BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION

IN THE MATTER OF SOUTHWESTERN PUBLIC SERVICE COMPANY'S APPLICATION FOR: (1) REVISION OF ITS RETAIL RATES UNDER ADVICE NOTICE NO. 282; (2) AUTHORIZATION AND APPROVAL TO SHORTEN THE SERVICE LIFE OF AND ABANDON ITS TOLK GENERATING STATION UNITS; AND (3) OTHER RELATED RELIEF,	)	**CASE NO. 19-00170-UT**
SOUTHWESTERN PUBLIC SERVICE COMPANY,	)	
APPLICANT.	)	

DIRECT TESTIMONY

of

JANNELL E. MARKS

on behalf of

SOUTHWESTERN PUBLIC SERVICE COMPANY

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GLOSSARY OF ACRONYMS AND DEFINED TERMS

Acronym/Defined Term	Meaning
Base Period	April 1, 2018 through March 31, 2019
Census class	Customer class in which all customers have IDR meters
Commission	New Mexico Public Regulation Commission
DW	Durbin-Watson
Golden Spread	Golden Spread Electric Cooperative, Inc.
IDR	Interval Demand Recorder
kW	Kilowatt
kWh	Kilowatt-hour
MW	Megawatt
MWh	Megawatt-hour
NCE	New Century Energies, Inc.
NOAA	National Oceanic and Atmospheric Administration
Non-Census class	Customer class in which not all customers have IDR meters
Operating Companies	Northern States Power Company, a Minnesota corporation; Northern States Power Company, a Wisconsin corporation; PSCo, and SPS
PSCo	Public Service Company of Colorado, a Colorado corporation

Acronym/Defined Term	**Meaning**
R^2 statistic	Coefficient of determination
RFP	Rate Filing Package
SPS	Southwestern Public Service Company, a New Mexico corporation
Test Year	Historical Test Year Period consisting of the Base Period, incorporating all proper adjustments
Xcel Energy	Xcel Energy Inc.

LIST OF ATTACHMENTS

Attachment	Description
JEM-1	Weather Normalization of New Mexico Retail Base Period Sales (*Filename:* JEM-1.xlsx)
JEM-2	Weather Normalization of Texas Retail Base Period Sales (*Filename:* JEM-2.xlsx)
JEM-3	Weather Normalization of Firm Wholesale Base Period Sales (*Filename:* JEM-3.xlsx)
JEM-4	Weather Normalization of SPS Base Period Peak Demand (*Filename:* JEM-4.xlsx)
JEM-5	Regression Models and Associated Statistics (*Filename:* JEM-5.xlsx)

Case No. 19-00170-UT
Direct Testimony
of
Jannell E. Marks

I. WITNESS IDENTIFICATION AND QUALIFICATIONS

Q. Please state your name and business address.

A. My name is Jannell E. Marks. My business address is 1800 Larimer Street, Denver, Colorado 80202.

Q. On whose behalf are you testifying in this proceeding?

A. I am filing testimony on behalf of Southwestern Public Service Company, a New Mexico corporation ("SPS") and wholly-owned electric utility subsidiary of Xcel Energy Inc. ("Xcel Energy").

Q. By whom are you employed and in what position?

A. I am employed by Xcel Energy Services Inc., the service company subsidiary of Xcel Energy, as Director of Sales, Energy and Demand Forecasting.

Q. Please briefly outline your responsibilities as Director of Sales, Energy and Demand Forecasting.

A. I am responsible for the development of forecasted customer, sales, and peak demand data and economic conditions for the Xcel Energy Operating Companies, and for the presentation of this information to Xcel Energy's senior management, other Xcel Energy departments, and various regulatory and reporting agencies. I also am responsible for Xcel Energy's Load Research function, which designs, maintains, monitors, and analyzes electric load research samples in the Xcel

Energy Operating Companies' service territories. Finally, I am responsible for developing and implementing forecasting, planning, and load analysis studies for regulatory proceedings.

Q. Please describe your educational background.

A. I graduated from Colorado State University with a Bachelor of Science degree in Statistics.

Q. Please describe your professional experience.

A. I began my employment with Public Service Company of Colorado ("PSCo") in 1982 in the Economics and Forecasting Department. In 1985, I became a Research Analyst, and, in 1991, I was promoted to Senior Research Analyst. In that position, I was responsible for developing the customer and sales forecasts for PSCo and the economic, customer, sales, and demand forecasts for Cheyenne Light, Fuel and Power Company. In 1997, when PSCo merged with SPS to form New Century Energies, Inc. ("NCE"), I assumed the position of Manager, Demand, Energy and Customer Forecasts. In that position, I was responsible for developing demand, energy, and customer forecasts for NCE's operating companies, including SPS. I also directed the preparation of statistical reporting for regulatory agencies and others regarding historical and forecasted reports. In

August 2000, following the merger of NCE and Northern States Power Company that created Xcel Energy, I was named Manager, Energy Forecasting, with the added responsibility for Northern States Power Company – Minnesota and Northern States Power Company – Wisconsin. I assumed my current position in February 2007, with the added responsibility for the Operating Companies' load research function.

Q. Have you attended or taken any special courses or seminars relating to public utilities?

A. Yes. I have attended the Institute for Professional Education's Economic Modeling and Forecasting class and Itron's Load Forecasting Workshops. I have also attended industry forecasting conferences and forecasting software user group meetings and training classes sponsored by the Electric Power Research Institute. I am a member of Itron's Energy Forecasting Group and Edison Electric Institute's Load Forecasting Group. Membership in these groups helps me to stay up-to-date on industry standards in load research and energy forecasting (including weather normalization).

Q. Have you testified before any regulatory authorities?

A. Yes. I have testified before the New Mexico Public Regulation Commission ("Commission"), the Public Utility Commission of Texas, the Colorado Public Utilities Commission, the Minnesota Public Utilities Commission, the North Dakota Public Service Commission, and the Public Service Commission of Wisconsin on the issues of load research, sales and demand forecasts, weather normalization of sales and demand, and other related topics. I also have submitted written testimony to the South Dakota Public Utilities Commission.

II. ASSIGNMENT AND SUMMARY OF TESTIMONY AND RECOMMENDATIONS

Q. What is your assignment in this proceeding?

A. The purpose of my testimony is to explain the function of load research as it is used in this proceeding, and to explain how SPS adjusts sales and demand for the period April 1, 2018 through March 31, 2019 ("Base Period") to minimize the impact of abnormal weather patterns experienced during the Base Period on the sales and demand used to set rates for the future.

To explain the purpose of load research and the weather normalization adjustment, I:

1. describe SPS's load research function and the load research information that is used for cost allocation and rate design in this proceeding; and

2. explain the methodology that SPS undertakes to measure normal weather and to adjust both sales and demand that have been affected by abnormal weather during the Base Period to determine the sales and demand for the Test Year.[1]

In addition, I sponsor or co-sponsor Schedules P-1, P-5, P-6, and Q-1 of SPS's Rate Filing Package ("RFP").

[1] The Test Year is the Historical Test Year Period consisting of the Base Period and further incorporating all proper adjustments.

Q. Please provide a summary of conclusions and recommendations in your testimony.

A. **Load Research** - Load research is the systematic collection and analysis of customers' electrical energy and demand requirements. SPS uses information from Interval Demand Recorder ("IDR")[2] meters to determine the coincident and non-coincident peaks for all customer classes. For the "Census" classes, which are the customer classes in which all customers have IDR meters, the meters provide actual measurements of demand. However, it is costly and not feasible to install an IDR meter for every customer in every class. Therefore, for those customer classes in which not all customers have IDR meters, which are referred to as the "non-Census" classes, it is necessary to develop load research samples to estimate the coincident and non-coincident peaks for the classes.

Using information from the IDR meters for the Census classes and information from the load research samples for the non-Census classes, I have provided various load research statistics to SPS witnesses Richard M. Luth and Evan D. Evans, who incorporate those statistics in the class cost of service study and rate design they present. Specifically, I provided the class coincident and

[2] IDRs are meters capable of recording loads for each interval of time.

non-coincident peak demand for Census classes and the class coincident and non-coincident load factors at peak for the non-Census classes. I recommend the Commission approve those peak demands and load factors for purposes of allocating costs among classes and designing rates.

Weather Normalization - SPS has calculated the effects of abnormal weather on Base Period sales. Normal daily weather was based on the average of the last 30 years of historical heating degree days, cooling degree days, and precipitation data. The Base Period heating degree days were 0.9% above normal; cooling degree days were 18.8% above normal; and precipitation was 22.1% below normal. SPS calculated the effects of abnormal weather on Base Period sales for customer classes whose consumption patterns are affected by the weather using weather normalization regression coefficients derived from econometric models. In total, colder-than-normal winter weather, hotter-than-normal summer weather, and lower than normal precipitation combined resulted in actual sales being 38,289 megawatt-hours ("MWh") or 0.6% higher than normal. Therefore, Base Period sales were adjusted (decreased) by 38,289 MWh.

Similarly, SPS also calculated the effects of abnormal weather on the coincident peak demands in the Base Period for total retail and aggregated full requirements wholesale. Taken together, the weather deviations resulted in an

average of 31 megawatts ("MW"), or 0.9%, more retail peak demand per month and an average of 11 MW, or 1.1%, more full requirements wholesale peak demand per month from June through September of the Base Period.

SPS also calculated the effect of abnormal weather on Golden Spread Electric Cooperative, Inc.'s ("Golden Spread") full load peak demand coincident with the SPS transmission system peak demand. The average weather adjustment for the Golden Spread full load peak demand coincident with the SPS transmission system peak demand for the four months of June through September of the Base Period was 30 MW per month.

I provided the MWh and MW impacts of abnormal weather to Mr. Luth, who uses them to calculate present revenues and the allocation of production and transmission capacity costs among classes.

I explain the methodology that SPS uses to weather normalize monthly sales and demand amounts. SPS's weather-impacted sales are developed using industry standard regression modeling techniques. SPS relies on a number of quantitative and qualitative tests to ensure that its regression models are statistically valid. Thus, SPS's estimates of weather normalized sales are reasonable and should be used to set rates in this proceeding.

I recommend that the Commission approve the adjusted sales and demand amounts resulting from the weather normalization discussed in this testimony.

Q. How is your testimony organized?

A. Section III provides a description of SPS's load research function. Section IV discusses weather's effect on Base Period sales. Section V discusses weather's effect on Base Period peak demand. An overview of the weather normalization methodology is provided in Section VI.

Q. Were Attachments JEM-1 through JEM-5 prepared by you or under your direct supervision and control?

A. Yes.

Q. Were the RFP schedules that you sponsor or co-sponsor prepared by you or under your direct supervision and control?

A. Yes.

Q. Do you incorporate the RFP schedules that are sponsored or co-sponsored by you into your testimony?

A. Yes.

III. LOAD RESEARCH

Q. What is the purpose of load research?

A. Load research is the systematic collection and analysis of customers' electrical energy and demand requirements by time-of-day, month, season, and year. This data, which includes load research samples, is collected and analyzed by customer classes, stratums of customer classes, and other subsets of customer classes. Load research enables utilities to better understand customers, their consumption patterns, their consumption responses to various factors, and the impact of customers' energy requirements on the electric utility's system. In addition, load research data is used to develop demand and energy allocators for cost allocation studies and is used in designing rates.

Q. What are load research samples?

A. It is costly and not feasible to install IDR meters for all customers in all customer classes. Therefore, it is necessary for SPS to develop load research samples to determine the coincident and non-coincident peaks for certain classes. Load research samples are subsets of the entire population that SPS surveys to estimate the characteristics of the entire population. SPS's load research samples are developed using a stratified random sampling method. This technique divides the class of interest into smaller groups with like-characteristics. This method

effectively reduces the overall variance of the class, thereby reducing the sample size. The samples are designed to meet or exceed the "90/10" load research standard specified by Federal Energy Regulatory Commission regulations implementing the Public Utilities Regulatory Policies Act of 1978:

> Accuracy Level. If sample metering is required, the sampling method and procedures for collecting, processing, and analyzing the sample loads, taken together, shall be designed so as to provide reasonably accurate data consistent with available technology and equipment. An accuracy of plus or minus 10 percent at the 90 percent confidence level shall be used as a target for the measurement of group loads at the time of system and customer group peaks.

While this no longer is a standard in the Code of Federal Regulations, it is still commonly used as the guideline for load research accuracy within the utility industry. Data validation is performed regularly on the load research samples to ensure that the energy use of the sample corresponds closely with the population energy use.

Q. Does SPS use load research samples to determine the demand of all its customer classes?

A. No. It is not necessary to conduct load research samples for customer classes in which all customers have IDR meters because the IDR meters provide actual measurements of demand. It also is not necessary to conduct load research

samples for the Street Lighting and Area Lighting classes because lighting facilities are generally unmetered. Most of the customers with IDR meters are in the Large General Service-Transmission class, although some Primary General Service customers with on-site generation also have IDR meters. In addition, a few of the customers with individual rate schedules have IDR meters installed. As noted earlier, I refer to the classes in which all customers have IDR meters as "Census" classes. SPS uses the output of those IDR meters to determine the Census classes' demands for purposes of allocation, rate design, and billing.

Q. For which customer classes has SPS developed load research samples?

A. SPS develops load research samples for its non-Census classes throughout its service territory in both New Mexico and Texas. SPS developed load research samples for the following New Mexico retail non-Census customer classes:

- Residential Service;
- Residential Space Heating Service;
- Small General Service;
- Secondary General Service;
- Irrigation Service;
- Primary General Service;
- Small Municipal and School Service; and
- Large Municipal and School Service.

Q. How does SPS go about performing the load research for the non-Census classes?

A. As I discussed earlier in my testimony, it is cost-prohibitive to install an IDR meter for every customer. Consequently, SPS installs IDR meters on a random sample of customers in each non-Census class (developed as I previously described). SPS then uses the electric usage data from those sample customers to extrapolate the demand data for the remainder of the class.

Q. What load research statistics did you provide for SPS's cost allocation study and rate design?

A. For each SPS Census customer class, I provided the class coincident peak demand and non-coincident peak demand. For each SPS non-Census customer class, I provided: (1) the load factors at the time of the monthly system peak, which is the class coincident peak; and (2) the load factors at the time of the monthly class peak, which is the class non-coincident peak.

Q. Please define the terms "monthly system peak," "class coincident peak," "monthly class peak," and "class non-coincident peak."

A. The *monthly system peak* is the 60-minute interval in each month in which SPS's system experiences the highest demand, and each class's demand during that

60-minute interval is the *class coincident peak*. The *monthly class peak* is the 30-minute interval in each month in which a class experiences its highest demand. Unless the monthly class peak occurs during the same 60-minute interval as the monthly system peak, the monthly class peak is a *class non-coincident peak*.

Q. What is a load factor?

A. A load factor is the ratio of the average load in kilowatts ("kW") supplied during a designated period to the peak or maximum load in kW occurring in that period. For example, assume a customer used 10,000 kilowatt-hours ("kWh") during a 30-day period (720 hours) and had a maximum demand of 21 kW during this same period. The customer's average load would be 13.89 kW (10,000 kWh / 720 hours = 13.89 kW). Dividing that number by 21 kW leads to 0.66 (13.89 / 21 = 0.66). That is then multiplied by 100% to arrive at a load factor of 66%.

Q. How did SPS use the non-Census class's load factors derived from your load research and the Census class's peak demand data?

A. I provided the non-Census class coincident and non-coincident load factors at peak and the Census class coincident and non-coincident peak demand for each month to Mr. Luth who used them to develop demand allocators. Mr. Luth discusses SPS's demand allocators in further detail in his testimony.

Q. How did SPS calculate the demand at the time of the monthly system peak and the demand at the monthly class peak for the non-Census classes?

A. As explained by Mr. Luth, each non-Census class's demand at the time of the system peak was calculated by applying the monthly system peak load factors derived from the load research to the monthly sales by customer class. Each non-Census class's demand at the time of the non-coincident peak was calculated by applying the monthly class peak load factors derived from the load research to the monthly energy sales by customer class.

Q. Did you make any adjustments to the class demands at the time of the monthly system peaks?

A. Yes. Because the hourly loads for the sample classes are estimates, the sum of each hourly demand, adjusted to generation level, will almost never equal SPS's total system load. To account for this difference, the sample classes were adjusted each month so that the sum of all hourly demand equals the hourly system load at the hour of SPS's monthly system peak demand. Mr. Luth describes this process in his direct testimony. Both monthly system peak demand by class and monthly non-coincident class peak demands were adjusted consistent with the proportional allocation process discussed above.

IV. WEATHER'S EFFECT ON BASE PERIOD SALES

Q. Did SPS calculate the effects on sales of abnormal weather for the Base Period?

A. Yes. SPS performed weather normalization to ensure that its Base Period sales and the present revenues calculated using those sales are adjusted to eliminate the effects of abnormal weather.

Because the twelve months that comprise the Base Period were hotter than the 30-year average in SPS's New Mexico service area during the cooling season and colder than the 30-year average during the heating season, and precipitation was lower than the 30-year average, SPS calculated the effects of abnormal weather, as it has done in prior cases. The Base Period heating degree days were 0.9% above normal; the Base Period cooling degree days were 18.8% above normal; and the Base Period precipitation was 22.1% below normal. The percent difference from normal is calculated using the following formula:

(Actual weather – Normal weather) / Normal weather

The calculation of the percent difference from normal weather is shown on page 1 of Attachment JEM-1.

SPS calculated the effects on sales of abnormal weather during the Base Period for the following customer classes:

- Residential Service;
- Residential Space Heating Service;
- Small General Service;
- Secondary General Service;
- Irrigation Service;
- Small Municipal and School Service; and
- Large Municipal and School Service.

SPS's research indicates that weather has little or no effect on the consumption of the Primary General Service, Large General Service-Transmission, Street Lighting and Area Lighting classes. Therefore, SPS did not make weather adjustments for those classes.

Taken together the weather deviations resulted in 38,289 MWh more being consumed in the Base Period than would have been consumed in the Base Period with normal weather, which amounts to 0.6% of total New Mexico retail sales. The calculation of the 0.6% appears on page 3 of Attachment JEM-1.

Q. How did SPS define the normal weather?

A. SPS used a 30-year average to define normal weather for purposes of this rate case. This aligns with the National Oceanic and Atmospheric Administration's

("NOAA") view that normal weather should be measured based on a 30-year period of time.

Q. What 30-year period did SPS use for weather normalization of sales?

A. SPS used actual weather data from January 1, 1988 through December 31, 2017.

Q. Did SPS include the Base Period in the 30-year period used to derive normal weather?

A. No. It is standard practice not to include the Base Period being normalized in the calculation of normal weather. Using actual weather data from the 12-month period used as the Base Period in the calculation of the "normal" weather may create a bias toward the actual Base Period weather, which would potentially misstate the variance of the Base Period weather from normal weather conditions. SPS applied this methodology for weather normalization adjustments in its most recent historical test year case, Case No. 17-00255-UT.[3] In addition, NOAA also excludes the current year's weather when calculating its 30-year normal weather statistics for purposes of comparing and analyzing the weather for a particular month.

[3] *In the Matter of Southwestern Public Service Company's Application for Revision of its Retail Electric Rates Pursuant to Advice Notice No. 272*, Case No. 17-00255-UT, New Final Order on Partial Mandate from the New Mexico Supreme Court (Mar. 6, 2019).

Q. How did SPS determine the normal weather?

A. Normal daily weather was based on the average of the last 30 years of historical heating degree days, cooling degree days, and precipitation data used to develop the weather adjustment coefficients for the Base Period. The Base Period actual and normal cooling degree days, heating degree days, and precipitation are reflected on page 1 of Attachment JEM-1.

Q. What measure did SPS use to calculate heating degree days, cooling degree days, and precipitation?

A. SPS used heating degree days and cooling degree days based on a 65-degree Fahrenheit temperature base and rainfall equivalent precipitation measured in inches as reported by NOAA for Roswell, New Mexico.

Q. Please explain how SPS calculated heating degree days.

A. SPS calculated heating degree days for each day by subtracting the average daily temperature from 65 degrees Fahrenheit. For example, if the average daily temperature was 45 degrees Fahrenheit, then 20 heating degree days were calculated for that day. If the average daily temperature was greater than 65 degrees Fahrenheit, then that day recorded zero heating degree days. Daily heating degree days are aggregated to monthly totals.

Q. How did SPS calculate cooling degree days?

A. SPS calculated cooling degree days for each day by subtracting 65 degrees Fahrenheit from the average daily temperature. For example, if the average daily temperature was 75 degrees Fahrenheit, 10 cooling degree days were calculated for that day. If the average daily temperature was less than 65 degrees Fahrenheit, then that day recorded zero cooling degree days. Daily cooling degree days are aggregated to monthly totals.

Q. How was the Base Period weather adjustment calculated?

A. SPS calculated the weather adjustment using the deviation between normal and actual weather, customer counts, and weather adjustment coefficients that quantify the impact of a one-unit change in weather on sales per customer.

Q. How did SPS develop the weather adjustment coefficients used in the weather normalization of sales?

A. SPS developed the billing-month coefficients for each weather-sensitive class using econometric models.[4] SPS then converted the billing-month coefficients to a calendar-month basis by prorating the modeled weather coefficients based on

[4] An econometric model is a widely accepted modeling approach in which a linear regression equation relates a dependent variable, such as sales, to a set of explanatory variables, such as economic and demographic concepts, customers, price, and weather. After the relationships are identified, forecasts of the explanatory variables can be used to predict future sales.

the number of billing days in each billing month that occur in a particular calendar month. Pages 8-13 of Attachment JEM-1 reflect the conversion of modeled weather coefficients to a calendar-month basis.

The data used in the models are:

- Historical billing-month sales by weather-sensitive class;
- Real personal income per household for the SPS New Mexico service territory;
- Non-farm employment for the SPS New Mexico service territory;
- Weather (heating or cooling degree days);
- Seasonal binary variables;
- Precipitation variables;
- Customer counts;
- Number of billing days in each month;
- Population for the SPS New Mexico service territory;
- Other binary variables; and
- Autoregressive correction terms.

Q. How do the factors listed in the previous question affect sales?

A. Sales are expected to increase as each of the economic indicators increases and to decrease as each economic indicator decreases. For example, if personal income

increases, electricity consumption will increase because customers have the means to purchase and use more electricity-consuming products. Likewise, as employment and population levels grow, electricity consumption is expected to increase.

Weather is also an independent variable that affects sales. The further the average daily temperature deviates from 65 degrees Fahrenheit, the more cooling degree days or heating degree days SPS will experience, which increases electricity consumption. Similarly, SPS expects more sales to irrigation customers when there is little precipitation, and it expects fewer sales to irrigation customers when there is more precipitation. This impacts customers in the irrigation, municipals and schools rate classes.

Q. Please explain the difference between "billing-month" sales and "calendar-month" sales.

A. SPS reads electric meters each working day according to a meter-reading schedule based on 21 billing cycles per billing month. Meters read early in the calendar month mostly reflect consumption that occurred during the previous calendar month. Meters read late in the calendar month mostly reflect consumption that occurred during the current calendar month. Consequently, the "billing-month" sales for the current calendar month reflect consumption that

occurred in both the previous calendar month and the current calendar month. Thus, billing-month sales lag calendar-month sales. In order to determine the sales for a calendar month, SPS estimates "unbilled" sales, which is the electricity consumed in the current calendar month that is not billed to the customer until the succeeding calendar month.

Q. What is the purpose of estimating calendar-month sales?

A. Calendar-month sales are used to align the Base Period revenues with the relevant Base Period expenses, which are reported on a calendar-month basis. SPS reflects calendar-month revenue on its books for accounting and financial reporting purposes.

Q. Why is it necessary to convert the billing-month coefficients to calendar-month coefficients?

A. Because the Base Period sales being weather normalized are calendar-month sales, the billing-month coefficients need to be converted to calendar-month coefficients. After the billing-month coefficients are developed through the econometric modeling process, the next step is to convert the billing-month coefficients to a coefficient that represents a calendar month. SPS determines the percentage of billing days for a calendar month that is billed in the current month

and that is billed in a future month. The monthly billing-month coefficient is converted to a monthly calendar-month coefficient using these percentages.

Q. Please explain the steps you went through to complete the weather-normalization calculation.

A. After calculating the calendar-month coefficients, I undertook a six-step process to calculate the effect on sales of weather variance from normal conditions during the Base Period. The numbers used as examples in the six steps recounted below appear on pages 4-5 of Attachment JEM-1:

- Step 1 – I calculated the difference between the 30-year average heating degree days in a particular month and the heating degree days in that month of the Base Period. For example, the 30-year average number of heating degree days in October 2018 is 129, whereas the number of heating degree days in October of the Base Period was 177, for a difference of 48.23.

- Step 2 – I multiplied the difference calculated in Step 1 by the number of customers in each class. For example, the Residential Service class had 60,145 customers in October 2018, so I multiplied 48.23 by 60,145, for a total of 2,900,994.

- Step 3 – I then multiplied the result from Step 2 by the heating degree day coefficient for that class to determine the number of MWh resulting from the abnormal weather. Multiplying 2,900,994 by the October 2018 coefficient for the Residential Service class, which is 0.0000015, yields 4.4 MWh.

- Step 4 – I then performed Steps 1-3 using the cooling degree data. For October 2018, that calculation results in 465.3 MWh.

- Step 5 – I netted the heating degree MWh against the cooling degree MWh for each class by month. That produces a total of 470 MWh for the Residential Service class for October 2018 (4.4 MWh + 465.3 MWh = 469.7 MWh, which rounds to 470 MWh).

- Step 6 – Finally, I totaled the number of MWh of all classes in each month, and then I added the monthly amounts to arrive at the 12-month total of 38,289 MWh attributable to abnormal weather. In other words, actual weather resulted in total Base Period retail sales being 38,289 MWh higher than if weather had been normal.

Q. How did SPS use the weather-adjusted sales figures?

A. After calculating the weather-adjusted sales by class, the Test Year sales, I supplied those sales figures to Mr. Luth, who used them to calculate present revenues. The numbers that I provided to Mr. Luth are summarized on page 4 of Attachment JEM-1.

Q. Did SPS adjust its Texas retail sales during the Base Period to account for the effects of abnormal weather on Texas retail sales?

A. Yes. SPS adjusted the Base Period sales for the weather-sensitive Texas retail classes using the same process described for New Mexico retail sales. These calculations are provided in Attachment JEM-2. SPS relied on NOAA weather data measured at weather stations in Amarillo and Lubbock, Texas. The weather data is aggregated to the state level by weighting the individual weather station

data by the share of load in the Amarillo and Lubbock regions of the Texas service area.[5]

Q. Did SPS adjust its firm wholesale sales during the Base Period to account for the effects of abnormal weather on wholesale sales?

A. Yes. SPS adjusted the Base Period sales for SPS firm wholesale customers using weather adjustment coefficients developed for each wholesale customer and weather specific to the location of each wholesale customer. The weather adjustment coefficients for the wholesale customers were developed using historical calendar-month sales for each customer, weather variables (heating or cooling degree days or precipitation), and an economic indicator such as Gross State Product. Since the coefficients are based on calendar-month sales, there is no need to convert the coefficients from a billing-month basis to a calendar-month basis. Sales to the wholesale customers in New Mexico were weather normalized based on Roswell weather, and sales to wholesale customers in Texas were weather normalized based on weather for Amarillo and Lubbock. The calculations of the weather adjustment for firm wholesale sales are provided in Attachment JEM-3.

[5] The weight for Amarillo is approximately 0.745, and the weight for Lubbock is approximately 0.255.

Q. Why does SPS adjust its Texas retail sales and its firm wholesale sales for purposes of this New Mexico retail rate case?

A. Certain allocation factors SPS uses to allocate the components of the total company cost of service among its three rate jurisdictions depend on relative levels of sales for each jurisdiction. Consequently, to ensure that the allocation percentages for each jurisdiction are determined on the same basis, it is necessary to adjust the sales in all three jurisdictions to account for the effects of abnormal weather on sales.

Q. Why does SPS use data from one weather station in New Mexico and two weather stations in Texas?

A. SPS uses these three weather stations because these three weather stations are representative of SPS's service territory weather conditions. For example, based on annual 2018 sales, 45.7% of SPS's weather-sensitive sales in Texas are to customers located in Randall County and Potter County, which include and surround Amarillo. Another 16.6% of SPS's weather-sensitive sales in Texas are to customers located in the counties immediately surrounding Lubbock. In addition, Roswell is a major population and economic center in the SPS New Mexico service territory, and is close to the geographic center of the SPS New

Mexico service territory and, more specifically, close to the center of the weather sensitive loads.

V. WEATHER'S EFFECT ON BASE PERIOD PEAK DEMAND

Q. Did SPS calculate the effects of abnormal weather on its Base Period system peak demand?

A. Yes. Because weather varied from normal during the Base Period, it was necessary to adjust the Base Period coincident peak demand[6] to account for weather for the following customer groups:

- Total retail; and
- Aggregated full requirements wholesale.

