Exhibit No. __ (BR-7T)
Docket No. UG-170929
Witness: Brian Robertson

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, Complainant, v. CASCADE NATURAL GAS CORPORATION Respondent.	DOCKET UG-170929

CASCADE NATURAL GAS CORPORATION

REBUTTAL TESTIMONY OF BRIAN ROBERTSON

March 23, 2018

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I. INTRODUCTION AND SUMMARY

Q. Are you the same Brian Robertson who filed direct testimony in this proceeding on behalf of Cascade Natural Gas Corporation ("Cascade" or "Company")?

A. Yes, as Exhibit No. __(BR-1T).

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to respond twofold: First, my testimony is to respond to Commission Staff's discussion on weather normalization methodologies as presented in the Testimony of Jing Liu (Exhibit JL-1CT). Second, I will describe Cascade's efforts to initiate a load study by the time of the filing of this rate case, as provided for the Settlement Agreement adopted in UG- 152286. In particular, I will discuss the efforts the Company made to understand the scope and required costs of a study that would include sampling of the constituents of the Company's core usage classes using loggers. I will also describe the discussions the Company had with Staff regarding the relative value of the type of load study described in the Settlement Agreement, and the Company's proposed alternative to such a study. In addition, I will respond to specific criticisms of Cascade's approach to a load study made by Staff and NWIGU and will demonstrate that the Company intended to comply with the Settlement Agreement in good faith

Q. Are you sponsoring any exhibits in this proceeding?

A. Yes. I am sponsoring the following exhibits:

- Exhibit No. BR-8 – CNGC's Supplemental response to the WUTC DR 67 issued in UG-152286.

- Exhibit No. BR-9C – Confidential Methodologies and Processes from Schneider Electric (formerly known as Telvent DTN).
- Exhibit No. __(BR-10) – Email - Staff (Hancock) to CNGC (Robertson)
- Exhibit No. __(BR-11) – Staff's Response to CNGC DR 6
- Exhibit No. __(BR-12) - Staff 's Response to CNGC DR 7
- Exhibit No. __(BR-13) – Cascade's Response to WUTC DR 26
- Exhibit No. __(BR-14) – Email between Staff (Hancock) and CNGC (Robertson)
- Exhibit No. __(BR-15) – Emails between Staff (Hancock) and CNGC (Robertson)

II. WEATHER NORMALIZATION

Cascade's Proposed Methodology

Q. Please summarize the weather normalization methodology used by the Company in preparing this case.

A. As described in my direct testimony,[1] the Company proposes using Cascade's forecast model, with actual test year customers and normal year weather to calculate the normalized therms. Cascade's forecast model forecasts at the daily citygate level which allows for more granularity. The Company's proposed methodology for weather normalization will be referred to as the Proposed Methodology.

Q. What do you mean when you say the Proposed Methodology allows for more granularity?

[1] Direct Testimony of Brian Robertson, Exhibit BR-1T.

A. The Proposed Methodology allows Cascade to analyze data in increasingly more focused and refined ways. For example, taking state-wide data and breaking it down to the district level would be one form of increased granularity. Another example could be taking monthly data and breaking it down to the daily level.

Q. How does this Proposed Methodology differ from Cascade's previous methodology?

A. The proposed methodology differs in four ways which will be explained throughout my testimony. Briefly, the differences are as follows;

- The usage data in the Proposed Methodology is Pipeline Electronic Bulletin Board data that Cascade allocates to each customer class based on allocations created using Customer Care & Billing (CC&B) data, whereas the previous methodology used CC&B data and Legacy[2] data;
- The Proposed Methodology analyzes regressions at the citygate level, whereas the previous methodology analyzes regressions at the four weather zones;
- The Proposed Methodology uses daily data, whereas the previous methodology used monthly data; and
- The Proposed Methodology uses weather data from Schneider Electric, whereas the previous methodology used NOAA weather data.

Cascade's Support for Use of the Proposed Methodology

Q. What did Commission Staff recommend regarding weather normalization methodology?

[2] Legacy is the software that was used prior to CC&B.

A. Ms. Liu recommends the Company use the weather normalization methodology that was agreed to by the parties and adopted by the Commission in Cascade's 2015 general rate case docketed as UG-152286 for purposes of preparing the Company's annual Commission Basis Report (CBR)[3] (hereafter, the weather normalization methodology from the UG-152286 Settlement Agreement is referred to as the Settlement Methodology).

Q. Do you agree with Staff's recommendations?

A. No. Fundamentally, I believe that the Settlement Methodology (in comparison with the Proposed Methodology) produces inferior weather normalization results because the Settlement Methodology uses less accurate NOAA temperature data and relies on monthly data instead of more granular daily data.

The overarching issue with the Settlement Methodology is the lack of granular data. As Ms. Liu mentioned "In general, granular data is preferred in statistical analysis. More fine-tuned units of analysis *usually* yield better statistical analysis and more accurate forecasting results. Daily data increases the sample size and allows a greater degree of freedom in statistical inference."[4] The Company strongly believes the lack of granular data is the main cause of producing the irregular results seen later in Table 1.

