

Attachment C

RESPONSE TO UNITED STATES ENVIRONMENTAL PROTECTION AGENCY CWA §308 LETTER

PSNH MERRIMACK STATION UNITS 1&2 BOW, NEW HAMPSHIRE



Prepared for:
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
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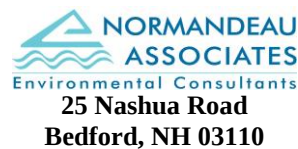


Table of Contents

1	Introduction.....	1
1.1	Background	1
2	Executive Summary	2
3	1984 – 2001 Data Set: Average Daily Temperatures	3
4	2002 – 2015 Data Set: 15 Minute Interval Values.....	4
5	Comparison of Data Sets	6
6	References.....	8

List of Appendices

Appendix 1 – Normandeau Monthly Summary Report Data – 2002-2015	22 pages
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1 Introduction

Merrimack Station, Public Service of New Hampshire's (PSNH's) electrical generating facility in Bow, New Hampshire, is seeking a renewal of its existing National Pollutant Discharge Elimination System (NPDES) permit, including issuance of a Clean Water Act (CWA) §316(a) variance. On November 30, 2015, the United States Environmental Protection Agency (EPA) sent PSNH an information request pursuant to §308(a) of the CWA seeking clarification on the plant's upstream ambient and thermal discharge data that had been obtained by PSNH over a 21-year monitoring period. The purpose of this technical paper is to address Requests 2 and 3 of the §308 Letter, which will be discussed in detail below. Request 1 will not be discussed in this document.

1.1 Background

In September 2011, PSNH received the draft NPDES permit for Merrimack Station from the EPA. Detailed comments were provided by PSNH in a February 2012 response to the EPA in which PSNH responded to the technology-based permit conditions and limits related to CWA §316(a) and (b). On September 4, 2015, PSNH issued a letter notifying the EPA of fundamental errors that had been found by PSNH in the EPA's §316(a) draft permit analysis. Specifically, the EPA misinterpreted some of the key thermal results presented in Appendix A of Normandeau Associates' (Normandeau) April 2007 report (2007 Report; Ref. 6.1). These misinterpreted results were used by EPA to reject PSNH's request for a thermal discharge variance.

Appendix A of the 2007 Report tabulates "Average Daily Maximum, Minimum and Mean Water Temperature Measured at Monitoring Stations N-10, S-0 and S-4 and Predicted at A-0 for Merrimack Station for the 1 April to 1 November period of 1984 through 2004". Correctly interpreted, these data tables provide the minimum, average, and maximum of the daily average temperature for each calendar day during the 21-year monitoring period, which occurred between 1984 and 2004. The electronic data set consisted only of daily average temperatures, and not instantaneous data. The EPA erred in assuming that the maximum daily average temperatures reported in Appendix A represented the 21-year average for each calendar day.

To clarify any potential uncertainty or confusion with regard to Appendix A of 2007 Report, the EPA sent PSNH a §308 Letter on November 30, 2015 (2015 §308 Letter), which stated the following:

1. Please provide a copy of Dr. Larry Barnthouse's review and conclusions of the water temperature data which was referenced in Ms. Landis's September 4, 2015 letter;
2. Please provide Eversource's water temperature data used in the annual reports for the period referenced above (i.e., 1 April – 31 October of 1984 – 2004 for Monitoring Stations N-10, S-0, and S-4). In the annual reports, these tables present the instantaneous maximum and minimum temperatures recorded on each date (and the specific times

recorded), as well as the daily average temperature, which is the mean of 96 (typically) temperature data points recorded on that date. These data shall be provided in hard copy as well as workable Excel files in the same monthly table format as they were presented in the PSNH Merrimack Generating Station Environmental Monitoring Program annual reports;

3. Using the same data sets presented in the environmental monitoring program annual reports (and submitted in accordance with request #2 above), please calculate the 21-year average of the daily “instantaneous maximums”, daily “instantaneous minimums”, and “daily mean” water temperatures (daily average of 96 temperature points for that date) recorded for each day from 1 April to 31 October for the period 1984 – 2004 for Monitoring Stations N-10, S-0, and S-4. For example, the maximum temperature (i.e., the “instantaneous” maximum) collected at Monitoring Station S-0 on July 4 of all 21 years from 1984 to 2004 shall be averaged and that value presented in a table under the heading “Average of the Instantaneous Maximum.” This table shall also include columns for the “Average of the Instantaneous Minimum” and “Average for the Daily Mean,” and include a row for each day of the month. A separate table will be generated for each month from April to October for Monitoring Stations N-10, S-0, and S-4. These data shall be presented in degrees Fahrenheit (°F) and provided in hard copy as well as workable Excel files in the same table format used in Appendix A of Normandeau Associate’s April 2007 report, referenced above. Please include an explanation of how the temperature values were calculated for each table so we can confirm they are responsive to this request.

Enercon Services, Inc. (ENERCON) and Normandeau have reviewed the 2015 §308 Letter, and this technical paper provides responses to Requests 2 and 3 above. Request 2 will be addressed in Sections 3 and 4. Request 3 will be addressed in Sections 4, 5, and Appendix 1.

2 Executive Summary

ENERCON and Normandeau have reviewed the 2015 §308 Letter and have worked together to create this response document on behalf of PSNH. Request 1 is not addressed in this document. Requests 2 and 3 of the 2015 §308 Letter issued to Merrimack Station are addressed in this technical paper as follows:

- Request 2 – As discussed in Sections 3 and 4, the 1984 through 2004 data set requested by the EPA does not reflect current operations at Merrimack Station. In addition, only daily average temperatures are currently available in electronic form for the majority of that time period (i.e., 1984 through 2001). Therefore, a newer, more detailed (i.e., measurements taken every 15-minutes) electronic data set from 2002 through 2015 is provided. This data set provides daily “instantaneous” minimum and maximum temperature values (and each corresponding time of occurrence), daily average

temperature values, and lists the number of intervals used for Stations N-10, S-0, and S-4 for 1 April to 1 November from 2002 through 2015. The use of this data set allows for calculation of the instantaneous maximum and minimum temperatures requested by EPA.

- Request 3 – As discussed in Section 4, the 21-year average summary calculations requested by the EPA are replaced by the 14-year (i.e., 2002 through 2015) average summary calculations (i.e., average daily “instantaneous” maximum and minimum and average daily average) found in the tables of Appendix 1. These tables present temperature monitoring data that is calculated for the entire 2002 through 2015 period. The data set covers each calendar day from 1 April to 1 November.

The 2002 through 2015 data set includes several years both before and after completion of the Clean Air Project, and is more representative of current plant operations than the 1984 through 2001 data set. As discussed in Section 5, when comparing the average monthly mean temperatures between the 1984 through 2001 and 2002 through 2015 data sets, the 2002 through 2015 data set yielded equivalent or lower downstream temperatures.

3 1984 – 2001 Data Set: Average Daily Temperatures

As discussed in the 2007 Report, Merrimack Station has monitored upstream ambient (Monitoring Station N-10), cooling canal discharge (Monitoring Station S-0), and downstream (Monitoring Station S-4) water temperatures in Hooksett Pool of the Merrimack River since the Station became fully operational in 1968. The maximum, minimum, and mean average daily water temperatures were measured at Monitoring Stations N-10, S-0 and S-4 from 1 April to 1 November. This occurred each year from 1984 through 2004 and the results of this monitoring were tabulated in Appendix A of the 2007 Report, discussed later in this section. All instantaneous thermal data for each monitoring station from 1984 through 2001 is currently only available in hard copy form. This amounts to 1.26 million raw data points¹ that must be manually entered and independently verified for quality control. Since this would be a very labor-intensive process, and since more recent data representing current plant operation is already available in electronic form (see Section 4), the 1984 – 2001 data set (as part of the 1984 through 2004 total monitoring period) has been provided by PSNH in hard copy form.

Appendix A of the 2007 Report includes the maximum, minimum, and mean of the average daily water temperatures measured at Monitoring Stations N-10, S-0, and S-4 (and Predicted at A-0) for each calendar day between 1 April to 1 November for the period of 1984 through 2004. The table below is an excerpt from the May N-10 summary table found in Appendix A, which will be used to explain how the temperature value in each column was calculated. This methodology was consistently applied every day from 1 April to 1 November for each monitoring station.

¹ A single data point includes the date and temperature for one monitoring station.

Table A.12: Monthly Summary Report for August 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR August 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum"	EPA Requested Average of the Daily "Mean"	EPA Requested Average of the Daily "Instantaneous Maximum"	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	
	Temperatures (° F)	Temperatures (° F)	Temperatures (° F)			
1-Aug	87.08	89.43	92.14	99.79	-7.65	13
2-Aug	87.78	90.76	93.23	100.24	-7.01	13
3-Aug	88.56	91.22	93.52	102.1	-8.58	13
4-Aug	89.37	91.47	93.88	101	-7.12	13
5-Aug	89.71	91.63	93.69	103.8	-10.11	13
6-Aug	87.14	90.66	93.21	97.96	-4.74	13
7-Aug	87.82	89.77	91.79	98.64	-6.85	13
8-Aug	87.86	89.99	92.25	97.63	-5.38	13
9-Aug	87.05	89.6	92.51	98.55	-6.03	13
10-Aug	86.05	88.76	92.29	96.96	-4.67	13
11-Aug	86.59	88.25	90.12	97.08	-6.95	13
12-Aug	86.21	87.69	89.68	98.57	-8.89	13
13-Aug	86.23	88.07	90.02	100.74	-10.72	13
14-Aug	86.45	88.24	89.93	102.52	-12.59	13
15-Aug	85.97	87.65	89.76	103.31	-13.55	13
16-Aug	85.46	87.41	89.52	104.23	-14.7	13
17-Aug	85.54	87.81	89.89	103.02	-13.13	13
18-Aug	85.61	87.47	89.4	103.31	-13.91	13
19-Aug	85.96	87.67	89.53	103.05	-13.51	13
20-Aug	84.86	87.55	90.06	101	-10.94	13
21-Aug	84.67	87.03	89.8	99.77	-9.96	13
22-Aug	86.29	88.25	90	100.06	-10.06	13
23-Aug	85.25	87.5	89.41	99.54	-10.13	13
24-Aug	83.67	85.37	87.73	96.66	-8.94	13
25-Aug	83.66	85.34	87.16	95.38	-8.22	13
26-Aug	83.19	85.44	87.55	96.93	-9.38	13
27-Aug	82.43	84.61	86.79	96.82	-10.02	13
28-Aug	82.81	85.26	87.41	97.3	-9.89	13
29-Aug	80.06	84.75	87.94	97.95	-10.01	13
30-Aug	83.32	85.66	88.65	99.53	-10.88	13
31-Aug	84.47	86.3	88.17	97.54	-9.37	13

Table A.13: Monthly Summary Report for September 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR September 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Sep	84	86.07	88.2	98.23	-10.03	13
2-Sep	83.28	85.87	88.42	99.85	-11.43	13
3-Sep	83.73	85.75	87.89	101.08	-13.19	13
4-Sep	82.1	85.13	87.35	97.25	-9.9	13
5-Sep	81.5	83.58	85.64	93.69	-8.05	13
6-Sep	80.4	83.05	85.42	93.93	-8.51	13
7-Sep	80.31	83.31	86.2	94.99	-8.79	13
8-Sep	81.21	83.53	85.35	96.34	-10.99	13
9-Sep	80.76	82.72	84.71	94.87	-10.16	13
10-Sep	79.67	81.9	84.1	92.96	-8.86	13
11-Sep	78.78	81.81	84.69	90.93	-6.24	13
12-Sep	80.14	81.72	84.73	89.68	-4.94	13
13-Sep	76.21	80.88	83.54	89.74	-6.21	13
14-Sep	79.08	81.02	82.71	90.67	-7.96	13
15-Sep	79.13	80.85	82.58	92.62	-10.04	13
16-Sep	78.42	80.19	82.06	91.5	-9.45	13
17-Sep	78.24	80.08	81.85	90.37	-8.52	13
18-Sep	77.34	79.28	80.96	89.46	-8.5	13
19-Sep	75.94	78.4	80.64	89.12	-8.48	13
20-Sep	75.67	77.48	79.51	90.59	-11.07	13
21-Sep	73.48	76.84	79.5	90.98	-11.49	13
22-Sep	73.87	75.75	77.54	91.3	-13.76	13
23-Sep	73.93	75.75	77.32	90.76	-13.44	13
24-Sep	73.07	75.46	77.67	88.25	-10.58	13
25-Sep	72.39	75.32	78.05	88.3	-10.25	13
26-Sep	73.53	76.07	78.58	87.63	-9.05	13
27-Sep	74.35	77.43	79.9	86.83	-6.93	13
28-Sep	73.7	77.02	79.81	84.61	-4.8	13
29-Sep	74.28	75.99	77.51	85.01	-7.5	13
30-Sep	73.5	75.47	76.97	85.99	-9.02	13

Table A.14: Monthly Summary Report for October 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR October 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Oct	72.95	75.03	77.02	84.85	-7.83	13
2-Oct	72.75	74.03	75.61	85.79	-10.19	13
3-Oct	70.09	72.24	75.04	82.1	-7.06	13
4-Oct	69.8	70.88	72.09	81.19	-9.1	13
5-Oct	69.44	71.6	73.42	84.36	-10.93	13
6-Oct	70.27	72.54	74.41	88.68	-14.28	13
7-Oct	69.96	71.66	73.81	87.04	-13.23	13
8-Oct	68.65	70.39	72.35	84.33	-11.97	13
9-Oct	66.89	69.92	72.76	82.51	-9.75	13
10-Oct	67.66	69.44	71.14	81.39	-10.25	13
11-Oct	67.33	68.87	70.3	81.82	-11.52	13
12-Oct	67.48	69.34	70.84	81.93	-11.09	13
13-Oct	66.97	68.23	69.79	81.31	-11.53	12
14-Oct	67.01	68.46	69.77	80.89	-11.12	12
15-Oct	68.08	69.68	71.51	80.87	-9.36	13
16-Oct	67.98	69.29	70.58	79.15	-8.57	13
17-Oct	67.29	68.5	69.82	78.12	-8.31	13
18-Oct	66.71	68.05	69.24	76.73	-7.49	13
19-Oct	66.2	67.54	68.88	76.46	-7.58	13
20-Oct	65.53	66.73	68.14	76.69	-8.56	13
21-Oct	64.93	66.19	67.47	77.98	-10.51	13
22-Oct	64.91	66.23	67.27	78.84	-11.57	13
23-Oct	64.61	65.91	67.19	79.72	-12.53	13
24-Oct	64.21	65.36	66.34	80.73	-14.39	13
25-Oct	63.54	64.61	65.66	80.08	-14.43	13
26-Oct	60.73	64.01	66.47	78.73	-12.26	13
27-Oct	62.53	64.46	66.16	76.74	-10.58	13
28-Oct	62.91	64.32	65.61	75.75	-10.14	13
29-Oct	60.84	63.17	65.13	74.6	-9.47	13
30-Oct	59.86	61.1	62.75	73.92	-11.17	13
31-Oct	58.85	60.43	61.79	72.44	-10.65	13

Table A.15: Monthly Summary Report for April 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR April 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Apr	43.4	46.08	50.49	50.99	-0.49	6
2-Apr	44.15	46.57	50.99	51.2	-0.21	6
3-Apr	44.67	47.04	51.34	52.03	-0.69	6
4-Apr	45	47.08	50.45	52.77	-2.32	6
5-Apr	43.45	45.23	48.14	53.79	-5.66	8
6-Apr	43.46	46.61	50.34	55	-4.66	9
7-Apr	44.64	47.65	50.59	56.02	-5.43	9
8-Apr	46.21	48.76	51.08	58.83	-7.75	10
9-Apr	45.46	47.51	49.87	59.48	-9.61	11
10-Apr	46.99	48.2	49.28	60.85	-11.58	11
11-Apr	47.28	48.66	50.28	58.93	-8.65	11
12-Apr	48.04	49.04	50.13	62.69	-12.56	12
13-Apr	47.57	48.78	49.85	60.37	-10.52	12
14-Apr	47.29	48.9	50.24	59.38	-9.14	12
15-Apr	48.37	49.7	50.85	61.28	-10.43	12
16-Apr	47.74	49.06	50.42	59.36	-8.93	12
17-Apr	48.73	49.85	51.06	62.67	-11.61	13
18-Apr	49.23	50.44	51.58	61.74	-10.17	13
19-Apr	49.49	50.95	52.44	61.08	-8.64	13
20-Apr	50.43	51.62	52.9	60.53	-7.64	13
21-Apr	50.66	51.75	52.84	60.49	-7.65	13
22-Apr	50.68	51.75	52.89	59.6	-6.71	13
23-Apr	50.15	51.11	52.17	55.63	-3.46	13
24-Apr	50.19	51.32	53.54	56.13	-2.6	13
25-Apr	50.69	51.71	52.94	57.79	-4.85	13
26-Apr	50.53	51.45	52.26	58.85	-6.58	13
27-Apr	50.74	51.61	52.57	58.99	-6.42	13
28-Apr	50.8	51.86	52.81	61.57	-8.76	13
29-Apr	51.19	52.14	53.21	59.81	-6.6	13
30-Apr	51.46	52.51	53.41	58.46	-5.05	12

Table A.13: Monthly Summary Report for September 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR September 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Sep	84	86.07	88.2	98.23	-10.03	13
2-Sep	83.28	85.87	88.42	99.85	-11.43	13
3-Sep	83.73	85.75	87.89	101.08	-13.19	13
4-Sep	82.1	85.13	87.35	97.25	-9.9	13
5-Sep	81.5	83.58	85.64	93.69	-8.05	13
6-Sep	80.4	83.05	85.42	93.93	-8.51	13
7-Sep	80.31	83.31	86.2	94.99	-8.79	13
8-Sep	81.21	83.53	85.35	96.34	-10.99	13
9-Sep	80.76	82.72	84.71	94.87	-10.16	13
10-Sep	79.67	81.9	84.1	92.96	-8.86	13
11-Sep	78.78	81.81	84.69	90.93	-6.24	13
12-Sep	80.14	81.72	84.73	89.68	-4.94	13
13-Sep	76.21	80.88	83.54	89.74	-6.21	13
14-Sep	79.08	81.02	82.71	90.67	-7.96	13
15-Sep	79.13	80.85	82.58	92.62	-10.04	13
16-Sep	78.42	80.19	82.06	91.5	-9.45	13
17-Sep	78.24	80.08	81.85	90.37	-8.52	13
18-Sep	77.34	79.28	80.96	89.46	-8.5	13
19-Sep	75.94	78.4	80.64	89.12	-8.48	13
20-Sep	75.67	77.48	79.51	90.59	-11.07	13
21-Sep	73.48	76.84	79.5	90.98	-11.49	13
22-Sep	73.87	75.75	77.54	91.3	-13.76	13
23-Sep	73.93	75.75	77.32	90.76	-13.44	13
24-Sep	73.07	75.46	77.67	88.25	-10.58	13
25-Sep	72.39	75.32	78.05	88.3	-10.25	13
26-Sep	73.53	76.07	78.58	87.63	-9.05	13
27-Sep	74.35	77.43	79.9	86.83	-6.93	13
28-Sep	73.7	77.02	79.81	84.61	-4.8	13
29-Sep	74.28	75.99	77.51	85.01	-7.5	13
30-Sep	73.5	75.47	76.97	85.99	-9.02	13