For the same reason I explained in Section IV of my testimony, I adjusted the peak demands in SPS's retail and full requirements wholesale rate jurisdictions to ensure that the allocation percentages for each jurisdiction are determined on the same basis for purposes of this rate case.

Q. What source of weather did SPS use to measure the adjustment?

A. SPS used a combination of peak day average daily temperature, peak day heating degree days, and accumulated precipitation for the week prior to the peak day to measure weather adjustments for peak demand. These weather values were calculated using weather data reported from the NOAA weather stations in Roswell, Amarillo, and Lubbock. The total SPS weather is an average of the

[6] SPS does not weather-normalize non-coincident peak demands.

Roswell, Amarillo, and Lubbock weather station data weighted by sales associated with the respective regions of the SPS service area.[7]

Q. How did SPS calculate average peak day temperature?

A. The peak day average temperature was calculated by adding the peak day maximum daily temperature and peak day minimum daily temperature, and then by dividing that amount by 2. For example, if the peak day maximum temperature was 55 degrees Fahrenheit and the peak day minimum temperature was 35 degrees Fahrenheit, the average peak day temperature would be 45 degrees Fahrenheit.

Q. Please explain how SPS calculated the peak day heating degree days.

A. SPS calculated peak day heating degree days by subtracting the peak day average temperature from 65 degrees Fahrenheit. For example, if the peak day average daily temperature was 45 degrees Fahrenheit, then 20 heating degree days were calculated for that day. If the average peak day temperature was greater than 65 degrees Fahrenheit, then that peak day recorded zero heating degree days.

[7] The weight for Amarillo is approximately 0.563, the weight for Lubbock is approximately 0.194, and the weight for Roswell is approximately 0.243.

Q. How did SPS calculate precipitation?

A. SPS calculated the accumulation of water equivalent precipitation for the seven days prior to the peak day, measured in inches.

Q. How did SPS define the normal weather?

A. As noted earlier, SPS agrees with NOAA's definition that normal weather is representative of typical weather based on a 30-year period. The normal peak day weather was based on the average of the 30-year period from January 1988 to December 2017 for the peak day of each month for historical average daily temperature, heating degree days, and precipitation. The Base Period and normal weather for average temperatures, heating degree days, and precipitation are summarized on page 1 of Attachment JEM-4.

Q. How was the Base Period weather adjustment calculated?

A. SPS calculated the peak demand weather adjustment using the deviation between normal and actual weather and weather adjustment coefficients that quantify the impact of a one-unit change in weather on retail and full requirements wholesale peak demand.

Q. How did SPS calculate the coefficients used in the peak demand weather normalization calculations?

A. SPS developed the peak demand weather coefficients for the retail coincident peak demand and full requirements wholesale coincident peak demand using econometric models. The data used in the models include historical peak demand and sales for each customer group, as well as the weather concept variables (average temperature, heating degree days, and precipitation for the week prior to the peak day). Each regression model also has an autoregressive error correction term variable.

Q. What dependent variables does SPS use in the regression models?

A. The dependent variables used to develop peak demand weather coefficients are the monthly coincident peak demands for each customer class. The first explanatory variable in each regression model is a 12-month moving average for the respective sales for each customer class. The next set of explanatory variables in each regression model uses the following weather concept variables:

- Average peak day temperature;
- Peak day heating degree days; and
- The accumulation of precipitation for the seven days prior to the peak day of each month.

Q. How did the Base Period peak day weather for the June through September period compare to normal weather?

A. Average peak day temperatures were hotter than normal in June, July, and August, and cooler than normal in September. Accumulated precipitation was less than normal in June, August, and September, and greater than normal in July. As shown on page 2 of Attachment JEM-4, taken together these weather deviations resulted in an average of 31 MW, or 0.9%, more retail peak demand per month and an average of 11 MW, or 1.1%, more full requirements wholesale peak demand per month from June, July, August, and September in the Base Period compared to normal weather. Because weather affected the level of peak demand, SPS adjusted the Base Period peak demand for deviations of the actual Base Period weather from the 30-year average weather.

Q. Please explain the steps you went through to complete the peak demand weather-normalization calculation.

A. I undertook a four-step process to calculate the effect on peak demand of weather variance from the normal conditions during the Base Period. The numbers used as examples in the four steps recounted below are for the retail peak demand and appear on page 3 of Attachment JEM-4:

- Step 1 – I calculated the difference between: (i) the normal weather concepts (as measured in peak day average temperature, peak day heating degree days, and precipitation) in a particular month, and (ii) the actual weather concepts in that month of the Base Period. For example, for the retail peak demand, the normal peak day average temperature in July is 84.1 degrees Fahrenheit, whereas the actual peak day average temperature in July of the Base Period was 90.0 degrees Fahrenheit, a difference of 5.9 degrees Fahrenheit. This step is repeated for each weather concept. The normal precipitation for the week preceding the peak day in July is 0.24 of an inch of precipitation, whereas the actual precipitation for the week preceding the peak day in July of the Base Period was 0.60 of an inch, for a difference of 0.36 of an inch of precipitation. The normal heating degree days on the peak day in July is 0.0, and the actual peak day heating degree days in July of the Base Period was also 0.0, resulting in no difference from normal.

- Step 2 – The variance in weather from the normal from Step 1 for each weather concept is multiplied by the respective weather adjustment coefficient to determine the number of MW resulting from the variance in actual weather from the normal weather. Weather adjustment coefficients are developed with econometric models using the same methodology described earlier. To continue with the retail peak demand example from Step 1, multiplying the variance in peak day average temperature of 5.9 degrees Fahrenheit by the July coefficient for average peak day temperature, which is 11.2468, yields 66.5 MW. This step is repeated for each weather concept. Multiplying the variance in precipitation of 0.36 by the July precipitation coefficient which is -62.25455, yields -22.4 MW. Because there is no weather adjustment coefficient in July for heating degree days, this weather concept does not have a weather adjustment in July.

- Step 3 – For each month, I summed the weather adjustments calculated in Step 2 from each weather concept. Continuing with the example from Step 1 and Step 2, this step produces a total weather adjustment

of 44 MW for the total retail peak demand for July (66.5 MW - 22.4 MW = 44.1 MW). In other words, weather normalized peak demand for July is 44 MW lower than the actual peak demand.

- Step 4 – Finally, I averaged the weather adjusted MW for the summer months of the Base Period to arrive at a 4-month average of weather's impact on the peak demand. Continuing with the example from the previous steps, the average weather adjustment for the retail peak demand for the four months of June, July, August, and September of the Base Period was 31 MW per month. Using the same methodology described in Step 1 through Step 4, the average weather adjustment for the full requirements wholesale peak demand for the four months of June, July, August, and September of the Base Period was 11 MW per month. Pages 3 and 4 of Attachment JEM-4 contain the weather adjustment calculations for the retail peak demand and the full requirements wholesale peak demand, respectively.

Q. Did SPS calculate the effect of weather on the Golden Spread full load peak demand coincident with the SPS system peak demand?

A. Yes. I calculated the effect of weather on the Golden Spread full load peak demand coincident with the SPS system peak demand using the same methodology previously described for weather adjusting the retail and full requirements wholesale peak demand. The weather values used to adjust the Golden Spread full load peak demand were calculated for the Texas Panhandle region. As I explained earlier, the Texas Panhandle weather is an average of the Amarillo and Lubbock weather station data weighted by sales associated with the respective regions of the SPS service area located in Texas. The peak demand

weather coefficients for Golden Spread were developed using an econometric model. The data used in the model includes historical peak demand for Golden Spread, as well as the weather concept variables for average temperature and accumulated precipitation for the week prior to the peak day, and an autoregressive error correction term variable. For the Texas Panhandle, average peak day temperatures were hotter than normal in June, July, August and September 2018. Accumulated precipitation was less than normal in June, August and September 2018 and greater than normal in July 2018.

Q. What is the weather adjustment for the Golden Spread full load peak demand coincident with the SPS system peak demand for the Base Period?

A. As shown on page 2 of Attachment JEM-4, the average weather adjustment for the Golden Spread full load peak demand coincident with the SPS system peak demand for the four months of June, July, August, and September of the Base Period was 30 MW per month. In other words, Golden Spread's actual peak demand was 30 MW higher than the weather normalized peak demand. Page 5 of Attachment JEM-4 provides the weather adjustment calculation for the Golden Spread full load peak demand.

Q. Why does SPS adjust its system retail peak demand and its firm wholesale peak demand for purposes of this New Mexico retail rate case?

A. Certain allocation factors SPS uses to allocate system production and transmission capacity costs among its three rate jurisdictions depend on relative levels of peak demand for each jurisdiction. Consequently, to ensure that the allocation percentages for each jurisdiction are determined on the same basis, it is necessary to adjust the peak demands in all three jurisdictions to account for the effects of abnormal weather.

Q. How did SPS use the weather-adjusted peak demand figures?

A. After calculating the weather adjustments for peak demand by customer class, I supplied those peak demand adjustments to Mr. Luth, who used them to calculate the class allocation of production and transmission capacity costs among classes. The numbers that I provided to Mr. Luth are on page 2 of Attachment JEM-4.

VI. WEATHER NORMALIZATION METHODOLOGY

Q. Please describe the data and data sources SPS relied on to develop the Base Period weather adjustment coefficients.

A. SPS uses econometric models to develop the weather coefficients used in the weather normalization process. These coefficients quantify the impact of a one-unit change in weather on sales per customer. The inputs to the econometric models include historical billing-month sales and monthly number of customers by rate class, which were obtained from SPS billing system reports.

Q. What measure of weather did SPS use for the weather normalization of New Mexico Base Period retail sales?

A. As explained in Section IV, the measure of weather used was heating degree days and cooling degree days, using a sixty-five degree temperature base, and rainfall equivalent precipitation, measured in inches. This information was obtained from the NOAA and was measured at the Roswell, New Mexico weather station. The workpaper for Schedule P-6 provides the historical data and the calculations applied to develop the weather variables used to weather normalize New Mexico Base Period retail sales.

Q. Did the weather reflect the same billing days as the sales data?

A. Yes. To align the weather data with the same period of time as the billing-month sales data, the heating degree days, cooling degree days, and precipitation data were weighted by the number of times a particular day was included in a particular billing month. These weighted heating degree days and cooling degree days were divided by the total billing cycle days to arrive at average heating degree days and cooling degree days for a billing month.

Q. What was your source of economic and demographic data?

A. Historical economic and demographic variables for the six-county SPS service territory, the state of New Mexico, and the nation were obtained from IHS Markit.[8] The variables used in the models were service territory non-farm employment, population, and real personal income per household. This information is used to determine the historical relationship between customers and sales measures, and economic and demographic measures.

[8] IHS Markit is a well-known provider of economic forecast information frequently relied on by energy forecasting professionals.

Q. Please describe the regression models and associated analyses used in SPS's weather normalization process.

A. The formulae in the regression models and associated statistics used in SPS's weather normalization process are provided in Attachment JEM-5. Specifically, Attachment JEM-5 shows, by customer class or major rate group, the formulae in the regression models with their summary statistics and descriptions for each variable included in the model.

Q. What techniques did SPS employ to evaluate the validity of its regression models?

A. There are a number of quantitative and qualitative validity tests that are applicable to multiple regression analysis. Several of the more common tests SPS uses are as follows:

First, the coefficient of determination ("R^2 statistic") test statistic is a measure of the quality of the model's fit to the historical data. It represents the proportion of the variation of the historical sales around their mean value that can be attributed to the functional relationship between the historical sales and the explanatory variables included in the model. If the R^2 statistic is high, the set of explanatory variables specified in the model are explaining a high degree of the historical sales variability. All regression models used to develop the weather

normalization coefficients demonstrate R^2 statistics larger than 72%, which is satisfactory under this standard.

Second, the t-statistic of each variable indicates the degree of correlation between that variable's data series and the sales data series being modeled. The t-statistic is a measure of the statistical significance of each variable's individual contribution to the prediction model. Generally, the absolute value of each t-statistic should be greater than 1.960 to be considered statistically significant at the 95% confidence level and greater than 1.645 to be considered statistically significant at the 90% confidence level. This criterion was applied in the development of the regression models used to develop the sales forecast. All variables in the final regression models used to develop the weather normalization coefficients tested satisfactorily at greater than a 93% confidence level.

Third, each model was inspected for the presence of first-order autocorrelation, as measured by the Durbin-Watson ("DW") test statistic. Autocorrelation refers to the correlation of the model's error terms for different time periods. For example, under the presence of first-order autocorrelation, an overestimate in one time period is likely to lead to an overestimate in the succeeding time period, and vice versa. Thus, when forecasting with a regression model, absence of autocorrelation between the error terms is very important. The

DW test statistic ranges between 0 and 4, and provides a measure to test for autocorrelation. In the absence of first-order autocorrelation, the DW test statistic equals 2.0. Autoregressive correction terms were applied where appropriate so that the final regression models used to develop the weather normalization coefficients tested satisfactorily for the absence of first-order autocorrelation, as measured by the DW test statistic.

Fourth, graphical inspection of each model's error terms (*i.e.*, actual less predicted) was used to verify that the models were not misspecified and that statistical assumptions pertaining to constant variance among the residual terms and their random distribution with respect to the predictor variables were not violated. Analysis of each model's residuals indicated that the residuals were homoscedastic (constant variance) and randomly distributed, indicating that the linear regression modeling technique was an appropriate selection for each customer class' sales that were statistically modeled.

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

A. Yes.

VERIFICATION

STATE OF COLORADO)
) ss.
COUNTY OF DENVER)

JANNELL E. MARKS, first being sworn on her oath, states:

I am the witness identified in the preceding direct testimony. I have read the direct testimony and the accompanying attachment(s) and am familiar with their contents. Based upon my personal knowledge, the facts stated in the testimony are true. In addition, in my judgment and based upon my professional experience, the opinions and conclusions stated in the testimony are true, valid, and accurate.

Jannell E. Marks
JANNELL E. MARKS

SUBSCRIBED AND SWORN TO before me this 21 day of June, 2019 by JANNELL E. MARKS.

LINDA S DISSETTE
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20184016179
MY COMMISSION EXPIRES APRIL 13, 2022

Linda S Dissette
Notary Public of the State of Colorado
My Commission Expires: 4-13-22

Southwestern Public Service Company

Weather Normalization of New Mexico Retail Base Period Sales

Roswell Weather Data
Normal Weather Based on a 30-year Historical Average

Month	Year	Weather Act Cal HDD65	Weather Act Cal CDD65	Weather Act Cal Precip	Weather Norm Cal HDD65	Weather Norm Cal CDD65	Weather Norm Cal Precip	Dev HDD65	Dev CDD65	Dev Precip
Apr	2018	111	57	0.03	135	50	0.58	-24	7	-0.55
May	2018	0	368	0.52	26	214	1.25	-26	154	-0.73
Jun	2018	0	554	1.40	0	453	1.23	0	101	0.17
Jul	2018	0	584	0.51	0	520	1.94	0	64	-1.43
Aug	2018	0	533	0.96	0	470	1.73	0	63	-0.77
Sep	2018	2	223	0.84	10	260	1.60	-8	-37	-0.76
Oct	2018	177	78	3.25	129	53	1.05	48	25	2.20
Nov	2018	522	0	0.01	443	2	0.42	80	-2	-0.41
Dec	2018	720	0	1.05	738	0	0.55	-18	0	0.50
Jan	2019	684	0	0.03	726	0	0.37	-42	0	-0.34
Feb	2019	474	0	0.00	513	1	0.38	-39	-1	-0.38
Mar	2019	400	13	0.42	341	5	0.48	59	8	-0.06
Annual - Update		**3,090**	**2,410**	**9.02**	**3,061**	**2,029**	**11.59**	**29**	**381**	**-2.57**
Annual Dev %								**0.9%**	**18.8%**	**-22.1%**

Southwestern Public Service Company

Weather Normalization of New Mexico Retail Base Period Sales

New Mexico Rate Case Base Period - Calendar Month Weather Normal Sales
30-Year Normal Weather

MONTHLY MWH

	Actual Sales Cal Mth Res	Actual Sales Cal Mth Small C&I	Actual Sales Cal Mth Large C&I	Actual Sales Cal Mth Street	Actual Sales Cal Mth Other Sale Auth	Actual Sales Cal Mth Retail	WN Sales Cal Mth Res	WN Sales Cal Mth Small C&I	WN Sales Cal Mth Large C&I	WN Sales Cal Mth Street	WN Sales Cal Mth Other Sale Auth	WN Sales Cal Mth Retail
Apr-18	61,008	133,516	267,846	1,109	10,809	474,289	61,179	133,022	267,846	1,109	10,510	473,665
May-18	91,602	153,164	254,656	1,110	10,425	510,957	85,279	150,062	254,656	1,110	9,673	500,780
Jun-18	112,124	165,273	259,457	1,114	13,831	551,799	103,862	161,780	259,456	1,114	13,397	539,609
Jul-18	123,623	170,015	274,139	1,115	12,711	581,603	117,676	166,896	274,139	1,115	12,401	572,226
Aug-18	115,848	170,461	278,746	1,115	12,445	578,614	110,179	167,497	278,745	1,115	12,037	569,573
Sep-18	77,079	160,091	262,329	1,114	13,643	514,256	79,717	160,827	262,329	1,114	14,256	518,243
Oct-18	73,993	147,744	270,170	1,115	10,404	503,426	72,975	147,478	270,170	1,115	10,132	501,870
Nov-18	89,384	140,430	261,865	1,115	9,161	501,955	86,703	140,345	261,865	1,115	9,161	499,188
Dec-18	119,748	138,811	278,770	1,115	9,966	548,410	120,823	138,857	278,770	1,115	9,966	549,531
Jan-19	124,512	166,801	289,021	1,116	9,921	591,371	127,241	166,922	289,021	1,116	9,919	594,220
Feb-19	85,766	131,648	257,128	1,111	7,631	483,284	87,916	131,231	257,128	1,111	7,457	484,843
Mar-19	85,232	166,720	302,325	1,111	11,438	566,826	83,402	166,527	302,325	1,111	11,388	564,753
Total	**1,159,920**	**1,844,673**	**3,256,453**	**13,359**	**132,384**	**6,406,790**	**1,136,952**	**1,831,443**	**3,256,451**	**13,359**	**130,296**	**6,368,502**

YEAR TO DATE MWH

	Actual Sales Cal Mth Res	Actual Sales Cal Mth Small C&I	Actual Sales Cal Mth Large C&I	Actual Sales Cal Mth Street	Actual Sales Cal Mth Other Sale Auth	Actual Sales Cal Mth Retail	WN Sales Cal Mth Res	WN Sales Cal Mth Small C&I	WN Sales Cal Mth Large C&I	WN Sales Cal Mth Street	WN Sales Cal Mth Other Sale Auth	WN Sales Cal Mth Retail
Apr-18	61,008	133,516	267,846	1,109	10,809	474,289	61,179	133,022	267,846	1,109	10,510	473,665
May-18	152,610	286,679	522,503	2,219	21,234	985,246	146,458	283,084	522,502	2,219	20,182	974,446
Jun-18	264,734	451,952	781,960	3,333	35,065	1,537,045	250,320	444,864	781,959	3,333	33,580	1,514,055
Jul-18	388,357	621,967	1,056,099	4,447	47,777	2,118,648	367,996	611,760	1,056,097	4,447	45,981	2,086,281
Aug-18	504,205	792,428	1,334,845	5,562	60,222	2,697,262	478,175	779,256	1,334,842	5,562	58,018	2,655,854
Sep-18	581,285	952,519	1,597,174	6,676	73,864	3,211,518	557,892	940,084	1,597,172	6,676	72,274	3,174,097
Oct-18	655,278	1,100,264	1,867,343	7,792	84,268	3,714,944	630,867	1,087,562	1,867,341	7,792	82,406	3,675,967
Nov-18	744,662	1,240,694	2,129,209	8,906	93,429	4,216,900	717,570	1,227,906	2,129,207	8,906	91,566	4,175,155
Dec-18	864,410	1,379,505	2,407,979	10,022	103,394	4,765,309	838,392	1,366,763	2,407,977	10,022	101,532	4,724,686
Jan-19	988,922	1,546,306	2,697,000	11,137	113,315	5,356,681	965,634	1,533,686	2,696,998	11,137	111,451	5,318,905
Feb-19	1,074,688	1,677,954	2,954,128	12,248	120,947	5,839,965	1,053,550	1,664,916	2,954,126	12,248	118,908	5,803,748
Mar-19	1,159,920	1,844,673	3,256,453	13,359	132,384	6,406,790	1,136,952	1,831,443	3,256,451	13,359	130,296	6,368,502

Southwestern Public Service Company

Weather Normalization of New Mexico Retail Base Period Sales

New Mexico Rate Case Base Period - Calendar Month Weather Normal Sales
30-Year Normal Weather

MONTHLY MWH

	Act var fr WN Res	Act var fr WN Small C&I	Act var fr WN Large C&I	Act var fr WN Street	Act var fr WN Other Sale Auth	Act var fr WN Retail	% var Res	% var Small C&I	% var Large C&I	% var Street	% var Other Sale Auth	% var Retail
Apr-18	(170)	494	0	0	300	623	-0.28%	0.37%	0.00%	0.00%	2.85%	0.1%
May-18	6,323	3,102	1	0	752	10,177	7.41%	2.07%	0.00%	0.00%	7.77%	2.0%
Jun-18	8,262	3,493	1	0	434	12,189	7.95%	2.16%	0.00%	0.00%	3.24%	2.3%
Jul-18	5,947	3,120	1	0	310	9,377	5.05%	1.87%	0.00%	0.00%	2.50%	1.6%
Aug-18	5,669	2,964	1	0	408	9,041	5.15%	1.77%	0.00%	0.00%	3.39%	1.6%
Sep-18	(2,637)	(736)	(0)	0	(613)	(3,987)	-3.31%	-0.46%	0.00%	0.00%	-4.30%	-0.8%
Oct-18	1,018	267	0	0	272	1,557	1.40%	0.18%	0.00%	0.00%	2.68%	0.3%
Nov-18	2,681	86	0	0	0	2,767	3.09%	0.06%	0.00%	0.00%	0.00%	0.6%
Dec-18	(1,075)	(46)	0	0	0	(1,121)	-0.89%	-0.03%	0.00%	0.00%	0.00%	-0.2%
Jan-19	(2,729)	(122)	0	0	2	(2,848)	-2.14%	-0.07%	0.00%	0.00%	0.02%	-0.5%
Feb-19	(2,150)	417	0	0	174	(1,559)	-2.45%	0.32%	0.00%	0.00%	2.34%	-0.3%
Mar-19	1,830	193	0	0	49	2,072	2.19%	0.12%	0.00%	0.00%	0.43%	0.4%
Total	**22,968**	**13,230**	**2**	**0**	**2,088**	**38,289**	**2.02%**	**0.72%**	**0.00%**	**0.00%**	**1.60%**	**0.6%**

YEAR TO DATE MWH

	Act var fr WN Res	Act var fr WN Small C&I	Act var fr WN Large C&I	Act var fr WN Street	Act var fr WN Other Sale Auth	Act var fr WN Retail	% var Res	% var Small C&I	% var Large C&I	% var Street	% var Other Sale Auth	% var Retail
Apr-18	(170)	494	0	0	300	623	-0.28%	0.37%	0.00%	0.00%	2.85%	0.1%
May-18	6,152	3,595	1	0	1,052	10,800	4.20%	1.27%	0.00%	0.00%	5.21%	1.1%
Jun-18	14,414	7,088	1	0	1,485	22,990	5.76%	1.59%	0.00%	0.00%	4.42%	1.5%
Jul-18	20,361	10,208	2	0	1,796	32,366	5.53%	1.67%	0.00%	0.00%	3.91%	1.6%
Aug-18	26,030	13,172	2	0	2,204	41,408	5.44%	1.69%	0.00%	0.00%	3.80%	1.6%
Sep-18	23,393	12,435	2	0	1,590	37,421	4.19%	1.32%	0.00%	0.00%	2.20%	1.2%
Oct-18	24,411	12,702	2	0	1,862	38,978	3.87%	1.17%	0.00%	0.00%	2.26%	1.1%
Nov-18	27,093	12,787	2	0	1,862	41,745	3.78%	1.04%	0.00%	0.00%	2.03%	1.0%
Dec-18	26,017	12,742	2	0	1,862	40,624	3.10%	0.93%	0.00%	0.00%	1.83%	0.9%
Jan-19	23,288	12,620	2	0	1,865	37,775	2.41%	0.82%	0.00%	0.00%	1.67%	0.7%
Feb-19	21,138	13,037	2	0	2,039	36,216	2.01%	0.78%	0.00%	0.00%	1.71%	0.6%
Mar-19	22,968	13,230	2	0	2,088	**38,289**	2.02%	0.72%	0.00%	0.00%	1.60%	**0.6%**

Southwestern Public Service Company

Weather Normalization of New Mexico Retail Base Period Sales

New Mexico Weather Impacted Sales Calculation
Using Roswell Weather (Normal Period 1988-2017)

New Mexico Retail Weather Adjustment Summary													
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Total
Heating Degree Days 30-yr normal	135	26	0	0	0	10	129	443	738	726	513	341	3,061
Heating Degree Days Actual	111	0	0	0	0	2	177	522	720	684	474	400	3,090
Variance from Normal	(24)	(26)	(0)	(0)	(0)	(8)	48	80	(18)	(42)	(39)	59	29
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Total
Cooling Degree Days 30-yr normal	50	214	453	520	470	260	53	2	0	0	1	5	2,029
Cooling Degree Days Actual	57	368	554	584	533	223	78	0	0	0	0	13	2,410
Variance from Normal	7	154	101	64	63	(37)	25	(2)	(0)	0	(1)	8	381
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Total
Precipitation 30-yr normal	0.58	1.25	1.23	1.94	1.73	1.60	1.05	0.42	0.55	0.37	0.38	0.48	11.59
Precipitation Actual	0.03	0.52	1.40	0.51	0.96	0.84	3.25	0.01	1.05	0.03	0.00	0.42	9.02
Variance from Normal	(0.55)	(0.73)	0.17	(1.43)	(0.77)	(0.76)	2.20	(0.41)	0.50	(0.34)	(0.38)	(0.06)	(2.57)
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Total
New Mexico Residential Service **(1)**	0	3,992	5,146	3,629	3,478	(1,678)	470	934	(419)	(972)	(681)	391	14,289
New Mexico Residential Space Heat **(2)**	(170)	2,330	3,116	2,318	2,191	(959)	549	1,748	(656)	(1,757)	(1,469)	1,439	8,679
New Mexico Small General Service **(3)**	0	601	783	538	515	(249)	67	86	(46)	(129)	(118)	77	2,124
New Mexico Secondary General Service **(4) & (5)**	0	2,105	2,803	1,932	1,877	(836)	199	0	0	0	0	0	8,081
New Mexico Irrigation Service **(6)**	494	396	(92)	650	573	348	0	0	0	7	536	116	3,028
Large Municipal and School Service **(7)**	273	682	398	282	372	(570)	252	0	0	2	156	45	1,893
Small Municipal and School Service **(8)**	26	70	36	28	36	(43)	20	0	0	0	18	5	195
New Mexico Retail Weather Adjustment Total	623	10,177	12,189	9,377	9,041	(3,987)	1,557	2,767	(1,121)	(2,848)	(1,559)	2,072	38,289

New Mexico Residential Service												
Heating Degree Days Weather Adjustment (30-yr normal)												
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	(24)	(26)	(0)	(0)	(0)	(8)	48	80	(18)	(42)	(39)	59
Heating Degree Days Weather Coefficients	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000015	0.0001951	0.0003873	0.0003795	0.0002851	0.0001090
Res Service Customers	59,684	59,785	59,827	59,935	60,001	60,018	60,145	60,203	60,255	60,384	60,509	60,579
Heating Degree Days Weather Adjustment (MWh)	0	0	0	0	0	0	4	934	(419)	(972)	(681)	391
Cooling Degree Days Weather Adjustment (30-yr normal)												
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	7	154	101	64	63	(37)	25	(2)	(0)	0	(1)	8
Cooling Degree Days Weather Coefficients	0.0000000	0.0004324	0.0008550	0.0009504	0.0009269	0.0007524	0.0003115	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Res Service Customers	59,684	59,785	59,827	59,935	60,001	60,018	60,145	60,203	60,255	60,384	60,509	60,579
Cooling Degree Days Weather Adjustment (MWh)	0	3,992	5,146	3,629	3,478	(1,678)	465	0	0	0	0	0
NM Residential Service Weather Adjustment (1)	0	3,992	5,146	3,629	3,478	(1,678)	470	934	(419)	(972)	(681)	391

Southwestern Public Service Company

Weather Normalization of New Mexico Retail Base Period Sales

New Mexico Weather Impacted Sales Calculation
Using Roswell Weather (Normal Period 1988-2017)