Q. Please explain why you disagree with Staff's recommendations.

A. As explained in my direct testimony, the Proposed Methodology is more accurate, and therefore should be used to set rates.[5] The Settlement Methodology should be rejected because it will produce less accurate results.

[3] Response Testimony of Jing Liu, Exh JL-1CT, 4:16-19.
[4] Response Testimony of Jing Liu, Exh JL-1CT, 10-11.
[5] Direct Testimony of Brian Robertson, Exhibit BR-1T, pages 2-7.

Q. How do you evaluate whether a methodology produces accurate results?

A. Generally, an accurate weather normalization methodology would produce normalized usage results that are consistent year over year that increases or decreases based on growth, conservation impacts to use per customer, and any changes to normal HDDs. Thus, methodologies can be compared and validated by considering the degree to which the results produce normalized usage results that are consistent after taking into account the other usage variables.

Q. Please explain why the Company believes that its Proposed Methodology is more accurate.

A. The Company analyzed and reproduced weather normalizations for the years 2012-2015 using both the Proposed Methodology and the Settlement Methodology, which is similar to Staff's Methodology. The Company shows that the Proposed Methodology produces results that are consistent from year to year, which proves that the Proposed Methodology is more accurate.

Q. Please explain how each methodology was analyzed.

A. The Company used all available historical data to compare the results from these different methodologies. The Proposed Methodology is limited to data going back to July of 2010 when CC&B was incorporated as the Company's billing software. Although the data available for the Proposed Methodology was limited because it is available only through 2010, that data is used alongside the pipeline data creating daily data which gives a sufficient sample size to run the regression analysis. The Settlement Methodology, which relies on CC&B and Legacy data, did not have any limitations for historical data. The Legacy data was used in the old weather normalization model,

therefore was easily transferred to be used in the Settlement Methodology. Cascade only has Legacy data by weather zone, and the Proposed Methodology would require Legacy data by city/town to create the allocations needed.

Q. Please explain the results of the analysis on the Proposed Methodology and Settlement Methodology.

A. As seen in Table 1 and Table 2, the Settlement Methodology weather normalized usages are within 7.55% of each other while the Proposed Methodology weather normalized usages are all within 1.68% of each other. Furthermore, the year-on-year change in the Settlement Methodology is unexplainably sporadic in comparison with the Proposed Methodology. The Proposed Methodology produces year over year results that are consistent and expected when factoring in growth, conservation, and the change in Normal HDDs.

Table 1 – Weather Normalized Volumes using Settlement Methodology

Weather Normalization Year	Historical Data Used	Actual Usage	Adjusted Usage	Weather Normalized Annual Usage	Year-to-year percentage change
2012	2003-2012	113,595,035	5,143,281	118,738,316	
2013	2004-2013	118,288,699	(1,090,564)	117,198,135	-1.30%
2014	2005-2014	110,709,177	9,641,601	120,350,778	2.69%
2015	2006-2015	100,888,451	15,479,824	116,368,275	-3.31%
2016	2007-2016	110,096,508	15,052,094	125,148,602	7.55%

Table 2 – Weather Normalized Volumes using Proposed Methodology

Weather Normalization Year	Historical Data Used	Actual Usage	Adjusted Usage	Weather Normalized Annual Usage	Year-to-year percentage change
2012	2010-2012	113,595,035	5,413,357	119,008,392	
2013	2010-2013	118,288,699	1,633,518	119,922,217	0.77%
2014	2010-2014	110,709,177	10,173,838	120,883,015	0.80%
2015	2010-2015	100,888,451	17,997,567	118,886,018	-1.65%
2016	2010-2016	110,096,508	9,711,742	119,808,250	0.78%

Q. Please summarize your position on weather normalization based on the analysis of these methodologies being used for past weather normalizations.

A. The Company recommends the Proposed Methodology since it provides a much more accurate and consistent weather normalization.

Cascade's Response to Staff's Critique of the Proposed Methodology

Q. In her testimony, Ms. Liu describes three areas of concern with the Company's Proposed Methodology. What are her concerns?

A. Ms. Liu questions the accuracy of the Company's citygate data, expresses concern with Cascade's use of Schneider weather data, and, asserts that Cascade's use of a single

temperature coefficient across all months of the year misrepresents the relationship between temperature and throughput for a customer class.[6]

Q. Please address Ms. Liu's concern with the Company's use of citygate data.

A. Ms. Liu has five concerns with the Company's use of citygate data. I list each concern below followed by the Company's response to her concern.[7]

