

Bridgeton Landfill, LLC

Weekly Data Submittal

Week of November 13, 2016 – November 19, 2016

**Required by Section 52.F of Agreed Order, Case No. 13SL-CC01088
Effective May 13, 2013**

Contents:

Attachment A – Leachate Levels in Leachate Collection Sumps

Attachment B – Temperature Monitoring Probe Analytical Charts

Attachment C – Gas Interceptor Wellhead Temperature Graphs

Attachment D – Neck-Area Gas Extraction Wellhead Temperature Graphs

Provided Separately:

- Leachate Level in Leachate Collection Sump Raw Data Excel Spreadsheet**
- Temperature Monitoring Probe Raw Data Excel Spreadsheet**
- Heat Extraction System TMP Raw Data Excel Spreadsheet**
- Gas Interceptor Well Reading Raw Data Excel Spreadsheet**
- Neck-Area Gas Extraction Well Data Excel Spreadsheet**

November 23, 2016

Commentary on Data

November 23, 2016

Attachment A – Leachate Levels in Leachate Collection Sumps

Leachate Collection Sumps (LCSs) LCS-1D, -4B, -5A, and -6B were fully operational during the weekly reporting period.

The level sensors in LCS-1D and LCS-4B are currently operational and responsive. Liquid levels were not recorded by either level sensor during the weekly reporting period. Both sumps are equipped with flow meters which displayed no flow during the weekly reporting period. Therefore, it can be concluded that the liquid levels in these sumps were below the bottom of the pumps and level sensors in each sump.

The pumps in LCS-2D and LCS-3D were non-operational during the weekly reporting period. The transducer in LCS-3D continued to report liquid levels.

Attachment B - Temperature Monitoring Probe Analytical Charts

The following Temperature Monitoring Probes (TMPs) indicated generally consistent profiles to previous observations: TMP-1, -2, -3, -3R, -4, -4R, -6, -9, -10, -11, -14R, -16, -17, -18, -21, -22, -23, -24, -25, -26, -27, -28, -29, -36, -37, -42, -43, -44, -45, and -46.

TMP-33, located in the North Quarry, has been added to the weekly report.

TMP-2R, -11, -39, -47, -48, and -49 were installed in the Neck Area and North Quarry during the reporting period.

TMP readings for evaluation of the Heat Extraction System (HES) are provided as attachment “Heat Extraction System TMP Raw Data Excel Spreadsheet,” but are not discussed in this report.

Attachment C - Gas Interceptor Wellhead Temperature Graphs

As part of the HES, there are currently cooling water circulation loops installed in twelve Gas Interceptor Wells (GIWs) (GIW-02 through GIW-13). The remaining well (GIW-01) had a measured gas temperature within its historical operating limits.

Attachment D – Neck Area Gas Extraction Well Data

Weekly gas temperature data is collected for select Gas Extraction Wells (GEWs) located in the neck area of the landfill. These wells include GEW-008, -009, -010, -038, -039, -040, 041R, -043R, -053, -054, -055, -056R, -109, and -110.

North Quarry Oxygen Levels

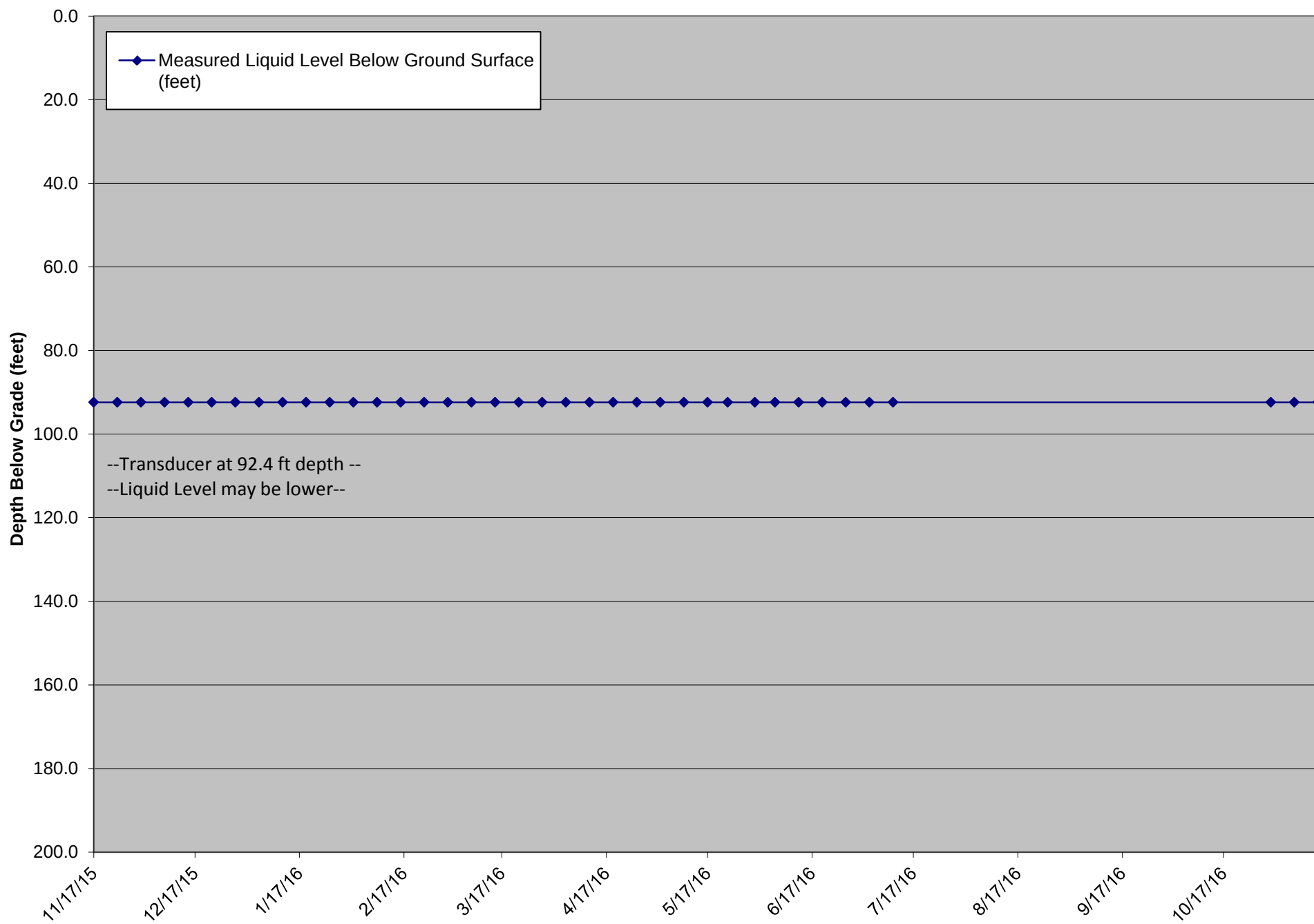
GEW-1A and GEW-2S have been added to the figure O2. The two gas wells had been inadvertently left off of the figure, because of incompatible survey information for the mapping software. GEW-1A is noted as having an oxygen concentration greater than 1.5%. This has been the case since it's installation in December 2015. Bridgeton has made MDNR and St Louis County's Air Pollution Control Program aware of this.

The area in which GEW-1A is installed is very saturated. Bridgeton has installed a sump in the vicinity of GEW-1A in the hope of lowering the potentiometric surface in the area to improve gas quality and reduce ambient air intrusion at the well.

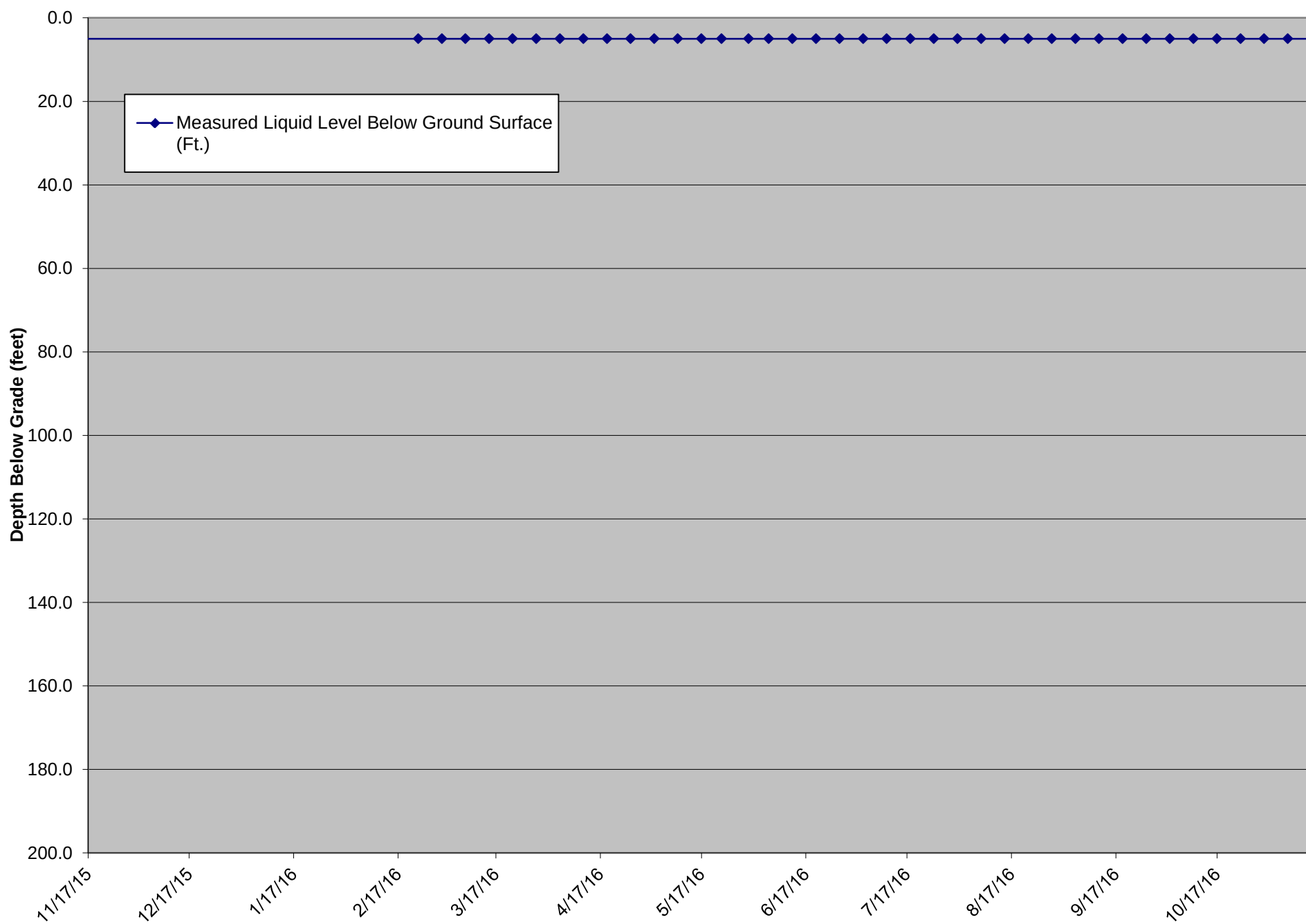
ATTACHMENT A

LEACHATE LEVELS IN LEACHATE COLLECTION SUMPS

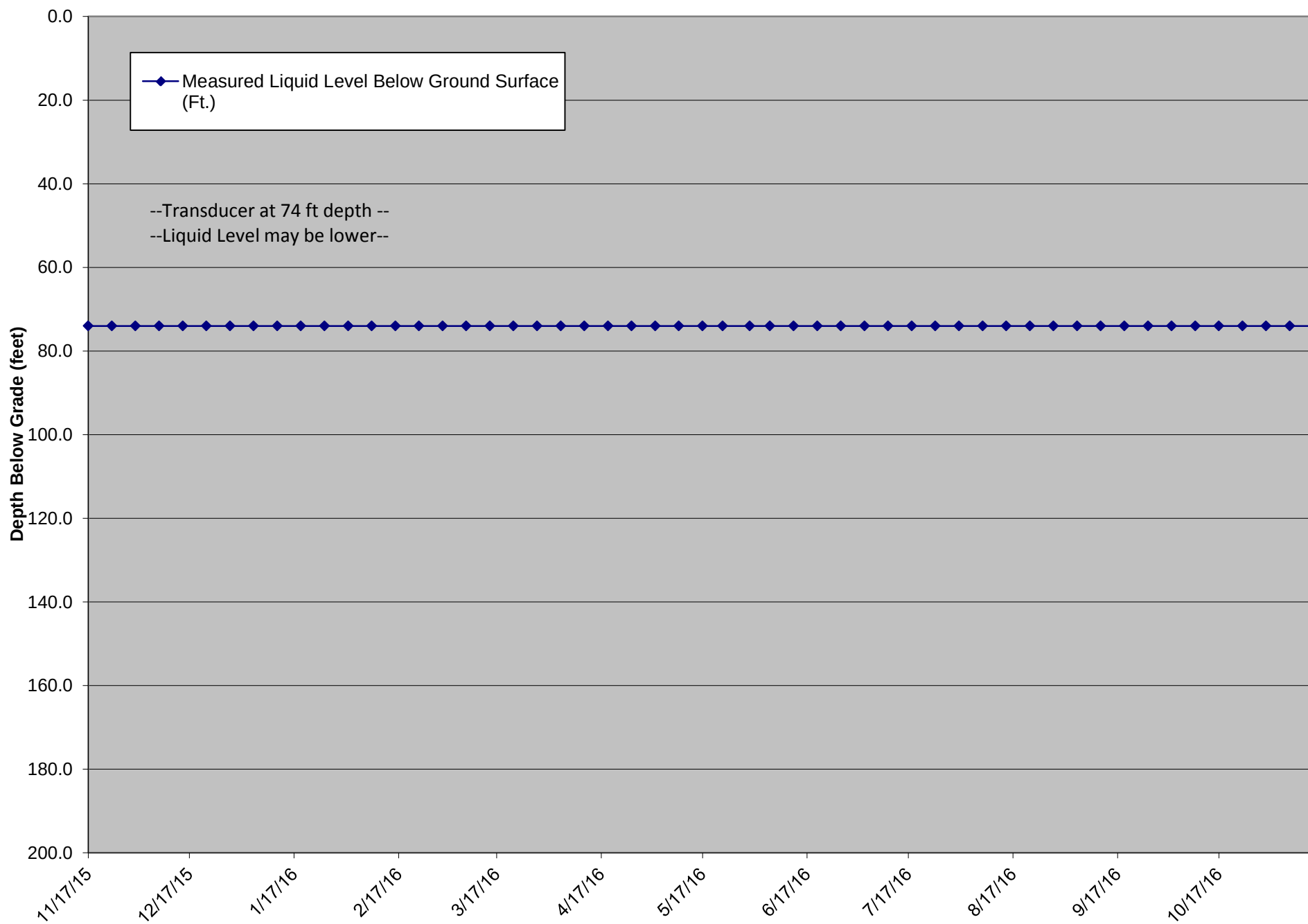
LCS-1D Liquid Level Below Ground Surface



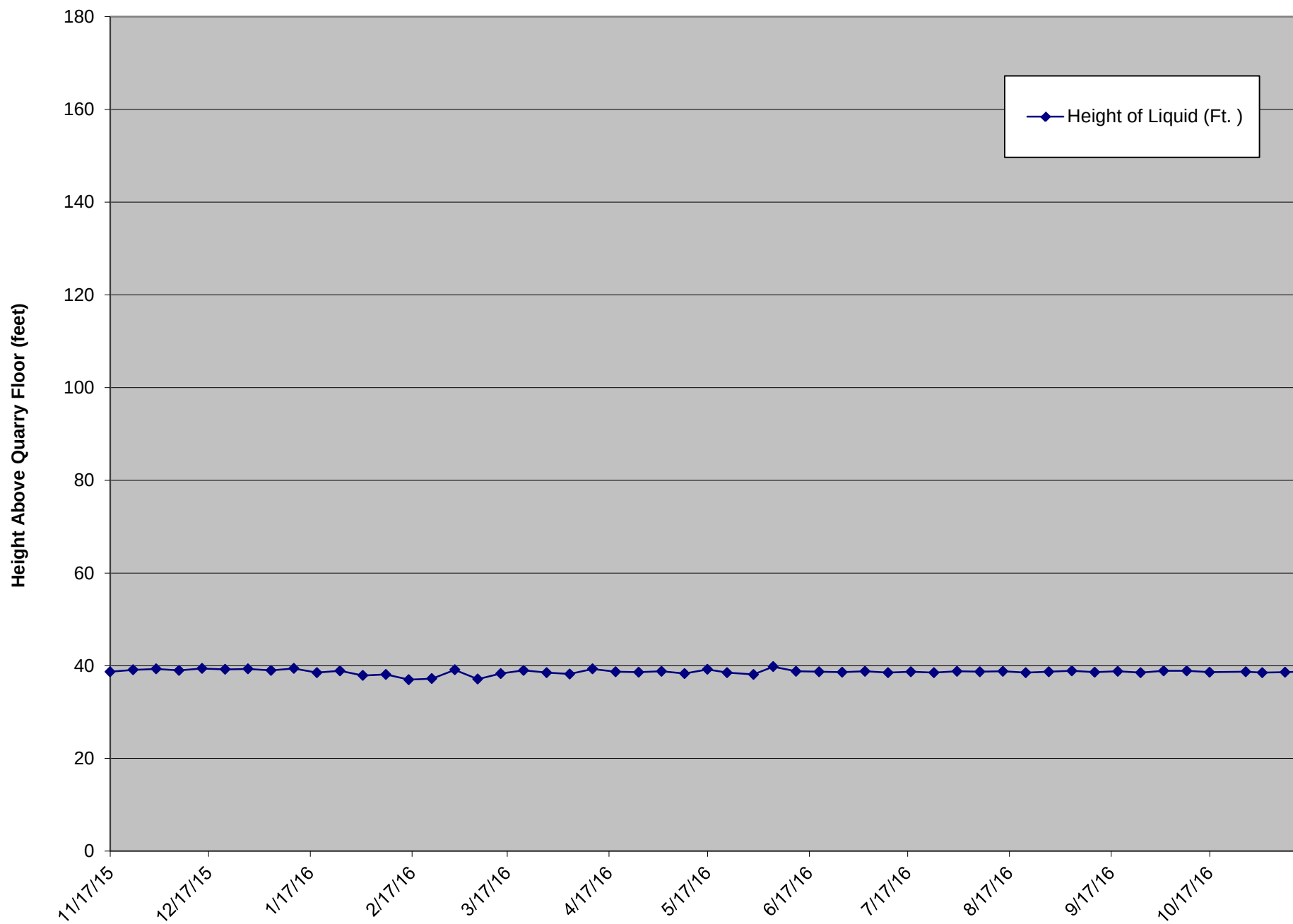
LCS-3D Liquid Level Below Ground Surface



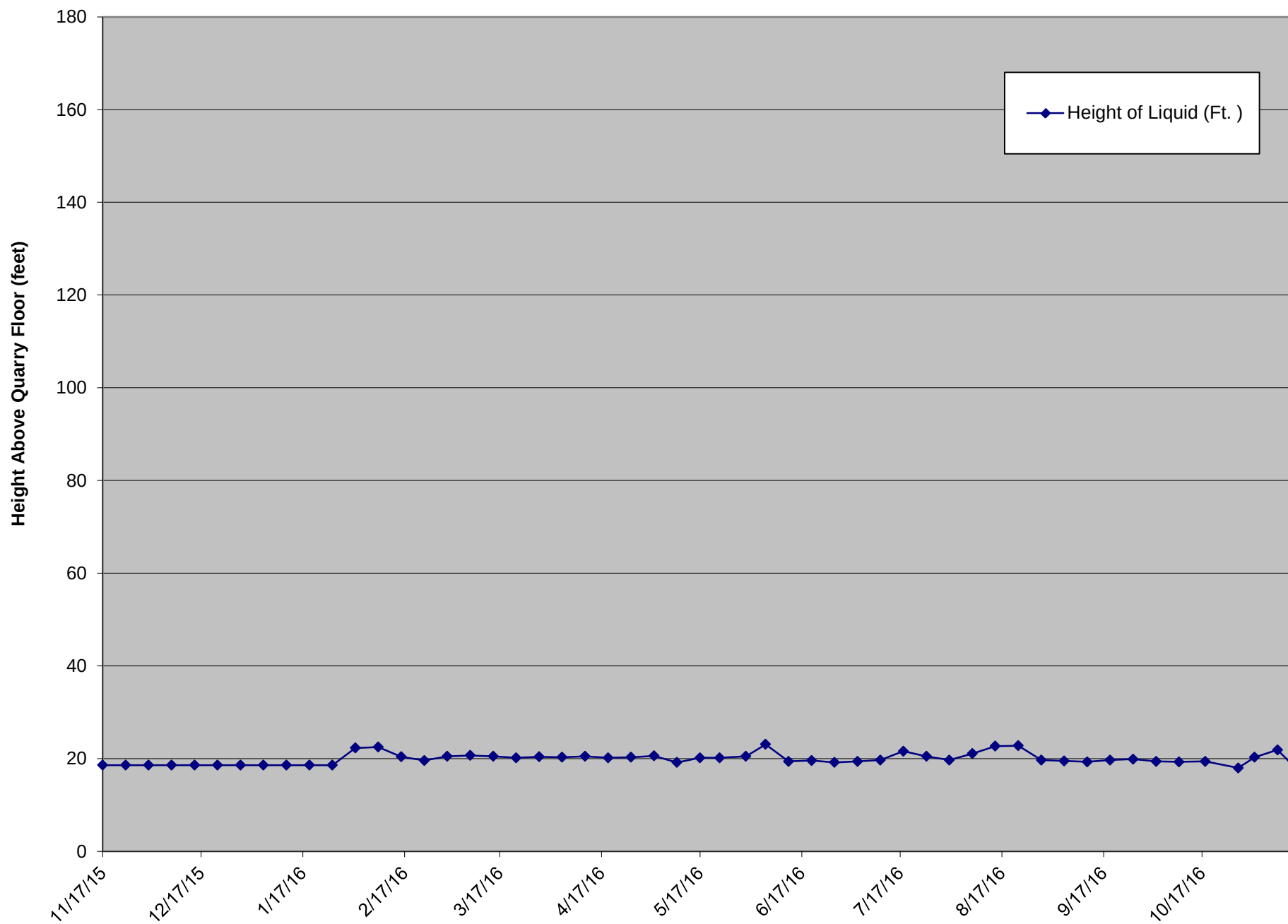
LCS-4B Liquid Level Below Ground Surface