New Mexico Residential Space Heat												
Heating Degree Days Weather Adjustment (30-yr normal)												
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	(24)	(26)	(0)	(0)	(0)	(8)	48	80	(18)	(42)	(39)	59
Heating Degree Days Weather Coefficients	0.0002354	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0002072	0.0007387	0.0012276	0.0013912	0.0012510	0.0008156
Res Space Heat Customers	29,694	29,715	29,718	29,696	29,727	29,700	29,743	29,758	29,744	29,759	29,758	29,760
Heating Degree Days Weather Adjustment (MWh)	(170)	0	0	0	0	0	297	1,748	(656)	(1,757)	(1,469)	1,439
Cooling Degree Days Weather Adjustment (30-yr normal)												
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	7	154	101	64	63	(37)	25	(2)	(0)	0	(1)	8
Cooling Degree Days Weather Coefficients	0.0000000	0.0005078	0.0010423	0.0012254	0.0011787	0.0008685	0.0003403	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Res Space Heat Customers	29,694	29,715	29,718	29,696	29,727	29,700	29,743	29,758	29,744	29,759	29,758	29,760
Cooling Degree Days Weather Adjustment (MWh)	0	2,330	3,116	2,318	2,191	(959)	251	0	0	0	0	0
NM Residential Space Heat Weather Adjustment (2)	(170)	2,330	3,116	2,318	2,191	(959)	549	1,748	(656)	(1,757)	(1,469)	1,439

New Mexico Small General Service												
Heating Degree Days Weather Adjustment (30-yr normal)												
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	(24)	(26)	(0)	(0)	(0)	(8)	48	80	(18)	(42)	(39)	59
Heating Degree Days Weather Coefficients	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000007	0.0000915	0.0002166	0.0002579	0.0002540	0.0001101
Small General Service Customers	11,630	11,645	11,624	11,651	11,661	11,701	11,681	11,765	11,765	11,788	11,819	11,827
Heating Degree Days Weather Adjustment (MWh)	0	0	0	0	0	0	0	86	-46	-129	-118	77
Cooling Degree Days Weather Adjustment (30-yr normal)												
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	7	154	101	64	63	(37)	25	(2)	(0)	0	(1)	8
Cooling Degree Days Weather Coefficients	0.0000000	0.0003339	0.0006695	0.0007247	0.0007059	0.0005728	0.0002300	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Small General Service Customers	11,630	11,645	11,624	11,651	11,661	11,701	11,681	11,765	11,765	11,788	11,819	11,827
Cooling Degree Days Weather Adjustment (MWh)	0	601	783	538	515	(249)	67	0	0	0	0	0
NM Small General Service Weather Adjustment (3)	0	601	783	538	515	(249)	67	86	(46)	(129)	(118)	77

Southwestern Public Service Company

Weather Normalization of New Mexico Retail Base Period Sales

New Mexico Weather Impacted Sales Calculation
Using Roswell Weather (Normal Period 1988-2017)

New Mexico Small Secondary General Service												
Cooling Degree Days Weather Adjustment (30-yr normal)												
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	7	154	101	64	63	(37)	25	(2)	(0)	0	(1)	8
Cooling Degree Days Weather Coefficients	0.0000000	0.0037871	0.0077142	0.0083252	0.0081816	0.0060956	0.0021631	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Small Secondary General Customers	3,586	3,599	3,611	3,642	3,667	3,688	3,712	3,739	3,751	3,769	3,778	3,801
Cooling Degree Days Weather Adjustment (MWh)	0	2,105	2,802	1,931	1,876	-836	199	0	0	0	0	0
NM Small Secondary General Service Weather Adjustment (4)	0	2,105	2,802	1,931	1,876	(836)	199	0	0	0	0	0

New Mexico Large Secondary General Service												
Cooling Degree Days Weather Adjustment (30-yr normal)												
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	7	154	101	64	63	(37)	25	(2)	(0)	0	(1)	8
Cooling Degree Days Weather Coefficients	0.0000000	0.0037871	0.0077142	0.0083252	0.0081816	0.0060956	0.0021631	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Large Secondary General Customers	1	1	1	1	1	1	1	1	1	1	1	1
Cooling Degree Days Weather Adjustment (MWh)	0	1	1	1	1	0	0	0	0	0	0	0
NM Large Secondary General Service Weather Adjustment (5)	0	1	1	1	1	(0)	0	0	0	0	0	0

New Mexico Irrigation Service												
Precipitation Weather Adjustment (30-yr normal)												
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	(0.55)	(0.73)	0.17	(1.43)	(0.77)	(0.76)	2.20	(0.41)	0.50	(0.34)	(0.38)	(0.06)
Precipitation Weather Coefficients	-0.8911295	-0.5379174	-0.5237386	-0.4492365	-0.7348683	-0.4493449	0.0000000	0.0000000	0.0000000	-0.0215856	-1.3924218	-1.7916601
Irrigation Customers	1,009	1,013	1,014	1,013	1,013	1,016	1,011	1,011	1,010	1,008	1,006	1,006
Precipitation Weather Adjustment (MWh)	494	396	(92)	650	573	348	0	0	0	7	536	116
NM Irrigation Weather Adjustment (6)	494	396	(92)	650	573	348	0	0	0	7	536	116

Southwestern Public Service Company

Weather Normalization of New Mexico Retail Base Period Sales

New Mexico Weather Impacted Sales Calculation
Using Roswell Weather (Normal Period 1988-2017)

New Mexico Municipal and School Service												
Cooling Degree Days Weather Adjustment (30-yr normal)												
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	7	154	101	64	63	(37)	25	(2)	(0)	0	(1)	8
Cooling Degree Days Weather Coefficients	0.0000000	0.0017724	0.0026518	0.0028064	0.0037520	0.0094815	0.0062902	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Municipal & School Customers	1,741	1,740	1,737	1,735	1,739	1,740	1,740	1,740	1,740	1,741	1,736	1,737
Cooling Degree Days Weather Adjustment (MWh)	0	476	463	310	408	(613)	272	0	0	0	0	0
Precipitation Weather Adjustment (30-yr normal)												
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	(0.55)	(0.73)	0.17	(1.43)	(0.77)	(0.76)	2.20	(0.41)	0.50	(0.34)	(0.38)	(0.06)
Precipitation Weather Coefficients	-0.3135424	-0.2177596	-0.0976233	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.0040627	-0.2623846	-0.4408061
Municipal & School Customers	1,741	1,740	1,737	1,735	1,739	1,740	1,740	1,740	1,740	1,741	1,736	1,737
Precipitation Weather Adjustment (MWh)	300	275	(30)	0	0	0	0	0	0	2	174	49
Municipal & School Weather Adjustment	300	752	434	310	408	(613)	272	0	0	2	174	49
New Mexico - Municipal and School Weather Impact Allocation												
Billed Sales in KWh	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
LMSNM	8,275	8,979	10,998	11,480	12,045	12,189	13,400	7,972	8,846	8,756	8,662	8,790
SMSNM	799	916	980	1,137	1,175	930	1,043	789	917	1,033	1,022	903
Total	9,074	9,895	11,979	12,617	13,220	13,119	14,443	8,761	9,762	9,789	9,684	9,693
Allocation Factors	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
LMSNM	91.20%	90.75%	91.82%	90.99%	91.11%	92.91%	92.78%	90.99%	90.61%	89.45%	89.45%	90.68%
SMSNM	8.80%	9.25%	8.18%	9.01%	8.89%	7.09%	7.22%	9.01%	9.39%	10.55%	10.55%	9.32%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Municipal and School Allocation of Sales impacted by weather												
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Dec-18	Dec-18	Dec-18
LMSNM **(7)**	273	682	398	282	372	(570)	252	0	0	2	156	45
SMSNM **(8)**	26	70	36	28	36	(43)	20	0	0	0	18	5

Southwestern Public Service Company

Weather Normalization of New Mexico Retail Base Period Sales

New Mexico Residential Service Coefficients (Modeled with MWH)

			Model Coefficients		Monthly weights Model to calendar			Calendar Month	
Year	Month	Date	RES HDD	RES CDD	Current	1st Future	2nd Future	RES HDD	RES CDD
2018	4	Apr-18	0.000000	0.000000	42.86%	57.14%	0.00%	0.0000000	0.0000000
2018	5	May-18	0.000000	0.000000	44.24%	55.61%	0.15%	0.0000000	0.0004324
2018	6	Jun-18	0.000000	0.000775	44.76%	54.92%	0.32%	0.0000000	0.0008550
2018	7	Jul-18	0.000000	0.000919	45.47%	54.53%	0.00%	0.0000000	0.0009504
2018	8	Aug-18	0.000000	0.000976	49.62%	49.46%	0.92%	0.0000000	0.0009269
2018	9	Sep-18	0.000000	0.000882	41.43%	58.57%	0.00%	0.0000000	0.0007524
2018	10	Oct-18	0.000000	0.000661	47.16%	52.38%	0.46%	0.0000015	0.0003115
2018	11	Nov-18	0.000000	0.000000	41.11%	58.41%	0.48%	0.0001951	0.0000000
2018	12	Dec-18	0.000331	0.000000	41.94%	58.06%	0.00%	0.0003873	0.0000000
2019	1	Jan-19	0.000428	0.000000	48.39%	50.69%	0.92%	0.0003795	0.0000000
2019	2	Feb-19	0.000335	0.000000	40.48%	59.35%	0.17%	0.0002851	0.0000000
2019	3	Mar-19	0.000252	0.000000	43.32%	56.68%	0.00%	0.0001090	0.0000000
2019	4	Apr-19	0.000000	0.000000	44.13%	55.87%	0.00%	0.0000000	0.0000000
2019	5	May-19	0.000000	0.000000	45.62%	53.92%	0.46%	0.0000000	0.0004221
2019	6	Jun-19	0.000000	0.000775	41.75%	58.25%	0.00%	0.0000000	0.0008592
2019	7	Jul-19	0.000000	0.000919	46.70%	53.30%	0.00%	0.0000000	0.0009497
2019	8	Aug-19	0.000000	0.000976	46.39%	52.84%	0.77%		
2019	9	Sep-19	0.000000	0.000882	42.70%	57.30%	0.00%		

Southwestern Public Service Company

Weather Normalization of New Mexico Retail Base Period Sales

New Mexico Residential Space Heat Coefficients (Modeled with MWH)

		Model Coefficients		Monthly weights Model to calendar			Calendar Month	
Year	Month	RES HDD	RES CDD	Current	1st Future	2nd Future	RES HDD	RES CDD
2018	4	0.000549	0.000000	42.86%	57.14%	0.00%	0.0002354	0.0000000
2018	5	0.000000	0.000000	44.24%	55.61%	0.15%	0.0000000	0.0005078
2018	6	0.000000	0.000910	44.76%	54.92%	0.32%	0.0000000	0.0010423
2018	7	0.000000	0.001149	45.47%	54.53%	0.00%	0.0000000	0.0012254
2018	8	0.000000	0.001289	49.62%	49.46%	0.92%	0.0000000	0.0011787
2018	9	0.000000	0.001076	41.43%	58.57%	0.00%	0.0000000	0.0008685
2018	10	0.000000	0.000722	47.16%	52.38%	0.46%	0.0002072	0.0003403
2018	11	0.000387	0.000000	41.11%	58.41%	0.48%	0.0007387	0.0000000
2018	12	0.000981	0.000000	41.94%	58.06%	0.00%	0.0012276	0.0000000
2019	1	0.001406	0.000000	48.39%	50.69%	0.92%	0.0013912	0.0000000
2019	2	0.001381	0.000000	40.48%	59.35%	0.17%	0.0012510	0.0000000
2019	3	0.001164	0.000000	43.32%	56.68%	0.00%	0.0008156	0.0000000
2019	4	0.000549	0.000000	44.13%	55.87%	0.00%	0.0002424	0.0000000
2019	5	0.000000	0.000000	45.62%	53.92%	0.46%	0.0000000	0.0004959
2019	6	0.000000	0.000910	41.75%	58.25%	0.00%	0.0000000	0.0010490
2019	7	0.000000	0.001149	46.70%	53.30%	0.00%	0.0000000	0.0012237
2019	8	0.000000	0.001289	46.39%	52.84%	0.77%		
2019	9	0.000000	0.001076	42.70%	57.30%	0.00%		

Southwestern Public Service Company

Weather Normalization of New Mexico Retail Base Period Sales

New Mexico Small General Service Coefficients (Modeled with MWH)

		Model Coefficients		Monthly weights Model to calendar			Calendar Month	
Year	Month	RES HDD	RES CDD	Current	1st Future	2nd Future	RES HDD	RES CDD
2018	4	0.000000	0.000000	42.86%	57.14%	0.00%	0.0000000	0.0000000
2018	5	0.000000	0.000000	44.24%	55.61%	0.15%	0.0000000	0.0003339
2018	6	0.000000	0.000599	44.76%	54.92%	0.32%	0.0000000	0.0006695
2018	7	0.000000	0.000727	45.47%	54.53%	0.00%	0.0000000	0.0007247
2018	8	0.000000	0.000723	49.62%	49.46%	0.92%	0.0000000	0.0007059
2018	9	0.000000	0.000693	41.43%	58.57%	0.00%	0.0000000	0.0005728
2018	10	0.000000	0.000488	47.16%	52.38%	0.46%	0.0000007	0.0002300
2018	11	0.000000	0.000000	41.11%	58.41%	0.48%	0.0000915	0.0000000
2018	12	0.000154	0.000000	41.94%	58.06%	0.00%	0.0002166	0.0000000
2019	1	0.000261	0.000000	48.39%	50.69%	0.92%	0.0002579	0.0000000
2019	2	0.000255	0.000000	40.48%	59.35%	0.17%	0.0002540	0.0000000
2019	3	0.000254	0.000000	43.32%	56.68%	0.00%	0.0001101	0.0000000
2019	4	0.000000	0.000000	44.13%	55.87%	0.00%	0.0000000	0.0000000
2019	5	0.000000	0.000000	45.62%	53.92%	0.46%	0.0000000	0.0003261
2019	6	0.000000	0.000599	41.75%	58.25%	0.00%	0.0000000	0.0006734
2019	7	0.000000	0.000727	46.70%	53.30%	0.00%	0.0000000	0.0007248
2019	8	0.000000	0.000723	46.39%	52.84%	0.77%		
2019	9	0.000000	0.000693	42.70%	57.30%	0.00%		

Southwestern Public Service Company

Weather Normalization of New Mexico Retail Base Period Sales

New Mexico Secondary General Service Coefficients (Modeled with MWH)

		Model Coefficients		Monthly weights Model to calendar			Calendar Month			
Year	Month	RES HDD	RES CDD	Current	1st Future	2nd Future	RES HDD	RES CDD	Actual Cust	RES CDD per Cst
2018	4	0.000000	0.000000	42.86%	57.14%	0.00%	0.0000000	0.0000000	3,587	0.0000000
2018	5	0.000000	0.000000	44.24%	55.61%	0.15%	0.0000000	13.6333866	3,600	0.0037871
2018	6	0.000000	24.432838	44.76%	54.92%	0.32%	0.0000000	27.8638230	3,612	0.0077142
2018	7	0.000000	30.647466	45.47%	54.53%	0.00%	0.0000000	30.3285339	3,643	0.0083252
2018	8	0.000000	30.062608	49.62%	49.46%	0.92%	0.0000000	30.0100426	3,668	0.0081816
2018	9	0.000000	30.199155	41.43%	58.57%	0.00%	0.0000000	22.4865197	3,689	0.0060956
2018	10	0.000000	17.031241	47.16%	52.38%	0.46%	0.0000000	8.0316298	3,713	0.0021631
2018	11	0.000000	0.000000	41.11%	58.41%	0.48%	0.0000000	0.0000000	3,740	0.0000000
2018	12	0.000000	0.000000	41.94%	58.06%	0.00%	0.0000000	0.0000000	3,752	0.0000000
2019	1	0.000000	0.000000	48.39%	50.69%	0.92%	0.0000000	0.0000000	3,770	0.0000000
2019	2	0.000000	0.000000	40.48%	59.35%	0.17%	0.0000000	0.0000000	3,779	0.0000000
2019	3	0.000000	0.000000	43.32%	56.68%	0.00%	0.0000000	0.0000000	3,802	0.0000000
2019	4	0.000000	0.000000	44.13%	55.87%	0.00%	0.0000000	0.0000000	0	0.0000000
2019	5	0.000000	0.000000	45.62%	53.92%	0.46%	0.0000000	13.3146980	0	0.0000000
2019	6	0.000000	24.432838	41.75%	58.25%	0.00%	0.0000000	28.0531050	0	0.0000000
2019	7	0.000000	30.647466	46.70%	53.30%	0.00%	0.0000000	30.3357211	0	0.0000000
2019	8	0.000000	30.062608	46.39%	52.84%	0.77%				
2019	9	0.000000	30.199155	42.70%	57.30%	0.00%				

Southwestern Public Service Company

Weather Normalization of New Mexico Retail Base Period Sales

New Mexico Muni & School Service Coefficients (Modeled with MWH)

		Model Coefficients			Monthly weights Model to calendar			Calendar Month		
Year	Month	RES HDD	RES CDD	Precip	Current	1st Future	2nd Future	RES HDD	RES CDD	Precip
2018	4	0.000000	0.000000	-0.440806	42.86%	57.14%	0.00%	0.0000000	0.000000	-0.3135424
2018	5	0.000000	0.000000	-0.218095	44.24%	55.61%	0.15%	0.0000000	0.001772	-0.2177596
2018	6	0.000000	0.003181	-0.218095	44.76%	54.92%	0.32%	0.0000000	0.002652	-0.0976233
2018	7	0.000000	0.002217	0.000000	45.47%	54.53%	0.00%	0.0000000	0.002806	0.0000000
2018	8	0.000000	0.003298	0.000000	49.62%	49.46%	0.92%	0.0000000	0.003752	0.0000000
2018	9	0.000000	0.004028	0.000000	41.43%	58.57%	0.00%	0.0000000	0.009482	0.0000000
2018	10	0.000000	0.013339	0.000000	47.16%	52.38%	0.46%	0.0000000	0.006290	0.0000000
2018	11	0.000000	0.000000	0.000000	41.11%	58.41%	0.48%	0.0000000	0.000000	0.0000000
2018	12	0.000000	0.000000	0.000000	41.94%	58.06%	0.00%	0.0000000	0.000000	0.0000000
2019	1	0.000000	0.000000	0.000000	48.39%	50.69%	0.92%	0.0000000	0.000000	-0.0040627
2019	2	0.000000	0.000000	0.000000	40.48%	59.35%	0.17%	0.0000000	0.000000	-0.2623846
2019	3	0.000000	0.000000	-0.440806	43.32%	56.68%	0.00%	0.0000000	0.000000	-0.4408061
2019	4	0.000000	0.00000	-0.440806	44.13%	55.87%	0.00%	0.0000000	0.000000	-0.3163704
2019	5	0.000000	0.00000	-0.218095	45.62%	53.92%	0.46%	0.0000000	0.001725	-0.2170895
2019	6	0.000000	0.00318	-0.218095	41.75%	58.25%	0.00%	0.0000000	0.002619	-0.0910458
2019	7	0.000000	0.00222	0.000000	46.70%	53.30%	0.00%	0.0000000	0.002793	0.0000000
2019	8	0.000000	0.00330	0.000000	46.39%	52.84%	0.77%			
2019	9	0.000000	0.00403	0.000000	42.70%	57.30%	0.00%			

Southwestern Public Service Company

Weather Normalization of New Mexico Retail Base Period Sales

New Mexico Irrigation Service Coefficients (Modeled with MWH)

		Model Coefficients			Monthly weights Model to calendar			Calendar Month		
Year	Month	RES HDD	RES CDD	Precip	Current	1st Future	2nd Future	RES HDD	RES CDD	Precip
2018	4	0.000000	0.000000	-1.371042	42.86%	57.14%	0.00%	0.0000000	0.0000000	-0.8911295
2018	5	0.000000	0.000000	-0.531195	44.24%	55.61%	0.15%	0.0000000	0.0000000	-0.5379174
2018	6	0.000000	0.000000	-0.543347	44.76%	54.92%	0.32%	0.0000000	0.0000000	-0.5237386
2018	7	0.000000	0.000000	-0.508473	45.47%	54.53%	0.00%	0.0000000	0.0000000	-0.4492365
2018	8	0.000000	0.000000	-0.399845	49.62%	49.46%	0.92%	0.0000000	0.0000000	-0.7348683
2018	9	0.000000	0.000000	-1.084626	41.43%	58.57%	0.00%	0.0000000	0.0000000	-0.4493449
2018	10	0.000000	0.000000	0.000000	47.16%	52.38%	0.46%	0.0000000	0.0000000	0.0000000
2018	11	0.000000	0.000000	0.000000	41.11%	58.41%	0.48%	0.0000000	0.0000000	0.0000000
2018	12	0.000000	0.000000	0.000000	41.94%	58.06%	0.00%	0.0000000	0.0000000	0.0000000
2019	1	0.000000	0.000000	0.000000	48.39%	50.69%	0.92%	0.0000000	0.0000000	-0.0215856
2019	2	0.000000	0.000000	0.000000	40.48%	59.35%	0.17%	0.0000000	0.0000000	-1.3924218
2019	3	0.000000	0.000000	-2.342043	43.32%	56.68%	0.00%	0.0000000	0.0000000	-1.7916601
2019	4	0.000000	0.000000	-1.371042	44.13%	55.87%	0.00%	0.0000000	0.0000000	-0.9017943
2019	5	0.000000	0.000000	-0.531195	45.62%	53.92%	0.46%	0.0000000	0.0000000	-0.5376423
2019	6	0.000000	0.000000	-0.543347	41.75%	58.25%	0.00%	0.0000000	0.0000000	-0.5230318
2019	7	0.000000	0.000000	-0.508473	46.70%	53.30%	0.00%	0.0000000	0.0000000	-0.4505714
2019	8	0.000000	0.000000	-0.399845	46.39%	52.84%	0.77%			
2019	9	0.000000	0.000000	-1.084626	42.70%	57.30%	0.00%			

Southwestern Public Service Company

Weather Normalization of Texas Retail Base Period Sales

Texas Panhandle Weather Data (Amarillo TX and Lubbock TX)
Normal Weather Based on a 30-year Historical Average

Month	Year	Weather Act Cal HDD65	Weather Act Cal CDD65	Weather Act Cal Precip	Weather Norm Cal HDD65	Weather Norm Cal CDD65	Weather Norm Cal Precip	Dev HDD65	Dev CDD65	Dev Precip
Apr	2018	288	32	0.45	235	30	1.47	53	2	-1.01
May	2018	7	324	0.46	75	141	2.48	-68	183	-2.02
Jun	2018	0	464	2.01	3	342	2.84	-3	122	-0.83
Jul	2018	0	497	1.65	0	445	2.63	0	52	-0.97
Aug	2018	0	461	2.39	1	400	2.64	-1	61	-0.25
Sep	2018	13	219	1.40	30	200	2.01	-17	19	-0.62
Oct	2018	270	44	4.09	199	42	1.41	71	2	2.68
Nov	2018	600	0	0.32	512	1	0.74	88	-1	-0.43
Dec	2018	792	0	0.80	815	0	0.66	-23	0	0.14
Jan	2019	755	0	0.04	817	0	0.72	-62	0	-0.68
Feb	2019	637	0	0.22	645	0	0.61	-8	0	-0.39
Mar	2019	558	4	1.86	468	5	1.20	90	-1	0.66
Annual		**3,920**	**2,045**	**15.69**	**3,801**	**1,606**	**19.42**	**119**	**439**	**-3.73**
Annual Dev %								**3.1%**	**27.3%**	**-19.2%**

Southwestern Public Service Company

Weather Normalization of Texas Retail Base Period Sales

SPS Texas Base Period Calendar Month Weather Normalized Sales
30-Year Normal Weather

MONTHLY MWH

	Actual Sales Cal Mth Res	Actual Sales Cal Mth Small C&I	Actual Sales Cal Mth Large C&I	Actual Sales Cal Mth Street	Actual Sales Cal Mth Muni&Sch	Actual Sales Cal Mth Retail	WN Sales Cal Mth Res	WN Sales Cal Mth Small C&I	WN Sales Cal Mth Large C&I	WN Sales Cal Mth Street	WN Sales Cal Mth Muni&Sch	WN Sales Cal Mth Retail
Apr-18	144,325	232,531	621,202	2,830	29,347	1,030,235	143,770	228,329	621,031	2,830	28,415	1,024,375
May-18	200,894	280,182	679,281	2,828	31,597	1,194,783	167,806	263,830	678,919	2,828	27,432	1,140,815
Jun-18	266,722	308,064	667,806	2,821	35,186	1,280,599	233,426	289,695	667,049	2,821	33,481	1,226,471
Jul-18	287,729	329,862	713,731	2,822	36,321	1,370,465	272,414	319,850	713,241	2,822	35,447	1,343,774
Aug-18	271,859	327,212	720,981	2,821	35,898	1,358,770	254,160	316,041	720,603	2,821	34,795	1,328,420
Sep-18	179,836	268,008	688,720	2,820	35,615	1,175,000	175,053	265,058	688,502	2,820	34,818	1,166,251
Oct-18	159,300	246,470	702,001	2,820	26,879	1,137,470	158,595	246,335	702,001	2,820	26,816	1,136,567
Nov-18	175,536	230,190	681,479	2,821	27,601	1,117,626	171,669	228,250	681,476	2,821	27,601	1,111,817
Dec-18	233,315	273,027	691,624	2,821	28,878	1,229,666	235,228	273,786	691,625	2,821	28,878	1,232,339
Jan-19	243,856	261,343	656,140	2,776	28,412	1,192,527	248,874	262,284	656,141	2,776	28,412	1,198,487
Feb-19	176,207	217,179	600,784	2,758	23,935	1,020,864	176,719	215,622	600,784	2,758	23,935	1,019,817
Mar-19	188,300	247,067	674,472	2,682	31,440	1,143,962	185,077	251,768	674,472	2,682	31,898	1,145,898
Total	**2,527,881**	**3,221,136**	**8,098,222**	**33,620**	**371,110**	**14,251,969**	**2,422,791**	**3,160,850**	**8,095,844**	**33,620**	**361,928**	**14,075,032**

YEAR TO DATE MWH

	Actual Sales Cal Mth Res	Actual Sales Cal Mth Small C&I	Actual Sales Cal Mth Large C&I	Actual Sales Cal Mth Street	Actual Sales Cal Mth Muni&Sch	Actual Sales Cal Mth Retail	WN Sales Cal Mth Res	WN Sales Cal Mth Small C&I	WN Sales Cal Mth Large C&I	WN Sales Cal Mth Street	WN Sales Cal Mth Muni&Sch	WN Sales Cal Mth Retail
Apr-18	144,325	232,531	621,202	2,830	29,347	1,030,235	143,770	228,329	621,031	2,830	28,415	1,024,375
May-18	345,219	512,714	1,300,484	5,658	60,944	2,225,018	311,576	492,160	1,299,950	5,658	55,847	2,165,191
Jun-18	611,941	820,778	1,968,290	8,479	96,130	3,505,618	545,002	781,854	1,966,999	8,479	89,328	3,391,662
Jul-18	899,670	1,150,640	2,682,021	11,302	132,451	4,876,083	817,416	1,101,705	2,680,239	11,302	124,774	4,735,436
Aug-18	1,171,529	1,477,852	3,403,002	14,122	168,348	6,234,853	1,071,576	1,417,746	3,400,842	14,122	159,569	6,063,856
Sep-18	1,351,366	1,745,860	4,091,722	16,943	203,964	7,409,854	1,246,629	1,682,804	4,089,344	16,943	194,387	7,230,107
Oct-18	1,510,666	1,992,330	4,793,723	19,763	230,843	8,547,324	1,405,224	1,929,139	4,791,345	19,763	221,203	8,366,674
Nov-18	1,686,202	2,222,520	5,475,202	22,583	258,444	9,664,950	1,576,893	2,157,389	5,472,821	22,583	248,804	9,478,491
Dec-18	1,919,517	2,495,547	6,166,826	25,404	287,322	10,894,616	1,812,121	2,431,175	6,164,446	25,404	277,683	10,710,830
Jan-19	2,163,373	2,756,890	6,822,966	28,180	315,734	12,087,143	2,060,995	2,693,459	6,820,588	28,180	306,095	11,909,316
Feb-19	2,339,580	2,974,069	7,423,750	30,938	339,669	13,108,007	2,237,714	2,909,082	7,421,371	30,938	330,029	12,929,134
Mar-19	2,527,881	3,221,136	8,098,222	33,620	371,110	**14,251,969**	2,422,791	3,160,850	8,095,844	33,620	361,928	**14,075,032**

Southwestern Public Service Company

Weather Normalization of Texas Retail Base Period Sales

SPS Texas Base Period Calendar Month Weather Normalized Sales
30-Year Normal Weather