1) Pipeline gas flow data

Ms. Liu expresses concern that the Company does not adjust its daily gas flow data for "line losses." Line losses is a common term in the electric industry for the actual loss of energy as that energy is transmitted over distances. Gas does not experience losses in the same manner electricity does. The gas industry uses the term *lost and unaccounted for* gas to refer to the difference in gas brought into the system and gas taken out of the system. Meters are considered accurate within a range of two percent up or down. The *lost and unaccounted for* rate is an accounting term for balancing the difference between gas in and gas out that largely results because of the deviation between meters. Gas systems can leak but any amount of fugitive emissions is addressed in the Company's *lost and unaccounted for* rate. The Company does not calculate the *lost and unaccounted for* rate that takes place on Cascade's distribution system. Cascade does calculate it on the entire system, including upstream pipelines. The Company would only be concerned about the impact on our distribution system. The impact of applying the *lost and unaccounted for* rate on the entire system would be approximately 200,000 therms for the 503 class. This was calculated taking the current 0.1615% *lost and*

[6] Response Testimony of Jing Liu, Exh JL-1CT, 10:3-15.
[7] Response Testimony of Jing Liu, Exh JL-1CT, 11-15.

unaccounted for rate and multiplying by the 2016 Proposed Methodology weather normalized annual usage of 119,808,250 therms. Given the Company is only interested in the *lost and unaccounted for* rate on Cascade's distribution system, the impact to the Proposed methodology would be a fraction of the 200,000 therms, which we believe is negligible. This *lost and unaccounted for* rate would decrement the weather normalization, but since there is not a precise number for Cascade's distribution system, Cascade does not account for it in the Proposed Methodology.

2) Core usage

The Company calculates core usage by subtracting the number of therms billed to transportation customers from the total gas flow data. Ms. Liu claims that the two sources of meter readings for this calculation are "not accurate or consistent"; she says this is demonstrated by days where core usage is negative.[8] These two sources of meter readings are Pipeline Electronic Bulletin Board (EBB) and Aligne which is the main source of transportation customer data for CC&B. Ms. Liu's assertion that these sources are "not accurate or consistent" is incorrect. Data sources are rarely 100% accurate, and yet the data anomalies which resulted in the errant result of negative core usage are unusual. For example, the daily results for core usage were negative when the upstream pipeline company adjusted the flow of gas so that it bypassed the citygate meter as it entered the Company's distribution system. This was done so the pipeline company could work on the citygate meter. Such scenarios like this are unusual and the Company reviews the data prior to running any regressions.

[8] Response Testimony of Jing Liu, Exh JL-1CT, 12-13.

The CC&B data, described above as "not accurate or consistent", is the basis for the Settlement Agreement methodology and Staff's methodology. Both the Pipeline EBB and CC&B data require data scrubbing, which is a common practice in statistical analysis. The Company looked at the complete data source for core usage (citygate data minus CC&B data) when cleaning the data. The Company has documents of the data set prior and after removing the data. The Company believes its data sources, Pipeline EBB and CC&B, are acceptable and its data scrubbing practices are appropriate.

3) Core Usage for Each Customer Class

The Company develops its customer class usage ratios based on historical billing usage. Ms. Liu claims this approach does not address the changes in daily specific usage.[9] The Company does not disagree with Staff's point, but feels the methodology still provides reasonable daily specific usages and that the benefit of allowing for the use of more granular data outweighs the downside of not having daily specific usage information. The Company used ratios for monthly billing allocations which, when tested, produces very similar results to the actual daily usage. For illustrative purposes, Table 3a gives a hypothetical example of actual daily meter reads. From Table 3a, monthly allocations are determined by taking the customer class total divided by the total throughput. In the illustration, the residential allocation would be 33 divided by 57. Table 3b presents the results of the daily usage allocated between the residential and commercial class using the allocation factor. The differences are immaterial. This

[9] Response Testimony of Jing Liu, Exh JL-1CT,13:4-14.

approach provides more accurate data than the monthly billing data used for the Settlement Methodology.

Table 3a and 3b– Example of Allocation for Daily Usage

Table 3a – Example of Actuals

	Daily Therms					Total
Residential	8	5	9	4	7	33
Commercial	6	4	7	2	5	24
Totals	14	9	16	6	12	57

Table 3b – Example of Allocation Applied to Daily Throughput

	Daily Therms					Total
Residential	8.1	5.2	9.3	3.5	6.9	33
Commercial	5.9	3.8	6.7	2.5	5.1	24
Totals	14	9	16	6	12	57

4) Number of Customers.

Ms. Liu claims the Company doesn't "know or use the actual number of customers for each class behind each city gate or city gate (sic) loop."[10] This is incorrect. The Company does know the actual number of customers for each class behind each citygate or citygate loop. The Company developed a methodology of using GIS Silverlight Viewer, now called GIS Web Viewer, and CC&B data to determine the customers behind each citygate. Where applicable, the Company would use GIS Web Viewer, manually counting each customer behind a citygate, to determine the customer allocation percent. This analysis was performed in 2013, and was a labor intensive, manual process that took the Company approximately six months to complete. The Company believes these allocations are still accurate, as described in the example below.

[10] Response Testimony of Jing Liu, Exh. JL-1CT, 13:16-17.