LCS-5A Liquid Level Above Quarry Floor

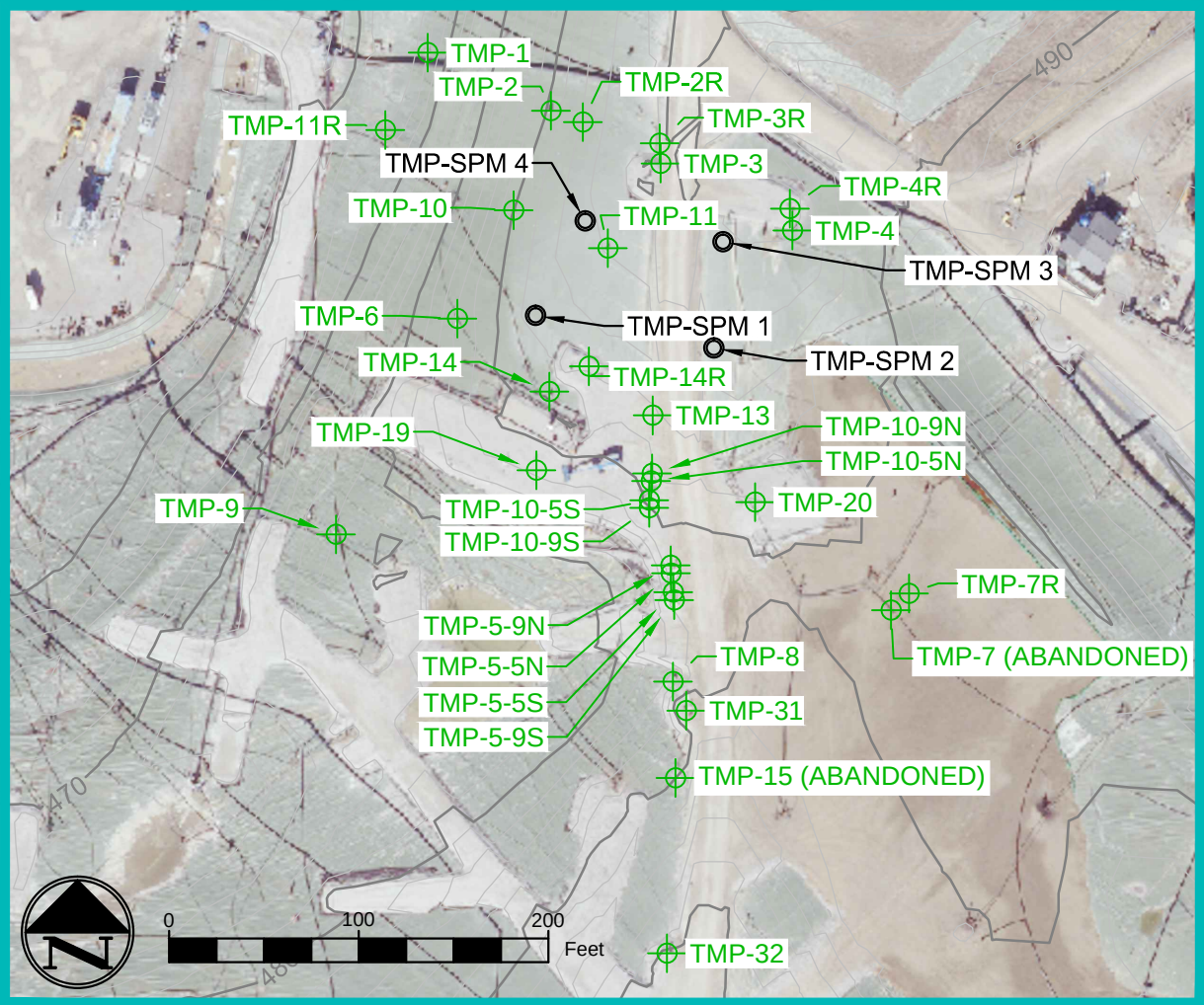
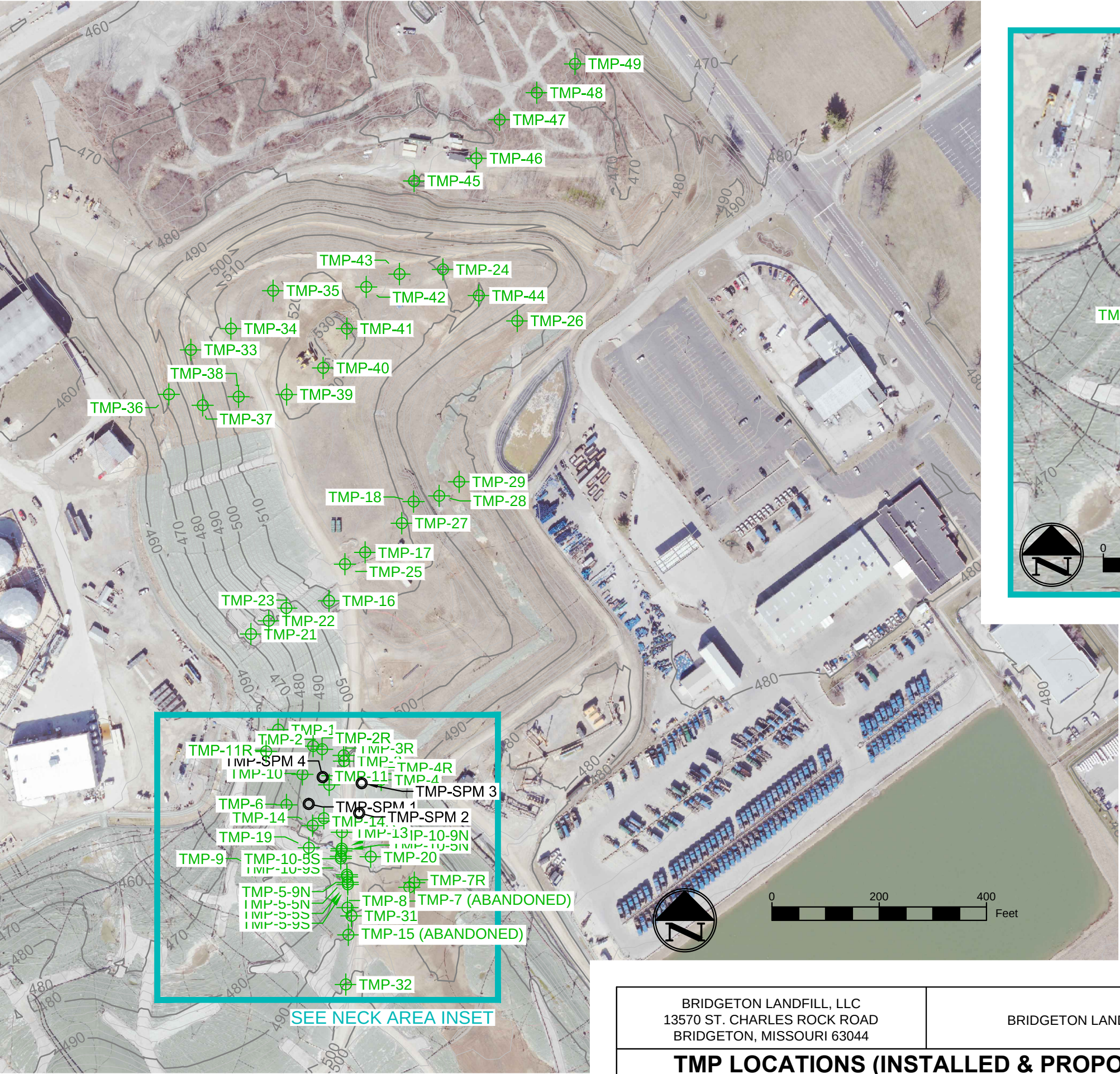


LCS-6B Liquid Level Above Quarry Floor



ATTACHMENT B

TEMPERATURE MONITORING PROBE ANALYTICAL CHARTS

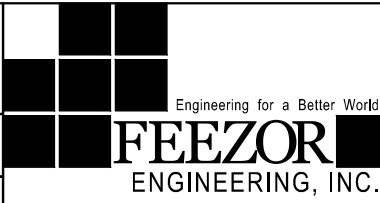


NECK AREA INSET

LEGEND

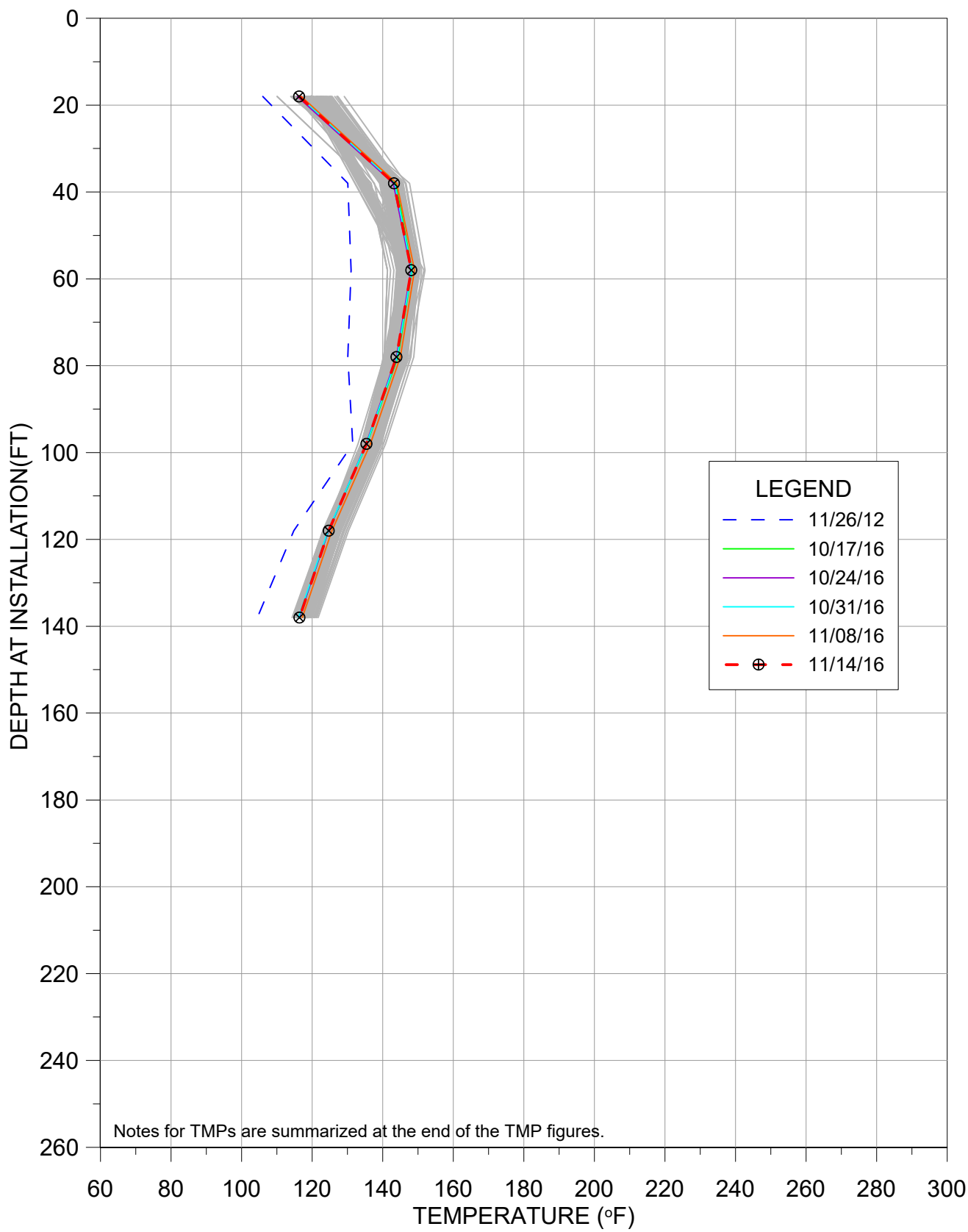
- 2016 AERIAL TOPOGRAPHY (2' CONTOUR)
- 2016 AERIAL TOPOGRAPHY (10' CONTOUR)
- INSTALLED TMP LOCATION
- TMP-SPM (ASBUILT OCTOBER 13, 2016)
- INFLUENT COOLING LOOP PIPING
- EFFLUENT COOLING LOOP PIPING
- HEAT EXTRACTION BARRIER - ZONE OF INFLUENCE
- HEAT EXTRACTION WELL

NOTE:
1.) 2016 AERIAL TOPOGRAPHY PROVIDED BY COOPER AERIAL SURVEYS, INC. AND IS DATED FEBRUARY 27, 2016

BRIDGETON LANDFILL, LLC 13570 ST. CHARLES ROCK ROAD BRIDGETON, MISSOURI 63044	BRIDGETON LANDFILL		OCTOBER 2016		DRAWING NO.: ■■■■■
			DESIGNED BY: PML		
			APPROVED BY: ---		
TMP LOCATIONS (INSTALLED & PROPOSED)					
PROJECT NUMBER: BT-124	D:\Dropbox\BT-113 Task - Action Plan Figure 3\Weekly Report Updated TMP Drawing\BT-124 Weekly TMP Update.dwg		REVISION		DATE

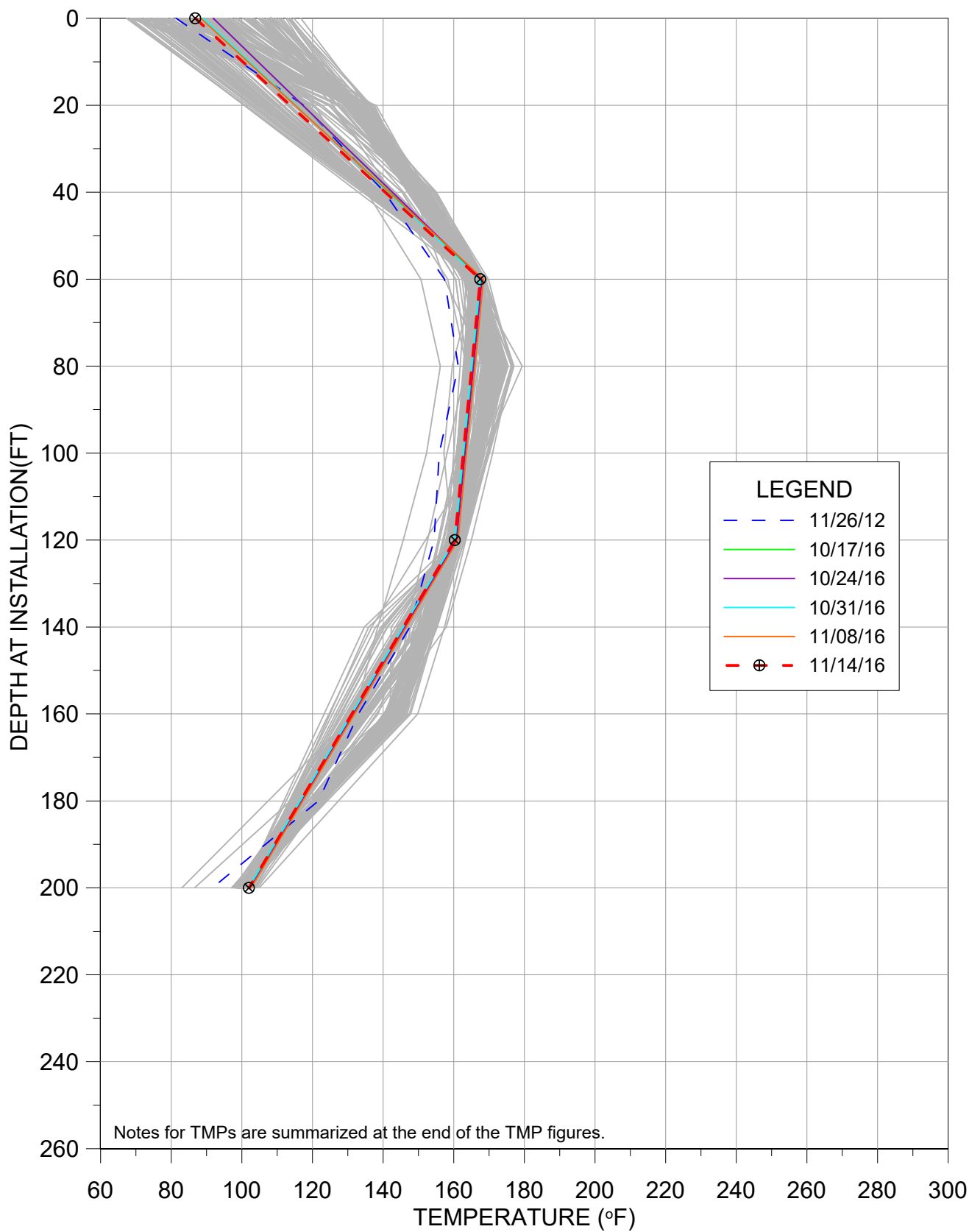
TMP LOCATIONS (INSTALLED & PROPOSED)

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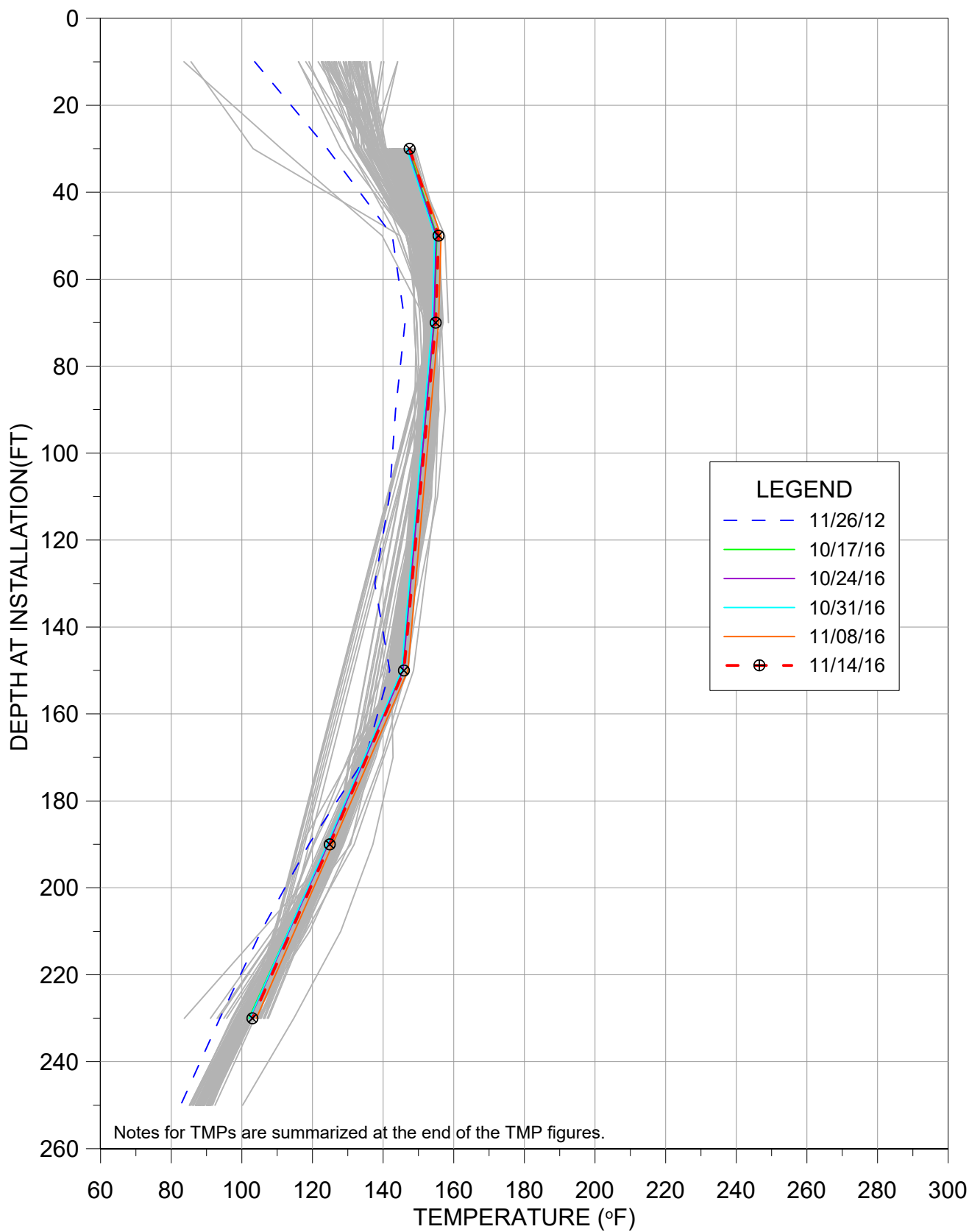
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-2

