BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION,	
Complainant,	**Docket UE-22____**
v.	**Docket UG-22____**
PUGET SOUND ENERGY,	
Respondent.	

SECOND EXHIBIT (NONCONFIDENTIAL) TO THE
PREFILED DIRECT TESTIMONY OF

CURT D. PUCKETT

ON BEHALF OF PUGET SOUND ENERGY

JANUARY 31, 2022

Gas Load Research Analysis

Puget Sound Energy

Date of first issue: October 18, 2021
Date of this revision: January 6, 2022
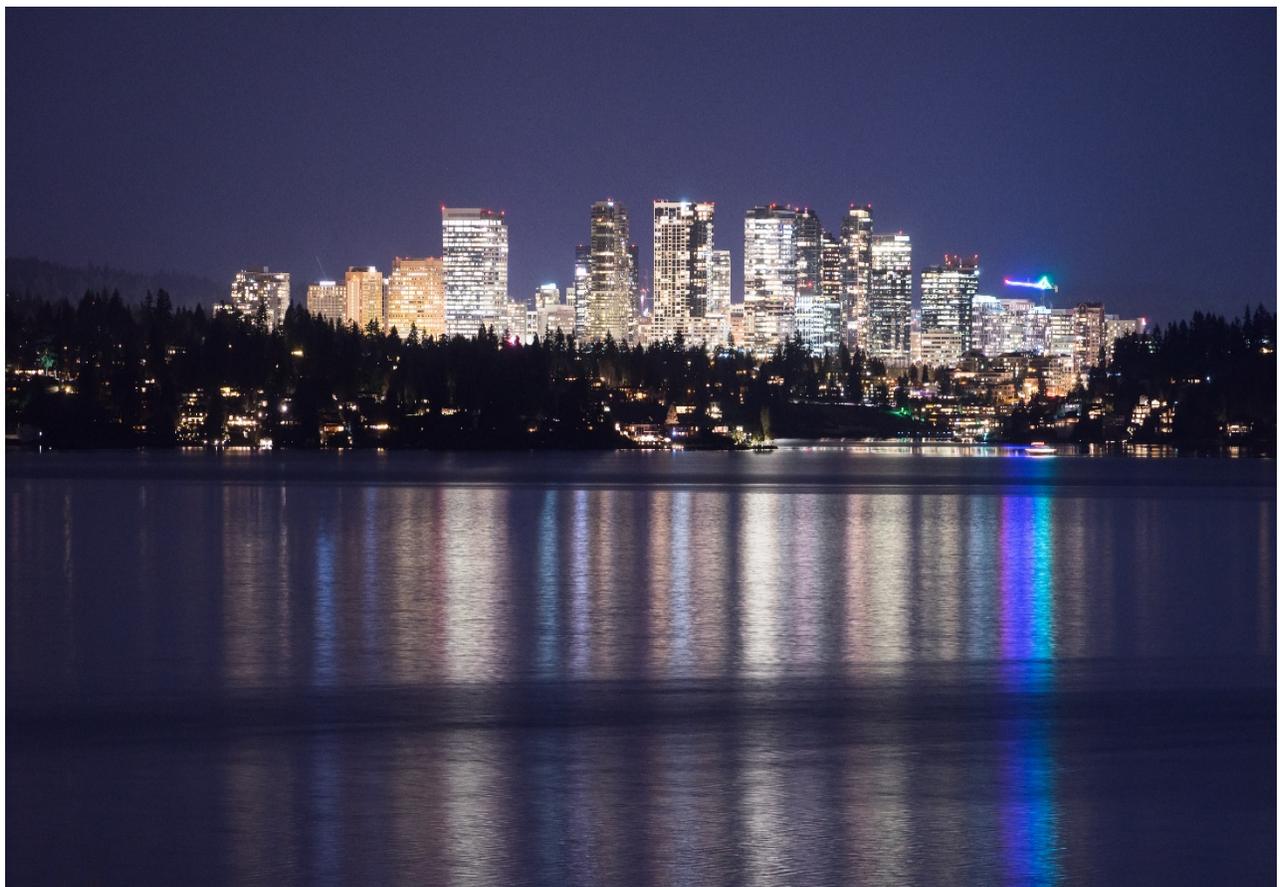
Customer Details

Customer Name: Puget Sound Energy

Customer Address: Bellevue, Washington

Customer Reference:

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About this document

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for Energy Services

Prepared by: Approved by:

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Vice President

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July 2020 – June 2021

1   EXECUTIVE SUMMARY

This study was conducted to develop daily gas load profiles for use in cost-of-service, rate design, and other internal planning activities. The analysis period was July 1, 2020 through June 30, 2021. This analysis focuses on the following gas rate classes of interest:

- SCH 23 – Residential General Service
- SCH 31 – Commercial and Industrial General Service
- SCH 31T – Distribution System Transportation Service (Firm Commercial and Industrial)
- SCH 41 – Large Volume High Load Factor
- SCH 41T – Distribution System Transportation Service (Firm-Large Volume High Load Factor)
- SCH 85 – Interruptible Gas Service with Firm Option
- SCH 85T – Distribution System Transportation Service (Interruptible with Firm Option)
- SCH 86 – Limited Interruptible Gas Service with Firm Option
- SCH 86T – Distribution System Transportation Service (Limited Interruptible with Firm Option)
- SCH 87 – Non-Exclusive Interruptible Service with Firm Option
- SCH 87T – Distribution System Transportation Service (Non-Exclusive Interruptible with Firm Option)
- Special Contracts

The analysis used daily data that were available for each rate schedule, which is about 98% of population of interest. Table EX 1 summarizes the number of accounts and the total annual usage in Therms for each rate schedule. The table is divided between Sales and Transportation domains. In addition, these statistics were reported by commercial and Industrial levels wherever appropriate. The Sales schedules represent 99.9% of the total number of accounts and 80.8% of the total annual gas usage.

Table EX 1 – Overall Summary of Rates and Domains

Schedule/Domain	Number of Accounts	Annual Use (Therms)	Average Annual Use (Therms)
Sales Customers			
23-Residential	796,281	595,407,721	748
31-Commercial	55,164	204,135,954	3,701
31-Industrial	2,216	12,661,336	5,714
41-Commercial	1,181	51,209,746	43,361
41-Industrial	70	9,735,512	139,079
85-Commercial	24	15,734,156	655,590
85-Industrial	5	3,992,016	798,403
86-Commercial	114	5,467,047	47,957
86-Industrial	4	172,847	43,212
87-Commercial	5	21,408,354	4,281,671
Sales Totals	855,064	919,924,691	1,076
Transportation Customers			
31T-Commercial	2	36,959	18,479
41T-Commercial	81	13,721,241	169,398
41T-Industrial	19	5,684,815	299,201
85T-Commercial	28	19,143,764	683,706
85T-Industrial	65	49,630,061	763,539
86T-Commercial	3	506,748	168,916
86T-Industrial	5	1,211,736	242,347
87T-Ccommercial	3	16,561,726	5,520,575
87T-Industrial	7	80,674,059	11,524,866
Special Contracts	10	31,302,307	3,130,231
Trasportation Totals	223	218,473,415	979,701
Sales & Transport Totals	855,287	1,138,398,105	1,331

Figure EX 1 presents vertical EnergyPrints that display the total daily use of each Sales schedule. The EnergyPrint displays day of year on the y-axis and the daily use as a color gradient with low levels of load in the black to blue spectrum and high levels of load in the yellow to white spectrum. The EnergyPrints present a "helicopter" view of the data providing a perspective on the average weekday, average weekend, and seasonality of the load. The EnergyPrints start on July 1, 2020 and present the daily use throughout the study period ending on June 30, 2021. In this figure, we present the average daily temperature, followed by the PSE system load and each of the rate Sales class schedule loads beginning with Schedule 23 Residential. Schedules 23- Residential and 31- General Service loads mimic the system load characteristics. The remaining classes are slightly different with Schedule 85 being the most different from the system load. Schedule 85 show much higher more consistent use during the summer months. In addition, the dark lines throughout show the lower loads experienced by this class on weekends.

Figure EX 1 – Sales Schedule Loads
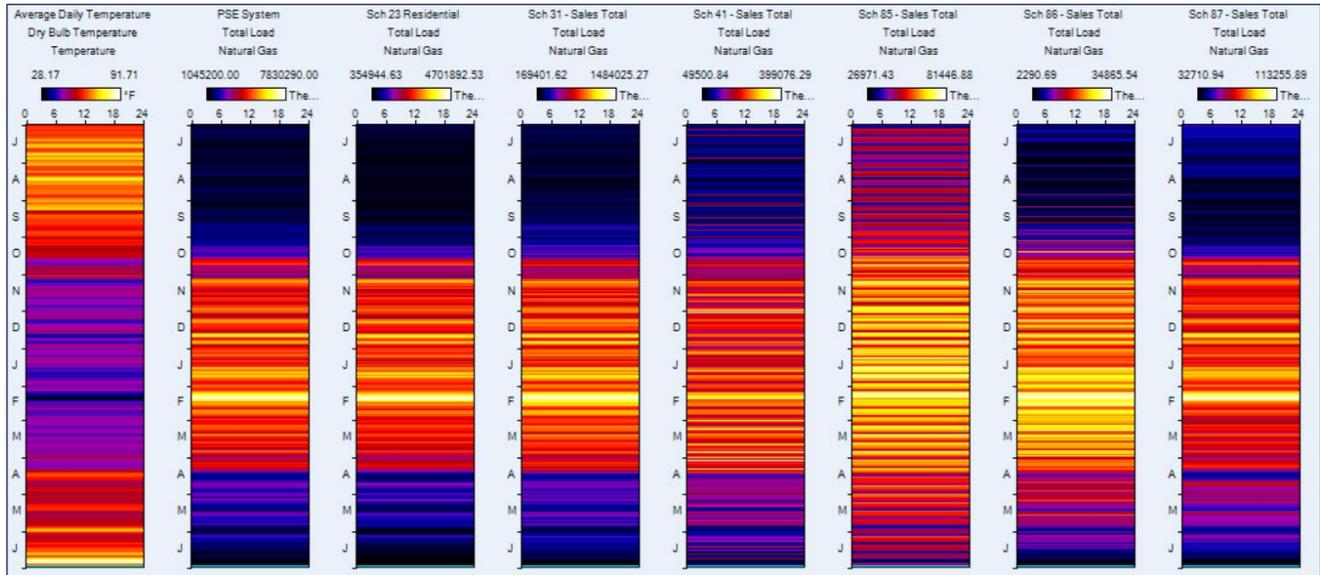
Figure EX 2 presents the vertical EnergyPrints for the Transportation schedules. Once again, we present the average daily temperature, the PSE system load, followed by the various transportation schedules. Here, most of the schedules show a substantial difference when compared to the System load. Schedules 41Transportation, 85 Transportation, and 87 Transportation show consistently higher weekday load throughout the year when compared to the system load. In general, the transportation loads have higher and more consistent load when compared to their Sales counterparts.

Figure EX 2 – Transportation Schedule Loads
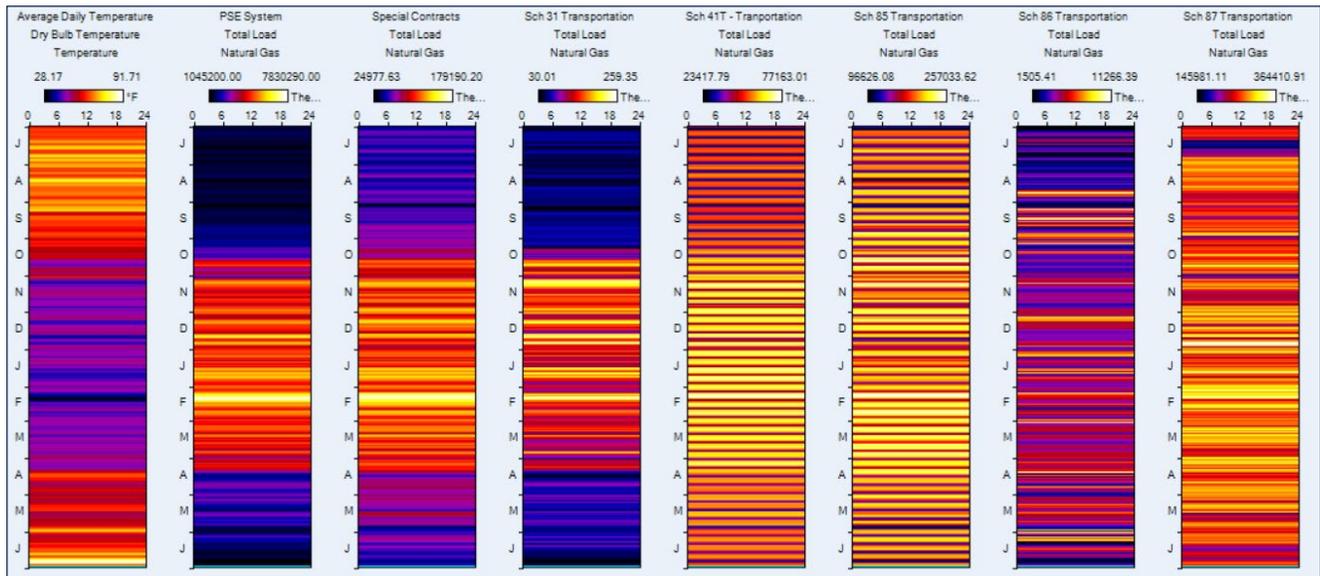
Table EX 2 summarizes the annual use, average daily use, annual class peak date, annual class peak demand, load factor, class demand at the time of the system peak, system peak load factor and coincidence factor. Schedule 23-Residential dominates, accounting for 65% of the total annual therm use and an even higher portion (78%) of the system peak demand.

Schedules 31, 31T, and 87 are coincident with the system peak. Schedules 23, 85, 86, and special contracts have a coincidence factor above 90%. Schedule 86T has the lowest coincidence with the system load calculated at 49%.

Table EX 2 – Summary of Results

Schedule	Annual Use (Therms)	Average Daily Use (Therms)	Non-Coincident (Class Peak) Date	Non-Coincident (Class Peak) Demand (Therms)	Non-Coincident Load Factor	Coincident (System Peak), Friday February 12, 2021 — Class Demand (Therms)	Load Factor (%)	Coincidence Factor
Sales								
23	595,407,721	1,631,254	Saturday, February 13, 2021	4,701,893	34.7%	4,554,816	35.8%	96.9%
31	216,797,290	593,965	Friday, February 12, 2021	1,484,025	40.0%	1,484,025	40.0%	100.0%
41	60,945,259	166,973	Monday, April 5, 2021	399,076	41.8%	325,801	51.3%	81.6%
85	19,726,173	54,044	Monday, January 25, 2021	81,447	66.4%	74,777	72.3%	91.8%
86	5,639,894	15,452	Thursday, February 18, 2021	34,866	44.3%	34,341	45.0%	98.5%
87	21,408,354	58,653	Friday, February 12, 2021	113,256	51.8%	113,256	51.8%	100.0%
Sales Totals	919,924,691	2,520,342	Saturday, February 13, 2021	6,664,543	37.8%	6,587,016	38.3%	98.8%
Transportation								
31T	36,959	101	Friday, February 12, 2021	259	39.0%	259	39.0%	100.0%
41T	19,406,055	53,167	Wednesday, February 10, 2021	77,163	68.9%	63,221	84.1%	81.9%
85T	68,773,825	188,421	Wednesday, February 10, 2021	257,034	73.3%	208,613	90.3%	81.2%
86T	1,718,484	4,708	Wednesday, September 9, 2020	11,266	41.8%	5,536	85.0%	49.1%
87T	97,235,785	266,399	Thursday, February 11, 2021	364,411	73.1%	319,744	83.3%	87.7%
Special Contracts	31,302,307	85,760	Thursday, February 11, 2021	179,190	47.9%	166,407	51.5%	92.9%
Transportation Totals	218,473,415	598,557	Thursday, February 11, 2021	859,548	69.6%	763,781	78.4%	88.9%

Puget Sound Energy
Gas Load Research Analysis
Daily Load Profiles

2 INTRODUCTION

DNV was hired to support Puget Sound Energy ("PSE") staff in the development of daily gas load profiles for use in cost-of-service, rate design, and other internal planning activities. The analysis period was July 1, 2020 through June 30, 2021. This analysis used daily data available at PSE and focused on the following gas rate classes of interest:

- SCH 23 – Residential General Service
- SCH 31 – Commercial and Industrial General Service
- SCH 31T – Distribution System Transportation Service (Firm Commercial and Industrial)
- SCH 41 – Large Volume High Load Factor
- SCH 41T – Distribution System Transportation Service (Firm-Large Volume High Load Factor)
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- SCH 85T – Distribution System Transportation Service (Interruptible with Firm Option)
- SCH 86 – Limited Interruptible Gas Service with Firm Option
- SCH 86T – Distribution System Transportation Service (Limited Interruptible with Firm Option)
- SCH 87 – Non-Exclusive Interruptible Service with Firm Option
- SCH 87T – Distribution System Transportation Service (Non-Exclusive Interruptible with Firm Option)
- Special Contracts

To gain greater insight, the class domains, i.e., commercial, industrial, and sales and Transportation components, are analyzed and reported on separately.

3 DAILY ANALYSIS OVERVIEW

3.1 Analysis Overview

The analysis begins by identifying the population frame of interest. This is accomplished by securing billing information on the full complement of customers on each of the rate schedules and domains of interest. This is followed by securing all available daily gas use data for all of these customers. While we expect the daily data to be available for most of the population, there are instances where the daily data will not be available due to a variety of reasons like equipment and communication failures as well as customers with manual reads that do not show up in the daily data stream. To maximize the amount of data available for analysis, the project team ran the daily data through a verification, editing and estimation (VEE) process that includes:

- Meter to bill comparison,
- Spike checks,
- Missing intervals check, and
- Weather modelling to fill in missing data.

Next, we use the available data in classic load research analysis framework to extrapolate the sample to the full population of interest. This starts by matching the available sample data to the various schedules and domains of interest to create case weights for use in the analysis. Case weights are simply the number of customers in the population represented by each sample point. In an ideal world, the case weights will be at or near 1.0. Next, the case weights are applied to estimate daily use for each class-domain. The estimated daily loads are then trued up to the official annual sales totals to get the final daily load profiles. This weighted analysis yields the best estimate of the daily total for each domain that are rolled up to the classes of interest. Finally, the total number of customers are used to create the best estimate of average daily use for use in further analysis and reporting. Classic load research statistics are calculated for each daily estimated load profiles including the total load and mean load.

3.2   Population Frame

To construct a population frame for the analysis, the monthly billing data for the full population identified above were used. Table 1 presents a summary of the population data used in the analysis by rate schedule. Note, several of the rate schedules have a commercial domain, an industrial domain and corresponding Transportation domains. There are eleven rate schedules and twenty domains of interest covered in this study.

The following summarizes the findings from Table 1.

- Schedule 23 (Residential) contains nearly 93% of the total number of accounts and consumes 52% of the total annual gas usage. The average residential annual use is calculated to be 748 therms.

- Schedule 31 (General Service) contains nearly 7% of the total number of accounts and consumes just over 19% of the total gas usage. There are two Transportation customers on this rate with relatively modest usage. This schedule is dominated by commercial customers accounting for 96% of the overall schedule use. The average Schedule 31 customer uses 3,779 therms per year.

- Schedule 41 (Large Volume High Load Factor) contains 1,350 customers with an average annual use of 59,475 therms. These customers account for approximately 7% of the total annual gas usage. Commercial customers represent 87% of the accounts and nearly 64% of the total therms use of this schedule.

- Schedule 85 (Interruptible Gas Service with Firm Option) contains just 122 accounts with an average annual gas usage of over 725,000 therms. There are 93 Transportation customers with an average annual gas usage more than 739,503 therms. In aggregate this schedule represents nearly 8% of the total annual gas usage.

- Schedule 86 (Limited Interruptible Gas Service with Firm Option) contains just under 126 accounts with an average annual gas usage of 58,400 therms. This schedule is dominated by commercial customers accounting for 91% of all accounts and 74% of the total annual consumption

- Schedule 87 (Non-Exclusive Interruptible Service with Firm Option) contains relatively few very large accounts with an average annual use of 7.9 million therms. This class is dominated by ten Transportation customers.

Table 1 – Population Frame Characteristics[1]

Schedule/Domain	Number of Accounts	% of Schedule Accounts	% of Total Accounts	Annual Use (Therms)	% of Schedule Use	% of Total Use	Average Annual Use (Therms)
23-Residential	796,281	100.00%		595,407,721	100.00%		748
Schedule 23 Total	796,281	100.00%	93.10%	595,407,721	100.00%	52.30%	748
31-Commercial	55,164	96.13%		204,135,954	94.14%		3,701
31-Industrial	2,216	3.86%		12,661,336	5.84%		5,714
Schedule 31 Sales Total	57,380	100.00%	6.71%	216,797,290	99.98%	19.04%	3,778
31T-Commercial	2	0.00%		36,959	0.02%		18,479
Schedule 31 Transportation Total	2	0.00%	0.00%	36,959	0.02%	0.00%	18,479
Schedule 31 Total	57,382	100.00%	6.71%	216,834,249	100.00%	19.05%	3,779
41-Commercial	1,181	87.42%		51,209,746	63.73%		43,361
41-Industrial	70	5.18%		9,735,512	12.12%		139,079
Schedule 41 Sales Total	1,251	92.60%	0.15%	60,945,259	75.85%	5.35%	48,717
41T-Commercial	81	6.00%		13,721,241	17.08%		169,398
41T-Industrial	19	1.41%		5,684,815	7.07%		299,201
Schedule 41 Transportation Total	100	7.40%	0.01%	19,406,055	24.15%	1.70%	194,061
Schedule 41 Total	1,351	100.00%	0.16%	80,351,314	100.00%	7.06%	59,475
85-Commercial	24	19.67%		15,734,156	17.78%		655,590
85-Industrial	5	4.10%		3,992,016	4.51%		798,403
Schedule 85 Sales Total	29	23.77%	0.00%	19,726,173	22.29%	1.73%	680,213
85T-Commercial	28	22.95%		19,143,764	21.63%		683,706
85T-Industrial	65	53.28%		49,630,061	56.08%		763,539
Schedule 85 Transportation Total	93	76.23%	0.01%	68,773,825	77.71%	6.04%	739,503
Schedule 85 Total	122	100.00%	0.01%	88,499,998	100.00%	7.77%	725,410
86-Commercial	114	90.48%		5,467,047	74.30%		47,957
86-Industrial	4	3.17%		172,847	2.35%		43,212
Schedule 86 Sales Total	118	93.65%	0.01%	5,639,894	76.65%	0.50%	47,796
86T-Commercial	3	2.38%		506,748	6.89%		168,916
86T-Industrial	5	3.97%		1,211,736	16.47%		242,347
Schedule 86 Transportation Total	8	6.35%	0.00%	1,718,484	23.35%	0.15%	214,811
Schedule 86 Total	126	100.00%	0.01%	7,358,379	100.00%	0.65%	58,400
87-Commercial	5	33.33%		21,408,354	18.04%		4,281,671
Schedule 87 Sales Total	5	33.33%	0.00%	21,408,354	18.04%	1.88%	4,281,671
87T-Ccommercial	3	20.00%		16,561,726	13.96%		5,520,575
87T-Industrial	7	46.67%		80,674,059	68.00%		11,524,866
Schedule 87 Transportation Total	10	66.67%	0.00%	97,235,785	81.96%	8.54%	9,723,578
Schedule 87 Total	15	100.00%	0.00%	118,644,138	100.00%	10.42%	7,909,609
Special Contracts	10	100.00%		31,302,307	100.00%		3,130,231
Special Contracts Total	10	100.00%	0.00%	31,302,307	100.00%	2.75%	3,130,231
All Sales & Transportation Schedule Totals	855,287		100.00%	1,138,398,105		100.00%	1,331

3.3 Available Sample Data and Associated Case Weights

The project used daily data available for the full complement of customers for the period July 1, 2020 through June 30, 2021. In the best of worlds, data would be available for all customers contained in the population frame. Unfortunately, the real world often results in a reduced set of data. Data are not captured for a variety of reasons including metrology, communication issues, outages or equipment failure. Prior to analysis, the available sample data are subjected to a series of quality checks. This is termed the validation, editing and estimation (VEE) process. Appendix A provides additional detail on the VEE process checks. During the VEE process some sites were removed based on specific criterion established that included:

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[1] For Sales the number of accounts are based on device location and for Transportation the number of accounts are based on installation number.

- Required to have data for at least 50% of the days,

- Required to have data in the analysis year,

- Required to have data in the last six-months, and

- Required to have positive consumption.

Table 2 and Table 3 present a summary of the daily data available for this analysis after VEE. Table 2 summarizes the data available for the Sales customers and Table 3 summarizes the data available for the Transportation customers. These tables show population counts, the number of customers with available daily data, and the percentage of data that are available and used in the analysis. It is important to note that in load research relatively modest sized stratified samples are often used to represent classes that are many times larger. For example, it is not uncommon to see the residential class represented by a stratified sample of just 300 or so sample points. For this analysis, we have nearly 99% of all residential customers represented or a sample of 787,104 accounts. In the table, we have highlighted the domain representing most of the total therms use of the schedule to highlight the excellent coverage we have for the aggregate schedules. For some of the larger rates, data are managed manually outside the PSE standard AMR/AMI metering system. And for these, currently, daily data are not available.

The analysis approach uses a classic load research methodology detailed in Appendix A – Analysis Approach. We are leveraging the daily information known for the sample of customers with other correlated information, e.g., monthly, seasonal, or annual billing data that is known for the full population of customers. Classically, we would stratify the population and map the sample customers into the stratification schema based on annual usage. Since we have most of the customers from the population represented in the sample (over 90 %), we have used a simple methodology to construct the case weights where the case weights are the number of customers in the population represented by each sample point. The case weights for each analysis class have been included in the associated tables and most are around 1.0. Schedule 87 commercial had only one of five accounts with available data. For the daily load profile of this schedule, we leveraged the daily allocation from their Transportation counterpart to create the allocation.

Table 2 – Sales Accounts with Available Daily Data and Associated Case Weights

Schedule/Domain	Number of Accounts (N)	Available Daily Data (n)	Percentage of Data Available	Case Weight (N/n)
23-Residential	796,281	787,104		1.01
Schedule 23 Total	796,281	787,104	98.8%	
31-Commercial	55,164	52,111		1.06
31-Industrial	2,216	2,105		1.05
Schedule 31 Sales Total	57,380	54,216	94.5%	
41-Commercial	1,181	1,170		1.01
41-Industrial	70	68		1.03
Schedule 41 Sales Total	1,251	1,238	99.0%	
85-Commercial	24	24		1.00
85-Industrial	5	4		1.21
Schedule 85 Sales Total	29	28	97.2%	
86-Commercial	114	114		1.00
86-Industrial	4	2		2.00
Schedule 86 Sales Total	118	116	98.3%	
87-Commercial	5	1		5.00
Schedule 87 Sales Total	5	1	20.0%	
Sales Totals	855,063	842,703	98.6%	

Table 3 – Transportation Accounts with Available Daily Data and Associated Case Weights

Schedule/Domain	Number of Accounts (N)	Available Daily Data (n)	Percentage of Data Available	Case Weight (N/n)
31T-Commercial	2	2		1.00
Schedule 31 Transportation Total	2	2	100.0%	
41T-Commercial	81	81		1.00
41T-Industrial	19	18		1.04
Schedule 41 Transportation Total	100	99	99.2%	
85T-Commercial	28	27		1.03
85T-Industrial	65	63		1.03
Schedule 85 Transportation Total	93	90	97.0%	
86T-Commercial	3	3		1.00
86T-Industrial	5	5		1.00
Schedule 86 Transportation Total	8	8	100.0%	
87T-Commercial	3	3		1.00
87T-Industrial	7	7		1.00
Schedule 87 Transportation Total	10	10	100.0%	
Special Contracts	10	10		1.00
Special Contracts	10	10	100.0%	
Transportation Totals	222	219	98.4%	

4 DAILY ANALYSIS

In this section we present the results of our analyses by each rate schedule. We begin with a look at the overall gas system load followed by each rate schedule.

4.1 System Load

Figure 1 presents the PSE System gas load plotted against temperature. The figure to the left is a vertical EnergyPrint which displays the time on the x-axis, the day of the year on the y-axis and the magnitude of load as a color gradient with low levels of load in the black to blue spectrum and high levels of load in the yellow to white spectrum. In the two-dimensional graph to the right, the daily gas system load is plotted in blue and the average daily temperature is plotted in red. The data goes from July 1, 2020 through June 30, 2021. During this period the system peaked at approximately 7,830,290 Therms on Friday, February 12, 2021. On this day the average outside temperature was 29.6°F.

Table 4 presents the monthly demand and energy usage for the system. The table presents the month, the date of the system peak, the peak demand, the total monthly use, the load factor and the coincidence factor based on the annual system peak. The monthly load factor ranges from a low of 55.8% in October to a high of 86.8% in August. The annual load factor for the system is 40%.

Figure 1 – System Load
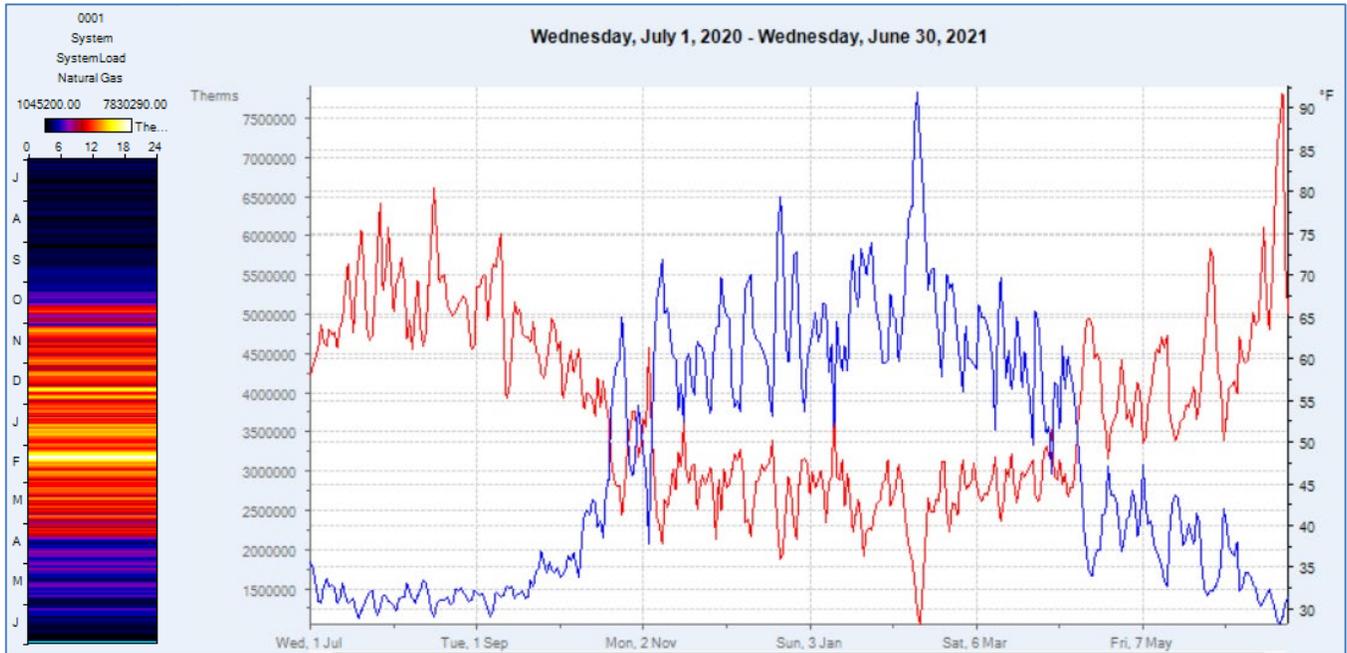
Table 4 – System Load Characteristics

Month	Date of Daily Coincident (System Peak) Demand	Maximum Day Use (Therms)	Total Monthly Use (Therms)	Load Factor (%)	Coincidence Factor (%)
July	Wednesday, July 1, 2020	1,841,520	43,622,760	76.4%	23.5%
August	Wednesday, August 12, 2020	1,603,050	43,122,750	86.8%	20.5%
September	Friday, September 25, 2020	1,979,180	45,352,400	76.4%	25.3%
October	Sunday, October 25, 2020	4,957,040	85,800,800	55.8%	63.3%
November	Monday, November 9, 2020	5,693,630	128,155,000	75.0%	72.7%
December	Wednesday, December 23, 2020	6,502,550	149,854,430	74.3%	83.0%
January	Tuesday, January 26, 2021	5,904,570	151,272,250	82.6%	75.4%
February	Friday, February 12, 2021	7,830,290	152,921,270	69.7%	100.0%
March	Monday, March 15, 2021	5,470,810	138,877,200	81.9%	69.9%
April	Wednesday, April 7, 2021	4,586,340	89,092,350	64.8%	58.6%
May	Friday, May 7, 2021	3,079,790	68,710,980	72.0%	39.3%
June	Sunday, June 6, 2021	2,515,030	47,332,190	62.7%	32.1%
12-Month Ending	Friday, February 12, 2021	7,830,290	1,144,114,380	40.0%	100.0%

Figure 2 presents the system load during the system peak week. The table presents the system load and the average outdoor temperature. The gas system peaked on Friday, February 12, 2021. During the week of system peak, load ranged from 5.82 million therms to the peak of 7.83 million therms.   .

Figure 2 – Coincident (System) Peak Week
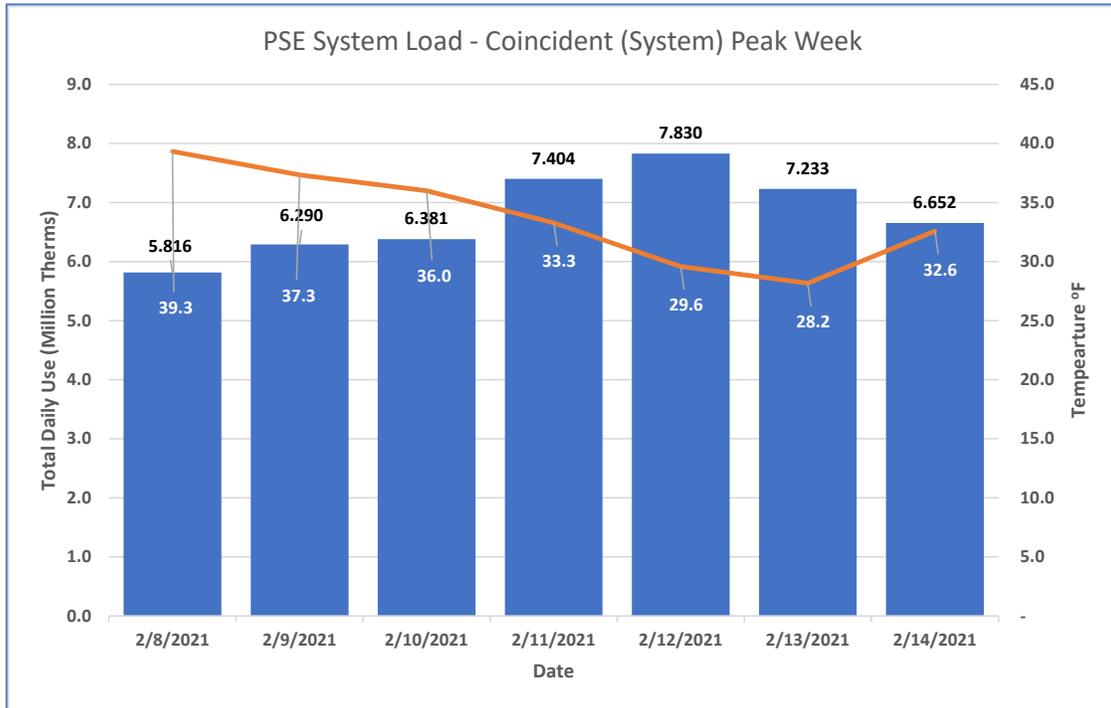
Figure 3 presents the daily load plotted against average daily temperature showing significant temperature sensitivity.

Figure 3 – Temperature Sensitivity of System Load
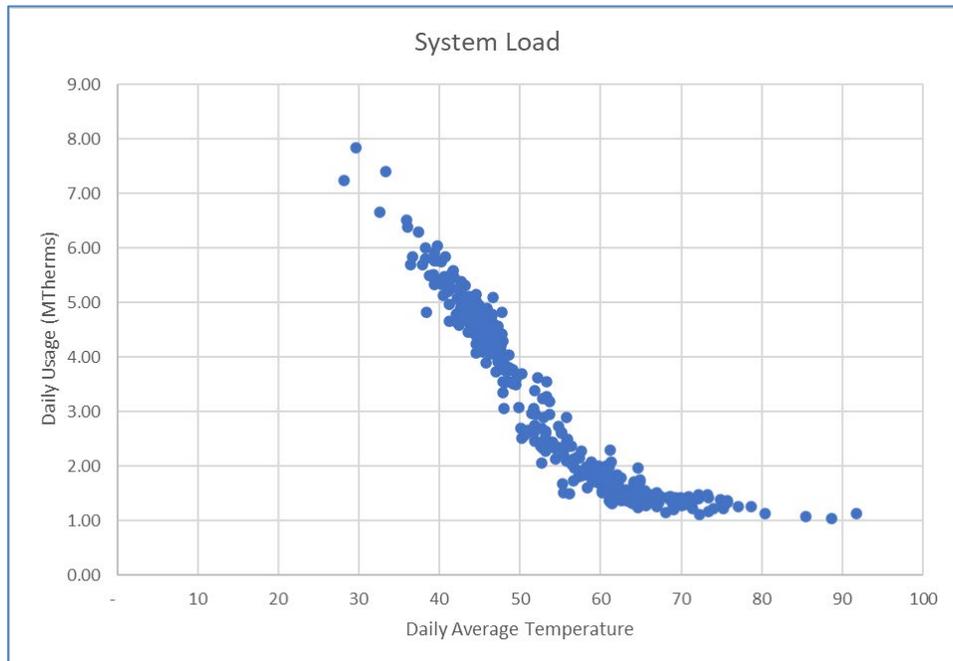
4.2   Schedule 23 – Residential

Table 5 presents a high-level summary of Schedule 23 – Residential load. This class is comprised of 796,281 accounts with a total annual usage of 595.408 million therms. The average annual usage per account is 748 therms.

Table 5 – Schedule 23: Billing Summary

Rate/Domain	Accounts	Total Annual Usage (Therms)	Average Annual Usage (Therms)
23 Residential	796,281	595,407,721	748

Figure 4 presents the daily profile of Schedule 23: Residential customers. The total Schedule 23 load is plotted in blue with the average daily temperature plotted in red. Clearly, the total daily gas use is highly weather sensitive with the peak usage corresponding to the coldest day. The peak of 4.70 million therms occurred one day after the system peak day on February 13, 2021 with a corresponding average daily temperature of 28.2°F. The daily demand on the system peak day was 4.55 million therms with a coincidence factor of 97%.

Figure 4 – Schedule 23 Residential: Total Daily Use
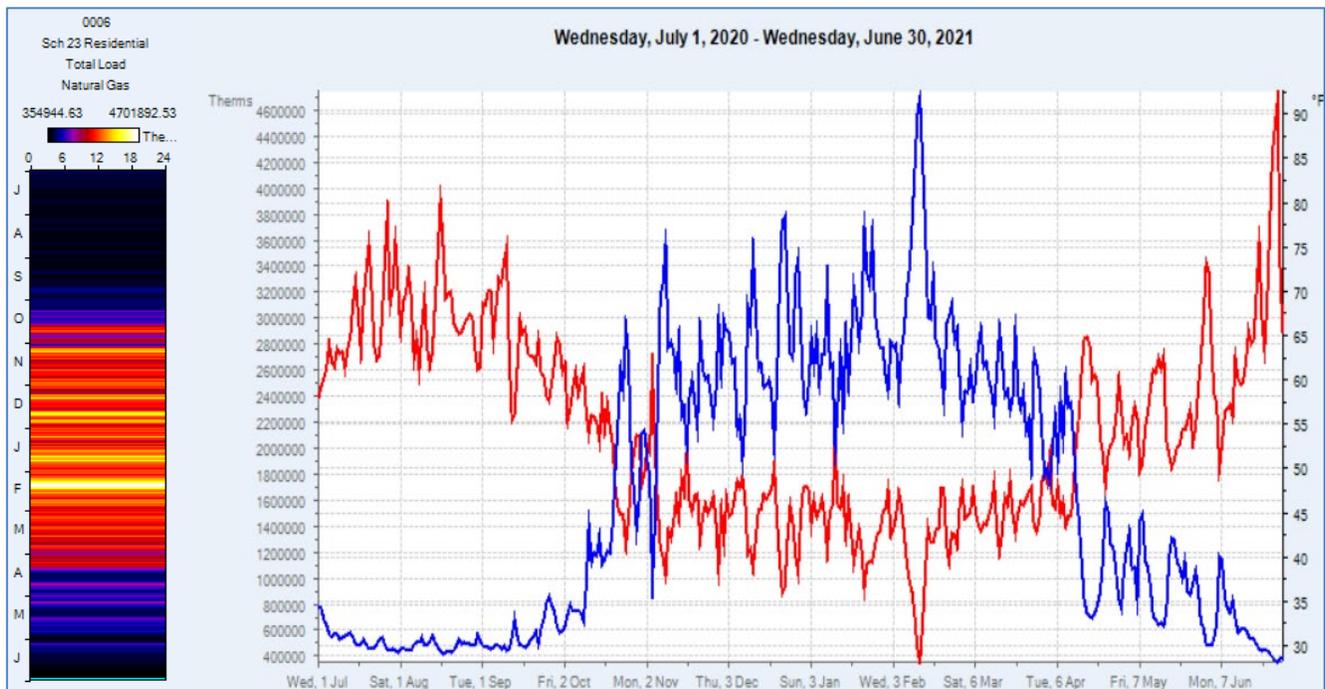
Table 6 presents selected monthly characteristics of Schedule 23: Residential load on a total class basis. The information includes monthly use, average daily use, date of class peak, class peak demand, load factor based on the class peak, date of the system peak, system peak demand, load factor based on the system peak and the monthly coincidence factor. The residential class peaked on a weekend in seven of the 12 months and was coincident with the system peak on five of the 12 months. The monthly class peak load factor ranged from a low of 47% to a high of 85% with an annual load factor of 35%.