Using the town of Sunnyside and the citygate of Dehawn Dairy as an example, the Company knows it has two residential customers behind that citygate. In CC&B, the Dehawn Dairy customers have the city/town location of Sunnyside. The town of Sunnyside had an average of 1833 residential customers in 2013. This would mean the number of customers behind the citygate of Dehawn Dairy was 0.11% of the total Sunnyside residential customers. Keeping the 0.11% constant, Sunnyside residential would require the 1833 count to drop to 916 or increase to 2749 customers to increase or decrease the Dehawn Dairy customers by one. This would require approximately a 50% decline or increase in growth in Sunnyside residential customers to change the 2 residential customers behind the Dehawn Dairy citygate. Sunnyside has seen approximately 2.5% growth from 2013 to 2016. The Company believes the ratios developed in 2013 are accurate, as described in the above example, for the current rate case as the Company would have had to have experience significant changes in population to result in a substantive change to these allocations.

5) Temperature Sensitivity for Customer Classes

Ms. Liu contends that the Company's intermingling of different rate schedules—Schedules 502 (residential dry-out customers), 503 (residential), and 541 (gas air conditioning) customers into the residential customer class; and included Schedules 504 (commercial), 511 (more than 50,000 therms) and 512 (compressed natural gas) into the commercial customer class—biases the weather sensitivity coefficients.[11] Cascade disagrees with her conclusion. The Company performed its analysis by combining the rate schedules by class for two reasons:

[11] Response Testimony of Jing Liu, Exh JL-1CT, 14-15.

1) It is more efficient. Splitting the data down to the rate schedule level would have approximately tripled the amount of regressions the Company would need to analyze. Since the original 143 regressions took two months to analyze, the process would have taken 6 months to analyze at the tariff level; and

2) The Company believes combining the rate schedules by class is reasonable. The 503 and 504 rate schedules are approximately 99% and 87% of their respective rate classes, therefore, the regressions are greatly impacted by those rate schedules. Once regressions are finalized, they're broken out by rate schedule based on their "distinctive usage characteristics" which removes those impacts from other rate schedules.

Q. Please address Ms. Liu's concern that the Company uses Schneider weather data instead of NOAA weather data.

A. Ms. Liu states,

> None of the reasons the Company has offered in the past for its refusal to use NOAA data, and instead use Schneider Electric data, justifies its refusal in this rate case. In the past, the Company has explained that it uses Schneider Electric's data because Schneider Electric supposedly modifies temperature data to improve accuracy, as needed. . . Schneider Electric's "improvement" to the data is a black box, for which neither the Company nor any other party has provided an explanation. [12]

Ms. Liu's statement that the data is a "black box" is not correct. The Company believes that the past discussions to which Ms. Liu refers occurred in discovery in the Company's 2015 rate case, and specifically in the Company's Supplemental Response to Staff's Data Request No. 67 in Docket UG-152286, attached as Exh. No. BR-8. The

[12] Response Testimony of Jing Liu, Exh. JL-1CT, 15-16.

Company provided this Supplemental Response on March 1, 2016. In this response, the Company says:

> There are a few reasons the company decided to switch from NOAA to Schneider Electric:
>
> i. NOAA has published daily weather data with missing weather data.
> ii. NOAA only publishes a 30 year "normal" every 10 years, which Cascade believes is an issue for the forecast model. For example, if Cascade used NOAA's current normals for the 2016 forecast we would be using 1981-2010 data while ignoring the most recent 2011-2015 weather data.
> iii. Cascade also wanted to be consistent with MDU and IGC by using the same data.[13]

Regarding Ms. Liu's claim that "Schneider Electric's 'improvement' to the data is a black box, for which the Company nor any other party has provided an explanation" [14], attached as Exhibit No. BR-9(C) is a document from Schneider Electric (formerly Telvent DTN) that was provided as an attachment to the Company's Supplemental Response to Staff's Data Request No. 67 in UG-152286. This document—and specifically the discussion in section 2.3 regarding data cleansing—explains how Schneider develops its weather forecast and supplements their data. Thus, Staff has the information about how Schneider improves its data, and has had this information since the Company provided its Supplemental Response to Staff's Data Request No. 67 in the previous rate case, approximately 2 years ago.

Q. Is there an additional reason as to why the Company prefers Schneider Electric over NOAA weather data?

A. Yes. As described in Schneider Electric's Methodologies and Processes[15] "Schneider Electric collects weather observations from a variety of sources." Cascade has a very

[13] Exh. BR-8.
[14] Response Testimony of Jing Liu, Exh. JL-1CT, 15-16.
[15] Exhibit No. BR-9(C).

rural service territory and believes that gathering data from multiple sources around a weather area adds a greater benefit to Cascade. In contrast, NOAA data relies on just one source for each weather area. The NOAAs data is collected at four weather locations in Washington, in which all weather data is received from the regional airports.

Q. Please address Ms. Liu's concern that Cascade's use of a single temperature coefficient across all months of the year misrepresents the relationship between temperature and throughput for a customer class.