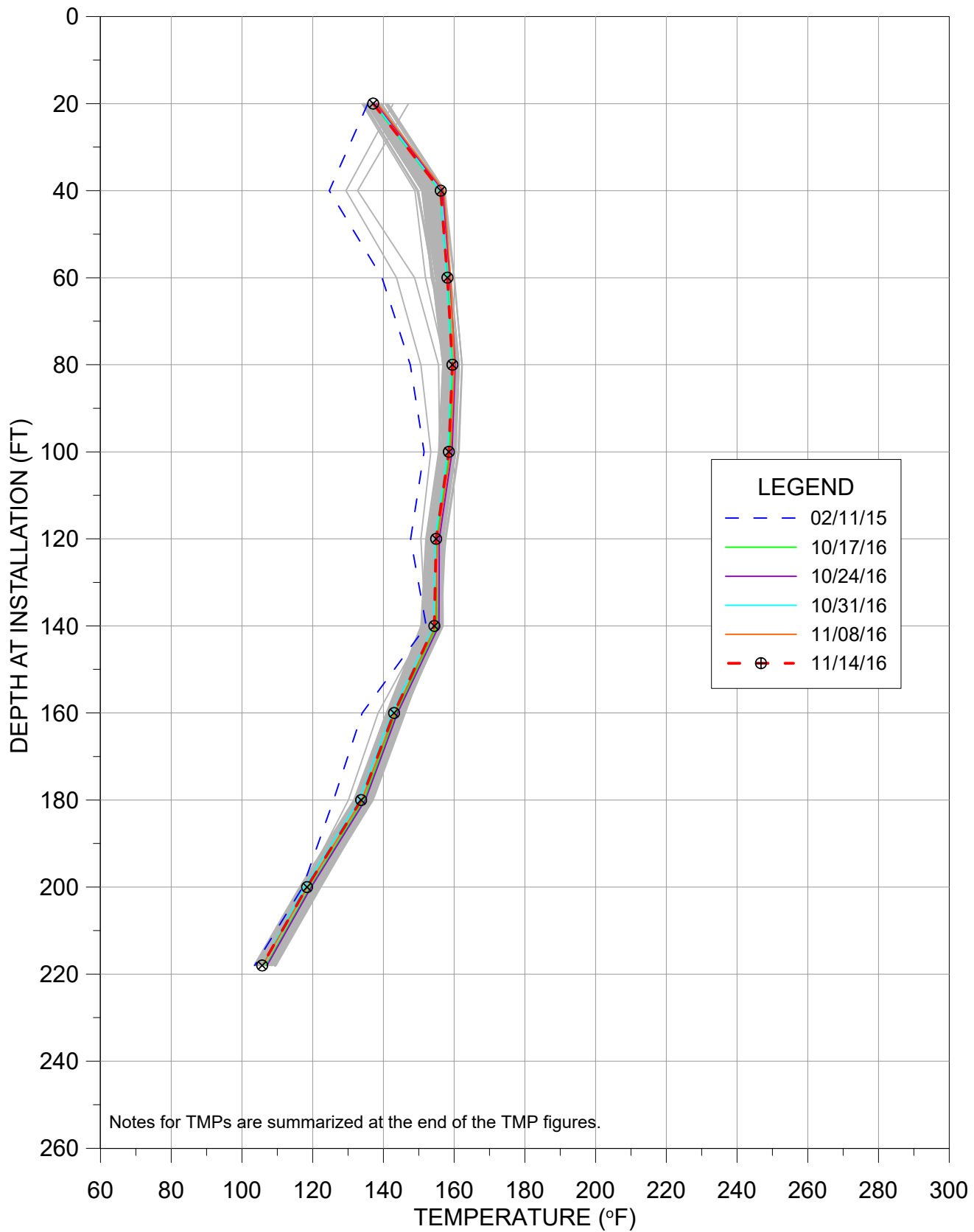


TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

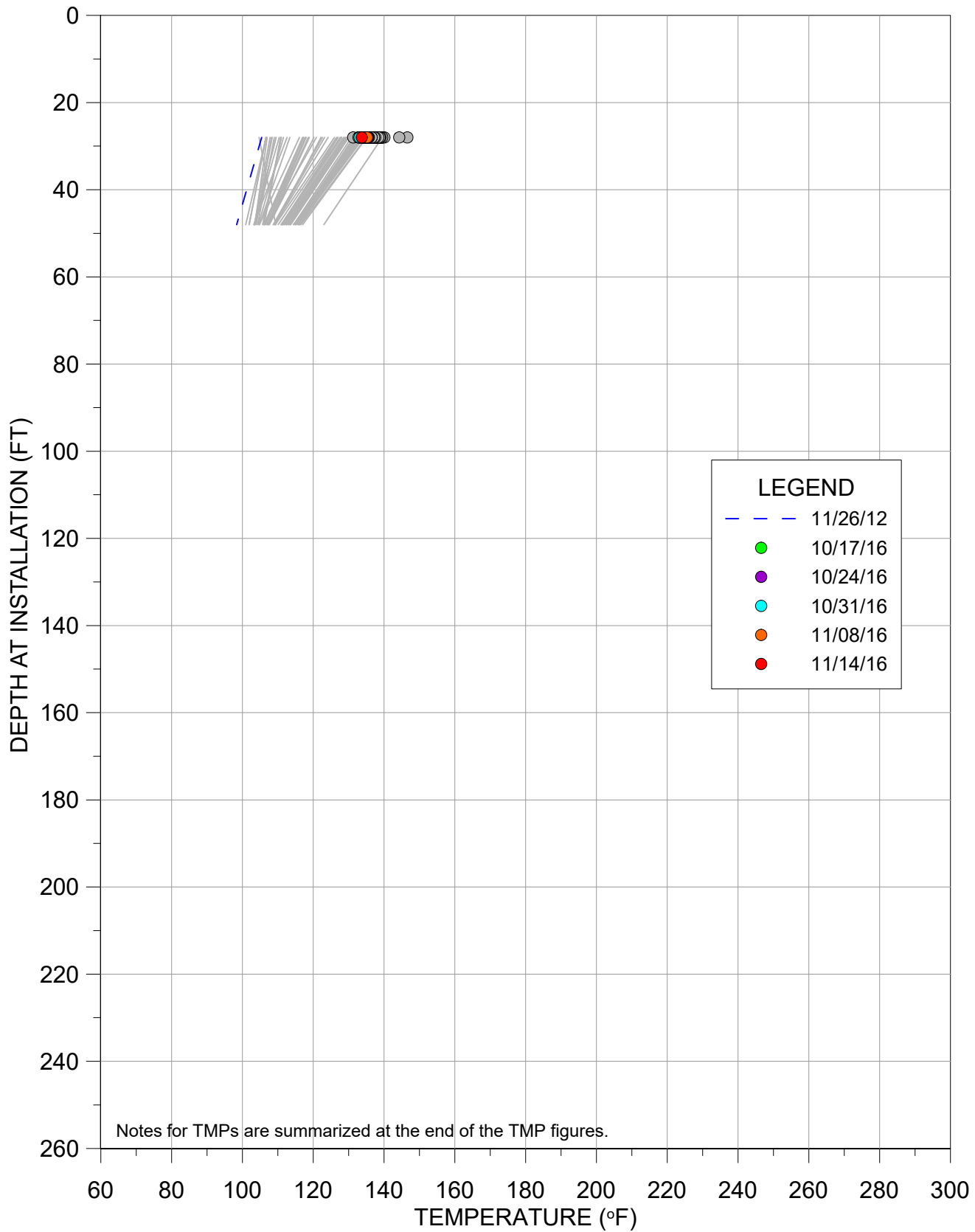
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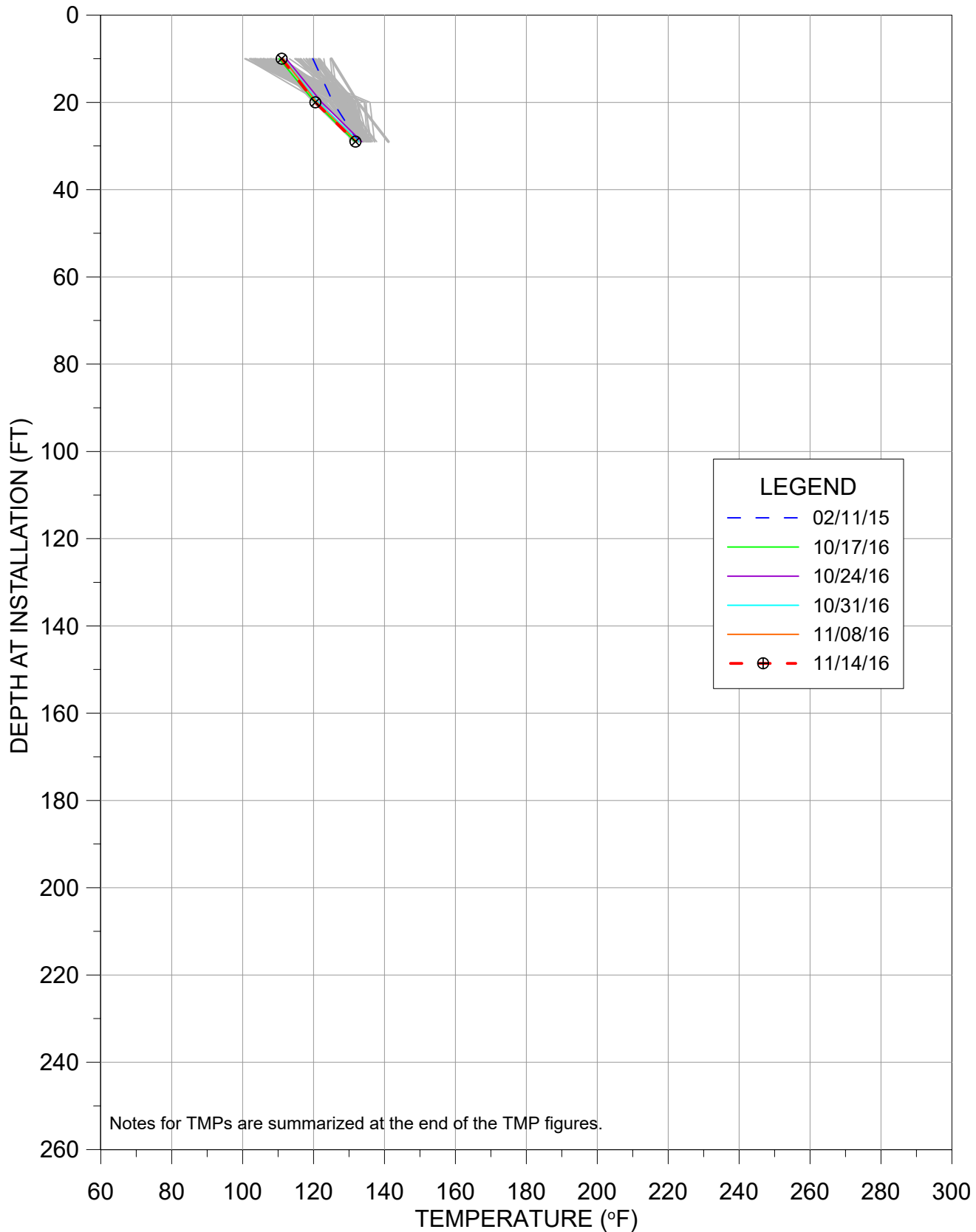
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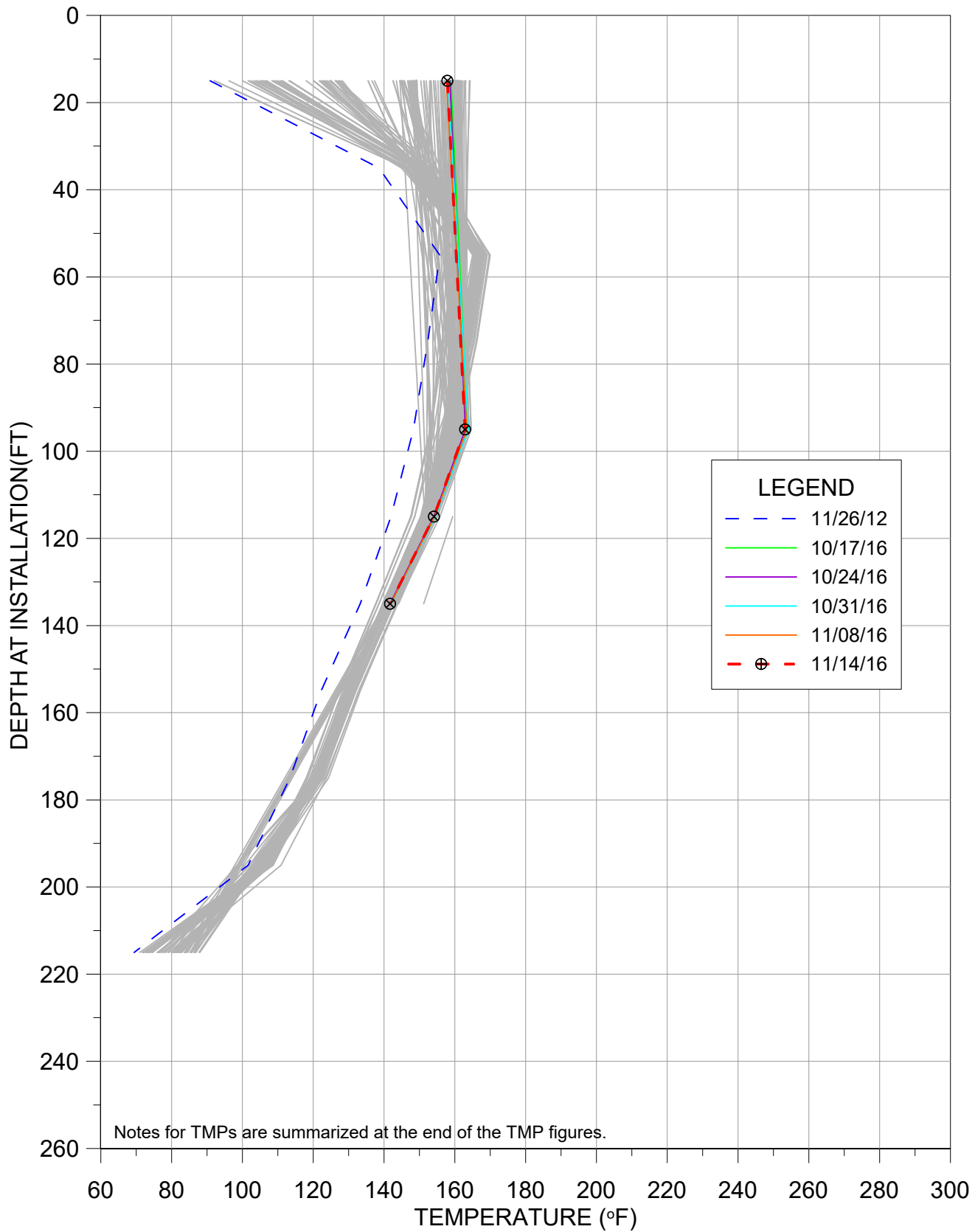
TMP-4



TMP-4R

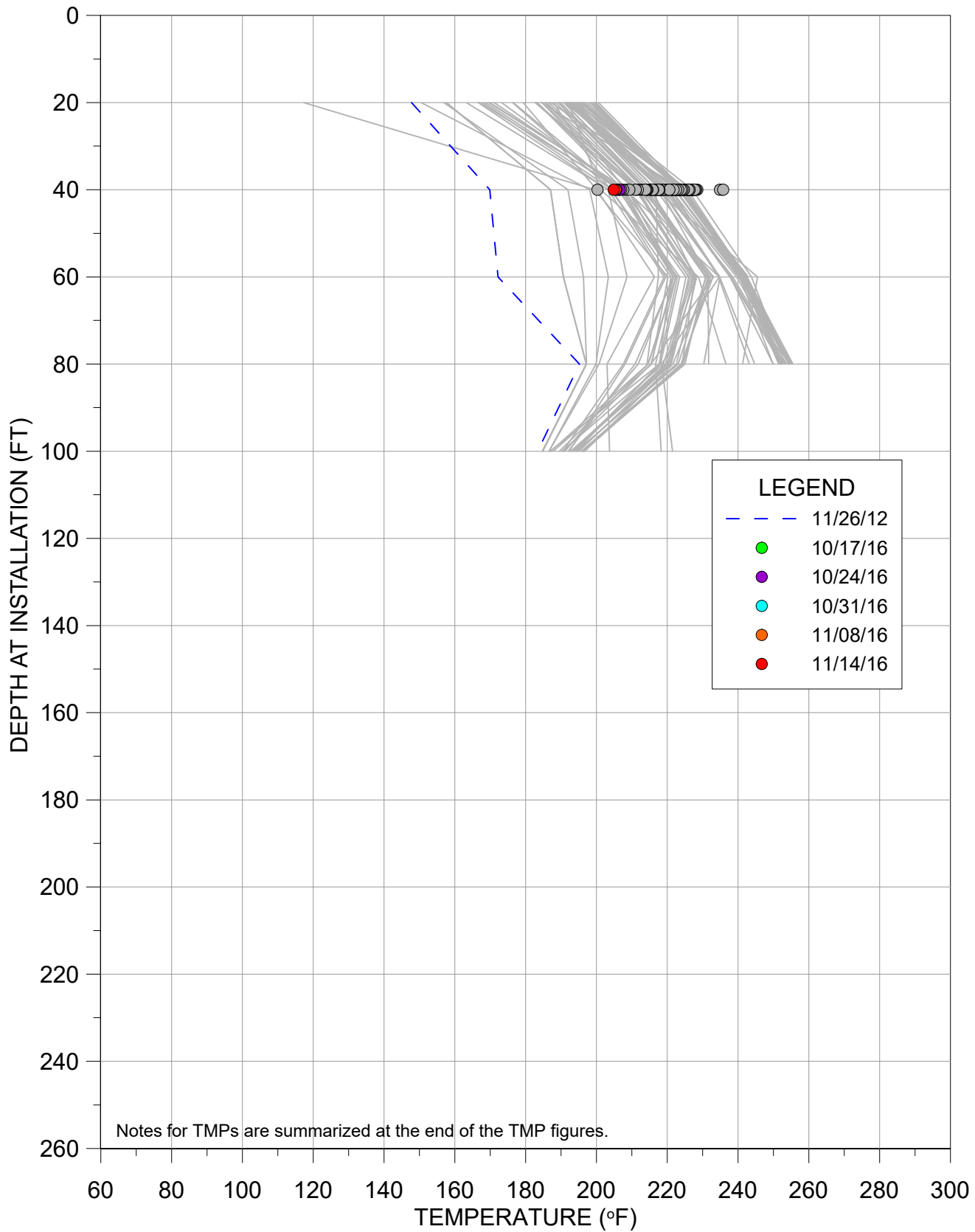


TMP-6



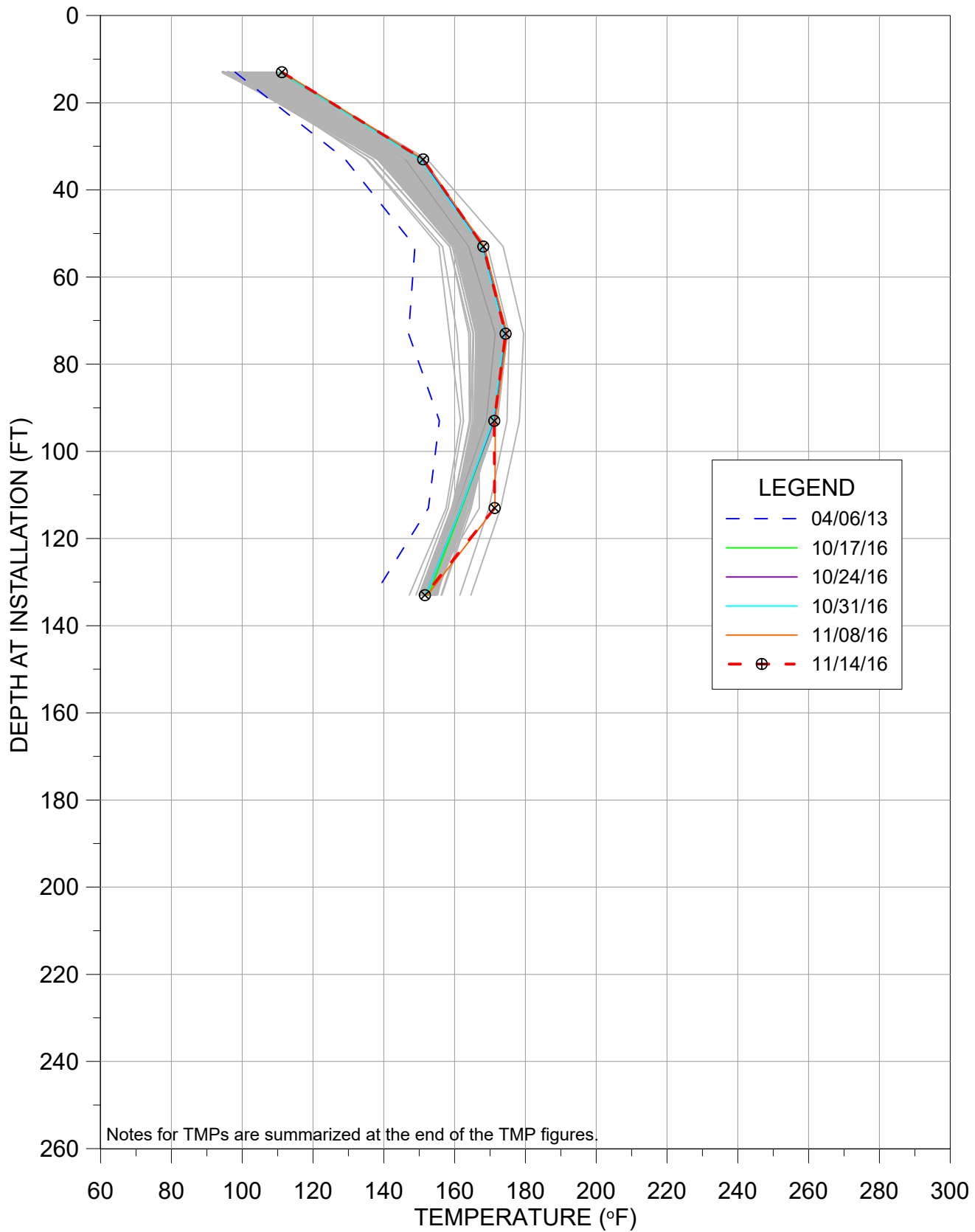
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-9