Table 6 – Schedule 23 Residential: Total Use Characteristics

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident Peaks				Coincident Peaks			Coincidence Factor
			Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load Factor		Coincident System Peak Date	Coincident Class Demand	Coincident Load Factor	
Jul	16,564,581	534,341	Thursday, July 2, 2020	767,603	69.6%		Wednesday, July 1, 2020	767,408	69.6%	100.0%
Aug	14,928,980	481,580	Sunday, August 30, 2020	572,824	84.1%		Wednesday, August 12, 2020	514,722	93.6%	89.9%
Sep	16,710,729	557,024	Saturday, September 26, 2020	855,249	65.1%		Friday, September 25, 2020	805,879	69.1%	94.2%
Oct	43,015,053	1,387,582	Sunday, October 25, 2020	2,931,271	47.3%		Sunday, October 25, 2020	2,931,271	47.3%	100.0%
Nov	73,485,895	2,449,530	Monday, November 9, 2020	3,566,807	68.7%		Monday, November 9, 2020	3,566,807	68.7%	100.0%
Dec	86,413,650	2,787,537	Thursday, December 24, 2020	3,778,197	73.8%		Wednesday, December 23, 2020	3,748,912	74.4%	99.2%
Jan	87,169,943	2,811,934	Saturday, January 23, 2021	3,710,934	75.8%		Tuesday, January 26, 2021	3,642,429	77.2%	98.2%
Feb	87,743,653	3,133,702	Saturday, February 13, 2021	4,701,893	66.6%		Friday, February 12, 2021	4,554,816	68.8%	96.9%
Mar	76,798,298	2,477,364	Monday, March 15, 2021	2,917,183	84.9%		Monday, March 15, 2021	2,917,183	84.9%	100.0%
Apr	44,185,874	1,472,862	Friday, April 9, 2021	2,534,221	58.1%		Wednesday, April 7, 2021	2,367,832	62.2%	93.4%
May	30,886,883	996,351	Saturday, May 8, 2021	1,491,586	66.8%		Friday, May 7, 2021	1,448,907	68.8%	97.1%
Jun	17,504,181	583,473	Sunday, June 6, 2021	1,175,244	49.6%		Sunday, June 6, 2021	1,175,244	49.6%	100.0%
12-Mths	595,407,721	1,631,254	Saturday, February 13, 2021	4,701,893	34.7%		Friday, February 12, 2021	4,554,816	35.8%	96.9%

Figure 5 presents the same information on a per customer basis. The average peak demand was estimated to be 5.90 therms.

Figure 5 – Schedule 23 Residential: Mean Daily Use
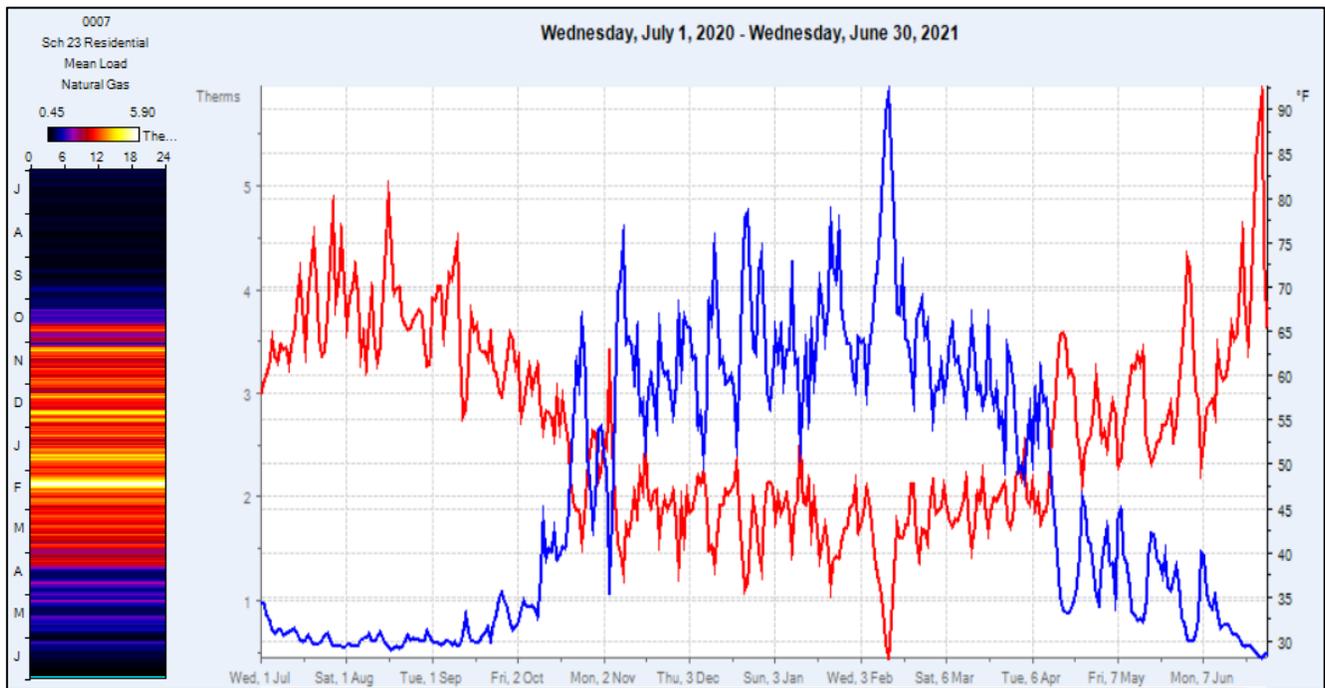
Table 7 presents the same information as Table 6 only on a per customer basis. The average monthly use ranges from a low of 19 therms to a high of 110 therms. Average daily use in the winter was approximately 3.5 times higher than the average daily use in the summer.

Table 7 – Schedule 23 Residential: Mean Use Characteristics

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident Peaks			Coincident Peaks			Coincidence Factor
			Non-Coincident (Class Peak) Date	Class Peak Demand	Non-Coincident Load	Coincident System Peak Date	Coincident Class Demand	Coincident Load Factor	
Jul	20.8	0.67	Thursday, July 2, 2020	0.96	69.6%	Wednesday, July 1, 2020	0.96	69.6%	100.0%
Aug	18.7	0.60	Sunday, August 30, 2020	0.72	84.1%	Wednesday, August 12, 2020	0.65	93.6%	89.9%
Sep	21.0	0.70	Saturday, September 26, 2020	1.07	65.1%	Friday, September 25, 2020	1.01	69.1%	94.2%
Oct	54.0	1.74	Sunday, October 25, 2020	3.68	47.3%	Sunday, October 25, 2020	3.68	47.3%	100.0%
Nov	92.3	3.08	Monday, November 9, 2020	4.48	68.7%	Monday, November 9, 2020	4.48	68.7%	100.0%
Dec	108.5	3.50	Thursday, December 24, 2020	4.74	73.8%	Wednesday, December 23, 2020	4.71	74.4%	99.2%
Jan	109.5	3.53	Saturday, January 23, 2021	4.66	75.8%	Tuesday, January 26, 2021	4.57	77.2%	98.2%
Feb	110.2	3.94	Saturday, February 13, 2021	5.90	66.6%	Friday, February 12, 2021	5.72	68.8%	96.9%
Mar	96.4	3.11	Monday, March 15, 2021	3.66	84.9%	Monday, March 15, 2021	3.66	84.9%	100.0%
Apr	55.5	1.85	Friday, April 9, 2021	3.18	58.1%	Wednesday, April 7, 2021	2.97	62.2%	93.4%
May	38.8	1.25	Saturday, May 8, 2021	1.87	66.8%	Friday, May 7, 2021	1.82	68.8%	97.1%
Jun	22.0	0.73	Sunday, June 6, 2021	1.48	49.6%	Sunday, June 6, 2021	1.48	49.6%	100.0%
12-Mths	747.7	2.05	Saturday, February 13, 2021	5.90	34.7%	Friday, February 12, 2021	5.72	35.8%	96.9%

Figure 6 presents the daily demand and temperature for the peak week February 8, 2021 through February 14, 2021. The class peak occurred one day after the system peak on Friday, February 12, 2021.

Figure 6 – Schedule 23 Residential: System Peak Week Demand
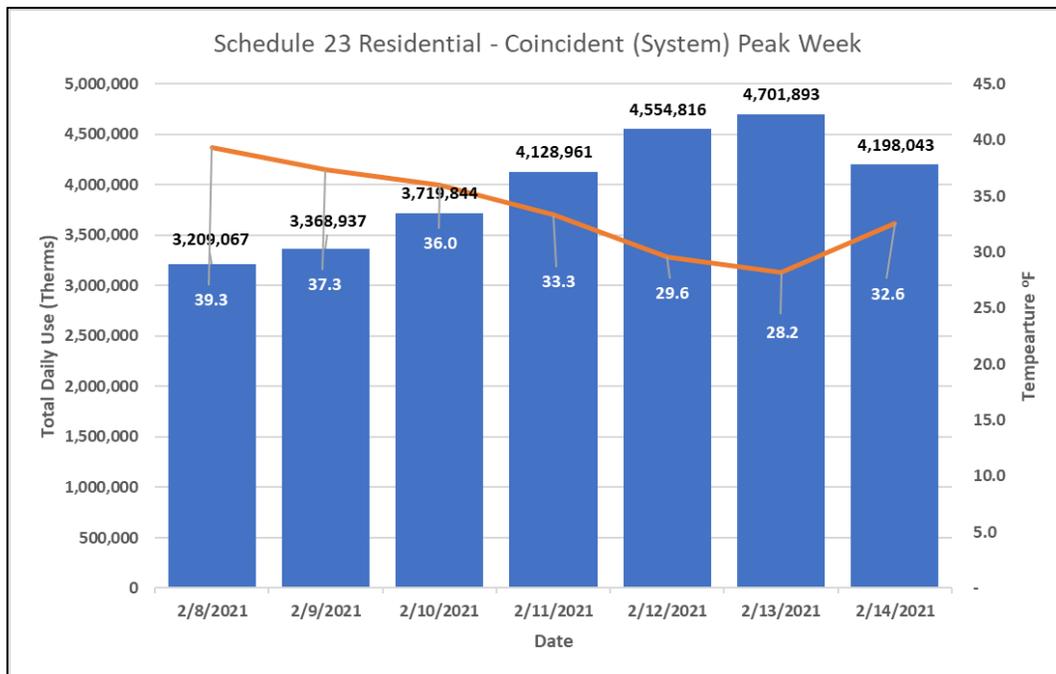
Figure 7 displays the total daily therms plotted against average daily temperature. As evidenced by the figure, the residential gas demand is highly temperature sensitive.

Figure 7 – Schedule 23 Residential: Temperature Sensitivity
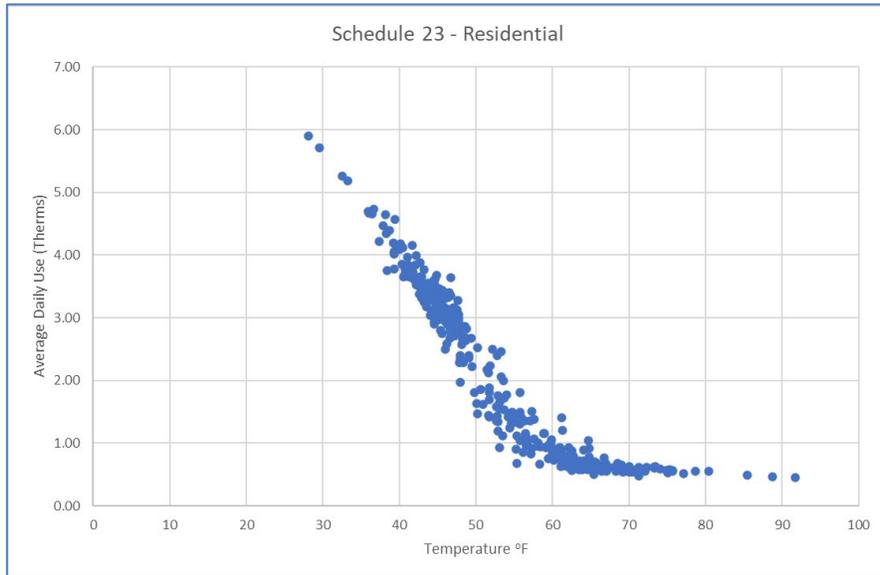
4.3   Schedule 31 – Commercial & Industrial General Service

Table 8 presents a high-level summary of Schedule 31 – Commercial & Industrial General Service. This class is comprised of commercial and industrial customers. There are 57,380 accounts with a total annual gas use of 216.797 million therms. The average annual usage per account is 3,778 therms.

Table 8 – Schedule 31 Sales: Billing Summary

Rate	Accounts	Total Annual Usage (Therms)	Average Annual Usage (Therms)
31-Commercial	55,164	204,135,954	3,701
31-Industrial	2,216	12,661,336	5,713
31 Sales Totals	57,380	216,797,290	3,778

Figure 8 presents the daily profile of Schedule 31, i.e., 31-C and 31-I. The figure to the left is a vertical EnergyPrint that presents the day of the year on the y-axis and the magnitude of load as a color gradient with low levels of daily use in the black-blue spectrum and high levels of daily use in the yellow-white spectrum. The figure to the right is a more conventional two-dimensional view of the data with the magnitude of load on the y-axis and the day on the x-axis. The Schedule 31 load is plotted in blue with the average daily temperature plotted in red. The total daily gas use is highly weather sensitive with the peak usage occurring coincident with the system peak day, February 12, 2021. This was the second coldest day of the study period. The peak is estimated to be 1.48 million therms with a corresponding average daily temperature of 29.6°F.

Figure 8 – Schedule 31 Sales: Total Daily Use

DNV
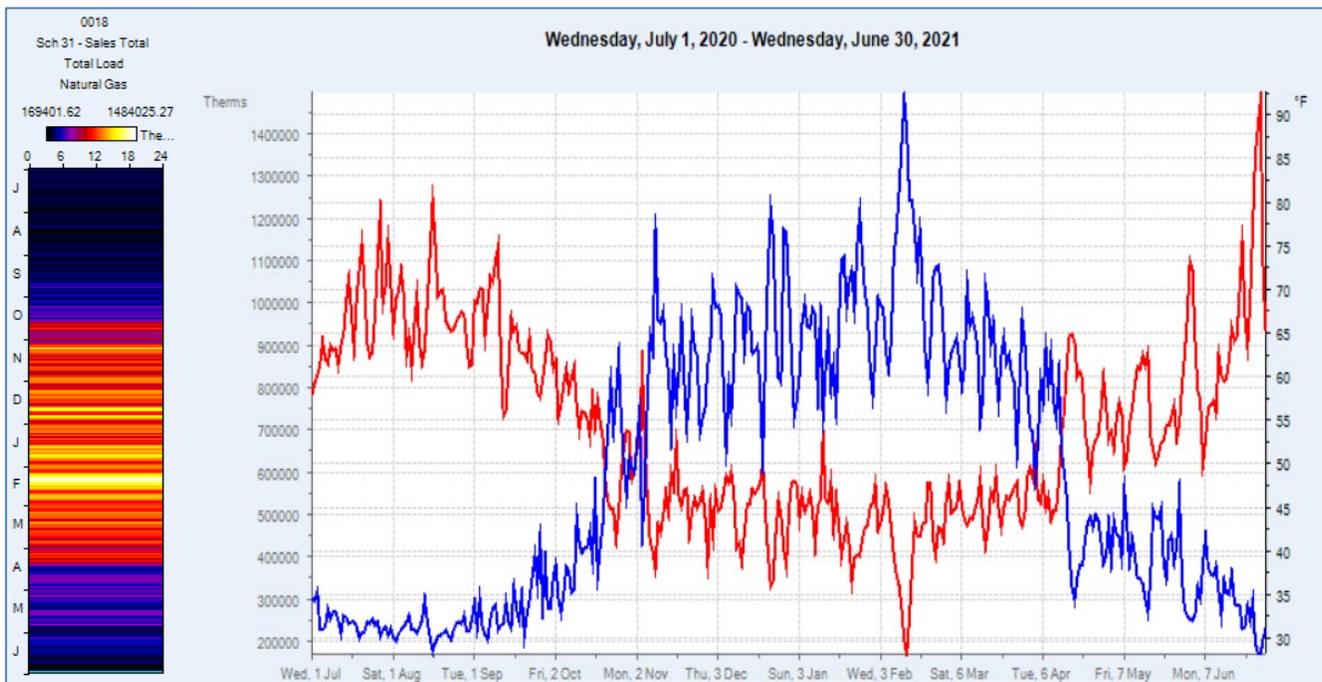
Table 9 presents selected monthly characteristics of Schedule 31: Sales on a total class basis. The information includes the monthly use, average daily use, date of class peak, class peak demand, load factor based on the class peak, date of the system peak, system peak demand, load factor based on the system peak and the monthly coincidence factor. The class was coincident with the system on six of the twelve months including the annual PSE system peak. The monthly load factor based on class peak ranged from a low of 57% to a high of 84%.

Table 9 – Schedule 31 Sales: Total Use Characteristics

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident Peaks			Coincident Peaks			Coincidence Factor
			Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load Factor	Coincident (System Peak) Date	Coincident Class Demand (Therms)	Coincident Load Factor	
Jul	7,608,099	245,423	Friday, July 3, 2020	316,649	77.5%	Wednesday, July 1, 2020	301,242	81.5%	95.1%
Aug	7,076,089	228,261	Thursday, August 13, 2020	298,524	76.5%	Wednesday, August 12, 2020	249,737	91.4%	83.7%
Sep	8,454,063	281,802	Saturday, September 26, 2020	443,429	63.6%	Friday, September 25, 2020	334,769	84.2%	75.5%
Oct	15,431,040	497,775	Monday, October 26, 2020	872,351	57.1%	Sunday, October 25, 2020	776,685	64.1%	89.0%
Nov	24,498,980	816,633	Monday, November 9, 2020	1,174,971	69.5%	Monday, November 9, 2020	1,174,971	69.5%	100.0%
Dec	29,009,549	935,792	Wednesday, December 23, 2020	1,220,513	76.7%	Wednesday, December 23, 2020	1,220,513	76.7%	100.0%
Jan	29,113,188	939,135	Tuesday, January 26, 2021	1,212,146	77.5%	Tuesday, January 26, 2021	1,212,146	77.5%	100.0%
Feb	29,822,675	1,065,096	Friday, February 12, 2021	1,484,025	71.8%	Friday, February 12, 2021	1,484,025	71.8%	100.0%
Mar	27,132,481	875,241	Monday, March 8, 2021	1,044,624	83.8%	Monday, March 15, 2021	1,040,584	84.1%	99.6%
Apr	17,187,213	572,907	Wednesday, April 7, 2021	895,501	64.0%	Wednesday, April 7, 2021	895,501	64.0%	100.0%
May	12,739,879	410,964	Friday, May 7, 2021	555,537	74.0%	Friday, May 7, 2021	555,537	74.0%	100.0%
Jun	8,724,034	290,801	Monday, June 7, 2021	446,635	65.1%	Sunday, June 6, 2021	386,536	75.2%	86.5%
12-Mths	216,797,290	593,965	Friday, February 12, 2021	1,484,025	40.0%	Friday, February 12, 2021	1,484,025	40.0%	100.0%

Figure 9 and Table 10 presents the same information as above but on a per customer basis. The peak demand was estimated to be 25.9 therms.

Figure 9 – Schedule 31 Sales: Mean Daily Use
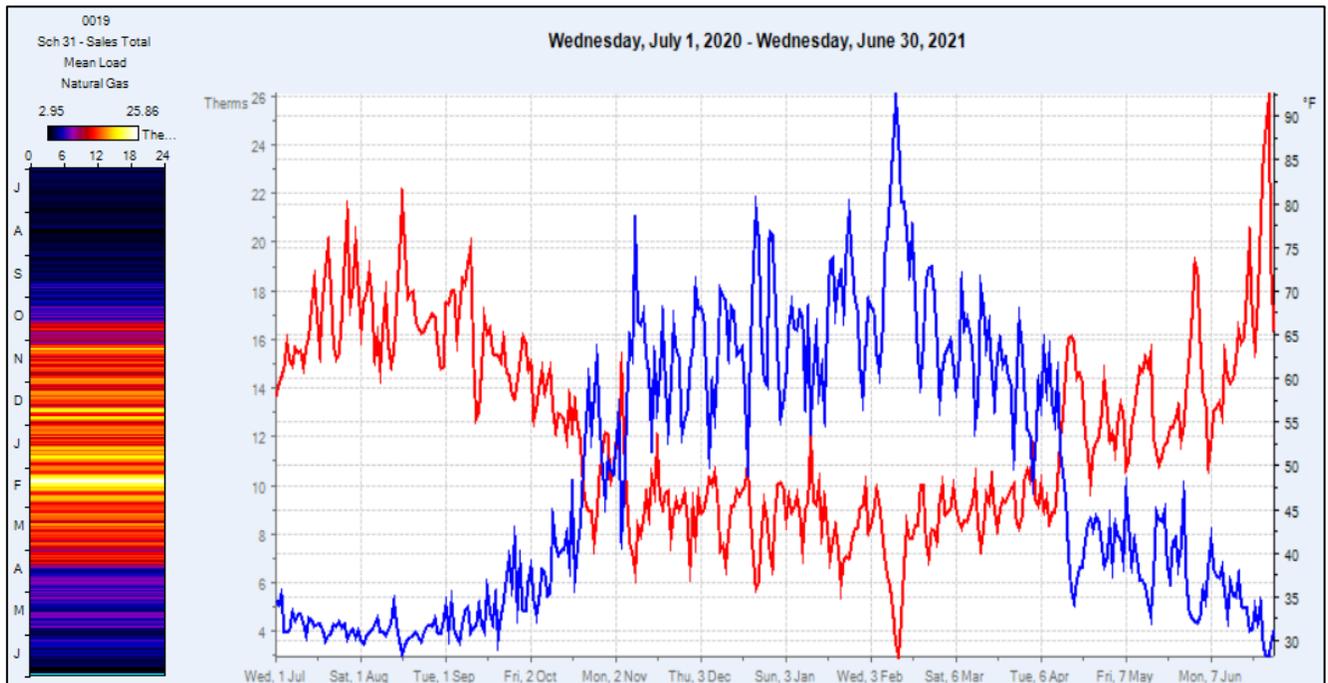
The average monthly use per account ranges from a low of 123 therms in August to a high of 520 therms in February. The maximum class peak demand was nearly five times higher than the summer class peak demands.

Table 10 – Schedule 31 Sales: Mean Use Characteristics

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident Peaks			Coincident Peaks			Coincidence Factor
			Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load Factor	Coincident System Peak Date	Coincident Class Demand	Coincident Load Factor	
Jul	132.59	4.28	Friday, July 3, 2020	5.52	77.5%	Wednesday, July 1, 2020	5.2	81.5%	95.1%
Aug	123.32	3.98	Thursday, August 13, 2020	5.20	76.5%	Wednesday, August 12, 2020	4.4	91.4%	83.7%
Sep	147.33	4.91	Saturday, September 26, 2020	7.73	63.6%	Friday, September 25, 2020	5.8	84.2%	75.5%
Oct	268.93	8.68	Monday, October 26, 2020	15.20	57.1%	Sunday, October 25, 2020	13.5	64.1%	89.0%
Nov	426.96	14.23	Monday, November 9, 2020	20.48	69.5%	Monday, November 9, 2020	20.5	69.5%	100.0%
Dec	505.57	16.31	Wednesday, December 23, 2020	21.27	76.7%	Wednesday, December 23, 2020	21.3	76.7%	100.0%
Jan	507.37	16.37	Tuesday, January 26, 2021	21.12	77.5%	Tuesday, January 26, 2021	21.1	77.5%	100.0%
Feb	519.74	18.56	Friday, February 12, 2021	25.86	71.8%	Friday, February 12, 2021	25.9	71.8%	100.0%
Mar	472.85	15.25	Monday, March 8, 2021	18.21	83.8%	Monday, March 15, 2021	18.1	84.1%	99.6%
Apr	299.53	9.98	Wednesday, April 7, 2021	15.61	64.0%	Wednesday, April 7, 2021	15.6	64.0%	100.0%
May	222.02	7.16	Friday, May 7, 2021	9.68	74.0%	Friday, May 7, 2021	9.7	74.0%	100.0%
Jun	152.04	5.07	Monday, June 7, 2021	7.78	65.1%	Sunday, June 6, 2021	6.7	75.2%	86.5%
12-Mths	3,778.25	10.35	Friday, February 12, 2021	25.86	40.0%	Friday, February 12, 2021	25.86	40.0%	100.0%

Figure 10 presents the daily demand and temperature for the peak week February 8, 2021 through February 14, 2021. The class peak occurred coincident with the system peak on Friday, February 12, 2021.

Figure 10 – Schedule 31 Sales: System Peak Week Demand
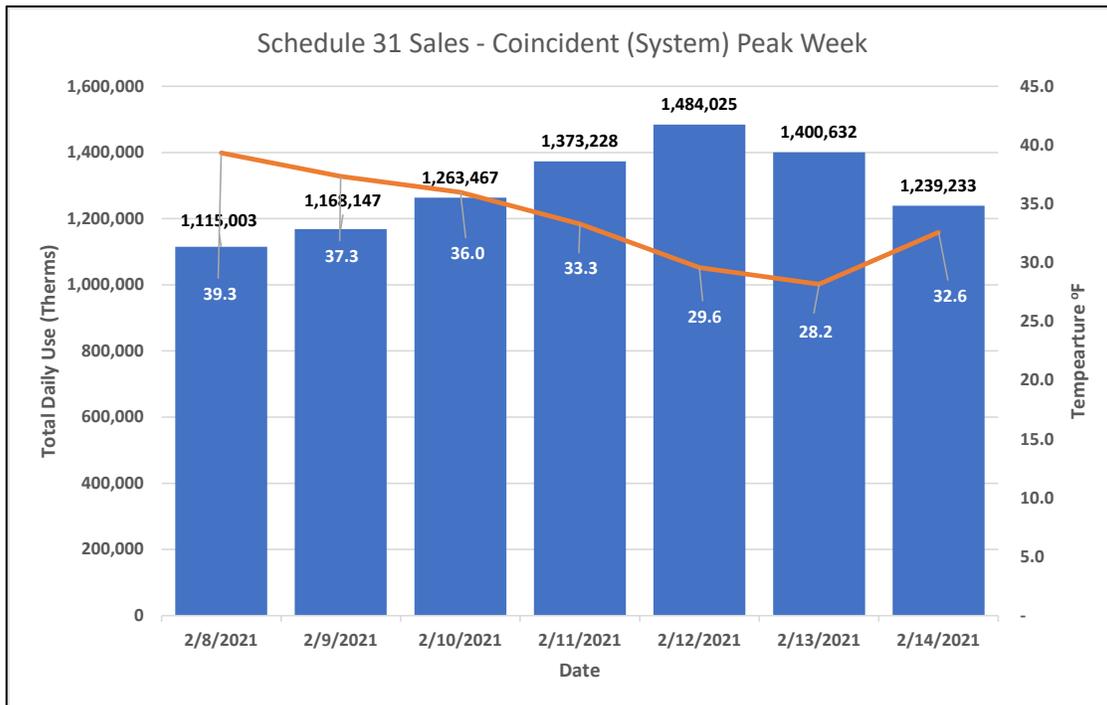
Figure 11 displays the total daily therms plotted against average daily temperature. As evidenced by the figure, similar to residential class, the schedule 31 gas load is highly temperature sensitive.

Figure 11 – Schedule 31 Sales: Temperature Sensitivity

4.4 Schedule 31T – Commercial and Industrial Transportation Service

Table 11 presents a high-level summary of Schedule 31T – Distribution System Transportation Service. This class is currently comprised of commercial customers only. There are two accounts with a total annual gas use of 36,959 therms.

Table 11 – Schedule 31 Transportation: Billing Summary

Rate	Accounts	Total Annual Usage (Therms)	Average Annual Usage (Therms)
31T-Commercial	2	36,959	18,479
31T Transportation	2	36,959	18,479

Figure 12 presents the daily profile of Schedule 31T. There are only two commercial customers on Schedule 31T. The total daily gas use is highly weather sensitive with the peak usage occurring coincident with the system peak day, February 12, 2021. This was the second coldest day of the study period. The peak is estimated to be 259 therms with a corresponding average daily temperature of 29.6°F.

Figure 12 – Schedule 31 Transportation: Commercial Total Daily Use
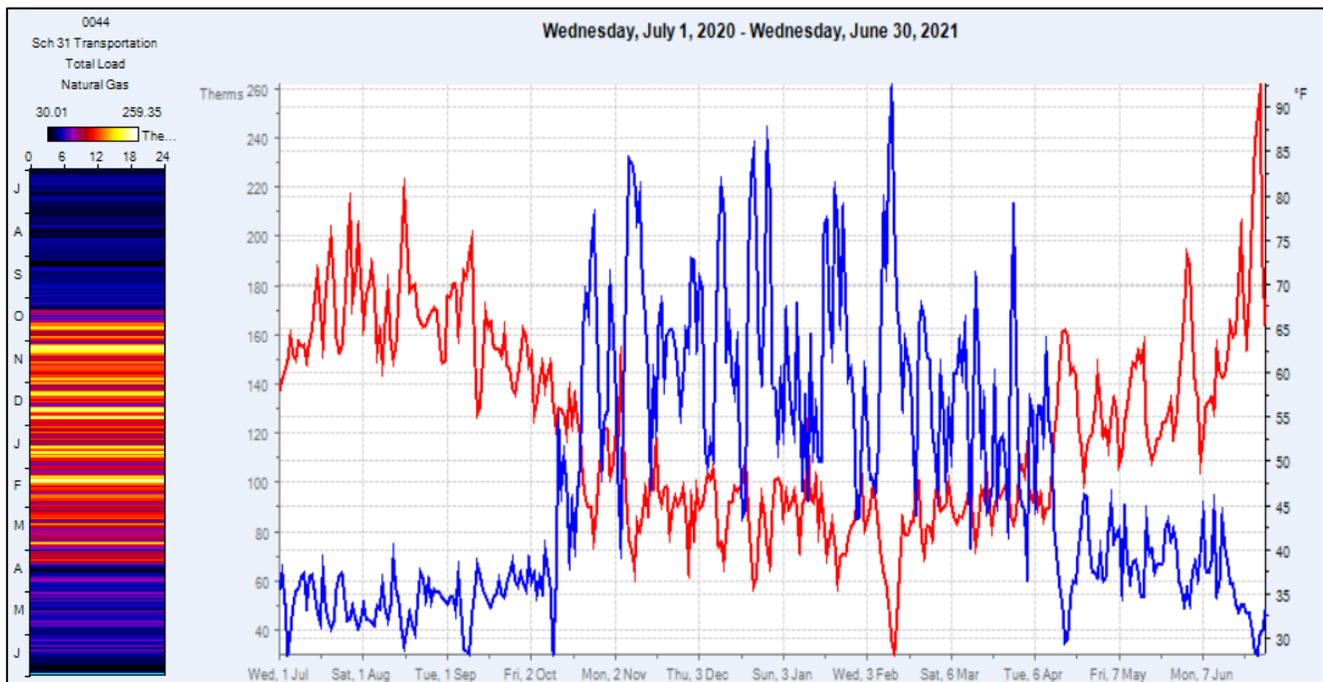
Table 12 presents selected monthly characteristics of Schedule 31: Transportation on a total class basis. The information includes the monthly use, average daily use, date of class peak, class peak demand, load factor based on the class peak, date of the system peak, system peak demand, load factor based on the system peak and the monthly coincidence factor. The class was coincident with the system on four of the twelve months. The monthly load factor based on coincident system peak ranged from a low of 51% to a high of 91%.

Table 12 – Schedule 31 Transportation: Total Use Characteristics

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident Peaks			Coincident Peaks			Coincidence Factor
			Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load	Coincident (System Peak) Date	Coincident Class	Coincident Load Factor	
Jul	1,589	51	Friday, July 17, 2020	65	79.4%	Wednesday, July 1, 2020	56	91.2%	87.1%
Aug	1,552	50	Wednesday, August 12, 2020	69	72.2%	Wednesday, August 12, 2020	69	72.2%	100.0%
Sep	1,612	54	Friday, September 25, 2020	68	79.2%	Friday, September 25, 2020	68	79.2%	100.0%
Oct	3,267	105	Sunday, October 25, 2020	205	51.3%	Sunday, October 25, 2020	205	51.3%	100.0%
Nov	4,824	161	Saturday, November 7, 2020	231	69.6%	Monday, November 9, 2020	224	71.7%	97.1%
Dec	5,043	163	Monday, December 28, 2020	239	68.1%	Wednesday, December 23, 2020	233	69.7%	97.7%
Jan	4,481	145	Friday, January 22, 2021	217	66.5%	Tuesday, January 26, 2021	173	83.5%	79.7%
Feb	4,215	151	Friday, February 12, 2021	259	58.0%	Friday, February 12, 2021	259	58.0%	100.0%
Mar	3,939	127	Monday, March 29, 2021	207	61.3%	Monday, March 15, 2021	180	70.8%	86.6%
Apr	2,558	85	Saturday, April 10, 2021	153	55.6%	Wednesday, April 7, 2021	131	65.2%	85.3%
May	2,160	70	Tuesday, May 4, 2021	91	76.6%	Friday, May 7, 2021	81	86.0%	89.1%
Jun	1,719	57	Friday, June 11, 2021	89	64.5%	Sunday, June 6, 2021	72	79.2%	81.5%
12-Mths	36,959	101	Friday, February 12, 2021	259	39.0%	Friday, February 12, 2021	259	39.0%	100.0%

Figure 13 presents the daily demand and temperature for the peak week February 8, 2021 through February 14, 2021. The class peak occurred coincident with the system peak on Friday, February 12, 2021.

Figure 13 – Schedule 31 Transportation: System Peak Week Demand
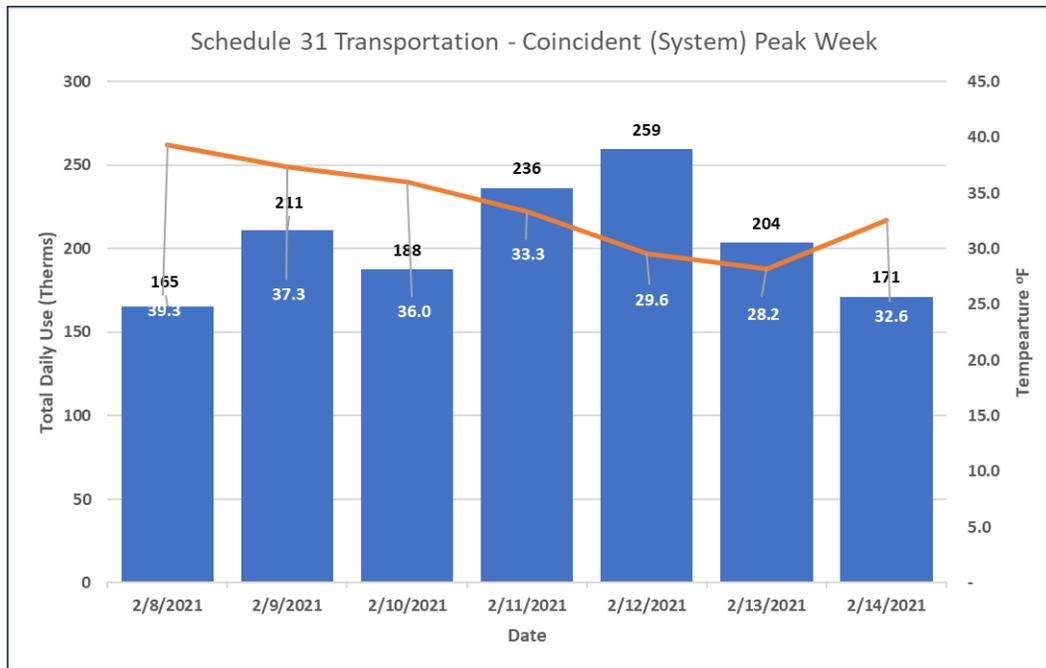
Figure 14 displays the total daily therms plotted against average daily temperature. As evidenced by the figure, the Schedule 31 Transportation gas demand is highly temperature sensitive.

Figure 14 – Schedule 31 Transportation: Temperature Sensitivity
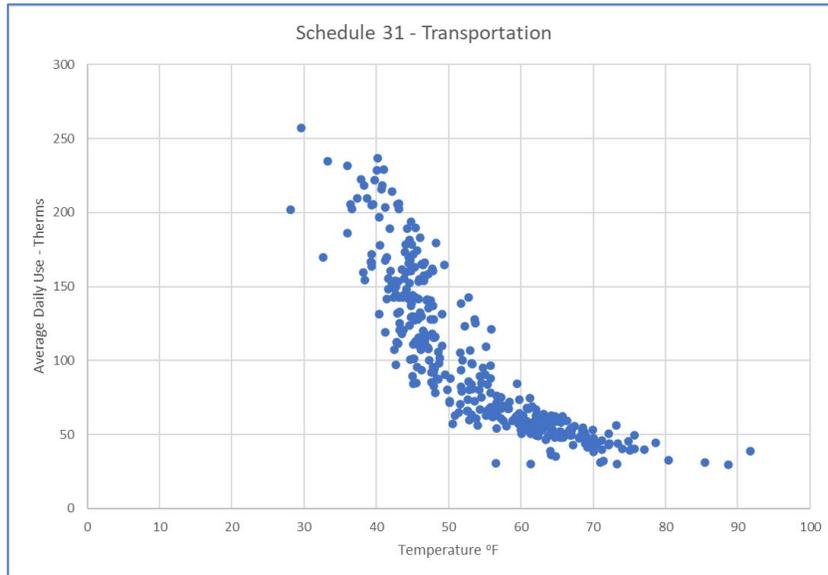
4.4   Schedule 41 – Large Volume High Load Factor

Table 13 presents a high-level summary of Schedule 41 – Large Volume High Load Factor. For the Sales component of the rate, there are 1,251 accounts with a total annual gas use of 60.945 million therms. The average annual usage per account is 48,717 therms.

Table 13 – Schedule 41 Sales: Billing Summary

Rate/Domain	Accounts	Total Annual Usage (Therms)	Average Annual Usage (Therms)
41-Commercial	1,181	51,209,746	43,361
41-Industrial	70	9,735,512	139,079
41 Sales Totals	1,251	60,945,259	48,717

4.4.1   Schedule 41 Sales

Figure 15 presents the daily profile of aggregate Sales component of Sales part of Schedule 41, i.e., 41-Commercial and 41-Industrial. The figure to the left is a vertical EnergyPrint that presents the day of the year on the y-axis and the magnitude of load as a color gradient with low levels of daily use in the black-blue spectrum and high levels of daily use in the yellow-white spectrum. The figure to the right is a more conventional two-dimensional view of the data with the magnitude of load on the y-axis and the day on the x-axis. The total Schedule 41 Sales load is plotted in blue with the average daily temperature plotted in red. The total daily gas use is less weather sensitive than Schedule 31 with the peak usage occurring on Monday, April 5, 2021. The peak is estimated to be 399,076 therms.