A. Ms. Liu states "The Company's regression model assumes that customers' gas usage sensitivity remains the same throughout all seasons."[16] However, Staff would expect to see residential customers' gas usage in the summer to be very flat and the sensitivity coefficients to be close to zero and not statistically significant. The Company believes assumptions like this present a biased opinion on which model is preferred without data to support it. The Company, as always, is willing to model different types of regressions to try and improve the model. Given the amount of regressions needed to be analyzed, and the amount of time and resources it would take, the analysis between the two models cannot be performed for this rate case. The Company is confident the regression models have captured the usage sensitivity with the HDD and monthly indicator coefficients.

Q. Why is the Company confident the regression models have captured the usage sensitivity with the HDD and monthly indicator coefficients?

A. The Company performed a backwards stepwise regression analysis on the use per customer using weekend, HDD, and the monthly indicators. The stepwise regression includes running a regression model with all variables the Company believes will impact

[16] Response Testimony of Jing Liu, Exh. JL-1CT, 17:3-4.

usage. Once the model is run, Cascade analyzes the variables and removes any variable that has a p-value above the recommended .05 statistical significance level. This step is repeated until all variables have a p-value below the .05 statistical significance level.

Q. Ms. Liu's recommended changes to the Company's weather normalization method result in three adjustments totaling $8,732,610 to Cascade's revenue requirement. Does the Company believe these adjustments are appropriate?

A. No. As explained in my testimony above, the Company is confident that the results of its methodology are more accurate and, therefore, no adjustments are necessary. The adjustment itself is discussed further in the Rebuttal Testimony of Michael Parvinen.

Q. In her testimony, Ms. Liu states the Company used a methodology other than the method agreed upon in the UG-152286 Settlement Agreement because, "the Company appears to have disliked the results." Is this accurate?

A. No, not entirely. However, when considering the accuracy of a weather normalization methodology, it is essential to consider the results. After reviewing the results, Cascade had serious concerns about the accuracy of the Settlement Methodology. Since the Settlement Methodology is fairly similar to the methodology that produced the 2015 Commission Basis Report (CBR), Cascade compared the 2015 results to the 2016 results. Comparing the 2015 CBR and the 2016 Settlement Methodology results, Cascade had concerns with the accuracy of Settlement Methodology given the significant change in results without a corresponding change in growth, conservation, or other measures that would impact normalized volumes. Cascade further confirms the concern with the analysis in Table 1 showing an increase of approximately 9,000,000 therms without any corresponding changes that can explain that increase.

Differences Between Cascade's Application of the Settlement Methodology and Staff's Application of the Settlement Methodology

Q. Did the Company perform an analysis of weather normalized volumes using the Settlement Methodology?

A. Yes. In my direct testimony, I explain that Cascade compared the results from the Settlement Methodology and the 2012 Weather Normalization result after incorporating growth, and determined that the Proposed Methodology produces more accurate results.[17]

Q. Does Staff's application of the Settlement Methodology produce the same results as Cascade's application of the Settlement Methodology?

A. No. Ms. Liu describes three differences between Cascade's approach to implementing the Settlement Methodology and the Staff's approach to implementing the Settlement Methodology for weather normalization:

1. Cascade's diverse service territory requires analysis of four distinct weather areas. For the Bremerton-Aberdeen-Longview area, the Company used the Hoquiam weather station for Cascade's Bremerton-Aberdeen-Longview service area. Staff, on the other hand used temperature data from Bremerton in place of the Hoquiam temperature data for the Company's Bremerton-Aberdeen-Longview service area because the Bremerton temperature data produced a better fit for the model.[18]
2. The NOAA weather data set used per the Settlement Methodology has missing data points for certain temperature values. In Cascade's implementation of the

[17] Direct Testimony of Brian Robertson, Exhibit BR-1T, pages 6-7.
[18] Response Testimony of Jing Liu, Exh. JL-1CT, 19:10-12.

Settlement Methodology, Cascade averaged the minimum and maximum temperatures of the day prior and the day after for any missing temperature values. Staff took a slightly different approach, and Ms. Liu filled in missing data points in NOAA daily temperature with the most up-to-date temperature data based on average temperature from the adjacent days as a proxy if a daily temperature value is missing.[19]

3. There appear to be slight differences in the NOAA weather data used by the Company and Staff, which Staff attributed to the Company using a 30-year rolling average, whereas Ms. Liu used NOAA's 30-year normal HDD data for 1981-2010.[20] However, in the Company's implementation of the Settlement Methodology, Cascade *also* used NOAA's 30-year normal HDD data for 1981-2010, and so, it appears that the differences in the data may be attributable to some other issue, such as pulling the data from two different sources within NOAA, or one source undergoing a smoothing process where the other source is just the underlying data.

Q. Regarding item 3, above, did you state in your direct testimony that the Company used a 30-year rolling average?

A. Yes. In my direct testimony, I stated "In this particular instance, normal weather is referring to the average daily temperature based on the most recent 30 years of weather history in each weather location which results in the average annual temperatures as well."[21]

Q. Do you want to make a correction to your Direct Testimony?

[19] Response Testimony of Jing Liu, Exh. JL-1CT, 19:15-17.
[20] Response Testimony of Jing Liu, Exh. JL-1CT, 20:2-3.
[21] Direct Testimony of Brian Robertson, Exhibit BR-1T, 4:2-3.