Table A.14: Monthly Summary Report for October 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR October 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)		
1-Oct	72.95	75.03	77.02	84.85	-7.83	13
2-Oct	72.75	74.03	75.61	85.79	-10.19	13
3-Oct	70.09	72.24	75.04	82.1	-7.06	13
4-Oct	69.8	70.88	72.09	81.19	-9.1	13
5-Oct	69.44	71.6	73.42	84.36	-10.93	13
6-Oct	70.27	72.54	74.41	88.68	-14.28	13
7-Oct	69.96	71.66	73.81	87.04	-13.23	13
8-Oct	68.65	70.39	72.35	84.33	-11.97	13
9-Oct	66.89	69.92	72.76	82.51	-9.75	13
10-Oct	67.66	69.44	71.14	81.39	-10.25	13
11-Oct	67.33	68.87	70.3	81.82	-11.52	13
12-Oct	67.48	69.34	70.84	81.93	-11.09	13
13-Oct	66.97	68.23	69.79	81.31	-11.53	12
14-Oct	67.01	68.46	69.77	80.89	-11.12	12
15-Oct	68.08	69.68	71.51	80.87	-9.36	13
16-Oct	67.98	69.29	70.58	79.15	-8.57	13
17-Oct	67.29	68.5	69.82	78.12	-8.31	13
18-Oct	66.71	68.05	69.24	76.73	-7.49	13
19-Oct	66.2	67.54	68.88	76.46	-7.58	13
20-Oct	65.53	66.73	68.14	76.69	-8.56	13
21-Oct	64.93	66.19	67.47	77.98	-10.51	13
22-Oct	64.91	66.23	67.27	78.84	-11.57	13
23-Oct	64.61	65.91	67.19	79.72	-12.53	13
24-Oct	64.21	65.36	66.34	80.73	-14.39	13
25-Oct	63.54	64.61	65.66	80.08	-14.43	13
26-Oct	60.73	64.01	66.47	78.73	-12.26	13
27-Oct	62.53	64.46	66.16	76.74	-10.58	13
28-Oct	62.91	64.32	65.61	75.75	-10.14	13
29-Oct	60.84	63.17	65.13	74.6	-9.47	13
30-Oct	59.86	61.1	62.75	73.92	-11.17	13
31-Oct	58.85	60.43	61.79	72.44	-10.65	13

Table A.15: Monthly Summary Report for April 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR April 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Apr	43.4	46.08	50.49	50.99	-0.49	6
2-Apr	44.15	46.57	50.99	51.2	-0.21	6
3-Apr	44.67	47.04	51.34	52.03	-0.69	6
4-Apr	45	47.08	50.45	52.77	-2.32	6
5-Apr	43.45	45.23	48.14	53.79	-5.66	8
6-Apr	43.46	46.61	50.34	55	-4.66	9
7-Apr	44.64	47.65	50.59	56.02	-5.43	9
8-Apr	46.21	48.76	51.08	58.83	-7.75	10
9-Apr	45.46	47.51	49.87	59.48	-9.61	11
10-Apr	46.99	48.2	49.28	60.85	-11.58	11
11-Apr	47.28	48.66	50.28	58.93	-8.65	11
12-Apr	48.04	49.04	50.13	62.69	-12.56	12
13-Apr	47.57	48.78	49.85	60.37	-10.52	12
14-Apr	47.29	48.9	50.24	59.38	-9.14	12
15-Apr	48.37	49.7	50.85	61.28	-10.43	12
16-Apr	47.74	49.06	50.42	59.36	-8.93	12
17-Apr	48.73	49.85	51.06	62.67	-11.61	13
18-Apr	49.23	50.44	51.58	61.74	-10.17	13
19-Apr	49.49	50.95	52.44	61.08	-8.64	13
20-Apr	50.43	51.62	52.9	60.53	-7.64	13
21-Apr	50.66	51.75	52.84	60.49	-7.65	13
22-Apr	50.68	51.75	52.89	59.6	-6.71	13
23-Apr	50.15	51.11	52.17	55.63	-3.46	13
24-Apr	50.19	51.32	53.54	56.13	-2.6	13
25-Apr	50.69	51.71	52.94	57.79	-4.85	13
26-Apr	50.53	51.45	52.26	58.85	-6.58	13
27-Apr	50.74	51.61	52.57	58.99	-6.42	13
28-Apr	50.8	51.86	52.81	61.57	-8.76	13
29-Apr	51.19	52.14	53.21	59.81	-6.6	13
30-Apr	51.46	52.51	53.41	58.46	-5.05	12

Table A.16: Monthly Summary Report for May 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR May 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)		
1-May	51.8	52.73	54.1	58.81	-4.71	13
2-May	52.23	53.22	54.25	59.66	-5.41	12
3-May	52.68	53.62	54.56	59.71	-5.15	12
4-May	52.82	53.84	54.82	61.06	-6.23	12
5-May	53.47	54.52	55.69	62.01	-6.33	12
6-May	53.98	55.17	56.37	63.47	-7.09	12
7-May	54.77	55.97	57.06	62.86	-5.8	12
8-May	55.56	56.76	58.3	62.17	-3.88	12
9-May	56.09	57.06	58.01	61.11	-3.09	12
10-May	56.72	57.93	59.09	62.29	-3.2	12
11-May	57.37	58.53	59.68	63.51	-3.82	12
12-May	57.77	58.82	60.14	64.34	-4.21	12
13-May	56.81	58.11	59.6	63.44	-3.84	13
14-May	57.04	57.98	59.43	64.28	-4.85	13
15-May	57.28	58.53	61.31	63.66	-2.35	12
16-May	57.72	58.81	60.67	66.82	-6.15	13
17-May	58.02	59.3	60.63	66.22	-5.6	13
18-May	58.03	59.08	60.23	66.47	-6.25	14
19-May	57.1	58.22	59.52	62.68	-3.15	13
20-May	57.53	58.87	60.23	63.11	-2.88	13
21-May	58.39	59.76	61.25	64.07	-2.83	13
22-May	59.14	60.16	61.41	66.98	-5.57	13
23-May	59.28	60.42	61.55	67.43	-5.88	13
24-May	59.69	61.09	62.65	70.35	-7.7	13
25-May	60.28	62.15	64.19	76.54	-12.35	13
26-May	61.71	63.46	65.23	80.64	-15.42	13
27-May	62.94	64.42	65.84	81.84	-16.01	13
28-May	63.29	64.6	65.89	80.69	-14.8	13
29-May	63.71	64.87	65.99	79.04	-13.04	13
30-May	64.56	65.88	68.15	79.54	-11.38	13
31-May	65.41	66.72	67.95	79.81	-11.87	13

Table A.17: Monthly Summary Report for June 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR June 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested Average of the Daily			Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)			
1-Jun	65.62	66.79	68.28	80.89	-12.62	12
2-Jun	65.86	67.52	69.46	82.3	-12.84	12
3-Jun	66.39	67.76	69.52	82.82	-13.3	12
4-Jun	66.16	67.59	69.36	82.37	-13.01	12
5-Jun	66.38	67.73	70.09	84.61	-14.52	12
6-Jun	65.57	67.33	69.62	80.7	-11.08	12
7-Jun	65.64	67.22	69.14	75.04	-5.9	11
8-Jun	66.15	67.96	70.25	74.99	-4.73	12
9-Jun	67.39	69.15	70.87	77.7	-6.83	12
10-Jun	67.72	69.22	71.58	76.57	-4.99	12
11-Jun	68.38	70.01	72.23	78.5	-6.27	12
12-Jun	67.93	69.41	71.55	79.23	-7.68	12
13-Jun	67.68	68.83	70.67	76.57	-5.9	12
14-Jun	67.53	68.65	70.11	76.78	-6.67	12
15-Jun	66.76	68.47	70.18	75.57	-5.39	12
16-Jun	67.25	68.81	70.86	75.38	-4.52	12
17-Jun	67.67	69.32	71.44	76.07	-4.63	12
18-Jun	68.28	70.03	72.05	76.75	-4.71	12
19-Jun	68.97	71.11	73.62	79.53	-5.9	12
20-Jun	70.22	72.13	74.49	82.14	-7.65	12
21-Jun	71.84	74.19	76.17	83.7	-7.53	13
22-Jun	72.26	74.27	76.4	84.83	-8.43	13
23-Jun	72.04	74.21	76.38	85.4	-9.02	13
24-Jun	72.37	74.57	76.59	85.95	-9.36	13
25-Jun	73.38	75.49	77.72	85.87	-8.15	13
26-Jun	74.35	76.2	78.34	89.32	-10.97	13
27-Jun	74.73	76.77	78.98	91.1	-12.12	13
28-Jun	74.39	76.36	78.41	89.37	-10.96	13
29-Jun	73.77	75.32	77.65	85.58	-7.93	13
30-Jun	74.25	75.67	77.07	85.25	-8.18	13

Table A.17: Monthly Summary Report for June 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR June 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	EPA Requested	EPA Requested	EPA Requested	Maximum of the Daily	Difference in Temperatures	Number of Data Points Utilized to Calculate EPA Requested Averages
	Average of the Daily	Average of the Daily	Average of the Daily	"Mean" Temperatures (° F)	Between EPA Requested	
	"Instantaneous Minimum" Temperatures (° F)	"Mean" Temperatures (° F)	"Instantaneous Maximum" Temperatures (° F)	Using the Approach of Normandeau (2007)	Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	
1-Jun	65.62	66.79	68.28	80.89	-12.62	12
2-Jun	65.86	67.52	69.46	82.3	-12.84	12
3-Jun	66.39	67.76	69.52	82.82	-13.3	12
4-Jun	66.16	67.59	69.36	82.37	-13.01	12
5-Jun	66.38	67.73	70.09	84.61	-14.52	12
6-Jun	65.57	67.33	69.62	80.7	-11.08	12
7-Jun	65.64	67.22	69.14	75.04	-5.9	11
8-Jun	66.15	67.96	70.25	74.99	-4.73	12
9-Jun	67.39	69.15	70.87	77.7	-6.83	12
10-Jun	67.72	69.22	71.58	76.57	-4.99	12
11-Jun	68.38	70.01	72.23	78.5	-6.27	12
12-Jun	67.93	69.41	71.55	79.23	-7.68	12
13-Jun	67.68	68.83	70.67	76.57	-5.9	12
14-Jun	67.53	68.65	70.11	76.78	-6.67	12
15-Jun	66.76	68.47	70.18	75.57	-5.39	12
16-Jun	67.25	68.81	70.86	75.38	-4.52	12
17-Jun	67.67	69.32	71.44	76.07	-4.63	12
18-Jun	68.28	70.03	72.05	76.75	-4.71	12
19-Jun	68.97	71.11	73.62	79.53	-5.9	12
20-Jun	70.22	72.13	74.49	82.14	-7.65	12
21-Jun	71.84	74.19	76.17	83.7	-7.53	13
22-Jun	72.26	74.27	76.4	84.83	-8.43	13
23-Jun	72.04	74.21	76.38	85.4	-9.02	13
24-Jun	72.37	74.57	76.59	85.95	-9.36	13
25-Jun	73.38	75.49	77.72	85.87	-8.15	13
26-Jun	74.35	76.2	78.34	89.32	-10.97	13
27-Jun	74.73	76.77	78.98	91.1	-12.12	13
28-Jun	74.39	76.36	78.41	89.37	-10.96	13
29-Jun	73.77	75.32	77.65	85.58	-7.93	13
30-Jun	74.25	75.67	77.07	85.25	-8.18	13

Table A.10: Monthly Summary Report for June 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR June 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Jun	77.07	79.33	81.72	88.13	-6.41	12
2-Jun	76.83	79.03	81.17	88.55	-7.38	12
3-Jun	76.39	78.72	80.8	89.27	-8.47	12
4-Jun	77.89	79.42	81.47	90.06	-8.59	12
5-Jun	77.78	80.29	82.13	91.78	-9.65	12
6-Jun	76.97	79.58	82.63	89.81	-7.18	12
7-Jun	77.91	80.05	82.07	88.38	-6.31	12
8-Jun	76.75	79.72	82.95	90.08	-7.13	12
9-Jun	78.44	80.89	83.42	90.76	-7.34	12
10-Jun	78.43	80.69	83.29	93.69	-10.4	12
11-Jun	79.11	80.55	82.07	94.02	-11.95	12
12-Jun	78.47	79.96	81.63	92.73	-11.11	12
13-Jun	78.61	79.97	81.27	91.62	-10.35	12
14-Jun	78.45	80.22	82.17	91.99	-9.83	12
15-Jun	78.29	79.97	82.04	90	-7.96	12
16-Jun	77.85	79.87	81.87	88.73	-6.86	12
17-Jun	78.84	80.82	82.79	89.01	-6.22	12
18-Jun	79.39	81.33	83.05	89.24	-6.19	12
19-Jun	79.72	81.68	83.94	89.79	-5.85	12
20-Jun	77.14	82.55	85.23	90.45	-5.22	12
21-Jun	81.85	84.36	86.6	91.89	-5.29	13
22-Jun	82.39	84.59	86.61	91.1	-4.5	13
23-Jun	79.84	83.47	86.23	93.54	-7.31	13
24-Jun	81.45	83.64	86.41	93.88	-7.47	13
25-Jun	83.21	85.28	87.15	95	-7.85	13
26-Jun	83.66	86.18	88.21	97.28	-9.07	13
27-Jun	83.31	85.55	88.43	98.74	-10.32	13
28-Jun	82.28	84.19	86.88	95.45	-8.57	13
29-Jun	81.78	83.67	86.01	92.73	-6.73	13
30-Jun	82.36	84.8	87.13	93.75	-6.61	13

Table A.11: Monthly Summary Report for July 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR July 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Jul	81.95	84.72	88.02	92.04	-4.02	13
2-Jul	82.89	85.89	88.29	93.5	-5.21	13
3-Jul	83.19	85.64	88.23	92.54	-4.31	13
4-Jul	84.74	86.82	88.96	100.67	-11.71	13
5-Jul	84.96	87.71	90.86	98.55	-7.68	13
6-Jul	87.15	90.5	92.74	99.05	-6.31	13
7-Jul	88.73	90.62	92.3	101.46	-9.16	13
8-Jul	88.11	90.33	92.82	101.88	-9.06	13
9-Jul	88.26	90.41	92.23	99.89	-7.66	13
10-Jul	86.52	89.62	91.91	98.07	-6.16	13
11-Jul	84.84	88.01	91.34	94.2	-2.86	13
12-Jul	86.02	88.68	91.55	99.5	-7.95	13
13-Jul	86.74	88.73	91.06	100.02	-8.96	13
14-Jul	86.62	89.39	92.59	100.56	-7.97	13
15-Jul	89.36	91.54	93.66	99.18	-5.52	13
16-Jul	89.38	91.95	94.21	99.62	-5.41	13
17-Jul	89.93	92.57	95.36	100.39	-5.03	13
18-Jul	92.17	94.27	96.21	99.75	-3.55	13
19-Jul	90.35	93.56	95.86	99.38	-3.52	13
20-Jul	89.97	92.54	94.42	99.54	-5.13	13
21-Jul	89.15	91.73	93.74	99.58	-5.84	13
22-Jul	89.49	91.77	94.13	102.09	-7.96	13
23-Jul	90.22	92.35	94.43	98.91	-4.47	13
24-Jul	87.37	89.96	93.75	99.89	-6.14	13
25-Jul	86.42	89.79	91.73	97.09	-5.36	13
26-Jul	88.23	89.91	91.65	96.2	-4.56	13
27-Jul	88.35	90.06	91.72	97.86	-6.13	13
28-Jul	88.3	89.93	91.75	98.63	-6.88	13
29-Jul	87.82	90.08	91.92	98.33	-6.4	13
30-Jul	87.68	89.55	91.76	98.11	-6.35	13
31-Jul	87.39	89.34	91.37	98.44	-7.07	13

Table A.12: Monthly Summary Report for August 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR August 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum"	EPA Requested Average of the Daily "Mean"	EPA Requested Average of the Daily "Instantaneous Maximum"	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	
	Temperatures (° F)	Temperatures (° F)	Temperatures (° F)			
1-Aug	87.08	89.43	92.14	99.79	-7.65	13
2-Aug	87.78	90.76	93.23	100.24	-7.01	13
3-Aug	88.56	91.22	93.52	102.1	-8.58	13
4-Aug	89.37	91.47	93.88	101	-7.12	13
5-Aug	89.71	91.63	93.69	103.8	-10.11	13
6-Aug	87.14	90.66	93.21	97.96	-4.74	13
7-Aug	87.82	89.77	91.79	98.64	-6.85	13
8-Aug	87.86	89.99	92.25	97.63	-5.38	13
9-Aug	87.05	89.6	92.51	98.55	-6.03	13
10-Aug	86.05	88.76	92.29	96.96	-4.67	13
11-Aug	86.59	88.25	90.12	97.08	-6.95	13
12-Aug	86.21	87.69	89.68	98.57	-8.89	13
13-Aug	86.23	88.07	90.02	100.74	-10.72	13
14-Aug	86.45	88.24	89.93	102.52	-12.59	13
15-Aug	85.97	87.65	89.76	103.31	-13.55	13
16-Aug	85.46	87.41	89.52	104.23	-14.7	13
17-Aug	85.54	87.81	89.89	103.02	-13.13	13
18-Aug	85.61	87.47	89.4	103.31	-13.91	13
19-Aug	85.96	87.67	89.53	103.05	-13.51	13
20-Aug	84.86	87.55	90.06	101	-10.94	13
21-Aug	84.67	87.03	89.8	99.77	-9.96	13
22-Aug	86.29	88.25	90	100.06	-10.06	13
23-Aug	85.25	87.5	89.41	99.54	-10.13	13
24-Aug	83.67	85.37	87.73	96.66	-8.94	13
25-Aug	83.66	85.34	87.16	95.38	-8.22	13
26-Aug	83.19	85.44	87.55	96.93	-9.38	13
27-Aug	82.43	84.61	86.79	96.82	-10.02	13
28-Aug	82.81	85.26	87.41	97.3	-9.89	13
29-Aug	80.06	84.75	87.94	97.95	-10.01	13
30-Aug	83.32	85.66	88.65	99.53	-10.88	13
31-Aug	84.47	86.3	88.17	97.54	-9.37	13

Attachment C

recorded), as well as the daily average temperature, which is the mean of 96 (typically) temperature data points recorded on that date. These data shall be provided in hard copy as well as workable Excel files in the same monthly table format as they were presented in the PSNH Merrimack Generating Station Environmental Monitoring Program annual reports;

3. Using the same data sets presented in the environmental monitoring program annual reports (and submitted in accordance with request #2 above), please calculate the 21-year average of the daily “instantaneous maximums”, daily “instantaneous minimums”, and “daily mean” water temperatures (daily average of 96 temperature points for that date) recorded for each day from 1 April to 31 October for the period 1984 – 2004 for Monitoring Stations N-10, S-0, and S-4. For example, the maximum temperature (i.e., the “instantaneous” maximum) collected at Monitoring Station S-0 on July 4 of all 21 years from 1984 to 2004 shall be averaged and that value presented in a table under the heading “Average of the Instantaneous Maximum.” This table shall also include columns for the “Average of the Instantaneous Minimum” and “Average for the Daily Mean,” and include a row for each day of the month. A separate table will be generated for each month from April to October for Monitoring Stations N-10, S-0, and S-4. These data shall be presented in degrees Fahrenheit (°F) and provided in hard copy as well as workable Excel files in the same table format used in Appendix A of Normandeau Associate’s April 2007 report, referenced above. Please include an explanation of how the temperature values were calculated for each table so we can confirm they are responsive to this request.

