the winter and spring
11 months that was largely offset by a reduction to usage for the hot summer. Overall, the
12 adjustment to normal required the addition of 1,043 heating degree-days during the heating
13 season¹ and the deduction of 335 cooling degree-days during the summer season². The
14 annual total adjustment to Washington electric sales volumes was an addition of 27,259,573
15 kWhs, which is approximately 0.5% of billed usage.

16 **Q. What was the impact of this adjustment on Commission Basis results of**
17 **operations?**

18 A. The Commission Basis weather normalization adjustment increased total
19 electric revenues by \$2,787,000. The combined effect of netting the increase to revenue
20 against the decoupling revenue offset of (\$321,000), resulted in a net revenue weather

¹ The heating season includes the months of January through June and October through December.

² The summer season includes the months of June through September. June is included in both seasons because both heating load and cooling load fluctuations occur during the month.

1 adjustment of \$3,108,000.³ After an offsetting reduction for revenue-related expenses and
2 taxes, the weather normalization adjustment produced an increase to net operating income of
3 \$1,927,000. The electric system monthly weather adjustment volumes were provided to
4 Company witness Mr. Johnson as an input to the Commission Basis Power Supply analysis.

5 **Eliminate Adder Schedules**

6 **Q. Moving on to the second revenue normalizing adjustment in the**
7 **Attrition Study, what is the purpose of the Eliminate Adder Schedules adjustment?**

8 A. The Eliminate Adder Schedules adjustment removes both the revenues and
9 expenses associated with all adder schedule rates not accounted for in other adjustments.
10 These items are recovered/rebated by separate tariffs and therefore are not part of base rates.
11 The items eliminated from the test year include: Schedule 59 Residential Exchange credit,
12 Schedule 91 Demand Side Management rate adjustment, Schedule 92, Low Income Rate
13 Assistance Program rate adjustment, the unbilled portion of Schedule 93 Energy Recovery
14 Mechanism rate adjustment, Schedule 94 BPA Capacity Support rebate, Schedule 95
15 Optional Renewable Power rate, and the unbilled portion of Schedule 98 Renewable Energy
16 Credit Revenue Mechanism.

17 **Q. What was the impact of the Eliminate Adder Schedule adjustment on**
18 **Commission Basis results of operations?**

19 A. The Commission Basis Eliminate Adder Schedule adjustment results in an
20 equal and offsetting reduction to both revenue and expense and has no impact on net
21 income. The billed portion of Schedules 93 and 98 are eliminated in the Eliminate WA
22 Power Cost Deferral adjustment 2.13, and Schedule 58 Municipal Tax Adjustment is

³ The Decoupling Mechanism went into effect January 1, 2015, and was therefore in effect during the months of January through September of the Company's test year.

1 eliminated in the Eliminate B&O Taxes adjustment 2.01. After these adjustments the
2 Commission Basis Restated Total General Business revenue represents weather normalized
3 base rate revenue received during the 12 months ended September 30, 2015 test period.

4 **Pro Forma Revenue**

5 **Q. Please describe the third revenue normalizing adjustment in the**
6 **Attrition Study. What is the purpose of the Pro Forma Revenue Normalization**
7 **adjustment?**

8 A. The purpose of the Pro Forma Revenue Normalization adjustment is to
9 restate revenue on a forward-looking basis. This is accomplished by re-pricing test year
10 normalized billing determinants (including unbilled and weather adjustments, as well as any
11 known and measurable changes to the test year loads and customers) to reflect revenues for
12 the October 2014 through September 2015 test period, as if the base tariff rates approved in
13 Docket No. UE-150204 effective January 11, 2016 had been in effect for the full twelve
14 months of the test period.

15 **Q. What is the impact of the Pro Forma Revenue Normalization**
16 **adjustment?**

17 A. The Pro Forma Revenue Normalization adjustment decreases revenue by
18 \$3,297,000 which, after revenue-related expenses and taxes, decreases Washington net
19 operating income \$1,988,000, as shown in column [D] on pages 4 and 5 of Exhibit
20 No. ____ (EMA-2).