A. Yes.

Q. What is the correction you'd like to make?

A. Similar to Staff, Cascade used the 30-year normal HDD data for 1981-2010 for the 30-year monthly normal HDDs used in the Settlement Methodology.

Q. Why are the 30-year monthly normal HDDs different if they are both pulled from NOAA and the same timeframe?

A. Staff and the Company used two different sources within NOAA for the 30-year monthly normal HDDs.[22] The Company agrees with Staff that the difference between the two sources are negligible.[23]

Q. Staff and Cascade has slightly different approaches for the Settlement Methodology. If the Commission were to agree with Staff that the Settlement Methodology should be used for weather normalization, do you have any concerns with Staff's approach for Settlement Methodology?

A. No. While Staff's approach is slightly different from Cascade's approach, Cascade has no objection to Ms. Liu's approach to the Settlement Methodology.

Conclusion

Q. Please summarize your position on weather normalization methodology.

A. The Company believes both the weather normalization methodologies being discussed—the Settlement Methodology and the Company's Proposed Methodology—are reasonable

[22] Staff's Source: *See* NOAA, *1981-2010 U.S. Climate Normals*, https://www.ncdc.noaa.gov/data-access/land-based-station-data/land-based-datasets/climate-normals/1981-2010-normals-data (last visited Feb. 12, 2018). Company Source: https://gis.ncdc.noaa.gov/maps/ncei#app=cdo&cfg=cdo&theme=normals&layers=01&node=gis&extent=-149.3:20.2:-60.1:69.6&custom=normals

[23] Response Testimony of Jing Liu, Exh. JL-1CT, 20:8-10.

but each contains assumptions that attempt to produce accurate results. But the Settlement Agreement methodology does not use granular data, and therefore produces inferior and inconsistent results.

The Company's proposal is more granular in that it gets as close as is reasonably possible to daily usage data without an automated metering infrastructure for daily meter reads. Per Ms. Liu,

> In general, granular data is preferred in statistical analysis. More fine-tuned units of analysis *usually* yield better statistical analysis and yield more accurate forecasting results.[24]

The most accurate methodology using the most granular data and producing the most accurate results would be a methodology that uses daily meter reads from a fixed network which the Company currently does not have in place. Of the three methodologies proposed, the Company believes the granular data, which lead to more accurate weather adjustments from its Proposed Methodology is the most accurate because it provides consistent weather normalized annual usage results and demonstrate year over year trends consistent with growth and conservation.

III. INITIATING A LOAD STUDY

Q. Please provide background on the settlement terms the parties reached in UG-152286 with respect to a load study.

A. In Cascade's last general rate case, UG-152286. parties reached a full settlement of all issues, which was approved by the Commission in Order 04. As part of the settlement

[24] Direct Testimony of Jing Liu, Exh JL-1CT, Page 10 lines 21-23.

regarding the issue of rate spread, the parties agreed to assign 75% of the proposed revenue increase to the residential class, with the remaining 25% assigned to the Commercial, Industrial, and Transportation customers on an equal basis.[25] To address Staff concerns about the accuracy of the assignments to the customer classes, Cascade agreed to initiate a load study, prior to its next general rate case, to determine the class core responsibilities for the amount of gas distributed on a daily basis in Cascade's service territory[26]. That agreement indicated that Cascade would "sample" the constituents of the Company's core usage classes.[27]

Q. After the settlement was approved, what actions did the Company take to investigate what it would take to perform the sampling agreed to in the Joint Settlement Agreement?

A. The Company began by investigating the types of load studies that might be performed including the various components, the time required for such studies, and the potential costs. The Company had informal discussions with several local distribution companies ("LDCs"), Puget Sound Energy, and Northwest Natural Gas Company. Additionally, Cascade's integrated resource planning (IRP) consultant, Bruce Folsom, spoke with his former employer, Avista Energy. Internal discussions with various groups such as Gas Control and Engineering were also held to determine the potential scope and costs of a load study.

[25] *Wash. Utils. & Transp. Comm'n v. Cascade Natural Gas Corp.*, Docket UG-152286, Order 04 at 7, ¶ 19 (July 7, 2016).
[26] *Wash. Utils. & Transp. Comm'n v. Cascade Natural Gas Corp.*, Docket UG-152286, Order 04, Joint Settlement Agreement at 7, ¶ 17 and at 15 ¶ 46 (July 7, 2016).
[27] W*ash. Utils. & Transp. Comm'n v. Cascade Natural Gas Corp.*, Docket UG-152286, Order 04, Joint Settlement Agreement at 15 ¶ 46 (July 7, 2016).