Enercon Services, Inc. (ENERCON) and Normandeau have reviewed the 2015 §308 Letter, and this technical paper provides responses to Requests 2 and 3 above. Request 2 will be addressed in Sections 3 and 4. Request 3 will be addressed in Sections 4, 5, and Appendix 1.

2 Executive Summary

ENERCON and Normandeau have reviewed the 2015 §308 Letter and have worked together to create this response document on behalf of PSNH. Request 1 is not addressed in this document. Requests 2 and 3 of the 2015 §308 Letter issued to Merrimack Station are addressed in this technical paper as follows:

- Request 2 – As discussed in Sections 3 and 4, the 1984 through 2004 data set requested by the EPA does not reflect current operations at Merrimack Station. In addition, only daily average temperatures are currently available in electronic form for the majority of that time period (i.e., 1984 through 2001). Therefore, a newer, more detailed (i.e., measurements taken every 15-minutes) electronic data set from 2002 through 2015 is provided. This data set provides daily “instantaneous” minimum and maximum temperature values (and each corresponding time of occurrence), daily average

temperature values, and lists the number of intervals used for Stations N-10, S-0, and S-4 for 1 April to 1 November from 2002 through 2015. The use of this data set allows for calculation of the instantaneous maximum and minimum temperatures requested by EPA.

- Request 3 – As discussed in Section 4, the 21-year average summary calculations requested by the EPA are replaced by the 14-year (i.e., 2002 through 2015) average summary calculations (i.e., average daily “instantaneous” maximum and minimum and average daily average) found in the tables of Appendix 1. These tables present temperature monitoring data that is calculated for the entire 2002 through 2015 period. The data set covers each calendar day from 1 April to 1 November.

The 2002 through 2015 data set includes several years both before and after completion of the Clean Air Project, and is more representative of current plant operations than the 1984 through 2001 data set. As discussed in Section 5, when comparing the average monthly mean temperatures between the 1984 through 2001 and 2002 through 2015 data sets, the 2002 through 2015 data set yielded equivalent or lower downstream temperatures.

3 1984 – 2001 Data Set: Average Daily Temperatures

As discussed in the 2007 Report, Merrimack Station has monitored upstream ambient (Monitoring Station N-10), cooling canal discharge (Monitoring Station S-0), and downstream (Monitoring Station S-4) water temperatures in Hooksett Pool of the Merrimack River since the Station became fully operational in 1968. The maximum, minimum, and mean average daily water temperatures were measured at Monitoring Stations N-10, S-0 and S-4 from 1 April to 1 November. This occurred each year from 1984 through 2004 and the results of this monitoring were tabulated in Appendix A of the 2007 Report, discussed later in this section. All instantaneous thermal data for each monitoring station from 1984 through 2001 is currently only available in hard copy form. This amounts to 1.26 million raw data points¹ that must be manually entered and independently verified for quality control. Since this would be a very labor-intensive process, and since more recent data representing current plant operation is already available in electronic form (see Section 4), the 1984 – 2001 data set (as part of the 1984 through 2004 total monitoring period) has been provided by PSNH in hard copy form.

Appendix A of the 2007 Report includes the maximum, minimum, and mean of the average daily water temperatures measured at Monitoring Stations N-10, S-0, and S-4 (and Predicted at A-0) for each calendar day between 1 April to 1 November for the period of 1984 through 2004. The table below is an excerpt from the May N-10 summary table found in Appendix A, which will be used to explain how the temperature value in each column was calculated. This methodology was consistently applied every day from 1 April to 1 November for each monitoring station.

¹ A single data point includes the date and temperature for one monitoring station.

Table A.12: Monthly Summary Report for August 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR August 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum"	EPA Requested Average of the Daily "Mean"	EPA Requested Average of the Daily "Instantaneous Maximum"	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	
	Temperatures (° F)	Temperatures (° F)	Temperatures (° F)			
1-Aug	87.08	89.43	92.14	99.79	-7.65	13
2-Aug	87.78	90.76	93.23	100.24	-7.01	13
3-Aug	88.56	91.22	93.52	102.1	-8.58	13
4-Aug	89.37	91.47	93.88	101	-7.12	13
5-Aug	89.71	91.63	93.69	103.8	-10.11	13
6-Aug	87.14	90.66	93.21	97.96	-4.74	13
7-Aug	87.82	89.77	91.79	98.64	-6.85	13
8-Aug	87.86	89.99	92.25	97.63	-5.38	13
9-Aug	87.05	89.6	92.51	98.55	-6.03	13
10-Aug	86.05	88.76	92.29	96.96	-4.67	13
11-Aug	86.59	88.25	90.12	97.08	-6.95	13
12-Aug	86.21	87.69	89.68	98.57	-8.89	13
13-Aug	86.23	88.07	90.02	100.74	-10.72	13
14-Aug	86.45	88.24	89.93	102.52	-12.59	13
15-Aug	85.97	87.65	89.76	103.31	-13.55	13
16-Aug	85.46	87.41	89.52	104.23	-14.7	13
17-Aug	85.54	87.81	89.89	103.02	-13.13	13
18-Aug	85.61	87.47	89.4	103.31	-13.91	13
19-Aug	85.96	87.67	89.53	103.05	-13.51	13
20-Aug	84.86	87.55	90.06	101	-10.94	13
21-Aug	84.67	87.03	89.8	99.77	-9.96	13
22-Aug	86.29	88.25	90	100.06	-10.06	13
23-Aug	85.25	87.5	89.41	99.54	-10.13	13
24-Aug	83.67	85.37	87.73	96.66	-8.94	13
25-Aug	83.66	85.34	87.16	95.38	-8.22	13
26-Aug	83.19	85.44	87.55	96.93	-9.38	13
27-Aug	82.43	84.61	86.79	96.82	-10.02	13
28-Aug	82.81	85.26	87.41	97.3	-9.89	13
29-Aug	80.06	84.75	87.94	97.95	-10.01	13
30-Aug	83.32	85.66	88.65	99.53	-10.88	13
31-Aug	84.47	86.3	88.17	97.54	-9.37	13

Table A.13: Monthly Summary Report for September 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR September 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Sep	84	86.07	88.2	98.23	-10.03	13
2-Sep	83.28	85.87	88.42	99.85	-11.43	13
3-Sep	83.73	85.75	87.89	101.08	-13.19	13
4-Sep	82.1	85.13	87.35	97.25	-9.9	13
5-Sep	81.5	83.58	85.64	93.69	-8.05	13
6-Sep	80.4	83.05	85.42	93.93	-8.51	13
7-Sep	80.31	83.31	86.2	94.99	-8.79	13
8-Sep	81.21	83.53	85.35	96.34	-10.99	13
9-Sep	80.76	82.72	84.71	94.87	-10.16	13
10-Sep	79.67	81.9	84.1	92.96	-8.86	13
11-Sep	78.78	81.81	84.69	90.93	-6.24	13
12-Sep	80.14	81.72	84.73	89.68	-4.94	13
13-Sep	76.21	80.88	83.54	89.74	-6.21	13
14-Sep	79.08	81.02	82.71	90.67	-7.96	13
15-Sep	79.13	80.85	82.58	92.62	-10.04	13
16-Sep	78.42	80.19	82.06	91.5	-9.45	13
17-Sep	78.24	80.08	81.85	90.37	-8.52	13
18-Sep	77.34	79.28	80.96	89.46	-8.5	13
19-Sep	75.94	78.4	80.64	89.12	-8.48	13
20-Sep	75.67	77.48	79.51	90.59	-11.07	13
21-Sep	73.48	76.84	79.5	90.98	-11.49	13
22-Sep	73.87	75.75	77.54	91.3	-13.76	13
23-Sep	73.93	75.75	77.32	90.76	-13.44	13
24-Sep	73.07	75.46	77.67	88.25	-10.58	13
25-Sep	72.39	75.32	78.05	88.3	-10.25	13
26-Sep	73.53	76.07	78.58	87.63	-9.05	13
27-Sep	74.35	77.43	79.9	86.83	-6.93	13
28-Sep	73.7	77.02	79.81	84.61	-4.8	13
29-Sep	74.28	75.99	77.51	85.01	-7.5	13
30-Sep	73.5	75.47	76.97	85.99	-9.02	13

Table A.14: Monthly Summary Report for October 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR October 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)		
1-Oct	72.95	75.03	77.02	84.85	-7.83	13
2-Oct	72.75	74.03	75.61	85.79	-10.19	13
3-Oct	70.09	72.24	75.04	82.1	-7.06	13
4-Oct	69.8	70.88	72.09	81.19	-9.1	13
5-Oct	69.44	71.6	73.42	84.36	-10.93	13
6-Oct	70.27	72.54	74.41	88.68	-14.28	13
7-Oct	69.96	71.66	73.81	87.04	-13.23	13
8-Oct	68.65	70.39	72.35	84.33	-11.97	13
9-Oct	66.89	69.92	72.76	82.51	-9.75	13
10-Oct	67.66	69.44	71.14	81.39	-10.25	13
11-Oct	67.33	68.87	70.3	81.82	-11.52	13
12-Oct	67.48	69.34	70.84	81.93	-11.09	13
13-Oct	66.97	68.23	69.79	81.31	-11.53	12
14-Oct	67.01	68.46	69.77	80.89	-11.12	12
15-Oct	68.08	69.68	71.51	80.87	-9.36	13
16-Oct	67.98	69.29	70.58	79.15	-8.57	13
17-Oct	67.29	68.5	69.82	78.12	-8.31	13
18-Oct	66.71	68.05	69.24	76.73	-7.49	13
19-Oct	66.2	67.54	68.88	76.46	-7.58	13
20-Oct	65.53	66.73	68.14	76.69	-8.56	13
21-Oct	64.93	66.19	67.47	77.98	-10.51	13
22-Oct	64.91	66.23	67.27	78.84	-11.57	13
23-Oct	64.61	65.91	67.19	79.72	-12.53	13
24-Oct	64.21	65.36	66.34	80.73	-14.39	13
25-Oct	63.54	64.61	65.66	80.08	-14.43	13
26-Oct	60.73	64.01	66.47	78.73	-12.26	13
27-Oct	62.53	64.46	66.16	76.74	-10.58	13
28-Oct	62.91	64.32	65.61	75.75	-10.14	13
29-Oct	60.84	63.17	65.13	74.6	-9.47	13
30-Oct	59.86	61.1	62.75	73.92	-11.17	13
31-Oct	58.85	60.43	61.79	72.44	-10.65	13

Table A.15: Monthly Summary Report for April 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR April 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Apr	43.4	46.08	50.49	50.99	-0.49	6
2-Apr	44.15	46.57	50.99	51.2	-0.21	6
3-Apr	44.67	47.04	51.34	52.03	-0.69	6
4-Apr	45	47.08	50.45	52.77	-2.32	6
5-Apr	43.45	45.23	48.14	53.79	-5.66	8
6-Apr	43.46	46.61	50.34	55	-4.66	9
7-Apr	44.64	47.65	50.59	56.02	-5.43	9
8-Apr	46.21	48.76	51.08	58.83	-7.75	10
9-Apr	45.46	47.51	49.87	59.48	-9.61	11
10-Apr	46.99	48.2	49.28	60.85	-11.58	11
11-Apr	47.28	48.66	50.28	58.93	-8.65	11
12-Apr	48.04	49.04	50.13	62.69	-12.56	12
13-Apr	47.57	48.78	49.85	60.37	-10.52	12
14-Apr	47.29	48.9	50.24	59.38	-9.14	12
15-Apr	48.37	49.7	50.85	61.28	-10.43	12
16-Apr	47.74	49.06	50.42	59.36	-8.93	12
17-Apr	48.73	49.85	51.06	62.67	-11.61	13
18-Apr	49.23	50.44	51.58	61.74	-10.17	13
19-Apr	49.49	50.95	52.44	61.08	-8.64	13
20-Apr	50.43	51.62	52.9	60.53	-7.64	13
21-Apr	50.66	51.75	52.84	60.49	-7.65	13
22-Apr	50.68	51.75	52.89	59.6	-6.71	13
23-Apr	50.15	51.11	52.17	55.63	-3.46	13
24-Apr	50.19	51.32	53.54	56.13	-2.6	13
25-Apr	50.69	51.71	52.94	57.79	-4.85	13
26-Apr	50.53	51.45	52.26	58.85	-6.58	13
27-Apr	50.74	51.61	52.57	58.99	-6.42	13
28-Apr	50.8	51.86	52.81	61.57	-8.76	13
29-Apr	51.19	52.14	53.21	59.81	-6.6	13
30-Apr	51.46	52.51	53.41	58.46	-5.05	12

Table A.13: Monthly Summary Report for September 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR September 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Sep	84	86.07	88.2	98.23	-10.03	13
2-Sep	83.28	85.87	88.42	99.85	-11.43	13
3-Sep	83.73	85.75	87.89	101.08	-13.19	13
4-Sep	82.1	85.13	87.35	97.25	-9.9	13
5-Sep	81.5	83.58	85.64	93.69	-8.05	13
6-Sep	80.4	83.05	85.42	93.93	-8.51	13
7-Sep	80.31	83.31	86.2	94.99	-8.79	13
8-Sep	81.21	83.53	85.35	96.34	-10.99	13
9-Sep	80.76	82.72	84.71	94.87	-10.16	13
10-Sep	79.67	81.9	84.1	92.96	-8.86	13
11-Sep	78.78	81.81	84.69	90.93	-6.24	13
12-Sep	80.14	81.72	84.73	89.68	-4.94	13
13-Sep	76.21	80.88	83.54	89.74	-6.21	13
14-Sep	79.08	81.02	82.71	90.67	-7.96	13
15-Sep	79.13	80.85	82.58	92.62	-10.04	13
16-Sep	78.42	80.19	82.06	91.5	-9.45	13
17-Sep	78.24	80.08	81.85	90.37	-8.52	13
18-Sep	77.34	79.28	80.96	89.46	-8.5	13
19-Sep	75.94	78.4	80.64	89.12	-8.48	13
20-Sep	75.67	77.48	79.51	90.59	-11.07	13
21-Sep	73.48	76.84	79.5	90.98	-11.49	13
22-Sep	73.87	75.75	77.54	91.3	-13.76	13
23-Sep	73.93	75.75	77.32	90.76	-13.44	13
24-Sep	73.07	75.46	77.67	88.25	-10.58	13
25-Sep	72.39	75.32	78.05	88.3	-10.25	13
26-Sep	73.53	76.07	78.58	87.63	-9.05	13
27-Sep	74.35	77.43	79.9	86.83	-6.93	13
28-Sep	73.7	77.02	79.81	84.61	-4.8	13
29-Sep	74.28	75.99	77.51	85.01	-7.5	13
30-Sep	73.5	75.47	76.97	85.99	-9.02	13

Table A.14: Monthly Summary Report for October 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR October 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)		
1-Oct	72.95	75.03	77.02	84.85	-7.83	13
2-Oct	72.75	74.03	75.61	85.79	-10.19	13
3-Oct	70.09	72.24	75.04	82.1	-7.06	13
4-Oct	69.8	70.88	72.09	81.19	-9.1	13
5-Oct	69.44	71.6	73.42	84.36	-10.93	13
6-Oct	70.27	72.54	74.41	88.68	-14.28	13
7-Oct	69.96	71.66	73.81	87.04	-13.23	13
8-Oct	68.65	70.39	72.35	84.33	-11.97	13
9-Oct	66.89	69.92	72.76	82.51	-9.75	13
10-Oct	67.66	69.44	71.14	81.39	-10.25	13
11-Oct	67.33	68.87	70.3	81.82	-11.52	13
12-Oct	67.48	69.34	70.84	81.93	-11.09	13
13-Oct	66.97	68.23	69.79	81.31	-11.53	12
14-Oct	67.01	68.46	69.77	80.89	-11.12	12
15-Oct	68.08	69.68	71.51	80.87	-9.36	13
16-Oct	67.98	69.29	70.58	79.15	-8.57	13
17-Oct	67.29	68.5	69.82	78.12	-8.31	13
18-Oct	66.71	68.05	69.24	76.73	-7.49	13
19-Oct	66.2	67.54	68.88	76.46	-7.58	13
20-Oct	65.53	66.73	68.14	76.69	-8.56	13
21-Oct	64.93	66.19	67.47	77.98	-10.51	13
22-Oct	64.91	66.23	67.27	78.84	-11.57	13
23-Oct	64.61	65.91	67.19	79.72	-12.53	13
24-Oct	64.21	65.36	66.34	80.73	-14.39	13
25-Oct	63.54	64.61	65.66	80.08	-14.43	13
26-Oct	60.73	64.01	66.47	78.73	-12.26	13
27-Oct	62.53	64.46	66.16	76.74	-10.58	13
28-Oct	62.91	64.32	65.61	75.75	-10.14	13
29-Oct	60.84	63.17	65.13	74.6	-9.47	13
30-Oct	59.86	61.1	62.75	73.92	-11.17	13
31-Oct	58.85	60.43	61.79	72.44	-10.65	13

Table A.15: Monthly Summary Report for April 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR April 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Apr	43.4	46.08	50.49	50.99	-0.49	6
2-Apr	44.15	46.57	50.99	51.2	-0.21	6
3-Apr	44.67	47.04	51.34	52.03	-0.69	6
4-Apr	45	47.08	50.45	52.77	-2.32	6
5-Apr	43.45	45.23	48.14	53.79	-5.66	8
6-Apr	43.46	46.61	50.34	55	-4.66	9
7-Apr	44.64	47.65	50.59	56.02	-5.43	9
8-Apr	46.21	48.76	51.08	58.83	-7.75	10
9-Apr	45.46	47.51	49.87	59.48	-9.61	11
10-Apr	46.99	48.2	49.28	60.85	-11.58	11
11-Apr	47.28	48.66	50.28	58.93	-8.65	11
12-Apr	48.04	49.04	50.13	62.69	-12.56	12
13-Apr	47.57	48.78	49.85	60.37	-10.52	12
14-Apr	47.29	48.9	50.24	59.38	-9.14	12
15-Apr	48.37	49.7	50.85	61.28	-10.43	12
16-Apr	47.74	49.06	50.42	59.36	-8.93	12
17-Apr	48.73	49.85	51.06	62.67	-11.61	13
18-Apr	49.23	50.44	51.58	61.74	-10.17	13
19-Apr	49.49	50.95	52.44	61.08	-8.64	13
20-Apr	50.43	51.62	52.9	60.53	-7.64	13
21-Apr	50.66	51.75	52.84	60.49	-7.65	13
22-Apr	50.68	51.75	52.89	59.6	-6.71	13
23-Apr	50.15	51.11	52.17	55.63	-3.46	13
24-Apr	50.19	51.32	53.54	56.13	-2.6	13
25-Apr	50.69	51.71	52.94	57.79	-4.85	13
26-Apr	50.53	51.45	52.26	58.85	-6.58	13
27-Apr	50.74	51.61	52.57	58.99	-6.42	13
28-Apr	50.8	51.86	52.81	61.57	-8.76	13
29-Apr	51.19	52.14	53.21	59.81	-6.6	13
30-Apr	51.46	52.51	53.41	58.46	-5.05	12