MONTHLY MWH

	Act var fr WN Res	Act var fr WN Small C&I	Act var fr WN Large C&I	Act var Cal Mth Street	Act var Cal Mth Muni&Sch	Act var fr WN Retail	% var Res	% var Small C&I	% var Large C&I	% var Street	% var Muni&Sch	% var Retail
Apr-18	554	4,202	171	0	932	5,859	0.4%	1.8%	0.0%	0.0%	3.3%	0.6%
May-18	33,088	16,352	363	0	4,165	53,968	19.7%	6.2%	0.1%	0.0%	15.2%	4.7%
Jun-18	33,296	18,369	758	0	1,705	54,128	14.3%	6.3%	0.1%	0.0%	5.1%	4.4%
Jul-18	15,315	10,012	490	0	874	26,691	5.6%	3.1%	0.1%	0.0%	2.5%	2.0%
Aug-18	17,700	11,171	378	0	1,103	30,351	7.0%	3.5%	0.1%	0.0%	3.2%	2.3%
Sep-18	4,783	2,950	218	0	797	8,749	2.7%	1.1%	0.0%	0.0%	2.3%	0.8%
Oct-18	705	135	0	0	63	903	0.4%	0.1%	0.0%	0.0%	0.2%	0.1%
Nov-18	3,867	1,939	3	0	0	5,809	2.3%	0.8%	0.0%	0.0%	0.0%	0.5%
Dec-18	(1,913)	(759)	(1)	0	0	(2,673)	-0.8%	-0.3%	0.0%	0.0%	0.0%	-0.2%
Jan-19	(5,018)	(941)	(1)	0	0	(5,960)	-2.0%	-0.4%	0.0%	0.0%	0.0%	-0.5%
Feb-19	(511)	1,557	0	0	1	1,046	-0.3%	0.7%	0.0%	0.0%	0.0%	0.1%
Mar-19	3,223	(4,701)	0	0	(458)	(1,936)	1.7%	-1.9%	0.0%	0.0%	-1.4%	-0.2%
Total	**105,089**	**60,286**	**2,379**	**0**	**9,182**	**176,937**	**4.3%**	**1.9%**	**0.0%**	**0.0%**	**2.5%**	**1.3%**

YEAR TO DATE MWH

	Act var fr WN Res	Act var fr WN Small C&I	Act var fr WN Large C&I	Act var fr WN Street	Act var fr WN Muni&Sch	Act var fr WN Retail	% var Res	% var Small C&I	% var Large C&I	% var Street	% var Muni&Sch	% var Retail
Apr-18	554	4,202	171	0	932	5,859	0.4%	1.8%	0.0%	0.0%	3.3%	0.6%
May-18	33,643	20,554	534	0	5,097	59,828	10.8%	4.2%	0.0%	0.0%	9.1%	2.8%
Jun-18	66,939	38,923	1,292	0	6,803	113,956	12.3%	5.0%	0.1%	0.0%	7.6%	3.4%
Jul-18	82,254	48,935	1,782	0	7,676	140,647	10.1%	4.4%	0.1%	0.0%	6.2%	3.0%
Aug-18	99,953	60,106	2,160	0	8,779	170,998	9.3%	4.2%	0.1%	0.0%	5.5%	2.8%
Sep-18	104,737	63,056	2,378	0	9,576	179,747	8.4%	3.7%	0.1%	0.0%	4.9%	2.5%
Oct-18	105,442	63,191	2,378	0	9,639	180,650	7.5%	3.3%	0.0%	0.0%	4.4%	2.2%
Nov-18	109,308	65,131	2,381	0	9,639	186,459	6.9%	3.0%	0.0%	0.0%	3.9%	2.0%
Dec-18	107,395	64,372	2,380	0	9,639	183,786	5.9%	2.6%	0.0%	0.0%	3.5%	1.7%
Jan-19	102,378	63,431	2,379	0	9,639	177,827	5.0%	2.4%	0.0%	0.0%	3.1%	1.5%
Feb-19	101,866	64,988	2,379	0	9,640	178,873	4.6%	2.2%	0.0%	0.0%	2.9%	1.4%
Mar-19	105,089	60,286	2,379	0	9,182	**176,937**	4.3%	1.9%	0.0%	0.0%	2.5%	**1.3%**

Southwestern Public Service Company

Weather Normalization of Texas Retail Base Period Sales

Texas Weather Impacted Sales Calculation
Using Panhandle Weather (Normal Period 1988-2017)

Texas Retail Weather Adjustment Summary													
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Total
Heating Degree Days 30-yr Normal	235	75	3	0	1	30	199	512	815	817	645	468	3,801
Heating Degree Days Actual	288	7	0	0	0	13	270	600	792	755	637	558	3,920
Variance from Normal	53	(68)	(3)	(0)	(1)	(17)	71	88	(23)	(62)	(8)	90	119
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Total
Cooling Degree Days 30-yr Normal	30	141	342	445	400	200	42	1	0	0	0	5	1,606
Cooling Degree Days Actual	32	324	464	497	461	219	44	0	0	0	0	4	2,045
Variance from Normal	2	183	122	52	61	19	2	(1)	0	0	(0)	(1)	439
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18				Total
Precipitation 30-yr Normal	1.47	2.48	2.84	2.63	2.64	2.01	1.41	0.74	0.66	0.72	0.61	1.20	19.42
Precipitation Actual	0.45	0.46	2.01	1.65	2.39	1.40	4.09	0.32	0.80	0.04	0.22	1.86	15.69
Variance from Normal	(1.01)	(2.02)	(0.83)	(0.97)	(0.25)	(0.62)	2.68	(0.43)	0.14	(0.68)	(0.39)	0.66	(3.73)
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Total
Texas Residential Service **(1)**	113	29,142	28,117	12,883	14,935	4,066	231	1,807	(1,069)	(2,759)	(257)	1,145	88,354
Texas Residential Space Heat **(2)**	441	3,946	5,179	2,432	2,764	718	474	2,059	(844)	(2,259)	(254)	2,078	16,735
Texas Small General Service **(3)**	0	1,820	2,425	1,232	1,573	425	23	242	(141)	(342)	(35)	174	7,398
Texas Secondary General Service **(4) & (5)**	4,202	14,553	15,970	8,793	9,614	2,529	112	1,700	(619)	(599)	1,592	(4,876)	52,970
CRMWA Weather Adjustment **(6)**	171	342	731	477	361	214	0	0	0	0	0	0	2,297
Small Municipal and School Service **(7)**	54	200	84	46	63	37	3	0	0	0	0	(29)	458
Large Municipal and School Service **(8)**	491	2,185	878	498	600	408	27	0	0	0	0	(210)	4,878
Large School Service **(9)**	387	1,780	743	330	440	353	33	0	0	0	0	(220)	3,846
Texas Retail Weather Adjustment Total	5,859	53,968	54,128	26,691	30,351	8,749	903	5,809	(2,673)	(5,960)	1,046	(1,936)	176,937

Texas Residential Service												
Heating Degree Days Weather Adjustment (30-yr Normal)												
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	53	(68)	(3)	(0)	(1)	(17)	71	88	(23)	(62)	(8)	90
Heating Degree Days Weather Coefficients	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000009	0.0001177	0.0002596	0.0002550	0.0001843	0.0000724
Res Service Customers	172,062	172,864	173,261	173,820	174,270	174,425	174,868	175,010	175,309	175,859	176,033	176,297
Heating Degree Days Weather Adjustment (MWh)	0	0	0	0	0	0	11	1,807	-1,069	-2,759	-257	1,145
Cooling Degree Days Weather Adjustment (30-yr Normal)												
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	2	183	122	52	61	19	2	(1)	0	0	(0)	(1)
Cooling Degree Days Weather Coefficients	0.0002878	0.0009237	0.0013320	0.0014180	0.0013974	0.0012103	0.0005204	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Res Service Customers	172,062	172,864	173,261	173,820	174,270	174,425	174,868	175,010	175,309	175,859	176,033	176,297
Cooling Degree Days Weather Adjustment (MWh)	113	29,142	28,117	12,883	14,935	4,066	220	0	0	0	0	0
TX Residential Service Weather Adjustment (1)	113	29,142	28,117	12,883	14,935	4,066	231	1,807	(1,069)	(2,759)	(257)	1,145

Southwestern Public Service Company

Weather Normalization of Texas Retail Base Period Sales

Texas Weather Impacted Sales Calculation
Using Panhandle Weather (Normal Period 1988-2017)

Texas Residential Space Heat												
Heating Degree Days Weather Adjustment (30-yr Normal)												
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	53	(68)	(3)	(0)	(1)	(17)	71	88	(23)	(62)	(8)	90
Heating Degree Days Weather Coefficients	0.0002658	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0002064	0.0007956	0.0012248	0.0012590	0.0011035	0.0008028
Res Space Heat Customers	31,403	31,094	30,792	30,477	30,178	29,950	29,694	29,494	29,326	29,154	28,986	28,825
Heating Degree Days Weather Adjustment (MWh)	441	0	0	0	0	0	436	2,059	-844	-2,259	-254	2,078
Cooling Degree Days Weather Adjustment (30-yr Normal)												
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	2	183	122	52	61	19	2	(1)	0	0	(0)	(1)
Cooling Degree Days Weather Coefficients	0.0000000	0.0006954	0.0013806	0.0015266	0.0014936	0.0012440	0.0005225	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Res Space Heat Customers	31,403	31,094	30,792	30,477	30,178	29,950	29,694	29,494	29,326	29,154	28,986	28,825
Cooling Degree Days Weather Adjustment (MWh)	0	3,946	5,179	2,432	2,764	718	37	0	0	0	0	0
TX Residential Space Heat Weather Adjustment (2)	441	3,946	5,179	2,432	2,764	718	474	2,059	(844)	(2,259)	(254)	2,078

Texas Small General Service												
Heating Degree Days Weather Adjustment (30-yr Normal)												
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	53	(68)	(3)	(0)	(1)	(17)	71	88	(23)	(62)	(8)	90
Heating Degree Days Weather Coefficients	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000007	0.0000853	0.0001853	0.0001731	0.0001370	0.0000605
Small General Service Customers	32,788	32,454	32,452	32,473	32,435	32,401	32,373	32,320	32,302	32,154	32,114	32,112
Heating Degree Days Weather Adjustment (MWh)	0	0	0	0	0	0	2	242	-141	-342	-35	174
Cooling Degree Days Weather Adjustment (30-yr Normal)												
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	2	183	122	52	61	19	2	(1)	0	0	(0)	(1)
Cooling Degree Days Weather Coefficients	0.0000000	0.0003072	0.0006135	0.0007261	0.0007910	0.0006814	0.0002793	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Small General Service Customers	32,788	32,454	32,452	32,473	32,435	32,401	32,373	32,320	32,302	32,154	32,114	32,112
Cooling Degree Days Weather Adjustment (MWh)	0	1,820	2,425	1,232	1,573	425	22	0	0	0	0	0
TX Small General Service Weather Adjustment	0	1,820	2,425	1,232	1,573	425	23	242	(141)	(342)	(35)	174

Southwestern Public Service Company

Weather Normalization of Texas Retail Base Period Sales

Texas Weather Impacted Sales Calculation
Using Panhandle Weather (Normal Period 1988-2017)

Texas Small Secondary General Service

Heating Degree Days Weather Adjustment (30-yr Normal)

	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	53	(68)	(3)	(0)	(1)	(17)	71	88	(23)	(62)	(8)	90
Heating Degree Days Weather Coefficients	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000129	0.0016393	0.0022300	0.0008693	0.0000000	0.0000000
Small Secondary General Customers	11,721	11,767	11,775	11,787	11,792	11,798	11,806	11,798	11,802	11,991	12,036	12,042
Heating Degree Days Weather Adjustment (MWh)	0	0	0	0	0	0	11	1,697	-618	-641	0	0

Cooling Degree Days Weather Adjustment (30-yr Normal)

	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	2	183	122	52	61	19	2	(1)	0	0	(0)	(1)
Cooling Degree Days Weather Coefficients	0.0000000	0.0054668	0.0103144	0.0120690	0.0127906	0.0095656	0.0035380	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Small Secondary General Customers	11,721	11,767	11,775	11,787	11,792	11,798	11,806	11,798	11,802	11,991	12,036	12,042
Cooling Degree Days Weather Adjustment (MWh)	0	11,740	14,797	7,436	9,250	2,174	101	0	0	0	0	0

Precipitation Weather Adjustment (30-yr Normal)

	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	(1.01)	(2.02)	(0.83)	(0.97)	(0.25)	(0.62)	2.68	(0.43)	0.14	(0.68)	(0.39)	0.66
Precipitation Weather Coefficients	-0.3540272	-0.1172631	-0.1171836	-0.1170645	-0.1159365	-0.0484530	0.0000000	0.0000000	0.0000000	-0.0053092	-0.3417404	-0.6176768
Small Secondary General Customers	11,721	11,767	11,775	11,787	11,792	11,798	11,806	11,798	11,802	11,991	12,036	12,042
Precipitation Weather Adjustment (MWh)	4,202	2,791	1,147	1,344	347	352	0	0	0	43	1,592	(4,876)

TX Small Secondary General Service Weather Adjustment (4)	4,202	14,532	15,944	8,780	9,597	2,525	112	1,697	(618)	(598)	1,592	(4,876)

Texas Large Secondary General Service

Heating Degree Days Weather Adjustment (30-yr Normal)

	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	53	(68)	(3)	(0)	(1)	(17)	71	88	(23)	(62)	(8)	90
Heating Degree Days Weather Coefficients	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000129	0.0016393	0.0022300	0.0008693	0.0000000	0.0000000
Large Secondary General Customers	21	21	21	21	21	21	21	21	21	20	20	20
Heating Degree Days Weather Adjustment (MWh)	0	0	0	0	0	0	0	3	-1	-1	0	0

Cooling Degree Days Weather Adjustment (30-yr Normal)

	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	2	183	122	52	61	19	2	(1)	0	0	(0)	(1)
Cooling Degree Days Weather Coefficients	0.0000000	0.0054668	0.0103144	0.0120690	0.0127906	0.0095656	0.0035380	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Large Secondary General Customers	21	21	21	21	21	21	21	21	21	20	20	20
Cooling Degree Days Weather Adjustment (MWh)	0	21	26	13	16	4	0	0	0	0	0	0

TX Large Secondary General Service Weather Adjustment (5)	0	21	26	13	16	4	0	3	(1)	(1)	0	0

Southwestern Public Service Company

Weather Normalization of Texas Retail Base Period Sales

Texas Weather Impacted Sales Calculation
Using Panhandle Weather (Normal Period 1988-2017)

Canadian River Municipal Water Authority (CRMWA)												
Cooling Degree Days Weather Adjustment (30-yr Normal)												
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	2	183	122	52	61	19	2	(1)	0	0	(0)	(1)
Cooling Degree Days Weather Coefficients	0.0000000	0.0000000	4.8487055	5.9721436	5.1930011	5.7373734	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
CRMWA Customers	1	1	1	1	1	1	1	1	1	1	1	1
Cooling Degree Days Weather Adjustment (MWh)	0	0	591	312	318	111	0	0	0	0	0	0
Precipitation Weather Adjustment (30-yr Normal)												
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	(1.01)	(2.02)	(0.83)	(0.97)	(0.25)	(0.62)	2.68	(0.43)	0.14	(0.68)	(0.39)	0.66
Precipitation Weather Coefficients	-169.01166	-169.01166	-169.01166	-169.01166	-169.01166	-169.01166	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Small Secondary General Customers	1	1	1	1	1	1	1	1	1	1	1	1
Precipitation Weather Adjustment (MWh)	171	342	140	165	43	104	0	0	0	0	0	0
CRMWA Weather Adjustment (6)	171	342	731	477	361	214	0	0	0	0	0	0

Southwestern Public Service Company

Weather Normalization of Texas Retail Base Period Sales

Texas Weather Impacted Sales Calculation
Using Panhandle Weather (Normal Period 1988-2017)

Texas Municipal and School Service

Cooling Degree Days Weather Adjustment (30-yr Normal)

	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	2	183	122	52	61	19	2	(1)	0	0	(0)	(1)
Cooling Degree Days Weather Coefficients	0.0028380	0.0040238	0.0027053	0.0025537	0.0038972	0.0092803	0.0058638	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Municipal & School Customers	4,463	4,457	4,451	4,454	4,462	4,459	4,460	4,464	4,466	4,469	4,469	4,466
Cooling Degree Days Weather Adjustment (MWh)	29	3,273	1,467	595	1,066	797	63	0	0	0	0	0

Precipitation Weather Adjustment (30-yr normal)

	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Variance from Normal	(1.01)	(2.02)	(0.83)	(0.97)	(0.25)	(0.62)	2.68	(0.43)	0.14	(0.68)	(0.39)	0.66
Precipitation Weather Coefficients	(0.1997289)	(0.0989718)	(0.0644261)	(0.0644261)	(0.0319656)	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	(0.0004694)	(0.1564512)
Small Secondary General Customers	4,463	4,457	4,451	4,454	4,462	4,459	4,460	4,464	4,466	4,469	4,469	4,466
Precipitation Weather Adjustment (MWh)	903	892	238	279	36	0	0	0	0	0	1	(458)
Weather Adjustment	932	4,165	1,705	874	1,103	797	63	0	0	0	1	(458)

Texas - Municipal and School Weather Impact Allocation (Billed Sales in KWh)

	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
SMSTX	1,628	1,377	1,593	1,892	1,927	1,604	1,586	1,520	2,043	2,413	1,751	1,810
LMSTX	14,922	15,016	16,589	20,452	18,483	17,725	14,595	13,027	13,929	14,003	13,751	13,305
LSSTX	11,751	12,236	14,029	13,565	13,562	15,335	17,565	12,668	13,892	13,811	12,090	13,941
Total	28,301	28,629	32,211	35,909	33,971	34,664	33,746	27,215	29,864	30,228	27,592	29,056

	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
SMSTX	5.75%	4.81%	4.94%	5.27%	5.67%	4.63%	4.70%	5.58%	6.84%	7.98%	6.35%	6.23%
LMSTX	52.72%	52.45%	51.50%	56.95%	54.41%	51.13%	43.25%	47.87%	46.64%	46.33%	49.84%	45.79%
LSSTX	41.52%	42.74%	43.55%	37.78%	39.92%	44.24%	52.05%	46.55%	46.52%	45.69%	43.82%	47.98%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Municipal and School Allocation of Sales impacted by weather

	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
SMSTX **(7)**	54	200	84	46	63	37	3	0	0	0	0	(29)
LMSTX **(8)**	491	2,185	878	498	600	408	27	0	0	0	0	(210)
LSSTX **(9)**	387	1,780	743	330	440	353	33	0	0	0	0	(220)

Southwestern Public Service Company

Weather Normalization of Texas Retail Base Period Sales

Texas Residential Service Coefficients (Modeled with MWH)

			Model Coefficients		Monthly Weights Model to Calendar			Calendar Month	
Year	Month	Date	RES HDD	RES CDD	Current	1st Future	2nd Future	RES HDD	RES CDD
2018	4	Apr-18	0.000000	0.000000	42.86%	57.14%	0.00%	0.0000000	0.0002878
2018	5	May-18	0.000000	0.000504	44.24%	55.61%	0.15%	0.0000000	0.0009237
2018	6	Jun-18	0.000000	0.001257	44.76%	54.92%	0.32%	0.0000000	0.0013320
2018	7	Jul-18	0.000000	0.001393	45.47%	54.53%	0.00%	0.0000000	0.0014180
2018	8	Aug-18	0.000000	0.001439	49.62%	49.46%	0.92%	0.0000000	0.0013974
2018	9	Sep-18	0.000000	0.001361	41.43%	58.57%	0.00%	0.0000000	0.0012103
2018	10	Oct-18	0.000000	0.001104	47.16%	52.38%	0.46%	0.0000009	0.0005204
2018	11	Nov-18	0.000000	0.000000	41.11%	58.41%	0.48%	0.0001177	0.0000000
2018	12	Dec-18	0.000199	0.000000	41.94%	58.06%	0.00%	0.0002596	0.0000000
2018	1	Jan-19	0.000303	0.000000	48.39%	50.69%	0.92%	0.0002550	0.0000000
2019	2	Feb-19	0.000210	0.000000	40.48%	59.35%	0.17%	0.0001843	0.0000000
2019	3	Mar-19	0.000167	0.000000	43.32%	56.68%	0.00%	0.0000724	0.0000000
2019	4	Apr-19	0.000000	0.000000	44.13%	55.87%	0.00%	0.0000000	0.0002814
2019	5	May-19	0.000000	0.000504	45.62%	53.92%	0.46%	0.0000000	0.0009137
2019	6	Jun-19	0.000000	0.001257	41.75%	58.25%	0.00%	0.0000000	0.0013360
2019	7	Jul-19	0.000000	0.001393	46.70%	53.30%	0.00%	0.0000000	0.0014174
2019	8	Aug-19	0.000000	0.001439	46.39%	52.84%	0.77%	0.0000000	0.0013953
2019	9	Sep-19	0.000000	0.001361	42.70%	57.30%	0.00%	0.0000000	0.0012135
2019	10	Oct-19	0.000000	0.001104	48.39%	50.69%	0.92%	0.0000018	0.0005340
2019	11	Nov-19	0.000000	0.000000	36.35%	63.02%	0.63%		
2019	12	Dec-19	0.000199	0.000000	43.32%	56.68%	0.00%		

Southwestern Public Service Company

Weather Normalization of Texas Retail Base Period Sales

Texas Residential Space Heat Coefficients (Modeled with MWH)

		Model Coefficients		Monthly Weights Model to Calendar			Calendar Month	
Year	Month	RES HDD	RES CDD	Current	1st Future	2nd Future	RES HDD	RES CDD
2018	4	0.000620	0.000000	42.86%	57.14%	0.00%	0.0002658	0.0000000
2018	5	0.000000	0.000000	44.24%	55.61%	0.15%	0.0000000	0.0006954
2018	6	0.000000	0.001246	44.76%	54.92%	0.32%	0.0000000	0.0013806
2018	7	0.000000	0.001489	45.47%	54.53%	0.00%	0.0000000	0.0015266
2018	8	0.000000	0.001558	49.62%	49.46%	0.92%	0.0000000	0.0014936
2018	9	0.000000	0.001436	41.43%	58.57%	0.00%	0.0000000	0.0012440
2018	10	0.000000	0.001108	47.16%	52.38%	0.46%	0.0002064	0.0005225
2018	11	0.000385	0.000000	41.11%	58.41%	0.48%	0.0007956	0.0000000
2018	12	0.001080	0.000000	41.94%	58.06%	0.00%	0.0012248	0.0000000
2018	1	0.001329	0.000000	48.39%	50.69%	0.92%	0.0012590	0.0000000
2019	2	0.001196	0.000000	40.48%	59.35%	0.17%	0.0011035	0.0000000
2019	3	0.001042	0.000000	43.32%	56.68%	0.00%	0.0008028	0.0000000
2019	4	0.000620	0.000000	44.13%	55.87%	0.00%	0.0002737	0.0000000
2019	5	0.000000	0.000000	45.62%	53.92%	0.46%	0.0000000	0.0006789
2019	6	0.000000	0.001246	41.75%	58.25%	0.00%	0.0000000	0.0013877
2019	7	0.000000	0.001489	46.70%	53.30%	0.00%	0.0000000	0.0015257
2019	8	0.000000	0.001558	46.39%	52.84%	0.77%	0.0000000	0.0014902
2019	9	0.000000	0.001436	42.70%	57.30%	0.00%	0.0000000	0.0012482
2019	10	0.000000	0.001108	48.39%	50.69%	0.92%	0.0002049	0.0005362
2019	11	0.000385	0.000000	36.35%	63.02%	0.63%		
2019	12	0.001080	0.000000	43.32%	56.68%	0.00%		

Southwestern Public Service Company

Weather Normalization of Texas Retail Base Period Sales

Texas Small General Service Coefficients (Modeled with MWH)

		Model Coefficients			Monthly Weights Model to Calendar			Calendar Month		
Year	Month	RES HDD	RES CDD	Precip	Current	1st Future	2nd Future	RES HDD	RES_CDD	Precip
2018	4	0.000000	0.000000	0.000000	42.86%	57.14%	0.00%	0.0000000	0.0000000	0.0000000
2018	5	0.000000	0.000000	0.000000	44.24%	55.61%	0.15%	0.0000000	0.0003072	0.0000000
2018	6	0.000000	0.000551	0.000000	44.76%	54.92%	0.32%	0.0000000	0.0006135	0.0000000
2018	7	0.000000	0.000664	0.000000	45.47%	54.53%	0.00%	0.0000000	0.0007261	0.0000000
2018	8	0.000000	0.000778	0.000000	49.62%	49.46%	0.92%	0.0000000	0.0007910	0.0000000
2018	9	0.000000	0.000808	0.000000	41.43%	58.57%	0.00%	0.0000000	0.0006814	0.0000000
2018	10	0.000000	0.000592	0.000000	47.16%	52.38%	0.46%	0.0000007	0.0002793	0.0000000
2018	11	0.000000	0.000000	0.000000	41.11%	58.41%	0.48%	0.0000853	0.0000000	0.0000000
2018	12	0.000144	0.000000	0.000000	41.94%	58.06%	0.00%	0.0001853	0.0000000	0.0000000
2018	1	0.000215	0.000000	0.000000	48.39%	50.69%	0.92%	0.0001731	0.0000000	0.0000000
2019	2	0.000134	0.000000	0.000000	40.48%	59.35%	0.17%	0.0001370	0.0000000	0.0000000
2019	3	0.000140	0.000000	0.000000	43.32%	56.68%	0.00%	0.0000605	0.0000000	0.0000000
2019	4	0.000000	0.000000	0.000000	44.13%	55.87%	0.00%	0.0000000	0.0000000	0.0000000
2019	5	0.000000	0.000000	0.000000	45.62%	53.92%	0.46%	0.0000000	0.0003000	0.0000000
2019	6	0.000000	0.000551	0.000000	41.75%	58.25%	0.00%	0.0000000	0.0006165	0.0000000
2019	7	0.000000	0.000664	0.000000	46.70%	53.30%	0.00%	0.0000000	0.0007247	0.0000000
2019	8	0.000000	0.000778	0.000000	46.39%	52.84%	0.77%	0.0000000	0.0007923	0.0000000
2019	9	0.000000	0.000808	0.000000	42.70%	57.30%	0.00%	0.0000000	0.0006842	0.0000000
2019	10	0.000000	0.000592	0.000000	48.39%	50.69%	0.92%	0.0000013	0.0002866	0.0000000
2019	11	0.000000	0.000000	0.000000						
2019	12	0.000144	0.000000	0.000000						

Southwestern Public Service Company

Weather Normalization of Texas Retail Base Period Sales

Texas Secondary General Service Coefficients (Modeled with MWH)

		Model Coefficients			Monthly Weights Model to Calendar		
Year	Month	RES HDD	RES CDD	Precip	Current	1st Future	2nd Future
2018	4	0.000000	0.000000	-7856.573035	42.86%	57.14%	0.00%
2018	5	0.000000	0.000000	-1382.297376	44.24%	55.61%	0.15%
2018	6	0.000000	115.540523	-1382.297376	44.76%	54.92%	0.32%
2018	7	0.000000	126.464815	-1382.297376	45.47%	54.53%	0.00%
2018	8	0.000000	155.890345	-1382.297376	49.62%	49.46%	0.92%
2018	9	0.000000	147.446719	-1382.297376	41.43%	58.57%	0.00%
2018	10	0.000000	88.731548	0.000000	47.16%	52.38%	0.46%
2018	11	0.000000	0.000000	0.000000	41.11%	58.41%	0.48%
2018	12	32.993218	0.000000	0.000000	41.94%	58.06%	0.00%
2018	1	21.577759	0.000000	0.000000	48.39%	50.69%	0.92%
2019	2	0.000000	0.000000	0.000000	40.48%	59.35%	0.17%
2019	3	0.000000	0.000000	-6918.958217	43.32%	56.68%	0.00%
2019	4	0.000000	0.000000	-7856.573035	44.13%	55.87%	0.00%
2019	5	0.000000	0.000000	-1382.297376	45.62%	53.92%	0.46%
2019	6	0.000000	115.540523	-1382.297376	41.75%	58.25%	0.00%
2019	7	0.000000	126.464815	-1382.297376	46.70%	53.30%	0.00%
2019	8	0.000000	155.890345	-1382.297376	46.39%	52.84%	0.77%
2019	9	0.000000	147.446719	-1382.297376	42.70%	57.30%	0.00%
2019	10	0.000000	88.731548	0.000000	48.39%	50.69%	0.92%
2019	11	0.000000	0.000000	0.000000	36.35%	63.02%	0.63%
2019	12	32.993218	0.000000	0.000000	43.32%	56.68%	0.00%

Southwestern Public Service Company

Weather Normalization of Texas Retail Base Period Sales

Texas Secondary General Service Coefficients (Modeled with MWH)