Figure 15 – Schedule 41 Sales: Total Daily Use
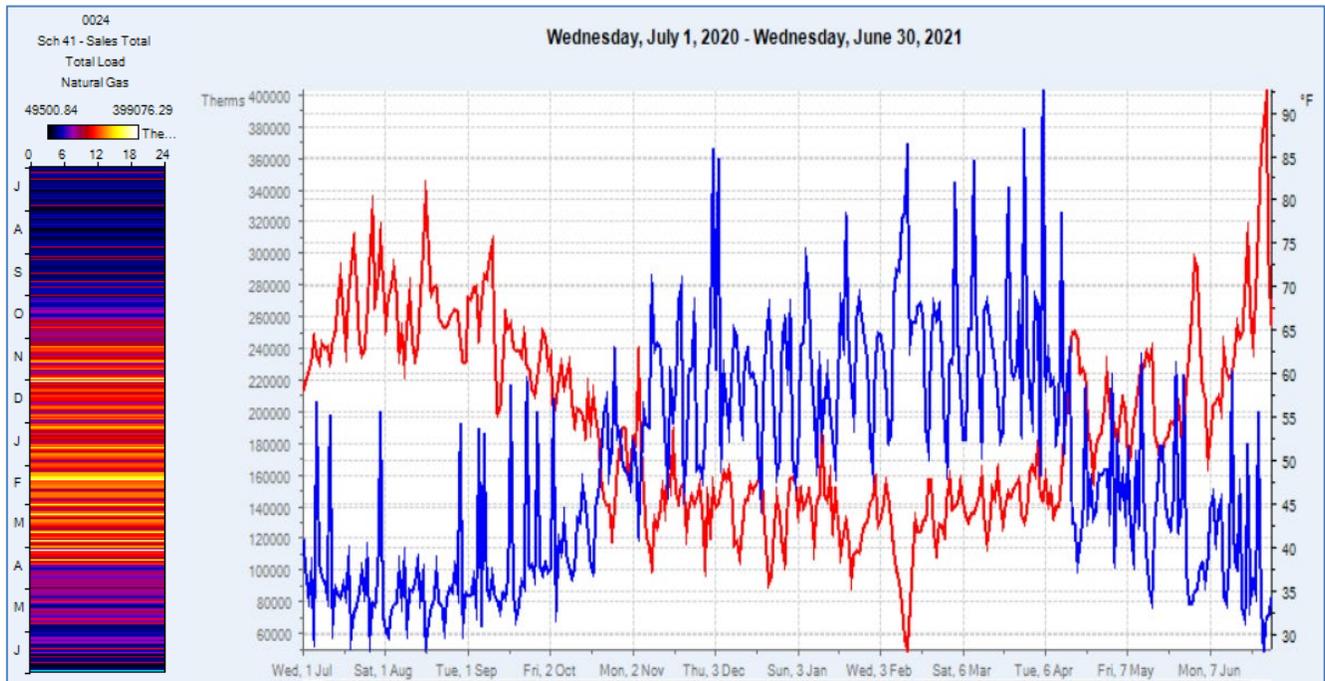
Table 14 presents selected monthly characteristics of Schedule 41: Sales on a total class basis. The information includes the monthly use, average daily use, date of class peak, class peak demand, load factor based on the class peak, date of the system peak, system peak demand, load factor based on the system peak and the monthly coincidence factor. The monthly load factor based on class peak ranged from a low of 46% to a high of 72%. The class peak was more than 90% coincident in just two (November & February) of the twelve months.

Table 14 – Schedule 41 Sales: Total Use Characteristics

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident Peaks			Coincident Peaks			Coincidence Factor
			Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load	Coincident System Peak Date	Coincident Class	Coincident Load Factor	
Jul	2,982,457	96,208	Monday, July 6, 2020	196,270	49.0%	Wednesday, July 1, 2020	119,861	80.3%	61.1%
Aug	2,627,311	84,752	Saturday, August 29, 2020	183,329	46.2%	Wednesday, August 12, 2020	92,000	92.1%	50.2%
Sep	3,164,774	105,492	Wednesday, September 23, 2020	212,862	49.6%	Friday, September 25, 2020	103,841	101.6%	48.8%
Oct	4,430,730	142,927	Monday, October 26, 2020	231,730	61.7%	Sunday, October 25, 2020	175,123	81.6%	75.6%
Nov	6,050,271	201,676	Friday, November 20, 2020	278,376	72.4%	Monday, November 9, 2020	277,518	72.7%	99.7%
Dec	7,028,330	226,720	Wednesday, December 2, 2020	356,953	63.5%	Wednesday, December 23, 2020	263,093	86.2%	73.7%
Jan	6,855,612	221,149	Thursday, January 21, 2021	316,612	69.8%	Tuesday, January 26, 2021	271,616	81.4%	85.8%
Feb	6,957,619	248,486	Saturday, February 13, 2021	359,403	69.1%	Friday, February 12, 2021	325,801	76.3%	90.7%
Mar	7,505,609	242,116	Monday, March 29, 2021	368,952	65.6%	Monday, March 15, 2021	269,290	89.9%	73.0%
Apr	5,694,271	189,809	Monday, April 5, 2021	399,076	47.6%	Wednesday, April 7, 2021	234,703	80.9%	58.8%
May	4,424,270	142,718	Wednesday, May 12, 2021	227,371	62.8%	Friday, May 7, 2021	168,923	84.5%	74.3%
Jun	3,224,006	107,467	Tuesday, June 15, 2021	215,621	49.8%	Sunday, June 6, 2021	106,457	100.9%	49.4%
12-Mths	60,945,259	166,973	Monday, April 5, 2021	399,076	41.8%	Friday, February 12, 2021	325,801	51.3%	81.6%

Figure 16 presents the same information on a per customer basis. The peak demand was estimated to be 319 therms.

Figure 16 – Schedule 41 Sales: Mean Daily Use
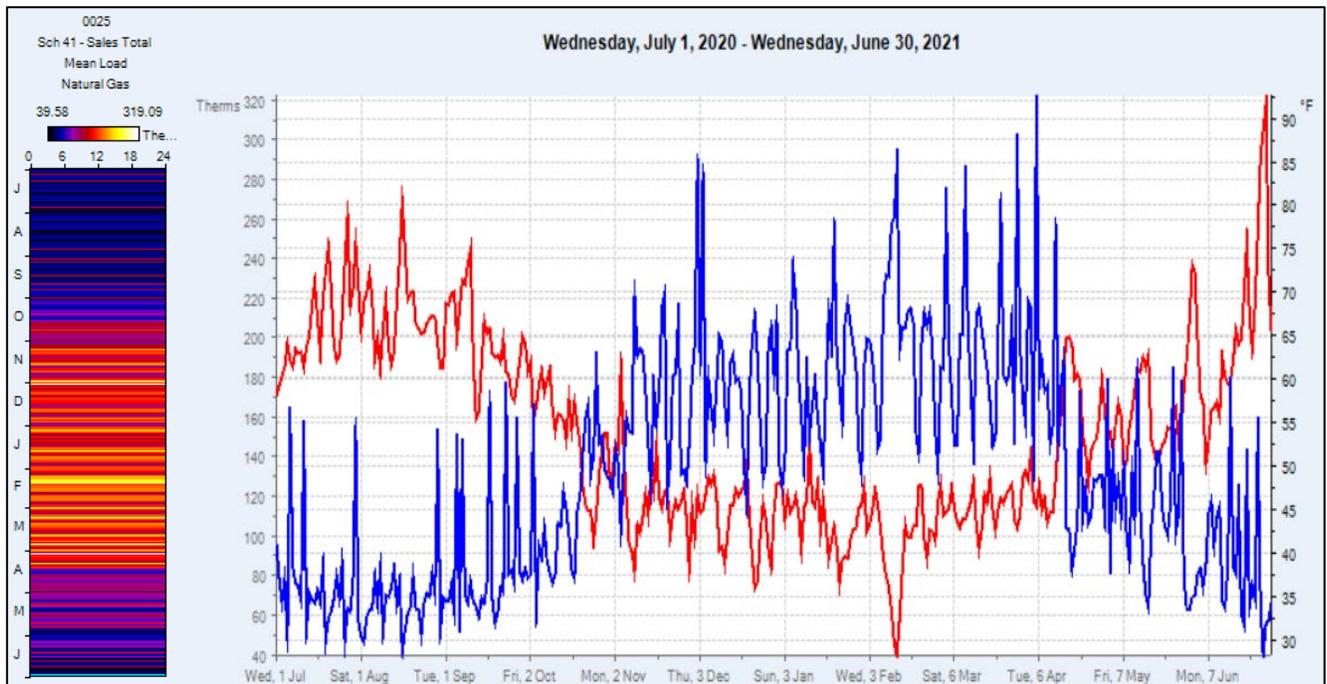
Table 15 presents the same information as Table 14 only on a per customer basis. The average monthly use per account ranges from a low of 2,101 therms in August to a high of 6,001 therms in March. The maximum class peak demand was more than double the summer class peak demands.

Table 15 – Schedule 41 Sales: Mean Use Characteristics

| Month | Monthly Use (Therms) | Average Daily Use (Therms) | Non-Coincident Peaks | | | Coincident Peaks | | | |
			Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load Factor	Coincident System Peak Date	Coincident Class	Coincident Load Factor	Coincidence Factor
Jul	2,385	76.93	Monday, July 6, 2020	156.93	49.0%	Wednesday, July 1, 2020	95.84	80.3%	61.1%
Aug	2,101	67.77	Saturday, August 29, 2020	146.59	46.2%	Wednesday, August 12, 2020	73.56	92.1%	50.2%
Sep	2,530	84.35	Wednesday, September 23, 2020	170.20	49.6%	Friday, September 25, 2020	83.03	101.6%	48.8%
Oct	3,543	114.28	Monday, October 26, 2020	185.29	61.7%	Sunday, October 25, 2020	140.02	81.6%	75.6%
Nov	4,838	161.25	Friday, November 20, 2020	222.58	72.4%	Monday, November 9, 2020	221.90	72.7%	99.7%
Dec	5,620	181.28	Wednesday, December 2, 2020	285.41	63.5%	Wednesday, December 23, 2020	210.36	86.2%	73.7%
Jan	5,482	176.82	Thursday, January 21, 2021	253.15	69.8%	Tuesday, January 26, 2021	217.18	81.4%	85.8%
Feb	5,563	198.68	Saturday, February 13, 2021	287.37	69.1%	Friday, February 12, 2021	260.50	76.3%	90.7%
Mar	6,001	193.59	Monday, March 29, 2021	295.00	65.6%	Monday, March 15, 2021	215.32	89.9%	73.0%
Apr	4,553	151.77	Monday, April 5, 2021	319.09	47.6%	Wednesday, April 7, 2021	187.66	80.9%	58.8%
May	3,538	114.11	Wednesday, May 12, 2021	181.80	62.8%	Friday, May 7, 2021	135.07	84.5%	74.3%
Jun	2,578	85.93	Tuesday, June 15, 2021	172.41	49.8%	Sunday, June 6, 2021	85.12	100.9%	49.4%
12-Mths	48,730	133.51	Monday, April 5, 2021	319.09	41.8%	Friday, February 12, 2021	260.50	51.3%	81.6%

Figure 17 presents the daily demand and temperature for the peak week February 8, 2021 through February 14, 2021. The class peak had a coincidence factor of just under 90% on the system peak day, Friday, February 12, 2021.

Figure 17 – Schedule 41 Sales: System Peak Week Demand
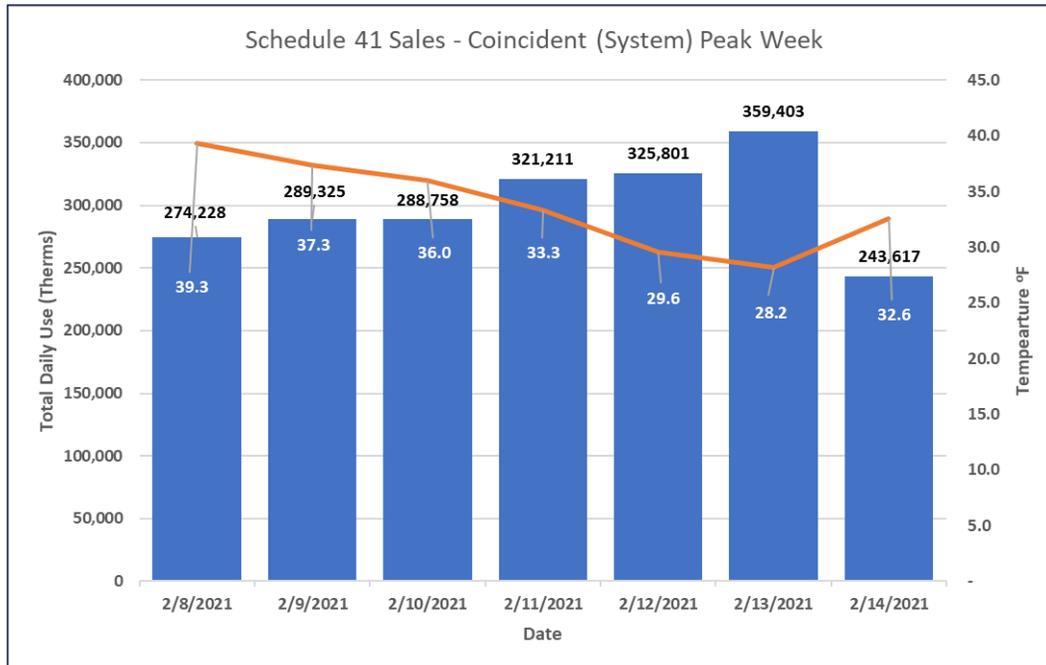
Figure 18 displays the total daily therms plotted against average daily temperature. As evidenced by the figure, the Schedule 41 Sales gas demand is temperature sensitive but there are selective days that show high demand at relatively modest temperatures.

Figure 18 – Schedule 41 Sales: Temperature Sensitivity
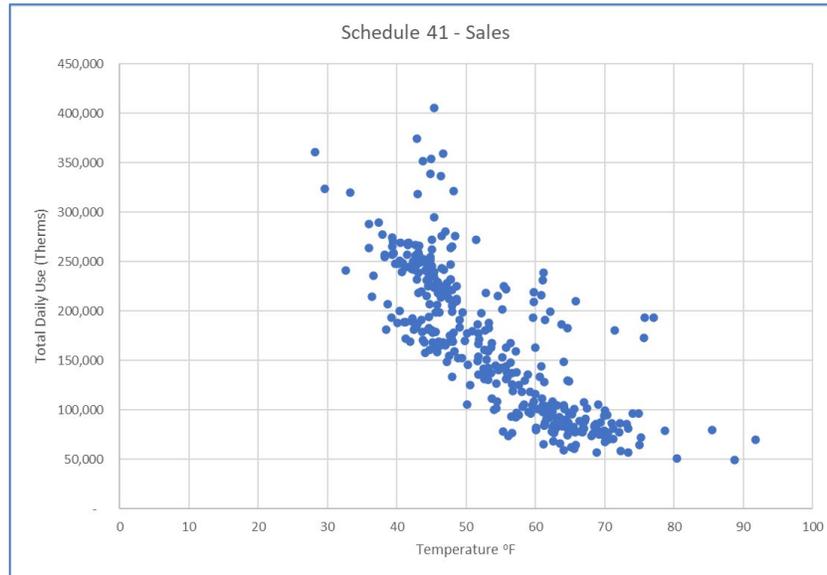
4.4.2   Schedule 41T – Large Volume High Load Factor Transportation Service

Table 16 presents a billing summary for Schedule 41 – Transportation. In aggregate, there are a total of 100 Transportation customers with a total annual usage of 19.406 million therms or an average annual use of 194,061 therms. The class is dominated by commercial customers representing 81% of the accounts and 71%of the total energy use.

Table 16 – Schedule 41 Transportation: Billing Summary

Rate/Domain	Accounts	Total Annual Usage (Therms)	Average Annual Usage (Therms)
41T-Commercial	81	13,721,241	169,398
41T-Industrial	19	5,684,815	299,201
41T Transportation Totals	100	19,406,055	194,061

Figure 19 presents the daily profile of aggregate Sales component of Transportation part of Schedule 41, i.e., 41-Commercial and 41-Industrial. The total Schedule 41 Transportation load is plotted in blue with the average daily temperature plotted in red. The total daily gas use is substantially less weather sensitive than its Sales counterpart. The peak is estimated to be 77,163 therms on Wednesday, February 10 with a corresponding average daily temperature of 36ºF. The lower weekend loads are evident in the EnergyPrint and by the sharp dips in the two-dimensional graph.

Figure 19 – Schedule 41 Transportation: Total Daily Use
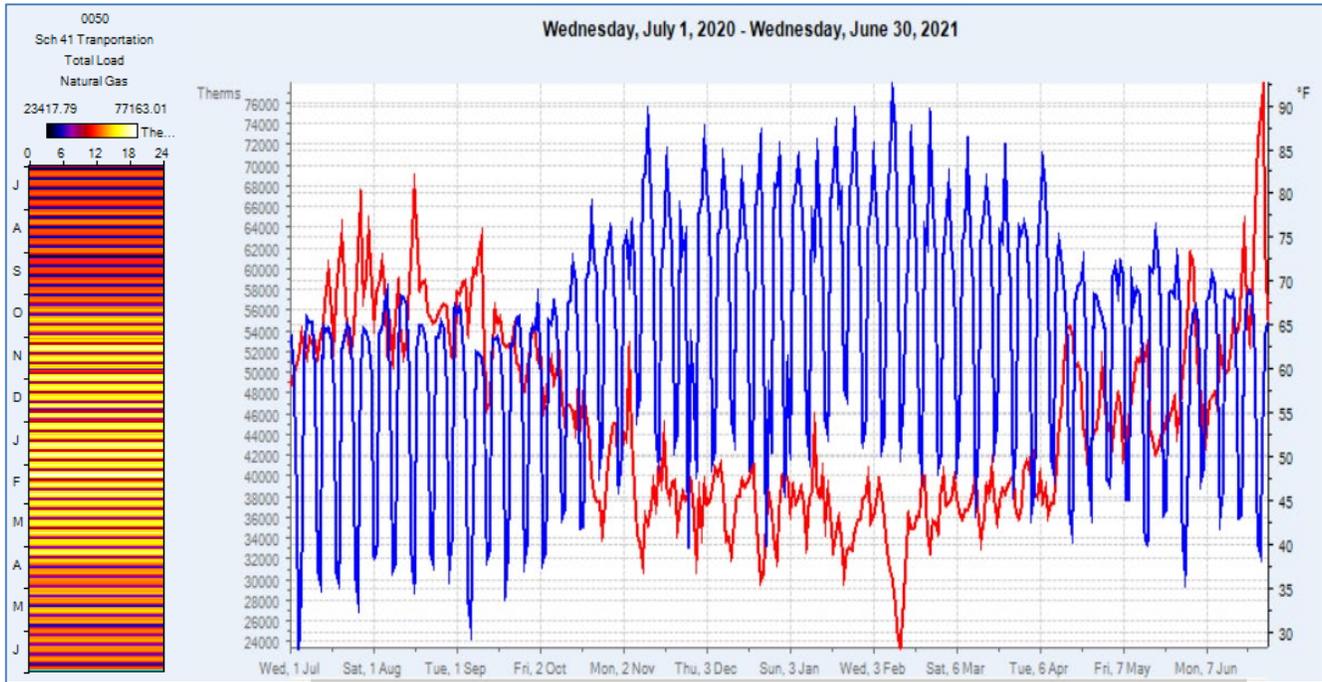
Table 17 presents selected monthly characteristics of Schedule 41 - Transportation on a total class basis. The information includes the monthly use, average daily use, date of class peak, class peak demand, load factor based on the class peak, date of the system peak, system peak demand, load factor based on the system peak and the monthly coincidence factor. The class was coincident with the system on two of the twelve months. The monthly load factor based on class peak was consistently high at or higher than 76% in every month.

Table 17 – Schedule 41 Transportation: Total Use Characteristics

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident Peaks			Coincident Peaks			Coincidence Factor
			Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load	Coincident System Peak Date	Coincident Class	Coincident Load Factor	
Jul	1,436,397	46,335	Tuesday, July 7, 2020	55,205	83.9%	Wednesday, July 1, 2020	53,671	86.3%	97.2%
Aug	1,449,635	46,762	Thursday, August 6, 2020	57,777	80.9%	Wednesday, August 12, 2020	57,267	81.7%	99.1%
Sep	1,390,865	46,362	Wednesday, September 2, 2020	56,344	82.3%	Friday, September 25, 2020	51,616	89.8%	91.6%
Oct	1,598,170	51,554	Wednesday, October 21, 2020	65,154	79.1%	Sunday, October 25, 2020	42,991	119.9%	66.0%
Nov	1,709,822	56,994	Wednesday, November 11, 2020	74,163	76.9%	Monday, November 9, 2020	68,538	83.2%	92.4%
Dec	1,823,117	58,810	Wednesday, December 2, 2020	72,462	81.2%	Wednesday, December 23, 2020	72,037	81.6%	99.4%
Jan	1,829,051	59,002	Wednesday, January 27, 2021	74,191	79.5%	Tuesday, January 26, 2021	69,394	85.0%	93.5%
Feb	1,667,504	59,554	Wednesday, February 10, 2021	77,163	77.2%	Friday, February 12, 2021	63,221	94.2%	81.9%
Mar	1,802,367	58,141	Wednesday, March 10, 2021	71,182	81.7%	Monday, March 15, 2021	63,545	91.5%	89.3%
Apr	1,615,509	53,850	Wednesday, April 7, 2021	70,336	76.6%	Wednesday, April 7, 2021	70,336	76.6%	100.0%
May	1,570,260	50,654	Wednesday, May 19, 2021	63,405	79.9%	Friday, May 7, 2021	59,466	85.2%	93.8%
Jun	1,513,358	50,445	Wednesday, June 9, 2021	59,441	84.9%	Sunday, June 6, 2021	40,877	123.4%	68.8%
12-Mths	19,406,055	53,167	Wednesday, February 10, 2021	77,163	68.9%	Friday, February 12, 2021	63,221	84.1%	81.9%

Figure 20 presents the same information on a per customer basis. The peak demand was estimated to be 774 therms.

DNV

Figure 20 – Schedule 41 Transportation: Mean Daily Use
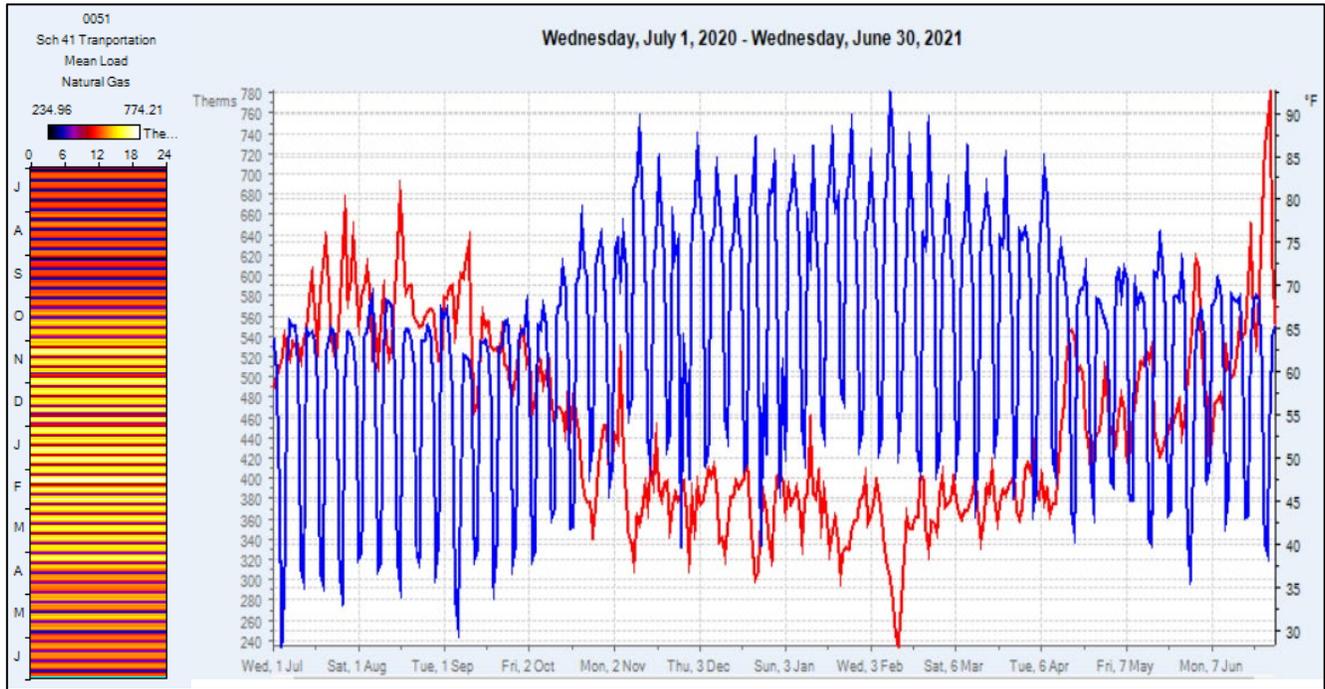
Table 18 presents the same information as Table 17 only on a per customer basis. The average monthly use per account ranges from a low of 13,955 therms in September to a high of 18,352 therms in January. This class had a coincidence factor over 90% in eight of the twelve months.

Table 18 – Schedule 41 Transportation: Mean Use Characteristics

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident Peaks				Coincident Peaks			Coincidence Factor
			Non-Coincident (Class Peak) Date	Class Peak Deman	Non-Coincident Load Factor		Coincident System Peak Date	Coincident Class Demand	Coincident Load Factor	
Jul	14,412	465	Tuesday, July 7, 2020	554	83.9%		Wednesday, July 1, 2020	539	86.3%	97.2%
Aug	14,545	469	Thursday, August 6, 2020	580	80.9%		Wednesday, August 12, 2020	575	81.7%	99.1%
Sep	13,955	465	Wednesday, September 2, 2020	565	82.3%		Friday, September 25, 2020	518	89.8%	91.6%
Oct	16,035	517	Wednesday, October 21, 2020	654	79.1%		Sunday, October 25, 2020	431	119.9%	66.0%
Nov	17,155	572	Wednesday, November 11, 2020	744	76.9%		Monday, November 9, 2020	688	83.2%	92.4%
Dec	18,292	590	Wednesday, December 2, 2020	727	81.2%		Wednesday, December 23, 2020	723	81.6%	99.4%
Jan	18,352	592	Wednesday, January 27, 2021	744	79.5%		Tuesday, January 26, 2021	696	85.0%	93.5%
Feb	16,731	598	Wednesday, February 10, 2021	774	77.2%		Friday, February 12, 2021	634	94.2%	81.9%
Mar	18,084	583	Wednesday, March 10, 2021	714	81.7%		Monday, March 15, 2021	638	91.5%	89.3%
Apr	16,209	540	Wednesday, April 7, 2021	706	76.6%		Wednesday, April 7, 2021	706	76.6%	100.0%
May	15,755	508	Wednesday, May 19, 2021	636	79.9%		Friday, May 7, 2021	597	85.2%	93.8%
Jun	15,184	506	Wednesday, June 9, 2021	596	84.9%		Sunday, June 6, 2021	410	123.4%	68.8%
12-Mths	194,710	533	Wednesday, February 10, 2021	774	68.9%		Friday, February 12, 2021	634	84.1%	81.9%

Figure 21 presents the daily demand and temperature for the peak week February 8, 2021 through February 14, 2021. The class peak occurred on Friday, February 10, 2021.

Figure 21 – Schedule 41 Transportation: System Peak Week Demand
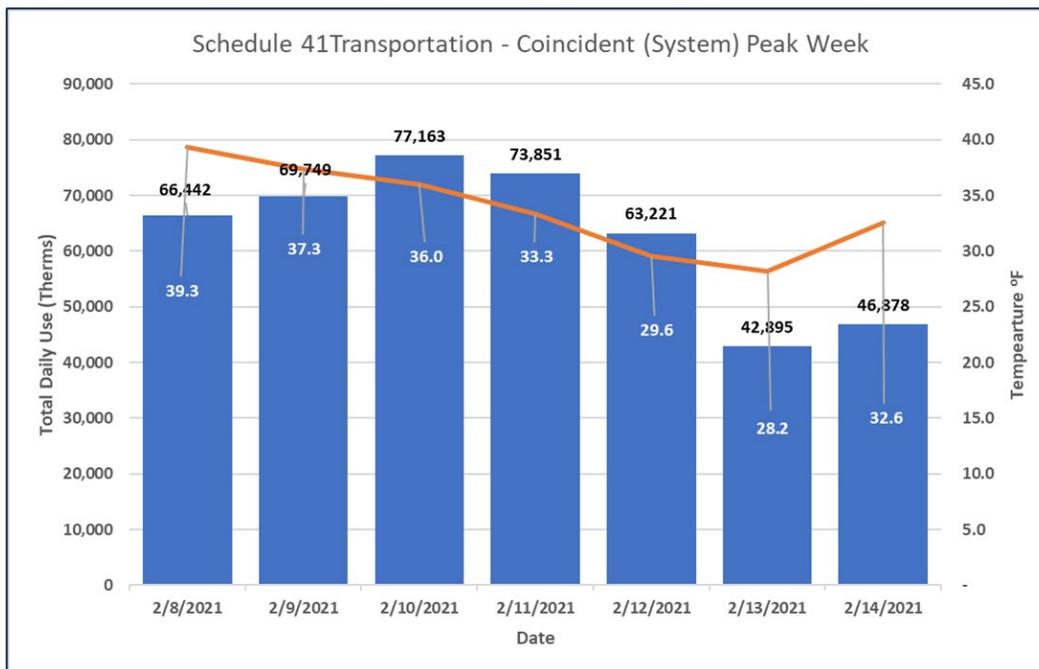
Figure 22 displays the total daily therms plotted against average daily temperature. As evidenced by the figure, the Schedule 41 – Transportation load shows a distinction between weekdays and weekend load levels. The weekend load is much lower than the weekend load. This is also evident in the EnergyPrint with the systematic dark channels that can be observed.

Figure 22 – Schedule 41 Transportation: Temperature Sensitivity
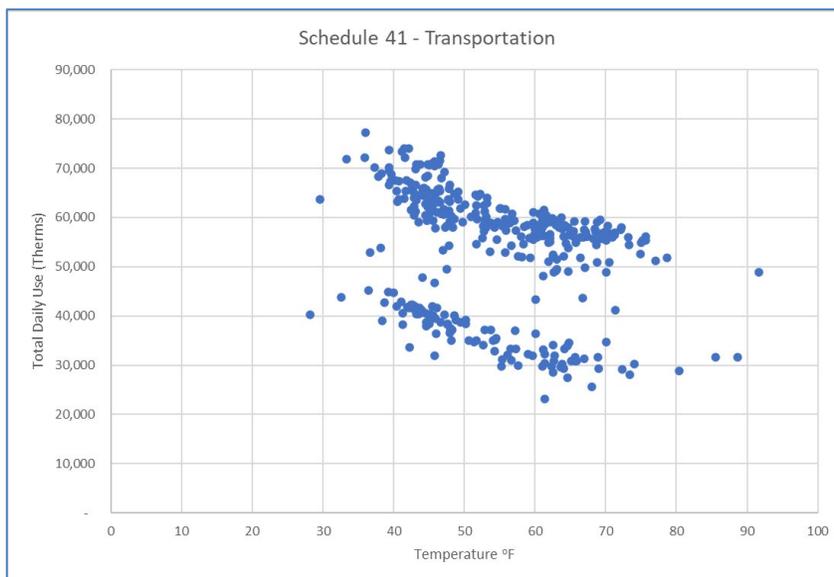
4.5 Schedule 85 – Interruptible Service with Firm Option

Table 19 presents a high-level summary of Schedule 85 – Interruptible Service with Firm Options. For the Sales component, there are 29 accounts with a total annual gas use of 19.726 million therms. The average annual usage per account is 680,213 therms.   All but five of the customers are commercial customers.

Table 19 – Schedule 85: Billing Summary

Rate/Domain	Accounts	Total Annual Usage (Therms)	Average Annual Usage (Therms)
85-Commercial	24	15,734,156	655,590
85-Industrial	5	3,992,016	798,403
85 Sales Totals	29	19,726,173	680,213

4.5.1 Schedule 85 Sales

Figure 23 presents the daily profile of aggregate Sales component of Sales part of Schedule 85, i.e., 85-C and 85-I. The total Schedule 85 Sales load is plotted in blue with the average daily temperature plotted in red. The total daily gas use is weather sensitive with the peak usage occurring on January 25 at a demand of 81,447 therms and a corresponding average daily temperature of 39.6°F.

Figure 23 – Schedule 85 Sales: Total Daily Use
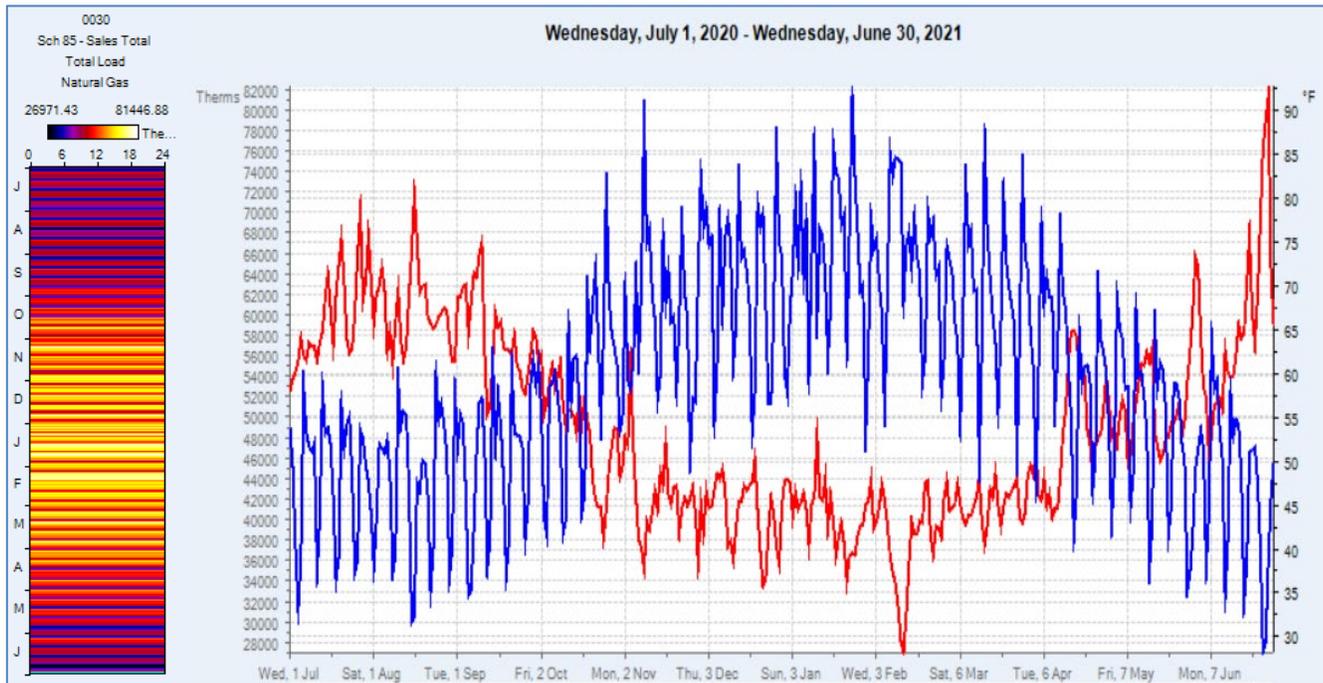
Table 20 presents selected monthly characteristics off Schedule 85 – Sales on a total class basis. The information includes the monthly use, average daily use, date of class peak, class peak demand, load factor based on the class peak, date of the system peak, system peak demand, load factor based on the system peak and the monthly coincidence factor. The class was coincident with the system on two of the twelve months and had a coincidence factor greater than 90% on another six months. This class had a 99% coincidence factor at the time of the annual system peak. The monthly load factor based on class peak was higher than 73% in all twelve months.

Table 20 – Schedule 85 Sales: Total Use Characteristics

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident Peaks			Coincident Peaks			Coincidence Factor
			Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load Factor	Coincident System Peak Date	Coincident Class	Coincident Load Factor	
Jul	1,364,850	44,027	Monday, July 6, 2020	53,079	82.9%	Wednesday, July 1, 2020	48,989	89.9%	92.3%
Aug	1,350,783	43,574	Monday, August 24, 2020	54,097	80.5%	Wednesday, August 12, 2020	50,552	86.2%	93.4%
Sep	1,372,106	45,737	Tuesday, September 29, 2020	55,499	82.4%	Friday, September 25, 2020	46,898	97.5%	84.5%
Oct	1,643,513	53,017	Monday, October 26, 2020	72,307	73.3%	Sunday, October 25, 2020	58,018	91.4%	80.2%
Nov	1,800,299	60,010	Monday, November 9, 2020	79,384	75.6%	Monday, November 9, 2020	79,384	75.6%	100.0%
Dec	1,951,593	62,955	Monday, December 28, 2020	76,846	81.9%	Wednesday, December 23, 2020	69,822	90.2%	90.9%
Jan	2,030,110	65,487	Monday, January 25, 2021	81,447	80.4%	Tuesday, January 26, 2021	73,451	89.2%	90.2%
Feb	1,824,835	65,173	Monday, February 8, 2021	75,785	86.0%	Friday, February 12, 2021	74,777	87.2%	98.7%
Mar	1,919,602	61,923	Monday, March 15, 2021	77,221	80.2%	Monday, March 15, 2021	77,221	80.2%	100.0%
Apr	1,655,822	55,194	Monday, April 5, 2021	69,061	79.9%	Wednesday, April 7, 2021	63,624	86.8%	92.1%
May	1,508,516	48,662	Monday, May 3, 2021	61,798	78.7%	Friday, May 7, 2021	52,881	92.0%	85.6%
Jun	1,304,143	43,471	Monday, June 7, 2021	57,787	75.2%	Sunday, June 6, 2021	40,812	106.5%	70.6%
12-Mths	19,726,173	54,044	Monday, January 25, 2021	81,447	66.4%	Friday, February 12, 2021	74,777	72.3%	91.8%

Figure 24 presents the same information on a per customer basis. The peak demand was estimated to be 2,785 therms.

**Figure 24 – Schedule 85 Sales: Mean Daily Use**
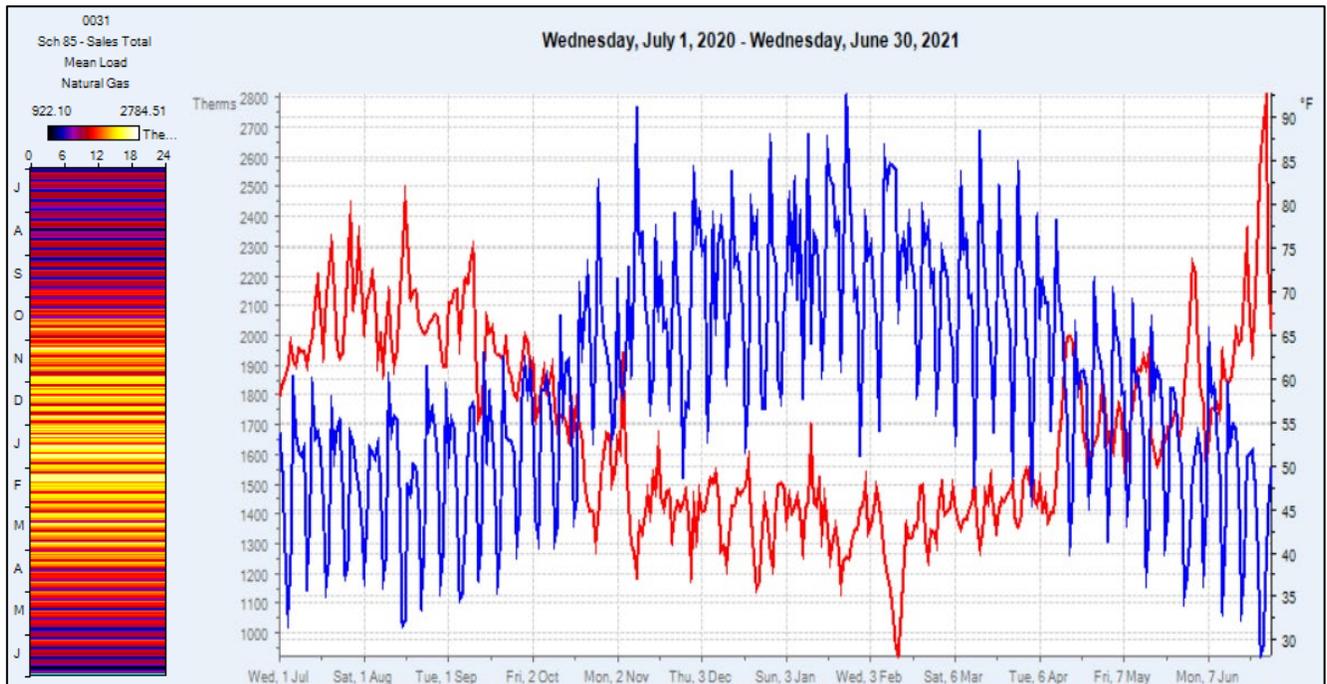
Table 21 presents the same information as Table 20 only on a per customer basis. The average daily use per account ranges from a low of 1,486 therms in June to a high of 2,239 therms in January. The maximum class peak demand was less than double the summer class peak demands.