Table A.16: Monthly Summary Report for May 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR May 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)		
1-May	51.8	52.73	54.1	58.81	-4.71	13
2-May	52.23	53.22	54.25	59.66	-5.41	12
3-May	52.68	53.62	54.56	59.71	-5.15	12
4-May	52.82	53.84	54.82	61.06	-6.23	12
5-May	53.47	54.52	55.69	62.01	-6.33	12
6-May	53.98	55.17	56.37	63.47	-7.09	12
7-May	54.77	55.97	57.06	62.86	-5.8	12
8-May	55.56	56.76	58.3	62.17	-3.88	12
9-May	56.09	57.06	58.01	61.11	-3.09	12
10-May	56.72	57.93	59.09	62.29	-3.2	12
11-May	57.37	58.53	59.68	63.51	-3.82	12
12-May	57.77	58.82	60.14	64.34	-4.21	12
13-May	56.81	58.11	59.6	63.44	-3.84	13
14-May	57.04	57.98	59.43	64.28	-4.85	13
15-May	57.28	58.53	61.31	63.66	-2.35	12
16-May	57.72	58.81	60.67	66.82	-6.15	13
17-May	58.02	59.3	60.63	66.22	-5.6	13
18-May	58.03	59.08	60.23	66.47	-6.25	14
19-May	57.1	58.22	59.52	62.68	-3.15	13
20-May	57.53	58.87	60.23	63.11	-2.88	13
21-May	58.39	59.76	61.25	64.07	-2.83	13
22-May	59.14	60.16	61.41	66.98	-5.57	13
23-May	59.28	60.42	61.55	67.43	-5.88	13
24-May	59.69	61.09	62.65	70.35	-7.7	13
25-May	60.28	62.15	64.19	76.54	-12.35	13
26-May	61.71	63.46	65.23	80.64	-15.42	13
27-May	62.94	64.42	65.84	81.84	-16.01	13
28-May	63.29	64.6	65.89	80.69	-14.8	13
29-May	63.71	64.87	65.99	79.04	-13.04	13
30-May	64.56	65.88	68.15	79.54	-11.38	13
31-May	65.41	66.72	67.95	79.81	-11.87	13

Table A.17: Monthly Summary Report for June 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR June 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested Average of the Daily					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum"	EPA Requested Average of the Daily "Mean"	EPA Requested Average of the Daily "Instantaneous Maximum"	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	"Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	
	Temperatures (° F)	Temperatures (° F)	Temperatures (° F)			
1-Jun	65.62	66.79	68.28	80.89	-12.62	12
2-Jun	65.86	67.52	69.46	82.3	-12.84	12
3-Jun	66.39	67.76	69.52	82.82	-13.3	12
4-Jun	66.16	67.59	69.36	82.37	-13.01	12
5-Jun	66.38	67.73	70.09	84.61	-14.52	12
6-Jun	65.57	67.33	69.62	80.7	-11.08	12
7-Jun	65.64	67.22	69.14	75.04	-5.9	11
8-Jun	66.15	67.96	70.25	74.99	-4.73	12
9-Jun	67.39	69.15	70.87	77.7	-6.83	12
10-Jun	67.72	69.22	71.58	76.57	-4.99	12
11-Jun	68.38	70.01	72.23	78.5	-6.27	12
12-Jun	67.93	69.41	71.55	79.23	-7.68	12
13-Jun	67.68	68.83	70.67	76.57	-5.9	12
14-Jun	67.53	68.65	70.11	76.78	-6.67	12
15-Jun	66.76	68.47	70.18	75.57	-5.39	12
16-Jun	67.25	68.81	70.86	75.38	-4.52	12
17-Jun	67.67	69.32	71.44	76.07	-4.63	12
18-Jun	68.28	70.03	72.05	76.75	-4.71	12
19-Jun	68.97	71.11	73.62	79.53	-5.9	12
20-Jun	70.22	72.13	74.49	82.14	-7.65	12
21-Jun	71.84	74.19	76.17	83.7	-7.53	13
22-Jun	72.26	74.27	76.4	84.83	-8.43	13
23-Jun	72.04	74.21	76.38	85.4	-9.02	13
24-Jun	72.37	74.57	76.59	85.95	-9.36	13
25-Jun	73.38	75.49	77.72	85.87	-8.15	13
26-Jun	74.35	76.2	78.34	89.32	-10.97	13
27-Jun	74.73	76.77	78.98	91.1	-12.12	13
28-Jun	74.39	76.36	78.41	89.37	-10.96	13
29-Jun	73.77	75.32	77.65	85.58	-7.93	13
30-Jun	74.25	75.67	77.07	85.25	-8.18	13

Table A.17: Monthly Summary Report for June 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR June 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested Average of the Daily					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum"	EPA Requested Average of the Daily "Mean"	EPA Requested Average of the Daily "Instantaneous Maximum"	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	"Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	
	Temperatures (° F)	Temperatures (° F)	Temperatures (° F)			
1-Jun	65.62	66.79	68.28	80.89	-12.62	12
2-Jun	65.86	67.52	69.46	82.3	-12.84	12
3-Jun	66.39	67.76	69.52	82.82	-13.3	12
4-Jun	66.16	67.59	69.36	82.37	-13.01	12
5-Jun	66.38	67.73	70.09	84.61	-14.52	12
6-Jun	65.57	67.33	69.62	80.7	-11.08	12
7-Jun	65.64	67.22	69.14	75.04	-5.9	11
8-Jun	66.15	67.96	70.25	74.99	-4.73	12
9-Jun	67.39	69.15	70.87	77.7	-6.83	12
10-Jun	67.72	69.22	71.58	76.57	-4.99	12
11-Jun	68.38	70.01	72.23	78.5	-6.27	12
12-Jun	67.93	69.41	71.55	79.23	-7.68	12
13-Jun	67.68	68.83	70.67	76.57	-5.9	12
14-Jun	67.53	68.65	70.11	76.78	-6.67	12
15-Jun	66.76	68.47	70.18	75.57	-5.39	12
16-Jun	67.25	68.81	70.86	75.38	-4.52	12
17-Jun	67.67	69.32	71.44	76.07	-4.63	12
18-Jun	68.28	70.03	72.05	76.75	-4.71	12
19-Jun	68.97	71.11	73.62	79.53	-5.9	12
20-Jun	70.22	72.13	74.49	82.14	-7.65	12
21-Jun	71.84	74.19	76.17	83.7	-7.53	13
22-Jun	72.26	74.27	76.4	84.83	-8.43	13
23-Jun	72.04	74.21	76.38	85.4	-9.02	13
24-Jun	72.37	74.57	76.59	85.95	-9.36	13
25-Jun	73.38	75.49	77.72	85.87	-8.15	13
26-Jun	74.35	76.2	78.34	89.32	-10.97	13
27-Jun	74.73	76.77	78.98	91.1	-12.12	13
28-Jun	74.39	76.36	78.41	89.37	-10.96	13
29-Jun	73.77	75.32	77.65	85.58	-7.93	13
30-Jun	74.25	75.67	77.07	85.25	-8.18	13

Table A.10: Monthly Summary Report for June 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR June 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Jun	77.07	79.33	81.72	88.13	-6.41	12
2-Jun	76.83	79.03	81.17	88.55	-7.38	12
3-Jun	76.39	78.72	80.8	89.27	-8.47	12
4-Jun	77.89	79.42	81.47	90.06	-8.59	12
5-Jun	77.78	80.29	82.13	91.78	-9.65	12
6-Jun	76.97	79.58	82.63	89.81	-7.18	12
7-Jun	77.91	80.05	82.07	88.38	-6.31	12
8-Jun	76.75	79.72	82.95	90.08	-7.13	12
9-Jun	78.44	80.89	83.42	90.76	-7.34	12
10-Jun	78.43	80.69	83.29	93.69	-10.4	12
11-Jun	79.11	80.55	82.07	94.02	-11.95	12
12-Jun	78.47	79.96	81.63	92.73	-11.11	12
13-Jun	78.61	79.97	81.27	91.62	-10.35	12
14-Jun	78.45	80.22	82.17	91.99	-9.83	12
15-Jun	78.29	79.97	82.04	90	-7.96	12
16-Jun	77.85	79.87	81.87	88.73	-6.86	12
17-Jun	78.84	80.82	82.79	89.01	-6.22	12
18-Jun	79.39	81.33	83.05	89.24	-6.19	12
19-Jun	79.72	81.68	83.94	89.79	-5.85	12
20-Jun	77.14	82.55	85.23	90.45	-5.22	12
21-Jun	81.85	84.36	86.6	91.89	-5.29	13
22-Jun	82.39	84.59	86.61	91.1	-4.5	13
23-Jun	79.84	83.47	86.23	93.54	-7.31	13
24-Jun	81.45	83.64	86.41	93.88	-7.47	13
25-Jun	83.21	85.28	87.15	95	-7.85	13
26-Jun	83.66	86.18	88.21	97.28	-9.07	13
27-Jun	83.31	85.55	88.43	98.74	-10.32	13
28-Jun	82.28	84.19	86.88	95.45	-8.57	13
29-Jun	81.78	83.67	86.01	92.73	-6.73	13
30-Jun	82.36	84.8	87.13	93.75	-6.61	13

Table A.11: Monthly Summary Report for July 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR July 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Jul	81.95	84.72	88.02	92.04	-4.02	13
2-Jul	82.89	85.89	88.29	93.5	-5.21	13
3-Jul	83.19	85.64	88.23	92.54	-4.31	13
4-Jul	84.74	86.82	88.96	100.67	-11.71	13
5-Jul	84.96	87.71	90.86	98.55	-7.68	13
6-Jul	87.15	90.5	92.74	99.05	-6.31	13
7-Jul	88.73	90.62	92.3	101.46	-9.16	13
8-Jul	88.11	90.33	92.82	101.88	-9.06	13
9-Jul	88.26	90.41	92.23	99.89	-7.66	13
10-Jul	86.52	89.62	91.91	98.07	-6.16	13
11-Jul	84.84	88.01	91.34	94.2	-2.86	13
12-Jul	86.02	88.68	91.55	99.5	-7.95	13
13-Jul	86.74	88.73	91.06	100.02	-8.96	13
14-Jul	86.62	89.39	92.59	100.56	-7.97	13
15-Jul	89.36	91.54	93.66	99.18	-5.52	13
16-Jul	89.38	91.95	94.21	99.62	-5.41	13
17-Jul	89.93	92.57	95.36	100.39	-5.03	13
18-Jul	92.17	94.27	96.21	99.75	-3.55	13
19-Jul	90.35	93.56	95.86	99.38	-3.52	13
20-Jul	89.97	92.54	94.42	99.54	-5.13	13
21-Jul	89.15	91.73	93.74	99.58	-5.84	13
22-Jul	89.49	91.77	94.13	102.09	-7.96	13
23-Jul	90.22	92.35	94.43	98.91	-4.47	13
24-Jul	87.37	89.96	93.75	99.89	-6.14	13
25-Jul	86.42	89.79	91.73	97.09	-5.36	13
26-Jul	88.23	89.91	91.65	96.2	-4.56	13
27-Jul	88.35	90.06	91.72	97.86	-6.13	13
28-Jul	88.3	89.93	91.75	98.63	-6.88	13
29-Jul	87.82	90.08	91.92	98.33	-6.4	13
30-Jul	87.68	89.55	91.76	98.11	-6.35	13
31-Jul	87.39	89.34	91.37	98.44	-7.07	13

Table A.12: Monthly Summary Report for August 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR August 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum"	EPA Requested Average of the Daily "Mean"	EPA Requested Average of the Daily "Instantaneous Maximum"	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	
	Temperatures (° F)	Temperatures (° F)	Temperatures (° F)			
1-Aug	87.08	89.43	92.14	99.79	-7.65	13
2-Aug	87.78	90.76	93.23	100.24	-7.01	13
3-Aug	88.56	91.22	93.52	102.1	-8.58	13
4-Aug	89.37	91.47	93.88	101	-7.12	13
5-Aug	89.71	91.63	93.69	103.8	-10.11	13
6-Aug	87.14	90.66	93.21	97.96	-4.74	13
7-Aug	87.82	89.77	91.79	98.64	-6.85	13
8-Aug	87.86	89.99	92.25	97.63	-5.38	13
9-Aug	87.05	89.6	92.51	98.55	-6.03	13
10-Aug	86.05	88.76	92.29	96.96	-4.67	13
11-Aug	86.59	88.25	90.12	97.08	-6.95	13
12-Aug	86.21	87.69	89.68	98.57	-8.89	13
13-Aug	86.23	88.07	90.02	100.74	-10.72	13
14-Aug	86.45	88.24	89.93	102.52	-12.59	13
15-Aug	85.97	87.65	89.76	103.31	-13.55	13
16-Aug	85.46	87.41	89.52	104.23	-14.7	13
17-Aug	85.54	87.81	89.89	103.02	-13.13	13
18-Aug	85.61	87.47	89.4	103.31	-13.91	13
19-Aug	85.96	87.67	89.53	103.05	-13.51	13
20-Aug	84.86	87.55	90.06	101	-10.94	13
21-Aug	84.67	87.03	89.8	99.77	-9.96	13
22-Aug	86.29	88.25	90	100.06	-10.06	13
23-Aug	85.25	87.5	89.41	99.54	-10.13	13
24-Aug	83.67	85.37	87.73	96.66	-8.94	13
25-Aug	83.66	85.34	87.16	95.38	-8.22	13
26-Aug	83.19	85.44	87.55	96.93	-9.38	13
27-Aug	82.43	84.61	86.79	96.82	-10.02	13
28-Aug	82.81	85.26	87.41	97.3	-9.89	13
29-Aug	80.06	84.75	87.94	97.95	-10.01	13
30-Aug	83.32	85.66	88.65	99.53	-10.88	13
31-Aug	84.47	86.3	88.17	97.54	-9.37	13

Attachment C

Table A.15: Monthly Summary Report for April 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR April 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Apr	43.4	46.08	50.49	50.99	-0.49	6
2-Apr	44.15	46.57	50.99	51.2	-0.21	6
3-Apr	44.67	47.04	51.34	52.03	-0.69	6
4-Apr	45	47.08	50.45	52.77	-2.32	6
5-Apr	43.45	45.23	48.14	53.79	-5.66	8
6-Apr	43.46	46.61	50.34	55	-4.66	9
7-Apr	44.64	47.65	50.59	56.02	-5.43	9
8-Apr	46.21	48.76	51.08	58.83	-7.75	10
9-Apr	45.46	47.51	49.87	59.48	-9.61	11
10-Apr	46.99	48.2	49.28	60.85	-11.58	11
11-Apr	47.28	48.66	50.28	58.93	-8.65	11
12-Apr	48.04	49.04	50.13	62.69	-12.56	12
13-Apr	47.57	48.78	49.85	60.37	-10.52	12
14-Apr	47.29	48.9	50.24	59.38	-9.14	12
15-Apr	48.37	49.7	50.85	61.28	-10.43	12
16-Apr	47.74	49.06	50.42	59.36	-8.93	12
17-Apr	48.73	49.85	51.06	62.67	-11.61	13
18-Apr	49.23	50.44	51.58	61.74	-10.17	13
19-Apr	49.49	50.95	52.44	61.08	-8.64	13
20-Apr	50.43	51.62	52.9	60.53	-7.64	13
21-Apr	50.66	51.75	52.84	60.49	-7.65	13
22-Apr	50.68	51.75	52.89	59.6	-6.71	13
23-Apr	50.15	51.11	52.17	55.63	-3.46	13
24-Apr	50.19	51.32	53.54	56.13	-2.6	13
25-Apr	50.69	51.71	52.94	57.79	-4.85	13
26-Apr	50.53	51.45	52.26	58.85	-6.58	13
27-Apr	50.74	51.61	52.57	58.99	-6.42	13
28-Apr	50.8	51.86	52.81	61.57	-8.76	13
29-Apr	51.19	52.14	53.21	59.81	-6.6	13
30-Apr	51.46	52.51	53.41	58.46	-5.05	12

Table A.13: Monthly Summary Report for September 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR September 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Sep	84	86.07	88.2	98.23	-10.03	13
2-Sep	83.28	85.87	88.42	99.85	-11.43	13
3-Sep	83.73	85.75	87.89	101.08	-13.19	13
4-Sep	82.1	85.13	87.35	97.25	-9.9	13
5-Sep	81.5	83.58	85.64	93.69	-8.05	13
6-Sep	80.4	83.05	85.42	93.93	-8.51	13
7-Sep	80.31	83.31	86.2	94.99	-8.79	13
8-Sep	81.21	83.53	85.35	96.34	-10.99	13
9-Sep	80.76	82.72	84.71	94.87	-10.16	13
10-Sep	79.67	81.9	84.1	92.96	-8.86	13
11-Sep	78.78	81.81	84.69	90.93	-6.24	13
12-Sep	80.14	81.72	84.73	89.68	-4.94	13
13-Sep	76.21	80.88	83.54	89.74	-6.21	13
14-Sep	79.08	81.02	82.71	90.67	-7.96	13
15-Sep	79.13	80.85	82.58	92.62	-10.04	13
16-Sep	78.42	80.19	82.06	91.5	-9.45	13
17-Sep	78.24	80.08	81.85	90.37	-8.52	13
18-Sep	77.34	79.28	80.96	89.46	-8.5	13
19-Sep	75.94	78.4	80.64	89.12	-8.48	13
20-Sep	75.67	77.48	79.51	90.59	-11.07	13
21-Sep	73.48	76.84	79.5	90.98	-11.49	13
22-Sep	73.87	75.75	77.54	91.3	-13.76	13
23-Sep	73.93	75.75	77.32	90.76	-13.44	13
24-Sep	73.07	75.46	77.67	88.25	-10.58	13
25-Sep	72.39	75.32	78.05	88.3	-10.25	13
26-Sep	73.53	76.07	78.58	87.63	-9.05	13
27-Sep	74.35	77.43	79.9	86.83	-6.93	13
28-Sep	73.7	77.02	79.81	84.61	-4.8	13
29-Sep	74.28	75.99	77.51	85.01	-7.5	13
30-Sep	73.5	75.47	76.97	85.99	-9.02	13