Calendar Month						
RES HDD	RES CDD	Precip	Actual Cust	RES HDD	RES CDD	Precip
0.0000000	0.0000000	-4156.9869438	11,742	0.0000000	0.0000000	-0.3540272
0.0000000	64.4426026	-1382.2973757	11,788	0.0000000	0.0054668	-0.1172631
0.0000000	121.6683084	-1382.2973757	11,796	0.0000000	0.0103144	-0.1171836
0.0000000	142.5109949	-1382.2973757	11,808	0.0000000	0.0120690	-0.1170645
0.0000000	151.0949528	-1369.5573077	11,813	0.0000000	0.0127906	-0.1159365
0.0000000	113.0564046	-572.6660556	11,819	0.0000000	0.0095656	-0.0484530
0.1520425	41.8442169	0.0000000	11,827	0.0000129	0.0035380	0.0000000
19.3749800	0.0000000	0.0000000	11,819	0.0016393	0.0000000	0.0000000
26.3648869	0.0000000	0.0000000	11,823	0.0022300	0.0000000	0.0000000
10.4408511	0.0000000	-63.7692002	12,011	0.0008693	0.0000000	-0.0053092
0.0000000	0.0000000	-4120.0220929	12,056	0.0000000	0.0000000	-0.3417404
0.0000000	0.0000000	-7450.4173069	12,062	0.0000000	0.0000000	-0.6176768
0.0000000	0.0000000	-4239.1999680				
0.0000000	62.8788298	-1382.2973757				
0.0000000	121.9043568	-1382.2973757				
0.0000000	142.1493908	-1382.2973757				
0.0000000	150.9127701	-1371.6806524				
0.0000000	113.8019941	-590.2190382				
0.3040850	42.9346199	0.0000000				

Southwestern Public Service Company

Weather Normalization of Texas Retail Base Period Sales

Texas CRMWA Coefficients (Modeled with MWH)

		Model Coefficients (Calendar)			Monthly Weights Model to Calendar			Revenue Month		
Year	Month	RES HDD	RES CDD	Precip	Current	1st Future	2nd Future	RES HDD	RES CDD	Precip
2018	4	0.000000	0.000000	-169.011655	42.86%	57.14%	0.00%	0.0000000	0.0000000	-169.0116553
2018	5	0.000000	0.000000	-169.011655	44.24%	55.61%	0.15%	0.0000000	4.8487055	-169.0116553
2018	6	0.000000	4.848705	-169.011655	44.76%	54.92%	0.32%	0.0000000	5.9721436	-169.0116553
2018	7	0.000000	5.972144	-169.011655	45.47%	54.53%	0.00%	0.0000000	5.1930011	-169.0116553
2018	8	0.000000	5.193001	-169.011655	49.62%	49.46%	0.92%	0.0000000	5.7373734	-169.0116553
2018	9	0.000000	5.737373	-169.011655	41.43%	58.57%	0.00%	0.0000000	0.0000000	0.0000000
2018	10	0.000000	0.000000	0.000000	47.16%	52.38%	0.46%	0.0000000	0.0000000	0.0000000
2018	11	0.000000	0.000000	0.000000	41.11%	58.41%	0.48%	0.0000000	0.0000000	0.0000000
2018	12	0.000000	0.000000	0.000000	41.94%	58.06%	0.00%	0.0000000	0.0000000	0.0000000
2018	1	0.000000	0.000000	0.000000	48.39%	50.69%	0.92%	0.0000000	0.0000000	0.0000000
2019	2	0.000000	0.000000	0.000000	40.48%	59.35%	0.17%	0.0000000	0.0000000	0.0000000
2019	3	0.000000	0.000000	0.000000	43.32%	56.68%	0.00%	0.0000000	0.0000000	-169.0116553
2019	4	0.000000	0.000000	-169.011655	44.13%	55.87%	0.00%	0.0000000	0.0000000	-169.0116553
2019	5	0.000000	0.000000	-169.011655	45.62%	53.92%	0.46%	0.0000000	4.8487055	-169.0116553
2019	6	0.000000	4.848705	-169.011655	41.75%	58.25%	0.00%	0.0000000	5.9721436	-169.0116553
2019	7	0.000000	5.972144	-169.011655	46.70%	53.30%	0.00%	0.0000000	5.1930011	-169.0116553
2019	8	0.000000	5.193001	-169.011655	46.39%	52.84%	0.77%	0.0000000	5.7373734	-169.0116553
2019	9	0.000000	5.737373	-169.011655	42.70%	57.30%	0.00%	0.0000000	0.0000000	0.0000000
2019	10	0.000000	0.000000	0.000000	48.39%	50.69%	0.92%	0.0000000	0.0000000	0.0000000
2019	11	0.000000	0.000000	0.000000	36.35%	63.02%	0.63%			
2019	12	0.000000	0.000000	0.000000	43.32%	56.68%	0.00%			

Southwestern Public Service Company

Weather Normalization of Texas Retail Base Period Sales

Texas Municipals and Schools Coefficients (Modeled with MWH)

		Model Coefficients			Monthly Weights Model to Calendar			Calendar Month		
Year	Month	RES HDD	RES CDD	Precip	Current	1st Future	2nd Future	RES HDD	RES_CDD	Precip
2018	4	0.000000	0.000000	-0.276015	42.86%	57.14%	0.00%	0.0000000	0.0028380	-0.1997289
2018	5	0.000000	0.004966	-0.142514	44.24%	55.61%	0.15%	0.0000000	0.0040238	-0.0989718
2018	6	0.000000	0.003279	-0.064426	44.76%	54.92%	0.32%	0.0000000	0.0027053	-0.0644261
2018	7	0.000000	0.002237	-0.064426	45.47%	54.53%	0.00%	0.0000000	0.0025537	-0.0644261
2018	8	0.000000	0.002818	-0.064426	49.62%	49.46%	0.92%	0.0000000	0.0038972	-0.0319656
2018	9	0.000000	0.004821	0.000000	41.43%	58.57%	0.00%	0.0000000	0.0092803	0.0000000
2018	10	0.000000	0.012434	0.000000	47.16%	52.38%	0.46%	0.0000000	0.0058638	0.0000000
2018	11	0.000000	0.000000	0.000000	41.11%	58.41%	0.48%	0.0000000	0.0000000	0.0000000
2018	12	0.000000	0.000000	0.000000	41.94%	58.06%	0.00%	0.0000000	0.0000000	0.0000000
2018	1	0.000000	0.000000	0.000000	48.39%	50.69%	0.92%	0.0000000	0.0000000	0.0000000
2019	2	0.000000	0.000000	0.000000	40.48%	59.35%	0.17%	0.0000000	0.0000000	-0.0004694
2019	3	0.000000	0.000000	0.000000	43.32%	56.68%	0.00%	0.0000000	0.0000000	-0.1564512
2019	4	0.000000	0.000000	-0.276015	44.13%	55.87%	0.00%	0.0000000	0.0027749	-0.2014241
2019	5	0.000000	0.004966	-0.142514	45.62%	53.92%	0.46%	0.0000000	0.0040439	-0.1000514
2019	6	0.000000	0.003279	-0.064426	41.75%	58.25%	0.00%	0.0000000	0.0026720	-0.0644261
2019	7	0.000000	0.002237	-0.064426	46.70%	53.30%	0.00%	0.0000000	0.0025466	-0.0644261
2019	8	0.000000	0.002818	-0.064426	46.39%	52.84%	0.77%	0.0000000	0.0039501	-0.0298874
2019	9	0.000000	0.004821	0.000000	42.70%	57.30%	0.00%	0.0000000	0.0091837	0.0000000
2019	10	0.000000	0.012434	0.000000	48.39%	50.69%	0.92%	0.0000000	0.0060166	0.0000000
2019	11	0.000000	0.000000	0.000000	0.00%	0.00%	0.00%			
2019	12	0.000000	0.000000	0.000000	0.00%	0.00%	0.00%			

Southwestern Public Service Company

Weather Normalization or Firm Wholesale Base Period Sales

Roswell Weather Data
Normal Weather Based on a 30-year Historical Average

Month	Year	Weather Act Cal HDD65	Weather Act Cal CDD65	Weather Act Cal Precip	Weather Norm Cal HDD65	Weather Norm Cal CDD65	Weather Norm Cal Precip	Dev HDD65	Dev CDD65	Dev Precip
Apr	2018	111	57	0.03	135	50	0.58	-24	7	-0.55
May	2018	0	368	0.52	26	214	1.25	-26	154	-0.73
Jun	2018	0	554	1.40	0	453	1.23	0	101	0.17
Jul	2018	0	584	0.51	0	520	1.94	0	64	-1.43
Aug	2018	0	533	0.96	0	470	1.73	0	63	-0.77
Sep	2018	2	223	0.84	10	260	1.60	-8	-37	-0.76
Oct	2018	177	78	3.25	129	53	1.05	48	25	2.20
Nov	2018	522	0	0.01	443	2	0.42	80	-2	-0.41
Dec	2018	720	0	1.05	738	0	0.55	-18	0	0.50
Jan	2019	684	0	0.03	726	0	0.37	-42	0	-0.34
Feb	2019	474	0	0.00	513	1	0.38	-39	-1	-0.38
Mar	2019	400	13	0.42	341	5	0.48	59	8	-0.06
Annual - Update		**3,090**	**2,410**	**9.02**	**3,061**	**2,029**	**11.59**	**29**	**381**	**-2.57**
Annual Dev %								**0.9%**	**18.8%**	**-22.1%**

Southwestern Public Service Company

Weather Normalization or Firm Wholesale Base Period Sales

Lubbock Weather Data
Normal Weather Based on a 30-year Historical Average

Month	Year	Weather Act Cal HDD65	Weather Act Cal CDD65	Weather Act Cal Precip	Weather Norm Cal HDD65	Weather Norm Cal CDD65	Weather Norm Cal Precip	Dev HDD65	Dev CDD65	Dev Precip
Apr	2018	208	53	0.03	161	57	1.36	47	-4	-1.33
May	2018	0	412	1.26	42	211	2.59	-42	201	-1.33
Jun	2018	0	543	1.36	1	415	2.61	-1	128	-1.25
Jul	2018	0	558	0.88	0	500	1.93	0	58	-1.05
Aug	2018	0	517	1.25	0	455	1.80	0	62	-0.55
Sep	2018	11	251	3.26	18	238	2.44	-7	13	0.82
Oct	2018	232	58	4.65	145	64	1.37	87	-6	3.28
Nov	2018	536	0	0.07	439	3	0.80	97	-3	-0.73
Dec	2018	753	0	1.44	730	0	0.72	23	0	0.72
Jan	2019	690	0	0.00	736	0	0.65	-46	0	-0.65
Feb	2019	550	0	0.04	558	0	0.73	-8	0	-0.69
Mar	2019	494	12	1.13	380	11	1.02	114	1	0.11
Annual		**3,474**	**2,404**	**15.37**	**3,209**	**1,954**	**18.00**	**265**	**450**	**-2.63**
Annual Dev %								**8.2%**	**23.0%**	**-14.6%**

Southwestern Public Service Company

Weather Normalization or Firm Wholesale Base Period Sales

Amarillo Weather Data
Normal Weather Based on a 30-year Historical Average

Month	Year	Weather Act Cal HDD65	Weather Act Cal CDD65	Weather Act Cal Precip	Weather Norm Cal HDD65	Weather Norm Cal CDD65	Weather Norm Cal Precip	Dev HDD65	Dev CDD65	Dev Precip
Apr	2018	319	26	0.60	262	21	1.51	57	5	-0.91
May	2018	10	288	0.18	87	118	2.44	-77	170	-2.26
Jun	2018	0	432	2.23	4	317	2.92	-4	115	-0.69
Jul	2018	0	481	1.92	0	426	2.87	0	55	-0.95
Aug	2018	0	442	2.78	1	380	2.93	-1	62	-0.15
Sep	2018	16	210	0.76	35	187	1.87	-19	23	-1.11
Oct	2018	284	41	3.90	219	35	1.43	66	6	2.47
Nov	2018	624	0	0.40	538	1	0.72	86	-1	-0.32
Dec	2018	803	0	0.58	845	0	0.64	-42	0	-0.06
Jan	2019	782	0	0.06	845	0	0.75	-63	0	-0.69
Feb	2019	672	0	0.28	676	0	0.56	-4	0	-0.28
Mar	2019	587	2	2.11	499	4	1.27	88	-2	0.84
Annual		**4,097**	**1,922**	**15.80**	**4,010**	**1,488**	**19.90**	**87**	**434**	**-4.10**
Annual Dev %								**2.2%**	**29.1%**	**-20.6%**

Southwestern Public Service Company

Weather Normalization or Firm Wholesale Base Period Sales

SPS Wholesale Weather Impacted Sales

Sales (In MWh) Calendar Month	Central Valley	Farmers	Lea County	Roosevelt	WTMPA	Tri County	Total
Apr-18	50,548	15,957	65,161	8,974	192,704	27,340	360,683
May-18	51,971	16,513	79,702	8,790	263,682	31,252	451,912
Jun-18	52,728	19,624	74,911	9,419	294,246	34,230	485,157
Jul-18	54,028	24,186	86,009	10,977	302,680	36,113	513,992
Aug-18	52,941	21,527	87,704	9,645	302,002	34,651	508,469
Sep-18	50,166	16,302	65,681	6,565	238,828	30,050	407,591
Oct-18	49,673	11,704	66,895	5,383	206,730	29,103	369,488
Nov-18	50,002	10,344	65,743	6,504	210,352	29,551	372,496
Dec-18	51,381	14,437	38,329	7,803	234,508	31,220	377,678
Jan-19	49,629	13,837	72,824	7,265	227,798	31,484	402,837
Feb-19	46,530	11,171	64,453	7,929	201,235	28,420	359,739
Mar-19	50,805	16,749	69,026	8,703	209,875	28,778	383,936
Total	**610,402**	**192,350**	**836,436**	**97,959**	**2,884,638**	**372,192**	**4,993,976**

Southwestern Public Service Company

Weather Normalization or Firm Wholesale Base Period Sales

SPS Wholesale Weather Impacted Sales

Sales (In MWh) Calendar Month	Central Valley	Farmers	Lea County	Roosevelt	WTMPA	Tri County	Total
Jul-16	50,548	15,957	65,161	8,974	192,704	27,340	360,683
Aug-16	49,116	12,106	70,224	6,625	232,130	29,559	399,760
Sep-16	51,048	17,601	70,708	8,469	271,406	32,642	451,873
Oct-16	52,603	22,247	82,346	9,652	291,077	35,099	493,025
Nov-16	51,608	19,732	83,541	8,574	288,745	33,469	485,669
Dec-16	50,406	16,978	66,822	6,897	236,305	29,764	407,173
Jan-17	49,673	11,011	66,895	5,383	207,730	29,103	369,795
Feb-17	50,002	10,344	65,743	6,504	208,751	29,551	370,895
Mar-17	51,381	14,437	38,329	7,803	233,353	31,384	376,687
Apr-17	49,629	13,837	72,824	7,265	230,066	31,686	405,308
May-17	46,530	11,171	64,453	7,929	201,379	28,420	359,882
Jun-17	50,805	16,749	69,026	8,703	207,553	28,778	381,615
Total	**603,351**	**182,169**	**816,071**	**92,780**	**2,801,198**	**366,795**	**4,862,364**

Southwestern Public Service Company

Weather Normalization or Firm Wholesale Base Period Sales

SPS Wholesale Weather Impacted Sales

Sales (In MWh) Calendar Month	Weather Impacted Sales						
	Central Valley	Farmers	Lea County	Roosevelt	WTMPA	Tri County	Total
Jul-16	0	0	0	0	0	0	0
Aug-16	2,855	4,408	9,478	2,165	31,552	1,694	52,152
Sep-16	1,680	2,023	4,203	950	22,840	1,588	33,284
Oct-16	1,424	1,939	3,663	1,325	11,603	1,013	20,967
Nov-16	1,332	1,795	4,163	1,071	13,257	1,181	22,800
Dec-16	-240	-677	-1,141	-332	2,522	286	418
Jan-17	0	693	0	0	-1,000	0	-307
Feb-17	0	0	0	0	1,601	0	1,601
Mar-17	0	0	0	0	1,155	-164	991
Apr-17	0	0	0	0	-2,268	-203	-2,471
May-17	0	0	0	0	-143	0	-143
Jun-17	0	0	0	0	2,321	0	2,321
Total	**7,051**	**10,181**	**20,365**	**5,179**	**83,439**	**5,397**	**131,613**
							2.7%

Southwestern Public Service Company

Weather Normalization or Firm Wholesale Base Period Sales

New Mexico Wholesale Weather Impacted Sales Calculation
Using Roswell Weather (Normal Period 1988-2017)

New Mexico Wholesale Weather Adjustment Summary													
	Apr2018	May2018	Jun2018	Jul2018	Aug2018	Sep2018	Oct2018	Nov2018	Dec2018	Jan2019	Feb2019	Mar2019	Total
Heating Degree Days 30-yr Normal	135	26	0	0	0	10	129	443	738	726	513	341	3,061
Heating Degree Days Actual	111	0	0	0	0	2	177	522	720	684	474	400	3,090
Variance from Normal	(24)	(26)	(0)	(0)	(0)	(8)	48	80	(18)	(42)	(39)	59	29
	Apr2018	May2018	Jun2018	Jul2018	Aug2018	Sep2018	Oct2018	Nov2018	Dec2018	Jan2019	Feb2019	Mar2019	Total
Cooling Degree Days 30-yr Normal	50	214	453	520	470	260	53	2	0	0	1	5	2,029
Cooling Degree Days Actual	57	368	554	584	533	223	78	0	0	0	0	13	2,410
Variance from Normal	7	154	101	64	63	(37)	25	(2)	(0)	0	(1)	8	381
	Apr2018	May2018	Jun2018	Jul2018	Aug2018	Sep2018	Oct2018	Nov2018	Dec2018	Jan2019	Feb2019	Mar2019	Total
Precipitation 30-yr Normal	0.58	1.25	1.23	1.94	1.73	1.60	1.05	0.42	0.55	0.37	0.38	0.48	11.59
Precipitation Actual	0.03	0.52	1.40	0.51	0.96	0.84	3.25	0.01	1.05	0.03	0.00	0.42	9.02
Variance from Normal	(0.55)	(0.73)	0.17	(1.43)	(0.77)	(0.76)	2.20	(0.41)	0.50	(0.34)	(0.38)	(0.06)	(2.57)
	Apr2018	May2018	Jun2018	Jul2018	Aug2018	Sep2018	Oct2018	Nov2018	Dec2018	Jan2019	Feb2019	Mar2019	Total
Central Valley **(1)**	0	2,855	1,680	1,424	1,332	(240)	0	0	0	0	0	0	7,051
Farmers **(2)**	0	4,408	2,023	1,939	1,795	(677)	693	0	0	0	0	0	10,181
Lea County **(3)**	0	9,478	4,203	3,663	4,163	(1,141)	0	0	0	0	0	0	20,365
Roosevelt **(4)**	0	2,165	950	1,325	1,071	(332)	0	0	0	0	0	0	5,179
New Mexico Wholesale Weather Adjustment Total	0	18,906	8,856	8,351	8,361	(2,390)	693	0	0	0	0	0	42,777

Central Valley												
Cooling Degree Days Weather Adjustment (30-yr Normal)												
	Apr2018	May2018	Jun2018	Jul2018	Aug2018	Sep2018	Oct2018	Nov2018	Dec2018	Jan2019	Feb2019	Mar2019
Variance from Normal	7	154	101	64	63	(37)	25	(2)	(0)	0	(1)	8
Cooling Degree Days Weather Coefficients	0.000	18.487	16.700	22.361	21.306	6.471	0.000	0.000	0.000	0.000	0.000	0.000
Cooling Degree Days Weather Adjustment (MWh)	0	2,855	1,680	1,424	1,332	(240)	0	0	0	0	0	0
Central Valley Weather Adjustment (1)	0	2,855	1,680	1,424	1,332	(240)	0	0	0	0	0	0

Southwestern Public Service Company

Weather Normalization or Firm Wholesale Base Period Sales

New Mexico Wholesale Weather Impacted Sales Calculation
Using Roswell Weather (Normal Period 1988-2017)

Farmers

Cooling Degree Days Weather Adjustment (30-yr Normal)

	Apr2018	May2018	Jun2018	Jul2018	Aug2018	Sep2018	Oct2018	Nov2018	Dec2018	Jan2019	Feb2019	Mar2019
Variance from Normal	7	154	101	64	63	(37)	25	(2)	(0)	0	(1)	8
Cooling Degree Days Weather Coefficients	0.000	28.540	20.113	30.433	28.703	18.210	27.923	0.000	0.000	0.000	0.000	0.000
Cooling Degree Days Weather Adjustment (MWh)	0	4,408	2,023	1,939	1,795	(677)	693	0	0	0	0	0
Farmers Weather Adjustment (2)	0	4,408	2,023	1,939	1,795	(677)	693	0	0	0	0	0

Lea County

Cooling Degree Days Weather Adjustment (30-yr Normal)

	Apr2018	May2018	Jun2018	Jul2018	Aug2018	Sep2018	Oct2018	Nov2018	Dec2018	Jan2019	Feb2019	Mar2019
Variance from Normal	7	154	101	64	63	(37)	25	(2)	(0)	0	(1)	8
Cooling Degree Days Weather Coefficients	0.000	61.373	41.777	57.500	66.569	30.700	0.000	0.000	0.000	0.000	0.000	0.000
Cooling Degree Days Weather Adjustment (MWh)	0	9,478	4,203	3,663	4,163	(1,141)	0	0	0	0	0	0
Lea County Weather Adjustment (3)	0	9,478	4,203	3,663	4,163	(1,141)	0	0	0	0	0	0

Roosevelt

Cooling Degree Days Weather Adjustment (30-yr Normal)

	Apr2018	May2018	Jun2018	Jul2018	Aug2018	Sep2018	Oct2018	Nov2018	Dec2018	Jan2019	Feb2019	Mar2019
Variance from Normal	7	154	101	64	63	(37)	25	(2)	(0)	0	(1)	8
Cooling Degree Days Weather Coefficients	0.000	12.837	9.874	15.172	14.043	8.930	0.000	0.000	0.000	0.000	0.000	0.000
Cooling Degree Days Weather Adjustment (MWh)	0	1,982	993	966	878	-332	0	0	0	0	0	0

Precipitation Weather Adjustment (30-yr Normal)

	Apr2018	May2018	Jun2018	Jul2018	Aug2018	Sep2018	Oct2018	Nov2018	Dec2018	Jan2019	Feb2019	Mar2019
Variance from Normal	-0.55	-0.73	0.17	-1.43	-0.77	-0.76	2.20	-0.41	0.50	-0.34	-0.38	-0.06
Precipitation Weather Coefficients	0	-251	-251	-251	-251	0	0	0	0	0	0	0
Precipitation Weather Adjustment (MWh)	0	182	-44	359	193	0	0	0	0	0	0	0
Roosevelt Weather Adjustment (4)	0	2,165	950	1,325	1,071	(332)	0	0	0	0	0	0

Southwestern Public Service Company

Weather Normalization or Firm Wholesale Base Period Sales

Texas Wholesale Weather Impacted Sales Calculation
Using Lubbock and Amarillo Weather (Normal Period 1988-2017)

WTMPA Wholesale Weather Adjustment Summary													
Lubbock Weather	Apr2018	May2018	Jun2018	Jul2018	Aug2018	Sep2018	Oct2018	Nov2018	Dec2018	Jan2019	Feb2019	Mar2019	Total
Heating Degree Days 30-yr Normal	161	42	1	0	0	18	145	439	730	736	558	380	3,209
Heating Degree Days Actual	208	0	0	0	0	11	232	536	753	690	550	494	3,474
Variance from Normal	47	(42)	(1)	(0)	(0)	(7)	87	97	23	(46)	(8)	114	265
	Apr2018	May2018	Jun2018	Jul2018	Aug2018	Sep2018	Oct2018	Nov2018	Dec2018	Jan2019	Feb2019	Mar2019	Total
Cooling Degree Days 30-yr Normal	57	211	415	500	455	238	64	3	0	0	0	11	1,954
Cooling Degree Days Actual	53	412	543	558	517	251	58	0	0	0	0	12	2,404
Variance from Normal	(4)	201	128	58	62	13	(6)	(3)	0	0	(0)	1	450
	Apr2018	May2018	Jun2018	Jul2018	Aug2018	Sep2018	Oct2018	Nov2018	Dec2018	Jan2019	Feb2019	Mar2019	Total
Precipitation 30-yr Normal	1.36	2.59	2.61	1.93	1.80	2.44	1.37	0.80	0.72	0.65	0.73	1.02	18.00
Precipitation Actual	0.03	1.26	1.36	0.88	1.25	3.26	4.65	0.07	1.44	0.00	0.04	1.13	15.37
Variance from Normal	(1.33)	(1.33)	(1.25)	(1.05)	(0.55)	0.82	3.28	(0.73)	0.72	(0.65)	(0.69)	0.11	(2.63)
	Apr2018	May2018	Jun2018	Jul2018	Aug2018	Sep2018	Oct2018	Nov2018	Dec2018	Jan2019	Feb2019	Mar2019	Total
WTMPA **(1)**	0	31,552	22,840	11,603	13,257	2,522	(1,000)	1,601	1,155	(2,268)	(143)	2,321	83,439
WTMPA Wholesale Weather Adjustment Total	0	31,552	22,840	11,603	13,257	2,522	(1,000)	1,601	1,155	(2,268)	(143)	2,321	83,439

WTMPA												
Cooling Degree Days Weather Adjustment (30-yr Normal)												
	Apr2018	May2018	Jun2018	Jul2018	Aug2018	Sep2018	Oct2018	Nov2018	Dec2018	Jan2019	Feb2019	Mar2019
Variance from Normal	(4)	201	128	58	62	13	(6)	(3)	0	0	(0)	1
Cooling Degree Days Weather Coefficients	0.000	156.937	178.504	200.163	212.963	195.780	181.826	0.000	0.000	0.000	0.000	0.000
Cooling Degree Days Weather Adjustment (MWh)	0	31,552	22,840	11,603	13,257	2,522	(1,000)	0	0	0	0	0
Heating Degree Days Weather Adjustment (30-yr Normal)												
Variance from Normal	47	(42)	(1)	(0)	(0)	(7)	87	97	23	(46)	(8)	114
Heating Degree Days Weather Coefficients	0.000	0.000	0.000	0.000	0.000	0.000	0.000	16.437	49.992	49.561	18.876	20.366
Heating Degree Days Weather Adjustment (MWh)	0	0	0	0	0	0	0	1,601	1,155	(2,268)	(143)	2,321
WTMPA Weather Adjustment (1)	0	31,552	22,840	11,603	13,257	2,522	(1,000)	1,601	1,155	(2,268)	(143)	2,321

Southwestern Public Service Company

Weather Normalization or Firm Wholesale Base Period Sales

Texas Wholesale Weather Impacted Sales Calculation
Using Lubbock and Amarillo Weather (Normal Period 1988-2017)

Tri County Wholesale Weather Adjustment Summary													Update
Amarillo Weather	Apr2018	May2018	Jun2018	Jul2018	Aug2018	Sep2018	Oct2018	Nov2018	Dec2018	Jan2019	Feb2019	Mar2019	Total
Heating Degree Days 30-yr Normal	262	87	4	0	1	35	219	538	845	845	676	499	4,010
Heating Degree Days Actual	319	10	0	0	0	16	284	624	803	782	672	587	4,097
Variance from Normal	57	(77)	(4)	(0)	(1)	(19)	66	86	(42)	(63)	(4)	88	87
	Apr2018	May2018	Jun2018	Jul2018	Aug2018	Sep2018	Oct2018	Nov2018	Dec2018	Jan2019	Feb2019	Mar2019	Total
Cooling Degree Days 30-yr Normal	21	118	317	426	380	187	35	1	0	0	0	4	1,488
Cooling Degree Days Actual	26	288	432	481	442	210	41	0	0	0	0	2	1,922
Variance from Normal	5	170	115	55	62	23	6	(1)	0	0	(0)	(2)	434
	Apr2018	May2018	Jun2018	Jul2018	Aug2018	Sep2018	Oct2018	Nov2018	Dec2018	Jan2019	Feb2019	Mar2019	Total
Precipitation 30-yr Normal	1.51	2.44	2.92	2.87	2.93	1.87	1.43	0.72	0.64	0.75	0.56	1.27	19.90
Precipitation Actual	0.60	0.18	2.23	1.92	2.78	0.76	3.90	0.40	0.58	0.06	0.28	2.11	15.80
Variance from Normal	(0.91)	(2.26)	(0.69)	(0.95)	(0.15)	(1.11)	2.47	(0.32)	(0.06)	(0.69)	(0.28)	0.84	(4.10)
	Apr2018	May2018	Jun2018	Jul2018	Aug2018	Sep2018	Oct2018	Nov2018	Dec2018	Jan2019	Feb2019	Mar2019	Total
Tri County **(2)**	0	1,694	1,588	1,013	1,181	286	0	0	(164)	(203)	0	0	5,397
Tri County Wholesale Weather Adjustment Tota	0	1,694	1,588	1,013	1,181	286	0	0	(164)	(203)	0	0	5,397