Table 21 – Schedule 85 Sales: Mean Use Characteristics

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident Peaks			Coincident Peaks			Coincidence Factor
			Non-Coincident (Class Peak) Date	Class Peak Dema	Non-Coincident Load	Coincident System Peak Date	Coincident Class Demand	Coincident Load Factor	
Jul	46,662	1,505	Monday, July 6, 2020	1,815	82.9%	Wednesday, July 1, 2020	1,675	89.9%	92.3%
Aug	46,181	1,490	Monday, August 24, 2020	1,849	80.5%	Wednesday, August 12, 2020	1,728	86.2%	93.4%
Sep	46,910	1,564	Tuesday, September 29, 2020	1,897	82.4%	Friday, September 25, 2020	1,603	97.5%	84.5%
Oct	56,188	1,813	Monday, October 26, 2020	2,472	73.3%	Sunday, October 25, 2020	1,984	91.4%	80.2%
Nov	61,549	2,052	Monday, November 9, 2020	2,714	75.6%	Monday, November 9, 2020	2,714	75.6%	100.0%
Dec	66,721	2,152	Monday, December 28, 2020	2,627	81.9%	Wednesday, December 23, 2020	2,387	90.2%	90.9%
Jan	69,405	2,239	Monday, January 25, 2021	2,785	80.4%	Tuesday, January 26, 2021	2,511	89.2%	90.2%
Feb	62,388	2,228	Monday, February 8, 2021	2,591	86.0%	Friday, February 12, 2021	2,556	87.2%	98.7%
Mar	65,627	2,117	Monday, March 15, 2021	2,640	80.2%	Monday, March 15, 2021	2,640	80.2%	100.0%
Apr	56,609	1,887	Monday, April 5, 2021	2,361	79.9%	Wednesday, April 7, 2021	2,175	86.8%	92.1%
May	51,573	1,664	Monday, May 3, 2021	2,113	78.7%	Friday, May 7, 2021	1,808	92.0%	85.6%
Jun	44,586	1,486	Monday, June 7, 2021	1,976	75.2%	Sunday, June 6, 2021	1,395	106.5%	70.6%
12-Mths	674,399	1,848	Monday, January 25, 2021	2,785	66.4%	Friday, February 12, 2021	2,556	72.3%	91.8%

Figure 25 presents the daily demand and temperature for the peak week February 8, 2021 through February 14, 2021. The class peak for February occurred on Monday the 8th.

Figure 25 – Schedule 85 Sales: System Peak Week Demand
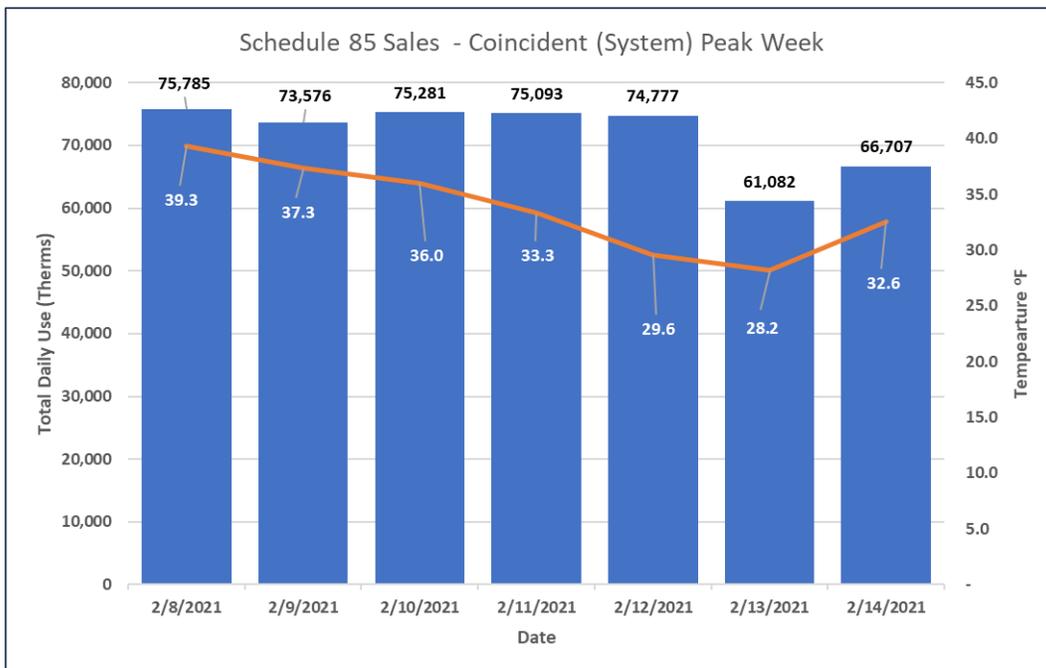
Figure 26 displays the total daily therms plotted against average daily temperature. As evidenced by the figure, the Schedule 85 gas demand is moderately temperature sensitive.

Figure 26 – Schedule 85 Sales: Temperature Sensitivity
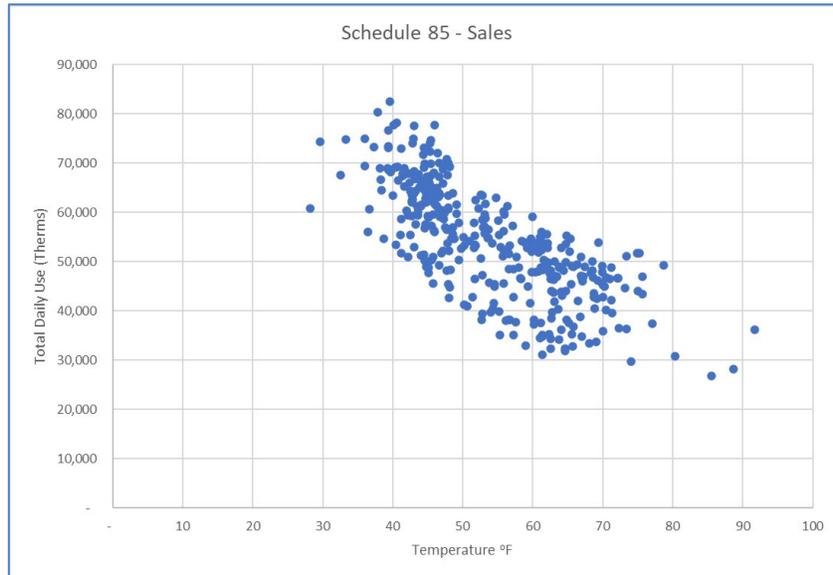
4.5.2   Schedule 85T – Interruptible Transportation Service with Firm Option

Table 22 presents a high-level summary of Schedule 85 – Interruptible Transportation Service with Firm Options. For Schedule 85 the Transportation component is dominated by Industrial customers representing 70% of the customers and 72% of the overall energy use. There are a total of 93 Transportation customers with a total annual usage of 68.774 million therms and an annual average use of 739,503 therms.

Table 22 – Schedule 85Transportation: Billing Summary

Rate/Domain	Accounts	Total Annual Usage (Therms)	Average Annual Usage (Therms)
85T-Commercial	28	19,143,764	683,706
85T-Industrial	65	49,630,061	763,539
85 Transportation Totals	93	68,773,825	739,503

Figure 27 presents the daily profile of aggregate Transportation component of Schedule 85 including both Commercial and Industrial customers. The total Schedule 85 Transportation load is plotted in blue with the average daily temperature plotted in red. The total daily gas use is not particularly weather sensitive although the class peak did occur on Wednesday, February 10, 2021 at a level of 257,034 therms. The average ambient temperature on this day was 36°F.

Figure 27 – Schedule 85 Transportation: Total Daily Use
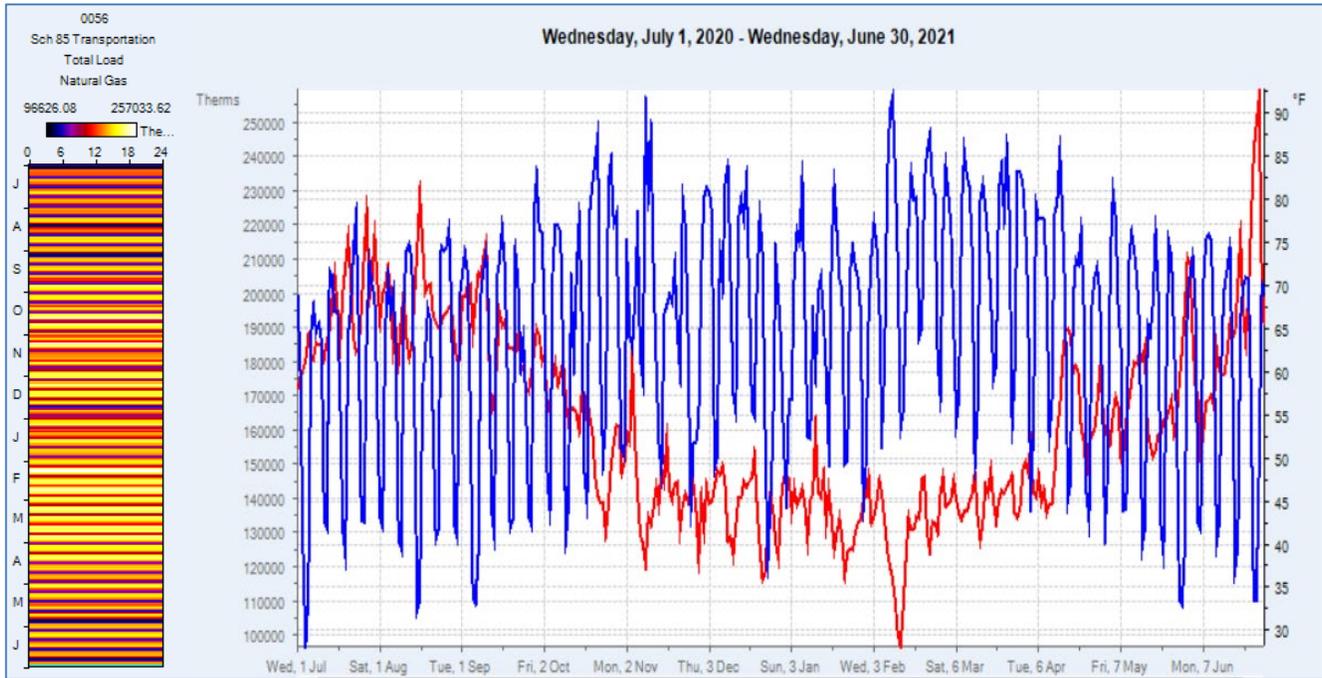
Table 23 presents selected monthly characteristics of Schedule 85 - Transportation on a total class basis. The information includes the monthly use, average daily use, date of class peak, class peak demand, load factor based on the class peak, date of the system peak, system peak demand, load factor based on the system peak and the monthly coincidence factor. The class was coincident with the system on just one month (November) but was above 90% on four additional months. The monthly load factor based on class peak was consistently high, above 75% in all months.

Table 23 – Schedule 85 Transportation: Total Use Characteristics

| Month | Monthly Use (Therms) | Average Daily Use (Therms) | Non-Coincident Peaks | | | Coincident Peaks | | | Coincidence Factor |
			Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load Factor	Coincident System Peak Date	Coincident Class Demand (Therms)	Coincident Load Factor	
Jul	5,388,754	173,831	Thursday, July 23, 2020	221,955	78.3%	Wednesday, July 1, 2020	199,641	87.1%	89.9%
Aug	5,385,606	173,729	Thursday, August 27, 2020	218,587	79.5%	Wednesday, August 12, 2020	214,290	81.1%	98.0%
Sep	5,380,182	179,339	Tuesday, September 29, 2020	233,752	76.7%	Friday, September 25, 2020	167,553	107.0%	71.7%
Oct	5,976,503	192,790	Thursday, October 22, 2020	246,184	78.3%	Sunday, October 25, 2020	162,978	118.3%	66.2%
Nov	5,740,331	191,344	Monday, November 9, 2020	253,181	75.6%	Monday, November 9, 2020	253,181	75.6%	100.0%
Dec	6,040,207	194,845	Thursday, December 10, 2020	237,452	82.1%	Wednesday, December 23, 2020	211,859	92.0%	89.2%
Jan	5,840,009	188,387	Thursday, January 7, 2021	234,510	80.3%	Tuesday, January 26, 2021	213,531	88.2%	91.1%
Feb	5,899,953	210,713	Wednesday, February 10, 2021	257,034	82.0%	Friday, February 12, 2021	208,613	101.0%	81.2%
Mar	6,532,678	210,732	Thursday, March 25, 2021	241,951	87.1%	Monday, March 15, 2021	227,066	92.8%	93.8%
Apr	5,817,080	193,903	Wednesday, April 14, 2021	241,685	80.2%	Wednesday, April 7, 2021	222,226	87.3%	91.9%
May	5,421,871	174,899	Tuesday, May 4, 2021	229,429	76.2%	Friday, May 7, 2021	183,765	95.2%	80.1%
Jun	5,350,651	178,355	Wednesday, June 9, 2021	217,185	82.1%	Sunday, June 6, 2021	130,743	136.4%	60.2%
12-Mths	68,773,825	188,421	Wednesday, February 10, 2021	257,034	73.3%	Friday, February 12, 2021	208,613	90.3%	81.2%

Figure 28 presents the same information on a per customer basis. The peak demand was estimated to be 2,771 therms.

Figure 28 – Schedule 85 Transportation: Mean Daily Use
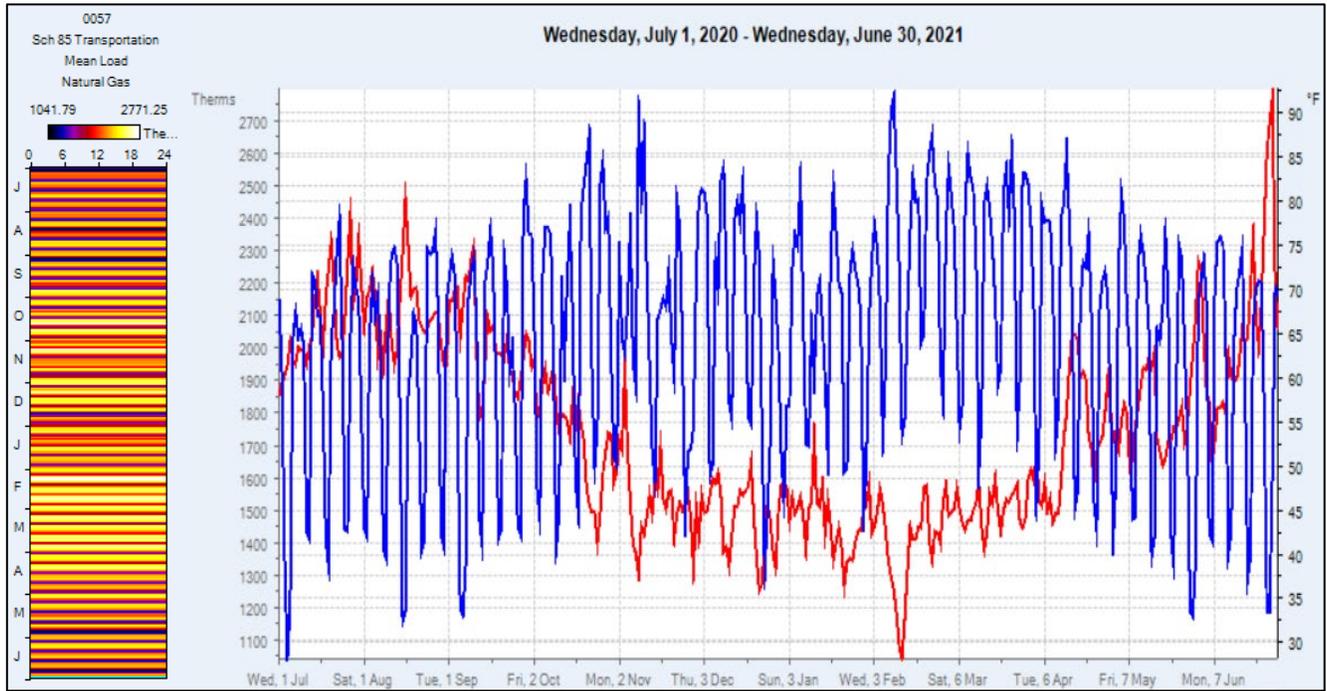
Table 24 presents the same information as Table 23 only on a per customer basis. The average daily use per account was reasonably consistent ranging from a low of 1,873 to a high of 2,272 therms. The class peak demands were all close to one another.

Table 24 – Schedule 85 Transportation: Mean Use Characteristics

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident Peaks			Coincident Peaks			Coincidence Factor
			Non-Coincident (Class Peak) Date	Class Peak Demand	Non-Coincident Load Factor	Coincident System Peak Date	Coincident Class Demand	Coincident Load Factor	
Jul	58,100	1,874	Thursday, July 23, 2020	2,393	78.3%	Wednesday, July 1, 2020	2,152	87.1%	89.9%
Aug	58,066	1,873	Thursday, August 27, 2020	2,357	79.5%	Wednesday, August 12, 2020	2,310	81.1%	98.0%
Sep	58,007	1,934	Tuesday, September 29, 2020	2,520	76.7%	Friday, September 25, 2020	1,807	107.0%	71.7%
Oct	64,437	2,079	Thursday, October 22, 2020	2,654	78.3%	Sunday, October 25, 2020	1,757	118.3%	66.2%
Nov	61,890	2,063	Monday, November 9, 2020	2,730	75.6%	Monday, November 9, 2020	2,730	75.6%	100.0%
Dec	65,124	2,101	Thursday, December 10, 2020	2,560	82.1%	Wednesday, December 23, 2020	2,284	92.0%	89.2%
Jan	62,965	2,031	Thursday, January 7, 2021	2,528	80.3%	Tuesday, January 26, 2021	2,302	88.2%	91.1%
Feb	63,611	2,272	Wednesday, February 10, 2021	2,771	82.0%	Friday, February 12, 2021	2,249	101.0%	81.2%
Mar	70,433	2,272	Thursday, March 25, 2021	2,609	87.1%	Monday, March 15, 2021	2,448	92.8%	93.8%
Apr	62,718	2,091	Wednesday, April 14, 2021	2,606	80.2%	Wednesday, April 7, 2021	2,396	87.3%	91.9%
May	58,457	1,886	Tuesday, May 4, 2021	2,474	76.2%	Friday, May 7, 2021	1,981	95.2%	80.1%
Jun	57,689	1,923	Wednesday, June 9, 2021	2,342	82.1%	Sunday, June 6, 2021	1,410	136.4%	60.2%
12-Mths	741,497	2,031	Wednesday, February 10, 2021	2,771	73.3%	Friday, February 12, 2021	2,249	90.3%	81.2%

Figure 29 presents the daily demand and temperature for the peak week February 8, 2021 through February 14, 2021. The class peak occurred during this week on Wednesday, February 10, 2021.

Figure 29 – Schedule 85 Transportation: System Peak Week Demand
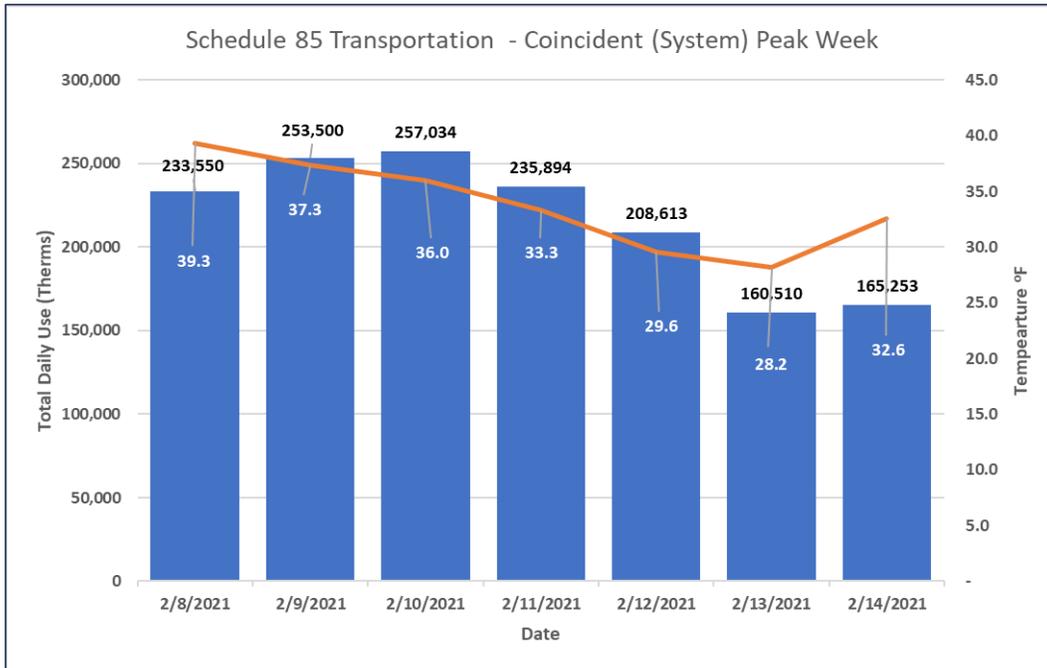
Figure 30 displays the total daily therms plotted against average daily temperature. As evidenced by the figure, there seems to be some separation between weekends and weekdays with less weather sensitivity than observed in other classes.

Figure 30 – Schedule 85 Transportation: Temperature Sensitivity
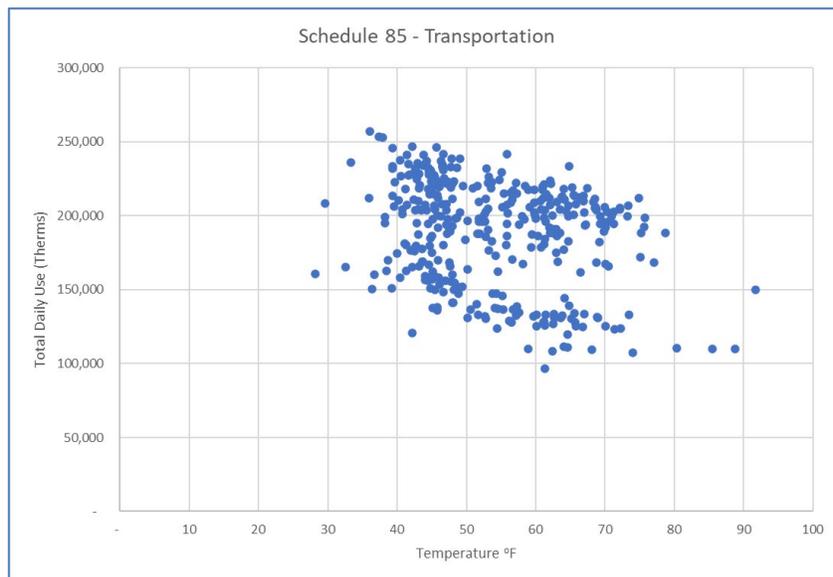
4.6 Schedule 86 – Limited Interruptible Service with Firm Option

Table 25 presents a high-level summary of Schedule 86 – Limited Interruptible Service with Firm Options. For the Sales component there are 118 accounts with a total annual gas use of 5.64 million therms. The average annual usage per account is 47,796 therms. The class is dominated by commercial customers representing nearly 97% of both types of accounts and total usage.

Table 25 – Schedule 86 Sales: Billing Summary

Rate/Domain	Accounts	Total Annual Usage (Therms)	Average Annual Usage (Therms)
86-Commercial	114	5,467,047	47,957
86G-Industrial	4	172,847	43,212
86 Sales Totals	118	5,639,894	47,796

4.6.1 Schedule 86 Sales

Figure 31 presents the daily profile of aggregate Sales component of Sales part of Schedule 86, including both Commercial and Industrial Customers. The total Schedule 86 Sales load is plotted in blue with the average daily temperature plotted in red. The peak is estimated to be 34,866 therms occurring on Thursday, February 18, 2021 with a corresponding average daily temperature of 41.7°F.

Figure 31 – Schedule 86 Sales: Total Daily Use
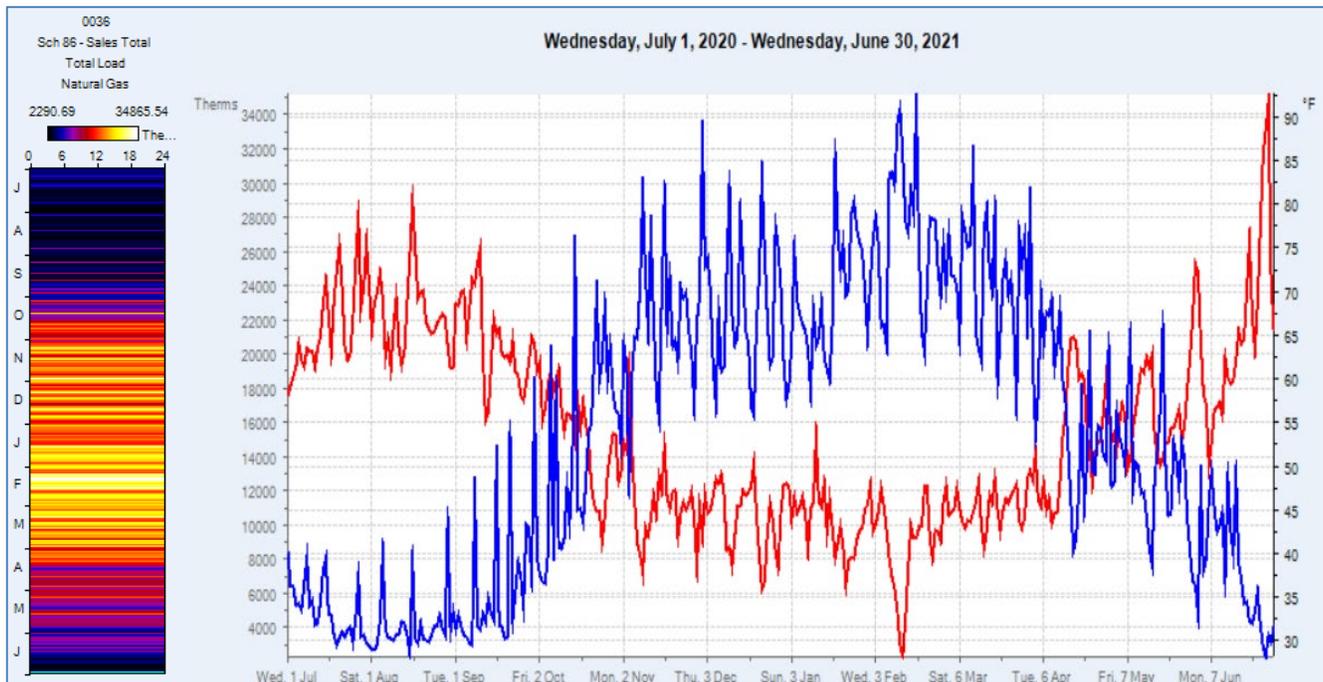
Table 26 presents selected monthly characteristics of Schedule 85 Sales on a total class basis. The information includes the monthly use, average daily use, date of class peak, class peak demand, load factor based on the class peak, date of the system peak, system peak demand, load factor based on the system peak and the monthly coincidence factor. The class was coincident with the system on two of the twelve months and had a coincidence factor over 90% for an additional three

months. At the time of the annual system peak, the class coincidence factor was 99%. The monthly load factor based on class peak ranged from a low of 35% in September to a high of 78% in March.

Table 26 – Schedule 86 Sales: Total Use Characteristics

Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident Peaks			Coincident Peaks			Coincidence Factor
		Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load Factor	Coincident System Peak Date	Coincident Class	Coincident Load Factor	
154,077	4,970	Wednesday, July 1, 2020	8,435	58.9%	Wednesday, July 1, 2020	8,435	58.9%	100.0%
128,136	4,133	Saturday, August 29, 2020	10,207	40.5%	Wednesday, August 12, 2020	4,374	94.5%	42.9%
188,637	6,288	Wednesday, September 30, 2020	17,767	35.4%	Friday, September 25, 2020	6,960	90.3%	39.2%
440,914	14,223	Thursday, October 15, 2020	26,062	54.6%	Sunday, October 25, 2020	19,639	72.4%	75.4%
644,490	21,483	Monday, November 9, 2020	29,482	72.9%	Monday, November 9, 2020	29,482	72.9%	100.0%
712,641	22,988	Tuesday, December 1, 2020	32,772	70.1%	Wednesday, December 23, 2020	30,435	75.5%	92.9%
713,920	23,030	Tuesday, January 19, 2021	31,672	72.7%	Tuesday, January 26, 2021	28,859	79.8%	91.1%
756,831	27,030	Thursday, February 18, 2021	34,866	77.5%	Friday, February 12, 2021	34,341	78.7%	98.5%
754,876	24,351	Thursday, March 11, 2021	31,312	77.8%	Monday, March 15, 2021	27,435	88.8%	87.6%
515,988	17,200	Thursday, April 1, 2021	28,839	59.6%	Wednesday, April 7, 2021	22,495	76.5%	78.0%
408,577	13,180	Thursday, May 20, 2021	21,630	60.9%	Friday, May 7, 2021	17,675	74.6%	81.7%
220,808	7,360	Monday, June 7, 2021	13,124	56.1%	Sunday, June 6, 2021	11,436	64.4%	87.1%
5,639,894	15,452	Thursday, February 18, 2021	34,866	44.3%	Friday, February 12, 2021	34,341	45.0%	98.5%

Figure 32 presents the same information on a per customer basis. The peak demand was estimated to be 297 therms.

**Figure 32 – Schedule 86 Sales: Mean Daily Use**
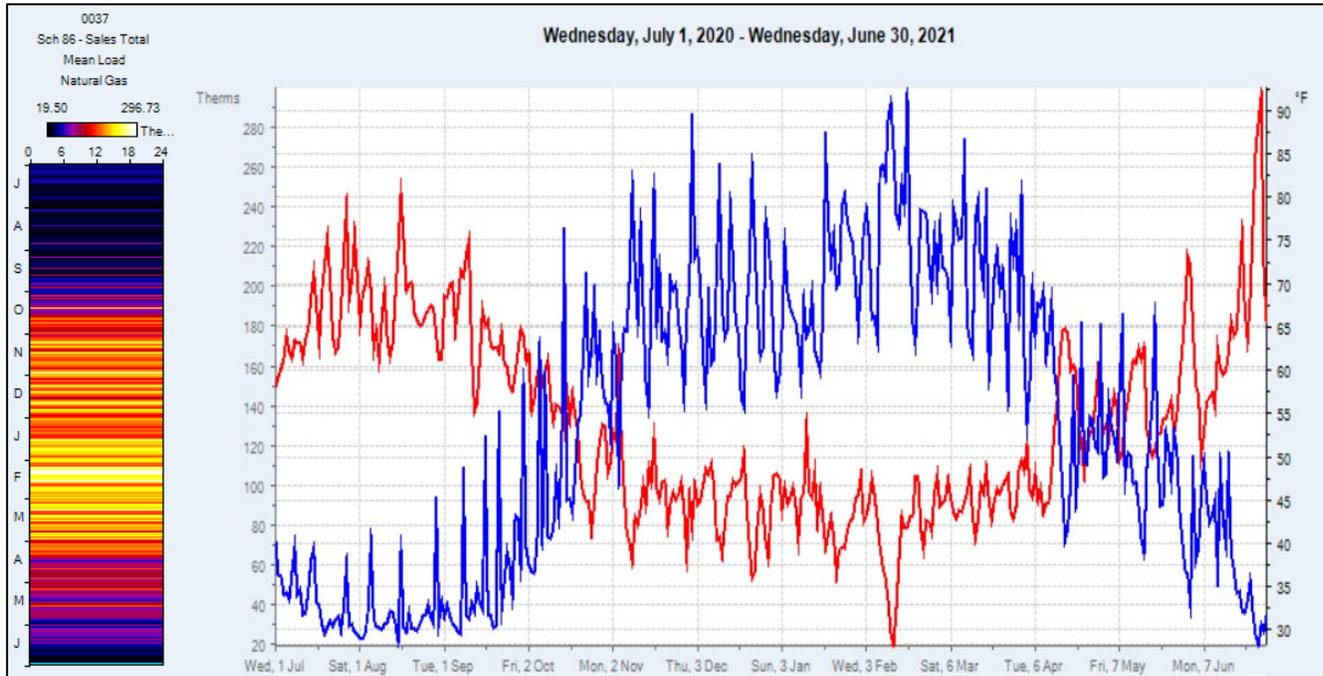
Table 27 presents the same information as Table 26 only on a per customer basis. The average monthly use per account ranges from a low of 1,091 therms in August to a high of 6,441 therms in February.

Table 27 – Schedule 86 Sales: Mean Use Characteristics

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident Peaks			Coincident Peaks			Coincidence Factor
			Non-Coincident (Class Peak) Date	Class Peak Dema	Non-Coincident Load	Coincident System Peak Date	Coincident Class Demand	Coincident Load Factor	
Jul	1,311	42	Wednesday, July 1, 2020	72	58.9%	Wednesday, July 1, 2020	72	58.9%	100.0%
Aug	1,091	35	Saturday, August 29, 2020	87	40.5%	Wednesday, August 12, 2020	37	94.5%	42.9%
Sep	1,605	54	Wednesday, September 30, 2020	151	35.4%	Friday, September 25, 2020	59	90.3%	39.2%
Oct	3,752	121	Thursday, October 15, 2020	222	54.6%	Sunday, October 25, 2020	167	72.4%	75.4%
Nov	5,485	183	Monday, November 9, 2020	251	72.9%	Monday, November 9, 2020	251	72.9%	100.0%
Dec	6,065	196	Tuesday, December 1, 2020	279	70.1%	Wednesday, December 23, 2020	259	75.5%	92.9%
Jan	6,076	196	Tuesday, January 19, 2021	270	72.7%	Tuesday, January 26, 2021	246	79.8%	91.1%
Feb	6,441	230	Thursday, February 18, 2021	297	77.5%	Friday, February 12, 2021	292	78.7%	98.5%
Mar	6,424	207	Thursday, March 11, 2021	266	77.8%	Monday, March 15, 2021	233	88.8%	87.6%
Apr	4,391	146	Thursday, April 1, 2021	245	59.6%	Wednesday, April 7, 2021	191	76.5%	78.0%
May	3,477	112	Thursday, May 20, 2021	184	60.9%	Friday, May 7, 2021	150	74.6%	81.7%
Jun	1,879	63	Monday, June 7, 2021	112	56.1%	Sunday, June 6, 2021	97	64.4%	87.1%
12-Mths	47,999	132	Thursday, February 18, 2021	297	44.3%	Friday, February 12, 2021	292	45.0%	98.5%

Figure 33 presents the daily demand and temperature for the peak week February 8, 2021 through February 14, 2021. The class peak occurred a week later but did have a coincidence factor of 98% with the system peak.

Figure 33 – Schedule 86 Sales: System Peak Week Demand
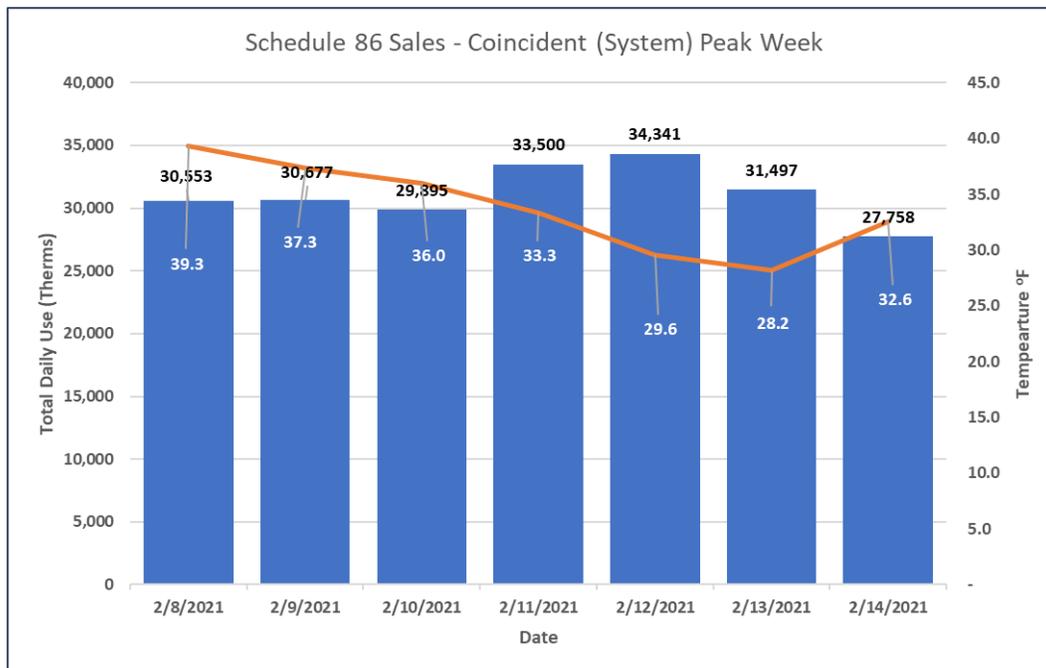
Figure 34 displays the total daily therms plotted against average daily temperature. As evidenced by the figure, the Schedule 86 – Sales is highly temperature sensitive.

Figure 34 – Schedule 86 Sales: Temperature Sensitivity
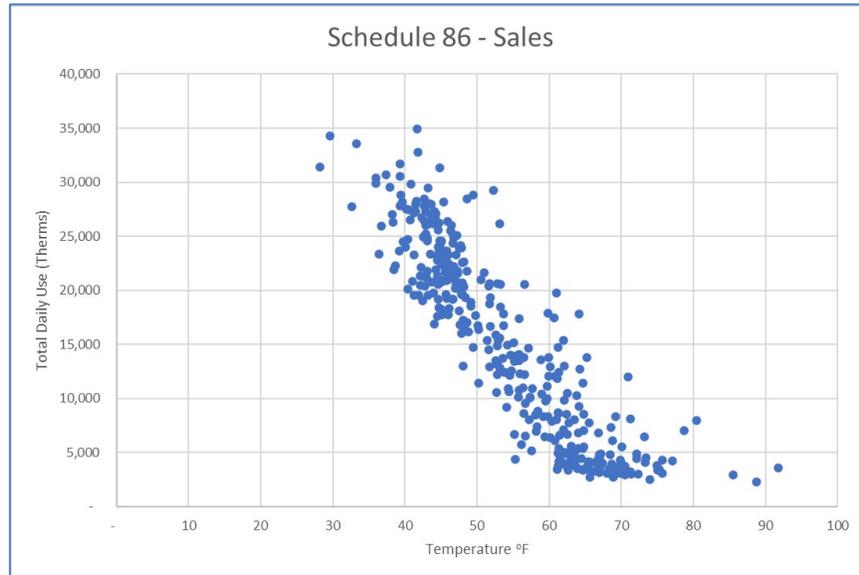
4.6.2 Schedule 86T – Limited Interruptible Transportation Service with Firm Option

Table 28 presents a high-level summary of Schedule 86 Transportation – Limited Interruptible Service with Firm Options. There are a total of 7 Transportation customers with a total annual usage of 1.718 million therms or an average of 245,498 therms. Five of the seven customers are industrial customers.

Table 28 – Schedule 86 Transportation: Billing Summary

Rate/Domain	Accounts	Total Annual Usage (Therms)	Average Annual Usage (Therms)
86T-Commercial	2	506,748	253,374
86T-Industrial	5	1,211,736	242,347
86 Transportation Totals	7	1,718,484	245,498

Figure 35 presents the daily profile of aggregate Transportation component of Schedule 86, i.e., including both Commercial and Industrial customers. The total Schedule 86 Transportation load is plotted in blue with the average daily temperature plotted in red. The total daily gas use is not weather sensitive with the peak usage occurring in September. The class peak was 11,266 therms on Wednesday, September 9, 2020. The ambient average temperature on this day was 73°F.