Q. Based on this research, did the Company have concerns about approaching a load study?

A. Yes. Our primary concern related to cost. In order to carry out the sampling contemplated in the Settlement Agreement, the Company would need to install loggers throughout the Company's service territory to capture the information required. Each of the regional LDCs with whom we spoke pointed out that Cascade's service territory is significantly more rural than their own, and indicated that the cost of installing loggers in Cascade's geographically diverse territory would be millions of dollars and that doing so would likely take years to complete. Based on this information, the Company concluded that it would be prudent to determine whether there was another approach to the study that could achieve Staff's goals, in a cost-effective manner, to that end, the Company initiated discussions with Staff in an effort to work collaboratively to achieve an acceptable solution.

Q. What efforts did the Company make to work collaboratively with Staff to find a mutually-agreeable solution?

A. The Company initiated contact with Staff member Christopher Hancock in early 2017, and a meeting was held with Mr. Hancock and Cascade personnel via teleconference on March 9, 2017.

Q. Please describe the March 9, 2017 meeting.

A. In addition to Mr. Hancock, the participants in attendance were our Manager of Supply Resource Planning Analyst, Mark Sellers-Vaughn, Resource Planning Analyst, Devin McGreal, and myself. Cascade also asked it's IRP consultant, Bruce Folsom, to participate. Mr. Folsom has a wealth of industry experience, including 23 years with

Avista Corporation and eight years with the Washington Utilities and Transportation Commission. The Company felt Mr. Folsom's combined utility and regulatory background would be useful during the load study discussions. We started the call with a discussion of the specific language contained in the Settlement Agreement regarding the load study. Mr. Hancock explained that in his viewpoint, the concept for the load study was to sample customers in each region using meters/loggers that provide daily measurements. Mr. Hancock also opined that a load study might also require installing smart meters across Cascade's system.

Q. Did Cascade express its concerns about conducting such a load study to Mr. Hancock?

A. Yes. We discussed our concerns about the study, particularly concerning the data collection infrastructure, timing and costs.

Q. Did the Company suggest an alternative to an approach requiring the installation of loggers that provide daily measurements?

A. Yes. The Company suggested that as an alternative, it might perform an enhanced version of the citygate study that the Company was developing, using a new regression methodology, which was designed to improve the accuracy of the Company's data.

Q. Did the Company provide a detailed explanation of its proposed approach?

A. Yes. The Company explained the methodologies it proposed to use in its citygate study to determine customer and demand, as well as the peak day demand forecasts. The Company explained that Cascade utilizes Autoregressive Integrated Moving Average ("ARIMA") models for the customer forecast as well as the demand forecast. The Company described the underlying data used for each model, the sources of the data, how

the data was scrubbed, and how the data was formatted for modeling. There was an open exchange of questions and ideas as the Company described how customer data is gathered through the customer billing system, including cycle, town and class. We discussed how demand usage data is gathered through the pipelines' Electronic Bulletin Board ("EBB") Systems where pipelines post daily usage data at the citygate level. We also discussed the topic of using data from Schneider Electric data instead of NOAA to determine heating degree days which prompted a discussion on how to handle gaps in weather data. Finally, we provided an explanation of the demand formulas for the forecast and peak day.

Q. Did Mr. Hancock indicate that he was open to the Company's proposed approach?

A. Yes. Mr. Hancock said he felt that Cascade's citygate study could potentially satisfy Staff's load study needs but he would need more time to ensure the accuracy of our calculation of the un-billed volumes, and to generally understand Cascade's approach better. Cascade agreed to provide more information to Mr. Hancock and look at arranging another discussion.

Q. Did Mr. Hancock follow up with you to indicate his optimism that the Company's approach would be acceptable to Staff?

A. Yes. On March 17, 2017, Mr. Hancock noted in an email that he was cautiously optimistic that a solution could be found that wasn't as costly as deploying meters/loggers.[28]

Q. Please describe the Company's actions following the March 9, 2017 meeting.

[28] Exh. (BR-10)

A. After the March 9, 2017 meeting, we began working on the documentation explaining our citygate study approach. The process was time-consuming, and on April 26, 2017, I sent an email to Mr. Hancock. In that email, I apologized for not sending the documentation sooner, and I explained that Cascade was hosting a meeting for the Oregon IRP at the Oregon Public Utility Commission on May 11th, at which the Company would be discussing the forecast model in depth at that time. I suggested that Mr. Hancock might want to participate by phone. Mr. Hancock stated that he did wish to attend the meeting and I sent him the meeting information.[29]

Q. Did Mr. Hancock attend the May 11, 2017 meeting?

A. Yes and no. On May 24, 2017, I followed up with Mr. Hancock to see if he had been able to attend the meeting on May 11. Mr. Hancock stated that he was able to see the slideshow, but there was no audio on the phone, and so he was unable to hear the presentation. At that time, I asked Mr. Hancock if he would like me to set up another meeting with him to go over the study. Mr. Hancock stated that he would.[30]

Q. Did you schedule that meeting?

A. No, I did not. At that point I became very busy working on a variety of issues including the load study for use in the IRP, the cost of service study, and Cascade's citygate study and much to my regret, I neglected to follow up further with Mr. Hancock.