TRI County												
Cooling Degree Days Weather Adjustment (30-yr Normal)												
	Apr2018	May2018	Jun2018	Jul2018	Aug2018	Sep2018	Oct2018	Nov2018	Dec2018	Jan2019	Feb2019	Mar2019
Variance from Normal	5	170	115	55	62	23	6	(1)	0	0	(0)	(2)
Cooling Degree Days Weather Coefficients	0.000	9.982	13.773	18.270	19.124	12.254	0.000	0.000	0.000	0.000	0.000	0.000
Cooling Degree Days Weather Adjustment (MWh)	0	1,694	1,588	1,013	1,181	286	0	0	0	0	0	0
Heating Degree Days Weather Adjustment (30-yr Normal)												
Variance from Normal	57	(77)	(4)	(0)	(1)	(19)	66	86	(42)	(63)	(4)	88
Heating Degree Days Weather Coefficients	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.894	3.243	0.000	0.000
Heating Degree Days Weather Adjustment (MWh)	0	0	0	0	0	0	0	0	(164)	(203)	0	0
TRI County Weather Adjustment (2)	0	1,694	1,588	1,013	1,181	286	0	0	(164)	(203)	0	0

Southwestern Public Service Company

Weather Normalization or Firm Wholesale Base Period Sales

Central Valley Coefficients (Modeled with MWH)

		Model Coefficients		
Year	Month	HDD	CDD	Precip
2018	Apr	0.0000	0.0000	0.0000
2018	May	0.0000	18.4871	0.0000
2018	Jun	0.0000	16.6999	0.0000
2018	Jul	0.0000	22.3606	0.0000
2018	Aug	0.0000	21.3061	0.0000
2018	Sep	0.0000	6.4705	0.0000
2018	Oct	0.0000	0.0000	0.0000
2018	Nov	0.0000	0.0000	0.0000
2018	Dec	0.0000	0.0000	0.0000
2019	Jan	0.0000	0.0000	0.0000
2019	Feb	0.0000	0.0000	0.0000
2019	Mar	0.0000	0.0000	0.0000
2019	Apr	0.0000	0.0000	0.0000
2019	May	0.0000	18.4871	0.0000
2019	Jun	0.0000	16.6999	0.0000
2019	Jul	0.0000	22.3606	0.0000
2019	Aug	0.0000	21.3061	0.0000
2019	Sep	0.0000	6.4705	0.0000

Farmers Coefficients (Modeled with MWH)

		Model Coefficients		
Year	Month	HDD	CDD	Precip
2018	Apr	0.0000	0.0000	0.0000
2018	May	0.0000	28.5405	0.0000
2018	Jun	0.0000	20.1129	0.0000
2018	Jul	0.0000	30.4335	0.0000
2018	Aug	0.0000	28.7032	0.0000
2018	Sep	0.0000	18.2100	0.0000
2018	Oct	0.0000	27.9229	0.0000
2018	Nov	0.0000	0.0000	0.0000
2018	Dec	0.0000	0.0000	0.0000
2019	Jan	0.0000	0.0000	0.0000
2019	Feb	0.0000	0.0000	0.0000
2019	Mar	0.0000	0.0000	0.0000
2019	Apr	0.0000	0.0000	0.0000
2019	May	0.0000	28.5405	0.0000
2019	Jun	0.0000	20.1129	0.0000
2019	Jul	0.0000	30.4335	0.0000
2019	Aug	0.0000	28.7032	0.0000
2019	Sep	0.0000	18.2100	0.0000

Southwestern Public Service Company

Weather Normalization or Firm Wholesale Base Period Sales

Lea County Coefficients (Modeled with MWH)

		Model Coefficients		
Year	Month	HDD	CDD	Precip
2018	Apr	0.0000	0.0000	0.0000
2018	May	0.0000	61.3727	0.0000
2018	Jun	0.0000	41.7768	0.0000
2018	Jul	0.0000	57.5004	0.0000
2018	Aug	0.0000	66.5690	0.0000
2018	Sep	0.0000	30.7005	0.0000
2018	Oct	0.0000	0.0000	0.0000
2018	Nov	0.0000	0.0000	0.0000
2018	Dec	0.0000	0.0000	0.0000
2019	Jan	0.0000	0.0000	0.0000
2019	Feb	0.0000	0.0000	0.0000
2019	Mar	0.0000	0.0000	0.0000
2019	Apr	0.0000	0.0000	0.0000
2019	May	0.0000	61.3727	0.0000
2019	Jun	0.0000	41.7768	0.0000
2019	Jul	0.0000	57.5004	0.0000
2019	Aug	0.0000	66.5690	0.0000
2019	Sep	0.0000	30.7005	0.0000

Roosevelt Coefficients (Modeled with MWH)

		Model Coefficients		
Year	Month	HDD	CDD	Precip
2018	Apr	0.0000	0.0000	0.0000
2018	May	0.0000	12.8370	-251.0146
2018	Jun	0.0000	9.8744	-251.0146
2018	Jul	0.0000	15.1722	-251.0146
2018	Aug	0.0000	14.0427	-251.0146
2018	Sep	0.0000	8.9305	0.0000
2018	Oct	0.0000	0.0000	0.0000
2018	Nov	0.0000	0.0000	0.0000
2018	Dec	0.0000	0.0000	0.0000
2019	Jan	0.0000	0.0000	0.0000
2019	Feb	0.0000	0.0000	0.0000
2019	Mar	0.0000	0.0000	0.0000
2019	Apr	0.0000	0.0000	0.0000
2019	May	0.0000	12.8370	-251.0146
2019	Jun	0.0000	9.8744	-251.0146
2019	Jul	0.0000	15.1722	-251.0146
2019	Aug	0.0000	14.0427	-251.0146
2019	Sep	0.0000	8.9305	0.0000

Southwestern Public Service Company

Weather Normalization or Firm Wholesale Base Period Sales

Tri County Coefficients (Modeled with MWH)

		Model Coefficients		
Year	Month	HDD	CDD	Precip
2018	Apr	0.0000	0.0000	0.0000
2018	May	0.0000	9.9816	0.0000
2018	Jun	0.0000	13.7731	0.0000
2018	Jul	0.0000	18.2696	0.0000
2018	Aug	0.0000	19.1243	0.0000
2018	Sep	0.0000	12.2538	0.0000
2018	Oct	0.0000	0.0000	0.0000
2018	Nov	0.0000	0.0000	0.0000
2018	Dec	3.8942	0.0000	0.0000
2019	Jan	3.2432	0.0000	0.0000
2019	Feb	0.0000	0.0000	0.0000
2019	Mar	0.0000	0.0000	0.0000
2019	Apr	0.0000	0.0000	0.0000
2019	May	0.0000	9.9816	0.0000
2019	Jun	0.0000	13.7731	0.0000
2019	Jul	0.0000	18.2696	0.0000
2019	Aug	0.0000	19.1243	0.0000
2019	Sep	0.0000	12.2538	0.0000

WTMPA Coefficients (Modeled with MWH)

		Model Coefficients		
Year	Month	HDD	CDD	Precip
2018	Apr	0.0000	0.0000	0.0000
2018	May	0.0000	156.9373	0.0000
2018	Jun	0.0000	178.5036	0.0000
2018	Jul	0.0000	200.1635	0.0000
2018	Aug	0.0000	212.9634	0.0000
2018	Sep	0.0000	195.7798	0.0000
2018	Oct	0.0000	181.8257	0.0000
2018	Nov	16.4368	0.0000	0.0000
2018	Dec	49.9924	0.0000	0.0000
2019	Jan	49.5610	0.0000	0.0000
2019	Feb	18.8761	0.0000	0.0000
2019	Mar	20.3658	0.0000	0.0000
2019	Apr	0.0000	0.0000	0.0000
2019	May	0.0000	156.9373	0.0000
2019	Jun	0.0000	178.5036	0.0000
2019	Jul	0.0000	200.1635	0.0000
2019	Aug	0.0000	212.9634	0.0000
2019	Sep	0.0000	195.7798	0.0000

Southwestern Public Service Company

Weather Normalization of SPS Base Period Peak Demand

Base Period Peak Day Weather Variance from the 30-yr Average by Concept (Retail and Full Requirement Wholesale)

	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Summer 4-mth Avg
Norm Avg Peak Day Temperature	69.4	77.4	83.1	84.1	83.3	78.8	70.6	35.7	26.8	26.6	27.6	44.0	82.3
Act Avg Peak Day Temperature	72.5	80.2	87.6	90.0	84.5	76.1	80.0	26.1	26.5	20.1	24.8	19.6	84.5
Variance	3.1	2.8	4.6	5.9	1.2	-2.8	9.4	-9.6	-0.3	-6.4	-2.7	-24.4	2.2
% Variance	4.5%	3.6%	5.5%	7.0%	1.4%	-3.5%	13.3%	-26.8%	-1.1%	-24.2%	-9.9%	-55.4%	2.7%
Norm Peak Day Heating Degree Days	0.7	0.0	0.0	0.0	0.0	0.0	0.1	29.4	38.2	38.4	37.4	21.3	0.0
Act Peak Day Heating Degree Days	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.9	38.5	44.9	40.2	45.4	0.0
Variance	-0.7	0.0	0.0	0.0	0.0	0.0	-0.1	9.5	0.3	6.4	2.7	24.1	0.0
% Variance	-100.0%						-100.0%	32.2%	0.8%	16.7%	7.3%	113.1%	0.0%
Norm Precipitation for the week prior to the Peak Day	0.08	0.35	0.30	0.24	0.53	0.21	0.10	0.14	0.11	0.13	0.15	0.16	0.3
Act Precipitation for the week prior to the Peak Day	0.00	0.01	0.07	0.60	0.39	0.19	0.19	0.15	0.35	0.46	0.00	0.00	0.3
Variance	-0.08	-0.34	-0.23	0.36	-0.13	-0.02	0.09	0.01	0.24	0.33	-0.15	-0.15	0.0
% Variance	-100.0%	-96.8%	-75.8%	148.4%	-25.3%	-7.5%	86.8%	8.0%	223.0%	261.3%	-100.0%	-98.8%	-1.4%

Southwestern Public Service Company

Weather Normalization of SPS Base Period Peak Demand

Base Period Peak Demand Weather Adjustment Summary by Customer Class

Summary Table of Retail Peak Weather Normal Adjustment

	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	4-mth Avg *
WN Peak	2,631	3,287	3,380	3,572	3,440	3,085	2,958	2,760	2,905	2,840	2,849	2,811	3,369
Weather Adj	22	69	81	44	22	-24	34	71	3	52	20	135	31
Actual Peak	2,653	3,357	3,461	3,616	3,462	3,061	2,992	2,831	2,908	2,892	2,869	2,946	3,400
Percent Chg	-0.8%	-2.1%	-2.3%	-1.2%	-0.6%	0.8%	-1.1%	-2.5%	-0.1%	-1.8%	-0.7%	-4.6%	0.9%

Summary Table of Full Requirement Wholesale Peak Weather Normal Adjustment with Precipitation

	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	4-mth Avg *
WN Peak	733	968	959	1,017	919	900	855	728	742	708	763	740	949
Weather Adj	7	20	27	16	10	-11	16	13	1	14	6	41	11
Actual Peak	741	987	986	1,032	929	889	871	740	742	722	769	781	959
Percent Chg	-1.0%	-2.0%	-2.7%	-1.5%	-1.1%	1.2%	-1.8%	-1.7%	-0.1%	-1.9%	-0.7%	-5.3%	1.1%

Summary Table of Golden Spread Full Load Peak Weather Normal Adjustment

	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	4-mth Avg *
WN Peak	751	1,018	1,037	1,279	1,224	897	543	507	519	472	492	530	1,109
Weather Adj	20	53	61	20	26	12	7	0	0	0	0	-50	30
Actual Peak	772	1,070	1,098	1,299	1,250	909	550	507	519	472	492	480	1,139
Percent Chg	-2.7%	-4.9%	-5.5%	-1.5%	-2.1%	-1.3%	-1.2%	0.0%	0.0%	0.0%	0.0%	10.5%	2.6%

** the four month average is of June 2018, July 2018, August 2018, and September 2018*

Southwestern Public Service Company

Weather Normalization of SPS Base Period Peak Demand

Base Period Retail Peak Demand Weather Adjustment Detail
Actual Historical Retail Peak Demand (MW)

	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Base Period	2,653	3,357	3,461	3,616	3,462	3,061	2,992	2,831	2,908	2,892	2,869	2,946

Average Temperature Weather Adjustment (30-yr Normal)												
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Average Temperature Normal	69.4	77.4	83.1	84.1	83.3	78.8	70.6	35.7	26.8	26.6	27.6	44.0
Average Temperature Actual	72.5	80.2	87.6	90.0	84.5	76.1	80.0	26.1	26.5	20.1	24.8	19.6
Variance from Normal	3.1	2.8	4.6	5.9	1.2	-2.8	9.4	-9.6	-0.3	-6.4	-2.7	-24.4
Average Temperature Weather Coefficients	3.5108	8.0190	10.7661	11.2468	11.4873	8.9039	3.6472	0.0000	0.0000	0.0000	0.0000	0.0000
Average Temperature Weather Adjustment (MW)	11.025	22.492	49.367	66.481	13.738	(24.892)	34.314	-	-	-	-	-

Heating Degree Days Weather Adjustment (30-yr Normal)												
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Heating Degree Days Normal	0.7	0.0	0.0	0.0	0.0	0.0	0.1	29.4	38.2	38.4	37.4	21.3
Heating Degree Days Actual	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.9	38.5	44.9	40.2	45.4
Variance from Normal	-0.7	0.0	0.0	0.0	0.0	0.0	-0.1	9.5	0.3	6.4	2.7	24.1
Heating Degree Days Weather Coefficients	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	7.4797	8.8523	8.0867	7.3008	5.5993
Heating Degree Days Weather Adjustment (MW)	-	-	-	-	-	-	-	71	3	52	20	135

Precipitation 1 week before Peak Day Weather Adjustment (30-yr Normal)												
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Precipitation Normal	0.08	0.35	0.30	0.24	0.53	0.21	0.10	0.14	0.11	0.13	0.15	0.16
Precipitation Actual	0.00	0.01	0.07	0.60	0.39	0.19	0.19	0.15	0.35	0.46	0.00	0.00
Variance from Normal	-0.08	-0.34	-0.23	0.36	-0.13	-0.02	0.09	0.01	0.24	0.33	-0.15	-0.15
Precipitation Weather Coefficients	-136.57361	-136.57361	-136.57361	-62.254546	-62.254546	-62.2545465	0	0	0	0	0	0
Precipitation Weather Adjustment (MW)	11	47	31	(22)	8	1	-	-	-	-	-	-

Southwestern Public Service Company

Weather Normalization of SPS Base Period Peak Demand

Base Period Full Requirement Wholesale Peak Demand Weather Adjustment Detail
Actual Historical Full Requirement Wholesale Peak Demand (MW)

	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Base Period	741	987	986	1,032	929	889	871	740	742	722	769	781

Average Temperature Weather Adjustment (30-yr Normal)	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Average Temperature Normal	69.4	77.4	83.1	84.1	83.3	78.8	70.6	35.7	26.8	26.6	27.6	44.0
Average Temperature Actual	72.5	80.2	87.6	90.0	84.5	76.1	80.0	26.1	26.5	20.1	24.8	19.6
Variance from Normal	3.1	2.8	4.6	5.9	1.2	-2.8	9.4	-9.6	-0.3	-6.4	-2.7	-24.4
Average Temperature Weather Coefficients	1.5280	2.9942	4.2363	4.6185	4.9781	4.0290	1.6495	0.0000	0.0000	0.0000	0.0000	0.0000
Average Temperature Weather Adjustment (MW)	4.8	8.4	19.4	27.3	6.0	(11.3)	15.5	-	-	-	-	-

Heating Degree Days Weather Adjustment (30-yr Normal)	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Heating Degree Days Normal	0.7	0.0	0.0	0.0	0.0	0.0	0.1	29.4	38.2	38.4	37.4	21.3
Heating Degree Days Actual	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.9	38.5	44.9	40.2	45.4
Variance from Normal	(0.7)	-	-	-	-	-	(0.1)	9.5	0.3	6.4	2.7	24.1
Heating Degree Days Weather Coefficients	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.3483	2.5391	2.1602	2.0289	1.7056
Heating Degree Days Weather Adjustment (MW)	-	-	-	-	-	-	-	12.8	0.7	13.9	5.5	41.1

Precipitation 1 week before Peak Day Weather Adjustment (30-yr Normal)	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Precipitation Normal	0.08	0.35	0.30	0.24	0.53	0.21	0.10	0.14	0.11	0.13	0.15	0.16
Precipitation Actual	0.00	0.01	0.07	0.60	0.39	0.19	0.19	0.15	0.35	0.46	0.00	0.00
Variance from Normal	-0.08	-0.34	-0.23	0.36	-0.13	-0.02	0.09	0.01	0.24	0.33	-0.15	-0.15
Precipitation Weather Coefficients	-32.702	-32.702	-32.702	-32.702	-32.702	-32.702	0.000	0.000	0.000	0.000	0.000	0.000
Precipitation Weather Adjustment (MW)	2.7	11.2	7.5	(11.8)	4.4	0.5	-	-	-	-	-	-

Southwestern Public Service Company

Weather Normalization of SPS Base Period Peak Demand

Base Period Golden Spread Full Load Peak Demand Weather Adjustment Detail
Actual Historical Golden Spread Full Load Peak Demand (MW)

	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Base Period	772	1,070	1,098	1,299	1,250	909	550	507	519	472	492	480

Average Temperature Weather Adjustment (30-yr Normal)												
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Average Temperature Normal	69.10	77.07	82.38	83.8	83.0	78.5	70.6	34.2	25.0	24.9	25.6	42.7
Average Temperature Actual	72.03	79.0	88.0	89.6	84.5	79.3	79.9	24.5	24.9	17.9	23.0	17.4
Variance from Normal	2.9	2.0	5.6	5.9	1.5	0.8	9.3	-9.7	-0.1	-7.0	-2.6	-25.3
Average Temperature Weather Coefficients	3.7005	4.2287	5.9141	7.8210	7.9318	4.4100	0.7132	0.0000	0.0000	0.0000	0.0000	1.9858
Average Temperature Weather Adjustment (MW)	10.8	8.3	33.3	46.1	11.7	3.5	6.6	-	-	-	-	(50.2)

Precipitation 1 week before Peak Day Weather Adjustment (30-yr Normal)												
	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Precipitation Normal	0.1	0.4	0.4	0.3	0.6	0.2	0.1	0.1	0.1	0.1	0.1	0.2
Precipitation Actual	0.0	0.0	0.1	0.8	0.4	0.1	0.2	0.2	0.4	0.5	0.0	0.0
Variance from Normal	-0.1	-0.4	-0.3	0.5	-0.3	-0.2	0.1	0.0	0.3	0.4	-0.1	-0.2
Precipitation Weather Coefficients	-108.231	-108.231	-108.231	-55.178	-55.178	-55.178	0.000	0.000	0.000	0.000	0.000	0.000
Precipitation Weather Adjustment (MW)	9.6	44.3	27.5	(25.9)	14.2	8.7	-	-	-	-	-	-

Southwestern Public Service Company

Weather Normalization of SPS Base Period Peak Demand

Retail Peak Demand

		Model Coefficients		
Year	Month	PD_HDD	PD_Avg_Temp	Precip 1WKB4
2018	4	0.0000	3.5108	-136.5736
2018	5	0.0000	8.0190	-136.5736
2018	6	0.0000	10.7661	-136.5736
2018	7	0.0000	11.2468	-62.2545
2018	8	0.0000	11.4873	-62.2545
2018	9	0.0000	8.9039	-62.2545
2018	10	0.0000	3.6472	0.0000
2018	11	7.4797	0.0000	0.0000
2018	12	8.8523	0.0000	0.0000
2019	1	8.0867	0.0000	0.0000
2019	2	7.3008	0.0000	0.0000
2019	3	5.5993	0.0000	0.0000

Full Req Wholesale Peak Demand

		Model Coefficients		
Year	Month	PD_HDD	PD_Avg_Temp	Precip 1WKB4
2018	4	0.0000	1.5280	-32.7022
2018	5	0.0000	2.9942	-32.7022
2018	6	0.0000	4.2363	-32.7022
2018	7	0.0000	4.6185	-32.7022
2018	8	0.0000	4.9781	-32.7022
2018	9	0.0000	4.0290	-32.7022
2018	10	0.0000	1.6495	0.0000
2018	11	1.3483	0.0000	0.0000
2018	12	2.5391	0.0000	0.0000
2019	1	2.1602	0.0000	0.0000
2019	2	2.0289	0.0000	0.0000
2019	3	1.7056	0.0000	0.0000

GSEC Full Load Peak Demand

		Model Coefficients		
Year	Month	PD_HDD	PD_Avg_Temp	Precip 1WKB4
2018	4	0.0000	3.7005	-108.2312
2018	5	0.0000	4.2287	-108.2312
2018	6	0.0000	5.9141	-108.2312
2018	7	0.0000	7.8210	-55.1781
2018	8	0.0000	7.9318	-55.1781
2018	9	0.0000	4.4100	-55.1781
2018	10	0.0000	0.7132	0.0000
2018	11	0.0000	0.0000	0.0000
2018	12	0.0000	0.0000	0.0000
2019	1	0.0000	0.0000	0.0000
2019	2	0.0000	0.0000	0.0000
2019	3	0.0000	1.9858	0.0000

Southwestern Public Service Company

Regression Models and Associated Statistics

New Mexico Residential Service

Line No.	Variable	Coefficient	StdErr	T-Stat	Definition
2	CONST	-24898.330	4264.762	-5.838	Constant term
3	CYPperHH_NM	295.838	27.106	10.914	Real Personal Income per Household New Mexico
4	H65_bill_ResSvc_NM_Jan	0.000428	0.000	23.636	Heating degree days (January) multiplied by customers
5	H65_bill_ResSvc_NM_Feb	0.000335	0.000	16.765	Heating degree days (February) multiplied by customers
6	H65_bill_ResSvc_NM_Mar	0.000252	0.000	10.545	Heating degree days (March) multiplied by customers
7	H65_bill_ResSvc_NM_Dec	0.000331	0.000	15.828	Heating degree days (December) multiplied by customers
8	C65_bill_ResSvc_NM_Jun	0.000775	0.000	23.933	Cooling degree days (June) multiplied by customers
9	C65_bill_ResSvc_NM_Jul	0.000919	0.000	37.068	Cooling degree days (July) multiplied by customers
10	C65_bill_ResSvc_NM_Aug	0.000976	0.000	39.187	Cooling degree days (August) multiplied by customers
11	C65_bill_ResSvc_NM_Sep	0.000882	0.000	26.907	Cooling degree days (September) multiplied by customers
12	C65_bill_ResSvc_NM_Oct	0.000661	0.000	9.784	Cooling degree days (October) multiplied by customers
13	BILLINGDAYS	908.771	102.171	8.895	Number of billing days
14	Bin0509	4744.051	1960.759	2.419	Binary variable for May 2009=1, otherwise=0
15	Bin1210	-5743.319	2025.918	-2.835	Binary variable for December 2010=1, otherwise=0
16	AR(1)	0.436	0.071	6.117	First Order Auto Regressive Term

17	Model Statistics	
18	Iterations	8
19	Adjusted Observations	167
20	Deg. of Freedom for Error	152
21	R-Squared	0.968
22	Adjusted R-Squared	0.965
23	AIC	15.402
24	BIC	15.682
25	F-Statistic	324.873
26	Prob (F-Statistic)	0.0000
27	Log-Likelihood	-1,508.02
28	Model Sum of Squares	20,401,788,695.50
29	Sum of Squared Errors	681,821,139.01
30	Mean Squared Error	4,485,665.39
31	Std. Error of Regression	2,117.94
32	Mean Abs. Dev. (MAD)	1,607.38
33	Mean Abs. % Err. (MAPE)	3.69%
34	Durbin-Watson Statistic	1.885
35	Durbin-H Statistic	
36	Ljung-Box Statistic	82.52
37	Prob (Ljung-Box)	0.0000
38	Skewness	0.429
39	Kurtosis	3.304
40	Jarque-Bera	5.770
41	Prob (Jarque-Bera)	0.0559

Southwestern Public Service Company

Regression Models and Associated Statistics

New Mexico Residential Space Heat

Line No.	Variable	Coefficient	StdErr	T-Stat	Definition
2	CONST	-17507.55418	4381.98912	-3.995	Constant term
3	CYPperHH_NM	95.459561	25.40236	3.758	Real Personal Income per Household New Mexico
4	H65_bill_ResSpHt_NM_Jan	0.001406	0.00004	37.190	Heating degree days (January) multiplied by customers
5	H65_bill_ResSpHt_NM_Feb	0.001381	0.00004	31.025	Heating degree days (February) multiplied by customers
6	H65_bill_ResSpHt_NM_Mar	0.001164	0.00006	20.455	Heating degree days (March) multiplied by customers
7	H65_bill_ResSpHt_NM_Apr	0.000549	0.00010	5.315	Heating degree days (April) multiplied by customers
8	H65_bill_ResSpHt_NM_Nov	0.000387	0.00012	3.146	Heating degree days (November) multiplied by customers
9	H65_bill_ResSpHt_NM_Dec	0.000981	0.00005	19.707	Heating degree days (December) multiplied by customers
10	C65_bill_ResSpHt_NM_Jun	0.000910	0.00007	13.391	Cooling degree days (June) multiplied by customers
11	C65_bill_ResSpHt_NM_Jul	0.001149	0.00005	22.469	Cooling degree days (July) multiplied by customers
12	C65_bill_ResSpHt_NM_Aug	0.001289	0.00005	25.318	Cooling degree days (August) multiplied by customers
13	C65_bill_ResSpHt_NM_Sep	0.00108	0.00007	15.494	Cooling degree days (September) multiplied by customers
14	C65_bill_ResSpHt_NM_Oct	0.00072	0.00016	4.633	Cooling degree days (October) multiplied by customers
15	BILLINGDAYS	1147.91424	114.58442	10.018	Number of Billing Days
16	Bin1210	-4271.56897	2051.02117	-2.083	Binary variable for December 2010=1, otherwise=0
17	Bin1213	7059.79126	2056.62688	3.433	Binary variable for December 2013=1, otherwise=0
18	AR(1)	0.37297	0.08056	4.630	First Order Auto Regressive Term

19	Model Statistics	
20	Iterations	11
21	Adjusted Observations	162
22	Deg. of Freedom for Error	145
23	R-Squared	0.969
24	Adjusted R-Squared	0.965
25	AIC	15.373
26	BIC	15.697
27	F-Statistic	282.165
28	Prob (F-Statistic)	0.0000
29	Log-Likelihood	-1,458.09
30	Model Sum of Squares	19,413,403,701.13
31	Sum of Squared Errors	623,514,169.35
32	Mean Squared Error	4,300,097.72
33	Std. Error of Regression	2,073.67
34	Mean Abs. Dev. (MAD)	1,465.68
35	Mean Abs. % Err. (MAPE)	3.72%
36	Durbin-Watson Statistic	2.137
37	Durbin-H Statistic	
38	Ljung-Box Statistic	42.85
39	Prob (Ljung-Box)	0.0103
40	Skewness	0.194
41	Kurtosis	3.556
42	Jarque-Bera	3.103
43	Prob (Jarque-Bera)	0.2119

Southwestern Public Service Company

Regression Models and Associated Statistics

New Mexico Small General Service

Line No.	Variable	Coefficient	StdErr	T-Stat	Definition
2	CONST	-7802.530	2153.026	-3.624	Constant term
3	EE_NM	76.100072	19.387	3.925	Non-farm employment, New Mexico service area
4	BILLINGDAYS	249.209518	25.949	9.604	Number of Billing Days
5	H65_bill_SGS_NM_Jan	0.000261	0.000	9.610	Heating degree days (January) multiplied by customers
6	H65_bill_SGS_NM_Feb	0.000255	0.000	8.629	Heating degree days (February) multiplied by customers
7	H65_bill_SGS_NM_Mar	0.000254	0.000	7.105	Heating degree days (March) multiplied by customers
8	H65_bill_SGS_NM_Dec	0.000154	0.000	4.981	Heating degree days (December) multiplied by customers
9	C65_bill_SGS_NM_Jun	0.000599	0.000	11.797	Cooling degree days (June) multiplied by customers
10	C65_bill_SGS_NM_Jul	0.000727	0.000	19.721	Cooling degree days (July) multiplied by customers
11	C65_bill_SGS_NM_Aug	0.000723	0.000	19.668	Cooling degree days (August) multiplied by customers
12	C65_bill_SGS_NM_Sep	0.000693	0.000	14.797	Cooling degree days (September) multiplied by customers
13	C65_bill_SGS_NM_Oct	0.000	0.000	5.331	Cooling degree days (October) multiplied by customers
14	RateShiftSGtoSGS	6236.450	262.844	23.727	Rate change SG to SGS due to demand req change
15	RateShift	-3693.130	282.285	-13.083	SGS customers moved to the SG rate effective June 2012
16	Bin0401	-2456.703	514.950	-4.771	Binary for April 2001=1, otherwise=0
17	Bin0102	-2623.056	522.567	-5.020	Binary for January 2002=1, otherwise=0
18	Bin0304	-3250.422	529.528	-6.138	Binary for March 2004=1, otherwise=0
19	Bin0606	4325.545	537.961	8.041	Binary for June 2006=1, otherwise=0
20	Bin0806	-3931.821	528.048	-7.446	Binary for August 2006=1, otherwise=0
21	Bin1209	-1942.821	538.579	-3.607	Binary for December 2009=1, otherwise=0
22	AR(1)	0.488	0.067	7.250	First order autoregressive term