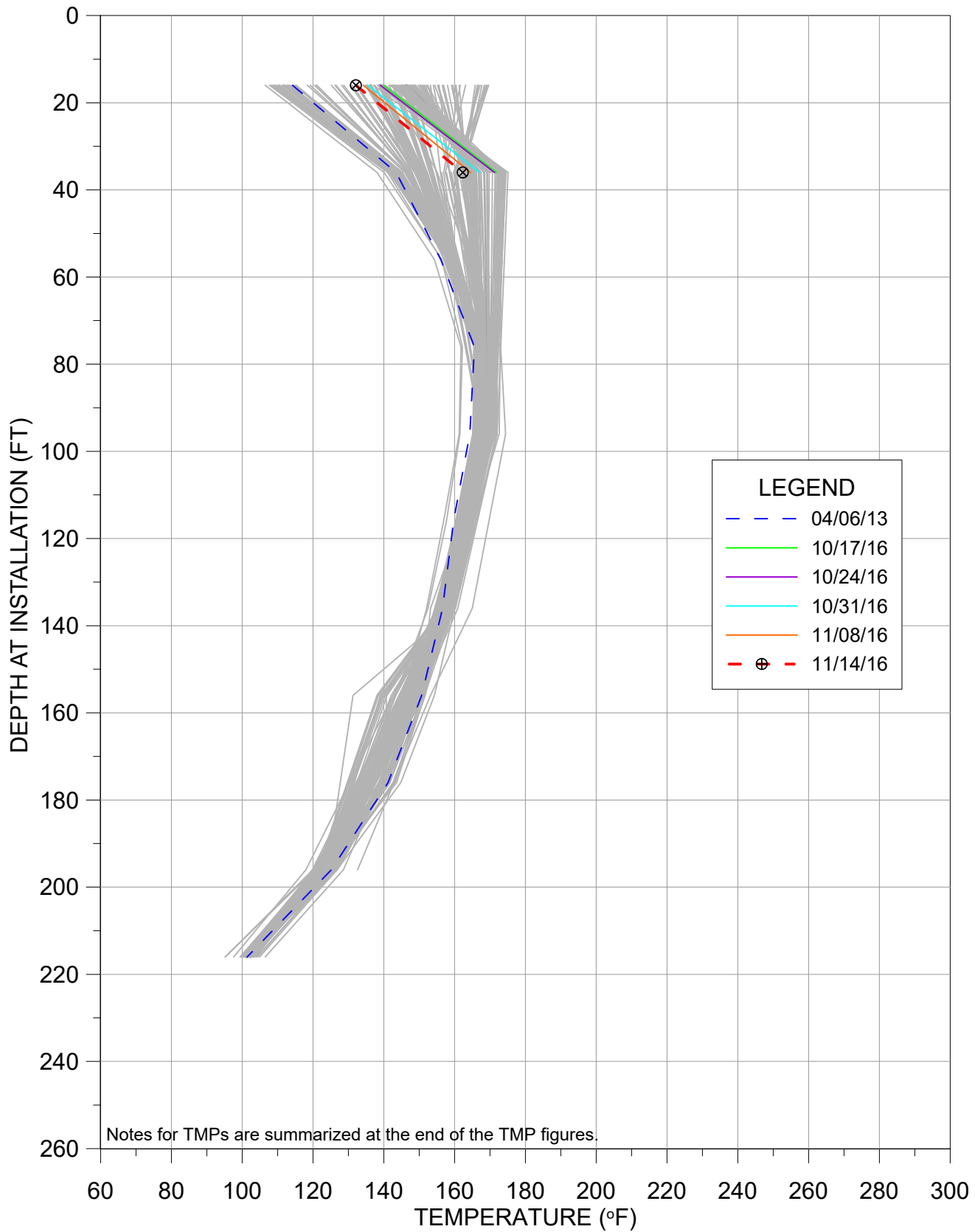


TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

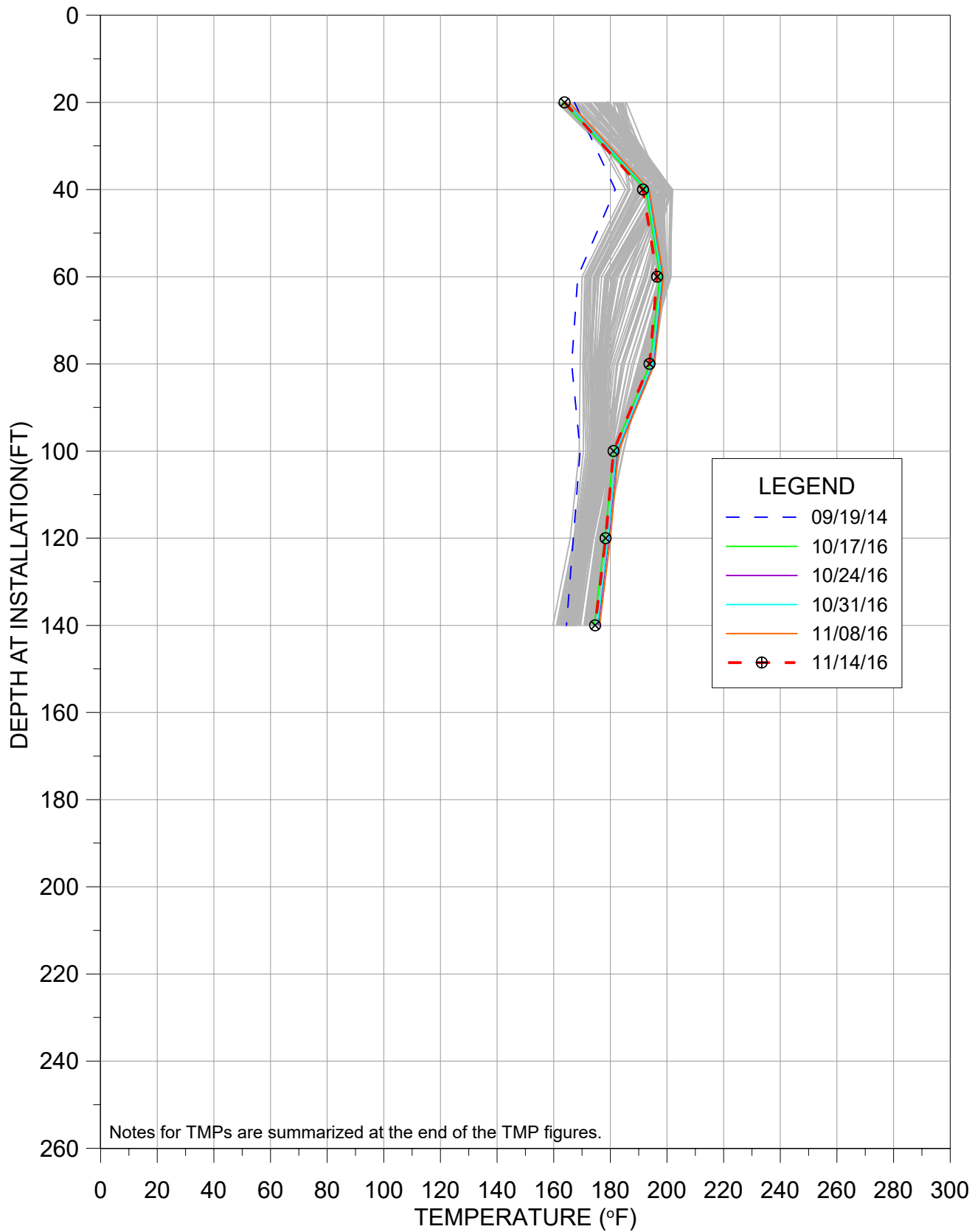
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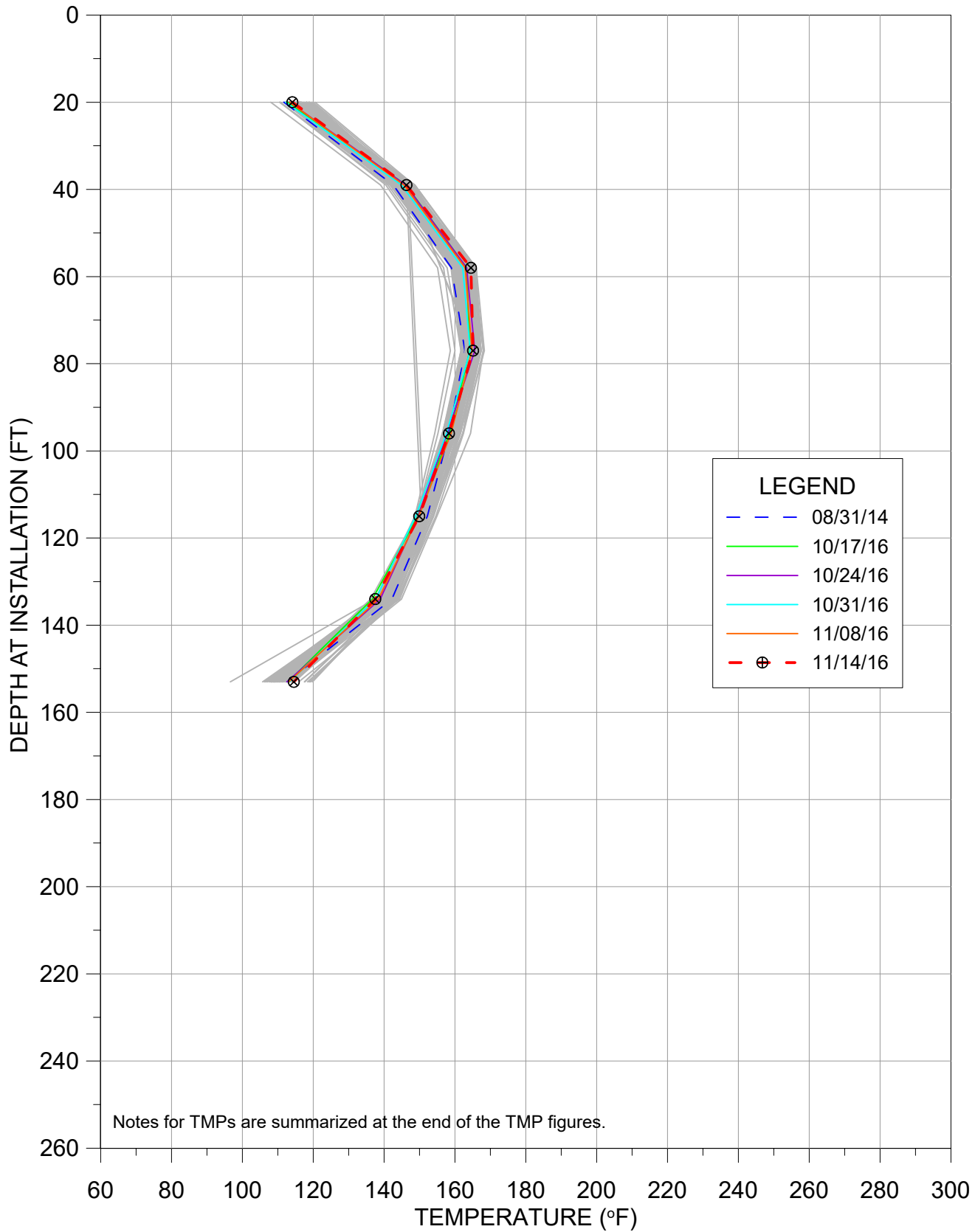
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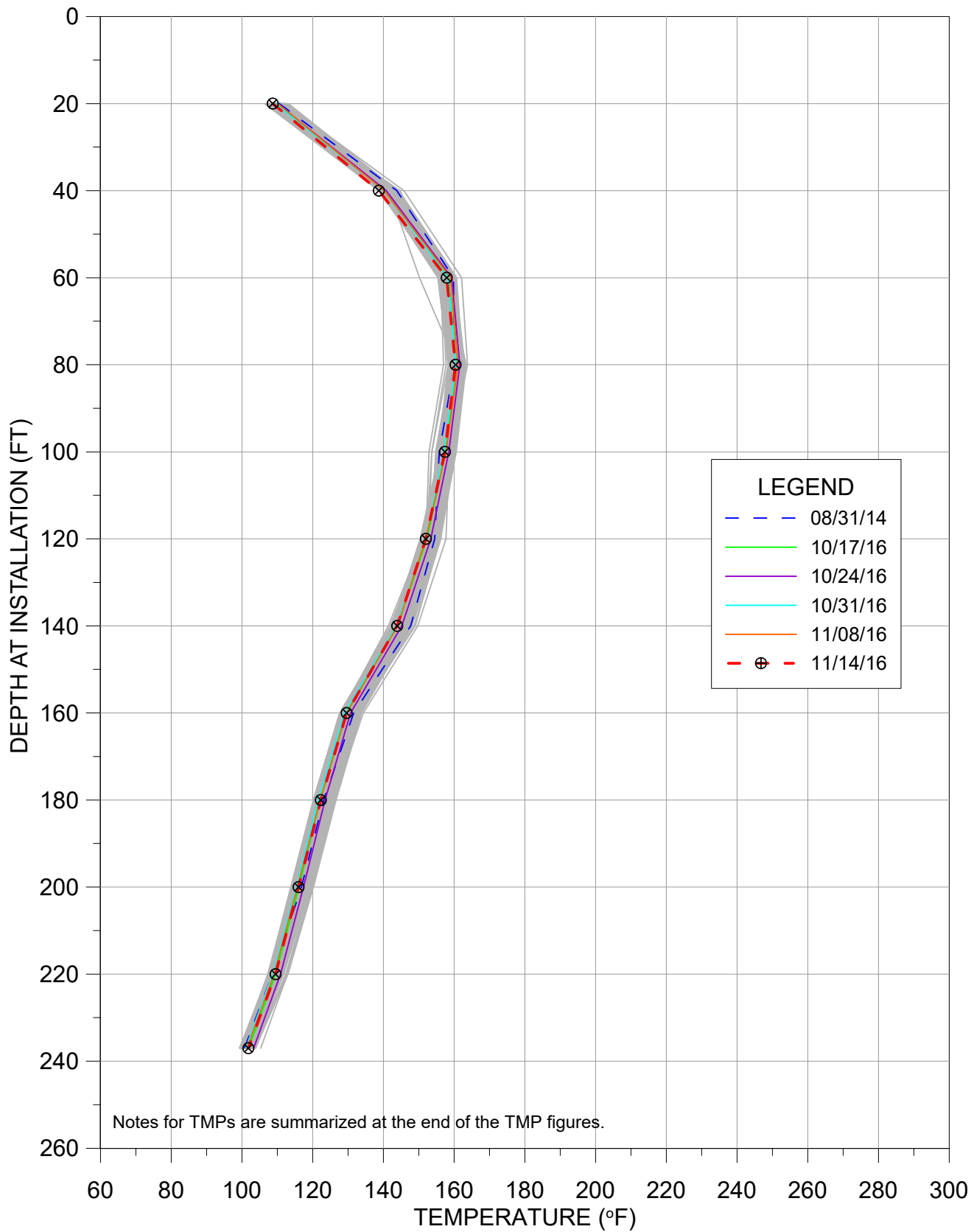
TMP-14R