Q. Does the Company believe it made a good faith effort to fulfill the requirements of the UG-152286 Settlement Agreement for the Company to initiate a load study?

[29] Exh. (BR-14)
[30] Exh. (BR-15)

A. Cascade believes the Company made a good faith effort to initiate the study by (a) investigating the scope and costs associated with a study such as described in the Settlement Agreement; (b) engaging in discussions with Staff regarding the Company's citygate study, which we viewed as the better resolution of the issue; and (c) working hard on that study, and including it in my direct testimony[31]. In retrospect we understand that we should have continued to follow up with Staff to ensure that Staff was comfortable with our approach. However, based on the communications we had, we believed that Staff was familiar with this approach, and that it would serve as a strong basis for future filings.

Q. Has the Company made efforts to demonstrate its commitment to complying with the Commission's policies and requirements?

A. Yes. In the past two years Cascade has made a concerted and major commitment to being responsive to Commission issues, not just the IRP issues but to all issues. The commitment is genuine and real.

Q. **Staff proposes that in this case the Commission direct Cascade to initiate a load study such as it originally envisioned, and to make clear that this obligation cannot be fulfilled with a load forecast. Do you agree that this is appropriate?**

A. No, I do not. Putting aside the parties' differing perspectives on whether the Company has initiated a load study, I do not agree that the Commission should order the Company to complete the type of load study advocated by Staff. Cascade believes that adequate consumption data exists in our billing system to accurately determine customer class

[31] Exh. (BR-2)

allocations. Installing an advanced data collection mechanism poses significant challenges due to the geographic makeup of the Company's distribution system. Cascade's service territory is not contiguous, with weather that is often materially different in different areas. Many of the communities the Company serves are not heavily populated and may not have reasonable sample size data for all classes of customers. Cascade believes the Company's approach to the load study is the most prudent way to determine the class allocations. As Ron Amen points out in his rebuttal testimony in Exhibit No. ___ (RJA-9T), the approach Staff requests would be expensive without providing incremental benefit.[32]

Q. Staff states that according to NARUC, a load study requires sampling of rate classes where it is too expensive to have time recording meters on all customers—and that by failing to perform that sampling, the Company is in violation of the settlement agreement.[33] What is your response?

A. Technically, NARUC's description of a load study is accurate. However, the Company notes that such studies are overwhelmingly performed by electric utilities—not LDCs--and Cascade does not agree that a similar type of study as originally envisioned by Staff is always feasible or prudent for an LDC.

Q. Do any other of the LDCs in Washington provide a load study such as the one Staff believes is appropriate in this case?

A. No. As seen in Staff response to Cascade's Data Requests Nos. 6 and 7, other LDCs have not provided the type of load study that Staff believes is appropriate in this case.[34]

[32] Rebuttal Testimony of Ron J. Amen, Exh RJA-9T at 13-19.
[33] Response Testimony of Melissa Cheesman, Exh. MCC-1T, at 18:8-10, 19:17-22, and 20:1-3.
[34] Exh. (BR-11) and Exh. (BR-12).

Staff provided Avista's and PSEs response to DRs regarding load studies in their respective general rate cases. Avista and PSE provided demand and actual usage information by schedule and by month for the duration of the test year.

Q. Has the Company provided all of the same information necessary to determine core class usage as that provided by Avista and PSE?

A. Yes. Cascade has provided similar information in its response to WUTC Data Request No. 26.[35] The data provided by Cascade in response to WUTC Data Request No. 26 is demand and actual usage information by schedule and by month for the duration of the test year.

Q. Does Staff seem to understand that the Company can and has provided the same information as provided by the other LDCs?

A. No. In Data Request No. 6, Cascade requested Staff to provide the Company with a list of each gas utility that has completed or were required to complete a load study.[36] In Data Request No. 7 Cascade requested a copy of the load study that was supplied by each utility who was able to provide data.[37]

In Staff's response to Data Request No. 6, Staff confirmed that Puget Sound Energy and Avista provided demand and actual usage information by schedule and by month for the duration of the test year in their recent general rate cases, Docket UG-170034 and Docket UG-170486, respectively, indicating that this information satisfied Staff's load study requirement.[38] However, Staff further states that Cascade "…doesn't

[35] Exh. (BR-13)
[36] Exh. (BR-11)
[37] Exh (BR-12)
[38] Exh. (BR-11)

track core class (residential, commercial and industrial) usage."[39] In making this statement, Staff mistakenly implies that Cascade is unable to provide the same demand and actual usage information as these companies. In fact, Cascade has the same ability to provide such information by month as the other LDCs and has done so as described in our response to WUTC Data Request No. 26[40].

Similarly, in response to Cascade's DR 7, Staff states Cascade does not have the metering infrastructure to track demand, which is also incorrect. Cascade has the metering infrastructure to track demand at the monthly level which seemed to have satisfied Staff's need for load studies in the recent Puget Sound Energy and Avista rate cases.

IV. CONCLUSION

Q. Does this conclude your testimony?

A. Yes.

[39] Exh. (BR-11)
[40] Exh. (BR-13)