23	**Model Statistics**	
24	Iterations	12
25	Adjusted Observations	203
26	Deg. of Freedom for Error	182
27	R-Squared	0.957
28	Adjusted R-Squared	0.952
29	AIC	12.776
30	BIC	13.118
31	F-Statistic	200.43
32	Prob (F-Statistic)	0
33	Log-Likelihood	-1,563.78
34	Model Sum of Squares	1,285,232,556.95
35	Sum of Squared Errors	58,353,204.40
36	Mean Squared Error	320,622.00
37	Std. Error of Regression	566.23
38	Mean Abs. Dev. (MAD)	396.93
39	Mean Abs. % Err. (MAPE)	4.63%
40	Durbin-Watson Statistic	2.056
41	Durbin-H Statistic	
42	Ljung-Box Statistic	25.21
43	Prob (Ljung-Box)	0.3943
44	Skewness	0.680
45	Kurtosis	4.201
46	Jarque-Bera	27.843
47	Prob (Jarque-Bera)	0.0000

Southwestern Public Service Company

Regression Models and Associated Statistics

New Mexico Secondary General Service

Line No.	Variable	Coefficient	StdErr	T-Stat	Definition
2	EE_NM	158.845	30.467	5.214	Non-farm employment, New Mexico service area
3	C65_bill_ROS_NM_Jun	24.433	2.223	10.992	Cooling degree days (June)
4	C65_bill_ROS_NM_Jul	30.647	1.533	19.998	Cooling degree days (July)
5	C65_bill_ROS_NM_Aug	30.063	1.406	21.378	Cooling degree days (August)
6	C65_bill_ROS_NM_Sep	30.199	1.909	15.822	Cooling degree days (September)
7	C65_bill_ROS_NM_Oct	17.031	4.261	3.997	Cooling degree days (October)
8	BILLINGDAYS	1982.558	108.018	18.354	Number of Billing Days
9	RateShiftJan09	-20556.095	574.570	-35.776	Rate Shift January 2009
10	RateShiftSGtoSGS	-4649.067	495.999	-9.373	Rate change SG to SGS due to demand req change
11	Bin0107	5220.214	2434.431	2.144	Binary variable for January 2007=1, otherwise=0
12	Bin0109	21069.099	2366.933	8.901	Binary variable for January 2009=1, otherwise=0
13	Bin0309	20736.166	2339.572	8.863	Binary variable for March 2009=1, otherwise=0
14	Bin0409	21450.708	2335.890	9.183	Binary variable for April 2009=1, otherwise=0
15	Bin0509	16174.975	2332.586	6.934	Binary variable for May 2009=1, otherwise=0
16	Bin0709	11030.032	2448.260	4.505	Binary variable for July 2009=1, otherwise=0
17	Bin1210	-8989.966	2362.516	-3.805	Binary variable for December 2010=1, otherwise=0
18	Bin0212	-8390.018	2332.780	-3.597	Binary variable for February 2012=1, otherwise=0
19	Bin0312	-71345.153	2334.373	-30.563	Binary variable for March 2012=1, otherwise=0
20	Bin0412	-22666.653	2334.809	-9.708	Binary variable for April 2012=1, otherwise=0
21	Bin1216	-7625.724552	2365.662	-3.2235	Binary variable for December 2016=1, otherwise=0

22	**Model Statistics**	
23	Iterations	1
24	Adjusted Observations	132
25	Deg. of Freedom for Error	112
26	R-Squared	0.977
27	Adjusted R-Squared	0.974
28	AIC	15.624
29	BIC	16.061
30	F-Statistic	
31	Prob (F-Statistic)	
32	Log-Likelihood	-1,198.51
33	Model Sum of Squares	25,741,302,581.27
34	Sum of Squared Errors	595,070,736.09
35	Mean Squared Error	5,313,131.57
36	Std. Error of Regression	2,305.02
37	Mean Abs. Dev. (MAD)	1,529.53
38	Mean Abs. % Err. (MAPE)	2.41%
39	Durbin-Watson Statistic	2.048
40	Durbin-H Statistic	
41	Ljung-Box Statistic	25.91
42	Prob (Ljung-Box)	0.3577
43	Skewness	-0.314
44	Kurtosis	3.970
45	Jarque-Bera	7.347
46	Prob (Jarque-Bera)	0.0254

Southwestern Public Service Company

Regression Models and Associated Statistics

New Mexico Muni & School Service

Line No.	Variable	Coefficient	StdErr	T-Stat	Definition
2	NR_NM	38.125	0.556	68.620	Population in New Mexico service area
3	C65_bill_MuniSch_NM_Jun	0.00318	0.001	5.211	Cooling degree days (June)
4	C65_bill_MuniSch_NM_Jul	0.00222	0.000	6.297	Cooling degree days (July)
5	C65_bill_MuniSch_NM_Aug	0.00330	0.000	8.375	Cooling degree days (August)
6	C65_bill_MuniSch_NM_Sep	0.00403	0.000	8.380	Cooling degree days (September)
7	C65_bill_MuniSch_NM_Oct	0.01334	0.001	10.233	Cooling degree days (October)
8	PrecipB_Mun_Sch_MarApr	-0.44081	0.191	-2.310	Precipitation inches (March, April)
9	PrecipB_Mun_Sch_MayJun	-0.21809	0.078	-2.811	Precipitation inches (May, June)
10	Bin0409	-1706.621	741.816	-2.301	Binary variable for April 2009=1, otherwise=0
11	Bin0911	1805.284	805.500	2.241	Binary variable for September 2011=1, otherwise =0
12	Bin0414	1538.239	765.735	2.009	Binary variable for April 2014=1, otherwise=0
13	Bin0815	-1611.850	878.043	-1.836	Binary variable for August 2015=1, otherwise=0
14	Bin1015	-3027.049	951.838	-3.180	Binary variable for October 2015=1, otherwise=0
15	Bin1017	-2542.328	880.678	-2.887	Binary variable for October 2017=1, otherwise=0
16	AR(1)	-0.350	0.111	-3.142	First order autoregressive term
17	AR(2)	0.382	0.105	3.650	Second order autoregressive term
18	AR(3)	0.313	0.107	2.933	Third order autoregressive term

19	**Model Statistics**	
20	Iterations	29
21	Adjusted Observations	105
22	Deg. of Freedom for Error	88
23	R-Squared	0.766
24	Adjusted R-Squared	0.724
25	AIC	13.675
26	BIC	14.105
27	F-Statistic	
28	Prob (F-Statistic)	
29	Log-Likelihood	-849.95
30	Model Sum of Squares	216,645,627
31	Sum of Squared Errors	66,028,545.60
32	Mean Squared Error	750,324.38
33	Std. Error of Regression	866.21
34	Mean Abs. Dev. (MAD)	640.48
35	Mean Abs. % Err. (MAPE)	5.80%
36	Durbin-Watson Statistic	2.033
37	Durbin-H Statistic	
38	Ljung-Box Statistic	45.92
39	Prob (Ljung-Box)	0.0045
40	Skewness	0.138
41	Kurtosis	2.619
42	Jarque-Bera	0.970
43	Prob (Jarque-Bera)	0.6158

Southwestern Public Service Company

Regression Models and Associated Statistics

New Mexico Irrigation Service

Line No.	Variable	Coefficient	StdErr	T-Stat	Definition
2	CONST	2105.865	367.588	5.729	Constant term
3	PrecipB_Irr_Mar	-2.342	0.672	-3.484	precipitation inches (March) multiplied by customer
4	PrecipB_Irr_Apr	-1.371	0.560	-2.449	precipitation inches (April) multiplied by customer
5	PrecipB_Irr_May	-0.531	0.251	-2.115	precipitation inches (May) multiplied by customer
6	PrecipB_Irr_Jun	-0.543	0.163	-3.339	precipitation inches (June) multiplied by customer
7	PrecipB_Irr_Jul	-0.508	0.197	-2.587	precipitation inches (July) multiplied by customer
8	PrecipB_Irr_Aug	-0.400	0.220	-1.817	precipitation inches (August) multiplied by customer
9	PrecipB_Irr_Sep	-1.085	0.148	-7.352	precipitation inches (September) multiplied by customer
10	Jan	-993.727	292.640	-3.396	Seasonal binary variable, January=1, otherwise=0
11	Feb	-730.173	338.048	-2.160	Seasonal binary variable, February=1, otherwise=0
12	Mar	3245.345	424.803	7.640	Seasonal binary variable, March=1, otherwise=0
13	Apr	7321.710	448.699	16.318	Seasonal binary variable, April=1, otherwise=0
14	May	7173.964	464.524	15.444	Seasonal binary variable, May=1, otherwise=0
15	Jun	8638.837	466.333	18.525	Seasonal binary variable, June=1, otherwise=0
16	Jul	11171.568	524.196	21.312	Seasonal binary variable, July=1, otherwise=0
17	Aug	11539.241	596.465	19.346	Seasonal binary variable, August=1, otherwise=0
18	Sep	9857.070	483.128	20.403	Seasonal binary variable, September=1, otherwise=0
19	Oct	3869.311	334.026	11.584	Seasonal binary variable, October=1, otherwise=0
20	Nov	1230.970	282.534	4.357	Seasonal binary variable, November=1, otherwise=0
21	Bin0607	-1627.303	856.083	-1.901	Binary variable for June 2007=1, otherwise=0
22	Bin0809	-2918.254	805.940	-3.621	Binary variable for August 2009=1, otherwise=0
23	Bin0610	2995.076	825.552	3.628	Binary variable for June 2010=1, otherwise=0
24	Bin1014	-3095.826	806.968	-3.836	Binary variable for October 2014=1, otherwise=0
25	AR(1)	0.549	0.092	5.993	First order autoregressive term
26	AR(2)	0.183	0.092	1.994	Second order autoregressive term

27	**Model Statistics**	
28	Iterations	16
29	Adjusted Observations	142
30	Deg. of Freedom for Error	117
31	R-Squared	0.964
32	Adjusted R-Squared	0.957
33	AIC	13.744
34	BIC	14.264
35	F-Statistic	130.340
36	Prob (F-Statistic)	0
37	Log-Likelihood	-1,152.30
38	Model Sum of Squares	2,485,036,065.84
39	Sum of Squared Errors	92,945,627.33
40	Mean Squared Error	794,407.07
41	Std. Error of Regression	891.30
42	Mean Abs. Dev. (MAD)	631.72
43	Mean Abs. % Err. (MAPE)	19.46%
44	Durbin-Watson Statistic	1.999
45	Durbin-H Statistic	
46	Ljung-Box Statistic	43.36
47	Prob (Ljung-Box)	0.0090
48	Skewness	-0.074
49	Kurtosis	3.077
50	Jarque-Bera	0.163
51	Prob (Jarque-Bera)	0.9215

Southwestern Public Service Company

Regression Models and Associated Statistics

Texas Residential Service

Line No.	Variable	Coefficient	StdErr	T-Stat	Definition
1					
2	CONST	-22589.043	8971.465	-2.518	Constant term
3	CYPperHH_TX	434.597	46.687	9.309	Real Personal Income per Household (Texas service area)
4	H65_bill_ResSrv_TX_Jan	0.000303	0.000	19.548	Heating degree days (January) multiplied by customers
5	H65_bill_ResSrv_TX_Feb	0.000210	0.000	14.217	Heating degree days (February) multiplied by customers
6	H65_bill_ResSrv_TX_Mar	0.000167	0.000	10.076	Heating degree days (March) multiplied by customers
7	H65_bill_ResSrv_TX_Dec	0.000199	0.000	11.382	Heating degree days (December) multiplied by customers
8	C65_bill_ResSrv_TX_May	0.000504	0.000	4.045	Cooling degree days (May) multiplied by customers
9	C65_bill_ResSrv_TX_Jun	0.001257	0.000	30.377	Cooling degree days (June) multiplied by customers
10	C65_bill_ResSrv_TX_Jul	0.001393	0.000	55.576	Cooling degree days (July) multiplied by customers
11	C65_bill_ResSrv_TX_Aug	0.001439	0.000	62.215	Cooling degree days (August) multiplied by customers
12	C65_bill_ResSrv_TX_Sep	0.001361	0.000	44.402	Cooling degree days (September) multiplied by customers
13	C65_bill_ResSrv_TX_Oct	0.001104	0.000	15.522	Cooling degree days (October) multiplied by customers
14	ResSvcSalesShift2012	11384.545	2204.327	5.165	Winter Sales Increased - caused by space heat customer moving to res svc
15	BILLINGDAYS	2390.156	247.376	9.662	Number of Billing Days
16	Bin1103	107680.367	4651.505	23.150	Binary variable for November 2003=1, otherwise=0
17	Bin0604	11912.147	4784.555	2.490	Binary variable for June 2004=1, otherwise=0
18	Bin0406	8853.887	4706.219	1.881	Binary variable for April 2006=1, otherwise=0
19	Bin0407	23424.745	4936.006	4.746	Binary variable for April 2007=1, otherwise=0
20	Bin0507	44724.689	5204.450	8.594	Binary variable for May 2007=1, otherwise=0
21	Bin0607	22048.115	4920.209	4.481	Binary variable for June 2007=1, otherwise=0
22	Bin0214	10353.598	4837.764	2.140	Binary variable for February 2014=1, otherwise=0
23	Bin0315	9560.384	4870.530	1.963	Binary variable for March 2015=1, otherwise=0
24	AR(1)	0.360	0.073	4.958	First Order Auto Regressive Term

25	**Model Statistics**	
26	Iterations	12
27	Adjusted Observations	190
28	Deg. of Freedom for Error	167
29	R-Squared	0.984
30	Adjusted R-Squared	0.982
31	AIC	17.095
32	BIC	17.488
33	F-Statistic	461.753
34	Prob (F-Statistic)	0.0000
35	Log-Likelihood	-1,870.64
36	Model Sum of Squares	241,038,097,136.71
37	Sum of Squared Errors	3,962,502,951.25
38	Mean Squared Error	23,727,562.58
39	Std. Error of Regression	4,871.09
40	Mean Abs. Dev. (MAD)	3,465.79
41	Mean Abs. % Err. (MAPE)	2.75%
42	Durbin-Watson Statistic	2.069
43	Durbin-H Statistic	
44	Ljung-Box Statistic	34.78
45	Prob (Ljung-Box)	0.0718
46	Skewness	0.403
47	Kurtosis	4.496
48	Jarque-Bera	22.870
49	Prob (Jarque-Bera)	0.0000

Southwestern Public Service Company

Regression Models and Associated Statistics

Texas Residential Space Heating

Line No.	Variable	Coefficient	StdErr	T-Stat	Definition
2	CONST	-16956.90811	4479.50801	-3.785	Constant term
3	TX_ResSpaceHeat_Cust	0.794808	0.06973	11.398	Customer population for Residential Space Heat
4	H65_bill_ResSpHt_TX_Jan	0.001329	0.00002	53.882	Heating degree days (January) multiplied by customers
5	H65_bill_ResSpHt_TX_Feb	0.001196	0.00003	45.128	Heating degree days (February) multiplied by customers
6	H65_bill_ResSpHt_TX_Mar	0.001042	0.00003	33.723	Heating degree days (March) multiplied by customers
7	H65_bill_ResSpHt_TX_Apr	0.000620	0.00005	13.388	Heating degree days (April) multiplied by customers
8	H65_bill_ResSpHt_TX_Nov	0.000385	0.00007	5.370	Heating degree days (November) multiplied by customers
9	H65_bill_ResSpHt_TX_Dec	0.001080	0.00003	34.017	Heating degree days (December) multiplied by customers
10	C65_bill_ResSpHt_TX_Jun	0.001246	0.00006	20.627	Cooling degree days (June) multiplied by customers
11	C65_bill_ResSpHt_TX_Jul	0.001489	0.00004	34.474	Cooling degree days (July) multiplied by customers
12	C65_bill_ResSpHt_TX_Aug	0.001558	0.00004	38.747	Cooling degree days (August) multiplied by customers
13	C65_bill_ResSpHt_TX_Sep	0.001436	0.00005	26.263	Cooling degree days (September) multiplied by customers
14	C65_bill_ResSpHt_TX_Oct	0.001108	0.00013	8.496	Cooling degree days (October) multiplied by customers
15	ResSpHtRateChg2012	-3073.78928	659.15403	-4.663	Residential Space Heat customers moving to Residential Service rate
16	BILLINGDAYS	806.00143	113.17939	7.121	Number of Billing Days
17	Bin1103	44357.75910	2198.64921	20.175	Binary variable for November 2003=1, otherwise=0
18	Bin0304	7414.01263	2225.94108	3.331	Binary variable for March 2004=1, otherwise=0
19	Bin0407	-22608.40256	2453.74747	-9.214	Binary variable for April 2007=1, otherwise=0
20	Bin0507	-41852.39711	2642.11477	-15.840	Binary variable for May 2007=1, otherwise=0
21	Bin0607	-27382.35245	2422.93030	-11.301	Binary variable for June 2007=1, otherwise=0
22	Bin0513	7529.93701	2266.41681	3.322	Binary variable for May 2013=1, otherwise=0
23	Bin1213	8869.66713	2279.79462	3.891	Binary variable for December 2013=1, otherwise=0
24	AR(1)	0.46865	0.06304	7.434	First Order Auto Regressive Term

25	Model Statistics	
26	Iterations	10
27	Adjusted Observations	215
28	Deg. of Freedom for Error	192
29	R-Squared	0.982
30	Adjusted R-Squared	0.980
31	AIC	15.667
32	BIC	16.028
33	F-Statistic	489.441
34	Prob (F-Statistic)	0.0000
35	Log-Likelihood	-1,966.30
36	Model Sum of Squares	62,019,137,958.97
37	Sum of Squared Errors	1,105,869,705.21
38	Mean Squared Error	5,759,738.05
39	Std. Error of Regression	2,399.95
40	Mean Abs. Dev. (MAD)	1,824.41
41	Mean Abs. % Err. (MAPE)	3.29%
42	Durbin-Watson Statistic	1.997
43	Durbin-H Statistic	
44	Ljung-Box Statistic	11.96
45	Prob (Ljung-Box)	0.9803
46	Skewness	0.053
47	Kurtosis	2.686
48	Jarque-Bera	0.987
49	Prob (Jarque-Bera)	0.6105

Southwestern Public Service Company

Regression Models and Associated Statistics

Texas Small General Service

Line No.	Variable	Coefficient	StdErr	T-Stat	Definition
2	EE_TX_Log	943.470	327.721	2.879	Log of non-farm employment, Texas service area
3	H65_bill_SGS_TX_Jan	0.000215	0.000	10.148	Heating degree days (January) multiplied by customers
4	H65_bill_SGS_TX_Feb	0.000134	0.000	6.035	Heating degree days (February) multiplied by customers
5	H65_bill_SGS_TX_Mar	0.000140	0.000	6.112	Heating degree days (March) multiplied by customers
6	H65_bill_SGS_TX_Dec	0.000144	0.000	6.402	Heating degree days (December) multiplied by customers
7	C65_bill_SGS_TX_Jun	0.000551	0.000	10.698	Cooling degree days (June) multiplied by customers
8	C65_bill_SGS_TX_Jul	0.000664	0.000	18.201	Cooling degree days (July) multiplied by customers
9	C65_bill_SGS_TX_Aug	0.000778	0.000	21.767	Cooling degree days (August) multiplied by customers
10	C65_bill_SGS_TX_Sep	0.000808	0.000	16.927	Cooling degree days (September) multiplied by customers
11	C65_bill_SGS_TX_Oct	0.001	0.000	5.603	Cooling degree days (October) multiplied by customers
12	RateShiftJun12	-5132.479	866.686	-5.922	SGS customers moved to the SG rate effective June 2012=1, prior values=0
13	RateShiftFeb14	5492.325	963.804	5.699	SG customers moved to the SGS rate effective February 2014=1, prior values=0
14	BILLINGDAYS	449.762	58.799	7.649	Number of billing days
15	Bin0405	6076.838	1279.189	4.751	Binary for April 2005=1, otherwise=0
16	Bin0505	-5259.189	1276.013	-4.122	Binary for May 2005=1, otherwise=0
17	Bin1106	-7057.320	1130.918	-6.240	Binary for November 2006=1, otherwise=0
18	Bin0507	-4402.545	1122.290	-3.923	Binary for May 2007=1, otherwise=0
19	bin0109	5139.597	1149.435	4.471	Binary for January 2009=1, otherwise=0
20	Bin0214	4517.888	1280.362	3.529	Binary for February 2014=1, otherwise=0
21	Bin0614	-2569.937	1159.771	-2.216	Binary for June 2014=1, otherwise=0
22	Bin1016	-9397.136	1220.130	-7.702	Binary for October 2016=1, otherwise=0
23	AR(1)	0.686	0.064	10.725	First order autoregressive term

24	**Model Statistics**	
25	Iterations	10
26	Adjusted Observations	167
27	Deg. of Freedom for Error	145
28	R-Squared	0.922
29	Adjusted R-Squared	0.911
30	AIC	14.540
31	BIC	14.951
32	F-Statistic	
33	Prob (F-Statistic)	
34	Log-Likelihood	-1,429.05
35	Model Sum of Squares	3,128,351,382.43
36	Sum of Squared Errors	264,804,197.98
37	Mean Squared Error	1,826,235.85
38	Std. Error of Regression	1,351.38
39	Mean Abs. Dev. (MAD)	977.63
40	Mean Abs. % Err. (MAPE)	4.54%
41	Durbin-Watson Statistic	1.788
42	Durbin-H Statistic	
43	Ljung-Box Statistic	34.32
44	Prob (Ljung-Box)	0.0792
45	Skewness	0.328
46	Kurtosis	4.925
47	Jarque-Bera	28.778
48	Prob (Jarque-Bera)	0.0000

Southwestern Public Service Company

Regression Models and Associated Statistics

Texas Secondary General Service

Line No.	Variable	Coefficient	StdErr	T-Stat	Definition
2	NR_TX	326.583	3.193	102.278	Population in Texas service area
3	Feb	-20378.277	3101.039	-6.571	Seasonal binary variable, February=1, otherwise=0
4	H65_bill_Pan_TX_Jan	21.578	3.519	6.131	Heating degree days (January)
5	H65_bill_Pan_TX_Dec	32.993	4.682	7.046	Heating degree days (December)
6	C65_bill_Pan_TX_Jun	115.541	11.572	9.984	Cooling degree days (June)
7	C65_bill_Pan_TX_Jul	126.465	7.279	17.374	Cooling degree days (July)
8	C65_bill_Pan_TX_Aug	155.890	6.591	23.651	Cooling degree days (August)
9	C65_bill_Pan_TX_Sep	147.447	9.072	16.253	Cooling degree days (September)
10	C65_bill_Pan_TX_Oct	88.732	21.731	4.083	Cooling degree days (October)
11	PAN_TX_PRECIPB_Mar	-6918.958	2542.492	-2.721	Precipitation inches (March)
12	PAN_TX_PRECIPB_Apr	-7856.573	1800.814	-4.363	Precipitation inches (April)
13	Pan_TX_PrecipB_MayJunJulAugSep	-1382.297	606.778	-2.278	Precipitation inches (May, June, July, August, September)
14	SGtoSGSRateChg	-10846.764	2272.506	-4.773	SG to SGS change (10-25KW)
15	RateShiftMay11	-15437.998	1986.036	-7.773	Binary for customers moving from secondary general to primary general, starting May 2011=1, otherwise=0
16	Bin0604	-31684.812	10058.425	-3.150	Binary variable for June 2004=1, otherwise=0
17	Bin0205	30319.959	9994.949	3.034	Binary variable for February 2005=1, otherwise=0
18	Bin0505	-22323.118	9745.145	-2.291	Binary variable for May 2005=1, otherwise=0
19	Bin0105	50573.010	9905.299	5.106	Binary variable for January 2005=1, otherwise=0
20	Bin1108	-26603.784	9769.582	-2.723	Binary variable for November 2008=1, otherwise=0
21	Bin0210	-53648.409	9996.781	-5.367	Binary variable for February 2010=1, otherwise=0
22	Bin0510	-24497.024	9798.011	-2.500	Binary variable for May 2010=1, otherwise=0
23	Bin0311	-24607.940	9749.074	-2.524	Binary variable for March 2011=1, otherwise=0
24	Bin0112	-36367.632	10074.471	-3.610	Binary variable for January 2012=1, otherwise=0

	Model Statistics	
26	Iterations	1
27	Adjusted Observations	180
28	Deg. of Freedom for Error	157
29	R-Squared	0.908
30	Adjusted R-Squared	0.895
31	AIC	18.460
32	BIC	18.868
33	F-Statistic	
34	Prob (F-Statistic)	
35	Log-Likelihood	-1,893.79
36	Model Sum of Squares	142,622,383,704.31
37	Sum of Squared Errors	14,495,960,574.29
38	Mean Squared Error	92,330,959.07
39	Std. Error of Regression	9,608.90
40	Mean Abs. Dev. (MAD)	7,052.45
41	Mean Abs. % Err. (MAPE)	3.80%
42	Durbin-Watson Statistic	1.786
43	Durbin-H Statistic	
44	Ljung-Box Statistic	32.98
45	Prob (Ljung-Box)	0.1045
46	Skewness	0.004
47	Kurtosis	2.701
48	Jarque-Bera	0.671
49	Prob (Jarque-Bera)	0.7149

Southwestern Public Service Company

Regression Models and Associated Statistics

Canadian River Municipal Water Authority

Line No.	Variable	Coefficient	StdErr	T-Stat	Definition
2	NR_TX	17.735	0.462	38.387	Population in Texas service area
3	Jan	-1818.631	365.482	-4.976	Seasonal binary variable, January=1, otherwise=0
4	Feb	-1367.384	343.975	-3.975	Seasonal binary variable, February=1, otherwise=0
5	May	1550.355	334.434	4.636	Seasonal binary variable, May=1, otherwise=0
6	Dec	-1434.659	331.016	-4.334	Seasonal binary variable, December=1, otherwise=0
7	C65_Cal_Pan_TX_Jun	4.849	0.858	5.650	Cooling degree days (June)
8	C65_Cal_Pan_TX_Jul	5.972	0.759	7.864	Cooling degree days (July)
9	C65_Cal_Pan_TX_Aug	5.193	0.806	6.443	Cooling degree days (August)
10	C65_Cal_Pan_TX_Sep	5.737	1.429	4.014	Cooling degree days (September)
11	Pan_TX_PrecipCal_AprtoSep	-169.012	58.105	-2.909	Precipitation inches (April, May, June, July, August, September)
12	SalesShift	1446.588	279.354	5.178	Binary variable for sales shift starting January 2010=1, otherwise=0
13	Bin0506	3205.904	964.218	3.325	Binary variable for May 2006=1, otherwise=0
14	Bin1206	-1912.227	969.176	-1.973	Binary variable for December 2006=1, otherwise=0
15	Bin0108	-8140.180	970.540	-8.387	Binary variable for January 2008=1, otherwise=0
16	Bin0308	8970.596	932.405	9.621	Binary variable for March 2008=1, otherwise=0
17	Bin1009	-9953.066	932.721	-10.671	Binary variable for October 2009=1, otherwise=0
18	Bin0210	-3353.543	1029.535	-3.257	Binary variable for February 2010=1, otherwise=0
19	Bin0310	-3213.292	981.803	-3.273	Binary variable for March 2010=1, otherwise=0
20	Bin1110	-2189.165	983.975	-2.225	Binary variable for November 2010=1, otherwise=0
21	Bin1210	-2719.998	1075.317	-2.529	Binary variable for December 2010=1, otherwise=0
22	Bin0111	-2538.595	1027.931	-2.470	Binary variable for January 2011=1, otherwise=0
23	Bin0213	-2030.506	972.658	-2.088	Binary variable for February 2013=1, otherwise=0
24	Bin1013	2235.102	935.105	2.390	Binary variable for October 2013=1, otherwise=0
25	Bin1115	-1944.734	929.412	-2.092	Binary variable for November 2015=1, otherwise=0
26	Bin0116	-3073.677	1039.546	-2.957	Binary variable for January 2016=1, otherwise=0
27	Bin0216	-6353.205	1083.389	-5.864	Binary variable for February 2016=1, otherwise=0
28	Bin0316	-7005.447	985.249	-7.110	Binary variable for March 2016=1, otherwise=0
29	AR(1)	0.354	0.091	3.891	First Order Auto Regressive Term