Table A.14: Monthly Summary Report for October 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR October 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum"	EPA Requested Average of the Daily "Mean"	EPA Requested Average of the Daily "Instantaneous Maximum"	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	
	Temperatures (° F)	Temperatures (° F)	Temperatures (° F)			
1-Oct	72.95	75.03	77.02	84.85	-7.83	13
2-Oct	72.75	74.03	75.61	85.79	-10.19	13
3-Oct	70.09	72.24	75.04	82.1	-7.06	13
4-Oct	69.8	70.88	72.09	81.19	-9.1	13
5-Oct	69.44	71.6	73.42	84.36	-10.93	13
6-Oct	70.27	72.54	74.41	88.68	-14.28	13
7-Oct	69.96	71.66	73.81	87.04	-13.23	13
8-Oct	68.65	70.39	72.35	84.33	-11.97	13
9-Oct	66.89	69.92	72.76	82.51	-9.75	13
10-Oct	67.66	69.44	71.14	81.39	-10.25	13
11-Oct	67.33	68.87	70.3	81.82	-11.52	13
12-Oct	67.48	69.34	70.84	81.93	-11.09	13
13-Oct	66.97	68.23	69.79	81.31	-11.53	12
14-Oct	67.01	68.46	69.77	80.89	-11.12	12
15-Oct	68.08	69.68	71.51	80.87	-9.36	13
16-Oct	67.98	69.29	70.58	79.15	-8.57	13
17-Oct	67.29	68.5	69.82	78.12	-8.31	13
18-Oct	66.71	68.05	69.24	76.73	-7.49	13
19-Oct	66.2	67.54	68.88	76.46	-7.58	13
20-Oct	65.53	66.73	68.14	76.69	-8.56	13
21-Oct	64.93	66.19	67.47	77.98	-10.51	13
22-Oct	64.91	66.23	67.27	78.84	-11.57	13
23-Oct	64.61	65.91	67.19	79.72	-12.53	13
24-Oct	64.21	65.36	66.34	80.73	-14.39	13
25-Oct	63.54	64.61	65.66	80.08	-14.43	13
26-Oct	60.73	64.01	66.47	78.73	-12.26	13
27-Oct	62.53	64.46	66.16	76.74	-10.58	13
28-Oct	62.91	64.32	65.61	75.75	-10.14	13
29-Oct	60.84	63.17	65.13	74.6	-9.47	13
30-Oct	59.86	61.1	62.75	73.92	-11.17	13
31-Oct	58.85	60.43	61.79	72.44	-10.65	13

Table A.15: Monthly Summary Report for April 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR April 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum"	EPA Requested Average of the Daily "Mean"	EPA Requested Average of the Daily "Instantaneous Maximum"	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	
	Temperatures (° F)	Temperatures (° F)	Temperatures (° F)			
1-Apr	43.4	46.08	50.49	50.99	-0.49	6
2-Apr	44.15	46.57	50.99	51.2	-0.21	6
3-Apr	44.67	47.04	51.34	52.03	-0.69	6
4-Apr	45	47.08	50.45	52.77	-2.32	6
5-Apr	43.45	45.23	48.14	53.79	-5.66	8
6-Apr	43.46	46.61	50.34	55	-4.66	9
7-Apr	44.64	47.65	50.59	56.02	-5.43	9
8-Apr	46.21	48.76	51.08	58.83	-7.75	10
9-Apr	45.46	47.51	49.87	59.48	-9.61	11
10-Apr	46.99	48.2	49.28	60.85	-11.58	11
11-Apr	47.28	48.66	50.28	58.93	-8.65	11
12-Apr	48.04	49.04	50.13	62.69	-12.56	12
13-Apr	47.57	48.78	49.85	60.37	-10.52	12
14-Apr	47.29	48.9	50.24	59.38	-9.14	12
15-Apr	48.37	49.7	50.85	61.28	-10.43	12
16-Apr	47.74	49.06	50.42	59.36	-8.93	12
17-Apr	48.73	49.85	51.06	62.67	-11.61	13
18-Apr	49.23	50.44	51.58	61.74	-10.17	13
19-Apr	49.49	50.95	52.44	61.08	-8.64	13
20-Apr	50.43	51.62	52.9	60.53	-7.64	13
21-Apr	50.66	51.75	52.84	60.49	-7.65	13
22-Apr	50.68	51.75	52.89	59.6	-6.71	13
23-Apr	50.15	51.11	52.17	55.63	-3.46	13
24-Apr	50.19	51.32	53.54	56.13	-2.6	13
25-Apr	50.69	51.71	52.94	57.79	-4.85	13
26-Apr	50.53	51.45	52.26	58.85	-6.58	13
27-Apr	50.74	51.61	52.57	58.99	-6.42	13
28-Apr	50.8	51.86	52.81	61.57	-8.76	13
29-Apr	51.19	52.14	53.21	59.81	-6.6	13
30-Apr	51.46	52.51	53.41	58.46	-5.05	12

Table A.16: Monthly Summary Report for May 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR May 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)		
1-May	51.8	52.73	54.1	58.81	-4.71	13
2-May	52.23	53.22	54.25	59.66	-5.41	12
3-May	52.68	53.62	54.56	59.71	-5.15	12
4-May	52.82	53.84	54.82	61.06	-6.23	12
5-May	53.47	54.52	55.69	62.01	-6.33	12
6-May	53.98	55.17	56.37	63.47	-7.09	12
7-May	54.77	55.97	57.06	62.86	-5.8	12
8-May	55.56	56.76	58.3	62.17	-3.88	12
9-May	56.09	57.06	58.01	61.11	-3.09	12
10-May	56.72	57.93	59.09	62.29	-3.2	12
11-May	57.37	58.53	59.68	63.51	-3.82	12
12-May	57.77	58.82	60.14	64.34	-4.21	12
13-May	56.81	58.11	59.6	63.44	-3.84	13
14-May	57.04	57.98	59.43	64.28	-4.85	13
15-May	57.28	58.53	61.31	63.66	-2.35	12
16-May	57.72	58.81	60.67	66.82	-6.15	13
17-May	58.02	59.3	60.63	66.22	-5.6	13
18-May	58.03	59.08	60.23	66.47	-6.25	14
19-May	57.1	58.22	59.52	62.68	-3.15	13
20-May	57.53	58.87	60.23	63.11	-2.88	13
21-May	58.39	59.76	61.25	64.07	-2.83	13
22-May	59.14	60.16	61.41	66.98	-5.57	13
23-May	59.28	60.42	61.55	67.43	-5.88	13
24-May	59.69	61.09	62.65	70.35	-7.7	13
25-May	60.28	62.15	64.19	76.54	-12.35	13
26-May	61.71	63.46	65.23	80.64	-15.42	13
27-May	62.94	64.42	65.84	81.84	-16.01	13
28-May	63.29	64.6	65.89	80.69	-14.8	13
29-May	63.71	64.87	65.99	79.04	-13.04	13
30-May	64.56	65.88	68.15	79.54	-11.38	13
31-May	65.41	66.72	67.95	79.81	-11.87	13

Table A.17: Monthly Summary Report for June 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR June 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested Average of the Daily					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum"	EPA Requested Average of the Daily "Mean"	EPA Requested Average of the Daily "Instantaneous Maximum"	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	"Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	
	Temperatures (° F)	Temperatures (° F)	Temperatures (° F)			
1-Jun	65.62	66.79	68.28	80.89	-12.62	12
2-Jun	65.86	67.52	69.46	82.3	-12.84	12
3-Jun	66.39	67.76	69.52	82.82	-13.3	12
4-Jun	66.16	67.59	69.36	82.37	-13.01	12
5-Jun	66.38	67.73	70.09	84.61	-14.52	12
6-Jun	65.57	67.33	69.62	80.7	-11.08	12
7-Jun	65.64	67.22	69.14	75.04	-5.9	11
8-Jun	66.15	67.96	70.25	74.99	-4.73	12
9-Jun	67.39	69.15	70.87	77.7	-6.83	12
10-Jun	67.72	69.22	71.58	76.57	-4.99	12
11-Jun	68.38	70.01	72.23	78.5	-6.27	12
12-Jun	67.93	69.41	71.55	79.23	-7.68	12
13-Jun	67.68	68.83	70.67	76.57	-5.9	12
14-Jun	67.53	68.65	70.11	76.78	-6.67	12
15-Jun	66.76	68.47	70.18	75.57	-5.39	12
16-Jun	67.25	68.81	70.86	75.38	-4.52	12
17-Jun	67.67	69.32	71.44	76.07	-4.63	12
18-Jun	68.28	70.03	72.05	76.75	-4.71	12
19-Jun	68.97	71.11	73.62	79.53	-5.9	12
20-Jun	70.22	72.13	74.49	82.14	-7.65	12
21-Jun	71.84	74.19	76.17	83.7	-7.53	13
22-Jun	72.26	74.27	76.4	84.83	-8.43	13
23-Jun	72.04	74.21	76.38	85.4	-9.02	13
24-Jun	72.37	74.57	76.59	85.95	-9.36	13
25-Jun	73.38	75.49	77.72	85.87	-8.15	13
26-Jun	74.35	76.2	78.34	89.32	-10.97	13
27-Jun	74.73	76.77	78.98	91.1	-12.12	13
28-Jun	74.39	76.36	78.41	89.37	-10.96	13
29-Jun	73.77	75.32	77.65	85.58	-7.93	13
30-Jun	74.25	75.67	77.07	85.25	-8.18	13

Table A.17: Monthly Summary Report for June 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR June 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested Average of the Daily					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum"	EPA Requested Average of the Daily "Mean"	EPA Requested Average of the Daily "Instantaneous Maximum"	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	"Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	
	Temperatures (° F)	Temperatures (° F)	Temperatures (° F)			
1-Jun	65.62	66.79	68.28	80.89	-12.62	12
2-Jun	65.86	67.52	69.46	82.3	-12.84	12
3-Jun	66.39	67.76	69.52	82.82	-13.3	12
4-Jun	66.16	67.59	69.36	82.37	-13.01	12
5-Jun	66.38	67.73	70.09	84.61	-14.52	12
6-Jun	65.57	67.33	69.62	80.7	-11.08	12
7-Jun	65.64	67.22	69.14	75.04	-5.9	11
8-Jun	66.15	67.96	70.25	74.99	-4.73	12
9-Jun	67.39	69.15	70.87	77.7	-6.83	12
10-Jun	67.72	69.22	71.58	76.57	-4.99	12
11-Jun	68.38	70.01	72.23	78.5	-6.27	12
12-Jun	67.93	69.41	71.55	79.23	-7.68	12
13-Jun	67.68	68.83	70.67	76.57	-5.9	12
14-Jun	67.53	68.65	70.11	76.78	-6.67	12
15-Jun	66.76	68.47	70.18	75.57	-5.39	12
16-Jun	67.25	68.81	70.86	75.38	-4.52	12
17-Jun	67.67	69.32	71.44	76.07	-4.63	12
18-Jun	68.28	70.03	72.05	76.75	-4.71	12
19-Jun	68.97	71.11	73.62	79.53	-5.9	12
20-Jun	70.22	72.13	74.49	82.14	-7.65	12
21-Jun	71.84	74.19	76.17	83.7	-7.53	13
22-Jun	72.26	74.27	76.4	84.83	-8.43	13
23-Jun	72.04	74.21	76.38	85.4	-9.02	13
24-Jun	72.37	74.57	76.59	85.95	-9.36	13
25-Jun	73.38	75.49	77.72	85.87	-8.15	13
26-Jun	74.35	76.2	78.34	89.32	-10.97	13
27-Jun	74.73	76.77	78.98	91.1	-12.12	13
28-Jun	74.39	76.36	78.41	89.37	-10.96	13
29-Jun	73.77	75.32	77.65	85.58	-7.93	13
30-Jun	74.25	75.67	77.07	85.25	-8.18	13

Table A.10: Monthly Summary Report for June 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR June 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Jun	77.07	79.33	81.72	88.13	-6.41	12
2-Jun	76.83	79.03	81.17	88.55	-7.38	12
3-Jun	76.39	78.72	80.8	89.27	-8.47	12
4-Jun	77.89	79.42	81.47	90.06	-8.59	12
5-Jun	77.78	80.29	82.13	91.78	-9.65	12
6-Jun	76.97	79.58	82.63	89.81	-7.18	12
7-Jun	77.91	80.05	82.07	88.38	-6.31	12
8-Jun	76.75	79.72	82.95	90.08	-7.13	12
9-Jun	78.44	80.89	83.42	90.76	-7.34	12
10-Jun	78.43	80.69	83.29	93.69	-10.4	12
11-Jun	79.11	80.55	82.07	94.02	-11.95	12
12-Jun	78.47	79.96	81.63	92.73	-11.11	12
13-Jun	78.61	79.97	81.27	91.62	-10.35	12
14-Jun	78.45	80.22	82.17	91.99	-9.83	12
15-Jun	78.29	79.97	82.04	90	-7.96	12
16-Jun	77.85	79.87	81.87	88.73	-6.86	12
17-Jun	78.84	80.82	82.79	89.01	-6.22	12
18-Jun	79.39	81.33	83.05	89.24	-6.19	12
19-Jun	79.72	81.68	83.94	89.79	-5.85	12
20-Jun	77.14	82.55	85.23	90.45	-5.22	12
21-Jun	81.85	84.36	86.6	91.89	-5.29	13
22-Jun	82.39	84.59	86.61	91.1	-4.5	13
23-Jun	79.84	83.47	86.23	93.54	-7.31	13
24-Jun	81.45	83.64	86.41	93.88	-7.47	13
25-Jun	83.21	85.28	87.15	95	-7.85	13
26-Jun	83.66	86.18	88.21	97.28	-9.07	13
27-Jun	83.31	85.55	88.43	98.74	-10.32	13
28-Jun	82.28	84.19	86.88	95.45	-8.57	13
29-Jun	81.78	83.67	86.01	92.73	-6.73	13
30-Jun	82.36	84.8	87.13	93.75	-6.61	13

Table A.11: Monthly Summary Report for July 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR July 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Jul	81.95	84.72	88.02	92.04	-4.02	13
2-Jul	82.89	85.89	88.29	93.5	-5.21	13
3-Jul	83.19	85.64	88.23	92.54	-4.31	13
4-Jul	84.74	86.82	88.96	100.67	-11.71	13
5-Jul	84.96	87.71	90.86	98.55	-7.68	13
6-Jul	87.15	90.5	92.74	99.05	-6.31	13
7-Jul	88.73	90.62	92.3	101.46	-9.16	13
8-Jul	88.11	90.33	92.82	101.88	-9.06	13
9-Jul	88.26	90.41	92.23	99.89	-7.66	13
10-Jul	86.52	89.62	91.91	98.07	-6.16	13
11-Jul	84.84	88.01	91.34	94.2	-2.86	13
12-Jul	86.02	88.68	91.55	99.5	-7.95	13
13-Jul	86.74	88.73	91.06	100.02	-8.96	13
14-Jul	86.62	89.39	92.59	100.56	-7.97	13
15-Jul	89.36	91.54	93.66	99.18	-5.52	13
16-Jul	89.38	91.95	94.21	99.62	-5.41	13
17-Jul	89.93	92.57	95.36	100.39	-5.03	13
18-Jul	92.17	94.27	96.21	99.75	-3.55	13
19-Jul	90.35	93.56	95.86	99.38	-3.52	13
20-Jul	89.97	92.54	94.42	99.54	-5.13	13
21-Jul	89.15	91.73	93.74	99.58	-5.84	13
22-Jul	89.49	91.77	94.13	102.09	-7.96	13
23-Jul	90.22	92.35	94.43	98.91	-4.47	13
24-Jul	87.37	89.96	93.75	99.89	-6.14	13
25-Jul	86.42	89.79	91.73	97.09	-5.36	13
26-Jul	88.23	89.91	91.65	96.2	-4.56	13
27-Jul	88.35	90.06	91.72	97.86	-6.13	13
28-Jul	88.3	89.93	91.75	98.63	-6.88	13
29-Jul	87.82	90.08	91.92	98.33	-6.4	13
30-Jul	87.68	89.55	91.76	98.11	-6.35	13
31-Jul	87.39	89.34	91.37	98.44	-7.07	13

Table A.12: Monthly Summary Report for August 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR August 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum"	EPA Requested Average of the Daily "Mean"	EPA Requested Average of the Daily "Instantaneous Maximum"	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	
	Temperatures (° F)	Temperatures (° F)	Temperatures (° F)			
1-Aug	87.08	89.43	92.14	99.79	-7.65	13
2-Aug	87.78	90.76	93.23	100.24	-7.01	13
3-Aug	88.56	91.22	93.52	102.1	-8.58	13
4-Aug	89.37	91.47	93.88	101	-7.12	13
5-Aug	89.71	91.63	93.69	103.8	-10.11	13
6-Aug	87.14	90.66	93.21	97.96	-4.74	13
7-Aug	87.82	89.77	91.79	98.64	-6.85	13
8-Aug	87.86	89.99	92.25	97.63	-5.38	13
9-Aug	87.05	89.6	92.51	98.55	-6.03	13
10-Aug	86.05	88.76	92.29	96.96	-4.67	13
11-Aug	86.59	88.25	90.12	97.08	-6.95	13
12-Aug	86.21	87.69	89.68	98.57	-8.89	13
13-Aug	86.23	88.07	90.02	100.74	-10.72	13
14-Aug	86.45	88.24	89.93	102.52	-12.59	13
15-Aug	85.97	87.65	89.76	103.31	-13.55	13
16-Aug	85.46	87.41	89.52	104.23	-14.7	13
17-Aug	85.54	87.81	89.89	103.02	-13.13	13
18-Aug	85.61	87.47	89.4	103.31	-13.91	13
19-Aug	85.96	87.67	89.53	103.05	-13.51	13
20-Aug	84.86	87.55	90.06	101	-10.94	13
21-Aug	84.67	87.03	89.8	99.77	-9.96	13
22-Aug	86.29	88.25	90	100.06	-10.06	13
23-Aug	85.25	87.5	89.41	99.54	-10.13	13
24-Aug	83.67	85.37	87.73	96.66	-8.94	13
25-Aug	83.66	85.34	87.16	95.38	-8.22	13
26-Aug	83.19	85.44	87.55	96.93	-9.38	13
27-Aug	82.43	84.61	86.79	96.82	-10.02	13
28-Aug	82.81	85.26	87.41	97.3	-9.89	13
29-Aug	80.06	84.75	87.94	97.95	-10.01	13
30-Aug	83.32	85.66	88.65	99.53	-10.88	13
31-Aug	84.47	86.3	88.17	97.54	-9.37	13

Attachment C

Table A.17: Monthly Summary Report for June 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR June 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested Average of the Daily					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum"	EPA Requested Average of the Daily "Mean"	EPA Requested Average of the Daily "Instantaneous Maximum"	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	"Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	
	Temperatures (° F)	Temperatures (° F)	Temperatures (° F)			
1-Jun	65.62	66.79	68.28	80.89	-12.62	12
2-Jun	65.86	67.52	69.46	82.3	-12.84	12
3-Jun	66.39	67.76	69.52	82.82	-13.3	12
4-Jun	66.16	67.59	69.36	82.37	-13.01	12
5-Jun	66.38	67.73	70.09	84.61	-14.52	12
6-Jun	65.57	67.33	69.62	80.7	-11.08	12
7-Jun	65.64	67.22	69.14	75.04	-5.9	11
8-Jun	66.15	67.96	70.25	74.99	-4.73	12
9-Jun	67.39	69.15	70.87	77.7	-6.83	12
10-Jun	67.72	69.22	71.58	76.57	-4.99	12
11-Jun	68.38	70.01	72.23	78.5	-6.27	12
12-Jun	67.93	69.41	71.55	79.23	-7.68	12
13-Jun	67.68	68.83	70.67	76.57	-5.9	12
14-Jun	67.53	68.65	70.11	76.78	-6.67	12
15-Jun	66.76	68.47	70.18	75.57	-5.39	12
16-Jun	67.25	68.81	70.86	75.38	-4.52	12
17-Jun	67.67	69.32	71.44	76.07	-4.63	12
18-Jun	68.28	70.03	72.05	76.75	-4.71	12
19-Jun	68.97	71.11	73.62	79.53	-5.9	12
20-Jun	70.22	72.13	74.49	82.14	-7.65	12
21-Jun	71.84	74.19	76.17	83.7	-7.53	13
22-Jun	72.26	74.27	76.4	84.83	-8.43	13
23-Jun	72.04	74.21	76.38	85.4	-9.02	13
24-Jun	72.37	74.57	76.59	85.95	-9.36	13
25-Jun	73.38	75.49	77.72	85.87	-8.15	13
26-Jun	74.35	76.2	78.34	89.32	-10.97	13
27-Jun	74.73	76.77	78.98	91.1	-12.12	13
28-Jun	74.39	76.36	78.41	89.37	-10.96	13
29-Jun	73.77	75.32	77.65	85.58	-7.93	13
30-Jun	74.25	75.67	77.07	85.25	-8.18	13