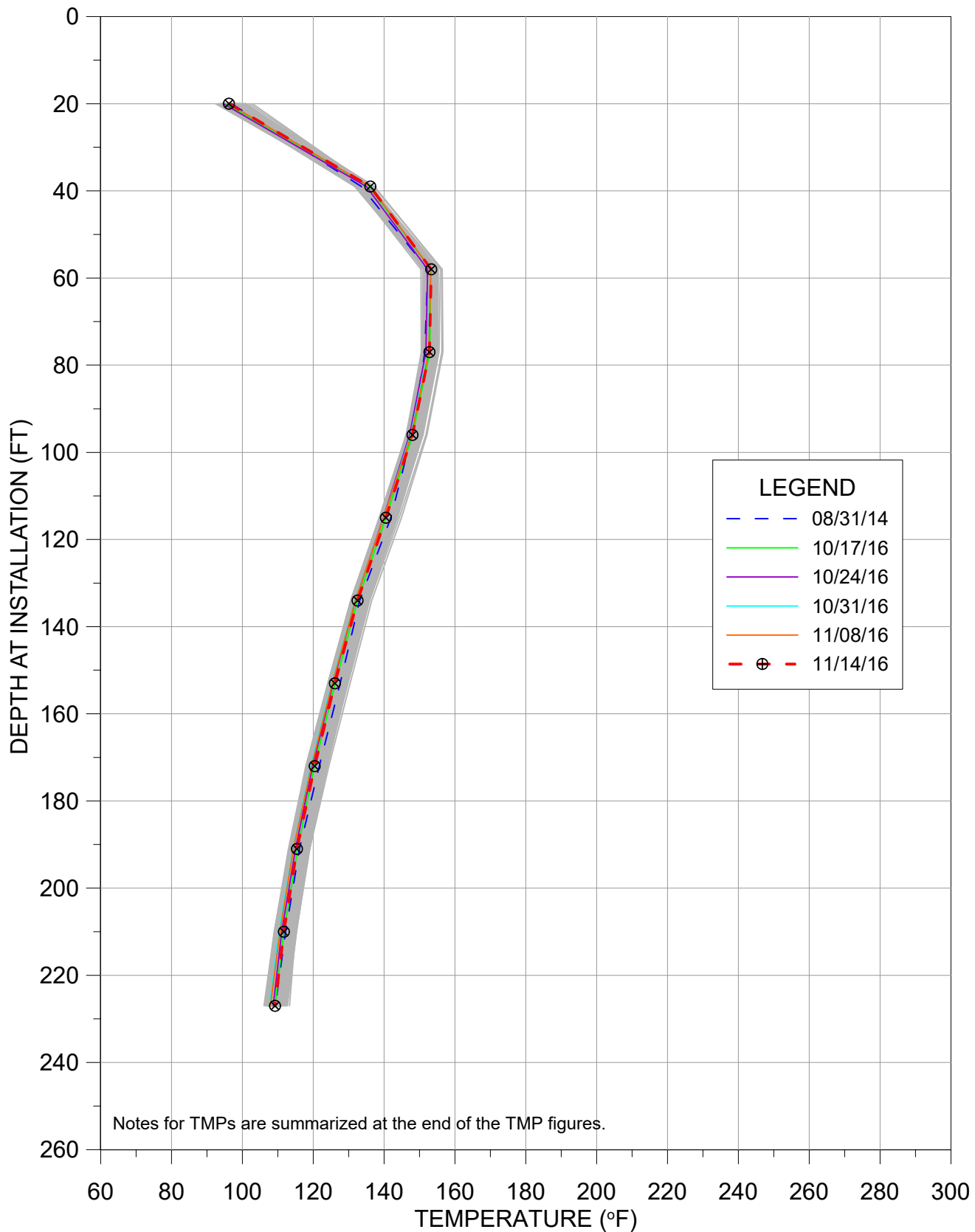
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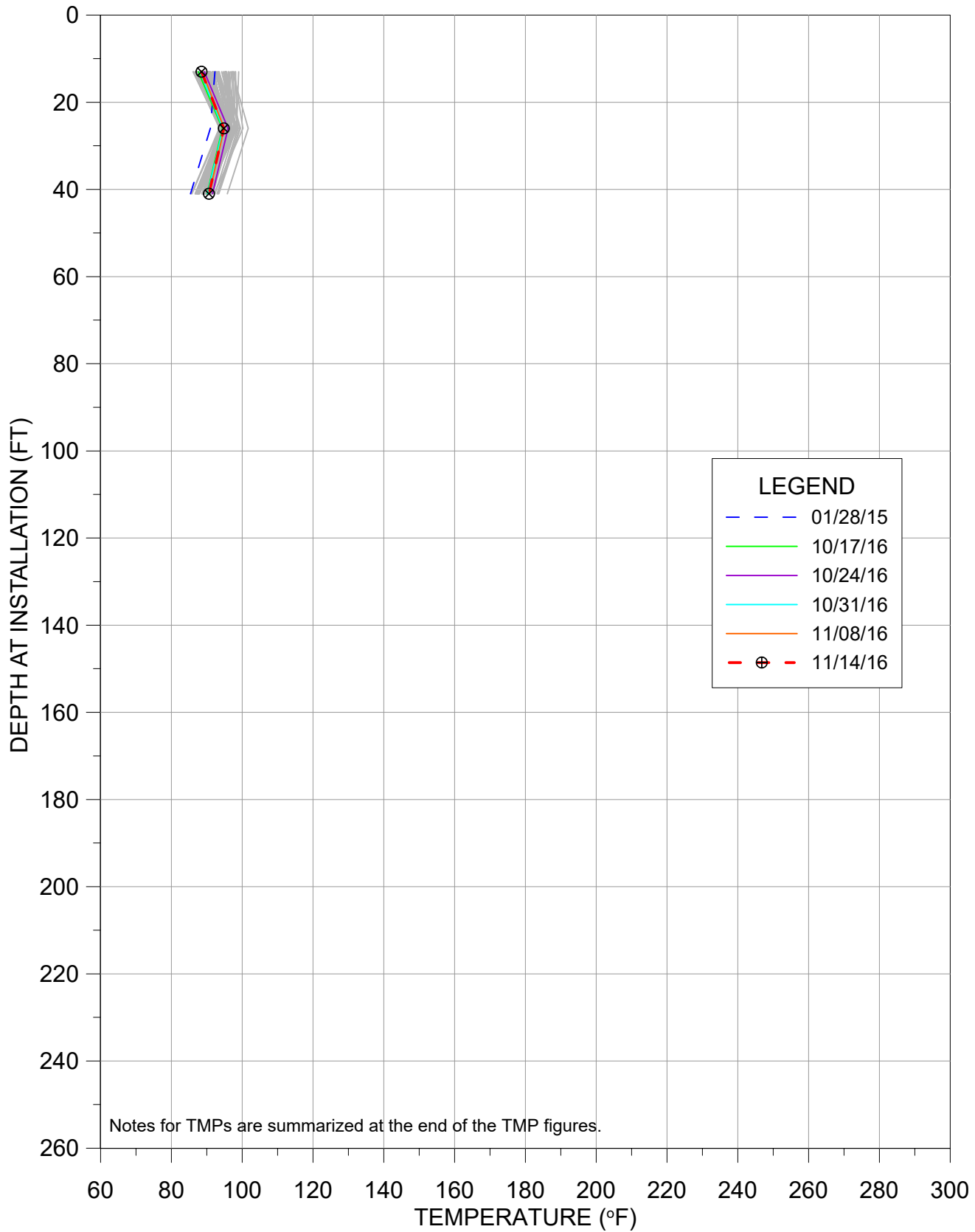
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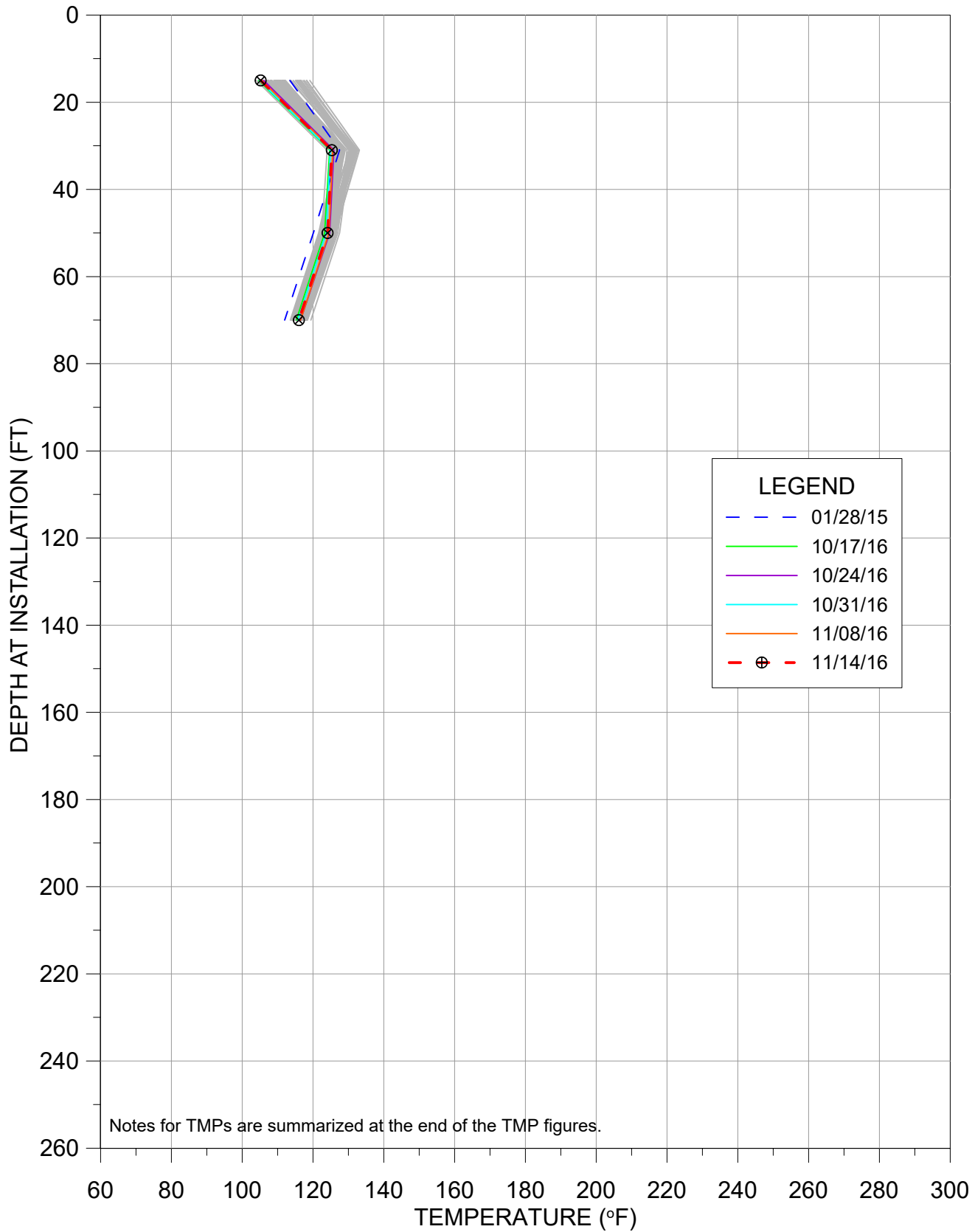
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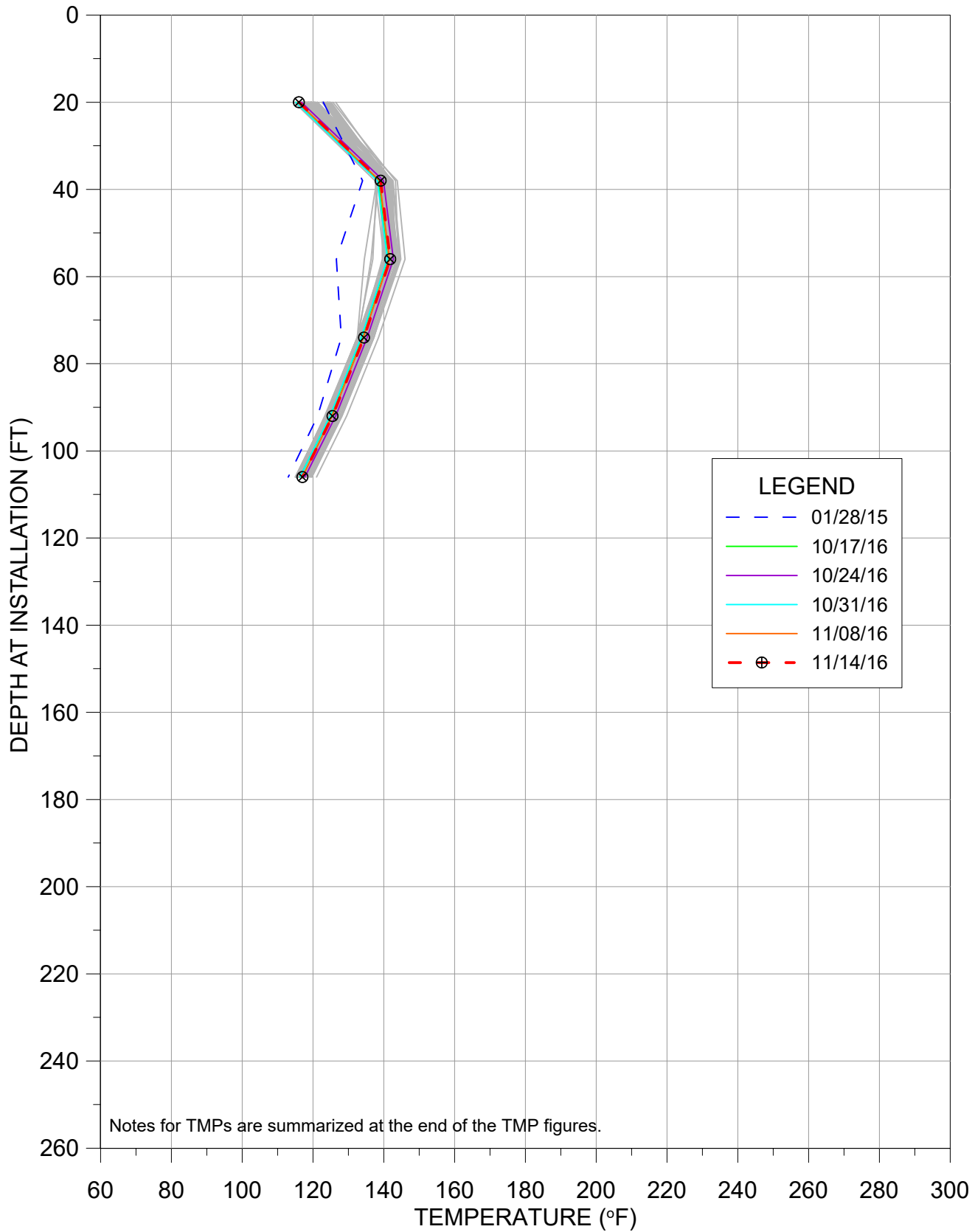
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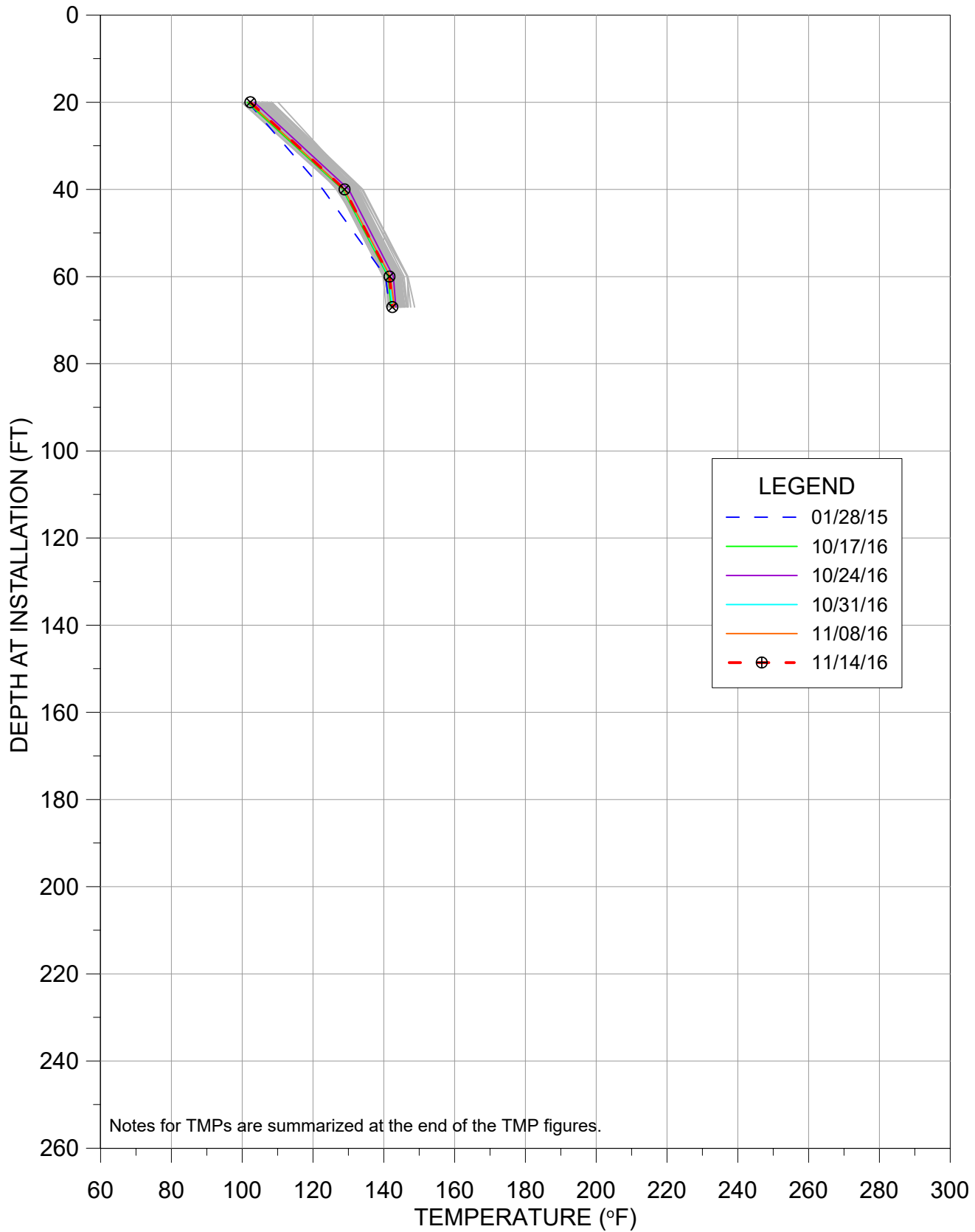
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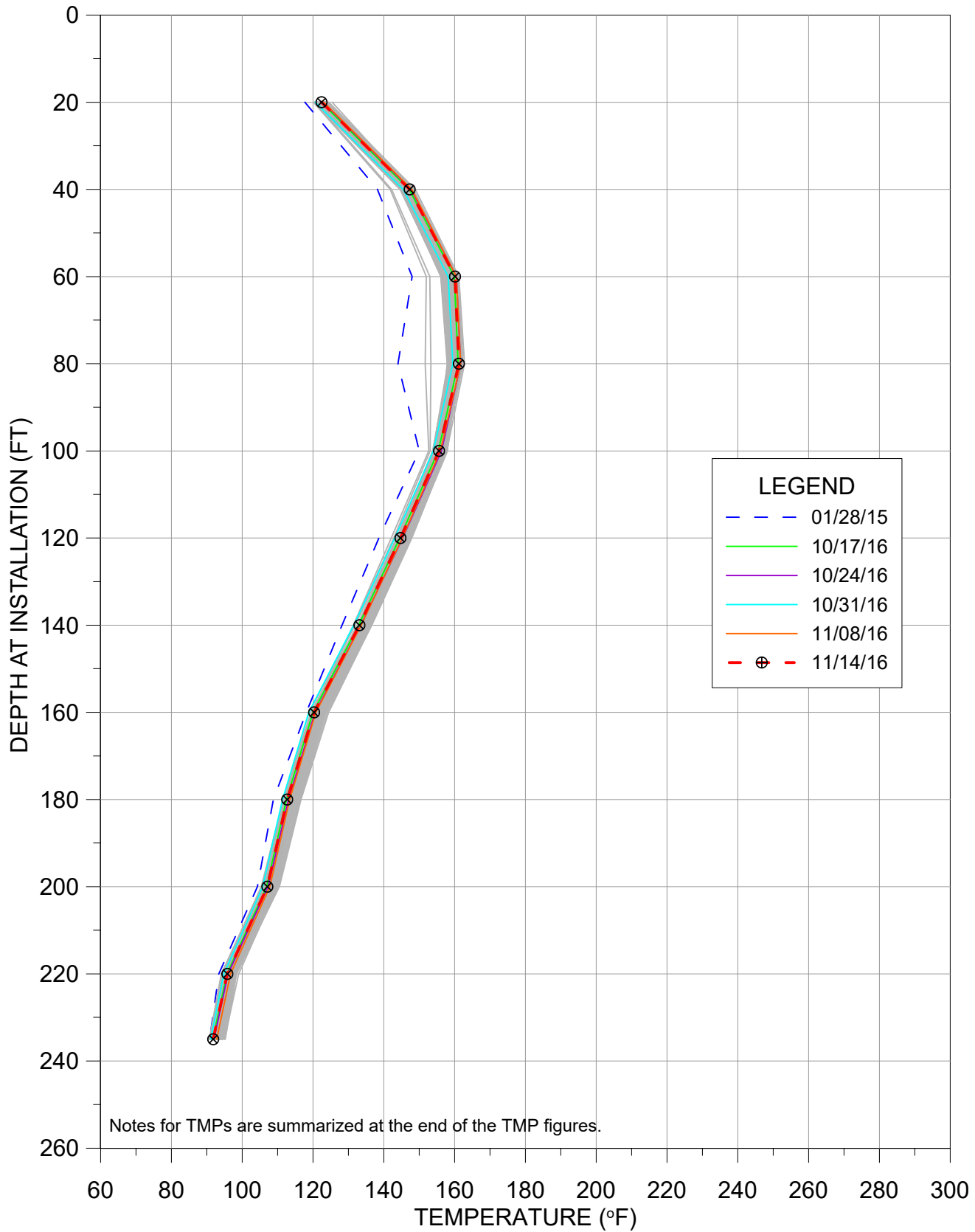