Figure 35 – Schedule 86 Transportation: Total Daily Use
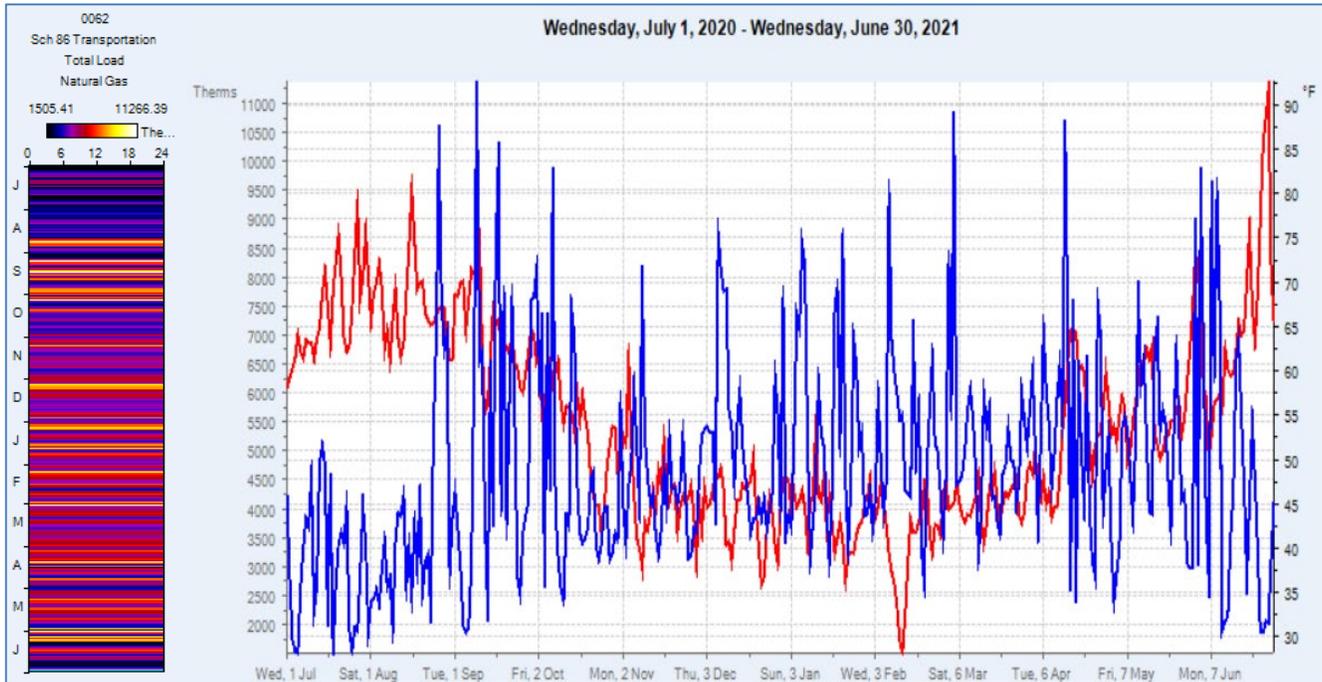
Table 29 presents selected monthly characteristics of Schedule 86 Transportation on a total class basis. The information includes the monthly use, average daily use, date of class peak, class peak demand, load factor based on the class peak, date of the system peak, system peak demand, load factor based on the system peak and the monthly coincidence factor. The class was coincident with the system on one of the twelve months. The monthly load factor based on class peak ranged from a low of 37% in August to a high of 63% in May.

Table 29 – Schedule 86 Transportation: Total Use Characteristics

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident Peaks			Coincident Peaks			Coincidence Factor
			Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load Factor	Coincident System Peak Date	Coincident Class	Coincident Load Factor	
Jul	94,096	3,035	Tuesday, July 14, 2020	5,097	59.6%	Wednesday, July 1, 2020	4,241	71.6%	83.2%
Aug	120,216	3,878	Wednesday, August 26, 2020	10,360	37.4%	Wednesday, August 12, 2020	3,879	100.0%	37.4%
Sep	152,403	5,080	Wednesday, September 9, 2020	11,266	45.1%	Friday, September 25, 2020	2,530	200.8%	22.5%
Oct	138,765	4,476	Wednesday, October 7, 2020	9,631	46.5%	Sunday, October 25, 2020	3,418	131.0%	35.5%
Nov	132,853	4,428	Monday, November 9, 2020	7,932	55.8%	Monday, November 9, 2020	7,932	55.8%	100.0%
Dec	162,713	5,249	Monday, December 7, 2020	8,764	59.9%	Wednesday, December 23, 2020	3,819	137.4%	43.6%
Jan	164,632	5,311	Friday, January 22, 2021	8,589	61.8%	Tuesday, January 26, 2021	6,924	76.7%	80.6%
Feb	142,486	5,089	Monday, February 8, 2021	9,429	54.0%	Friday, February 12, 2021	5,536	91.9%	58.7%
Mar	158,850	5,124	Thursday, March 4, 2021	10,593	48.4%	Monday, March 15, 2021	5,966	85.9%	56.3%
Apr	162,065	5,402	Wednesday, April 14, 2021	10,433	51.8%	Wednesday, April 7, 2021	6,075	88.9%	58.2%
May	148,818	4,801	Tuesday, May 11, 2021	7,665	62.6%	Friday, May 7, 2021	5,319	90.3%	69.4%
Jun	140,586	4,686	Thursday, June 3, 2021	9,634	48.6%	Sunday, June 6, 2021	2,719	172.3%	28.2%
12-Mths	1,718,484	4,708	Wednesday, September 9, 2020	11,266	41.8%	Friday, February 12, 2021	5,536	85.0%	49.1%

Figure 36 presents the daily demand and temperature for the peak week February 8, 2021 through February 14, 2021. The class peak coincidence factor in February was just 59%.

Figure 36 – Schedule 86 Transportation: System Peak Week Demand
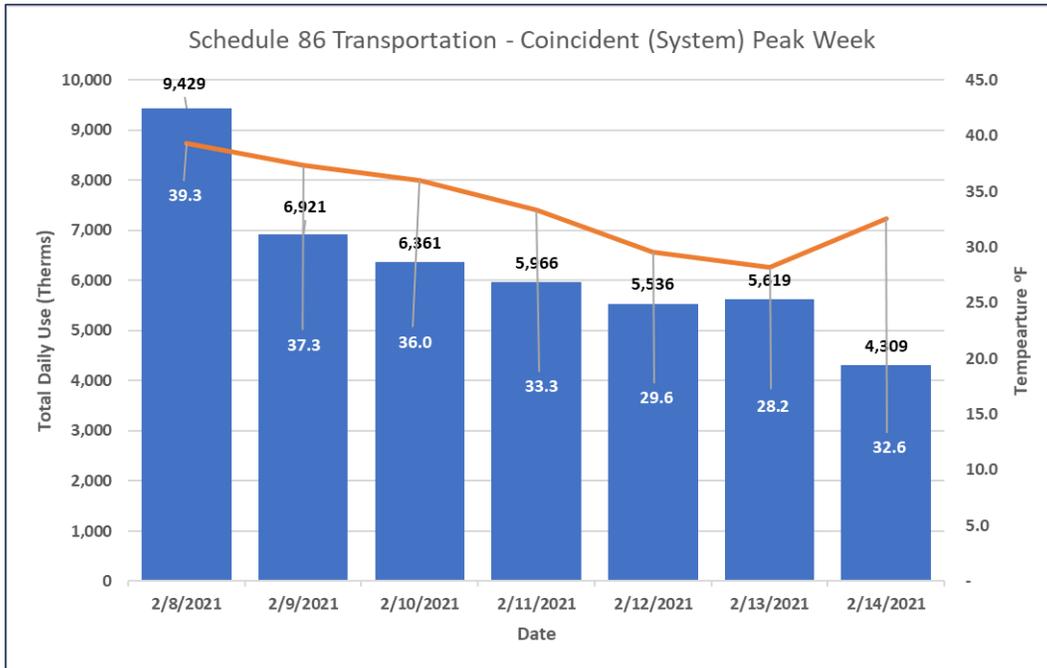
Figure 37 displays the total daily therms plotted against average daily temperature. As evidenced by the figure, the Schedule 86-Transportation gas demand is not particularly temperature sensitive.

Figure 37 – Schedule 86 Transportation: Temperature Sensitivity
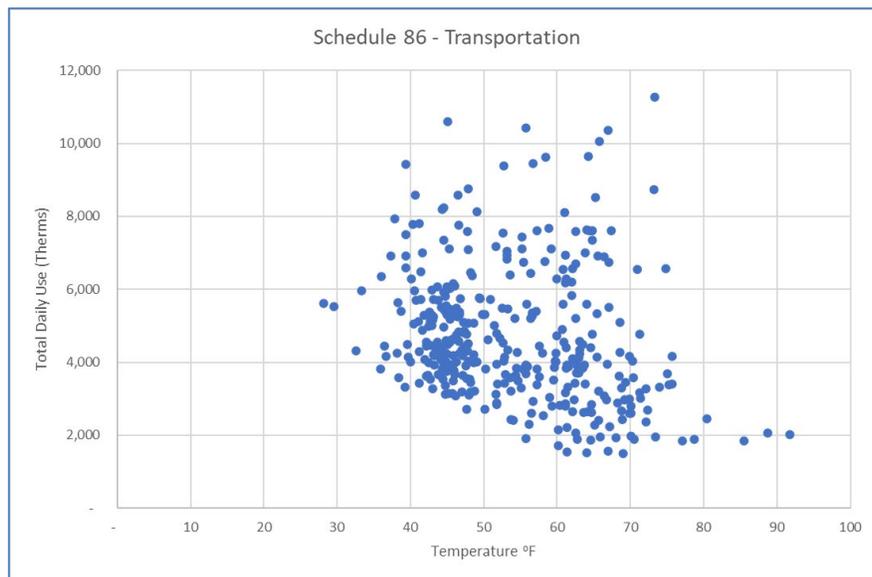
4.7 Schedule 87 – Non-Exclusive Interruptible Service with Firm Option

Table 30 presents a high-level summary of Schedule 87 – Non-Exclusive Interruptible Service with Firm Options.   For the Sales there are just five commercial accounts with a total annual gas use of 21.408 million therms. The average annual usage per account is 4.282 million therms.

Table 30 – Schedule 87 Sales: Billing Summary

Rate	Accounts	Total Annual Usage (Therms)	Average Annual Usage (Therms)
87-Commercial	5	21,408,354	4,281,671
87 Sales Totals	5	21,408,354	4,281,671

4.7.1 Schedule 87 Sales

Figure 38 presents the daily profile of aggregate Sales component of Schedule 87, i.e., commercial. The figure to the left is a vertical EnergyPrint that presents the day of the year on the y-axis and the magnitude of load as a color gradient with low levels of daily use in the black-blue spectrum and high levels of daily use in the yellow-white spectrum. The figure to the right is a more conventional two-dimensional view of the data with the magnitude of load on the y-axis and the day on the x-axis. The total Schedule 87 Sales load is plotted in blue with the average daily temperature plotted in red. The total daily gas use is highly weather sensitive with the peak usage occurring coincident with the system peak day, February 12, 2021. This was the second coldest day of the study period. The peak is estimated to be 113,256 therms with a corresponding average daily temperature of 29.6ºF.

Figure 38 – Schedule 87 Sales: Total Daily Use
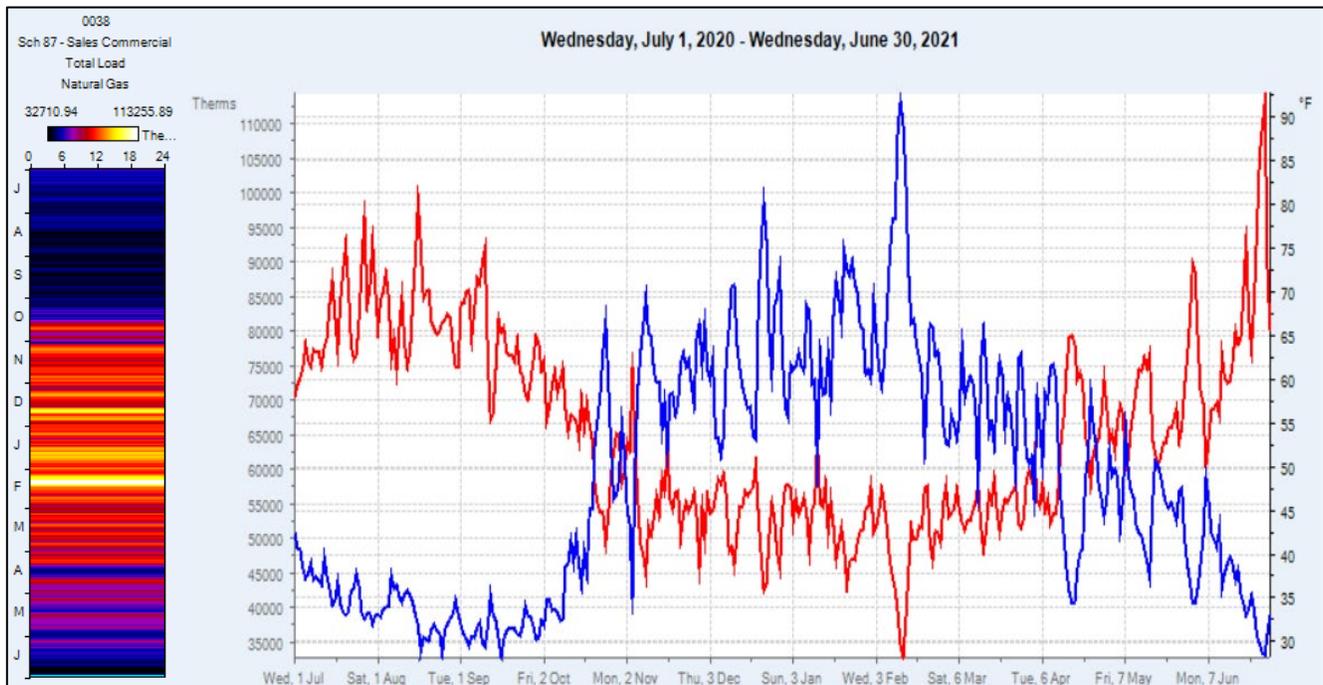
Table 31 presents selected monthly characteristics of Schedule 87 Sales on a total class basis. The information includes the monthly use, average daily use, date of class peak, class peak demand, load factor based on the class peak, date of the system peak, system peak demand, load factor based on the system peak and the monthly coincidence factor. The class

was coincident with the system on eight of the twelve months. The monthly load factor based on class peak ranged from a low of 64% to a high of 88%.

Table 31 – Schedule 87 Sales: Total Use Characteristics

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident Peaks			Coincident Peaks			Coincidence Factor
			Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load Factor	Coincident System Peak Date	Coincident Class Demand	Coincident Load Factor	
Jul	1,325,836	42,769	Wednesday, July 1, 2020	50,857	84.1%	Wednesday, July 1, 2020	50,857	84.1%	100.0%
Aug	1,205,848	38,898	Thursday, August 6, 2020	44,633	87.2%	Wednesday, August 12, 2020	42,395	91.8%	95.0%
Sep	1,101,814	36,727	Saturday, September 12, 2020	41,797	87.9%	Friday, September 25, 2020	40,289	91.2%	96.4%
Oct	1,614,601	52,084	Sunday, October 25, 2020	81,533	63.9%	Sunday, October 25, 2020	81,533	63.9%	100.0%
Nov	2,119,701	70,657	Monday, November 9, 2020	84,932	83.2%	Monday, November 9, 2020	84,932	83.2%	100.0%
Dec	2,374,630	76,601	Wednesday, December 23, 2020	98,543	77.7%	Wednesday, December 23, 2020	98,543	77.7%	100.0%
Jan	2,429,784	78,380	Friday, January 22, 2021	91,583	85.6%	Tuesday, January 26, 2021	86,853	90.2%	94.8%
Feb	2,326,500	83,089	Friday, February 12, 2021	113,256	73.4%	Friday, February 12, 2021	113,256	73.4%	100.0%
Mar	2,144,908	69,191	Monday, March 15, 2021	79,973	86.5%	Monday, March 15, 2021	79,973	86.5%	100.0%
Apr	1,760,023	58,667	Saturday, April 10, 2021	75,242	78.0%	Wednesday, April 7, 2021	70,932	82.7%	94.3%
May	1,696,865	54,738	Friday, May 7, 2021	66,208	82.7%	Friday, May 7, 2021	66,208	82.7%	100.0%
Jun	1,307,845	43,595	Sunday, June 6, 2021	58,780	74.2%	Sunday, June 6, 2021	58,780	74.2%	100.0%
12-Mths	21,408,354	58,653	Friday, February 12, 2021	113,256	51.8%	Friday, February 12, 2021	113,256	51.8%	100.0%

Figure 39 presents the daily demand and temperature for the peak week February 8, 2021 through February 14, 2021. The class peak occurred coincident with the system peak on Friday, February 12, 2021.

Figure 39 – Schedule 87 Sales: System Peak Week Demand
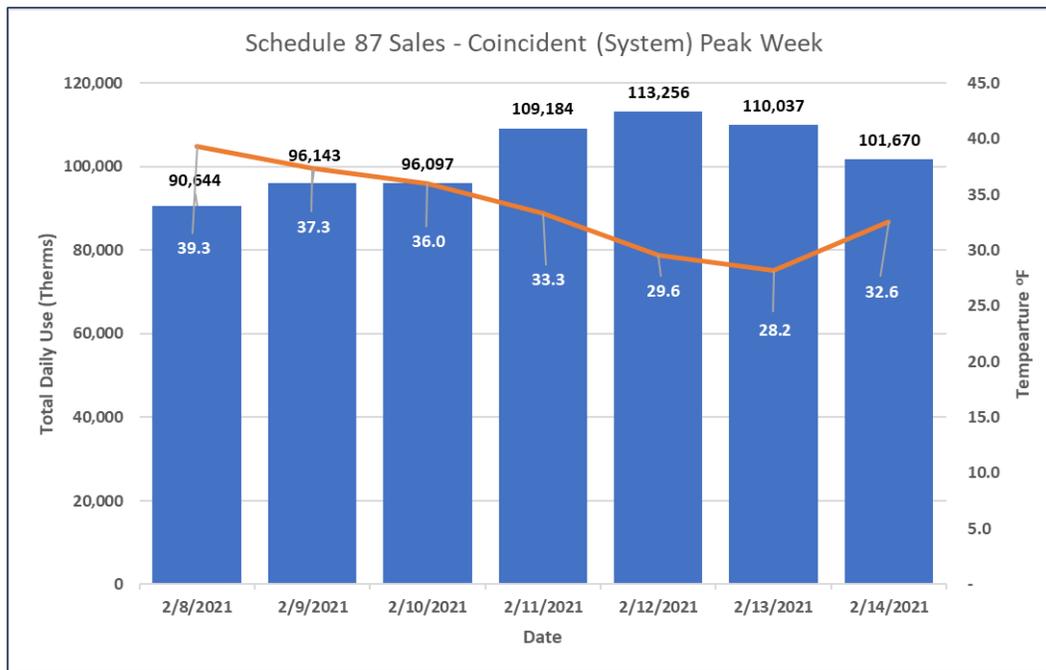
Figure 40 displays the total daily therms plotted against average daily temperature. As evidenced by the figure, the Schedule 87 Sales gas demand is highly temperature sensitive.

**Figure 40 – Schedule 87 Sales: Temperature Sensitivity**
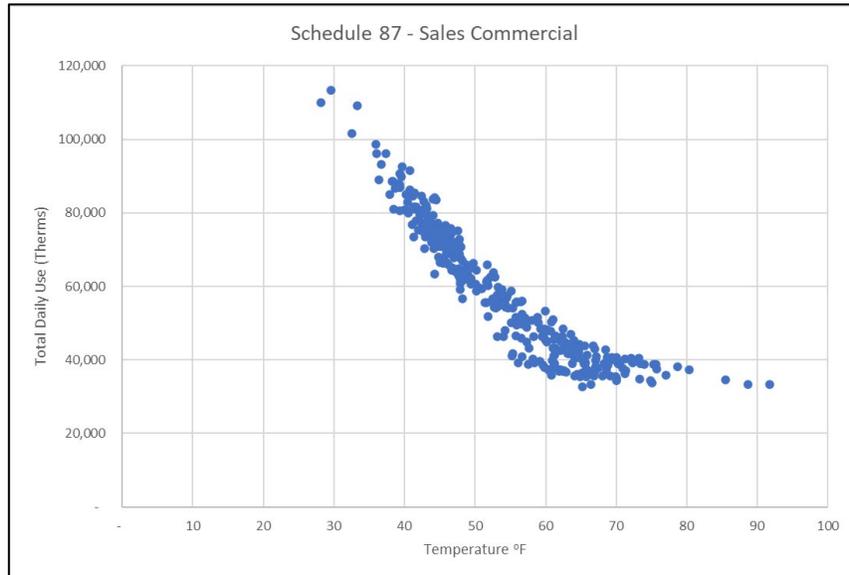
4.7.2 Schedule 87T – Non-Exclusive Interruptible Transportation Service with Firm Option

Error! Reference source not found. presents a high-level summary of Schedule 87 Transportation – Non-Exclusive Interruptible Service with Firm Options. This class is comprised of Sales and Transportation components with the Transportation component being dominate. There are a total of 10 Transportation customers with a total annual usage of 97.236 million therms or an average of 9.724 million therms per account.

Table 32 – Schedule 87 Transportation: Billing Summary

Rate	Accounts	Total Annual Usage (Therms)	Average Annual Usage (Therms)
87T-Commercial	3	16,561,726	5,520,575
87T-Industrial	7	80,674,059	11,524,866
87 Transportation Totals	10	97,235,785	9,723,578

Figure 41 presents the daily profile of aggregate Transportation component of Schedule 87, which included both Commercial and Industrial cusomters. The total Schedule 87 Transportation load is plotted in blue with the average daily temperature plotted in red. The total daily gas use is weather sensitive with the peak usage occurring on Thursday, February 11, 2021, one day before the system peak day. The peak is estimated to be 364,411 therms with a corresponding average daily temperature of 33.3°F.

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Figure 41 – Schedule 87 Transportation: Total Daily Use
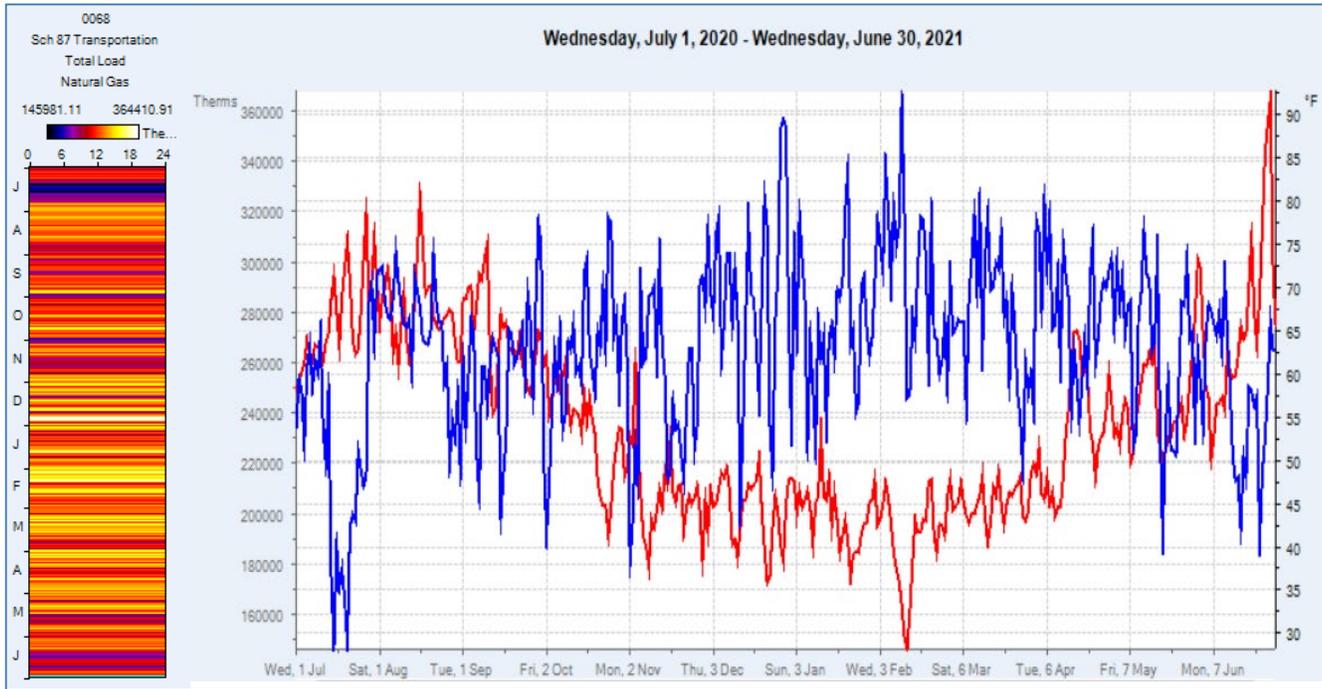
Table 33 presents selected monthly characteristics of Schedule 87-Transportation on a total class basis. The information includes the monthly use, average daily use, date of class peak, class peak demand, load factor based on the class peak, date of the system peak, system peak demand, load factor based on the system peak and the monthly coincidence factor. The monthly load factors are high at or above 76% for all months. The annual load factor was 73%. This class had a system peak coincidence factor above 90% for eight of the twelve months.

Table 33 – Schedule 87 Transportation: Total Use Characteristics

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident Peaks			Coincident Peaks			Coincidence Factor
			Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load Factor	Coincident System Peak Date	Coincident Class	Coincident Load Factor	
Jul	6,992,614	225,568	Friday, July 31, 2020	294,182	76.7%	Wednesday, July 1, 2020	234,129	96.3%	79.6%
Aug	8,428,511	271,887	Friday, August 7, 2020	304,712	89.2%	Wednesday, August 12, 2020	277,184	98.1%	91.0%
Sep	7,766,373	258,879	Tuesday, September 29, 2020	315,718	82.0%	Friday, September 25, 2020	288,129	89.8%	91.3%
Oct	8,151,714	262,959	Sunday, October 25, 2020	317,628	82.8%	Sunday, October 25, 2020	317,628	82.8%	100.0%
Nov	7,524,071	250,802	Friday, November 13, 2020	303,774	82.6%	Monday, November 9, 2020	286,616	87.5%	94.4%
Dec	8,906,058	287,292	Tuesday, December 29, 2020	356,502	80.6%	Wednesday, December 23, 2020	314,300	91.4%	88.2%
Jan	8,475,135	273,391	Friday, January 22, 2021	337,003	81.1%	Tuesday, January 26, 2021	244,132	112.0%	72.4%
Feb	8,228,818	293,886	Thursday, February 11, 2021	364,411	80.6%	Friday, February 12, 2021	319,744	91.9%	87.7%
Mar	8,643,948	278,837	Friday, March 12, 2021	323,643	86.2%	Monday, March 15, 2021	318,940	87.4%	98.5%
Apr	8,445,465	281,516	Monday, April 5, 2021	324,982	86.6%	Wednesday, April 7, 2021	318,482	88.4%	98.0%
May	8,224,215	265,297	Wednesday, May 12, 2021	312,381	84.9%	Friday, May 7, 2021	284,220	93.3%	91.0%
Jun	7,448,863	248,295	Friday, June 11, 2021	294,585	84.3%	Sunday, June 6, 2021	280,591	88.5%	95.3%
12-Mths	97,235,785	266,399	Thursday, February 11, 2021	364,411	73.1%	Friday, February 12, 2021	319,744	83.3%	87.7%

Figure 42 presents the daily demand and temperature for the peak week February 8, 2021 through February 14, 2021. The class peak occurred on Thursday, February 11 and had a coincidence factor of 88% on the system peak day of Friday, February 12, 2021.

Figure 42 – Schedule 87 Transportation: System Peak Week Demand
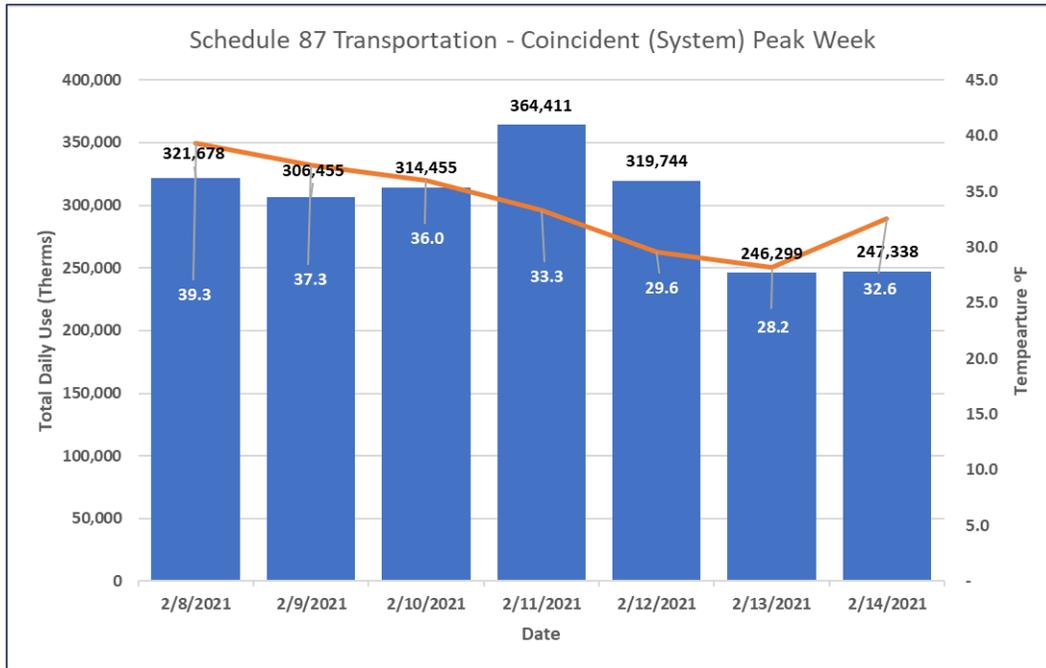
Figure 43 displays the total daily therms plotted against average daily temperature. As evidenced by the figure, this class is less weather sensitive.

Figure 43 – Schedule 87 Transportation: Temperature Sensitivity
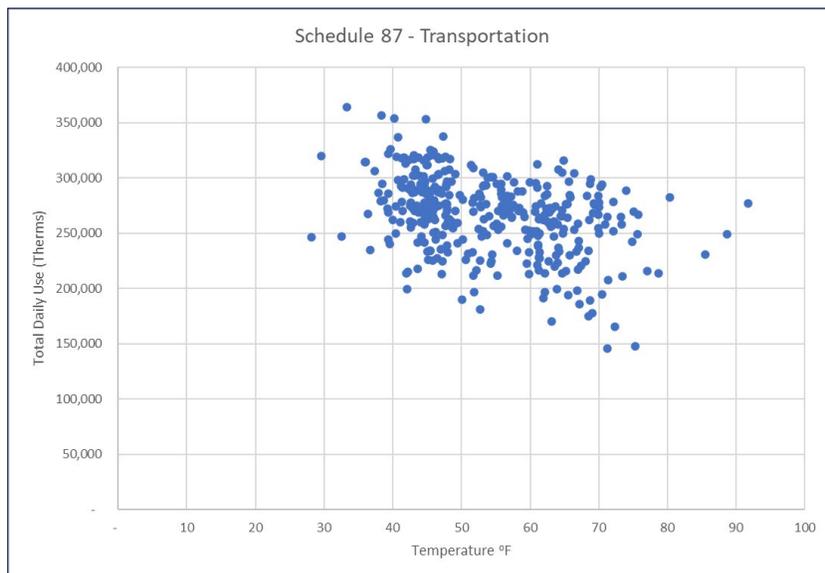
4.8 Special Contracts

Table 34 presents a high-level summary of Special Contracts. This class is comprised of 10 accounts with a total annual gas use of 31.302 million therms. The average annual usage per account is 3.13 million therms.

Table 34 – Special Contracts: Billing Summary

Rate/Domain	Accounts	Total Annual Usage (Therms)	Average Annual Usage (Therms)
Special Contracts	10	31,302,307	3,130,231
Special Contracts Totals	10	31,302,307	3,130,231

Figure 44 presents the daily profile of aggregate Special Contracts. The figure to the left is a vertical EnergyPrint that presents the day of the year on the y-axis and the magnitude of load as a color gradient with low levels of daily use in the black-blue spectrum and high levels of daily use in the yellow-white spectrum. The figure to the right is a more conventional two-dimensional view of the data with the magnitude of load on the y-axis and the day on the x-axis. The total Special Contract load is plotted in blue with the average daily temperature plotted in red. The total daily gas use is highly weather sensitive with the peak usage occurring one day before the system peak day of February 12, 2021. The class peak of 179,190 therms occurred on Thursday, February 11. The corresponding average daily temperature on this day was 33.3°F.

Figure 44 – Special Contracts: Total Daily Use
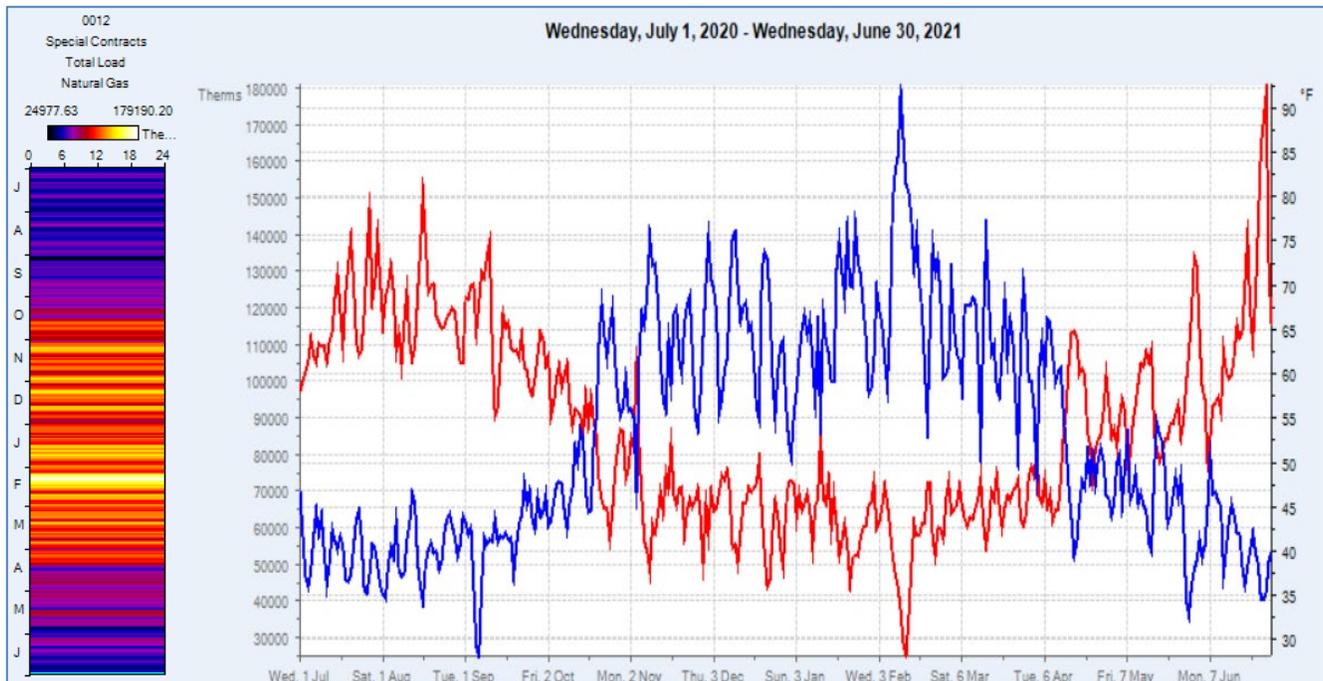
Table 35 presents selected monthly characteristics of Special Contracts on a total class basis. The information includes the monthly use, average daily use, date of class peak, class peak demand, load factor based on the class peak, date of the system peak, system peak demand, load factor based on the system peak and the monthly coincidence factor. The class was coincident with the system on five of the twelve months and had a coincidence factor greater than 90% in all but one month. The monthly load factor based on class peak was consistently over 70%.

Table 35 – Special Contracts: Total Use Characteristics

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident Peaks				Coincident Peaks			Coincidence Factor
			Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load Factor		Coincident System Peak Date	Coincident Class	Coincident Load Factor	
Jul	1,652,981	53,322	Wednesday, July 1, 2020	69,879	76.3%		Wednesday, July 1, 2020	69,879	76.3%	100.0%
Aug	1,668,201	53,813	Wednesday, August 12, 2020	69,151	77.8%		Wednesday, August 12, 2020	69,151	77.8%	100.0%
Sep	1,704,066	56,802	Wednesday, September 23, 2020	72,117	78.8%		Friday, September 25, 2020	70,083	81.1%	97.2%
Oct	2,610,240	84,201	Thursday, October 22, 2020	121,193	69.5%		Sunday, October 25, 2020	113,935	73.9%	94.0%
Nov	3,263,346	108,778	Monday, November 9, 2020	139,325	78.1%		Monday, November 9, 2020	139,325	78.1%	100.0%
Dec	3,528,350	113,818	Friday, December 11, 2020	140,886	80.8%		Wednesday, December 23, 2020	133,228	85.4%	94.6%
Jan	3,519,684	113,538	Monday, January 25, 2021	142,083	79.9%		Tuesday, January 26, 2021	132,323	85.8%	93.1%
Feb	3,601,315	128,618	Thursday, February 11, 2021	179,190	71.8%		Friday, February 12, 2021	166,407	77.3%	92.9%
Mar	3,439,229	110,943	Monday, March 15, 2021	140,092	79.2%		Monday, March 15, 2021	140,092	79.2%	100.0%
Apr	2,533,226	84,441	Wednesday, April 7, 2021	116,854	72.3%		Wednesday, April 7, 2021	116,854	72.3%	100.0%
May	2,105,252	67,911	Tuesday, May 18, 2021	88,596	76.7%		Friday, May 7, 2021	84,130	80.7%	95.0%
Jun	1,676,417	55,881	Monday, June 7, 2021	79,633	70.2%		Sunday, June 6, 2021	65,638	85.1%	82.4%
12-Mths	31,302,307	85,760	Thursday, February 11, 2021	179,190	47.9%		Friday, February 12, 2021	166,407	51.5%	92.9%

Figure 45 presents the daily demand and temperature for the peak week February 8, 2021 through February 14, 2021. The class peak occurred coincident with the system peak on Thursday, February 12, 2021 with a 93% coincidence factor on the system peak day.

**Figure 45 – Special Contracts: System Peak Week Demand**
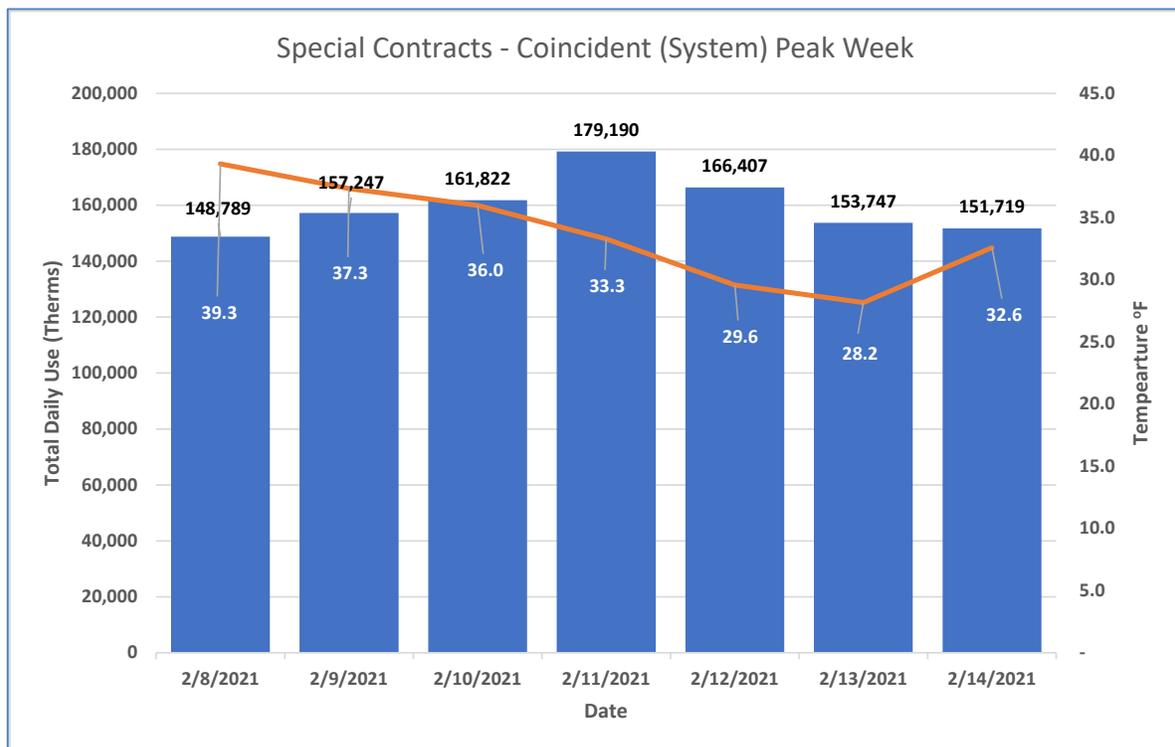
Figure 46 displays the total daily therms plotted against average daily temperature. As evidenced by the figure, this schedule is highly temperature sensitive.

Figure 46 – Special Contracts: Temperature Sensitivity

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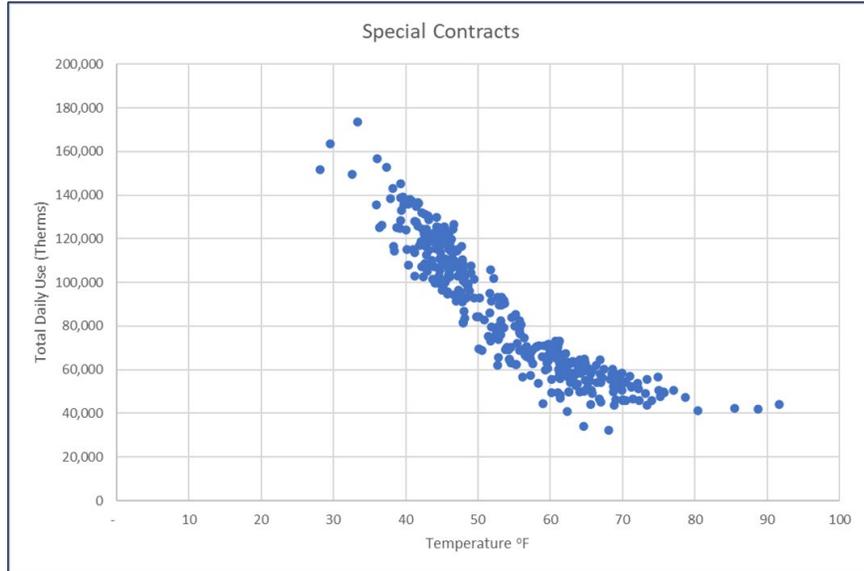
5 APPENDIX A – VALIDATION, EDITING, AND ESTIMATION (VEE) APPROACH

This appendix highlights the validation, editing, and estimation (VEE) approaches we used during the analysis process.