21 **Q. Are the same normalized restated revenues included in Company witness**
22 **Ms. Smith's Pro Forma and Cross Check studies shown as Exhibit No. ____ (JSS-2)?**

1 A. Yes. The Weather Normalization adjustment is shown as adjustment 2.10
2 and the Eliminate Adder Schedule adjustment is shown as adjustment 2.11 on page 7 of
3 Exhibit No.____(JSS-2). The Pro Forma Revenue Normalization adjustment is shown as
4 adjustment 3.08 on page 10 of Exhibit No.____(JSS-2).

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IV. ELECTRIC COST OF SERVICE

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**Q. Please identify the Company’s electric cost studies presented to this
Commission in the last five years as required by WAC 480-07-510 (6).**

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A. Electric cost of service studies were presented to this Commission in Docket
No. UE-100467, Docket No. UE-110876, Docket No. UE-120436 Docket No. UE-140188,
and Docket No. UE-150204.

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Q. What is an electric cost of service study and what is its purpose?

A. An electric cost of service study is an engineering-economic study, which
separates the revenue, expenses, and rate base associated with providing electric service to
designated groups of customers. The groups are made up of customers with similar load
characteristics and facilities requirements. Costs are assigned or allocated to each group
based on (among other things), test period load and facilities requirements, resulting in an
evaluation of the cost of the service provided to each group. The rate of return by customer
group indicates whether the revenue provided by the customers in each group recovers the
cost to serve those customers. The study results are used as a guide in determining the
appropriate rate spread among the groups of customers. Exhibit No. ____ (TLK-2) explains
the basic concepts involved in performing an electric cost of service study. It also details the

1 specific methodology and assumptions utilized in the Company's Base Case cost of service
2 study.

3 **Q. What is the basis for the electric cost of service study provided in this**
4 **case?**

5 A. The electric cost of service study provided by the Company as Exhibit
6 No. ____ (TLK-3) is based on the attrition-adjusted revenue requirement for the 2017 rate
7 period as determined by Ms. Andrews. The twelve months ended September 30, 2015 test
8 year Pro Forma and Cross Check studies presented by Ms. Smith in Exhibit No. ____ (JSS-2),
9 including total expenses and rate base, were adjusted and reconciled with the Attrition Study
10 in order to provide the detailed cost basis for the cost of service study in this case.

11 **Q. Would you please explain the cost of service study presented in Exhibit**
12 **No. ____ (TLK-3)?**

13 A. Yes. Exhibit No. ____ (TLK-3) is composed of a series of summaries of the
14 cost of service study results. The summary on page 1 shows the results of the study by
15 FERC account category. The rate of return by rate schedule and the ratio of each schedule's
16 return to the overall return are shown on Lines 39 and 40. This summary was provided to
17 Company witness Mr. Ehrbar for his consideration regarding rate spread and rate design.
18 The results will be discussed in more detail later in my testimony.

19 Pages 2 and 3 are both summaries that show the revenue-to-cost relationship at
20 current and proposed revenue. Costs by category are shown first at the existing schedule
21 returns (revenue); next the costs are shown as if all schedules were providing equal recovery
22 (cost). These comparisons show how far current and proposed rates are from rates that
23 would be in alignment with the cost study. Page 2 shows the costs segregated into

1 production, transmission, distribution, and common functional categories. Line 44 on page
2 2 shows the target change in revenue which would produce unity in this cost study. Page 3
3 segregates the costs into demand, energy, and customer classifications. Page 4 is a summary
4 identifying specific customer related costs embedded in the study.

5 The Excel model used to calculate the cost of service and supporting schedules has
6 been included in its entirety both electronically and in hard copy in the workpapers
7 accompanying this case.

8 **Q. Given that the specific details of this methodology are described in the**
9 **narrative in Exhibit No. ____ (TLK-2), would you please give a brief overview of the key**
10 **elements and the history associated with those elements?**

11 A. Yes. In general, the cost study follows the methodology established in
12 Docket No. UE-920499 for Puget Sound Power and Light (now Puget Sound Energy).
13 Production and transmission costs are classified into energy-related and demand-related by a
14 peak credit analysis. The definitions of “peaks” and “peak credit” specific to Avista were
15 accepted by the Commission for Avista in Docket No. UE-991606 and confirmed in Docket
16 No. UE-050482.