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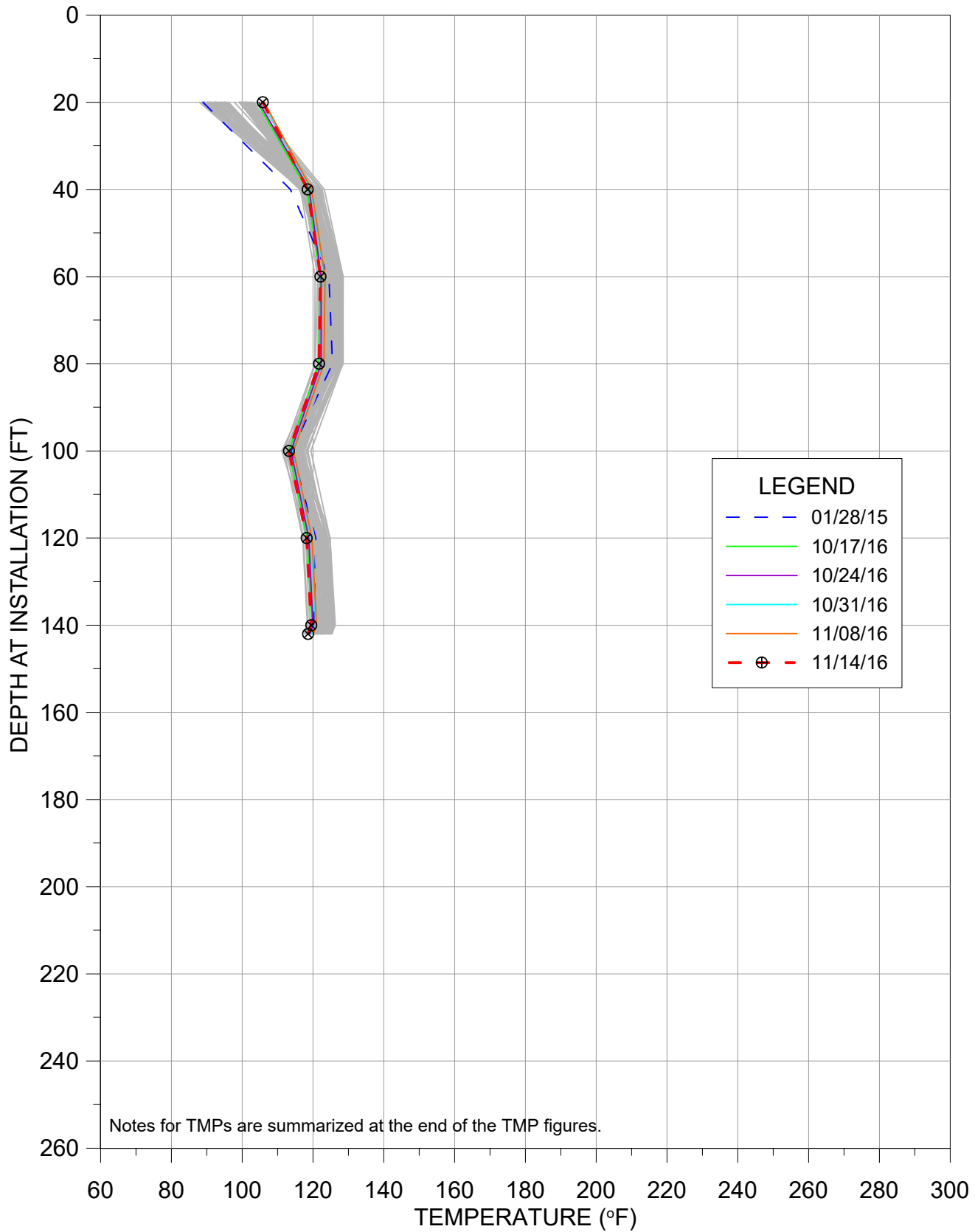
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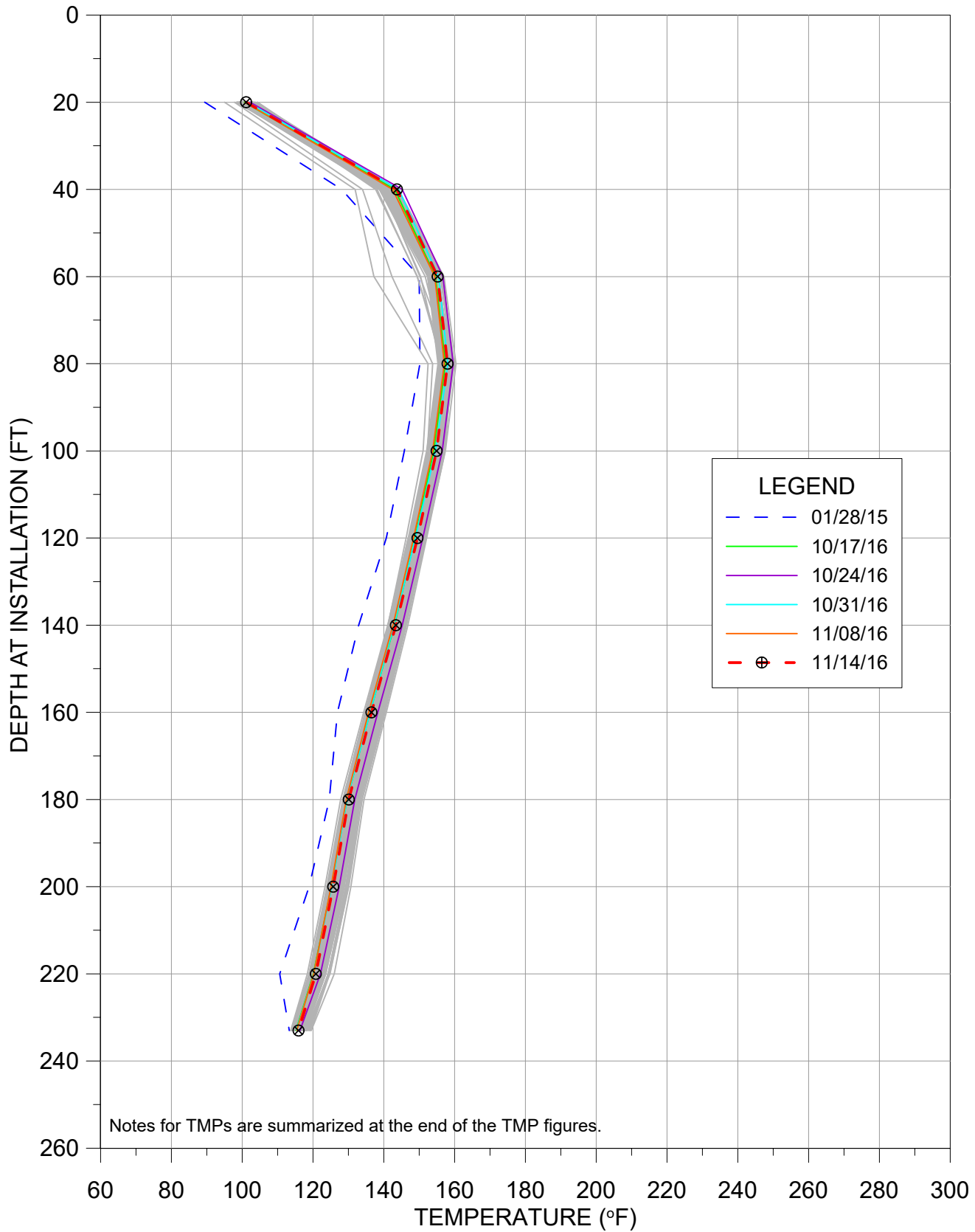
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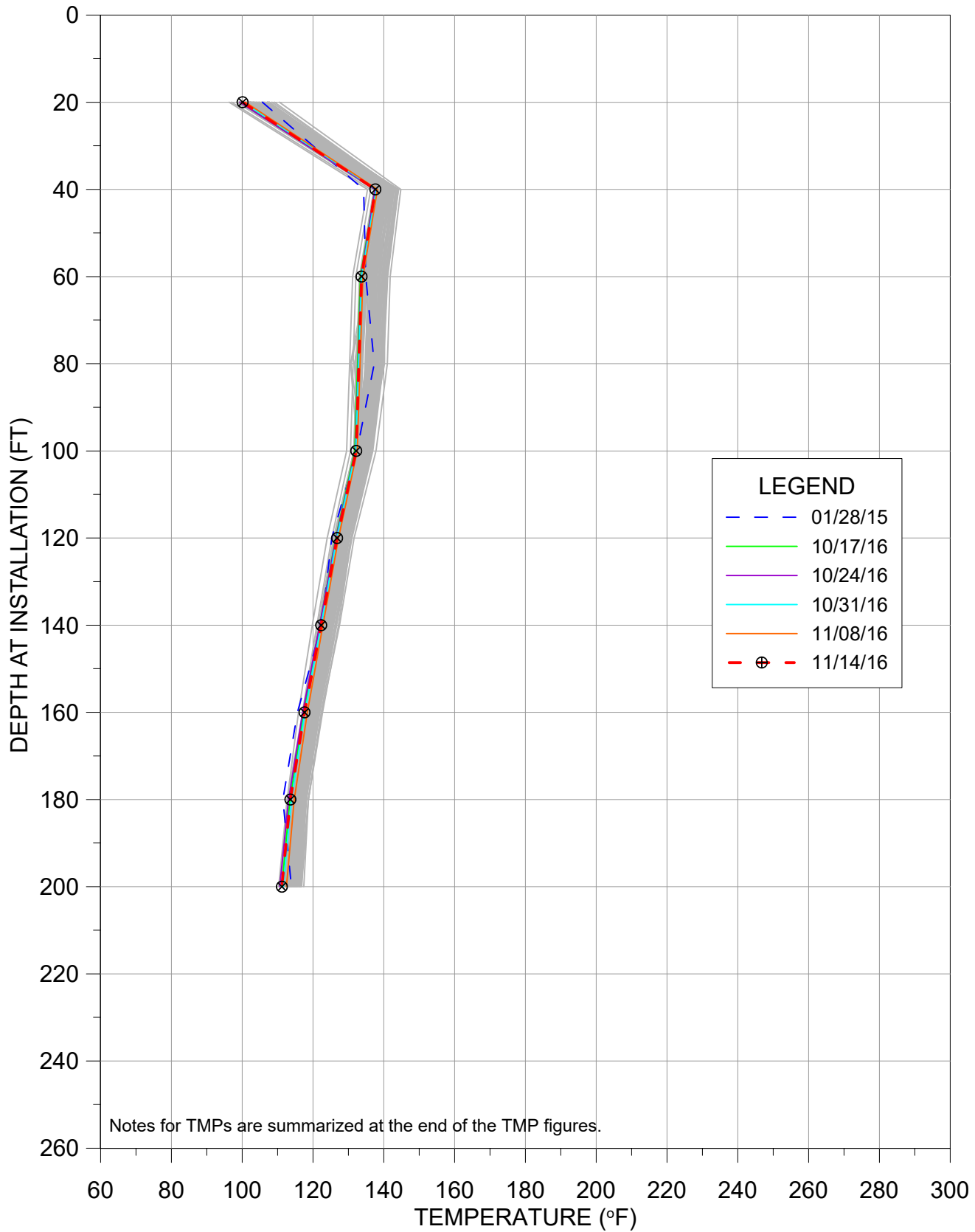
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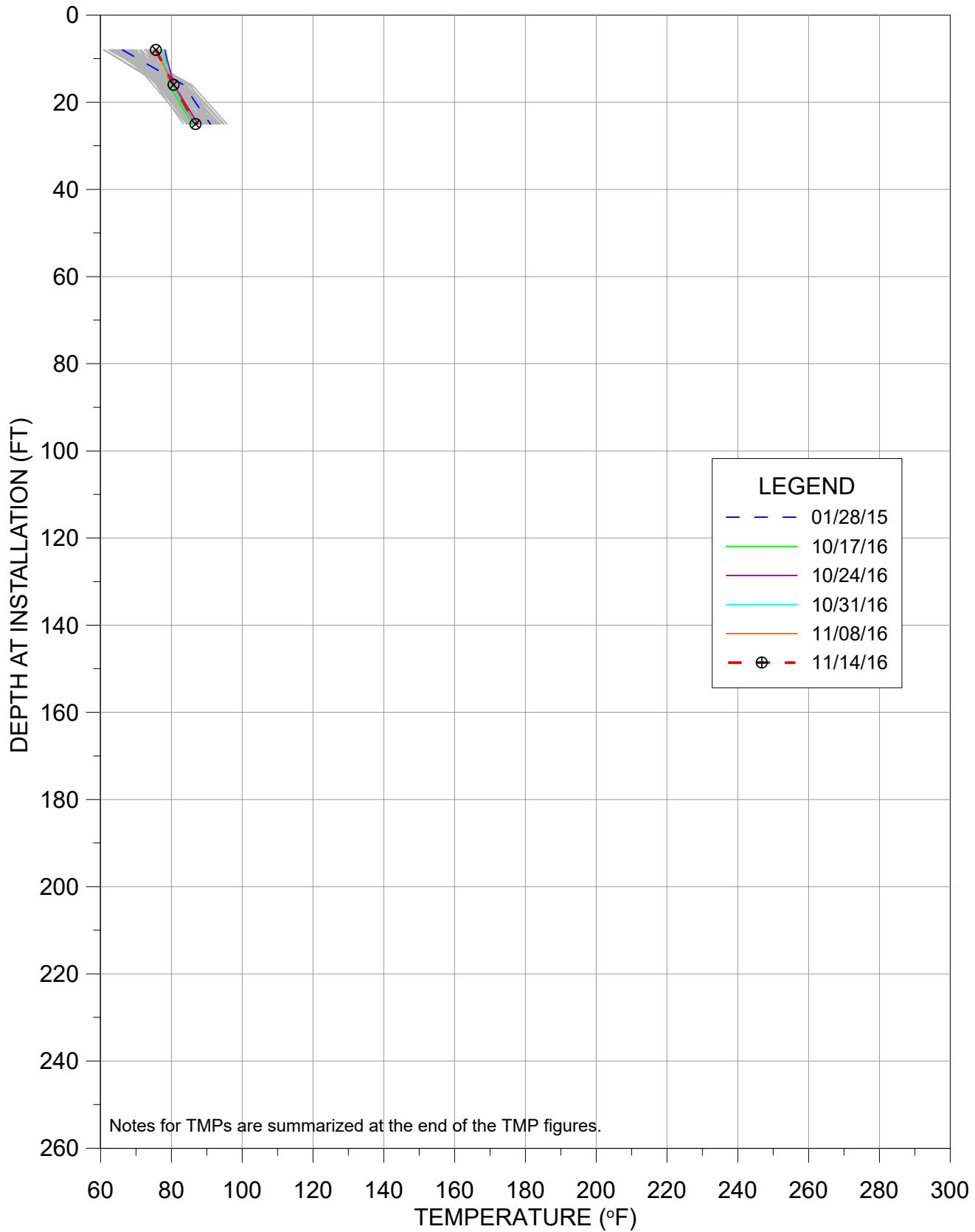
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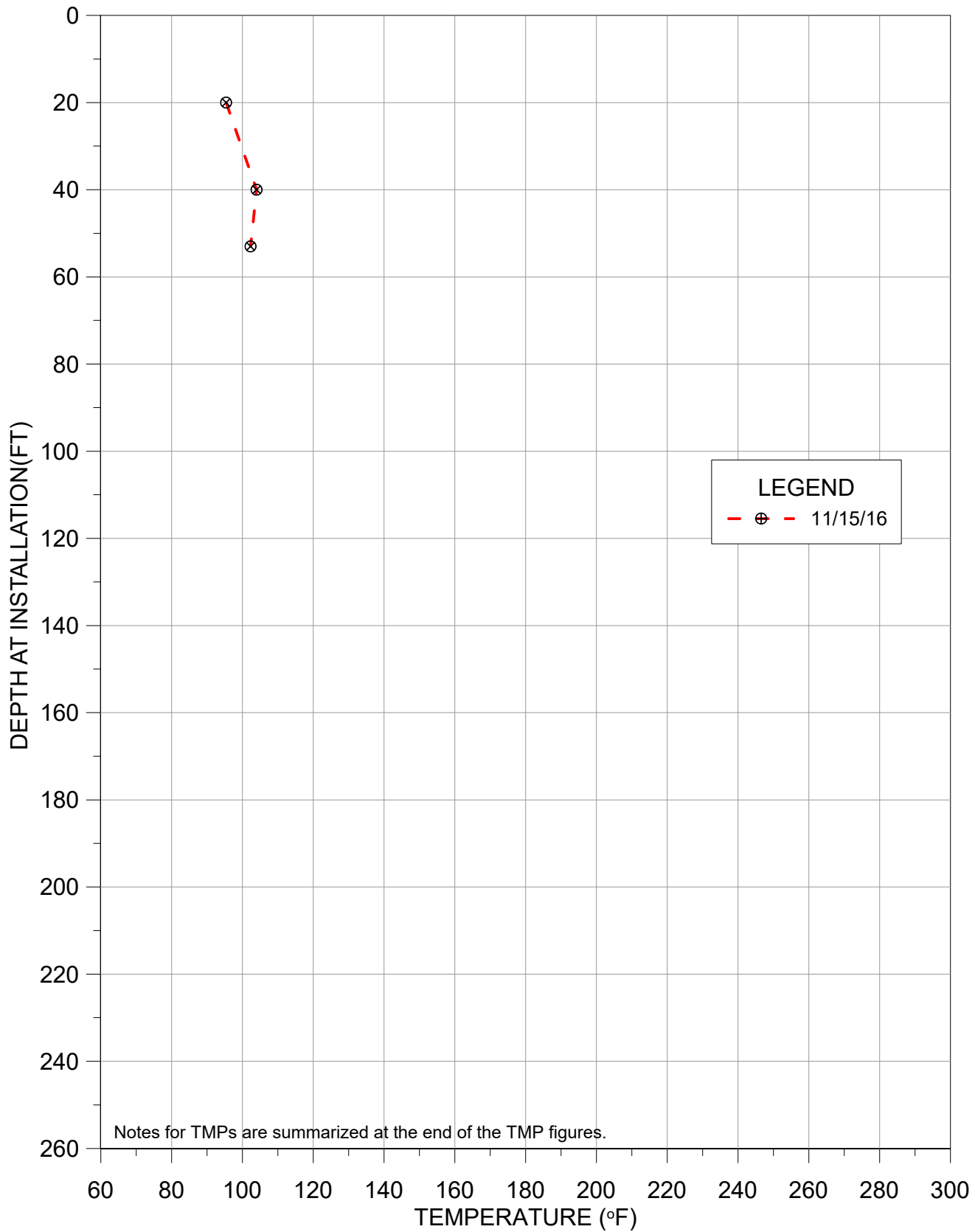
TMP-28