5.1 Outlier Identification

The system contains several strategies for identifying and correcting outliers. Currently, we have included four approaches into the system for detecting outliers. The idea of having four approaches is so the user can define which method(s) they would like to apply for an analysis. The overarching goal is to identify the "true" outliers while minimizing false positives. Two of the methods in the system compare values within a given day and as such are not applicable for a daily analysis. The two remaining methods were both used to identify outliers in the daily data set.

For each approach, we have developed default cut off values to identify outliers. The approaches used in this analysis include:

- **Weather Regression Modelled Approach:** This approach builds a weather model to predict the value of each interval and identifies intervals where the observed value deviates from the predicted value by more than a defined number of studentized residuals[2].

- **Malyack Approach:** This approach is a variation on the California method that compares intervals **across calendar weeks** (Sunday-Saturday) instead of within a single day.

5.2 Metered to Billing Comparison

Validating the load data is an important part of the VEE process, whether it is load data that fully exists for any sample point or if estimation was used to fill in gaps. The main goal of the bill-to-meter process is to be a validation check on the load data when comparing to a known, true value. This value is often the billed usage obtained for the same sample point. The user can compare the load data on a bill-by-bill basis or at an aggregate level for the study frame being compared. Whether the user uses the actual bill read dates and days in the billing cycle to define the start and end frames for comparison or a read cycle definition to define these time frames, the process ensures that the load data being compared to the billing data are examining an appropriate time frame allowing for an "apples-to-apples" comparison.

When comparing the billing usage against the load data, the ratio between the two are compared to a defined threshold. The calculation of this comparison is:

$$1 - (RatioThreshold - 1) < \frac{\sum LoadData_i}{\sum BillData_i} < RatioThreshold$$

Where,

- *RatioThreshold* is the percent difference the load data is allowed to be within to be considered "ok". This value should be greater than 1. If the allowed threshold is 5%, then this value should be set to 1.05;
- *LoadData* is the sum of the interval usage for the given time frame *i;*
- *BillData* is the sum of the billing usage for the given time frame *i*. It could just be the billed usage as is without doing any summation; and
- *i* is the representation of a given bill or timeframe. The user could choose to sum all *i* bills for comparison or do each of them individually.

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[2] A studentized residual is the quotient resulting from the division of a residual by an estimate of its standard deviation

5.3 Time-Temperature Regression Modelling

The project team uses a time-temperature modelling strategy as the fundamental basis to build models for use to fill gaps and missing data. The approach develops a mathematical model that represents the relationship between energy usage and temperature. Using this model, intervals with missing load data can be predicted applying the temperature of that hour to the model of best fit for that hour.

This normalization analysis recognizes that each customer reacts differently to varying heating and cooling degree days, and each customer has unique space conditioning characteristics. Buildings with more efficient heating or cooling equipment, radiant barriers, more insulation, and efficient windows will consume less energy because they will require less heating and/or cooling.

The simplest model where the specifications is such that energy consumptions depends on either heating or cooling degree days only is shown in Equation 1.

Equation 1 – Basic Model

$$U_i = \alpha + \beta * DD_i(\tau) + e$$

Where;

U_i	=	average daily consumption in interval i.
$DD_i(\tau)$	=	average degree days in interval i, based on reference temperature
α, β	=	parameters to be estimated to minimize e.
e	=	a random error term.

The base model reflects that a customer's energy usage is equal to some base level α, and a linear function between a reference temperature τ, and the outside temperature. The constant proportionality, β, represents a customer's effective heat-loss or heat-gain rate. As mentioned, the model recognizes that each customer has unique space conditioning operating characteristics. To capture these unique space conditioning characteristics, the modelling runs regressions for a range of heating and cooling reference temperatures (i.e., temperatures at which users tend to turn on heating or cooling equipment) against usage. The model chosen to represent a customer's energy use is the model that best linearizes the relationship between usage and degree days. A degree day is the difference between the recorded temperature for a period (could be 15 minute, hourly, or daily depending on how the modelling approach is being applied) and the point at which an occupant will act in response to temperature (either turning on the heating or air conditioning). For example, if a building occupant will turn on the AC at 74°F and the recorded temperature for an hour was 85°F, the total cooling degrees would be 11. A cooling degree day is the sum of cooling degrees for each day. For each customer, an optimal model based on a unique reference temperature (τ is identified by the minimum mean squared error (MSE) of the modelling regression) is selected. Models for each site are built by DOW and hour. Users can specify to use individual days or weekday/weekend for the model DOW.

When the model regression is applied to a customer's heating characteristics, it is referred to as the *heating only model* (HOM). When the model regression is applied to a customer's cooling characteristics, it is referred to as the *cooling only model* (COM). When the model regression model is applied to both heating and cooling characteristics, it is referred to as the *heating and cooling model* (HCM). One example of a customer that would use the HCM would be a customer that had electric heating as well as air conditioning. For this analysis all customers used an HOM because we are conducting a gas analysis where cooling is not relevant.

The analysis identifies the optimum HDD and/or CDD for each customer, which will be used to fill in gaps in the load data file using actual temperature for that DOW.

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6 APPENDIX B – ANALYSIS APPROACH

Our approach follows the principals of model-based statistical sampling ("MBSS") as the basis for analysis. MBSS techniques have been used to create a very efficient and flexible structure for collecting data on countless energy efficiency evaluations, demand response evaluations, and interval load data analyses, e.g., load research and end-use metering, projects. This project uses near population-based samples requiring little or no post-stratification.

6.1 Background

Conventional methods are documented in standard texts such as Cochran's *Sampling Techniques*.[3] MBSS is grounded in theory of model-assisted survey sampling developed by C.E. Sarndal and others.[4] [5] MBSS methodology has been applied in load research for more than fifty years and in energy efficiency evaluation for more than thirty years. This fusion of theory and practice has led to important advances in both model-based theory and interval load data collection practice, including the use of the error ratio for preliminary sample design, the model-based methodology for efficient stratified ratio estimation, and effective methods for domains estimation.

MBSS and conventional methodologies are currently taught in the Association of Edison Illuminating Companies' *Advanced Methods in Load Research* seminar.   MBSS methodology is also documented in *The California Evaluation Framework*.[6] MBSS has been used successfully for decades in countless load research and program evaluation studies. It has also been examined in public utility hearings and in at least two EPRI studies.

6.2 The Role of the Statistical Model

MBSS uses a statistical model to guide the planning and the sample design. The parameters of the model, especially the error ratio, are used to represent prior information about the population to be sampled. The model describes the nature of the variation in the relationship between any target *y variable* of the study, in our case the normalized daily consumption of the customer, and one or more *x variable*s that can be developed from known billing data and other supporting information. The *x variable* is usually a measure of the size of the customer, e.g., annual use, and assumes good information is available in the billing to support the analysis. The model is used to help choose the sample size *n*, to assess the expected statistical precision of any sample design, and to help formulate a sample design that is efficiently stratified for ratio estimation using case weights.

The model is used as a *guide* to the sample design, but the results of the study itself are *not* strongly dependent on the accuracy of the model.[7] Once the sample design is selected, the subsequent analysis of the data is based only on the sample design and not on the model used to develop the sample design. The resulting estimates will be essentially unbiased in repeated sampling and the confidence intervals will also be valid, provided that the sample design has been followed to select the sample customers. The results will be consistent with traditional sampling theory as found in texts such as Cochran's *Sampling Techniques* and consistent with standard load and market research practice.

6.3 Stratified Ratio Estimation

We assume that the data collected and analysed in the study is for a given population of *N* premises in a given customer class. In this study, daily therm use will be the unit of measure. We let *y* denote any customer characteristic to be

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[3] *Sampling Techniques*, by W. G. Cochran, 3rd. Ed. Wiley, 1977.

[4] *Model Assisted Survey Sampling*, by Carl Erik Sarndal, Bengt Swensson and Jan Wretman, Springer-Verlag, 1992.

[5] Wright, R. L. (1983), "Finite population sampling with multivariate auxiliary information," *Journal of the American Statistical Association*, **78**, 879-884.

[6] The report can be downloaded from the webaccount http://www.calmac.org/calmac-filings.asp

[7] Other methods, called model-dependent sampling, are much more dependent on the accuracy of the model. Such methods are not commonly used in load research applications since they would be more difficult to defend than MBSS and conventional methods.

determined from the customer's interval load data, i.e., weather normalized daily usage, and we let x denote any suitable characteristic of the customer that is known from billing system data such as annual use or daily use.

We define the population ratio B by the equation

$$B = \frac{\sum_{i=1}^{N} y_i}{\sum_{i=1}^{N} x_i} .$$

Here the summations are over the entire N units (e.g., customers) in the target population. We note that the population mean or total of y is equal to B times the population mean or total of x. The latter is assumed to be known from the billing data.

We assume that a sample of n customers is selected following a stratified sample design. But in this case, we have near population-based samples requiring little or no post-stratification. For each sample customer we define the case weight w to be equal to the number of customers in the target population within the stratum containing the given customer divided by the number of customers in the sample within the given stratum. Here again, by using near population-based sample we simply construct the weight as the population count (N) divided by customers with available daily data (n). In most instances the weight will be close to 1.0. Typically, the case weight is used to avoid any bias that might otherwise arise from the different sampling fractions used from one stratum to another.

Using the case weight, we define the combined ratio estimator of B by the equation: [8]

$$b = \frac{\sum_{i=1}^{n} w_i\, y_i}{\sum_{i=1}^{n} w_i\, x_i}$$

Then, if desired, the population mean or total of y can be estimated as b times the population mean or total of x, known from the billing data.

Using the case weights, we calculate the relative precision at the 90% level of confidence in three steps:

1. Calculate the sample residual $e_i = y_i - b\,x_i$ for each unit in the sample.

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[8] This equation gives the same result as the conventional stratum-weighted equation: $b = \dfrac{\sum_{h=1}^{L} N_h\, \bar{y}_h}{\sum_{h=1}^{L} N_h\, \bar{x}_h}$.

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2. Calculate[9] $se(b) = \dfrac{\sqrt{\sum\limits_{i=1}^{n} w_i (w_i - 1) e_i^2}}{\sum\limits_{i=1}^{n} w_i x_i}$.

3. Calculate $rp = \dfrac{1.645\, se(b)}{b}$.

A 90% confidence interval for B is calculated using the equation $b \pm rp\, b$. A confidence interval for the mean or total can be calculated in a similar way. The total is calculated by multiplying the ratio by the known population total from the billing system (Equation 2).

Equation 2 – Estimating Totals

$$\hat{Y} = \hat{B}\, X$$

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[9] The conventional equation is $se(b) = \dfrac{1}{\sum\limits_{h=1}^{L} N_h \bar{x}_h} \sqrt{\sum\limits_{h=1}^{L} N_h^2 \left(1 - \dfrac{n_h}{N_h}\right) \dfrac{s_h^2(e)}{n_h}}$ where $s_h^2(e) = \dfrac{1}{n_h - 1} \sum\limits_{i=1}^{n_h} (e_i - \bar{e})^2$. Our equation

assumes that $\dfrac{1}{n_h - 1} \sum\limits_{i=1}^{n_h} (e_i - \bar{e})^2$ is approximately equal to $\dfrac{1}{n_h} \sum\limits_{i=1}^{n_h} (e_i)^2$ in each stratum.

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7 APPENDIX C – COMMERCIAL AND INDUSTRIAL DETAIL

7.1 Schedules 31 & 31T C&I Components

Schedule's 31 and 31T serve the same class of customers with Sales customers taking service on Schedule 31 and Transportation customers taking service on Schedule 31T. Within the Sales and Transportation Schedules, the customers are segmented by commercial and industrial. Figure 47 presents the vertical EnergyPrints for the system load to the left and then each component of the Schedule's 31 and 31T, namely, Sales commercial, Sales industrial, aggregate Sales, and Transportation commercial. The EnergyPrints are presented on a total class basis. There are striking similarities between the Schedule 31 load and the system load except for Transportation.

Figure 47 – Schedule 31 C&I Components: EnergyPrints
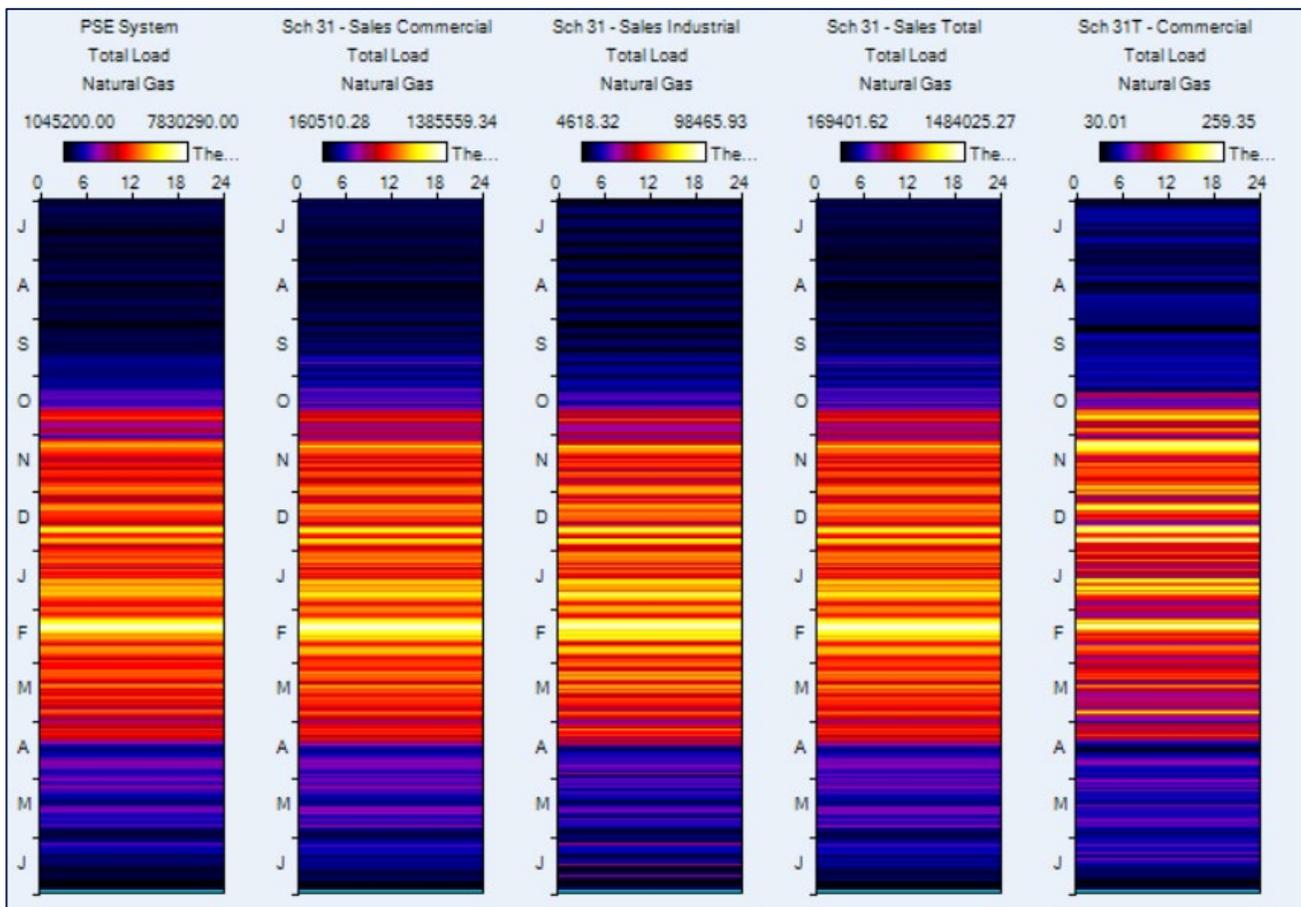
The following tables highlight the energy usage and demand characteristics by presenting monthly summaries, first as class totals followed by class means. We only present the commercial and industrial breakdowns for the Sales since the total Sales and Commercial transportation classes are included in the body of the report.

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Table 36 – Schedule 31 Commercial & Industrial Summary (Totals)

Schedule 31 - Commercial

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident Peaks			Coincident Peaks			Coincidence Factor
			Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load Factor	Coincident System Peak Date	Coincident Class Demand (Therms)	Coincident Load Factor	
Jul	7,288,227	235,104	Friday, July 3, 2020	308,596	76.2%	Wednesday, July 1, 2020	285,788	82.3%	92.6%
Aug	6,772,031	218,453	Thursday, August 13, 2020	284,594	76.8%	Wednesday, August 12, 2020	236,276	92.5%	83.0%
Sep	8,114,810	270,494	Saturday, September 26, 2020	433,617	62.4%	Friday, September 25, 2020	319,695	84.6%	73.7%
Oct	14,614,828	471,446	Monday, October 26, 2020	814,237	57.9%	Sunday, October 25, 2020	734,384	64.2%	90.2%
Nov	22,995,872	766,529	Monday, November 9, 2020	1,097,649	69.8%	Monday, November 9, 2020	1,097,649	69.8%	100.0%
Dec	27,154,180	875,941	Wednesday, December 23, 2020	1,137,867	77.0%	Wednesday, December 23, 2020	1,137,867	77.0%	100.0%
Jan	27,227,276	878,299	Tuesday, January 26, 2021	1,126,247	78.0%	Tuesday, January 26, 2021	1,126,247	78.0%	100.0%
Feb	27,910,937	996,819	Friday, February 12, 2021	1,385,559	71.9%	Friday, February 12, 2021	1,385,559	71.9%	100.0%
Mar	25,423,921	820,126	Monday, March 8, 2021	974,262	84.2%	Monday, March 15, 2021	972,678	84.3%	99.8%
Apr	16,199,977	539,999	Wednesday, April 7, 2021	830,316	65.0%	Wednesday, April 7, 2021	830,316	65.0%	100.0%
May	12,157,893	392,190	Friday, May 28, 2021	531,023	73.9%	Friday, May 7, 2021	528,499	74.2%	99.5%
Jun	8,276,002	275,867	Monday, June 7, 2021	423,889	65.1%	Sunday, June 6, 2021	350,300	78.8%	82.6%
12-Mths	204,135,954	559,277	Friday, February 12, 2021	1,385,559	40.4%	Friday, February 12, 2021	1,385,559	40.4%	100.0%

Schedule 31 - Industrial

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident Peaks			Coincident Peaks			Coincidence Factor
			Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load Factor	Coincident System Peak Date	Coincident Class Demand (Therms)	Coincident Load Factor	
Jul	319,873	10,318	Wednesday, July 1, 2020	15,454	66.8%	Wednesday, July 1, 2020	15,454	66.8%	100.0%
Aug	304,058	9,808	Thursday, August 13, 2020	13,930	70.4%	Wednesday, August 12, 2020	13,461	72.9%	96.6%
Sep	339,253	11,308	Wednesday, September 30, 2020	17,801	63.5%	Friday, September 25, 2020	15,075	75.0%	84.7%
Oct	816,213	26,329	Monday, October 26, 2020	58,114	45.3%	Sunday, October 25, 2020	42,301	62.2%	72.8%
Nov	1,503,107	50,104	Monday, November 9, 2020	77,322	64.8%	Monday, November 9, 2020	77,322	64.8%	100.0%
Dec	1,855,368	59,851	Wednesday, December 23, 2020	82,645	72.4%	Wednesday, December 23, 2020	82,645	72.4%	100.0%
Jan	1,885,912	60,836	Tuesday, January 26, 2021	85,899	70.8%	Tuesday, January 26, 2021	85,899	70.8%	100.0%
Feb	1,911,738	68,276	Friday, February 12, 2021	98,466	69.3%	Friday, February 12, 2021	98,466	69.3%	100.0%
Mar	1,708,560	55,115	Monday, March 8, 2021	70,362	78.3%	Monday, March 15, 2021	67,906	81.2%	96.5%
Apr	987,237	32,908	Wednesday, April 7, 2021	65,185	50.5%	Wednesday, April 7, 2021	65,185	50.5%	100.0%
May	581,986	18,774	Thursday, May 20, 2021	27,275	68.8%	Friday, May 7, 2021	27,038	69.4%	99.1%
Jun	448,033	14,934	Thursday, June 17, 2021	37,381	40.0%	Sunday, June 6, 2021	36,236	41.2%	96.9%
12-Mths	12,661,336	34,689	Friday, February 12, 2021	98,466	35.2%	Friday, February 12, 2021	98,466	35.2%	100.0%

Schedule 31 - Transportation Commercial

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident Peaks			Coincident Peaks			Coincidence Factor
			Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load Factor	Coincident (System Peak) Date	Coincident Class	Coincident Load Factor	
Jul	1,589	51	Friday, July 17, 2020	65	79.4%	Wednesday, July 1, 2020	56	91.2%	87.1%
Aug	1,552	50	Wednesday, August 12, 2020	69	72.2%	Wednesday, August 12, 2020	69	72.2%	100.0%
Sep	1,612	54	Friday, September 25, 2020	68	79.2%	Friday, September 25, 2020	68	79.2%	100.0%
Oct	3,267	105	Sunday, October 25, 2020	205	51.3%	Sunday, October 25, 2020	205	51.3%	100.0%
Nov	4,824	161	Saturday, November 7, 2020	231	69.6%	Monday, November 9, 2020	224	71.7%	97.1%
Dec	5,043	163	Monday, December 28, 2020	239	68.1%	Wednesday, December 23, 2020	233	69.7%	97.7%
Jan	4,481	145	Friday, January 22, 2021	217	66.5%	Tuesday, January 26, 2021	173	83.5%	79.7%
Feb	4,215	151	Friday, February 12, 2021	259	58.0%	Friday, February 12, 2021	259	58.0%	100.0%
Mar	3,939	127	Monday, March 29, 2021	207	61.3%	Monday, March 15, 2021	180	70.8%	86.6%
Apr	2,558	85	Saturday, April 10, 2021	153	55.6%	Wednesday, April 7, 2021	131	65.2%	85.3%
May	2,160	70	Tuesday, May 4, 2021	91	76.6%	Friday, May 7, 2021	81	86.0%	89.1%
Jun	1,719	57	Friday, June 11, 2021	89	64.5%	Sunday, June 6, 2021	72	79.2%	81.5%
12-Mths	36,959	101	Friday, February 12, 2021	259	39.0%	Friday, February 12, 2021	259	39.0%	100.0%

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Table 37 – Schedule 31 Commercial & Industrial Summary (Means)

Schedule 31 - Commercial

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load Factor	Coincident System Peak Date	Coincident Class Demand	Coincident Load Factor	Coincidence Factor
Jul	132.12	4.26	Friday, July 3, 2020	5.59	76.2%	Wednesday, July 1, 2020	5.2	82.3%	92.6%
Aug	122.76	3.96	Thursday, August 13, 2020	5.16	76.8%	Wednesday, August 12, 2020	4.3	92.5%	83.0%
Sep	147.10	4.90	Saturday, September 26, 2020	7.86	62.4%	Friday, September 25, 2020	5.8	84.6%	73.7%
Oct	264.93	8.55	Monday, October 26, 2020	14.76	57.9%	Sunday, October 25, 2020	13.3	64.2%	90.2%
Nov	416.86	13.90	Monday, November 9, 2020	19.90	69.8%	Monday, November 9, 2020	19.9	69.8%	100.0%
Dec	492.24	15.88	Wednesday, December 23, 2020	20.63	77.0%	Wednesday, December 23, 2020	20.6	77.0%	100.0%
Jan	493.57	15.92	Tuesday, January 26, 2021	20.42	78.0%	Tuesday, January 26, 2021	20.4	78.0%	100.0%
Feb	505.96	18.07	Friday, February 12, 2021	25.12	71.9%	Friday, February 12, 2021	25.1	71.9%	100.0%
Mar	460.88	14.87	Monday, March 8, 2021	17.66	84.2%	Monday, March 15, 2021	17.6	84.3%	99.8%
Apr	293.67	9.79	Wednesday, April 7, 2021	15.05	65.0%	Wednesday, April 7, 2021	15.1	65.0%	100.0%
May	220.40	7.11	Friday, May 28, 2021	9.63	73.9%	Friday, May 7, 2021	9.6	74.2%	99.5%
Jun	150.03	5.00	Monday, June 7, 2021	7.68	65.1%	Sunday, June 6, 2021	6.4	78.8%	82.6%
12-Mths	3,700.52	10.14	Friday, February 12, 2021	25.12	40.4%	Friday, February 12, 2021	25.12	40.4%	100.0%

Schedule 31 - Industrial

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load Factor	Coincident System Peak Date	Coincident Class Demand	Coincident Load Factor	Coincidence Factor
Jul	144.33	4.66	Wednesday, July 1, 2020	6.97	66.8%	Wednesday, July 1, 2020	7.0	66.8%	100.0%
Aug	137.19	4.43	Thursday, August 13, 2020	6.29	70.4%	Wednesday, August 12, 2020	6.1	72.9%	96.6%
Sep	153.07	5.10	Wednesday, September 30, 2020	8.03	63.5%	Friday, September 25, 2020	6.8	75.0%	84.7%
Oct	368.27	11.88	Monday, October 26, 2020	26.22	45.3%	Sunday, October 25, 2020	19.1	62.2%	72.8%
Nov	678.20	22.61	Monday, November 9, 2020	34.89	64.8%	Monday, November 9, 2020	34.9	64.8%	100.0%
Dec	837.13	27.00	Wednesday, December 23, 2020	37.29	72.4%	Wednesday, December 23, 2020	37.3	72.4%	100.0%
Jan	850.92	27.45	Tuesday, January 26, 2021	38.76	70.8%	Tuesday, January 26, 2021	38.8	70.8%	100.0%
Feb	862.57	30.81	Friday, February 12, 2021	44.43	69.3%	Friday, February 12, 2021	44.4	69.3%	100.0%
Mar	770.89	24.87	Monday, March 8, 2021	31.75	78.3%	Monday, March 15, 2021	30.6	81.2%	96.5%
Apr	445.44	14.85	Wednesday, April 7, 2021	29.41	50.5%	Wednesday, April 7, 2021	29.4	50.5%	100.0%
May	262.59	8.47	Thursday, May 20, 2021	12.31	68.8%	Friday, May 7, 2021	12.2	69.4%	99.1%
Jun	202.15	6.74	Thursday, June 17, 2021	16.87	40.0%	Sunday, June 6, 2021	16.3	41.2%	96.9%
12-Mths	5,712.74	15.65	Friday, February 12, 2021	44.43	35.2%	Friday, February 12, 2021	44.43	35.2%	100.0%

Schedule 31 - Transportation

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident (Class Peak) Date	Class Peak Demand	Non-Coincident Load Factor	Coincident System Peak Date	Coincident Class	Coincident Load Factor	Coincidence Factor
Jul	795	25.63	Friday, July 17, 2020	32	79.4%	Wednesday, July 1, 2020	28	91.2%	87.1%
Aug	776	25.03	Wednesday, August 12, 2020	35	72.2%	Wednesday, August 12, 2020	35	72.2%	100.0%
Sep	806	26.87	Friday, September 25, 2020	34	79.2%	Friday, September 25, 2020	34	79.2%	100.0%
Oct	1,633	52.69	Sunday, October 25, 2020	103	51.3%	Sunday, October 25, 2020	103	51.3%	100.0%
Nov	2,412	80.39	Saturday, November 7, 2020	116	69.6%	Monday, November 9, 2020	112	71.7%	97.1%
Dec	2,521	81.33	Monday, December 28, 2020	119	68.1%	Wednesday, December 23, 2020	117	69.7%	97.7%
Jan	2,241	72.28	Friday, January 22, 2021	109	66.5%	Tuesday, January 26, 2021	87	83.5%	79.7%
Feb	2,108	75.27	Friday, February 12, 2021	130	58.0%	Friday, February 12, 2021	130	58.0%	100.0%
Mar	1,969	63.53	Monday, March 29, 2021	104	61.3%	Monday, March 15, 2021	90	70.8%	86.6%
Apr	1,279	42.64	Saturday, April 10, 2021	77	55.6%	Wednesday, April 7, 2021	65	65.2%	85.3%
May	1,080	34.84	Tuesday, May 4, 2021	45	76.6%	Friday, May 7, 2021	41	86.0%	89.1%
Jun	860	28.65	Friday, June 11, 2021	44	64.5%	Sunday, June 6, 2021	36	79.2%	81.5%
12-Mths	18,479	50.63	Friday, February 12, 2021	130	39.0%	Friday, February 12, 2021	130	39.0%	100.0%

Figure 48 shows the weather sensitivity of the load components. All domains are quite weather sensitive.

Figure 48 – Schedule 31 C&I Components: Temperature Sensitivity
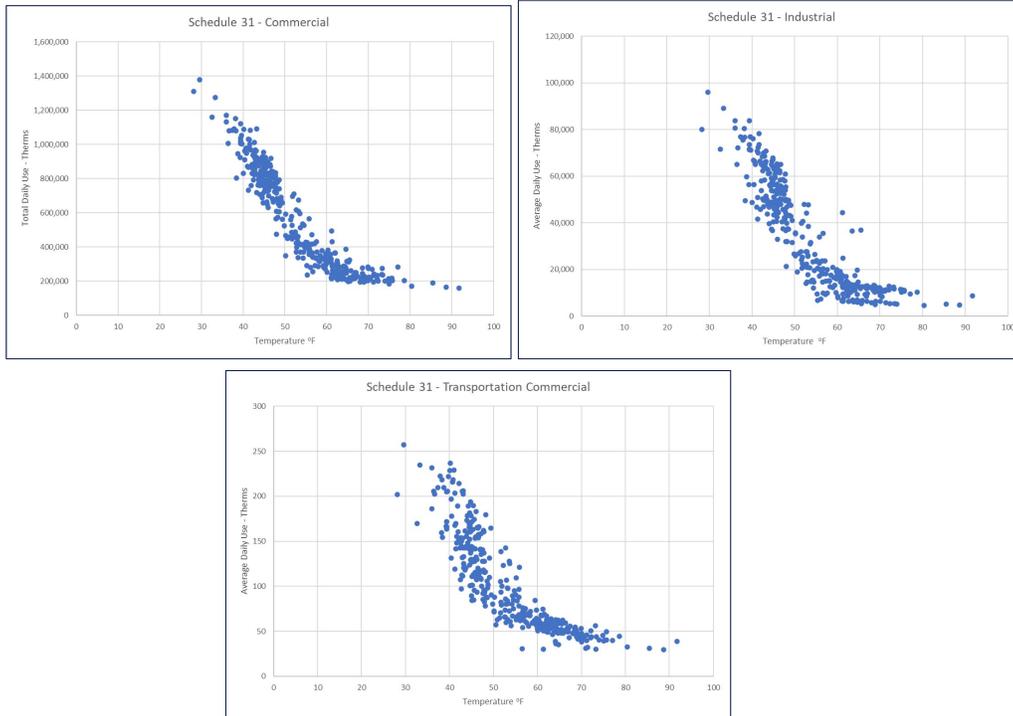
7.2 Schedules 41 & 41T C&I Components

Schedule's 41 and 41T serve the same class of customers with Sales customers taking service on Schedule 41 and Transportation customers taking service on Schedule 41T. Within the Sales and Transportation Schedules, the customers are segmented by commercial and industrial. Figure 49 presents the vertical EnergyPrints for the system load to the left and then each component of the Schedule's 41 and 41T, namely, Sales commercial, Sales industrial, aggregate Sales, Transportation commercial, Transportation industrial and aggregate Transportation. The EnergyPrints are presented on a total class basis. The industrial load shows less weather sensitivity and distinct weekend patterning.

Figure 49 – Schedule 41 C&I Components: EnergyPrints
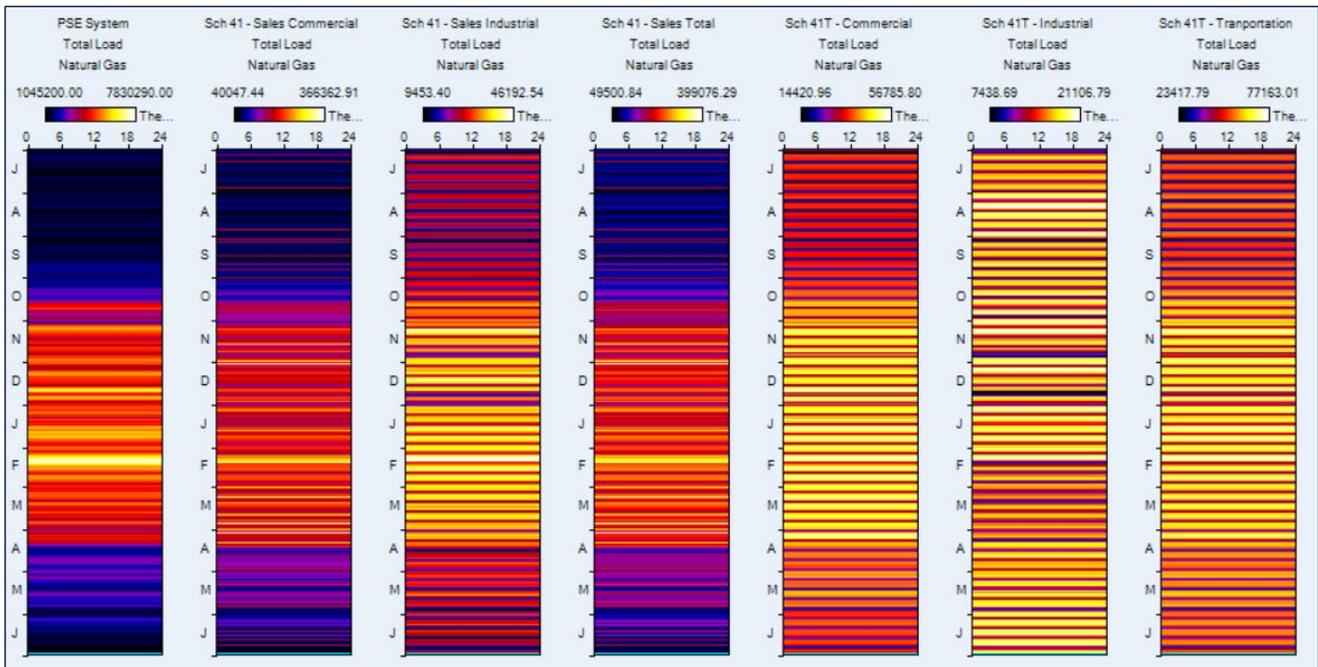
The following tables highlight the energy usage and demand characteristics by presenting monthly summaries, first as class totals followed by class means. Here we provide tables for just the Commercial and Industrial domains for Sales and Transportation since the aggregate tables are presented in the body of the report.