17 Distribution costs are classified and allocated by the basic customer theory⁴ that was
18 derived directly from the methodology approved for Puget in Docket No. UE-920499.
19 Administrative and general costs are first directly assigned to production, transmission,
20 distribution, and customer relations functions. The Commission found this process
21 acceptable in Avista’s Docket No. UE-991606. The remaining administrative and general
22 costs are categorized as common costs and have been allocated by a variety of factors as

⁴ Basic customer theory classifies only meters, services and street lights as customer-related plant; all other distribution facilities are considered demand-related.

1 approved by this Commission for Puget in Docket No. UE-920499. The specific factors and
2 items they are applied to are described in detail in Exhibit No. ____ (TLK-2) on page 5 and
3 listed by account on page 9.

4 **Q. Does the Company's electric Base Case cost of service study follow the**
5 **methodology filed in the Company's last electric general rate case in Washington?**

6 A. Yes. The methodology presented in this case is the same as that used in the
7 studies presented in Docket Nos. UE-150204, UE-140188, UE-120436 and UE-110876.

8 **Q. What peak credit methodology did the Company use in this case?**

9 A. In this case the Company used the system load factor to determine the
10 proportion of the production function that is demand-related.⁵ This single peak credit ratio
11 is then applied uniformly to all production costs. This is the same method the Company
12 proposed in its recent rate filings.⁶ In Washington, transmission costs have traditionally
13 been treated as an extension of the generation system, therefore, the peak credit ratio has
14 also been applied to transmission costs in this study.

15 **Q. What are the benefits of using the system load factor to determine the**
16 **peak credit ratio?**

17 A. There are several benefits to the system load factor approach for identifying
18 the demand-related proportion of production costs: 1) It is simple and straightforward to

⁵ One minus the load factor equals the demand percentage or peak credit ratio.

⁶ In the Company's cost of service studies prior to 2010, Avista's electric system resource costs were classified to energy and demand using a comparison of the replacement cost per kW of the Company's peaking units to the replacement cost per kW of the Company's thermal and hydro plants (separately). This analysis created separate peak credit ratios applied to thermal plant and hydro plant. Transmission costs were assigned to energy and demand by a 50/50 weighting of the thermal and hydro peak credit ratios. Fuel and load dispatching expenses were classified entirely to energy, and peaking plant-related costs were classified entirely to demand.

1 calculate; 2) it is directly related to the system and test year under evaluation; and 3) the
2 relationship should remain relatively stable from year to year.

3 **Q. What are the results in this case using the system load factor peak credit**
4 **methodology?**

5 A. Under the system load factor peak credit methodology, 37.93% of total
6 production and transmission costs are classified as demand-related, and 62.07% are
7 classified as energy-related.

8 **Q. What are the results of the Company's electric cost of service study**
9 **presented in this case?**

10 A. Table No. 2 shows the rate of return and the relationship of the customer
11 class return to the overall return (relative return ratio) at present rates for each rate schedule:

12 **Table No. 2**

<u>Customer Class</u>	<u>Rate of Return</u>	<u>Return Ratio</u>
Residential Service Schedule 1	3.30%	0.55
General Service Schedules 11/12	11.92%	1.98
Large General Service Schedules 21/22	8.96%	1.49
Extra Large General Service Schedule 25	6.23%	1.03
Pumping Service Schedules 31/32	5.01%	0.83
Lighting Service Schedules 41 - 49	<u>5.32%</u>	<u>0.88</u>
Total Washington Electric System	<u>6.02%</u>	<u>1.00</u>

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20 As can be observed from the above table, Residential service Schedule 1 shows
21 under-recovery of the costs to serve them. The Pumping service schedule (31/32) and the
22 Lighting service schedules (41-48) show moderate under-recovery. The Extra Large
23 General service Schedule 25 is essentially at unity with the overall return from present rates.

1 However, the General and Large General service schedules (11/12 and 21/22) show over-
2 recovery of the costs to serve them. The summary results of this study were provided to Mr.
3 Ehrbar for consideration in the development of proposed rates.

4 **Q. Does this conclude your pre-filed direct testimony?**

5 A. Yes.