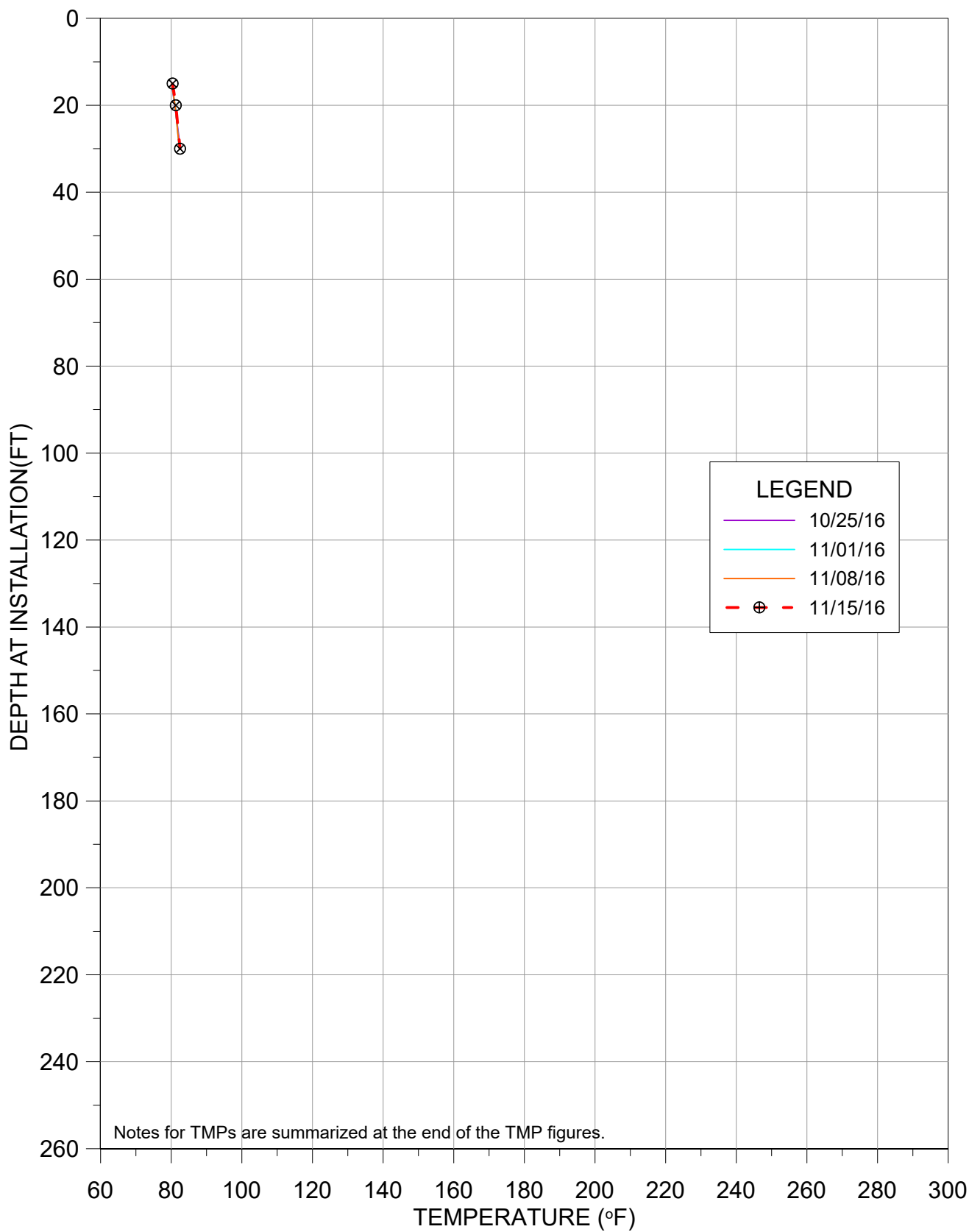
TMP-29



TMP-33

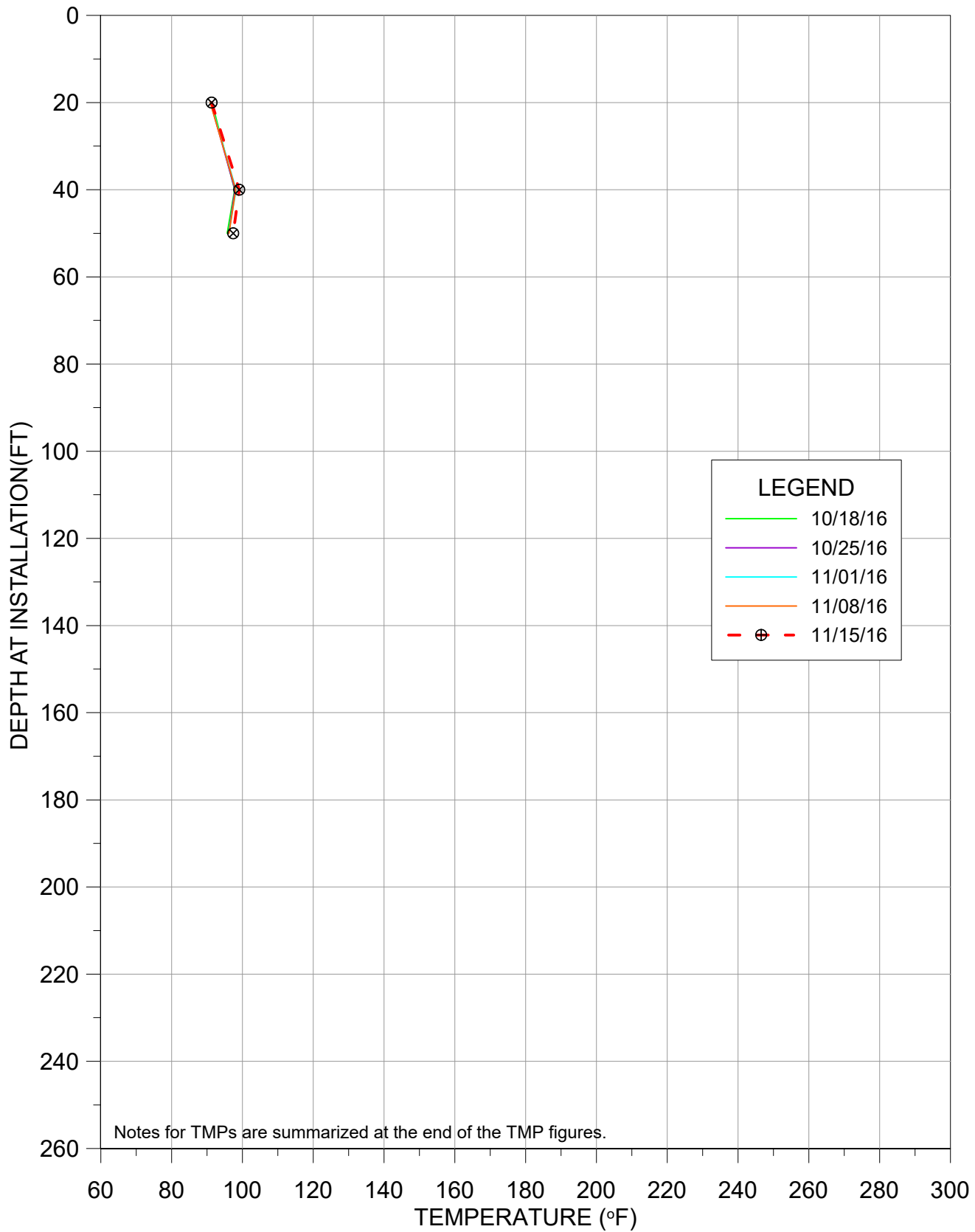


TMP-36

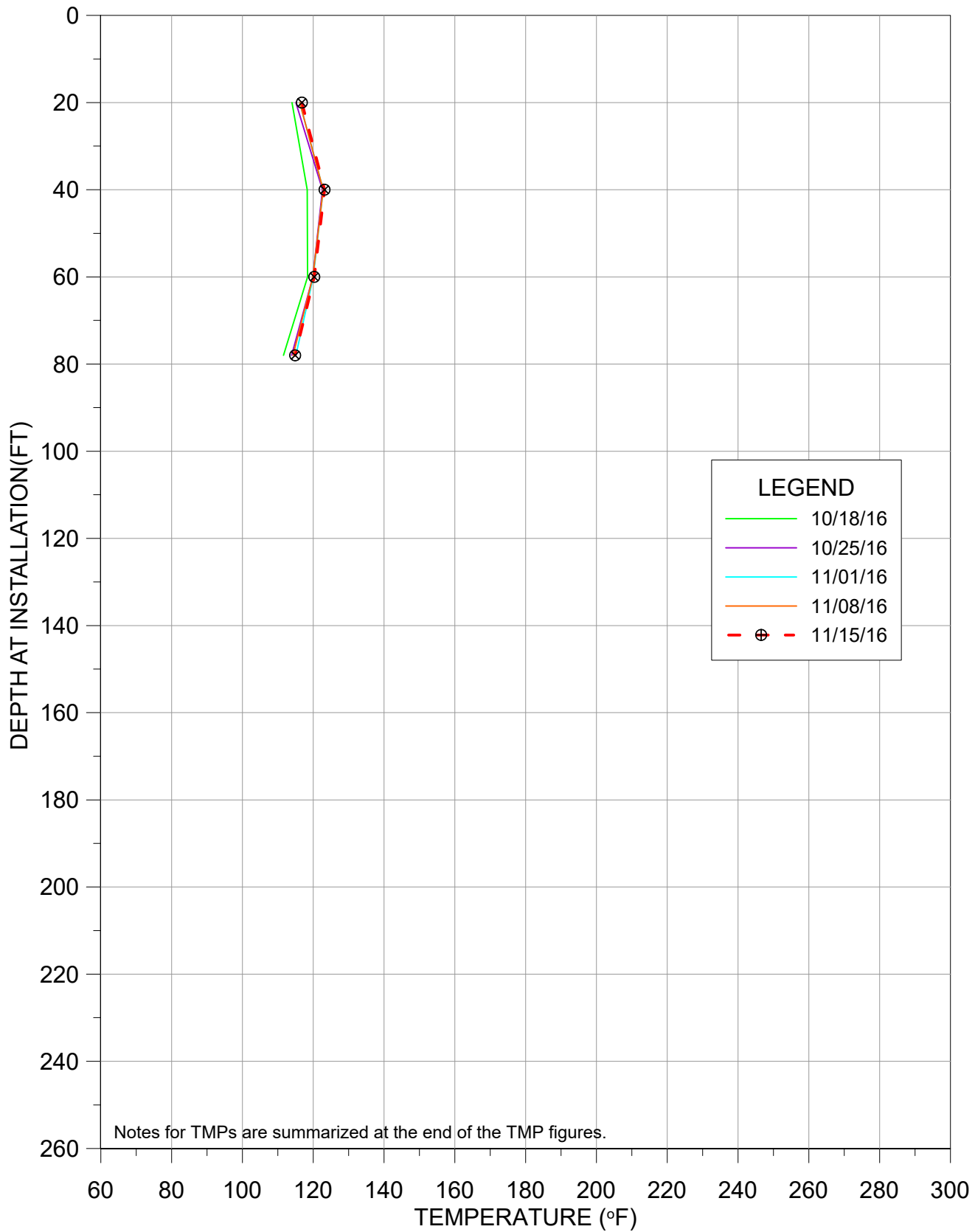


TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

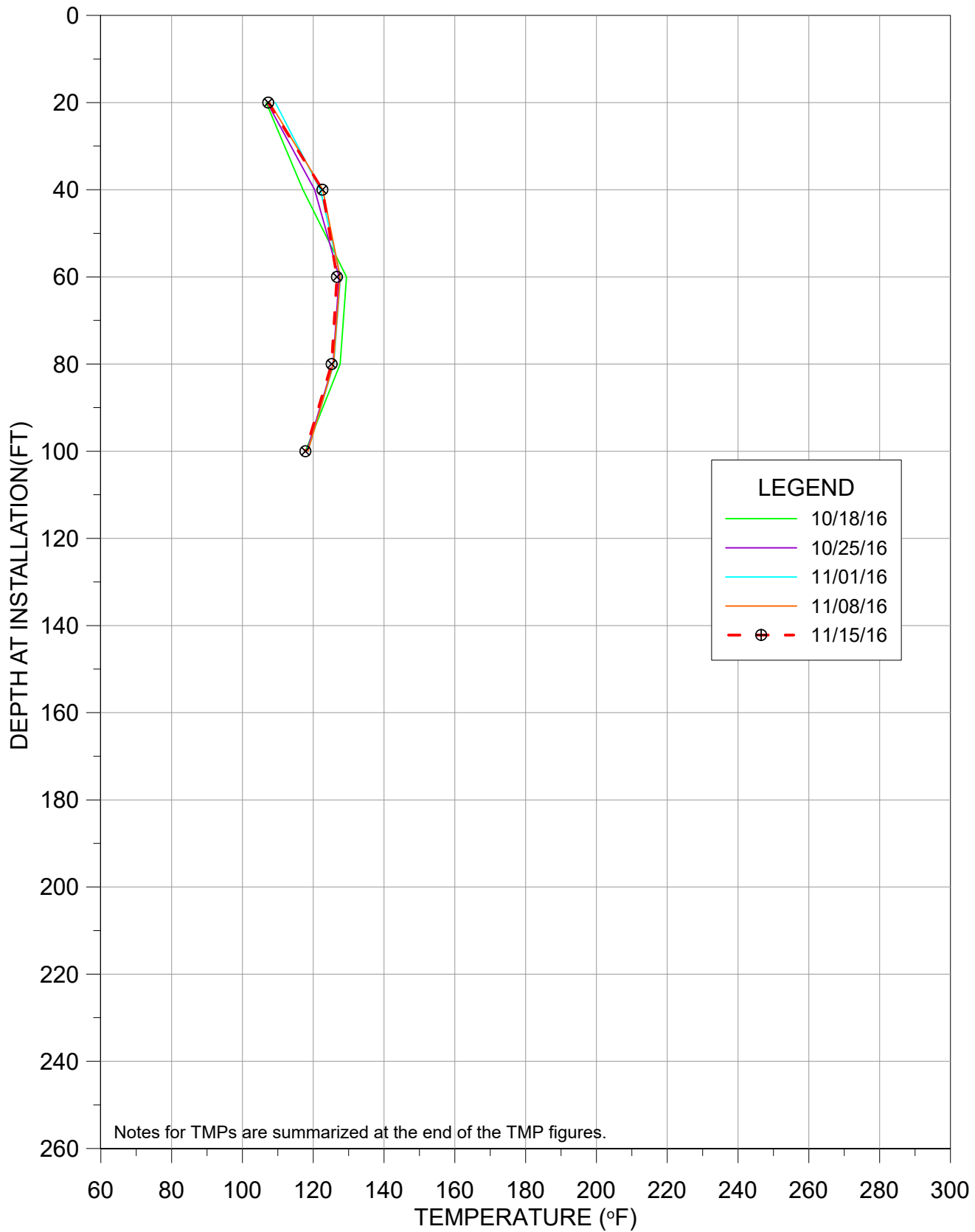
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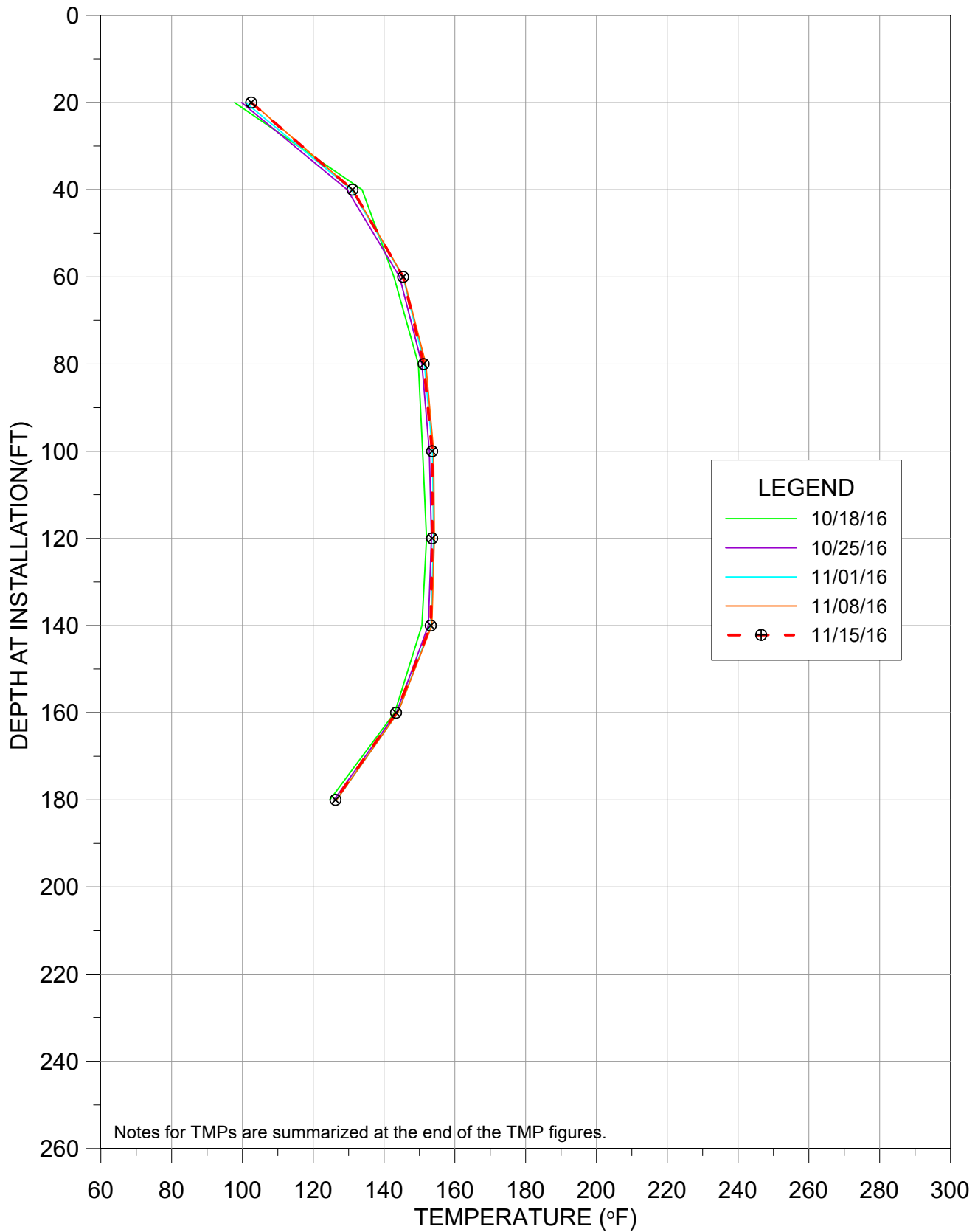
TMP-42



TMP-43

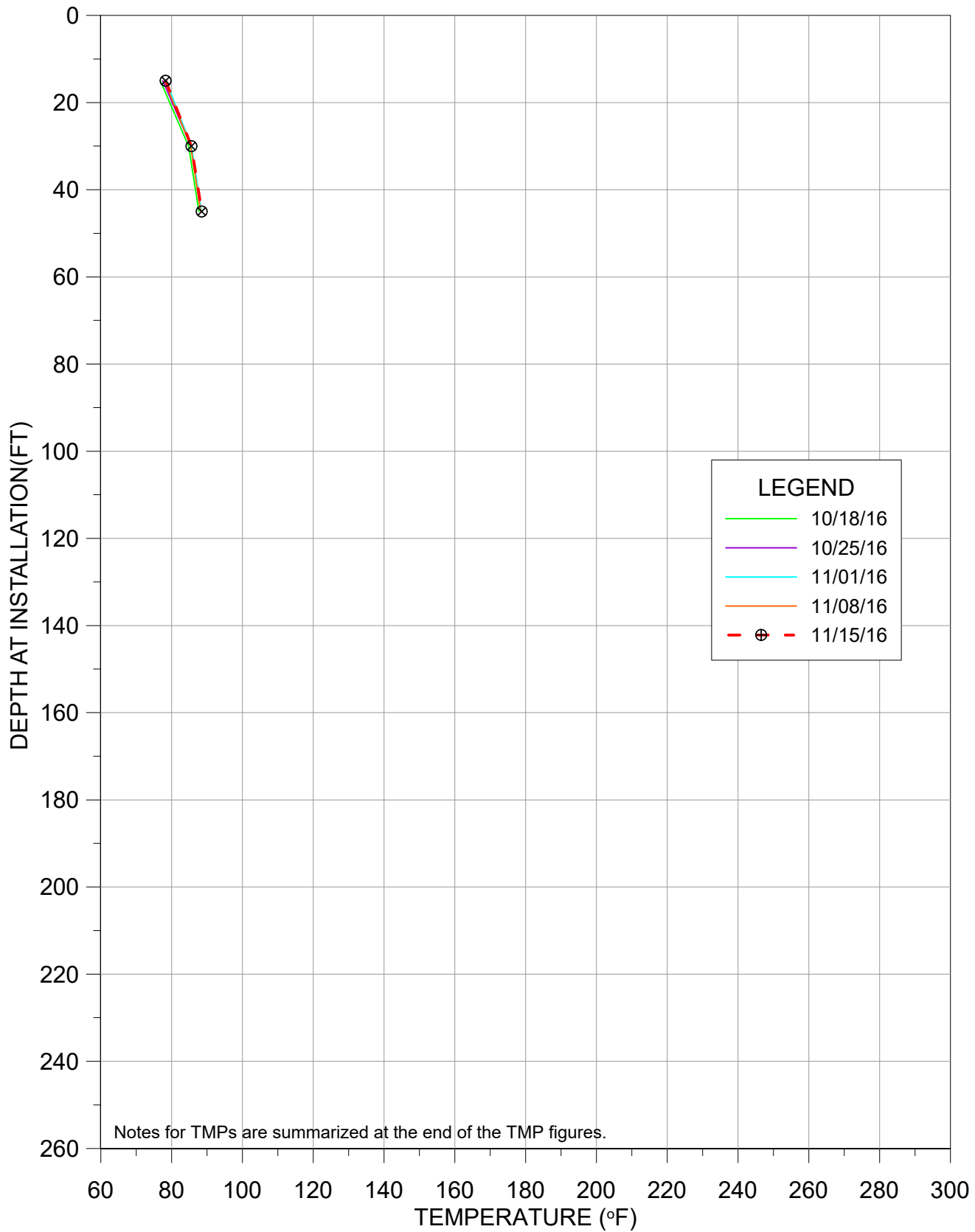


TMP-44



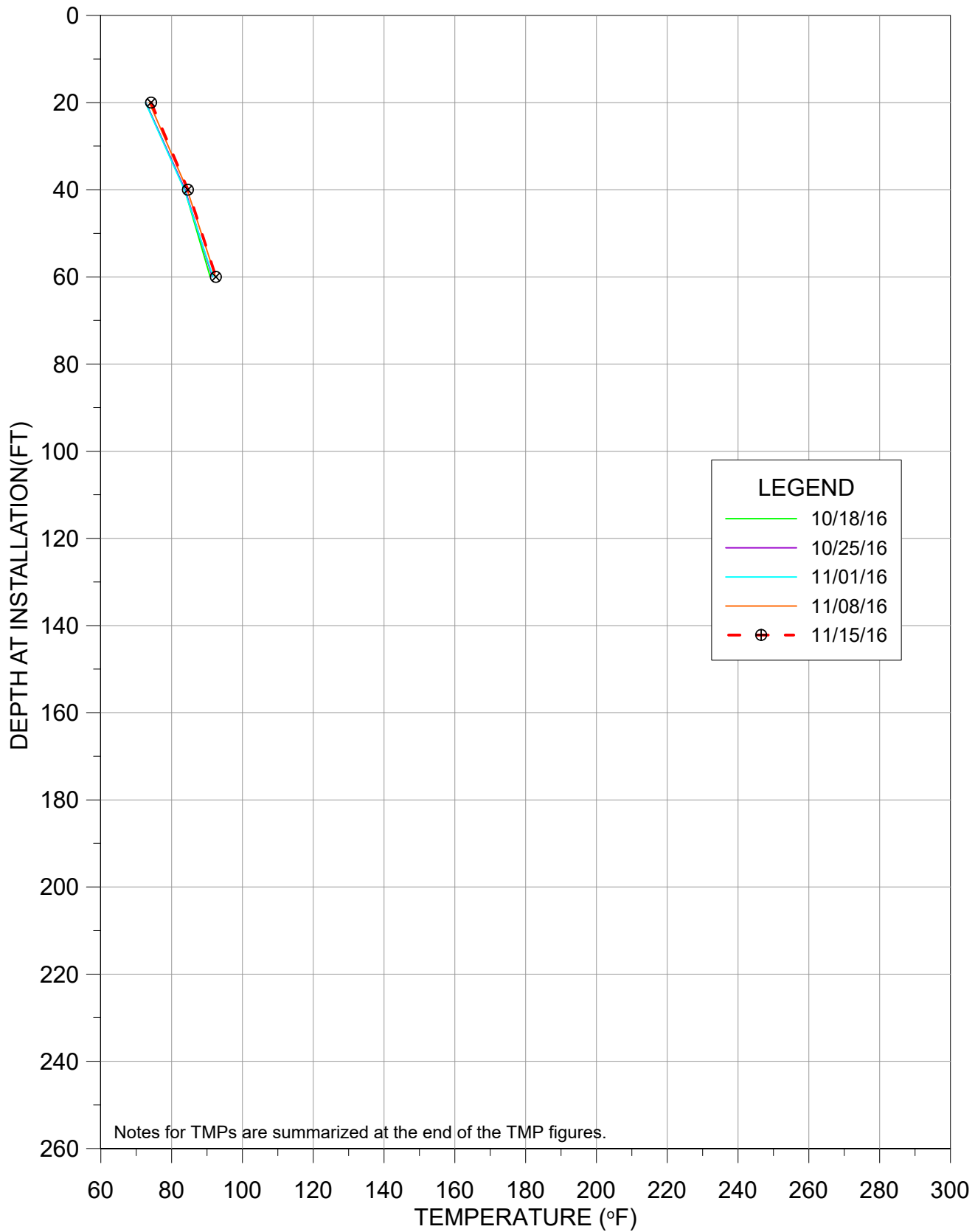
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-45



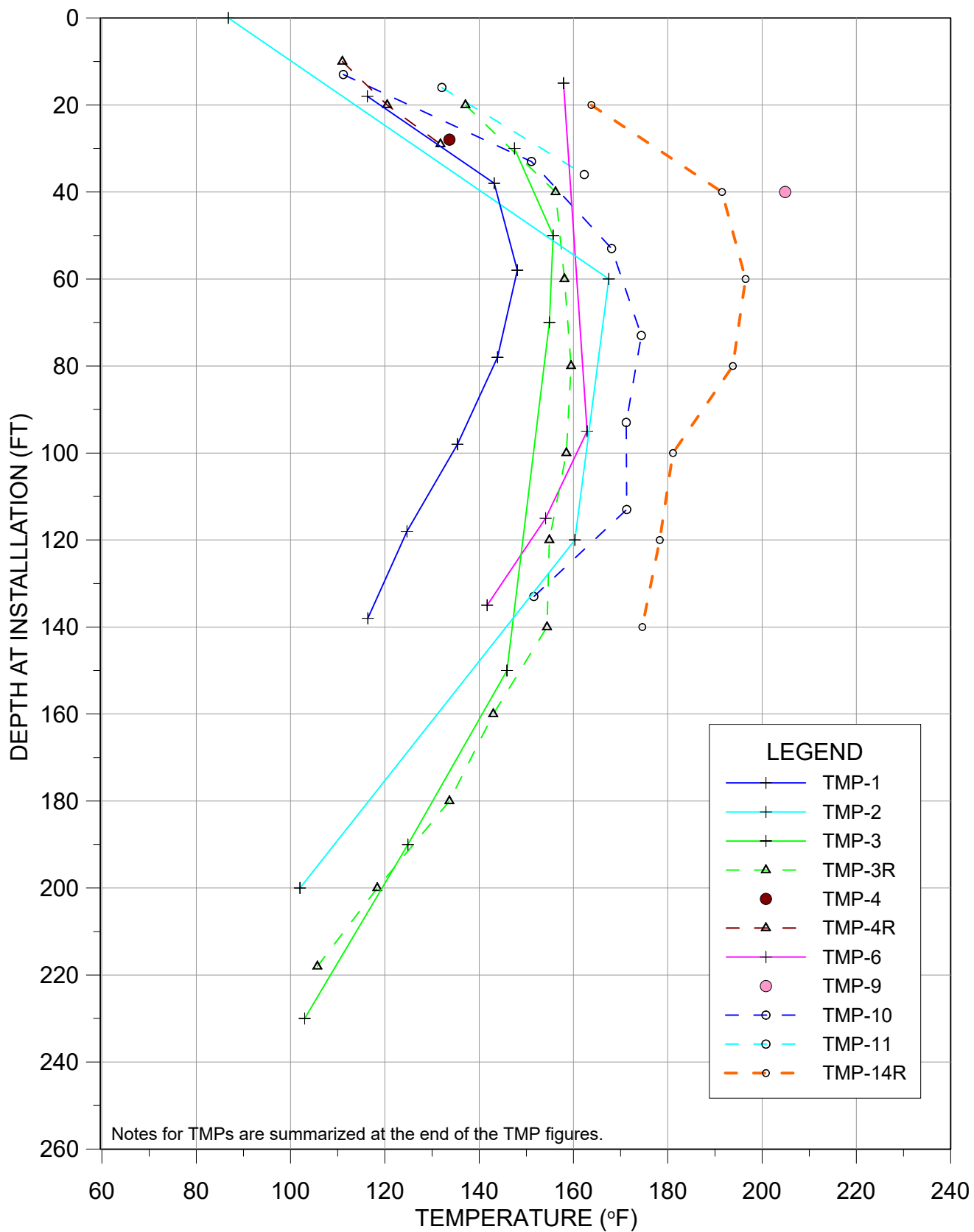
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-46



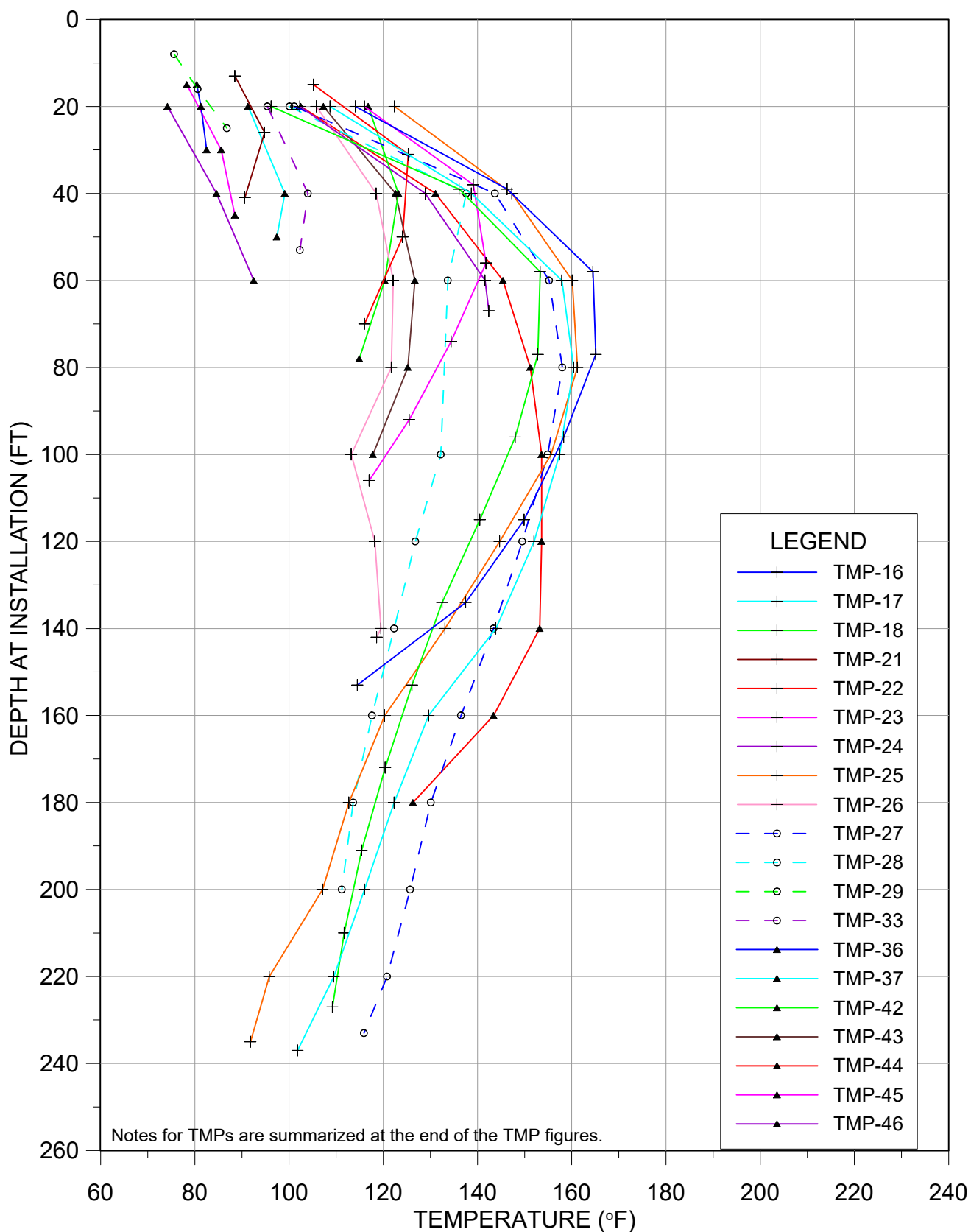
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