Table 38 - Schedule 41: Commercial & Industrial Summary (Totals)

Schedule 41 - Commercial										
			Non-Coincident Peaks			**Coincident Peaks**				
Month	**Monthly Use (Therms)**	**Average Daily Use (Therms)**	**Non-Coincident (Class Peak) Date**	**Class Peak Demand (Therms)**	**Non-Coincident Load**	**Coincident System Peak Date**	**Coincident Class**	**Coincident Load Factor**	**Coincidence Factor**
Jul	2,326,394	75,045	Monday, July 6, 2020	176,242	42.6%	Wednesday, July 1, 2020	90,657	82.8%	51.4%
Aug	2,003,193	64,619	Saturday, August 29, 2020	169,795	38.1%	Wednesday, August 12, 2020	67,028	96.4%	39.5%
Sep	2,535,206	84,507	Wednesday, September 23, 2020	186,618	45.3%	Friday, September 25, 2020	80,802	104.6%	43.3%
Oct	3,629,150	117,069	Monday, October 26, 2020	199,595	58.7%	Sunday, October 25, 2020	150,955	77.6%	75.6%
Nov	5,150,800	171,693	Friday, November 20, 2020	246,187	69.7%	Monday, November 9, 2020	234,062	73.4%	95.1%
Dec	6,059,117	195,455	Wednesday, December 2, 2020	320,063	61.1%	Wednesday, December 23, 2020	225,951	86.5%	70.6%
Jan	5,867,809	189,284	Thursday, January 21, 2021	277,809	68.1%	Tuesday, January 26, 2021	231,576	81.7%	83.4%
Feb	5,970,533	213,233	Saturday, February 13, 2021	331,466	64.3%	Friday, February 12, 2021	282,582	75.5%	85.3%
Mar	6,490,143	209,359	Monday, March 29, 2021	335,074	62.5%	Monday, March 15, 2021	235,072	89.1%	70.2%
Apr	4,887,532	162,918	Monday, April 5, 2021	366,363	44.5%	Wednesday, April 7, 2021	197,223	82.6%	53.8%
May	3,708,182	119,619	Wednesday, May 12, 2021	200,454	59.7%	Friday, May 7, 2021	140,862	84.9%	70.3%
Jun	2,581,687	86,056	Tuesday, June 15, 2021	186,567	46.1%	Sunday, June 6, 2021	92,506	93.0%	49.6%
12-Mths	51,209,746	140,301	Monday, April 5, 2021	366,363	38.3%	Friday, February 12, 2021	282,582	49.6%	77.1%
Schedule 41 - Industrial										
			Non-Coincident Peaks			**Coincident Peaks**				
Month	**Monthly Use (Therms)**	**Average Daily Use (Therms)**	**Non-Coincident (Class Peak) Date**	**Class Peak Demand (Therms)**	**Non-Coincident Load**	**Coincident System Peak Date**	**Coincident Class**	**Coincident Load Factor**	**Coincidence Factor**
Jul	656,063	21,163	Wednesday, July 1, 2020	29,204	72.5%	Wednesday, July 1, 2020	29,204	72.5%	100.0%
Aug	624,118	20,133	Thursday, August 20, 2020	27,861	72.3%	Wednesday, August 12, 2020	24,972	80.6%	89.6%
Sep	629,568	20,986	Wednesday, September 30, 2020	27,262	77.0%	Friday, September 25, 2020	23,038	91.1%	84.5%
Oct	801,580	25,857	Thursday, October 22, 2020	34,753	74.4%	Sunday, October 25, 2020	24,168	107.0%	69.5%
Nov	899,471	29,982	Monday, November 9, 2020	43,456	69.0%	Monday, November 9, 2020	43,456	69.0%	100.0%
Dec	969,214	31,265	Tuesday, December 15, 2020	42,571	73.4%	Wednesday, December 23, 2020	37,142	84.2%	87.2%
Jan	987,803	31,865	Tuesday, January 19, 2021	42,890	74.3%	Tuesday, January 26, 2021	40,040	79.6%	93.4%
Feb	987,086	35,253	Thursday, February 11, 2021	46,193	76.3%	Friday, February 12, 2021	43,219	81.6%	93.6%
Mar	1,015,466	32,757	Tuesday, March 9, 2021	39,563	82.8%	Monday, March 15, 2021	34,218	95.7%	86.5%
Apr	806,739	26,891	Wednesday, April 7, 2021	37,480	71.7%	Wednesday, April 7, 2021	37,480	71.7%	100.0%
May	716,088	23,100	Thursday, May 20, 2021	31,874	72.5%	Friday, May 7, 2021	28,061	82.3%	88.0%
Jun	642,318	21,411	Thursday, June 10, 2021	30,268	70.7%	Sunday, June 6, 2021	13,951	153.5%	46.1%
12-Mths	9,735,512	26,673	Thursday, February 11, 2021	46,193	57.7%	Friday, February 12, 2021	43,219	61.7%	93.6%

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Table 39 – Schedule 41 Transportation: Commercial & Industrial Summary (Totals)

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load	Coincident System Peak Date	Coincident Class	Coincident Load Factor	Coincidence Factor
Schedule 41 Transportation - Commercial									
Jul	968,962	31,257	Tuesday, July 7, 2020	38,581	81.0%	Wednesday, July 1, 2020	36,802	84.9%	95.4%
Aug	941,746	30,379	Thursday, August 6, 2020	38,257	79.4%	Wednesday, August 12, 2020	36,664	82.9%	95.8%
Sep	935,228	31,174	Wednesday, September 30, 2020	36,731	84.9%	Friday, September 25, 2020	36,440	85.5%	99.2%
Oct	1,120,932	36,159	Wednesday, October 21, 2020	46,753	77.3%	Sunday, October 25, 2020	31,263	115.7%	66.9%
Nov	1,242,002	41,400	Wednesday, November 11, 2020	53,992	76.7%	Monday, November 9, 2020	47,431	87.3%	87.8%
Dec	1,340,064	43,228	Wednesday, December 23, 2020	56,172	77.0%	Wednesday, December 23, 2020	56,172	77.0%	100.0%
Jan	1,318,580	42,535	Wednesday, January 27, 2021	54,551	78.0%	Tuesday, January 26, 2021	50,080	84.9%	91.8%
Feb	1,237,986	44,214	Wednesday, February 10, 2021	56,786	77.9%	Friday, February 12, 2021	48,784	90.6%	85.9%
Mar	1,350,783	43,574	Wednesday, March 10, 2021	54,530	79.9%	Monday, March 15, 2021	49,531	88.0%	90.8%
Apr	1,159,485	38,650	Wednesday, April 7, 2021	53,550	72.2%	Wednesday, April 7, 2021	53,550	72.2%	100.0%
May	1,091,858	35,221	Wednesday, May 19, 2021	44,001	80.0%	Friday, May 7, 2021	43,152	81.6%	98.1%
Jun	1,013,615	33,787	Wednesday, June 9, 2021	39,830	84.8%	Sunday, June 6, 2021	28,405	118.9%	71.3%
12-Mths	13,721,241	37,592	Wednesday, February 10, 2021	56,786	66.2%	Friday, February 12, 2021	48,784	77.1%	85.9%
Schedule 41 Transportation - Industrial									
Jul	467,434	15,079	Wednesday, July 8, 2020	18,355	82.1%	Wednesday, July 1, 2020	16,869	89.4%	91.9%
Aug	507,888	16,383	Tuesday, August 11, 2020	20,758	78.9%	Wednesday, August 12, 2020	20,602	79.5%	99.3%
Sep	455,638	15,188	Wednesday, September 2, 2020	20,163	75.3%	Friday, September 25, 2020	15,176	100.1%	75.3%
Oct	477,238	15,395	Wednesday, October 28, 2020	20,485	75.2%	Sunday, October 25, 2020	11,728	131.3%	57.3%
Nov	467,820	15,594	Monday, November 9, 2020	21,107	73.9%	Monday, November 9, 2020	21,107	73.9%	100.0%
Dec	483,053	15,582	Tuesday, December 8, 2020	20,116	77.5%	Wednesday, December 23, 2020	15,865	98.2%	78.9%
Jan	510,471	16,467	Tuesday, January 5, 2021	20,386	80.8%	Tuesday, January 26, 2021	19,314	85.3%	94.7%
Feb	429,518	15,340	Wednesday, February 10, 2021	20,377	75.3%	Friday, February 12, 2021	14,438	106.3%	70.9%
Mar	451,584	14,567	Wednesday, March 24, 2021	18,131	80.3%	Monday, March 15, 2021	14,014	103.9%	77.3%
Apr	456,024	15,201	Thursday, April 22, 2021	19,243	79.0%	Wednesday, April 7, 2021	16,786	90.6%	87.2%
May	478,402	15,432	Wednesday, May 19, 2021	19,404	79.5%	Friday, May 7, 2021	16,314	94.6%	84.1%
Jun	499,743	16,658	Thursday, June 24, 2021	20,111	82.8%	Sunday, June 6, 2021	12,472	133.6%	62.0%
12-Mths	5,684,815	15,575	Tuesday, August 11, 2020	21,107	73.8%	Friday, February 12, 2021	14,438	107.9%	68.4%

Table 40 - Schedule 41: Commercial & Industrial Summary (Means)

Schedule 41 - Commercial

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident Peaks			Coincident Peaks			Coincidence Factor
			Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load Factor	Coincident System Peak Date	Coincident Class	Coincident Load Factor	
Jul	1,970	63.56	Monday, July 6, 2020	149.26	42.6%	Wednesday, July 1, 2020	76.78	82.8%	51.4%
Aug	1,697	54.73	Saturday, August 29, 2020	143.80	38.1%	Wednesday, August 12, 2020	56.77	96.4%	39.5%
Sep	2,147	71.57	Wednesday, September 23, 2020	158.05	45.3%	Friday, September 25, 2020	68.43	104.6%	43.3%
Oct	3,074	99.15	Monday, October 26, 2020	169.04	58.7%	Sunday, October 25, 2020	127.85	77.6%	75.6%
Nov	4,362	145.41	Friday, November 20, 2020	208.50	69.7%	Monday, November 9, 2020	198.23	73.4%	95.1%
Dec	5,132	165.53	Wednesday, December 2, 2020	271.07	61.1%	Wednesday, December 23, 2020	191.36	86.5%	70.6%
Jan	4,970	160.31	Thursday, January 21, 2021	235.28	68.1%	Tuesday, January 26, 2021	196.13	81.7%	83.4%
Feb	5,057	180.59	Saturday, February 13, 2021	280.73	64.3%	Friday, February 12, 2021	239.32	75.5%	85.3%
Mar	5,497	177.31	Monday, March 29, 2021	283.78	62.5%	Monday, March 15, 2021	199.09	89.1%	70.2%
Apr	4,139	137.98	Monday, April 5, 2021	310.28	44.5%	Wednesday, April 7, 2021	167.03	82.6%	53.8%
May	3,141	101.31	Wednesday, May 12, 2021	169.77	59.7%	Friday, May 7, 2021	119.30	84.9%	70.3%
Jun	2,186	72.88	Tuesday, June 15, 2021	158.01	46.1%	Sunday, June 6, 2021	78.35	93.0%	49.6%
12-Mths	43,371	118.82	Monday, April 5, 2021	310.28	38.3%	Friday, February 12, 2021	239.32	49.6%	77.1%

Schedule 41 - Industrial

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident Peaks			Coincident Peaks			Coincidence Factor
			Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load Factor	Coincident System Peak Date	Coincident Class	Coincident Load Factor	
Jul	9,384	302.69	Wednesday, July 1, 2020	417.69	72.5%	Wednesday, July 1, 2020	417.69	72.5%	100.0%
Aug	8,927	287.95	Thursday, August 20, 2020	398.49	72.3%	Wednesday, August 12, 2020	357.17	80.6%	89.6%
Sep	9,005	300.15	Wednesday, September 30, 2020	389.92	77.0%	Friday, September 25, 2020	329.51	91.1%	84.5%
Oct	11,465	369.83	Thursday, October 22, 2020	497.06	74.4%	Sunday, October 25, 2020	345.68	107.0%	69.5%
Nov	12,865	428.83	Monday, November 9, 2020	621.54	69.0%	Monday, November 9, 2020	621.54	69.0%	100.0%
Dec	13,862	447.17	Tuesday, December 15, 2020	608.88	73.4%	Wednesday, December 23, 2020	531.23	84.2%	87.2%
Jan	14,128	455.75	Tuesday, January 19, 2021	613.45	74.3%	Tuesday, January 26, 2021	572.68	79.6%	93.4%
Feb	14,118	504.22	Thursday, February 11, 2021	660.68	76.3%	Friday, February 12, 2021	618.15	81.6%	93.6%
Mar	14,524	468.51	Tuesday, March 9, 2021	565.86	82.8%	Monday, March 15, 2021	489.41	95.7%	86.5%
Apr	11,539	384.62	Wednesday, April 7, 2021	536.07	71.7%	Wednesday, April 7, 2021	536.07	71.7%	100.0%
May	10,242	330.39	Thursday, May 20, 2021	455.89	72.5%	Friday, May 7, 2021	401.36	82.3%	88.0%
Jun	9,187	306.23	Thursday, June 10, 2021	432.92	70.7%	Sunday, June 6, 2021	199.54	153.5%	46.1%
12-Mths	139,245	381.49	Thursday, February 11, 2021	660.68	57.7%	Friday, February 12, 2021	618.15	61.7%	93.6%

Table 41 - Schedule 41 Transportation: Commercial & Industrial Summary (Means)

			Non-Coincident Peaks			Coincident Peaks			
Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident (Class Peak) Date	Class Peak Deman	Non-Coincident Load Factor	Coincident System Peak Date	Coincident Class Demand	Coincident Load Factor	Coincidence Factor
			Schedule 41 Transportation - Commercial						
Jul	11,975	386	Tuesday, July 7, 2020	477	81.0%	Wednesday, July 1, 2020	455	84.9%	95.4%
Aug	11,638	375	Thursday, August 6, 2020	473	79.4%	Wednesday, August 12, 2020	453	82.9%	95.8%
Sep	11,558	385	Wednesday, September 30, 2020	454	84.9%	Friday, September 25, 2020	450	85.5%	99.2%
Oct	13,853	447	Wednesday, October 21, 2020	578	77.3%	Sunday, October 25, 2020	386	115.7%	66.9%
Nov	15,349	512	Wednesday, November 11, 2020	667	76.7%	Monday, November 9, 2020	586	87.3%	87.8%
Dec	16,561	534	Wednesday, December 23, 2020	694	77.0%	Wednesday, December 23, 2020	694	77.0%	100.0%
Jan	16,296	526	Wednesday, January 27, 2021	674	78.0%	Tuesday, January 26, 2021	619	84.9%	91.8%
Feb	15,300	546	Wednesday, February 10, 2021	702	77.9%	Friday, February 12, 2021	603	90.6%	85.9%
Mar	16,694	539	Wednesday, March 10, 2021	674	79.9%	Monday, March 15, 2021	612	88.0%	90.8%
Apr	14,329	478	Wednesday, April 7, 2021	662	72.2%	Wednesday, April 7, 2021	662	72.2%	100.0%
May	13,494	435	Wednesday, May 19, 2021	544	80.0%	Friday, May 7, 2021	533	81.6%	98.1%
Jun	12,527	418	Wednesday, June 9, 2021	492	84.8%	Sunday, June 6, 2021	351	118.9%	71.3%
12-Mths	169,572	465	Wednesday, February 10, 2021	702	66.2%	Friday, February 12, 2021	603	77.1%	85.9%
			Schedule 41 Transportation - Industrial						
Jul	24,930	804	Wednesday, July 8, 2020	979	82.1%	Wednesday, July 1, 2020	900	89.4%	91.9%
Aug	27,087	874	Tuesday, August 11, 2020	1,107	78.9%	Wednesday, August 12, 2020	1,099	79.5%	99.3%
Sep	24,301	810	Wednesday, September 2, 2020	1,075	75.3%	Friday, September 25, 2020	809	100.1%	75.3%
Oct	25,453	821	Wednesday, October 28, 2020	1,093	75.2%	Sunday, October 25, 2020	626	131.3%	57.3%
Nov	24,950	832	Monday, November 9, 2020	1,126	73.9%	Monday, November 9, 2020	1,126	73.9%	100.0%
Dec	25,763	831	Tuesday, December 8, 2020	1,073	77.5%	Wednesday, December 23, 2020	846	98.2%	78.9%
Jan	27,225	878	Tuesday, January 5, 2021	1,087	80.8%	Tuesday, January 26, 2021	1,030	85.3%	94.7%
Feb	22,908	818	Wednesday, February 10, 2021	1,087	75.3%	Friday, February 12, 2021	770	106.3%	70.9%
Mar	24,085	777	Wednesday, March 24, 2021	967	80.3%	Monday, March 15, 2021	747	103.9%	77.3%
Apr	24,321	811	Thursday, April 22, 2021	1,026	79.0%	Wednesday, April 7, 2021	895	90.6%	87.2%
May	25,515	823	Wednesday, May 19, 2021	1,035	79.5%	Friday, May 7, 2021	870	94.6%	84.1%
Jun	26,653	888	Thursday, June 24, 2021	1,073	82.8%	Sunday, June 6, 2021	665	133.6%	62.0%
12-Mths	303,190	831	Tuesday, August 11, 2020	1,126	73.8%	Friday, February 12, 2021	770	107.9%	68.4%

Figure 50 shows the weather sensitivity of the load components. Three of the four domains show a load level difference between the weekday and weekend loads. The Transportation Industrial load is the least weather sensitive.

Figure 50 – Schedule 41 C&I Components: Temperature Sensitivity
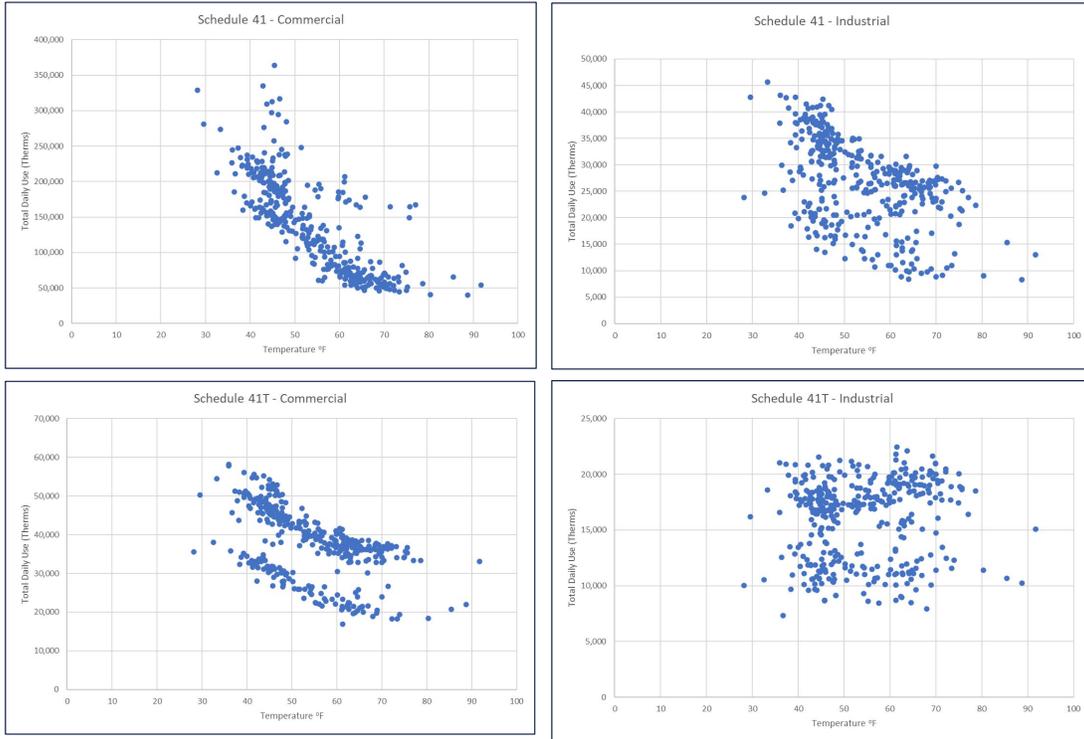
7.3 Schedules 85 & 85T C&I Components

Schedule's 85 and 85T serve the same class of customers with Sales customers taking service on Schedule 85 and Transportation customers taking service on Schedule 85T. Within the Sales and Transportation Schedules, the customers are segmented by commercial and industrial. Figure 51 presents the vertical EnergyPrints for the system load to the left and then each component of the Schedule's 85 and 85T, namely, Sales commercial, Sales industrial, aggregate Sales, Transportation commercial, Transportation industrial and aggregate Transportation. The EnergyPrints are presented on a total class basis. There are striking differences between the commercial and industrial classes.

Figure 51 – Schedule 85 C&I Components: EnergyPrints
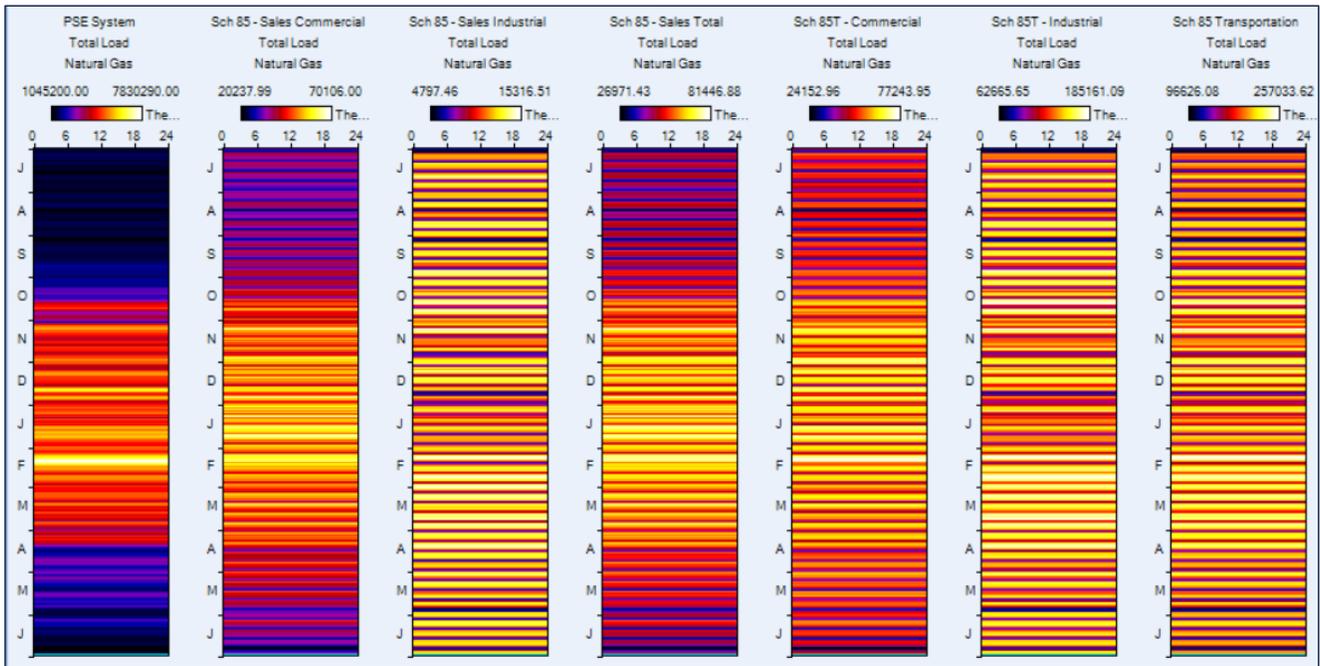
The following tables highlight the energy usage and demand characteristics by presenting monthly summaries, first as class totals followed by class means. Here we provide tables for just the Commercial and Industrial domains for Sales and Transportation since the aggregate tables are presented in the body of the report.

Table 42 - Schedule 85: Commercial & Industrial Summaries (Totals)

Schedule 85 - Commercial									
			Non-Coincident Peaks			**Coincident Peaks**			
Month	**Monthly Use (Therms)**	**Average Daily Use (Therms)**	**Non-Coincident (Class Peak) Date**	**Class Peak Demand (Therms)**	**Non-Coincident Load Factor**	**Coincident System Peak Date**	**Coincident Class**	**Coincident Load Factor**	**Coincidence Factor**
Jul	1,040,268	33,557	Monday, July 6, 2020	42,391	79.2%	Wednesday, July 1, 2020	36,701	91.4%	86.6%
Aug	1,027,396	33,142	Monday, August 10, 2020	41,349	80.2%	Wednesday, August 12, 2020	37,075	89.4%	89.7%
Sep	1,053,945	35,132	Monday, September 14, 2020	43,023	81.7%	Friday, September 25, 2020	36,913	95.2%	85.8%
Oct	1,291,126	41,649	Monday, October 26, 2020	58,498	71.2%	Sunday, October 25, 2020	49,607	84.0%	84.8%
Nov	1,480,513	49,350	Monday, November 9, 2020	64,486	76.5%	Monday, November 9, 2020	64,486	76.5%	100.0%
Dec	1,614,589	52,084	Monday, December 28, 2020	64,754	80.4%	Wednesday, December 23, 2020	58,214	89.5%	89.9%
Jan	1,708,813	55,123	Monday, January 25, 2021	70,106	78.6%	Tuesday, January 26, 2021	61,327	89.9%	87.5%
Feb	1,494,264	53,367	Friday, February 12, 2021	63,923	83.5%	Friday, February 12, 2021	63,923	83.5%	100.0%
Mar	1,538,383	49,625	Monday, March 15, 2021	64,010	77.5%	Monday, March 15, 2021	64,010	77.5%	100.0%
Apr	1,313,424	43,781	Monday, April 5, 2021	55,508	78.9%	Wednesday, April 7, 2021	50,138	87.3%	90.3%
May	1,190,945	38,418	Monday, May 3, 2021	49,100	78.2%	Friday, May 7, 2021	42,017	91.4%	85.6%
Jun	980,489	32,683	Monday, June 7, 2021	45,201	72.3%	Sunday, June 6, 2021	33,978	96.2%	75.2%
12-Mths	15,734,156	43,107	Monday, January 25, 2021	70,106	61.5%	Friday, February 12, 2021	63,923	67.4%	91.2%
Schedule 85 - Industrial									
			Non-Coincident Peaks			**Coincident Peaks**			
Month	**Monthly Use (Therms)**	**Average Daily Use (Therms)**	**Non-Coincident (Class Peak) Date**	**Class Peak Demand (Therms)**	**Non-Coincident Load Factor**	**Coincident System Peak Date**	**Coincident Class**	**Coincident Load Factor**	**Coincidence Factor**
Jul	324,582	10,470	Thursday, July 23, 2020	14,243	73.5%	Wednesday, July 1, 2020	12,288	85.2%	86.3%
Aug	323,386	10,432	Thursday, August 27, 2020	14,056	74.2%	Wednesday, August 12, 2020	13,477	77.4%	95.9%
Sep	318,160	10,605	Tuesday, September 29, 2020	14,385	73.7%	Friday, September 25, 2020	9,986	106.2%	69.4%
Oct	352,388	11,367	Tuesday, October 27, 2020	14,855	76.5%	Sunday, October 25, 2020	8,410	135.2%	56.6%
Nov	319,786	10,660	Wednesday, November 11, 2020	15,115	70.5%	Monday, November 9, 2020	14,898	71.6%	98.6%
Dec	337,004	10,871	Thursday, December 10, 2020	14,115	77.0%	Wednesday, December 23, 2020	11,608	93.7%	82.2%
Jan	321,297	10,364	Thursday, January 7, 2021	13,712	75.6%	Tuesday, January 26, 2021	12,124	85.5%	88.4%
Feb	330,571	11,806	Wednesday, February 24, 2021	15,181	77.8%	Friday, February 12, 2021	10,855	108.8%	71.5%
Mar	381,219	12,297	Tuesday, March 2, 2021	14,644	84.0%	Monday, March 15, 2021	13,211	93.1%	90.2%
Apr	342,398	11,413	Wednesday, April 14, 2021	15,317	74.5%	Wednesday, April 7, 2021	13,486	84.6%	88.0%
May	317,571	10,244	Tuesday, May 11, 2021	13,822	74.1%	Friday, May 7, 2021	10,864	94.3%	78.6%
Jun	323,654	10,788	Wednesday, June 9, 2021	13,460	80.2%	Sunday, June 6, 2021	6,833	157.9%	50.8%
12-Mths	3,992,016	10,937	Wednesday, April 14, 2021	15,317	71.4%	Friday, February 12, 2021	10,855	100.8%	70.9%

Table 43 - Schedule 85 Transportation: Commercial & Industrial Summaries (Totals)

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load Factor	Coincident System Peak Date	Coincident Class	Coincident Load Factor	Coincidence Factor
			Non-Coincident Peaks			**Coincident Peaks**			

Schedule 85 Transportation - Commercial

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load Factor	Coincident System Peak Date	Coincident Class	Coincident Load Factor	Coincidence Factor
Jul	1,441,205	46,490	Monday, July 6, 2020	55,337	84.0%	Wednesday, July 1, 2020	52,590	88.4%	95.0%
Aug	1,400,232	45,169	Thursday, August 13, 2020	54,225	83.3%	Wednesday, August 12, 2020	54,046	83.6%	99.7%
Sep	1,422,675	47,423	Tuesday, September 29, 2020	56,844	83.4%	Friday, September 25, 2020	50,791	93.4%	89.4%
Oct	1,618,688	52,216	Thursday, October 22, 2020	64,700	80.7%	Sunday, October 25, 2020	50,533	103.3%	78.1%
Nov	1,716,331	57,211	Monday, November 9, 2020	68,020	84.1%	Monday, November 9, 2020	68,020	84.1%	100.0%
Dec	1,860,822	60,027	Wednesday, December 2, 2020	70,618	85.0%	Wednesday, December 23, 2020	70,315	85.4%	99.6%
Jan	1,807,306	58,300	Tuesday, January 26, 2021	71,781	81.2%	Tuesday, January 26, 2021	71,781	81.2%	100.0%
Feb	1,669,448	59,623	Thursday, February 11, 2021	77,244	77.2%	Friday, February 12, 2021	73,917	80.7%	95.7%
Mar	1,748,554	56,405	Tuesday, March 16, 2021	67,495	83.6%	Monday, March 15, 2021	66,523	84.8%	98.6%
Apr	1,590,400	53,013	Wednesday, April 7, 2021	62,987	84.2%	Wednesday, April 7, 2021	62,987	84.2%	100.0%
May	1,519,957	49,031	Tuesday, May 4, 2021	62,282	78.7%	Friday, May 7, 2021	54,001	90.8%	86.7%
Jun	1,348,147	44,938	Tuesday, June 8, 2021	58,015	77.5%	Sunday, June 6, 2021	38,767	115.9%	66.8%
12-Mths	19,143,764	52,449	Thursday, February 11, 2021	77,244	67.9%	Friday, February 12, 2021	73,917	71.0%	95.7%

Schedule 85 Transportation - Industrial

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load Factor	Coincident System Peak Date	Coincident Class	Coincident Load Factor	Coincidence Factor
Jul	3,947,550	127,340	Thursday, July 23, 2020	169,971	74.9%	Wednesday, July 1, 2020	147,051	86.6%	86.5%
Aug	3,985,374	128,560	Thursday, August 27, 2020	168,035	76.5%	Wednesday, August 12, 2020	160,244	80.2%	95.4%
Sep	3,957,506	131,917	Tuesday, September 29, 2020	176,909	74.6%	Friday, September 25, 2020	116,762	113.0%	66.0%
Oct	4,357,816	140,575	Thursday, October 22, 2020	181,484	77.5%	Sunday, October 25, 2020	112,445	125.0%	62.0%
Nov	4,024,001	134,133	Monday, November 9, 2020	185,161	72.4%	Monday, November 9, 2020	185,161	72.4%	100.0%
Dec	4,179,385	134,819	Thursday, December 17, 2020	169,154	79.7%	Wednesday, December 23, 2020	141,544	95.2%	83.7%
Jan	4,032,703	130,087	Thursday, January 7, 2021	171,487	75.9%	Tuesday, January 26, 2021	141,750	91.8%	82.7%
Feb	4,230,506	151,089	Wednesday, February 10, 2021	185,009	81.7%	Friday, February 12, 2021	134,696	112.2%	72.8%
Mar	4,784,124	154,327	Thursday, March 25, 2021	182,735	84.5%	Monday, March 15, 2021	160,544	96.1%	87.9%
Apr	4,226,680	140,889	Wednesday, April 14, 2021	183,379	76.8%	Wednesday, April 7, 2021	159,239	88.5%	86.8%
May	3,901,915	125,868	Tuesday, May 4, 2021	167,147	75.3%	Friday, May 7, 2021	129,765	97.0%	77.6%
Jun	4,002,503	133,417	Thursday, June 10, 2021	161,313	82.7%	Sunday, June 6, 2021	91,976	145.1%	57.0%
12-Mths	49,630,061	135,973	Wednesday, February 10, 2021	185,161	73.4%	Friday, February 12, 2021	134,696	100.9%	72.7%

Table 44 - Schedule 85: Commercial & Industrial Summaries (Means)

			Schedule 85 - Commercial							
			Non-Coincident Peaks			**Coincident Peaks**				
Month	**Monthly Use (Therms)**	**Average Daily Use (Therms)**	**Non-Coincident (Class Peak) Date**	**Class Peak Dema**	**Non-Coincident Load**	**Coincident System Peak Date**	**Coincident Class Demand**	**Coincident Load Factor**	**Coincidence Factor**
Jul	42,605	1,374	Monday, July 6, 2020	1,736	79.2%	Wednesday, July 1, 2020	1,503	91.4%	86.6%
Aug	42,078	1,357	Monday, August 10, 2020	1,693	80.2%	Wednesday, August 12, 2020	1,518	89.4%	89.7%
Sep	43,165	1,439	Monday, September 14, 2020	1,762	81.7%	Friday, September 25, 2020	1,512	95.2%	85.8%
Oct	52,879	1,706	Monday, October 26, 2020	2,396	71.2%	Sunday, October 25, 2020	2,032	84.0%	84.8%
Nov	60,635	2,021	Monday, November 9, 2020	2,641	76.5%	Monday, November 9, 2020	2,641	76.5%	100.0%
Dec	66,127	2,133	Monday, December 28, 2020	2,652	80.4%	Wednesday, December 23, 2020	2,384	89.5%	89.9%
Jan	69,986	2,258	Monday, January 25, 2021	2,871	78.6%	Tuesday, January 26, 2021	2,512	89.9%	87.5%
Feb	61,199	2,186	Friday, February 12, 2021	2,618	83.5%	Friday, February 12, 2021	2,618	83.5%	100.0%
Mar	63,005	2,032	Monday, March 15, 2021	2,622	77.5%	Monday, March 15, 2021	2,622	77.5%	100.0%
Apr	53,792	1,793	Monday, April 5, 2021	2,273	78.9%	Wednesday, April 7, 2021	2,053	87.3%	90.3%
May	48,776	1,573	Monday, May 3, 2021	2,011	78.2%	Friday, May 7, 2021	1,721	91.4%	85.6%
Jun	40,157	1,339	Monday, June 7, 2021	1,851	72.3%	Sunday, June 6, 2021	1,392	96.2%	75.2%
12-Mths	644,402	1,765	Monday, January 25, 2021	2,871	61.5%	Friday, February 12, 2021	2,618	67.4%	91.2%

			Schedule 85 - Industrial							
			Non-Coincident Peaks			**Coincident Peaks**				
Month	**Monthly Use (Therms)**	**Average Daily Use (Therms)**	**Non-Coincident (Class Peak) Date**	**Class Peak Dema**	**Non-Coincident Load**	**Coincident System Peak Date**	**Coincident Class Demand**	**Coincident Load Factor**	**Coincidence Factor**
Jul	67,155	2,166	Thursday, July 23, 2020	2,947	73.5%	Wednesday, July 1, 2020	2,542	85.2%	86.3%
Aug	66,908	2,158	Thursday, August 27, 2020	2,908	74.2%	Wednesday, August 12, 2020	2,788	77.4%	95.9%
Sep	65,826	2,194	Tuesday, September 29, 2020	2,976	73.7%	Friday, September 25, 2020	2,066	106.2%	69.4%
Oct	72,908	2,352	Tuesday, October 27, 2020	3,074	76.5%	Sunday, October 25, 2020	1,740	135.2%	56.6%
Nov	66,163	2,205	Wednesday, November 11, 2020	3,127	70.5%	Monday, November 9, 2020	3,082	71.6%	98.6%
Dec	69,725	2,249	Thursday, December 10, 2020	2,920	77.0%	Wednesday, December 23, 2020	2,402	93.7%	82.2%
Jan	66,475	2,144	Thursday, January 7, 2021	2,837	75.6%	Tuesday, January 26, 2021	2,508	85.5%	88.4%
Feb	68,394	2,443	Wednesday, February 24, 2021	3,141	77.8%	Friday, February 12, 2021	2,246	108.8%	71.5%
Mar	78,873	2,544	Tuesday, March 2, 2021	3,030	84.0%	Monday, March 15, 2021	2,733	93.1%	90.2%
Apr	70,841	2,361	Wednesday, April 14, 2021	3,169	74.5%	Wednesday, April 7, 2021	2,790	84.6%	88.0%
May	65,704	2,119	Tuesday, May 11, 2021	2,860	74.1%	Friday, May 7, 2021	2,248	94.3%	78.6%
Jun	66,963	2,232	Wednesday, June 9, 2021	2,785	80.2%	Sunday, June 6, 2021	1,414	157.9%	50.8%
12-Mths	825,934	2,263	Wednesday, April 14, 2021	3,169	71.4%	Friday, February 12, 2021	2,246	100.8%	70.9%

**Table 45 - Schedule 85 Transportation: Commercial & Industiral Summaries (Means)**

			Schedule 85 Transportation - Commercial							
			Non-Coincident Peaks			Coincident Peaks				
Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident (Class Peak) Date	Class Peak Deman	Non-Coincident Load	Coincident System Peak Date	Coincident Class Demand	Coincident Load Factor	Coincidence Factor
Jul	51,935	1,675	Monday, July 6, 2020	1,994	84.0%	Wednesday, July 1, 2020	1,895	88.4%	95.0%
Aug	50,459	1,628	Thursday, August 13, 2020	1,954	83.3%	Wednesday, August 12, 2020	1,948	83.6%	99.7%
Sep	51,268	1,709	Tuesday, September 29, 2020	2,048	83.4%	Friday, September 25, 2020	1,830	93.4%	89.4%
Oct	58,331	1,882	Thursday, October 22, 2020	2,332	80.7%	Sunday, October 25, 2020	1,821	103.3%	78.1%
Nov	61,850	2,062	Monday, November 9, 2020	2,451	84.1%	Monday, November 9, 2020	2,451	84.1%	100.0%
Dec	67,057	2,163	Wednesday, December 2, 2020	2,545	85.0%	Wednesday, December 23, 2020	2,534	85.4%	99.6%
Jan	65,128	2,101	Tuesday, January 26, 2021	2,587	81.2%	Tuesday, January 26, 2021	2,587	81.2%	100.0%
Feb	60,160	2,149	Thursday, February 11, 2021	2,784	77.2%	Friday, February 12, 2021	2,664	80.7%	95.7%
Mar	63,011	2,033	Tuesday, March 16, 2021	2,432	83.6%	Monday, March 15, 2021	2,397	84.8%	98.6%
Apr	57,312	1,910	Wednesday, April 7, 2021	2,270	84.2%	Wednesday, April 7, 2021	2,270	84.2%	100.0%
May	54,773	1,767	Tuesday, May 4, 2021	2,244	78.7%	Friday, May 7, 2021	1,946	90.8%	86.7%
Jun	48,582	1,619	Tuesday, June 8, 2021	2,091	77.5%	Sunday, June 6, 2021	1,397	115.9%	66.8%
12-Mths	689,865	1,890	Thursday, February 11, 2021	2,784	67.9%	Friday, February 12, 2021	2,664	71.0%	95.7%
			Schedule 85 Transportation - Industrial							
			Non-Coincident Peaks			Coincident Peaks				
Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident (Class Peak) Date	Class Peak Deman	Non-Coincident Load	Coincident System Peak Date	Coincident Class Demand	Coincident Load Factor	Coincidence Factor
Jul	60,732	1,959	Thursday, July 23, 2020	2,615	74.9%	Wednesday, July 1, 2020	2,262	86.6%	86.5%
Aug	61,313	1,978	Thursday, August 27, 2020	2,585	76.5%	Wednesday, August 12, 2020	2,465	80.2%	95.4%
Sep	60,885	2,029	Tuesday, September 29, 2020	2,722	74.6%	Friday, September 25, 2020	1,796	113.0%	66.0%
Oct	67,043	2,163	Thursday, October 22, 2020	2,792	77.5%	Sunday, October 25, 2020	1,730	125.0%	62.0%
Nov	61,908	2,064	Monday, November 9, 2020	2,849	72.4%	Monday, November 9, 2020	2,849	72.4%	100.0%
Dec	64,298	2,074	Thursday, December 17, 2020	2,602	79.7%	Wednesday, December 23, 2020	2,178	95.2%	83.7%
Jan	62,042	2,001	Thursday, January 7, 2021	2,638	75.9%	Tuesday, January 26, 2021	2,181	91.8%	82.7%
Feb	65,085	2,324	Wednesday, February 10, 2021	2,846	81.7%	Friday, February 12, 2021	2,072	112.2%	72.8%
Mar	73,602	2,374	Thursday, March 25, 2021	2,811	84.5%	Monday, March 15, 2021	2,470	96.1%	87.9%
Apr	65,026	2,168	Wednesday, April 14, 2021	2,821	76.8%	Wednesday, April 7, 2021	2,450	88.5%	86.8%
May	60,029	1,936	Tuesday, May 4, 2021	2,571	75.3%	Friday, May 7, 2021	1,996	97.0%	77.6%
Jun	61,577	2,053	Thursday, June 10, 2021	2,482	82.7%	Sunday, June 6, 2021	1,415	145.1%	57.0%
12-Mths	763,539	2,092	Wednesday, February 10, 2021	2,849	73.4%	Friday, February 12, 2021	2,072	100.9%	72.7%

Figure 52 shows the weather sensitivity of the load components. The commercial domains are more weather sensitive than their industrial counterparts.

Figure 52 – Schedule 85 C&I Components: Temperature Sensitivity
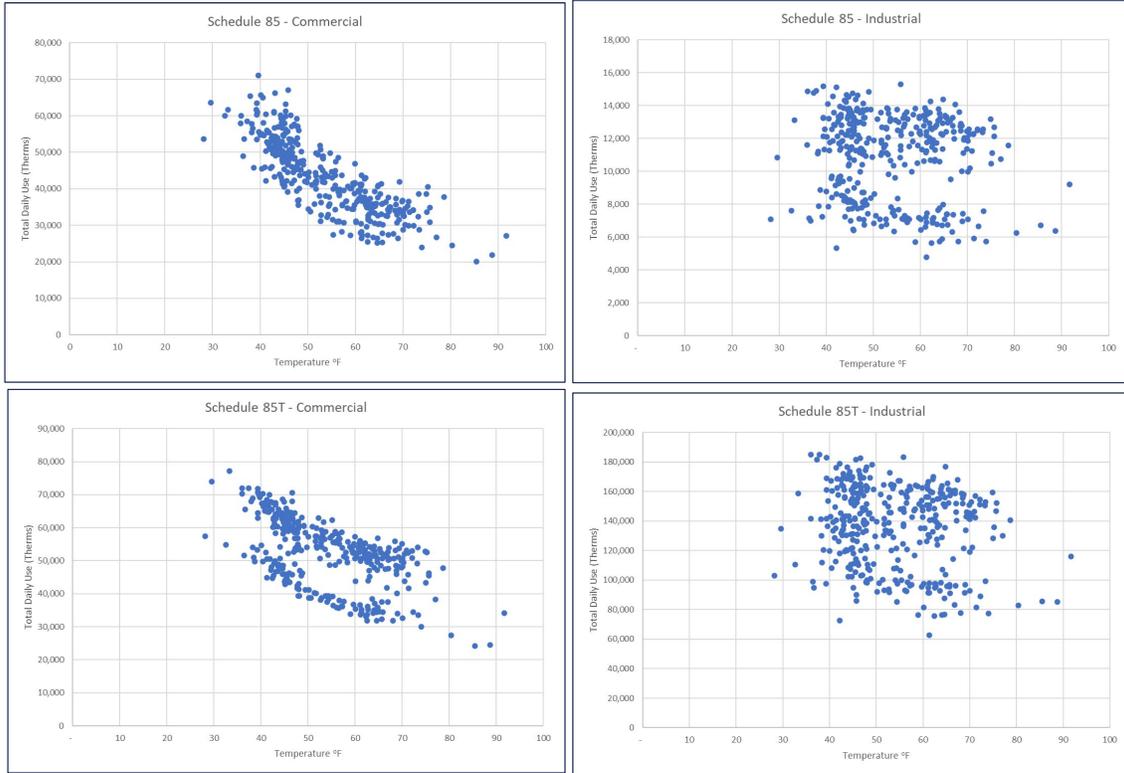
7.4   Schedules 86 & 86T C&I Components

Schedule's 86 and 86T serve the same class of customers with Sales customers taking service on Schedule 86 and Transportation customers taking service on Schedule 86T. Within the Sales and Transportation Schedules, the customers are segmented by commercial and industrial. Figure 53 presents the vertical EnergyPrints for the system load to the left and then each component of the Schedule's 86 and 86T, namely, Sales commercial, Sales industrial, aggregate Sales, Transportation commercial, Transportation Industrial and aggregate Transportation. The EnergyPrints are presented on a total class basis. There are similarities between the Schedule 86-Commercial load and the system load. The Schedule 86-Industrial has different characteristics.