Line No.	Model Statistics	
31	Iterations	11
32	Adjusted Observations	144
33	Deg. of Freedom for Error	116
34	R-Squared	0.892
35	Adjusted R-Squared	0.866
36	AIC	13.942
37	BIC	14.520
38	F-Statistic	#NA
39	Prob (F-Statistic)	#NA
40	Log-Likelihood	-1,180.18
41	Model Sum of Squares	911,450,798.94
42	Sum of Squared Errors	110,816,582.07
43	Mean Squared Error	955,315.36
44	Std. Error of Regression	977.40
45	Mean Abs. Dev. (MAD)	676.11
46	Mean Abs. % Err. (MAPE)	6.36%
47	Durbin-Watson Statistic	2.003
48	Durbin-H Statistic	#NA
49	Ljung-Box Statistic	14.51
50	Prob (Ljung-Box)	0.9342
51	Skewness	-0.217
52	Kurtosis	2.926
53	Jarque-Bera	1.163
54	Prob (Jarque-Bera)	0.5591

Southwestern Public Service Company

Regression Models and Associated Statistics

Texas Municipals and Schools

Line No.	Variable	Coefficient	StdErr	T-Stat	Definition
2	NR_TX	52.260	0.454	115.214	Population in Texas service area
3	C65_bill_MSS_TX_May	0.004966	0.002	2.270	Cooling degree days (May) multiplied by customers
4	C65_bill_MSS_TX_Jun	0.003279	0.001	5.467	Cooling degree days (June) multiplied by customers
5	C65_bill_MSS_TX_Jul	0.002237	0.000	5.776	Cooling degree days (July) multiplied by customers
6	C65_bill_MSS_TX_Aug	0.002818	0.000	7.500	Cooling degree days (August) multiplied by customers
7	C65_bill_MSS_TX_Sep	0.005	0.000	10.751	Cooling degree days (September) multiplied by customers
8	C65_bill_MSS_TX_Oct	0.012	0.001	11.601	Cooling degree days (October) multiplied by customers
9	Bin0806	22282.051	2139.935	10.412	Binary variable for August 2006=1, otherwise=0
10	Bin1206	-13425.124	2078.440	-6.459	Binary variable for December 2006=1, otherwise=0
11	Bin1107	9420.018	2078.574	4.532	Binary variable for November 2007=1, otherwise=0
12	PrecipB_MSS_TX_Apr	-0.276	0.092	-2.994	Bill Month Precipitation (April) multiplied by customers
13	PrecipB_MSS_TX_May	-0.143	0.062	-2.285	Bill Month Precipitation (May) multiplied by customers
14	PrecipB_MSS_TXJunJulAug	-0.064	0.035	-1.848	Bill Month Precipitation (June, July, August) multiplied by customers
15	Bin0317	-7846.181	2080.072	-3.772	Binary variable for March 2017=1, otherwise=0

16	**Model Statistics**	
17	Iterations	1
18	Adjusted Observations	144
19	Deg. of Freedom for Error	130
20	R-Squared	0.808
21	Adjusted R-Squared	0.789
22	AIC	15.357
23	BIC	15.645
24	F-Statistic	
25	Prob (F-Statistic)	
26	Log-Likelihood	-1,296.00
27	Model Sum of Squares	2,325,646,730.80
28	Sum of Squared Errors	553,600,087.83
29	Mean Squared Error	4,258,462.21
30	Std. Error of Regression	2,063.60
31	Mean Abs. Dev. (MAD)	1,562.54
32	Mean Abs. % Err. (MAPE)	4.97%
33	Durbin-Watson Statistic	1.923
34	Durbin-H Statistic	
35	Ljung-Box Statistic	67.64
36	Prob (Ljung-Box)	0.0000
37	Skewness	-0.209
38	Kurtosis	2.920
39	Jarque-Bera	1.085
40	Prob (Jarque-Bera)	0.5812

Southwestern Public Service Company

Regression Models and Associated Statistics

Wholesale Central Valley

Line No.	Variable	Coefficient	StdErr	T-Stat	Definition
1	CGSPNM_MA12	0.75816	0.01331	56.977	Real Gross State Product New Mexico 12 month moving average
2	Feb	-5003.93973	597.86315	-8.370	Seasonal binary February
3	Mar	2910.37130	722.36857	4.029	Seasonal binary March
4	Apr	2420.09336	779.66111	3.104	Seasonal binary April
5	C65_cal_ROS_NM_May	18.48705	3.90708	4.732	Cooling degree days (May) Roswell NM
6	C65_cal_ROS_NM_Jun	16.69987	1.67101	9.994	Cooling degree days (Jun) Roswell NM
7	C65_cal_ROS_NM_Jul	22.36057	1.48304	15.078	Cooling degree days (July) Roswell NM
8	C65_cal_ROS_NM_Aug	21.30606	1.45352	14.658	Cooling degree days (August) Roswell NM
9	C65_cal_ROS_NM_Sep	6.47055	2.06319	3.136	Cooling degree days (September) Roswell NM
10	Nov	-2775.96368	457.75744	-6.064	Seasonal binary November
11	Bin0908	-7855.66702	1607.18673	-4.888	Binary variable for September 2008=1, otherwise=0
12	Bin0710	-4644.16039	1632.46374	-2.845	Binary variable for July 2010=1, otherwise=0
13	Bin0211	-7801.41879	1655.28939	-4.713	Binary variable for February 2011=1, otherwise=0
14	Bin1114	4147.22303	1649.41720	2.514	Binary variable for November 2014=1, otherwise=0
15	Bin0215	-4725.32431	1656.93869	-2.852	Binary variable for February 2015=1, otherwise=0
16	AR(1)	0.84253	0.04635	18.177	First order autoregressive term
17					

18	Model Statistics	
19	Iterations	9
20	Adjusted Observations	155
21	Deg. of Freedom for Error	139
22	R-Squared	0.907
23	Adjusted R-Squared	0.897
24	AIC	15.377
25	BIC	15.691
26	F-Statistic	
27	Prob (F-Statistic)	
28	Log-Likelihood	-1,395.67
29	Model Sum of Squares	5,842,198,285.49
30	Sum of Squared Errors	601,073,716.01
31	Mean Squared Error	4,324,271.34
32	Std. Error of Regression	2,079.49
33	Mean Abs. Dev. (MAD)	1,556.55
34	Mean Abs. % Err. (MAPE)	2.40%
35	Durbin-Watson Statistic	2.115
36	Durbin-H Statistic	
37	Ljung-Box Statistic	14.09
38	Prob (Ljung-Box)	0.9446
39	Skewness	-0.005
40	Kurtosis	3.082
41	Jarque-Bera	0.044
42	Prob (Jarque-Bera)	0.9784
43		

Southwestern Public Service Company

Regression Models and Associated Statistics

Wholesale Farmers

Line No.	Variable	Coefficient	StdErr	T-Stat	Definition
2	CGSP_NM	0.310	0.016	19.573	Real Gross State Product New Mexico
3	Feb	-1517.967	634.260	-2.393	Seasonal binary February
4	Mar	4121.681	810.866	5.083	Seasonal binary March
5	Apr	6436.087	881.305	7.303	Seasonal binary April
6	C65_cal_ROS_NM_May	28.540	4.283	6.663	Cooling degree days (May) Roswell NM
7	C65_cal_ROS_NM_Jun	20.113	1.956	10.283	Cooling degree days (June) Roswell NM
8	C65_cal_ROS_NM_Jul	30.433	1.752	17.367	Cooling degree days (July) Roswell NM
9	C65_cal_ROS_NM_Aug	28.703	1.796	15.982	Cooling degree days (August) Roswell NM
10	C65_cal_ROS_NM_Sep	18.210	2.888	6.305	Cooling degree days (September) Roswell NM
11	C65_cal_ROS_NM_Oct	27.923	10.169	2.746	Cooling degree days (October) Roswell NM
12	Bin1004	-4767.067	1973.205	-2.416	Binary variable for October 2004=1, otherwise=0
13	AR(1)	0.850	0.039	21.782	First order autoregressive term

14	**Model Statistics**	
15	Iterations	6
16	Adjusted Observations	191
17	Deg. of Freedom for Error	179
18	R-Squared	0.890
19	Adjusted R-Squared	0.883
20	AIC	15.767
21	BIC	15.971
22	F-Statistic	
23	Prob (F-Statistic)	
24	Log-Likelihood	-1,764.76
25	Model Sum of Squares	9,616,626,631.96
26	Sum of Squared Errors	1,185,605,716.91
27	Mean Squared Error	6,623,495.63
28	Std. Error of Regression	2,573.62
29	Mean Abs. Dev. (MAD)	1,967.96
30	Mean Abs. % Err. (MAPE)	6.91%
31	Durbin-Watson Statistic	2.046
32	Durbin-H Statistic	
33	Ljung-Box Statistic	45.90
34	Prob (Ljung-Box)	0.0045
35	Skewness	-0.071
36	Kurtosis	3.038
37	Jarque-Bera	0.173
38	Prob (Jarque-Bera)	0.9174

Southwestern Public Service Company

Regression Models and Associated Statistics

Wholesale Lea County

Line No.	Variable	Coefficient	StdErr	T-Stat	Definition
2	CONST	12583.721	6600.656	1.906	Constant term
3	CGCPNM_MA12	7.366	0.655	11.243	Real Gross County Product New Mexico 12 month moving average
4	Feb	-7191.717	1205.350	-5.966	Seasonal binary variable for February
5	Mar	5109.993	1435.567	3.560	Seasonal binary variable for March
6	Apr	7984.854	1504.935	5.306	Seasonal binary variable for April
7	C65_cal_ROS_NM_May	61.373	7.169	8.560	Cooling degree days (May) Roswell NM
8	C65_cal_ROS_NM_Jun	41.777	3.274	12.758	Cooling degree days (June) Roswell NM
9	C65_cal_ROS_NM_Jul	57.500	2.839	20.255	Cooling degree days (July) Roswell NM
10	C65_cal_ROS_NM_Aug	66.569	2.941	22.638	Cooling degree days (August) Roswell NM
11	C65_cal_ROS_NM_Sep	30.700	4.490	6.838	Cooling degree days (September) Roswell NM
12	Bin0805	-14755.39948	4181.092	-3.529	Binary variable for August 2005=1, otherwise=0
13	Bin0510	8298.775	4177.639	1.986	Binary variable for May 2010=1, otherwise=0
14	Bin0614	-11042.075	4219.550	-2.617	Binary variable for June 2014=1, otherwise=0
15	Bin0914	-12553.489	4163.514	-3.015	Binary variable for September 2014=1, otherwise=0
16	Bin0517	11234.40573	4186.392	2.6836	Binary variable for May 2017=1, otherwise=0
17	LeaLoadDecreaseWind	-12388.988	2374.904	-5.217	Binary for behind the meter wind
18	AR(1)	0.553	0.063	8.727	First order autoregressive term

19	Model Statistics	
20	Iterations	9
21	Adjusted Observations	203
22	Deg. of Freedom for Error	186
23	R-Squared	0.917
24	Adjusted R-Squared	0.910
25	AIC	16.980
26	BIC	17.258
27	F-Statistic	128.25
28	Prob (F-Statistic)	0.0000
29	Log-Likelihood	-1,994.53
30	Model Sum of Squares	44,855,531,072.88
31	Sum of Squared Errors	4,065,845,973.89
32	Mean Squared Error	21,859,386.96
33	Std. Error of Regression	4,675.40
34	Mean Abs. Dev. (MAD)	3,527.50
35	Mean Abs. % Err. (MAPE)	3.76%
36	Durbin-Watson Statistic	1.907
37	Durbin-H Statistic	
38	Ljung-Box Statistic	29.70
39	Prob (Ljung-Box)	0.1949
40	Skewness	-0.019
41	Kurtosis	3.120
42	Jarque-Bera	0.133
43	Prob (Jarque-Bera)	0.9355

Wholesale Roosevelt

Line No.	Variable	Coefficient	StdErr	T-Stat	Definition
2	CGSP_NM	0.158	0.006	24.501	Real Gross State Product New Mexico
3	Feb	-765.295	332.538	-2.301	Seasonal binary variable for February
4	Mar	2181.723	422.761	5.161	Seasonal binary variable for March
5	Apr	3378.875	459.021	7.361	Seasonal binary variable for April
6	C65_cal_ROS_NM_May	12.837	2.185	5.876	Cooling degree days (May) Roswell NM
7	C65_cal_ROS_NM_Jun	9.874	1.010	9.775	Cooling degree days (June) Roswell NM
8	C65_cal_ROS_NM_Jul	15.172	0.909	16.695	Cooling degree days (July) Roswell NM
9	C65_cal_ROS_NM_Aug	14.043	0.872	16.101	Cooling degree days (August) Roswell NM
10	C65_cal_ROS_NM_Sep	8.930	1.232	7.248	Cooling degree days (September) Roswell NM
11	Nov	-893.803	260.273	-3.434	Seasonal binary variable for November
12	NM_PRECIP_MaythruAug	-251.015	83.710	-2.999	Precipitation inches (May, June, July, August)
13	Bin1004	-2333.063	1079.752	-2.161	Binary variable October 2004=1, otherwise=0
14	Bin0614	-2736.619	1142.146	-2.396	Binary variable June 2014=1, otherwise=0
15	AR(1)	0.804	0.043	18.555	First order autoregressive term

16	Model Statistics	
17	Iterations	6
18	Adjusted Observations	203
19	Deg. of Freedom for Error	189
20	R-Squared	0.846
21	Adjusted R-Squared	0.835
22	AIC	14.509
23	BIC	14.737
24	F-Statistic	
25	Prob (F-Statistic)	
26	Log-Likelihood	-1,746.71
27	Model Sum of Squares	1,944,194,077.03
28	Sum of Squared Errors	353,807,263.21
29	Mean Squared Error	1,871,996.10
30	Std. Error of Regression	1,368.21
31	Mean Abs. Dev. (MAD)	1,005.75
32	Mean Abs. % Err. (MAPE)	6.91%
33	Durbin-Watson Statistic	2.185
34	Durbin-H Statistic	
35	Ljung-Box Statistic	36.05
36	Prob (Ljung-Box)	0.0542
37	Skewness	-0.028
38	Kurtosis	3.527
39	Jarque-Bera	2.375
40	Prob (Jarque-Bera)	0.3050

Southwestern Public Service Company

Regression Models and Associated Statistics

Wholesale Tri County

Line No.	Variable	Coefficient	StdErr	T-Stat	Definition
2	CGCP_TRI	17.731	0.600	29.566	Real Gross County Product Tri County
3	H65_cal_AMAR_TX_Jan	3.243	0.382	8.494	Heating degree days (Jan) Amarillo TX
4	H65_cal_AMAR_TX_Dec	3.894	0.373	10.443	Heating degree days (Dec) Amarillo TX
5	C65_cal_AMAR_TX_May	9.982	2.451	4.072	Cooling degree days (May) Amarillo TX
6	C65_cal_AMAR_TX_Jun	13.773	0.988	13.940	Cooling degree days (June) Amarillo TX
7	C65_cal_AMAR_TX_Jul	18.270	0.809	22.586	Cooling degree days (July) Amarillo TX
8	C65_cal_AMAR_TX_Aug	19.124	0.860	22.250	Cooling degree days (August) Amarillo TX
9	C65_cal_AMAR_TX_Sep	12.254	1.594	7.689	Cooling degree days (September) Amarillo TX
10	Bin0706	-9608.171	1080.419	-8.893	Binary variable July 2006=1, otherwise=0
11	Bin0615	5212.141	1068.729	4.877	Binary variable June 2015=1, otherwise=0
12	AR(1)	0.549	0.067	8.169	First order autoregressive term
13	AR(2)	0.341	0.066	5.203	Second order autoregressive term
14	SAR(1)	0.128339078	0.043668	2.939	First order seasonal autoregressive term

15	**Model Statistics**	
16	Iterations	18
17	Adjusted Observations	202
18	Deg. of Freedom for Error	189
19	R-Squared	0.926
20	Adjusted R-Squared	0.921
21	AIC	14.415
22	BIC	14.628
23	F-Statistic	
24	Prob (F-Statistic)	
25	Log-Likelihood	-1,729.52
26	Model Sum of Squares	4,021,636,279.39
27	Sum of Squared Errors	323,394,957.88
28	Mean Squared Error	1,711,084.43
29	Std. Error of Regression	1,308.08
30	Mean Abs. Dev. (MAD)	955.75
31	Mean Abs. % Err. (MAPE)	3.32%
32	Durbin-Watson Statistic	2.003
33	Durbin-H Statistic	
34	Ljung-Box Statistic	44.71
35	Prob (Ljung-Box)	0.0063
36	Skewness	0.209
37	Kurtosis	3.840
38	Jarque-Bera	7.405
39	Prob (Jarque-Bera)	0.0247

Southwestern Public Service Company

Regression Models and Associated Statistics

Wholesale WTMPA

Line No.	Variable	Coefficient	StdErr	T-Stat	Definition
2	CONST	186528.997	4605.638	40.500	Constant term
3	CGSP_TX	0.006	0.003	1.832	Real Gross State Product TX
4	H65_cal_LUBB_TX_Jan	49.561	2.710	18.288	Heating degree days (Jan) Lubbock TX
5	H65_cal_LUBB_TX_Feb	18.876	3.414	5.529	Heating degree days (Feb) Lubbock TX
6	H65_cal_LUBB_TX_Mar	20.366	5.235	3.890	Heating degree days (Mar) Lubbock TX
7	H65_cal_LUBB_TX_Nov	16.437	4.738	3.469	Heating degree days (Nov) Lubbock TX
8	H65_cal_LUBB_TX_Dec	49.992	2.687	18.602	Heating degree days (Dec) Lubbock TX
9	C65_cal_LUBB_TX_May	156.937	8.384	18.718	Cooling degree days (May) Lubbock TX
10	C65_cal_LUBB_TX_Jun	178.504	4.198	42.517	Cooling degree days (Jun) Lubbock TX
11	C65_cal_LUBB_TX_Jul	200.163	3.841	52.118	Cooling degree days (Jul) Lubbock TX
12	C65_cal_LUBB_TX_Aug	212.963	4.068	52.351	Cooling degree days (Aug) Lubbock TX
13	C65_cal_LUBB_TX_Sep	195.780	7.494	26.126	Cooling degree days (Sep) Lubbock TX
14	C65_cal_LUBB_TX_Oct	181.826	25.274	7.194	Cooling degree days (Oct) Lubbock TX
15	Bin0312	19921.090	5364.851	3.713	Binary variable March 2012=1, otherwise=0
16	Bin0914	-18740.178	5419.237	-3.458	Binary variable September 2014=1, otherwise=0
17	AR(1)	0.180	0.084	2.147	First order autoregressive term

18	Model Statistics	
19	Iterations	11
20	Adjusted Observations	155
21	Deg. of Freedom for Error	139
22	R-Squared	0.981
23	Adjusted R-Squared	0.979
24	AIC	17.265
25	BIC	17.580
26	F-Statistic	472.840
27	Prob (F-Statistic)	0.0000
28	Log-Likelihood	-1,542.00
29	Model Sum of Squares	202,634,437,684.14
30	Sum of Squared Errors	3,971,210,431.58
31	Mean Squared Error	28,569,859.22
32	Std. Error of Regression	5,345.08
33	Mean Abs. Dev. (MAD)	3,914.14
34	Mean Abs. % Err. (MAPE)	1.74%
35	Durbin-Watson Statistic	1.985
36	Durbin-H Statistic	
37	Ljung-Box Statistic	20.27
38	Prob (Ljung-Box)	0.6813
39	Skewness	0.056
40	Kurtosis	3.102
41	Jarque-Bera	0.147
42	Prob (Jarque-Bera)	0.9290

Southwestern Public Service Company

Regression Models and Associated Statistics

Retail Peak Demand

Line No.	Variable	Coefficient	StdErr	T-Stat	Definition
2	MA_Retail_Sales	0.001	0.000	64.454	12-month moving average of actual total retail sales adjusted for DSM savings, sale of Lubbock assets, wind generation, and forecasted new load additions.
3	HDD_Jan_PD	8.087	1.029	7.862	Heating Degree Days, Peak Day, January Calendar Month
4	HDD_Feb_PD	7.301	0.979	7.460	Heating Degree Days, Peak Day, February Calendar Month
5	HDD_Mar_PD	5.599	1.468	3.814	Heating Degree Days, Peak Day, March Calendar Month
6	AvgTemp_SPS_Apr	3.511	0.566	6.199	Average peak day temperature for the month of April
7	AvgTemp_SPS_May	8.019	0.562	14.258	Average peak day temperature for the month of May
8	AvgTemp_SPS_Jun	10.766	0.513	21.000	Average peak day temperature for the month of June
9	AvgTemp_SPS_Jul	11.247	0.501	22.431	Average peak day temperature for the month of July
10	AvgTemp_SPS_Aug	11.487	0.516	22.281	Average peak day temperature for the month of August
11	AvgTemp_SPS_Sep	8.904	0.534	16.681	Average peak day temperature for the month of September
12	AvgTemp_SPS_Oct	3.647	0.579	6.304	Average peak day temperature for the month of October
13	HDD_Nov_PD	7.480	1.294	5.782	Heating Degree Days, Peak Day, November Calendar Month
14	HDD_Dec_PD	8.852	0.979	9.042	Heating Degree Days, Peak Day, December Calendar Month
15	AprMayJun_Precip_1WKB4	-136.574	36.612	-3.730	Sum of the number of precipitation inches in the week prior to the peak day, Calendar Months April, May, June
16	JulAugSep_Precip_1WKB4	-62.255	23.120	-2.693	Sum of the number of precipitation inches in the week prior to the peak day, Calendar Months July, August, September
17	Bin0415	-289.607	104.683	-2.767	Binary variable April 2015=1, otherwise=0
18	Bin0615	-247.371	104.939	-2.357	Binary variable June 2015=1, otherwise=0
19	AR(1)	0.329	0.071	4.655	First order autoregressive term

20	**Model Statistics**	
21	Iterations	11
22	Adjusted Observations	203
23	Deg. of Freedom for Error	185
24	R-Squared	0.939
25	Adjusted R-Squared	0.933
26	AIC	9.378
27	BIC	9.672
28	F-Statistic	
29	Prob (F-Statistic)	
30	Log-Likelihood	-1,221.90
31	Model Sum of Squares	30,681,853.83
32	Sum of Squared Errors	2,010,208.67
33	Mean Squared Error	10,865.99
34	Std. Error of Regression	104.24
35	Mean Abs. Dev. (MAD)	75.59
36	Mean Abs. % Err. (MAPE)	3.01%
37	Durbin-Watson Statistic	2.050
38	Durbin-H Statistic	
39	Ljung-Box Statistic	36.50
40	Prob (Ljung-Box)	0.0490
41	Skewness	-0.638
42	Kurtosis	4.404
43	Jarque-Bera	30.434
44	Prob (Jarque-Bera)	0.0000

Southwestern Public Service Company

Regression Models and Associated Statistics

Full Requirements Wholesale Peak Demand

Line No.	Variable	Coefficient	StdErr	T-Stat	Definition
2	REC_Sales_12MA	0.0015	0.000	46.358	12-month moving average of actual total wholesale sales
3	HDD_Jan_PD	2.1602	0.420	5.142	Heating Degree Days, Peak Day, January Calendar Month
4	HDD_Feb_PD	2.0289	0.397	5.112	Heating Degree Days, Peak Day, February Calendar Month
5	HDD_Mar_PD	1.7056	0.599	2.846	Heating Degree Days, Peak Day, March Calendar Month
6	AvgTemp_SPS_Apr	1.5280	0.233	6.549	Average peak day temperature for the month of April
7	AvgTemp_SPS_May	2.9942	0.237	12.659	Average peak day temperature for the month of May
8	AvgTemp_SPS_Jun	4.2363	0.226	18.743	Average peak day temperature for the month of June
9	AvgTemp_SPS_Jul	4.6185	0.228	20.238	Average peak day temperature for the month of July
10	AvgTemp_SPS_Aug	4.9781	0.232	21.493	Average peak day temperature for the month of August
11	AvgTemp_SPS_Sep	4.0290	0.239	16.890	Average peak day temperature for the month of September
12	AvgTemp_SPS_Oct	1.6495	0.251	6.574	Average peak day temperature for the month of October
13	HDD_Nov_PD	1.3483	0.545	2.472	Heating Degree Days, Peak Day, November Calendar Month
14	HDD_Dec_PD	2.5391	0.403	6.302	Heating Degree Days, Peak Day, December Calendar Month
15	AprthruSep_Precip_1WkB4	-32.7022	7.420	-4.408	Sum of the number of precipitation inches in the week prior to the peak day, Calendar Months April thru September
16	AR(1)	0.6195	0.057	10.774	First order autoregressive term

17	**Model Statistics**	
18	Iterations	9
19	Adjusted Observations	203
20	Deg. of Freedom for Error	188
21	R-Squared	0.931
22	Adjusted R-Squared	0.926
23	AIC	7.690
24	BIC	7.935
25	F-Statistic	
26	Prob (F-Statistic)	
27	Log-Likelihood	-1,053.63
28	Model Sum of Squares	5,202,554.65
29	Sum of Squared Errors	383,032.30
30	Mean Squared Error	2,037.41
31	Std. Error of Regression	45.14
32	Mean Abs. Dev. (MAD)	34.69
33	Mean Abs. % Err. (MAPE)	3.97%
34	Durbin-Watson Statistic	2.099
35	Durbin-H Statistic	
36	Ljung-Box Statistic	16.19
37	Prob (Ljung-Box)	0.8811
38	Skewness	0.023
39	Kurtosis	2.798
40	Jarque-Bera	0.362
41	Prob (Jarque-Bera)	0.8345

Southwestern Public Service Company

Regression Models and Associated Statistics

Golden Spread Electric Cooperative Full Requirements Peak Demand

Line No.	Variable	Coefficient	StdErr	T-Stat	Definition
2	GSEC_Sales_12MA	0.001	0.000	27.884	12 month moving average of Golden Spread sales
3	Mar_Pan_AvgPDTemp	1.986	0.446	4.453	Average Panhandle Peak Day temperature for the month of March
4	Apr_Pan_AvgPDTemp	3.701	0.343	10.775	Average Panhandle Peak Day temperature for the month of April
5	May_Pan_AvgPDTemp	4.229	0.352	12.007	Average Panhandle Peak Day temperature for the month of May
6	Jun_Pan_AvgPDTemp	5.914	0.320	18.471	Average Panhandle Peak Day temperature for the month of June
7	Jul_Pan_AvgPDTemp	7.821	0.307	25.492	Average Panhandle Peak Day temperature for the month of July
8	Aug_Pan_AvgPDTemp	7.932	0.316	25.127	Average Panhandle Peak Day temperature for the month of August
9	Sep_Pan_AvgPDTemp	4.410	0.331	13.313	Average Panhandle Peak Day temperature for the month of September
10	Oct_Pan_AvgPDTemp	0.713	0.292	2.444	Average Panhandle Peak Day temperature for the month of October
11	AprMayJun_Precip_1WkB4_Pan	-108.231	20.807	-5.202	Sum of the number of Panhandle precipitation inches in the week prior to the peak day, Calendar Months April, May, June
12	JulAugSep_1WkB4_Pan	-55.178	12.968	-4.255	Sum of the number of Panhandle precipitation inches in the week prior to the peak day, Calendar Months July, August, September
13	Bin0906	-229.042	73.830	-3.102	Binary variable September 2006=1, otherwise=0
14	Bin0614	-316.622	73.487	-4.309	Binary variable June 2014=1, otherwise=0
15	Bin0914	271.906	73.891	3.680	Binary variable September 2014=1, otherwise=0
16	Bin0916	-351.579	73.991	-4.752	Binary variable September 2016=1, otherwise=0
17	Bin0905	-184.531	73.474	-2.512	Binary variable September 2005=1, otherwise=0
18	AR(1)	0.493	0.065	7.534	First order autoregressive term

19	Model Statistics	
20	Iterations	8
21	Adjusted Observations	203
22	Deg. of Freedom for Error	186
23	R-Squared	0.928
24	Adjusted R-Squared	0.922
25	AIC	8.826
26	BIC	9.104
27	F-Statistic	
28	Prob (F-Statistic)	
29	Log-Likelihood	-1,166.92
30	Model Sum of Squares	15,157,115.40
31	Sum of Squared Errors	1,169,441.72
32	Mean Squared Error	6,287.32
33	Std. Error of Regression	79.29
34	Mean Abs. Dev. (MAD)	56.20
35	Mean Abs. % Err. (MAPE)	9.79%
36	Durbin-Watson Statistic	2.098
37	Durbin-H Statistic	
38	Ljung-Box Statistic	32.79
39	Prob (Ljung-Box)	0.1085
40	Skewness	0.903
41	Kurtosis	5.908
42	Jarque-Bera	99.135
43	Prob (Jarque-Bera)	0.0000