Table A.17: Monthly Summary Report for June 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR June 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested Average of the Daily					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum"	EPA Requested Average of the Daily "Mean"	EPA Requested Average of the Daily "Instantaneous Maximum"	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	"Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	
	Temperatures (° F)	Temperatures (° F)	Temperatures (° F)			
1-Jun	65.62	66.79	68.28	80.89	-12.62	12
2-Jun	65.86	67.52	69.46	82.3	-12.84	12
3-Jun	66.39	67.76	69.52	82.82	-13.3	12
4-Jun	66.16	67.59	69.36	82.37	-13.01	12
5-Jun	66.38	67.73	70.09	84.61	-14.52	12
6-Jun	65.57	67.33	69.62	80.7	-11.08	12
7-Jun	65.64	67.22	69.14	75.04	-5.9	11
8-Jun	66.15	67.96	70.25	74.99	-4.73	12
9-Jun	67.39	69.15	70.87	77.7	-6.83	12
10-Jun	67.72	69.22	71.58	76.57	-4.99	12
11-Jun	68.38	70.01	72.23	78.5	-6.27	12
12-Jun	67.93	69.41	71.55	79.23	-7.68	12
13-Jun	67.68	68.83	70.67	76.57	-5.9	12
14-Jun	67.53	68.65	70.11	76.78	-6.67	12
15-Jun	66.76	68.47	70.18	75.57	-5.39	12
16-Jun	67.25	68.81	70.86	75.38	-4.52	12
17-Jun	67.67	69.32	71.44	76.07	-4.63	12
18-Jun	68.28	70.03	72.05	76.75	-4.71	12
19-Jun	68.97	71.11	73.62	79.53	-5.9	12
20-Jun	70.22	72.13	74.49	82.14	-7.65	12
21-Jun	71.84	74.19	76.17	83.7	-7.53	13
22-Jun	72.26	74.27	76.4	84.83	-8.43	13
23-Jun	72.04	74.21	76.38	85.4	-9.02	13
24-Jun	72.37	74.57	76.59	85.95	-9.36	13
25-Jun	73.38	75.49	77.72	85.87	-8.15	13
26-Jun	74.35	76.2	78.34	89.32	-10.97	13
27-Jun	74.73	76.77	78.98	91.1	-12.12	13
28-Jun	74.39	76.36	78.41	89.37	-10.96	13
29-Jun	73.77	75.32	77.65	85.58	-7.93	13
30-Jun	74.25	75.67	77.07	85.25	-8.18	13

Table A.10: Monthly Summary Report for June 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR June 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Jun	77.07	79.33	81.72	88.13	-6.41	12
2-Jun	76.83	79.03	81.17	88.55	-7.38	12
3-Jun	76.39	78.72	80.8	89.27	-8.47	12
4-Jun	77.89	79.42	81.47	90.06	-8.59	12
5-Jun	77.78	80.29	82.13	91.78	-9.65	12
6-Jun	76.97	79.58	82.63	89.81	-7.18	12
7-Jun	77.91	80.05	82.07	88.38	-6.31	12
8-Jun	76.75	79.72	82.95	90.08	-7.13	12
9-Jun	78.44	80.89	83.42	90.76	-7.34	12
10-Jun	78.43	80.69	83.29	93.69	-10.4	12
11-Jun	79.11	80.55	82.07	94.02	-11.95	12
12-Jun	78.47	79.96	81.63	92.73	-11.11	12
13-Jun	78.61	79.97	81.27	91.62	-10.35	12
14-Jun	78.45	80.22	82.17	91.99	-9.83	12
15-Jun	78.29	79.97	82.04	90	-7.96	12
16-Jun	77.85	79.87	81.87	88.73	-6.86	12
17-Jun	78.84	80.82	82.79	89.01	-6.22	12
18-Jun	79.39	81.33	83.05	89.24	-6.19	12
19-Jun	79.72	81.68	83.94	89.79	-5.85	12
20-Jun	77.14	82.55	85.23	90.45	-5.22	12
21-Jun	81.85	84.36	86.6	91.89	-5.29	13
22-Jun	82.39	84.59	86.61	91.1	-4.5	13
23-Jun	79.84	83.47	86.23	93.54	-7.31	13
24-Jun	81.45	83.64	86.41	93.88	-7.47	13
25-Jun	83.21	85.28	87.15	95	-7.85	13
26-Jun	83.66	86.18	88.21	97.28	-9.07	13
27-Jun	83.31	85.55	88.43	98.74	-10.32	13
28-Jun	82.28	84.19	86.88	95.45	-8.57	13
29-Jun	81.78	83.67	86.01	92.73	-6.73	13
30-Jun	82.36	84.8	87.13	93.75	-6.61	13

Table A.11: Monthly Summary Report for July 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR July 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Jul	81.95	84.72	88.02	92.04	-4.02	13
2-Jul	82.89	85.89	88.29	93.5	-5.21	13
3-Jul	83.19	85.64	88.23	92.54	-4.31	13
4-Jul	84.74	86.82	88.96	100.67	-11.71	13
5-Jul	84.96	87.71	90.86	98.55	-7.68	13
6-Jul	87.15	90.5	92.74	99.05	-6.31	13
7-Jul	88.73	90.62	92.3	101.46	-9.16	13
8-Jul	88.11	90.33	92.82	101.88	-9.06	13
9-Jul	88.26	90.41	92.23	99.89	-7.66	13
10-Jul	86.52	89.62	91.91	98.07	-6.16	13
11-Jul	84.84	88.01	91.34	94.2	-2.86	13
12-Jul	86.02	88.68	91.55	99.5	-7.95	13
13-Jul	86.74	88.73	91.06	100.02	-8.96	13
14-Jul	86.62	89.39	92.59	100.56	-7.97	13
15-Jul	89.36	91.54	93.66	99.18	-5.52	13
16-Jul	89.38	91.95	94.21	99.62	-5.41	13
17-Jul	89.93	92.57	95.36	100.39	-5.03	13
18-Jul	92.17	94.27	96.21	99.75	-3.55	13
19-Jul	90.35	93.56	95.86	99.38	-3.52	13
20-Jul	89.97	92.54	94.42	99.54	-5.13	13
21-Jul	89.15	91.73	93.74	99.58	-5.84	13
22-Jul	89.49	91.77	94.13	102.09	-7.96	13
23-Jul	90.22	92.35	94.43	98.91	-4.47	13
24-Jul	87.37	89.96	93.75	99.89	-6.14	13
25-Jul	86.42	89.79	91.73	97.09	-5.36	13
26-Jul	88.23	89.91	91.65	96.2	-4.56	13
27-Jul	88.35	90.06	91.72	97.86	-6.13	13
28-Jul	88.3	89.93	91.75	98.63	-6.88	13
29-Jul	87.82	90.08	91.92	98.33	-6.4	13
30-Jul	87.68	89.55	91.76	98.11	-6.35	13
31-Jul	87.39	89.34	91.37	98.44	-7.07	13

Table A.12: Monthly Summary Report for August 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR August 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum"	EPA Requested Average of the Daily "Mean"	EPA Requested Average of the Daily "Instantaneous Maximum"	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	
	Temperatures (° F)	Temperatures (° F)	Temperatures (° F)			
1-Aug	87.08	89.43	92.14	99.79	-7.65	13
2-Aug	87.78	90.76	93.23	100.24	-7.01	13
3-Aug	88.56	91.22	93.52	102.1	-8.58	13
4-Aug	89.37	91.47	93.88	101	-7.12	13
5-Aug	89.71	91.63	93.69	103.8	-10.11	13
6-Aug	87.14	90.66	93.21	97.96	-4.74	13
7-Aug	87.82	89.77	91.79	98.64	-6.85	13
8-Aug	87.86	89.99	92.25	97.63	-5.38	13
9-Aug	87.05	89.6	92.51	98.55	-6.03	13
10-Aug	86.05	88.76	92.29	96.96	-4.67	13
11-Aug	86.59	88.25	90.12	97.08	-6.95	13
12-Aug	86.21	87.69	89.68	98.57	-8.89	13
13-Aug	86.23	88.07	90.02	100.74	-10.72	13
14-Aug	86.45	88.24	89.93	102.52	-12.59	13
15-Aug	85.97	87.65	89.76	103.31	-13.55	13
16-Aug	85.46	87.41	89.52	104.23	-14.7	13
17-Aug	85.54	87.81	89.89	103.02	-13.13	13
18-Aug	85.61	87.47	89.4	103.31	-13.91	13
19-Aug	85.96	87.67	89.53	103.05	-13.51	13
20-Aug	84.86	87.55	90.06	101	-10.94	13
21-Aug	84.67	87.03	89.8	99.77	-9.96	13
22-Aug	86.29	88.25	90	100.06	-10.06	13
23-Aug	85.25	87.5	89.41	99.54	-10.13	13
24-Aug	83.67	85.37	87.73	96.66	-8.94	13
25-Aug	83.66	85.34	87.16	95.38	-8.22	13
26-Aug	83.19	85.44	87.55	96.93	-9.38	13
27-Aug	82.43	84.61	86.79	96.82	-10.02	13
28-Aug	82.81	85.26	87.41	97.3	-9.89	13
29-Aug	80.06	84.75	87.94	97.95	-10.01	13
30-Aug	83.32	85.66	88.65	99.53	-10.88	13
31-Aug	84.47	86.3	88.17	97.54	-9.37	13

Attachment C

Table A.10: Monthly Summary Report for June 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR June 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Jun	77.07	79.33	81.72	88.13	-6.41	12
2-Jun	76.83	79.03	81.17	88.55	-7.38	12
3-Jun	76.39	78.72	80.8	89.27	-8.47	12
4-Jun	77.89	79.42	81.47	90.06	-8.59	12
5-Jun	77.78	80.29	82.13	91.78	-9.65	12
6-Jun	76.97	79.58	82.63	89.81	-7.18	12
7-Jun	77.91	80.05	82.07	88.38	-6.31	12
8-Jun	76.75	79.72	82.95	90.08	-7.13	12
9-Jun	78.44	80.89	83.42	90.76	-7.34	12
10-Jun	78.43	80.69	83.29	93.69	-10.4	12
11-Jun	79.11	80.55	82.07	94.02	-11.95	12
12-Jun	78.47	79.96	81.63	92.73	-11.11	12
13-Jun	78.61	79.97	81.27	91.62	-10.35	12
14-Jun	78.45	80.22	82.17	91.99	-9.83	12
15-Jun	78.29	79.97	82.04	90	-7.96	12
16-Jun	77.85	79.87	81.87	88.73	-6.86	12
17-Jun	78.84	80.82	82.79	89.01	-6.22	12
18-Jun	79.39	81.33	83.05	89.24	-6.19	12
19-Jun	79.72	81.68	83.94	89.79	-5.85	12
20-Jun	77.14	82.55	85.23	90.45	-5.22	12
21-Jun	81.85	84.36	86.6	91.89	-5.29	13
22-Jun	82.39	84.59	86.61	91.1	-4.5	13
23-Jun	79.84	83.47	86.23	93.54	-7.31	13
24-Jun	81.45	83.64	86.41	93.88	-7.47	13
25-Jun	83.21	85.28	87.15	95	-7.85	13
26-Jun	83.66	86.18	88.21	97.28	-9.07	13
27-Jun	83.31	85.55	88.43	98.74	-10.32	13
28-Jun	82.28	84.19	86.88	95.45	-8.57	13
29-Jun	81.78	83.67	86.01	92.73	-6.73	13
30-Jun	82.36	84.8	87.13	93.75	-6.61	13

Table A.11: Monthly Summary Report for July 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR July 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Jul	81.95	84.72	88.02	92.04	-4.02	13
2-Jul	82.89	85.89	88.29	93.5	-5.21	13
3-Jul	83.19	85.64	88.23	92.54	-4.31	13
4-Jul	84.74	86.82	88.96	100.67	-11.71	13
5-Jul	84.96	87.71	90.86	98.55	-7.68	13
6-Jul	87.15	90.5	92.74	99.05	-6.31	13
7-Jul	88.73	90.62	92.3	101.46	-9.16	13
8-Jul	88.11	90.33	92.82	101.88	-9.06	13
9-Jul	88.26	90.41	92.23	99.89	-7.66	13
10-Jul	86.52	89.62	91.91	98.07	-6.16	13
11-Jul	84.84	88.01	91.34	94.2	-2.86	13
12-Jul	86.02	88.68	91.55	99.5	-7.95	13
13-Jul	86.74	88.73	91.06	100.02	-8.96	13
14-Jul	86.62	89.39	92.59	100.56	-7.97	13
15-Jul	89.36	91.54	93.66	99.18	-5.52	13
16-Jul	89.38	91.95	94.21	99.62	-5.41	13
17-Jul	89.93	92.57	95.36	100.39	-5.03	13
18-Jul	92.17	94.27	96.21	99.75	-3.55	13
19-Jul	90.35	93.56	95.86	99.38	-3.52	13
20-Jul	89.97	92.54	94.42	99.54	-5.13	13
21-Jul	89.15	91.73	93.74	99.58	-5.84	13
22-Jul	89.49	91.77	94.13	102.09	-7.96	13
23-Jul	90.22	92.35	94.43	98.91	-4.47	13
24-Jul	87.37	89.96	93.75	99.89	-6.14	13
25-Jul	86.42	89.79	91.73	97.09	-5.36	13
26-Jul	88.23	89.91	91.65	96.2	-4.56	13
27-Jul	88.35	90.06	91.72	97.86	-6.13	13
28-Jul	88.3	89.93	91.75	98.63	-6.88	13
29-Jul	87.82	90.08	91.92	98.33	-6.4	13
30-Jul	87.68	89.55	91.76	98.11	-6.35	13
31-Jul	87.39	89.34	91.37	98.44	-7.07	13

Table A.12: Monthly Summary Report for August 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR August 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum"	EPA Requested Average of the Daily "Mean"	EPA Requested Average of the Daily "Instantaneous Maximum"	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	
	Temperatures (° F)	Temperatures (° F)	Temperatures (° F)			
1-Aug	87.08	89.43	92.14	99.79	-7.65	13
2-Aug	87.78	90.76	93.23	100.24	-7.01	13
3-Aug	88.56	91.22	93.52	102.1	-8.58	13
4-Aug	89.37	91.47	93.88	101	-7.12	13
5-Aug	89.71	91.63	93.69	103.8	-10.11	13
6-Aug	87.14	90.66	93.21	97.96	-4.74	13
7-Aug	87.82	89.77	91.79	98.64	-6.85	13
8-Aug	87.86	89.99	92.25	97.63	-5.38	13
9-Aug	87.05	89.6	92.51	98.55	-6.03	13
10-Aug	86.05	88.76	92.29	96.96	-4.67	13
11-Aug	86.59	88.25	90.12	97.08	-6.95	13
12-Aug	86.21	87.69	89.68	98.57	-8.89	13
13-Aug	86.23	88.07	90.02	100.74	-10.72	13
14-Aug	86.45	88.24	89.93	102.52	-12.59	13
15-Aug	85.97	87.65	89.76	103.31	-13.55	13
16-Aug	85.46	87.41	89.52	104.23	-14.7	13
17-Aug	85.54	87.81	89.89	103.02	-13.13	13
18-Aug	85.61	87.47	89.4	103.31	-13.91	13
19-Aug	85.96	87.67	89.53	103.05	-13.51	13
20-Aug	84.86	87.55	90.06	101	-10.94	13
21-Aug	84.67	87.03	89.8	99.77	-9.96	13
22-Aug	86.29	88.25	90	100.06	-10.06	13
23-Aug	85.25	87.5	89.41	99.54	-10.13	13
24-Aug	83.67	85.37	87.73	96.66	-8.94	13
25-Aug	83.66	85.34	87.16	95.38	-8.22	13
26-Aug	83.19	85.44	87.55	96.93	-9.38	13
27-Aug	82.43	84.61	86.79	96.82	-10.02	13
28-Aug	82.81	85.26	87.41	97.3	-9.89	13
29-Aug	80.06	84.75	87.94	97.95	-10.01	13
30-Aug	83.32	85.66	88.65	99.53	-10.88	13
31-Aug	84.47	86.3	88.17	97.54	-9.37	13

Attachment C

RESPONSE TO UNITED STATES ENVIRONMENTAL PROTECTION AGENCY CWA §308 LETTER

PSNH MERRIMACK STATION UNITS 1&2 BOW, NEW HAMPSHIRE



Prepared for:
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
D.B.A EVERSOURCE ENERGY

780 North Commercial Street
Manchester, NH 03101

February 2016

Prepared by:
Enercon Services, Inc.
and
Normandeau Associates, Inc.



Excellence—Every project. Every day.

500 TownPark Lane
Kennesaw, GA 30144



**NORMANDEAU
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Bedford, NH 03110

Table of Contents

1	Introduction.....	1
1.1	Background	1
2	Executive Summary	2
3	1984 – 2001 Data Set: Average Daily Temperatures	3
4	2002 – 2015 Data Set: 15 Minute Interval Values.....	4
5	Comparison of Data Sets	6
6	References.....	8

List of Appendices

Appendix 1 – Normandeau Monthly Summary Report Data – 2002-2015	22 pages
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1 Introduction

Merrimack Station, Public Service of New Hampshire's (PSNH's) electrical generating facility in Bow, New Hampshire, is seeking a renewal of its existing National Pollutant Discharge Elimination System (NPDES) permit, including issuance of a Clean Water Act (CWA) §316(a) variance. On November 30, 2015, the United States Environmental Protection Agency (EPA) sent PSNH an information request pursuant to §308(a) of the CWA seeking clarification on the plant's upstream ambient and thermal discharge data that had been obtained by PSNH over a 21-year monitoring period. The purpose of this technical paper is to address Requests 2 and 3 of the §308 Letter, which will be discussed in detail below. Request 1 will not be discussed in this document.

1.1 Background

In September 2011, PSNH received the draft NPDES permit for Merrimack Station from the EPA. Detailed comments were provided by PSNH in a February 2012 response to the EPA in which PSNH responded to the technology-based permit conditions and limits related to CWA §316(a) and (b). On September 4, 2015, PSNH issued a letter notifying the EPA of fundamental errors that had been found by PSNH in the EPA's §316(a) draft permit analysis. Specifically, the EPA misinterpreted some of the key thermal results presented in Appendix A of Normandeau Associates' (Normandeau) April 2007 report (2007 Report; Ref. 6.1). These misinterpreted results were used by EPA to reject PSNH's request for a thermal discharge variance.