Figure 53 – Schedule 86 C&I Components: EnergyPrints
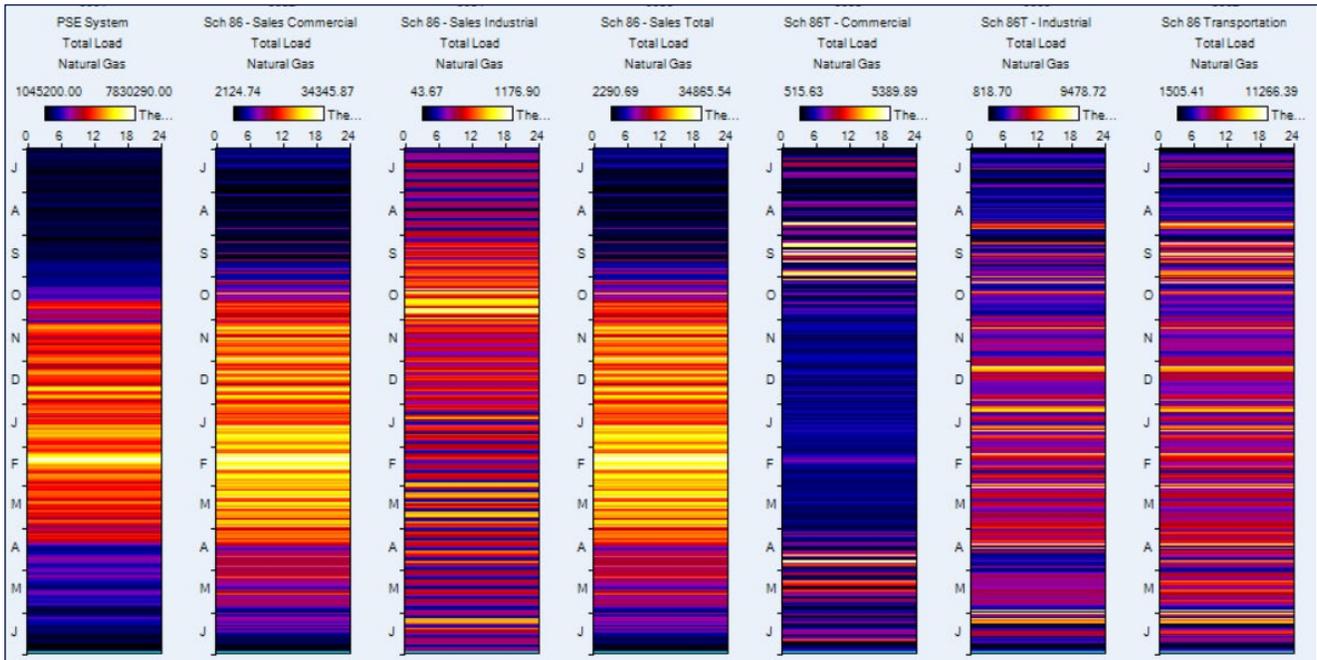
The following tables highlight the energy usage and demand characteristics by presenting monthly summaries, first as class totals followed by class means. Here we provide tables for just the Commercial and Industrial domains for Sales and Transportation since the aggregate tables are presented in the body of the report.

Table 46 - Schedule 86: Commercial & Industrial Summaries (Totals)

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load Factor	Coincident System Peak Date	Coincident Class	Coincident Load Factor	Coincidence Factor
Schedule 86 - Commercial									
Jul	143,122	4,617	Wednesday, July 1, 2020	7,935	58.2%	Wednesday, July 1, 2020	7,935	58.2%	100.0%
Aug	117,817	3,801	Saturday, August 29, 2020	10,043	37.8%	Wednesday, August 12, 2020	3,959	96.0%	39.4%
Sep	172,704	5,757	Wednesday, September 30, 2020	17,114	33.6%	Friday, September 25, 2020	6,285	91.6%	36.7%
Oct	418,225	13,491	Thursday, October 15, 2020	25,230	53.5%	Sunday, October 25, 2020	19,104	70.6%	75.7%
Nov	629,136	20,971	Monday, November 9, 2020	28,831	72.7%	Monday, November 9, 2020	28,831	72.7%	100.0%
Dec	696,595	22,471	Tuesday, December 1, 2020	32,135	69.9%	Wednesday, December 23, 2020	29,853	75.3%	92.9%
Jan	699,821	22,575	Tuesday, January 19, 2021	30,986	72.9%	Tuesday, January 26, 2021	28,337	79.7%	91.5%
Feb	744,892	26,603	Thursday, February 18, 2021	34,346	77.5%	Friday, February 12, 2021	33,955	78.4%	98.9%
Mar	737,037	23,775	Thursday, March 11, 2021	30,555	77.8%	Monday, March 15, 2021	26,673	89.1%	87.3%
Apr	502,334	16,744	Thursday, April 1, 2021	28,164	59.5%	Wednesday, April 7, 2021	21,940	76.3%	77.9%
May	397,411	12,820	Thursday, May 20, 2021	21,080	60.8%	Friday, May 7, 2021	17,350	73.9%	82.3%
Jun	207,954	6,932	Sunday, June 13, 2021	12,579	55.1%	Sunday, June 6, 2021	11,220	61.8%	89.2%
12-Mths	5,467,047	14,978	Thursday, February 18, 2021	34,346	43.6%	Friday, February 12, 2021	33,955	44.1%	98.9%
Schedule 86 - Industrial									
Jul	10,955	353	Tuesday, July 14, 2020	579	61.1%	Wednesday, July 1, 2020	500	70.7%	86.4%
Aug	10,319	333	Wednesday, August 26, 2020	526	63.3%	Wednesday, August 12, 2020	415	80.2%	78.8%
Sep	15,933	531	Thursday, September 24, 2020	773	68.7%	Friday, September 25, 2020	675	78.7%	87.3%
Oct	22,689	732	Wednesday, October 28, 2020	1,177	62.2%	Sunday, October 25, 2020	535	136.8%	45.5%
Nov	15,354	512	Monday, November 2, 2020	878	58.3%	Monday, November 9, 2020	651	78.7%	74.1%
Dec	16,046	518	Thursday, December 10, 2020	723	71.6%	Wednesday, December 23, 2020	583	88.8%	80.7%
Jan	14,099	455	Wednesday, January 13, 2021	886	51.3%	Tuesday, January 26, 2021	522	87.2%	58.9%
Feb	11,939	426	Thursday, February 11, 2021	659	64.7%	Friday, February 12, 2021	386	110.3%	58.6%
Mar	17,839	575	Thursday, March 25, 2021	880	65.4%	Monday, March 15, 2021	762	75.5%	86.6%
Apr	13,653	455	Tuesday, April 27, 2021	799	57.0%	Wednesday, April 7, 2021	555	82.1%	69.4%
May	11,166	360	Tuesday, May 18, 2021	585	61.6%	Friday, May 7, 2021	325	110.7%	55.6%
Jun	12,854	428	Wednesday, June 9, 2021	838	51.1%	Sunday, June 6, 2021	216	198.2%	25.8%
12-Mths	172,847	474	Wednesday, October 28, 2020	1,177	40.2%	Friday, February 12, 2021	386	122.5%	32.8%

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Table 47 - Schedule 86 Transportation: Commercial & Industrial Summaries (Totals)

			Schedule 86 Transportation - Commercial						
			Non-Coincident Peaks			**Coincident Peaks**			
Month	**Monthly Use (Therms)**	**Average Daily Use (Therms)**	**Non-Coincident (Class Peak) Date**	**Class Peak Demand (Therms)**	**Non-Coincident Load Factor**	**Coincident System Peak Date**	**Coincident Class**	**Coincident Load Factor**	**Coincidence Factor**
Jul	36,978	1,193	Monday, July 13, 2020	2,663	44.8%	Wednesday, July 1, 2020	1,468	81.2%	55.1%
Aug	42,148	1,360	Wednesday, August 26, 2020	4,758	28.6%	Wednesday, August 12, 2020	1,430	95.1%	30.1%
Sep	71,584	2,386	Tuesday, September 22, 2020	5,390	44.3%	Friday, September 25, 2020	914	261.2%	16.9%
Oct	46,373	1,496	Thursday, October 1, 2020	5,240	28.5%	Sunday, October 25, 2020	1,090	137.2%	20.8%
Nov	31,532	1,051	Thursday, November 5, 2020	1,349	77.9%	Monday, November 9, 2020	1,208	87.0%	89.5%
Dec	33,643	1,085	Monday, December 28, 2020	1,388	78.2%	Wednesday, December 23, 2020	994	109.2%	71.6%
Jan	34,868	1,125	Friday, January 22, 2021	1,354	83.1%	Tuesday, January 26, 2021	1,140	98.7%	84.2%
Feb	32,688	1,167	Saturday, February 13, 2021	1,954	59.8%	Friday, February 12, 2021	1,545	75.6%	79.1%
Mar	31,220	1,007	Monday, March 15, 2021	1,312	76.8%	Monday, March 15, 2021	1,312	76.8%	100.0%
Apr	53,530	1,784	Tuesday, April 27, 2021	4,915	36.3%	Wednesday, April 7, 2021	1,086	164.3%	22.1%
May	50,597	1,632	Tuesday, May 11, 2021	3,760	43.4%	Friday, May 7, 2021	934	174.7%	24.9%
Jun	41,587	1,386	Tuesday, June 22, 2021	3,320	41.8%	Sunday, June 6, 2021	793	174.7%	23.9%
12-Mths	506,748	1,388	Saturday, February 13, 2021	5,390	25.8%	Friday, February 12, 2021	1,545	89.9%	28.7%

			Schedule 86 Transportation - Industrial						
			Non-Coincident Peaks			**Coincident Peaks**			
Month	**Monthly Use (Therms)**	**Average Daily Use (Therms)**	**Non-Coincident (Class Peak) Date**	**Class Peak Demand (Therms)**	**Non-Coincident Load Factor**	**Coincident System Peak Date**	**Coincident Class**	**Coincident Load Factor**	**Coincidence Factor**
Jul	57,118	1,843	Friday, July 17, 2020	3,483	52.9%	Wednesday, July 1, 2020	2,772	66.5%	79.6%
Aug	78,068	2,518	Saturday, August 29, 2020	6,285	40.1%	Wednesday, August 12, 2020	2,449	102.8%	39.0%
Sep	80,819	2,694	Wednesday, September 9, 2020	5,984	45.0%	Friday, September 25, 2020	1,617	166.6%	27.0%
Oct	92,392	2,980	Wednesday, October 7, 2020	7,785	38.3%	Sunday, October 25, 2020	2,327	128.1%	29.9%
Nov	101,321	3,377	Monday, November 9, 2020	6,724	50.2%	Monday, November 9, 2020	6,724	50.2%	100.0%
Dec	129,070	4,164	Monday, December 7, 2020	7,860	53.0%	Wednesday, December 23, 2020	2,825	147.4%	35.9%
Jan	129,764	4,186	Thursday, January 7, 2021	7,495	55.9%	Tuesday, January 26, 2021	5,785	72.4%	77.2%
Feb	109,798	3,921	Monday, February 8, 2021	8,225	47.7%	Friday, February 12, 2021	3,992	98.2%	48.5%
Mar	127,630	4,117	Thursday, March 4, 2021	9,479	43.4%	Monday, March 15, 2021	4,654	88.5%	49.1%
Apr	108,535	3,618	Wednesday, April 14, 2021	8,808	41.1%	Wednesday, April 7, 2021	4,989	72.5%	56.6%
May	98,222	3,168	Friday, May 7, 2021	4,384	72.3%	Friday, May 7, 2021	4,384	72.3%	100.0%
Jun	98,999	3,300	Thursday, June 3, 2021	8,309	39.7%	Sunday, June 6, 2021	1,926	171.3%	23.2%
12-Mths	1,211,736	3,320	Monday, February 8, 2021	9,479	35.0%	Friday, February 12, 2021	3,992	83.2%	42.1%

Table 48 - Schedule 86 Sales: Commercial & Industrial Summaries (Means)

			Schedule 86 - Commercial							
			Non-Coincident Peaks			**Coincident Peaks**				
Month	**Monthly Use (Therms)**	**Average Daily Use (Therms)**	**Non-Coincident (Class Peak) Date**	**Class Peak Dema**	**Non-Coincident Load**	**Coincident System Peak Date**	**Coincident Class Demand**	**Coincident Load Factor**	**Coincidence Factor**
Jul	1,261	41	Wednesday, July 1, 2020	70	58.2%	Wednesday, July 1, 2020	70	58.2%	100.0%
Aug	1,038	33	Saturday, August 29, 2020	88	37.8%	Wednesday, August 12, 2020	35	96.0%	39.4%
Sep	1,522	51	Wednesday, September 30, 2020	151	33.6%	Friday, September 25, 2020	55	91.6%	36.7%
Oct	3,685	119	Thursday, October 15, 2020	222	53.5%	Sunday, October 25, 2020	168	70.6%	75.7%
Nov	5,543	185	Monday, November 9, 2020	254	72.7%	Monday, November 9, 2020	254	72.7%	100.0%
Dec	6,137	198	Tuesday, December 1, 2020	283	69.9%	Wednesday, December 23, 2020	263	75.3%	92.9%
Jan	6,166	199	Tuesday, January 19, 2021	273	72.9%	Tuesday, January 26, 2021	250	79.7%	91.5%
Feb	6,563	234	Thursday, February 18, 2021	303	77.5%	Friday, February 12, 2021	299	78.4%	98.9%
Mar	6,494	209	Thursday, March 11, 2021	269	77.8%	Monday, March 15, 2021	235	89.1%	87.3%
Apr	4,426	148	Thursday, April 1, 2021	248	59.5%	Wednesday, April 7, 2021	193	76.3%	77.9%
May	3,501	113	Thursday, May 20, 2021	186	60.8%	Friday, May 7, 2021	153	73.9%	82.3%
Jun	1,832	61	Sunday, June 13, 2021	111	55.1%	Sunday, June 6, 2021	99	61.8%	89.2%
12-Mths	48,168	132	Thursday, February 18, 2021	303	43.6%	Friday, February 12, 2021	299	44.1%	98.9%

			Schedule 86 - Industrial							
			Non-Coincident Peaks			**Coincident Peaks**				
Month	**Monthly Use (Therms)**	**Average Daily Use (Therms)**	**Non-Coincident (Class Peak) Date**	**Class Peak Dema**	**Non-Coincident Load**	**Coincident System Peak Date**	**Coincident Class Demand**	**Coincident Load Factor**	**Coincidence Factor**
Jul	2,739	88	Tuesday, July 14, 2020	145	61.1%	Wednesday, July 1, 2020	125	70.7%	86.4%
Aug	2,580	83	Wednesday, August 26, 2020	132	63.3%	Wednesday, August 12, 2020	104	80.2%	78.8%
Sep	3,983	133	Thursday, September 24, 2020	193	68.7%	Friday, September 25, 2020	169	78.7%	87.3%
Oct	5,672	183	Wednesday, October 28, 2020	294	62.2%	Sunday, October 25, 2020	134	136.8%	45.5%
Nov	3,839	128	Monday, November 2, 2020	219	58.3%	Monday, November 9, 2020	163	78.7%	74.1%
Dec	4,012	129	Thursday, December 10, 2020	181	71.6%	Wednesday, December 23, 2020	146	88.8%	80.7%
Jan	3,525	114	Wednesday, January 13, 2021	222	51.3%	Tuesday, January 26, 2021	130	87.2%	58.9%
Feb	2,985	107	Thursday, February 11, 2021	165	64.7%	Friday, February 12, 2021	97	110.3%	58.6%
Mar	4,460	144	Thursday, March 25, 2021	220	65.4%	Monday, March 15, 2021	191	75.5%	86.6%
Apr	3,413	114	Tuesday, April 27, 2021	200	57.0%	Wednesday, April 7, 2021	139	82.1%	69.4%
May	2,792	90	Tuesday, May 18, 2021	146	61.6%	Friday, May 7, 2021	81	110.7%	55.6%
Jun	3,214	107	Wednesday, June 9, 2021	210	51.1%	Sunday, June 6, 2021	54	198.2%	25.8%
12-Mths	43,212	118	Wednesday, October 28, 2020	294	40.2%	Friday, February 12, 2021	97	122.5%	32.8%

Table 49 – Schedule 86 Transportation: Commercial & Industrial Summaries (Means)

			Schedule 86 Transportation - Commercial							
			Non-Coincident Peaks			**Coincident Peaks**				
Month	**Monthly Use (Therms)**	**Average Daily Use (Therms)**	**Non-Coincident (Class Peak) Date**	**Class Peak Deman**	**Non-Coincident Load**	**Coincident System Peak Date**	**Coincident Class Demand**	**Coincident Load Factor**	**Coincidence Factor**
Jul	16,435	530	Monday, July 13, 2020	1,183	44.8%	Wednesday, July 1, 2020	653	81.2%	55.1%
Aug	18,733	604	Wednesday, August 26, 2020	2,115	28.6%	Wednesday, August 12, 2020	636	95.1%	30.1%
Sep	31,815	1,060	Tuesday, September 22, 2020	2,396	44.3%	Friday, September 25, 2020	406	261.2%	16.9%
Oct	20,610	665	Thursday, October 1, 2020	2,329	28.5%	Sunday, October 25, 2020	485	137.2%	20.8%
Nov	14,014	467	Thursday, November 5, 2020	600	77.9%	Monday, November 9, 2020	537	87.0%	89.5%
Dec	14,953	482	Monday, December 28, 2020	617	78.2%	Wednesday, December 23, 2020	442	109.2%	71.6%
Jan	15,497	500	Friday, January 22, 2021	602	83.1%	Tuesday, January 26, 2021	507	98.7%	84.2%
Feb	14,528	519	Saturday, February 13, 2021	868	59.8%	Friday, February 12, 2021	686	75.6%	79.1%
Mar	13,875	448	Monday, March 15, 2021	583	76.8%	Monday, March 15, 2021	583	76.8%	100.0%
Apr	23,791	793	Tuesday, April 27, 2021	2,185	36.3%	Wednesday, April 7, 2021	483	164.3%	22.1%
May	22,487	725	Tuesday, May 11, 2021	1,671	43.4%	Friday, May 7, 2021	415	174.7%	24.9%
Jun	18,483	616	Tuesday, June 22, 2021	1,476	41.8%	Sunday, June 6, 2021	353	174.7%	23.9%
12-Mths	225,221	617	Saturday, February 13, 2021	2,396	25.8%	Friday, February 12, 2021	686	89.9%	28.7%
			Schedule 86 Transportation - Industrial							
			Non-Coincident Peaks			**Coincident Peaks**				
Month	**Monthly Use (Therms)**	**Average Daily Use (Therms)**	**Non-Coincident (Class Peak) Date**	**Class Peak Deman**	**Non-Coincident Load**	**Coincident System Peak Date**	**Coincident Class Demand**	**Coincident Load Factor**	**Coincidence Factor**
Jul	12,240	395	Friday, July 17, 2020	746	52.9%	Wednesday, July 1, 2020	594	66.5%	79.6%
Aug	16,729	540	Saturday, August 29, 2020	1,347	40.1%	Wednesday, August 12, 2020	525	102.8%	39.0%
Sep	17,318	577	Wednesday, September 9, 2020	1,282	45.0%	Friday, September 25, 2020	346	166.6%	27.0%
Oct	19,798	639	Wednesday, October 7, 2020	1,668	38.3%	Sunday, October 25, 2020	499	128.1%	29.9%
Nov	21,712	724	Monday, November 9, 2020	1,441	50.2%	Monday, November 9, 2020	1,441	50.2%	100.0%
Dec	27,658	892	Monday, December 7, 2020	1,684	53.0%	Wednesday, December 23, 2020	605	147.4%	35.9%
Jan	27,807	897	Thursday, January 7, 2021	1,606	55.9%	Tuesday, January 26, 2021	1,240	72.4%	77.2%
Feb	23,528	840	Monday, February 8, 2021	1,763	47.7%	Friday, February 12, 2021	855	98.2%	48.5%
Mar	27,349	882	Thursday, March 4, 2021	2,031	43.4%	Monday, March 15, 2021	997	88.5%	49.1%
Apr	23,257	775	Wednesday, April 14, 2021	1,887	41.1%	Wednesday, April 7, 2021	1,069	72.5%	56.6%
May	21,048	679	Friday, May 7, 2021	939	72.3%	Friday, May 7, 2021	939	72.3%	100.0%
Jun	21,214	707	Thursday, June 3, 2021	1,781	39.7%	Sunday, June 6, 2021	413	171.3%	23.2%
12-Mths	259,658	711	Monday, February 8, 2021	2,031	35.0%	Friday, February 12, 2021	855	83.2%	42.1%

Figure 54 shows the weather sensitivity of the load components. The commercial domains are much more weather sensitive when contrasted with the industrial domains.

Figure 54 – Schedule 86 C&I Components: Temperature Sensitivity
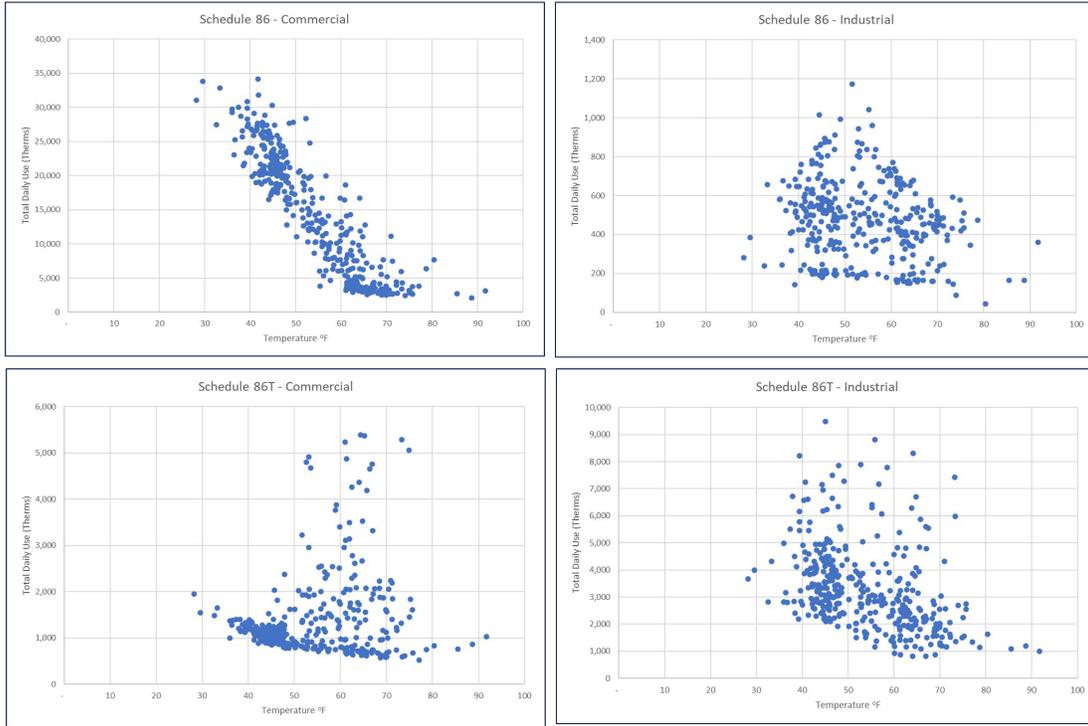
7.4.1 Schedules 87 & 87T C&I Components

Schedule's 87 and 87T serve the same class of customers with Sales customers taking service on Schedule 87 and Transportation customers taking service on Schedule 87T. Within the Sales and Transportation Schedules, the customers are segmented by commercial and industrial. Figure 55 presents the vertical EnergyPrints for the system load to the left and then each component of the Schedule's 87 and 87T, namely, Sales Commercial, Transportation Commercial, Transportation Industrial and Aggregate Transportation. The EnergyPrints are presented on a total class basis. The commercial loads are very similar.

**Figure 55 – Schedule 8G C&I7 Components: EnergyPrints**
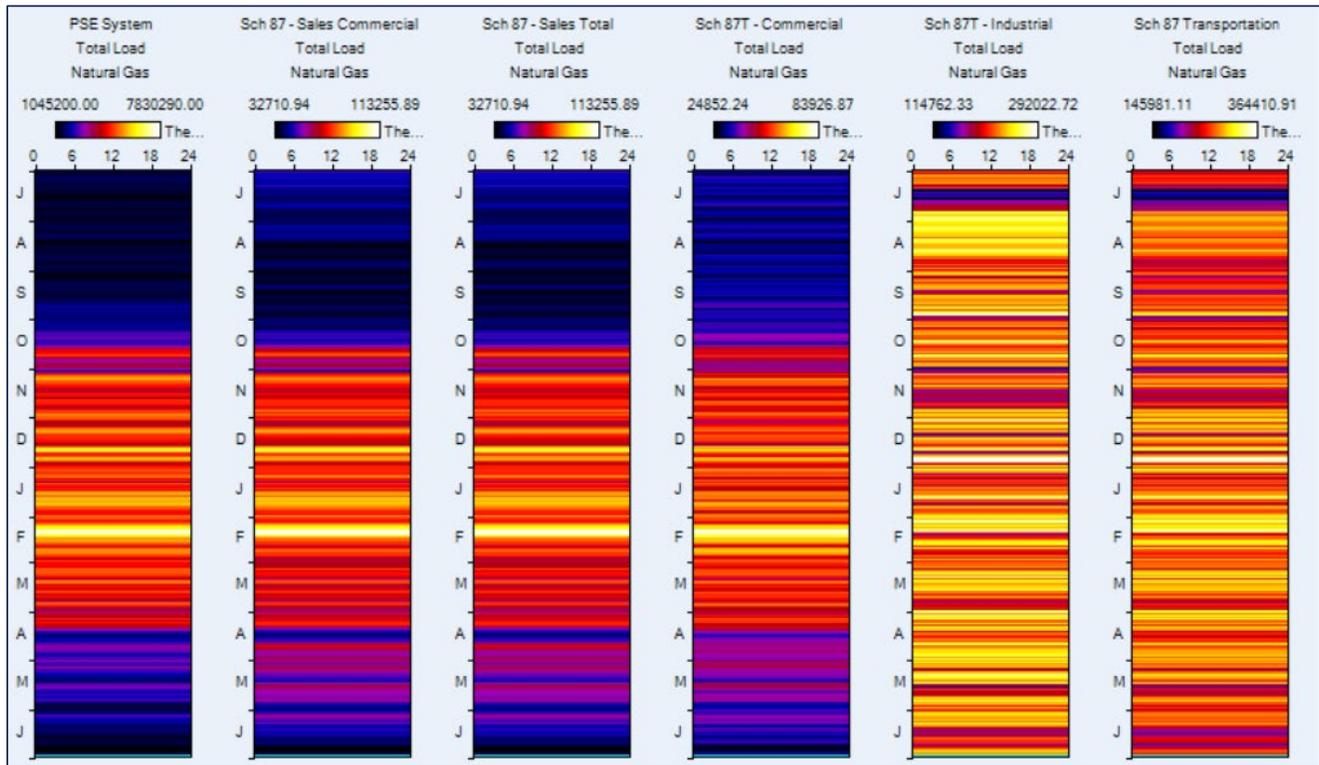
The following tables highlight the energy usage and demand characteristics by presenting monthly summaries, first as class totals followed by class means. Here we provide tables for just the Commercial and Industrial domains for the Transportation component of the schedule since the aggregate tables are presented in the body of the report.

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Table 50 - Schedule 87 Sales & Transportation: Commercial & Industrial Summaries (Totals)

Schedule 87 - Sales Commercial

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident Peaks			Coincident Peaks			Coincidence Factor
			Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load Factor	Coincident System Peak Date	Coincident Class Demand	Coincident Load Factor	
Jul	1,325,836	42,769	Wednesday, July 1, 2020	50,857	84.1%	Wednesday, July 1, 2020	50,857	84.1%	100.0%
Aug	1,205,848	38,898	Thursday, August 6, 2020	44,633	87.2%	Wednesday, August 12, 2020	42,395	91.8%	95.0%
Sep	1,101,814	36,727	Saturday, September 12, 2020	41,797	87.9%	Friday, September 25, 2020	40,289	91.2%	96.4%
Oct	1,614,601	52,084	Sunday, October 25, 2020	81,533	63.9%	Sunday, October 25, 2020	81,533	63.9%	100.0%
Nov	2,119,701	70,657	Monday, November 9, 2020	84,932	83.2%	Monday, November 9, 2020	84,932	83.2%	100.0%
Dec	2,374,630	76,601	Wednesday, December 23, 2020	98,543	77.7%	Wednesday, December 23, 2020	98,543	77.7%	100.0%
Jan	2,429,784	78,380	Friday, January 22, 2021	91,583	85.6%	Tuesday, January 26, 2021	86,853	90.2%	94.8%
Feb	2,326,500	83,089	Friday, February 12, 2021	113,256	73.4%	Friday, February 12, 2021	113,256	73.4%	100.0%
Mar	2,144,908	69,191	Monday, March 15, 2021	79,973	86.5%	Monday, March 15, 2021	79,973	86.5%	100.0%
Apr	1,760,023	58,667	Saturday, April 10, 2021	75,242	78.0%	Wednesday, April 7, 2021	70,932	82.7%	94.3%
May	1,696,865	54,738	Friday, May 7, 2021	66,208	82.7%	Friday, May 7, 2021	66,208	82.7%	100.0%
Jun	1,307,845	43,595	Sunday, June 6, 2021	58,780	74.2%	Sunday, June 6, 2021	58,780	74.2%	100.0%
12-Mths	21,408,354	58,653	Friday, February 12, 2021	113,256	51.8%	Friday, February 12, 2021	113,256	51.8%	100.0%

Schedule 87 Transportation - Commercial

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident Peaks			Coincident Peaks			Coincidence Factor
			Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load Factor	Coincident System Peak Date	Coincident Class	Coincident Load Factor	
Jul	1,010,809	32,607	Wednesday, July 1, 2020	37,709	86.5%	Wednesday, July 1, 2020	37,709	86.5%	100.0%
Aug	974,036	31,421	Thursday, August 6, 2020	35,445	88.6%	Wednesday, August 12, 2020	34,591	90.8%	97.6%
Sep	989,178	32,973	Friday, September 25, 2020	38,046	86.7%	Friday, September 25, 2020	38,046	86.7%	100.0%
Oct	1,283,477	41,402	Monday, October 26, 2020	55,325	74.8%	Sunday, October 25, 2020	54,534	75.9%	98.6%
Nov	1,595,983	53,199	Monday, November 9, 2020	63,874	83.3%	Monday, November 9, 2020	63,874	83.3%	100.0%
Dec	1,763,826	56,898	Wednesday, December 23, 2020	69,783	81.5%	Wednesday, December 23, 2020	69,783	81.5%	100.0%
Jan	1,774,665	57,247	Monday, January 25, 2021	66,775	85.7%	Tuesday, January 26, 2021	65,040	88.0%	97.4%
Feb	1,788,507	63,875	Friday, February 12, 2021	83,927	76.1%	Friday, February 12, 2021	83,927	76.1%	100.0%
Mar	1,711,253	55,202	Monday, March 15, 2021	63,466	87.0%	Monday, March 15, 2021	63,466	87.0%	100.0%
Apr	1,377,335	45,911	Wednesday, April 7, 2021	58,580	78.4%	Wednesday, April 7, 2021	58,580	78.4%	100.0%
May	1,265,795	40,832	Friday, May 7, 2021	49,527	82.4%	Friday, May 7, 2021	49,527	82.4%	100.0%
Jun	1,026,862	34,229	Monday, June 7, 2021	41,789	81.9%	Sunday, June 6, 2021	38,708	88.4%	92.6%
12-Mths	16,561,726	45,375	Friday, February 12, 2021	83,927	54.1%	Friday, February 12, 2021	83,927	54.1%	100.0%

Schedule 87 Transportation - Industrial

Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident Peaks			Coincident Peaks			Coincidence Factor
			Non-Coincident (Class Peak) Date	Class Peak Demand (Therms)	Non-Coincident Load Factor	Coincident System Peak Date	Coincident Class	Coincident Load Factor	
Jul	5,981,805	192,961	Friday, July 31, 2020	260,754	74.0%	Wednesday, July 1, 2020	196,420	98.2%	75.3%
Aug	7,454,475	240,467	Friday, August 21, 2020	272,773	88.2%	Wednesday, August 12, 2020	242,593	99.1%	88.9%
Sep	6,777,195	225,906	Tuesday, September 29, 2020	281,100	80.4%	Friday, September 25, 2020	250,083	90.3%	89.0%
Oct	6,868,237	221,556	Saturday, October 17, 2020	264,481	83.8%	Sunday, October 25, 2020	263,094	84.2%	99.5%
Nov	5,928,089	197,603	Friday, November 13, 2020	246,732	80.1%	Monday, November 9, 2020	222,741	88.7%	90.3%
Dec	7,142,232	230,395	Wednesday, December 30, 2020	292,023	78.9%	Wednesday, December 23, 2020	244,517	94.2%	83.7%
Jan	6,700,470	216,144	Friday, January 22, 2021	273,990	78.9%	Tuesday, January 26, 2021	179,091	120.7%	65.4%
Feb	6,440,311	230,011	Thursday, February 11, 2021	282,836	81.3%	Friday, February 12, 2021	235,817	97.5%	83.4%
Mar	6,932,695	223,635	Friday, March 12, 2021	270,757	82.6%	Monday, March 15, 2021	255,473	87.5%	94.4%
Apr	7,068,131	235,604	Monday, April 5, 2021	270,500	87.1%	Wednesday, April 7, 2021	259,902	90.7%	96.1%
May	6,958,420	224,465	Wednesday, May 12, 2021	272,025	82.5%	Friday, May 7, 2021	234,693	95.6%	86.3%
Jun	6,422,000	214,067	Friday, June 11, 2021	255,274	83.9%	Sunday, June 6, 2021	241,883	88.5%	94.8%
12-Mths	80,674,059	221,025	Wednesday, December 30, 2020	292,023	75.7%	Friday, February 12, 2021	235,817	93.7%	80.8%

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Table 51 - Schedule 87 Sales & Transportation: Commercial & Industrial Summaries (Means)

			Schedule 87 - Sales Commercial						
			Non-Coincident Peaks			Coincident Peaks			
Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident (Class Peak) Date	Class Peak Demand	Non-Coincident Load	Coincident System Peak Date	Coincident Class Demand	Coincident Load Factor	Coincidence Factor
Jul	265,167	8,554	Wednesday, July 1, 2020	10,171	84.1%	Wednesday, July 1, 2020	10,171	84.1%	100.0%
Aug	241,170	7,780	Thursday, August 6, 2020	8,927	87.2%	Wednesday, August 12, 2020	8,479	91.8%	95.0%
Sep	220,363	7,345	Saturday, September 12, 2020	8,359	87.9%	Friday, September 25, 2020	8,058	91.2%	96.4%
Oct	322,920	10,417	Sunday, October 25, 2020	16,307	63.9%	Sunday, October 25, 2020	16,307	63.9%	100.0%
Nov	423,940	14,131	Monday, November 9, 2020	16,986	83.2%	Monday, November 9, 2020	16,986	83.2%	100.0%
Dec	474,926	15,320	Wednesday, December 23, 2020	19,709	77.7%	Wednesday, December 23, 2020	19,709	77.7%	100.0%
Jan	485,957	15,676	Friday, January 22, 2021	18,317	85.6%	Tuesday, January 26, 2021	17,371	90.2%	94.8%
Feb	465,300	16,618	Friday, February 12, 2021	22,651	73.4%	Friday, February 12, 2021	22,651	73.4%	100.0%
Mar	428,982	13,838	Monday, March 15, 2021	15,995	86.5%	Monday, March 15, 2021	15,995	86.5%	100.0%
Apr	352,005	11,733	Saturday, April 10, 2021	15,048	78.0%	Wednesday, April 7, 2021	14,186	82.7%	94.3%
May	339,373	10,948	Friday, May 7, 2021	13,242	82.7%	Friday, May 7, 2021	13,242	82.7%	100.0%
Jun	261,569	8,719	Sunday, June 6, 2021	11,756	74.2%	Sunday, June 6, 2021	11,756	74.2%	100.0%
12-Mths	4,281,671	11,731	Friday, February 12, 2021	22,651	51.8%	Friday, February 12, 2021	22,651	51.8%	100.0%

|			Schedule 87 Transportation - Commercial						
			Non-Coincident Peaks			Coincident Peaks			
Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident (Class Peak) Date	Class Peak Deman	Non-Coincident Load	Coincident System Peak Date	Coincident Class Demand	Coincident Load Factor	Coincidence Factor
Jul	336,936	10,869	Wednesday, July 1, 2020	12,570	86.5%	Wednesday, July 1, 2020	12,570	86.5%	100.0%
Aug	324,679	10,474	Thursday, August 6, 2020	11,815	88.6%	Wednesday, August 12, 2020	11,530	90.8%	97.6%
Sep	329,726	10,991	Friday, September 25, 2020	12,682	86.7%	Friday, September 25, 2020	12,682	86.7%	100.0%
Oct	427,826	13,801	Monday, October 26, 2020	18,442	74.8%	Sunday, October 25, 2020	18,178	75.9%	98.6%
Nov	531,994	17,733	Monday, November 9, 2020	21,291	83.3%	Monday, November 9, 2020	21,291	83.3%	100.0%
Dec	587,942	18,966	Wednesday, December 23, 2020	23,261	81.5%	Wednesday, December 23, 2020	23,261	81.5%	100.0%
Jan	591,555	19,082	Monday, January 25, 2021	22,258	85.7%	Tuesday, January 26, 2021	21,680	88.0%	97.4%
Feb	596,169	21,292	Friday, February 12, 2021	27,976	76.1%	Friday, February 12, 2021	27,976	76.1%	100.0%
Mar	570,418	18,401	Monday, March 15, 2021	21,155	87.0%	Monday, March 15, 2021	21,155	87.0%	100.0%
Apr	459,112	15,304	Wednesday, April 7, 2021	19,527	78.4%	Wednesday, April 7, 2021	19,527	78.4%	100.0%
May	421,932	13,611	Friday, May 7, 2021	16,509	82.4%	Friday, May 7, 2021	16,509	82.4%	100.0%
Jun	342,287	11,410	Monday, June 7, 2021	13,930	81.9%	Sunday, June 6, 2021	12,903	88.4%	92.6%
12-Mths	5,520,575	15,125	Friday, February 12, 2021	27,976	54.1%	Friday, February 12, 2021	27,976	54.1%	100.0%

|			Schedule 87 Transportation - Industrial						
			Non-Coincident Peaks			Coincident Peaks			
Month	Monthly Use (Therms)	Average Daily Use (Therms)	Non-Coincident (Class Peak) Date	Class Peak Deman	Non-Coincident Load	Coincident System Peak Date	Coincident Class Demand	Coincident Load Factor	Coincidence Factor
Jul	854,544	27,566	Friday, July 31, 2020	37,251	74.0%	Wednesday, July 1, 2020	28,060	98.2%	75.3%
Aug	1,064,925	34,352	Friday, August 21, 2020	38,968	88.2%	Wednesday, August 12, 2020	34,656	99.1%	88.9%
Sep	968,171	32,272	Tuesday, September 29, 2020	40,157	80.4%	Friday, September 25, 2020	35,726	90.3%	89.0%
Oct	981,177	31,651	Saturday, October 17, 2020	37,783	83.8%	Sunday, October 25, 2020	37,585	84.2%	99.5%
Nov	846,870	28,229	Friday, November 13, 2020	35,247	80.1%	Monday, November 9, 2020	31,820	88.7%	90.3%
Dec	1,020,319	32,914	Wednesday, December 30, 2020	41,718	78.9%	Wednesday, December 23, 2020	34,931	94.2%	83.7%
Jan	957,210	30,878	Friday, January 22, 2021	39,141	78.9%	Tuesday, January 26, 2021	25,584	120.7%	65.4%
Feb	920,044	32,859	Thursday, February 11, 2021	40,405	81.3%	Friday, February 12, 2021	33,688	97.5%	83.4%
Mar	990,385	31,948	Friday, March 12, 2021	38,680	82.6%	Monday, March 15, 2021	36,496	87.5%	94.4%
Apr	1,009,733	33,658	Monday, April 5, 2021	38,643	87.1%	Wednesday, April 7, 2021	37,129	90.7%	96.1%
May	994,060	32,066	Wednesday, May 12, 2021	38,861	82.5%	Friday, May 7, 2021	33,528	95.6%	86.3%
Jun	917,429	30,581	Friday, June 11, 2021	36,468	83.9%	Sunday, June 6, 2021	34,555	88.5%	94.8%
12-Mths	11,524,866	31,575	Wednesday, December 30, 2020	41,718	75.7%	Friday, February 12, 2021	33,688	93.7%	80.8%

Figure 56 shows the weather sensitivity of the load components. The commercial domains are quite weather sensitive, especially when contrasted against the industrial domain.

Figure 56 – Schedule 87 C&I Components: Temperature Sensitivity
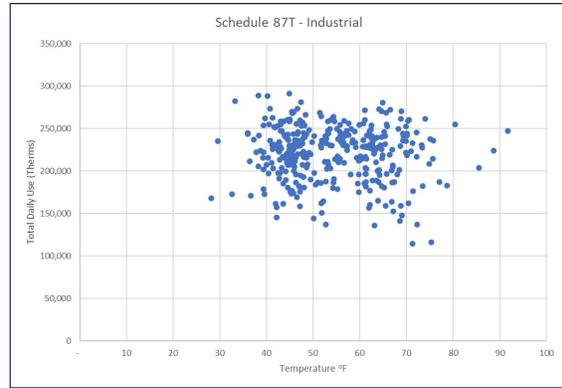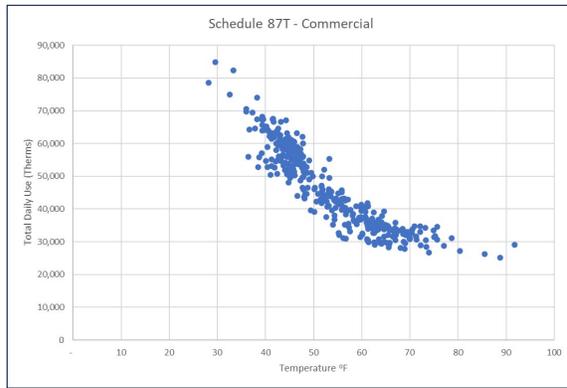
About DNV

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