Appendix A of the 2007 Report tabulates "Average Daily Maximum, Minimum and Mean Water Temperature Measured at Monitoring Stations N-10, S-0 and S-4 and Predicted at A-0 for Merrimack Station for the 1 April to 1 November period of 1984 through 2004". Correctly interpreted, these data tables provide the minimum, average, and maximum of the daily average temperature for each calendar day during the 21-year monitoring period, which occurred between 1984 and 2004. The electronic data set consisted only of daily average temperatures, and not instantaneous data. The EPA erred in assuming that the maximum daily average temperatures reported in Appendix A represented the 21-year average for each calendar day.

To clarify any potential uncertainty or confusion with regard to Appendix A of 2007 Report, the EPA sent PSNH a §308 Letter on November 30, 2015 (2015 §308 Letter), which stated the following:

1. Please provide a copy of Dr. Larry Barnthouse's review and conclusions of the water temperature data which was referenced in Ms. Landis's September 4, 2015 letter;
2. Please provide Eversource's water temperature data used in the annual reports for the period referenced above (i.e., 1 April – 31 October of 1984 – 2004 for Monitoring Stations N-10, S-0, and S-4). In the annual reports, these tables present the instantaneous maximum and minimum temperatures recorded on each date (and the specific times

recorded), as well as the daily average temperature, which is the mean of 96 (typically) temperature data points recorded on that date. These data shall be provided in hard copy as well as workable Excel files in the same monthly table format as they were presented in the PSNH Merrimack Generating Station Environmental Monitoring Program annual reports;

3. Using the same data sets presented in the environmental monitoring program annual reports (and submitted in accordance with request #2 above), please calculate the 21-year average of the daily “instantaneous maximums”, daily “instantaneous minimums”, and “daily mean” water temperatures (daily average of 96 temperature points for that date) recorded for each day from 1 April to 31 October for the period 1984 – 2004 for Monitoring Stations N-10, S-0, and S-4. For example, the maximum temperature (i.e., the “instantaneous” maximum) collected at Monitoring Station S-0 on July 4 of all 21 years from 1984 to 2004 shall be averaged and that value presented in a table under the heading “Average of the Instantaneous Maximum.” This table shall also include columns for the “Average of the Instantaneous Minimum” and “Average for the Daily Mean,” and include a row for each day of the month. A separate table will be generated for each month from April to October for Monitoring Stations N-10, S-0, and S-4. These data shall be presented in degrees Fahrenheit (°F) and provided in hard copy as well as workable Excel files in the same table format used in Appendix A of Normandeau Associate’s April 2007 report, referenced above. Please include an explanation of how the temperature values were calculated for each table so we can confirm they are responsive to this request.

Enercon Services, Inc. (ENERCON) and Normandeau have reviewed the 2015 §308 Letter, and this technical paper provides responses to Requests 2 and 3 above. Request 2 will be addressed in Sections 3 and 4. Request 3 will be addressed in Sections 4, 5, and Appendix 1.

2 Executive Summary

ENERCON and Normandeau have reviewed the 2015 §308 Letter and have worked together to create this response document on behalf of PSNH. Request 1 is not addressed in this document. Requests 2 and 3 of the 2015 §308 Letter issued to Merrimack Station are addressed in this technical paper as follows:

- Request 2 – As discussed in Sections 3 and 4, the 1984 through 2004 data set requested by the EPA does not reflect current operations at Merrimack Station. In addition, only daily average temperatures are currently available in electronic form for the majority of that time period (i.e., 1984 through 2001). Therefore, a newer, more detailed (i.e., measurements taken every 15-minutes) electronic data set from 2002 through 2015 is provided. This data set provides daily “instantaneous” minimum and maximum temperature values (and each corresponding time of occurrence), daily average

temperature values, and lists the number of intervals used for Stations N-10, S-0, and S-4 for 1 April to 1 November from 2002 through 2015. The use of this data set allows for calculation of the instantaneous maximum and minimum temperatures requested by EPA.

- Request 3 – As discussed in Section 4, the 21-year average summary calculations requested by the EPA are replaced by the 14-year (i.e., 2002 through 2015) average summary calculations (i.e., average daily “instantaneous” maximum and minimum and average daily average) found in the tables of Appendix 1. These tables present temperature monitoring data that is calculated for the entire 2002 through 2015 period. The data set covers each calendar day from 1 April to 1 November.

The 2002 through 2015 data set includes several years both before and after completion of the Clean Air Project, and is more representative of current plant operations than the 1984 through 2001 data set. As discussed in Section 5, when comparing the average monthly mean temperatures between the 1984 through 2001 and 2002 through 2015 data sets, the 2002 through 2015 data set yielded equivalent or lower downstream temperatures.

3 1984 – 2001 Data Set: Average Daily Temperatures

As discussed in the 2007 Report, Merrimack Station has monitored upstream ambient (Monitoring Station N-10), cooling canal discharge (Monitoring Station S-0), and downstream (Monitoring Station S-4) water temperatures in Hooksett Pool of the Merrimack River since the Station became fully operational in 1968. The maximum, minimum, and mean average daily water temperatures were measured at Monitoring Stations N-10, S-0 and S-4 from 1 April to 1 November. This occurred each year from 1984 through 2004 and the results of this monitoring were tabulated in Appendix A of the 2007 Report, discussed later in this section. All instantaneous thermal data for each monitoring station from 1984 through 2001 is currently only available in hard copy form. This amounts to 1.26 million raw data points¹ that must be manually entered and independently verified for quality control. Since this would be a very labor-intensive process, and since more recent data representing current plant operation is already available in electronic form (see Section 4), the 1984 – 2001 data set (as part of the 1984 through 2004 total monitoring period) has been provided by PSNH in hard copy form.

Appendix A of the 2007 Report includes the maximum, minimum, and mean of the average daily water temperatures measured at Monitoring Stations N-10, S-0, and S-4 (and Predicted at A-0) for each calendar day between 1 April to 1 November for the period of 1984 through 2004. The table below is an excerpt from the May N-10 summary table found in Appendix A, which will be used to explain how the temperature value in each column was calculated. This methodology was consistently applied every day from 1 April to 1 November for each monitoring station.

¹ A single data point includes the date and temperature for one monitoring station.

Table A.12: Monthly Summary Report for August 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR August 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum"	EPA Requested Average of the Daily "Mean"	EPA Requested Average of the Daily "Instantaneous Maximum"	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	
	Temperatures (° F)	Temperatures (° F)	Temperatures (° F)			
1-Aug	87.08	89.43	92.14	99.79	-7.65	13
2-Aug	87.78	90.76	93.23	100.24	-7.01	13
3-Aug	88.56	91.22	93.52	102.1	-8.58	13
4-Aug	89.37	91.47	93.88	101	-7.12	13
5-Aug	89.71	91.63	93.69	103.8	-10.11	13
6-Aug	87.14	90.66	93.21	97.96	-4.74	13
7-Aug	87.82	89.77	91.79	98.64	-6.85	13
8-Aug	87.86	89.99	92.25	97.63	-5.38	13
9-Aug	87.05	89.6	92.51	98.55	-6.03	13
10-Aug	86.05	88.76	92.29	96.96	-4.67	13
11-Aug	86.59	88.25	90.12	97.08	-6.95	13
12-Aug	86.21	87.69	89.68	98.57	-8.89	13
13-Aug	86.23	88.07	90.02	100.74	-10.72	13
14-Aug	86.45	88.24	89.93	102.52	-12.59	13
15-Aug	85.97	87.65	89.76	103.31	-13.55	13
16-Aug	85.46	87.41	89.52	104.23	-14.7	13
17-Aug	85.54	87.81	89.89	103.02	-13.13	13
18-Aug	85.61	87.47	89.4	103.31	-13.91	13
19-Aug	85.96	87.67	89.53	103.05	-13.51	13
20-Aug	84.86	87.55	90.06	101	-10.94	13
21-Aug	84.67	87.03	89.8	99.77	-9.96	13
22-Aug	86.29	88.25	90	100.06	-10.06	13
23-Aug	85.25	87.5	89.41	99.54	-10.13	13
24-Aug	83.67	85.37	87.73	96.66	-8.94	13
25-Aug	83.66	85.34	87.16	95.38	-8.22	13
26-Aug	83.19	85.44	87.55	96.93	-9.38	13
27-Aug	82.43	84.61	86.79	96.82	-10.02	13
28-Aug	82.81	85.26	87.41	97.3	-9.89	13
29-Aug	80.06	84.75	87.94	97.95	-10.01	13
30-Aug	83.32	85.66	88.65	99.53	-10.88	13
31-Aug	84.47	86.3	88.17	97.54	-9.37	13

Table A.13: Monthly Summary Report for September 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR September 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Sep	84	86.07	88.2	98.23	-10.03	13
2-Sep	83.28	85.87	88.42	99.85	-11.43	13
3-Sep	83.73	85.75	87.89	101.08	-13.19	13
4-Sep	82.1	85.13	87.35	97.25	-9.9	13
5-Sep	81.5	83.58	85.64	93.69	-8.05	13
6-Sep	80.4	83.05	85.42	93.93	-8.51	13
7-Sep	80.31	83.31	86.2	94.99	-8.79	13
8-Sep	81.21	83.53	85.35	96.34	-10.99	13
9-Sep	80.76	82.72	84.71	94.87	-10.16	13
10-Sep	79.67	81.9	84.1	92.96	-8.86	13
11-Sep	78.78	81.81	84.69	90.93	-6.24	13
12-Sep	80.14	81.72	84.73	89.68	-4.94	13
13-Sep	76.21	80.88	83.54	89.74	-6.21	13
14-Sep	79.08	81.02	82.71	90.67	-7.96	13
15-Sep	79.13	80.85	82.58	92.62	-10.04	13
16-Sep	78.42	80.19	82.06	91.5	-9.45	13
17-Sep	78.24	80.08	81.85	90.37	-8.52	13
18-Sep	77.34	79.28	80.96	89.46	-8.5	13
19-Sep	75.94	78.4	80.64	89.12	-8.48	13
20-Sep	75.67	77.48	79.51	90.59	-11.07	13
21-Sep	73.48	76.84	79.5	90.98	-11.49	13
22-Sep	73.87	75.75	77.54	91.3	-13.76	13
23-Sep	73.93	75.75	77.32	90.76	-13.44	13
24-Sep	73.07	75.46	77.67	88.25	-10.58	13
25-Sep	72.39	75.32	78.05	88.3	-10.25	13
26-Sep	73.53	76.07	78.58	87.63	-9.05	13
27-Sep	74.35	77.43	79.9	86.83	-6.93	13
28-Sep	73.7	77.02	79.81	84.61	-4.8	13
29-Sep	74.28	75.99	77.51	85.01	-7.5	13
30-Sep	73.5	75.47	76.97	85.99	-9.02	13

Table A.14: Monthly Summary Report for October 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR October 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum"	EPA Requested Average of the Daily "Mean"	EPA Requested Average of the Daily "Instantaneous Maximum"	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	
	Temperatures (° F)	Temperatures (° F)	Temperatures (° F)			
1-Oct	72.95	75.03	77.02	84.85	-7.83	13
2-Oct	72.75	74.03	75.61	85.79	-10.19	13
3-Oct	70.09	72.24	75.04	82.1	-7.06	13
4-Oct	69.8	70.88	72.09	81.19	-9.1	13
5-Oct	69.44	71.6	73.42	84.36	-10.93	13
6-Oct	70.27	72.54	74.41	88.68	-14.28	13
7-Oct	69.96	71.66	73.81	87.04	-13.23	13
8-Oct	68.65	70.39	72.35	84.33	-11.97	13
9-Oct	66.89	69.92	72.76	82.51	-9.75	13
10-Oct	67.66	69.44	71.14	81.39	-10.25	13
11-Oct	67.33	68.87	70.3	81.82	-11.52	13
12-Oct	67.48	69.34	70.84	81.93	-11.09	13
13-Oct	66.97	68.23	69.79	81.31	-11.53	12
14-Oct	67.01	68.46	69.77	80.89	-11.12	12
15-Oct	68.08	69.68	71.51	80.87	-9.36	13
16-Oct	67.98	69.29	70.58	79.15	-8.57	13
17-Oct	67.29	68.5	69.82	78.12	-8.31	13
18-Oct	66.71	68.05	69.24	76.73	-7.49	13
19-Oct	66.2	67.54	68.88	76.46	-7.58	13
20-Oct	65.53	66.73	68.14	76.69	-8.56	13
21-Oct	64.93	66.19	67.47	77.98	-10.51	13
22-Oct	64.91	66.23	67.27	78.84	-11.57	13
23-Oct	64.61	65.91	67.19	79.72	-12.53	13
24-Oct	64.21	65.36	66.34	80.73	-14.39	13
25-Oct	63.54	64.61	65.66	80.08	-14.43	13
26-Oct	60.73	64.01	66.47	78.73	-12.26	13
27-Oct	62.53	64.46	66.16	76.74	-10.58	13
28-Oct	62.91	64.32	65.61	75.75	-10.14	13
29-Oct	60.84	63.17	65.13	74.6	-9.47	13
30-Oct	59.86	61.1	62.75	73.92	-11.17	13
31-Oct	58.85	60.43	61.79	72.44	-10.65	13

Table A.15: Monthly Summary Report for April 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR April 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Apr	43.4	46.08	50.49	50.99	-0.49	6
2-Apr	44.15	46.57	50.99	51.2	-0.21	6
3-Apr	44.67	47.04	51.34	52.03	-0.69	6
4-Apr	45	47.08	50.45	52.77	-2.32	6
5-Apr	43.45	45.23	48.14	53.79	-5.66	8
6-Apr	43.46	46.61	50.34	55	-4.66	9
7-Apr	44.64	47.65	50.59	56.02	-5.43	9
8-Apr	46.21	48.76	51.08	58.83	-7.75	10
9-Apr	45.46	47.51	49.87	59.48	-9.61	11
10-Apr	46.99	48.2	49.28	60.85	-11.58	11
11-Apr	47.28	48.66	50.28	58.93	-8.65	11
12-Apr	48.04	49.04	50.13	62.69	-12.56	12
13-Apr	47.57	48.78	49.85	60.37	-10.52	12
14-Apr	47.29	48.9	50.24	59.38	-9.14	12
15-Apr	48.37	49.7	50.85	61.28	-10.43	12
16-Apr	47.74	49.06	50.42	59.36	-8.93	12
17-Apr	48.73	49.85	51.06	62.67	-11.61	13
18-Apr	49.23	50.44	51.58	61.74	-10.17	13
19-Apr	49.49	50.95	52.44	61.08	-8.64	13
20-Apr	50.43	51.62	52.9	60.53	-7.64	13
21-Apr	50.66	51.75	52.84	60.49	-7.65	13
22-Apr	50.68	51.75	52.89	59.6	-6.71	13
23-Apr	50.15	51.11	52.17	55.63	-3.46	13
24-Apr	50.19	51.32	53.54	56.13	-2.6	13
25-Apr	50.69	51.71	52.94	57.79	-4.85	13
26-Apr	50.53	51.45	52.26	58.85	-6.58	13
27-Apr	50.74	51.61	52.57	58.99	-6.42	13
28-Apr	50.8	51.86	52.81	61.57	-8.76	13
29-Apr	51.19	52.14	53.21	59.81	-6.6	13
30-Apr	51.46	52.51	53.41	58.46	-5.05	12

Table A.13: Monthly Summary Report for September 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR September 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Sep	84	86.07	88.2	98.23	-10.03	13
2-Sep	83.28	85.87	88.42	99.85	-11.43	13
3-Sep	83.73	85.75	87.89	101.08	-13.19	13
4-Sep	82.1	85.13	87.35	97.25	-9.9	13
5-Sep	81.5	83.58	85.64	93.69	-8.05	13
6-Sep	80.4	83.05	85.42	93.93	-8.51	13
7-Sep	80.31	83.31	86.2	94.99	-8.79	13
8-Sep	81.21	83.53	85.35	96.34	-10.99	13
9-Sep	80.76	82.72	84.71	94.87	-10.16	13
10-Sep	79.67	81.9	84.1	92.96	-8.86	13
11-Sep	78.78	81.81	84.69	90.93	-6.24	13
12-Sep	80.14	81.72	84.73	89.68	-4.94	13
13-Sep	76.21	80.88	83.54	89.74	-6.21	13
14-Sep	79.08	81.02	82.71	90.67	-7.96	13
15-Sep	79.13	80.85	82.58	92.62	-10.04	13
16-Sep	78.42	80.19	82.06	91.5	-9.45	13
17-Sep	78.24	80.08	81.85	90.37	-8.52	13
18-Sep	77.34	79.28	80.96	89.46	-8.5	13
19-Sep	75.94	78.4	80.64	89.12	-8.48	13
20-Sep	75.67	77.48	79.51	90.59	-11.07	13
21-Sep	73.48	76.84	79.5	90.98	-11.49	13
22-Sep	73.87	75.75	77.54	91.3	-13.76	13
23-Sep	73.93	75.75	77.32	90.76	-13.44	13
24-Sep	73.07	75.46	77.67	88.25	-10.58	13
25-Sep	72.39	75.32	78.05	88.3	-10.25	13
26-Sep	73.53	76.07	78.58	87.63	-9.05	13
27-Sep	74.35	77.43	79.9	86.83	-6.93	13
28-Sep	73.7	77.02	79.81	84.61	-4.8	13
29-Sep	74.28	75.99	77.51	85.01	-7.5	13
30-Sep	73.5	75.47	76.97	85.99	-9.02	13

Table A.14: Monthly Summary Report for October 2002-2015 – Monitoring Station S0

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR October 2002-2015

STATION: S0

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum"	EPA Requested Average of the Daily "Mean"	EPA Requested Average of the Daily "Instantaneous Maximum"	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	
	Temperatures (° F)	Temperatures (° F)	Temperatures (° F)			
1-Oct	72.95	75.03	77.02	84.85	-7.83	13
2-Oct	72.75	74.03	75.61	85.79	-10.19	13
3-Oct	70.09	72.24	75.04	82.1	-7.06	13
4-Oct	69.8	70.88	72.09	81.19	-9.1	13
5-Oct	69.44	71.6	73.42	84.36	-10.93	13
6-Oct	70.27	72.54	74.41	88.68	-14.28	13
7-Oct	69.96	71.66	73.81	87.04	-13.23	13
8-Oct	68.65	70.39	72.35	84.33	-11.97	13
9-Oct	66.89	69.92	72.76	82.51	-9.75	13
10-Oct	67.66	69.44	71.14	81.39	-10.25	13
11-Oct	67.33	68.87	70.3	81.82	-11.52	13
12-Oct	67.48	69.34	70.84	81.93	-11.09	13
13-Oct	66.97	68.23	69.79	81.31	-11.53	12
14-Oct	67.01	68.46	69.77	80.89	-11.12	12
15-Oct	68.08	69.68	71.51	80.87	-9.36	13
16-Oct	67.98	69.29	70.58	79.15	-8.57	13
17-Oct	67.29	68.5	69.82	78.12	-8.31	13
18-Oct	66.71	68.05	69.24	76.73	-7.49	13
19-Oct	66.2	67.54	68.88	76.46	-7.58	13
20-Oct	65.53	66.73	68.14	76.69	-8.56	13
21-Oct	64.93	66.19	67.47	77.98	-10.51	13
22-Oct	64.91	66.23	67.27	78.84	-11.57	13
23-Oct	64.61	65.91	67.19	79.72	-12.53	13
24-Oct	64.21	65.36	66.34	80.73	-14.39	13
25-Oct	63.54	64.61	65.66	80.08	-14.43	13
26-Oct	60.73	64.01	66.47	78.73	-12.26	13
27-Oct	62.53	64.46	66.16	76.74	-10.58	13
28-Oct	62.91	64.32	65.61	75.75	-10.14	13
29-Oct	60.84	63.17	65.13	74.6	-9.47	13
30-Oct	59.86	61.1	62.75	73.92	-11.17	13
31-Oct	58.85	60.43	61.79	72.44	-10.65	13

Table A.18: Monthly Summary Report for July 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR July 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Jul	74.36	75.97	78.04	84.39	-6.36	13
2-Jul	75.08	76.89	78.84	89.13	-10.29	13
3-Jul	75.23	76.82	78.65	83.62	-4.97	13
4-Jul	76.15	77.9	79.74	88.8	-9.06	13
5-Jul	76.48	78.51	80.74	87.52	-6.78	13
6-Jul	77.6	79.86	82.13	90.49	-8.37	13
7-Jul	77.94	80.02	81.97	92.68	-10.72	13
8-Jul	78.15	80.09	81.93	93.96	-12.04	13
9-Jul	77.16	79.76	82.22	93.04	-10.82	13
10-Jul	76.18	78.62	80.85	92.05	-11.2	13
11-Jul	76.14	78.06	80.28	87.63	-7.34	13
12-Jul	76.15	78.51	80.9	91.96	-11.06	13
13-Jul	77.4	79.2	81.63	92.69	-11.05	13
14-Jul	77.84	79.97	82.3	92.55	-10.25	13
15-Jul	78.52	80.85	82.99	90.92	-7.92	13
16-Jul	78.61	81.35	84.3	91.16	-6.86	13
17-Jul	77.99	81.54	84.53	92.47	-7.94	13
18-Jul	79.46	81.94	85.12	91.68	-6.57	13
19-Jul	79.71	81.88	84.72	92.07	-7.35	13
20-Jul	78.3	80.66	84.16	91.35	-7.2	13
21-Jul	78.2	81.04	83.92	91.37	-7.45	13
22-Jul	79.3	82.24	85.48	89	-3.52	13
23-Jul	80.22	82.28	85.09	88.99	-3.91	13
24-Jul	78.64	80.98	83.84	88.42	-4.58	13
25-Jul	78.38	81.04	82.94	88.51	-5.57	13
26-Jul	79.18	81.32	83.4	88.79	-5.39	13
27-Jul	79.52	81.5	83.56	90.62	-7.06	13
28-Jul	78.87	81.23	83.17	90.31	-7.14	13
29-Jul	78.86	81.38	83.95	90.42	-6.47	13
30-Jul	78.7	80.86	83.21	90.64	-7.43	13
31-Jul	79.36	81.12	83.24	90.61	-7.37	13

Table A.19: Monthly Summary Report for August 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR August 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Aug	80.05	81.9	84.56	91.25	-6.69	13
2-Aug	79.12	82	84.87	92.16	-7.29	13
3-Aug	79.97	82.57	85.01	94.04	-9.02	13
4-Aug	80.04	83.14	85.55	93.28	-7.74	13
5-Aug	81.37	83.75	86.01	93.35	-7.33	13
6-Aug	79.68	82.15	84.43	90.79	-6.35	13
7-Aug	78.83	81.28	83.58	90.14	-6.55	13
8-Aug	78.71	81.06	83.31	90.01	-6.69	13
9-Aug	78.36	80.89	83.55	89.99	-6.44	13
10-Aug	78.47	81.18	84.24	89.5	-5.26	13
11-Aug	78.32	80.32	82.49	92.2	-9.71	13
12-Aug	77.96	79.45	81.06	91.85	-10.78	13
13-Aug	77.68	79.96	82.6	91.99	-9.4	13
14-Aug	77.29	79.93	82.19	91.81	-9.63	13
15-Aug	77.8	79.99	82.07	94.94	-12.88	13
16-Aug	77.92	79.92	81.73	97.85	-16.12	13
17-Aug	77.35	79.86	82.28	92.22	-9.94	12
18-Aug	77.48	79.46	81.33	92.43	-11.1	13
19-Aug	78.05	79.77	81.58	90.27	-8.68	13
20-Aug	77.53	79.6	82.05	88.07	-6.01	13
21-Aug	76.81	79.43	82.23	86.42	-4.19	13
22-Aug	77.65	80.05	82.28	90.05	-7.77	13
23-Aug	76.89	79.24	81.37	85.19	-3.83	13
24-Aug	76.18	78.53	81.11	85.27	-4.16	13
25-Aug	76.17	78.68	80.96	86.47	-5.51	13
26-Aug	76.25	78.57	80.79	87.33	-6.55	13
27-Aug	75.88	78.49	80.85	86.76	-5.91	13
28-Aug	75.79	78.38	81.69	86.71	-5.02	13
29-Aug	76.18	78.27	80.62	88.44	-7.83	13
30-Aug	75.93	78.1	80.33	89.18	-8.85	13
31-Aug	75.11	77.7	80.39	88.37	-7.97	13

Table A.20: Monthly Summary Report for September 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR September 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Sep	75.2	77.39	79.71	87.12	-7.41	13
2-Sep	74.78	77.17	79.84	90.3	-10.46	13
3-Sep	75.4	77.67	80.26	92.17	-11.92	13
4-Sep	75.24	77.64	80.03	90.72	-10.69	13
5-Sep	74.69	77.01	79.12	86.15	-7.03	13
6-Sep	73.55	76.4	78.63	84.82	-6.19	13
7-Sep	73.81	76.4	78.94	86.83	-7.9	13
8-Sep	74.77	77.03	79.04	89.72	-10.68	13
9-Sep	73.52	75.69	78.04	83.88	-5.84	13
10-Sep	72	74.01	76.56	82.54	-5.98	13
11-Sep	72.01	74	76.49	82.51	-6.03	13
12-Sep	70.86	73.55	75.61	81.47	-5.86	13
13-Sep	70.97	73.61	76.07	82.33	-6.26	13
14-Sep	72.09	74.34	76.51	84.73	-8.22	13
15-Sep	72.4	74.41	76.28	85.31	-9.03	13
16-Sep	70.74	73.15	75.57	84.35	-8.78	13
17-Sep	69.81	72.13	74.33	82.78	-8.45	13
18-Sep	69.25	71.44	73.38	82.28	-8.89	13
19-Sep	69.21	70.95	73.01	82.12	-9.11	13
20-Sep	68.98	70.61	72.53	82.56	-10.03	13
21-Sep	67.32	69.85	72.27	81.29	-9.01	13
22-Sep	67.47	69.66	71.86	82.18	-10.32	13
23-Sep	66.89	69.11	71.23	80.63	-9.41	13
24-Sep	66.75	68.47	70.8	78.67	-7.87	13
25-Sep	66.68	68.26	70.31	79.63	-9.32	13
26-Sep	66.21	67.85	69.84	79.52	-9.68	13
27-Sep	66.04	67.5	69.53	75.91	-6.38	13
28-Sep	65.98	68.2	70.29	75.21	-4.91	13
29-Sep	65.76	67.18	68.5	74.5	-6.01	13
30-Sep	64.8	66.4	68.11	71.86	-3.75	13

Table A.21: Monthly Summary Report for October 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR October 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)		
1-Oct	63.79	65.8	68.13	71.75	-3.62	13
2-Oct	63.64	65.3	67.23	72.81	-5.57	13
3-Oct	62.87	64.96	67.46	74.63	-7.17	13
4-Oct	63.16	64.81	66.13	75.2	-9.08	13
5-Oct	62.41	64.39	66.52	76.41	-9.88	13
6-Oct	62.16	64.41	66.84	79.66	-12.83	13
7-Oct	61.9	64.29	66.3	79.43	-13.13	13
8-Oct	61.01	63.3	65.29	77.97	-12.68	13
9-Oct	60.63	62.31	63.75	76.59	-12.84	13
10-Oct	59.97	61.58	63.11	75.38	-12.27	13
11-Oct	59.27	60.7	61.85	73.15	-11.3	13
12-Oct	58.13	59.55	61.08	69.7	-8.62	13
13-Oct	57.14	58.76	60.25	66.18	-5.93	13
14-Oct	56.96	58.56	59.9	67.43	-7.53	13
15-Oct	56.33	58.15	60.2	64.2	-4	13
16-Oct	56.02	57.56	59.18	65.37	-6.19	13
17-Oct	55.03	56.66	57.98	67.16	-9.18	13
18-Oct	54.85	55.92	57.42	68.35	-10.92	13
19-Oct	54.54	55.62	56.84	69.03	-12.19	13
20-Oct	53.91	55.31	56.96	69.69	-12.73	13
21-Oct	52.95	54.07	55.64	61.83	-6.19	13
22-Oct	52.4	53.4	54.81	61.29	-6.48	13
23-Oct	52.23	53.2	54.37	64.52	-10.16	13
24-Oct	51.5	52.68	53.89	65.75	-11.86	13
25-Oct	51.31	52.68	53.83	66.96	-13.14	13
26-Oct	50.97	52.77	57.39	67.22	-9.83	12
27-Oct	51.09	52.46	53.69	65.28	-11.59	12
28-Oct	50.62	51.84	53.07	59.25	-6.18	13
29-Oct	50.2	51.44	52.41	59.18	-6.76	13
30-Oct	50.03	50.81	51.57	57.61	-6.03	13
31-Oct	49.94	50.81	51.71	59.77	-8.06	13

Table A.18: Monthly Summary Report for July 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR July 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Jul	74.36	75.97	78.04	84.39	-6.36	13
2-Jul	75.08	76.89	78.84	89.13	-10.29	13
3-Jul	75.23	76.82	78.65	83.62	-4.97	13
4-Jul	76.15	77.9	79.74	88.8	-9.06	13
5-Jul	76.48	78.51	80.74	87.52	-6.78	13
6-Jul	77.6	79.86	82.13	90.49	-8.37	13
7-Jul	77.94	80.02	81.97	92.68	-10.72	13
8-Jul	78.15	80.09	81.93	93.96	-12.04	13
9-Jul	77.16	79.76	82.22	93.04	-10.82	13
10-Jul	76.18	78.62	80.85	92.05	-11.2	13
11-Jul	76.14	78.06	80.28	87.63	-7.34	13
12-Jul	76.15	78.51	80.9	91.96	-11.06	13
13-Jul	77.4	79.2	81.63	92.69	-11.05	13
14-Jul	77.84	79.97	82.3	92.55	-10.25	13
15-Jul	78.52	80.85	82.99	90.92	-7.92	13
16-Jul	78.61	81.35	84.3	91.16	-6.86	13
17-Jul	77.99	81.54	84.53	92.47	-7.94	13
18-Jul	79.46	81.94	85.12	91.68	-6.57	13
19-Jul	79.71	81.88	84.72	92.07	-7.35	13
20-Jul	78.3	80.66	84.16	91.35	-7.2	13
21-Jul	78.2	81.04	83.92	91.37	-7.45	13
22-Jul	79.3	82.24	85.48	89	-3.52	13
23-Jul	80.22	82.28	85.09	88.99	-3.91	13
24-Jul	78.64	80.98	83.84	88.42	-4.58	13
25-Jul	78.38	81.04	82.94	88.51	-5.57	13
26-Jul	79.18	81.32	83.4	88.79	-5.39	13
27-Jul	79.52	81.5	83.56	90.62	-7.06	13
28-Jul	78.87	81.23	83.17	90.31	-7.14	13
29-Jul	78.86	81.38	83.95	90.42	-6.47	13
30-Jul	78.7	80.86	83.21	90.64	-7.43	13
31-Jul	79.36	81.12	83.24	90.61	-7.37	13

Table A.19: Monthly Summary Report for August 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR August 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Aug	80.05	81.9	84.56	91.25	-6.69	13
2-Aug	79.12	82	84.87	92.16	-7.29	13
3-Aug	79.97	82.57	85.01	94.04	-9.02	13
4-Aug	80.04	83.14	85.55	93.28	-7.74	13
5-Aug	81.37	83.75	86.01	93.35	-7.33	13
6-Aug	79.68	82.15	84.43	90.79	-6.35	13
7-Aug	78.83	81.28	83.58	90.14	-6.55	13
8-Aug	78.71	81.06	83.31	90.01	-6.69	13
9-Aug	78.36	80.89	83.55	89.99	-6.44	13
10-Aug	78.47	81.18	84.24	89.5	-5.26	13
11-Aug	78.32	80.32	82.49	92.2	-9.71	13
12-Aug	77.96	79.45	81.06	91.85	-10.78	13
13-Aug	77.68	79.96	82.6	91.99	-9.4	13
14-Aug	77.29	79.93	82.19	91.81	-9.63	13
15-Aug	77.8	79.99	82.07	94.94	-12.88	13
16-Aug	77.92	79.92	81.73	97.85	-16.12	13
17-Aug	77.35	79.86	82.28	92.22	-9.94	12
18-Aug	77.48	79.46	81.33	92.43	-11.1	13
19-Aug	78.05	79.77	81.58	90.27	-8.68	13
20-Aug	77.53	79.6	82.05	88.07	-6.01	13
21-Aug	76.81	79.43	82.23	86.42	-4.19	13
22-Aug	77.65	80.05	82.28	90.05	-7.77	13
23-Aug	76.89	79.24	81.37	85.19	-3.83	13
24-Aug	76.18	78.53	81.11	85.27	-4.16	13
25-Aug	76.17	78.68	80.96	86.47	-5.51	13
26-Aug	76.25	78.57	80.79	87.33	-6.55	13
27-Aug	75.88	78.49	80.85	86.76	-5.91	13
28-Aug	75.79	78.38	81.69	86.71	-5.02	13
29-Aug	76.18	78.27	80.62	88.44	-7.83	13
30-Aug	75.93	78.1	80.33	89.18	-8.85	13
31-Aug	75.11	77.7	80.39	88.37	-7.97	13

Table A.20: Monthly Summary Report for September 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR September 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)	Number of Data Points Utilized to Calculate EPA Requested Averages
1-Sep	75.2	77.39	79.71	87.12	-7.41	13
2-Sep	74.78	77.17	79.84	90.3	-10.46	13
3-Sep	75.4	77.67	80.26	92.17	-11.92	13
4-Sep	75.24	77.64	80.03	90.72	-10.69	13
5-Sep	74.69	77.01	79.12	86.15	-7.03	13
6-Sep	73.55	76.4	78.63	84.82	-6.19	13
7-Sep	73.81	76.4	78.94	86.83	-7.9	13
8-Sep	74.77	77.03	79.04	89.72	-10.68	13
9-Sep	73.52	75.69	78.04	83.88	-5.84	13
10-Sep	72	74.01	76.56	82.54	-5.98	13
11-Sep	72.01	74	76.49	82.51	-6.03	13
12-Sep	70.86	73.55	75.61	81.47	-5.86	13
13-Sep	70.97	73.61	76.07	82.33	-6.26	13
14-Sep	72.09	74.34	76.51	84.73	-8.22	13
15-Sep	72.4	74.41	76.28	85.31	-9.03	13
16-Sep	70.74	73.15	75.57	84.35	-8.78	13
17-Sep	69.81	72.13	74.33	82.78	-8.45	13
18-Sep	69.25	71.44	73.38	82.28	-8.89	13
19-Sep	69.21	70.95	73.01	82.12	-9.11	13
20-Sep	68.98	70.61	72.53	82.56	-10.03	13
21-Sep	67.32	69.85	72.27	81.29	-9.01	13
22-Sep	67.47	69.66	71.86	82.18	-10.32	13
23-Sep	66.89	69.11	71.23	80.63	-9.41	13
24-Sep	66.75	68.47	70.8	78.67	-7.87	13
25-Sep	66.68	68.26	70.31	79.63	-9.32	13
26-Sep	66.21	67.85	69.84	79.52	-9.68	13
27-Sep	66.04	67.5	69.53	75.91	-6.38	13
28-Sep	65.98	68.2	70.29	75.21	-4.91	13
29-Sep	65.76	67.18	68.5	74.5	-6.01	13
30-Sep	64.8	66.4	68.11	71.86	-3.75	13

Table A.21: Monthly Summary Report for October 2002-2015 – Monitoring Station S4

PUBLIC SERVICE OF NEW HAMPSHIRE
MERRIMACK GENERATING STATION
ENVIRONMENTAL MONITORING PROGRAM

MONTHLY SUMMARY REPORT FOR October 2002-2015

STATION: S4

PARAMETER: Temperature (Deg. F)

Day	Difference in Temperatures Between EPA Requested Average of the Daily "Instantaneous Maximum" and Normandeau (2007) Approach (max daily) (° F)					Number of Data Points Utilized to Calculate EPA Requested Averages
	EPA Requested Average of the Daily "Instantaneous Minimum" Temperatures (° F)	EPA Requested Average of the Daily "Mean" Temperatures (° F)	EPA Requested Average of the Daily "Instantaneous Maximum" Temperatures (° F)	Maximum of the Daily "Mean" Temperatures (° F) Using the Approach of Normandeau (2007)		
1-Oct	63.79	65.8	68.13	71.75	-3.62	13
2-Oct	63.64	65.3	67.23	72.81	-5.57	13
3-Oct	62.87	64.96	67.46	74.63	-7.17	13
4-Oct	63.16	64.81	66.13	75.2	-9.08	13
5-Oct	62.41	64.39	66.52	76.41	-9.88	13
6-Oct	62.16	64.41	66.84	79.66	-12.83	13
7-Oct	61.9	64.29	66.3	79.43	-13.13	13
8-Oct	61.01	63.3	65.29	77.97	-12.68	13
9-Oct	60.63	62.31	63.75	76.59	-12.84	13
10-Oct	59.97	61.58	63.11	75.38	-12.27	13
11-Oct	59.27	60.7	61.85	73.15	-11.3	13
12-Oct	58.13	59.55	61.08	69.7	-8.62	13
13-Oct	57.14	58.76	60.25	66.18	-5.93	13
14-Oct	56.96	58.56	59.9	67.43	-7.53	13
15-Oct	56.33	58.15	60.2	64.2	-4	13
16-Oct	56.02	57.56	59.18	65.37	-6.19	13
17-Oct	55.03	56.66	57.98	67.16	-9.18	13
18-Oct	54.85	55.92	57.42	68.35	-10.92	13
19-Oct	54.54	55.62	56.84	69.03	-12.19	13
20-Oct	53.91	55.31	56.96	69.69	-12.73	13
21-Oct	52.95	54.07	55.64	61.83	-6.19	13
22-Oct	52.4	53.4	54.81	61.29	-6.48	13
23-Oct	52.23	53.2	54.37	64.52	-10.16	13
24-Oct	51.5	52.68	53.89	65.75	-11.86	13
25-Oct	51.31	52.68	53.83	66.96	-13.14	13
26-Oct	50.97	52.77	57.39	67.22	-9.83	12
27-Oct	51.09	52.46	53.69	65.28	-11.59	12
28-Oct	50.62	51.84	53.07	59.25	-6.18	13
29-Oct	50.2	51.44	52.41	59.18	-6.76	13
30-Oct	50.03	50.81	51.57	57.61	-6.03	13
31-Oct	49.94	50.81	51.71	59.77	-8.06	13