11/14/2016



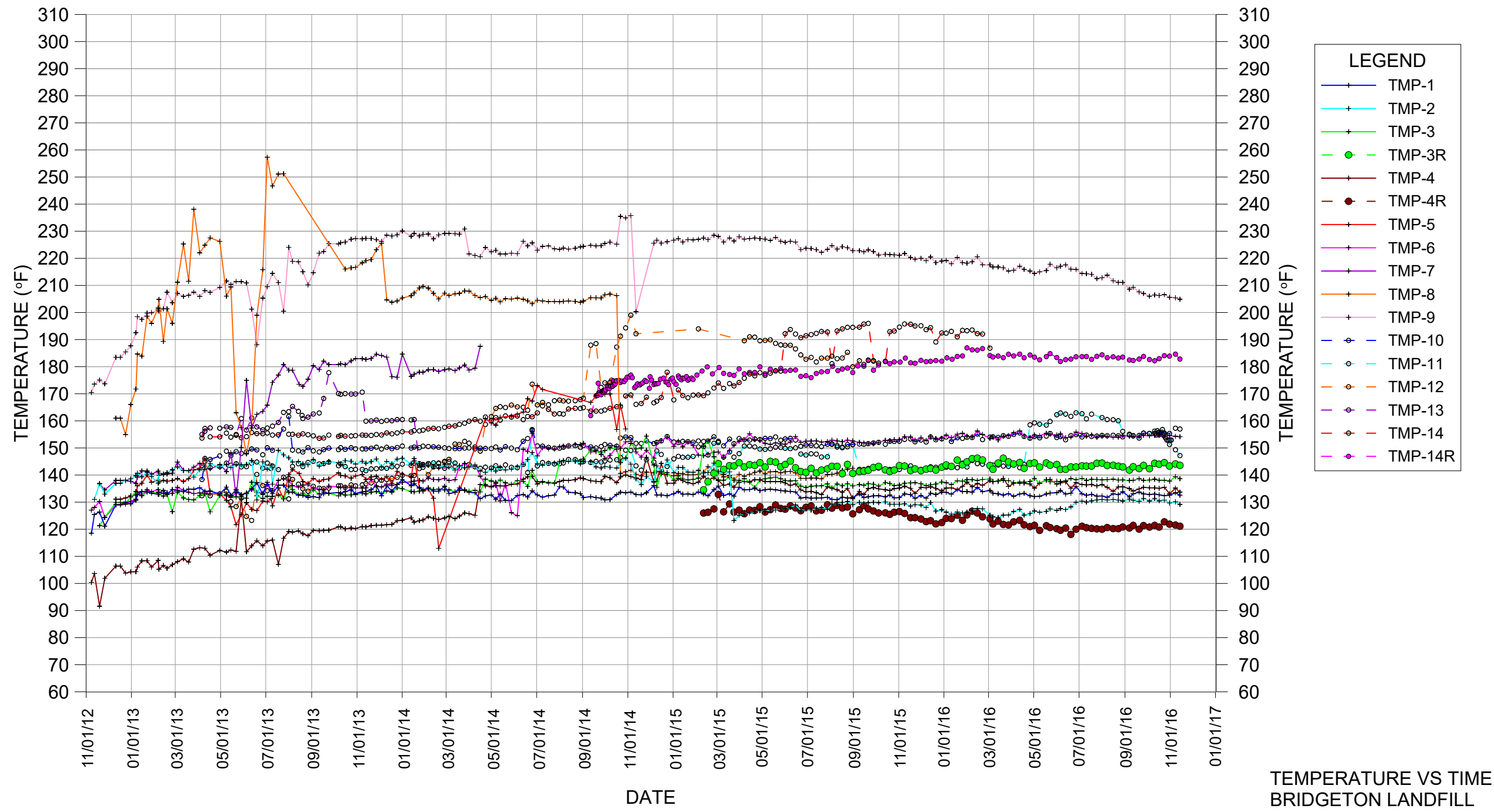
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

11/14 & 11/15/2016 - NORTH QUARRY

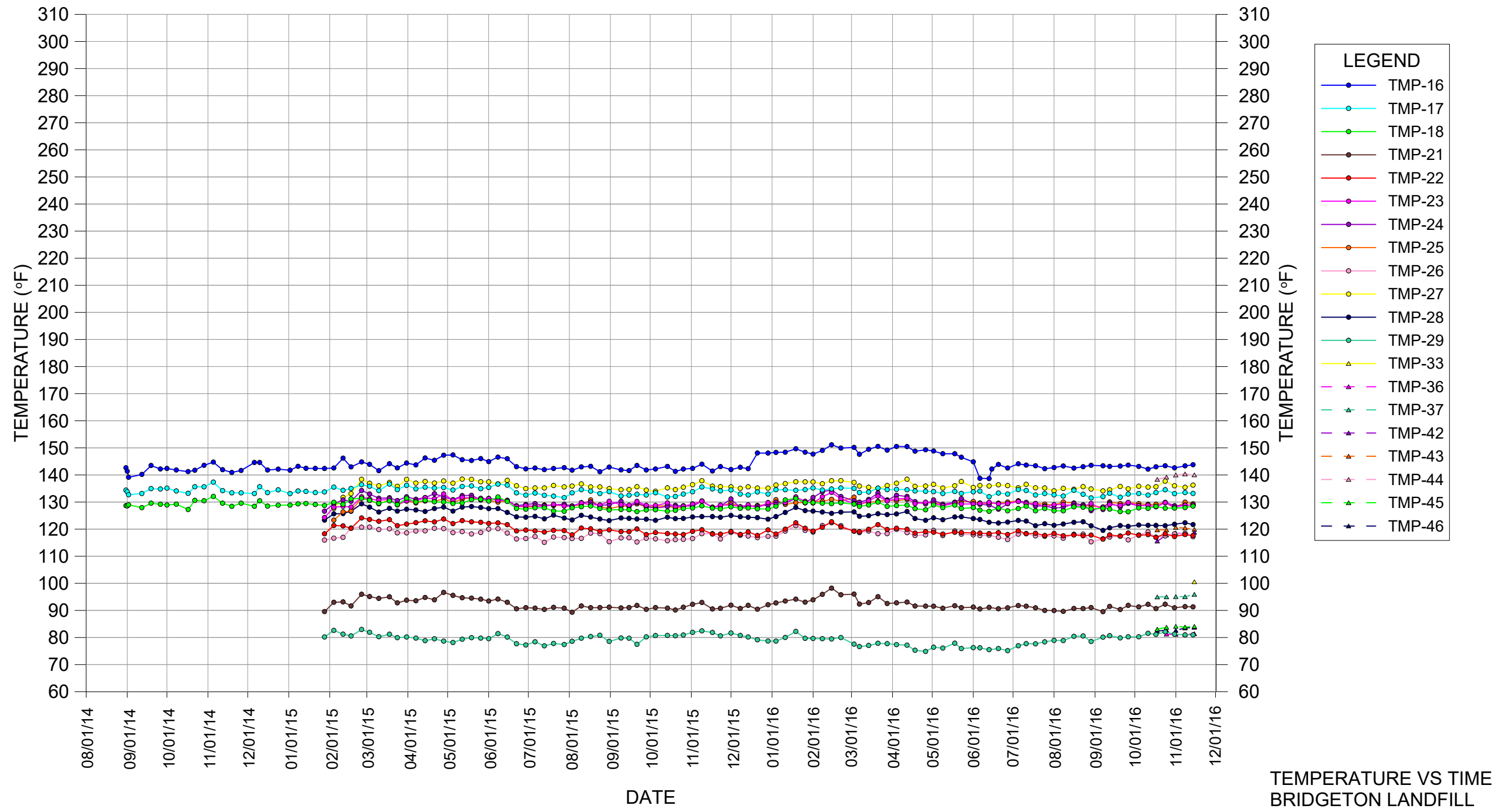


TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

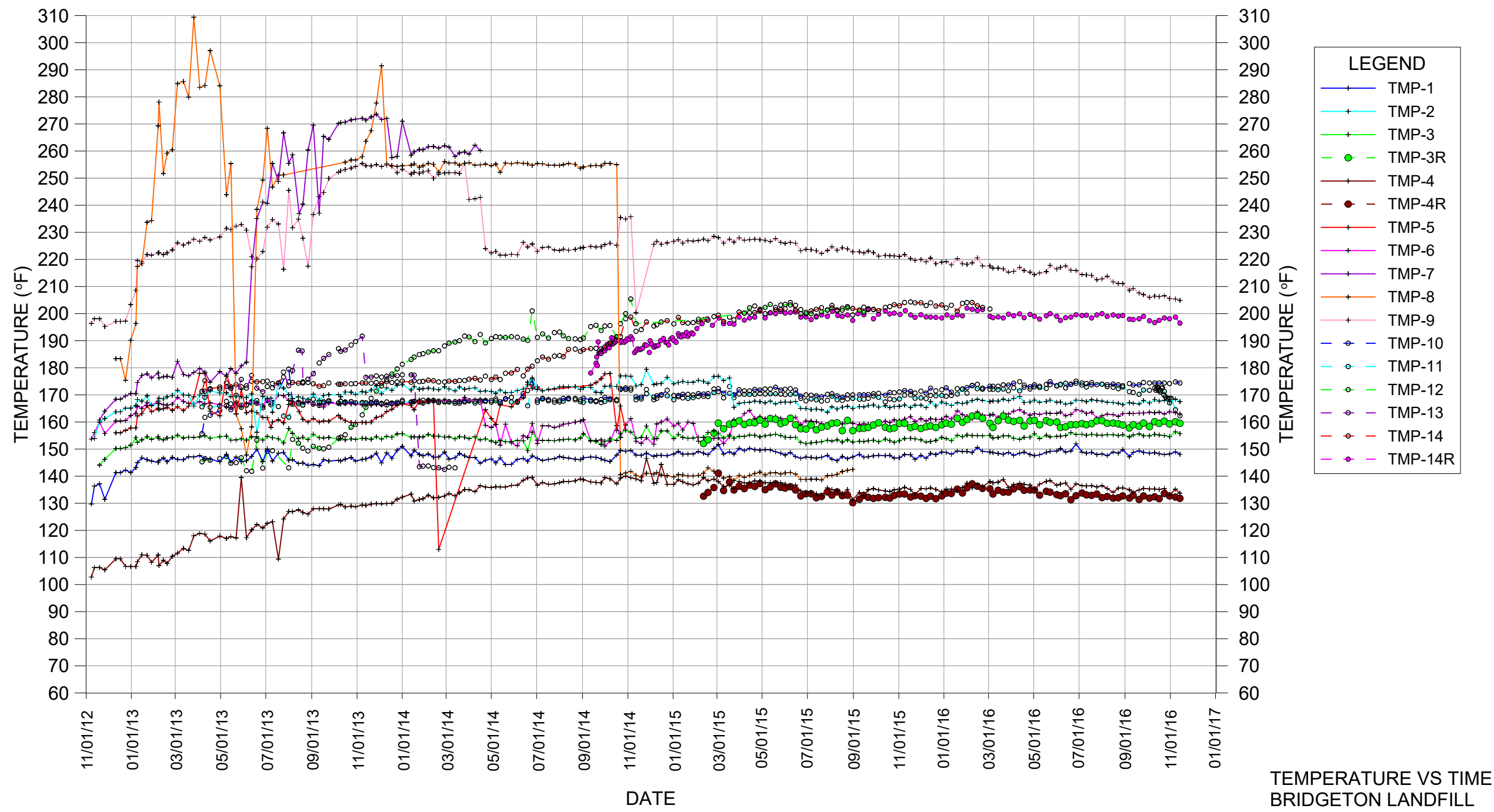
AVERAGE TEMPERATURES



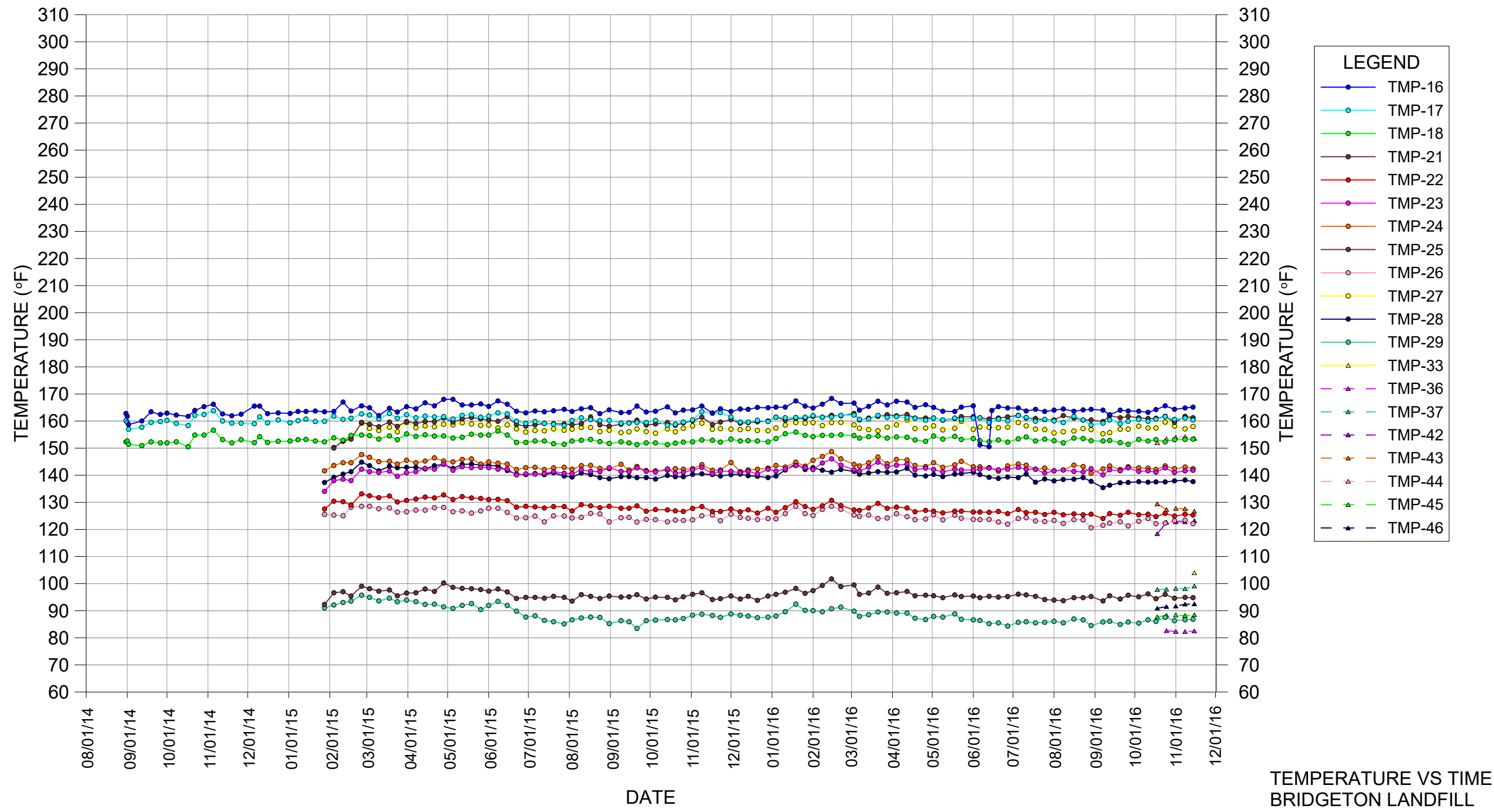
AVERAGE TEMPERATURES - NORTH QUARRY



MAXIMUM TEMPERATURES



MAXIMUM TEMPERATURES - NORTH QUARRY



TEMPERATURE VS TIME
BRIDGETON LANDFILL

TMP BRIDGETON LANDFILL NOTES

TMP notes that are new for the reporting week are in **bold**.

TMP-1: NONE

TMP-2:

1. Unit at 180 ft depth had resistance reading above allowable and is no longer working. No reliable reading has been obtained since 11/26/2012.
2. The resistance reading was high and no temperature readings were obtained at 160 ft depth since 6/19/2014.
3. The connectivity tests on 3/19/2015 conducted by Feezor Engineering showed that units at 20, 40, 80, 100, 140 ft depths are no longer reliable.

TMP-3:

1. No reliable temperature readings have been obtained at 170 ft depth since 1/29/2014, except on 3/13/2014.
2. The connectivity tests on 4/11/2014 conducted by CEC showed that units at 10, 90, 130, 210 and 250 ft depths are no longer reliable.
3. The connectivity tests on 10/28/2014 conducted by Feezor Engineering showed that units at 10, 90, 110, 130, 210 and 250 ft depths are not reliable.

TMP-3R: NONE

TMP-4:

1. The connectivity tests on 4/11/2014 conducted by CEC showed that the unit at 48 ft depth is no longer reliable.

TMP-4R: NONE

TMP-5: TMP NO LONGER IN SERVICE– Verified by Connectivity testing by Feezor Engineering in March 2015.

TMP-6:

1. The connectivity tests on 4/11/2014 conducted by CEC showed that units at 35, 55, 75, 155, 175, and 195 ft depths are no longer reliable.
2. No reliable temperature readings have been obtained at the unit at 215 ft depth since 6/13/2014.

TMP-7R: TMP NO LONGER IN SERVICE

TMP-8: TMP NO LONGER IN SERVICE

TMP-9:

1. Unit at 100 ft depth had an inaccurate temperature reading on 8/1/2013 and no reading since 8/6/2013.
2. The connectivity tests on 4/11/2014 conducted by CEC showed that units at 20, 60, 80, and 100 ft depths are no longer reliable.

TMP-10: NONE

TMP-11:

1. All units had acceptable resistance readings starting on 7/25/2013, except a high resistance reading at 116 ft depth since 10/30/2013.
2. No temperature reading has been obtained at 176 ft depth since 1/17/2014.
3. The unit at 156 ft depth has had high or questionable resistance since 1/17/2014. The unit at 56 ft depth has had a high resistance reading since 3/19/2014 and no temperatures have been obtained since this time.
4. The connectivity tests on 4/11/2014 conducted by CEC showed that units at 56, 116, and 176 ft depths are no longer reliable.
5. The connectivity tests on 10/28/2014 conducted by Feezor Engineering showed that units at 56, 116 and 176 ft are not reliable.
6. No temperature or resistivity readings were obtained at a depth of 96 ft depth since 8/29/2016 despite multiple attempts.

TMP-12:

1. All units were verified by connectivity testing by Feezor Engineering in October 2015 to be unreliable.

TMP-13: TMP NO LONGER IN SERVICE

TMP-14:

1. All units were verified by connectivity testing by Feezor Engineering in March 2016 to be unreliable.

TMP-14R:

1. Due to the connectivity test results by Feezor Engineering on TMP-14 (see note above), TMP-14R is added to this reporting data set as of 3/7/2016.

TMP-15: TMP WAS NEVER IN SERVICE

TMP-16:

1. A connectivity test conducted by Feezor Engineering showed that the units on TMP-16 may not be reliable since 9/9/2015. Further testing at the end of September 2015 showed possible connectivity on some of the units.
2. The unit at 153 ft depth had a low resistance reading and unreliable temperature since 12/21/2015.

TMP-17: NONE

TMP-18: NONE

TMP-19: NOT PART OF THIS SUBMITTAL (HEAT EXTRACTION TMP)

TMP-20: NOT PART OF THIS SUBMITTAL (HEAT EXTRACTION TMP)

TMP-21: NONE

TMP-22: NONE

TMP-23: NONE

TMP-24: NONE

TMP-25: NONE

TMP-26: NONE

TMP-27: NONE

TMP-28:

1. The unit at 217 ft depth has had no resistance or temperature readings since installation.
2. The unit at 80 ft depth had a resistance drop and an unreasonable temperature decrease on 6/1/2016. The temperature has since fluctuated and is determined to be unreliable.

TMP-29: NONE

TMP-33: NONE

TMP-36: NONE

TMP-37: NONE

TMP-42: NONE

TMP-43: NONE

TMP-44: NONE

TMP-45: NONE

TMP-46: NONE

TMP vs DEPTH and TMP vs ELEVATION (for **11/14/16**):

1. There were no reliable temperature readings for TMP-13 since 3/19/2014.
2. There were no reliable temperature readings for TMP-7R, as determined by the connectivity test on 4/11/2014.
3. There were no reliable temperature readings for TMP-5 since 11/5/2014.
4. There were no reliable temperature readings for TMP-12 since 9/28/2015.
5. There were no reliable temperature readings for TMP-8 since 9/9/2015.
6. There were no reliable temperature readings for TMP-14, confirmed since 3/7/2016.

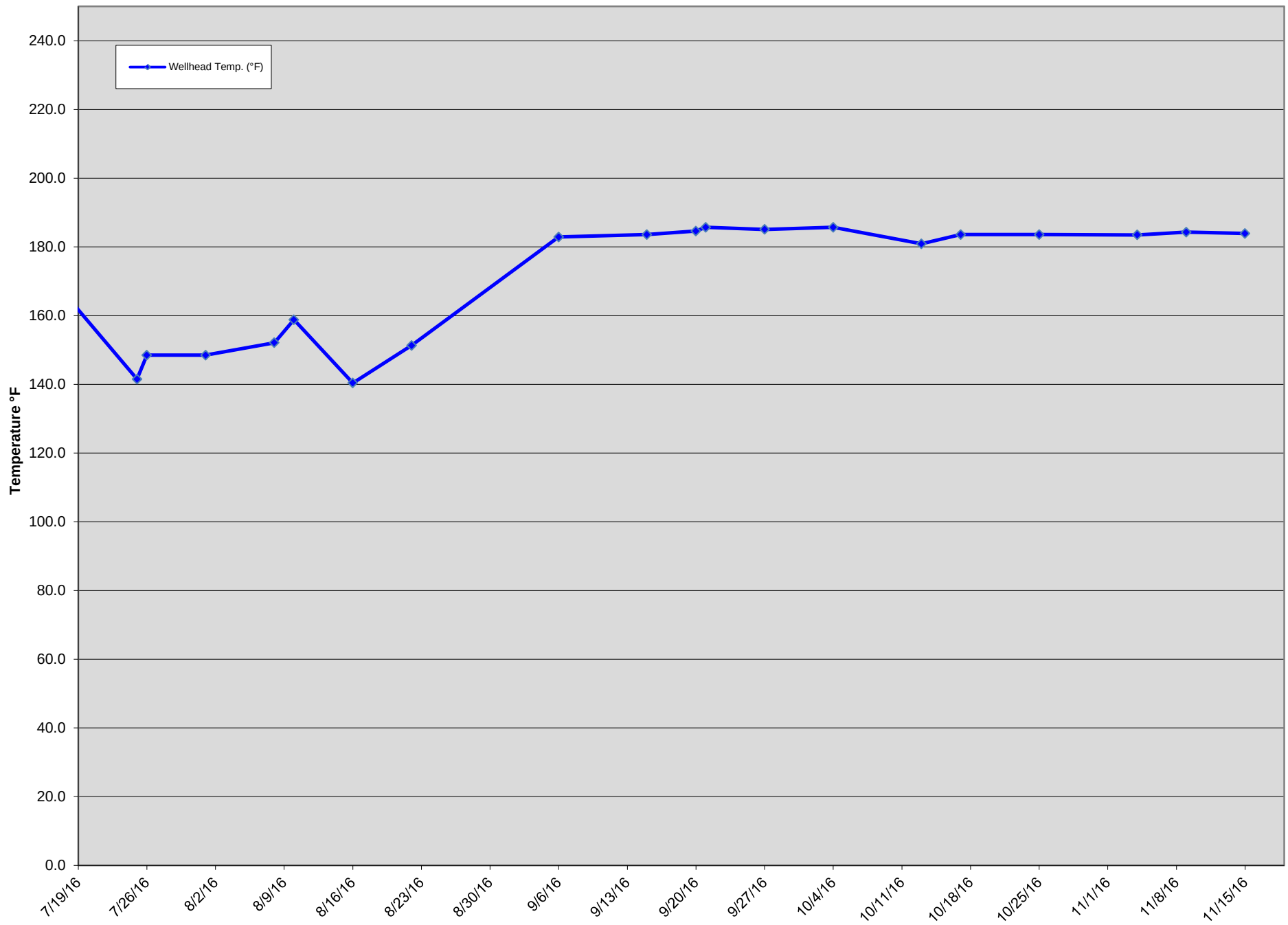
ATTACHMENT C

GAS INTERCEPTOR WELLHEAD TEMPERATURE GRAPHS

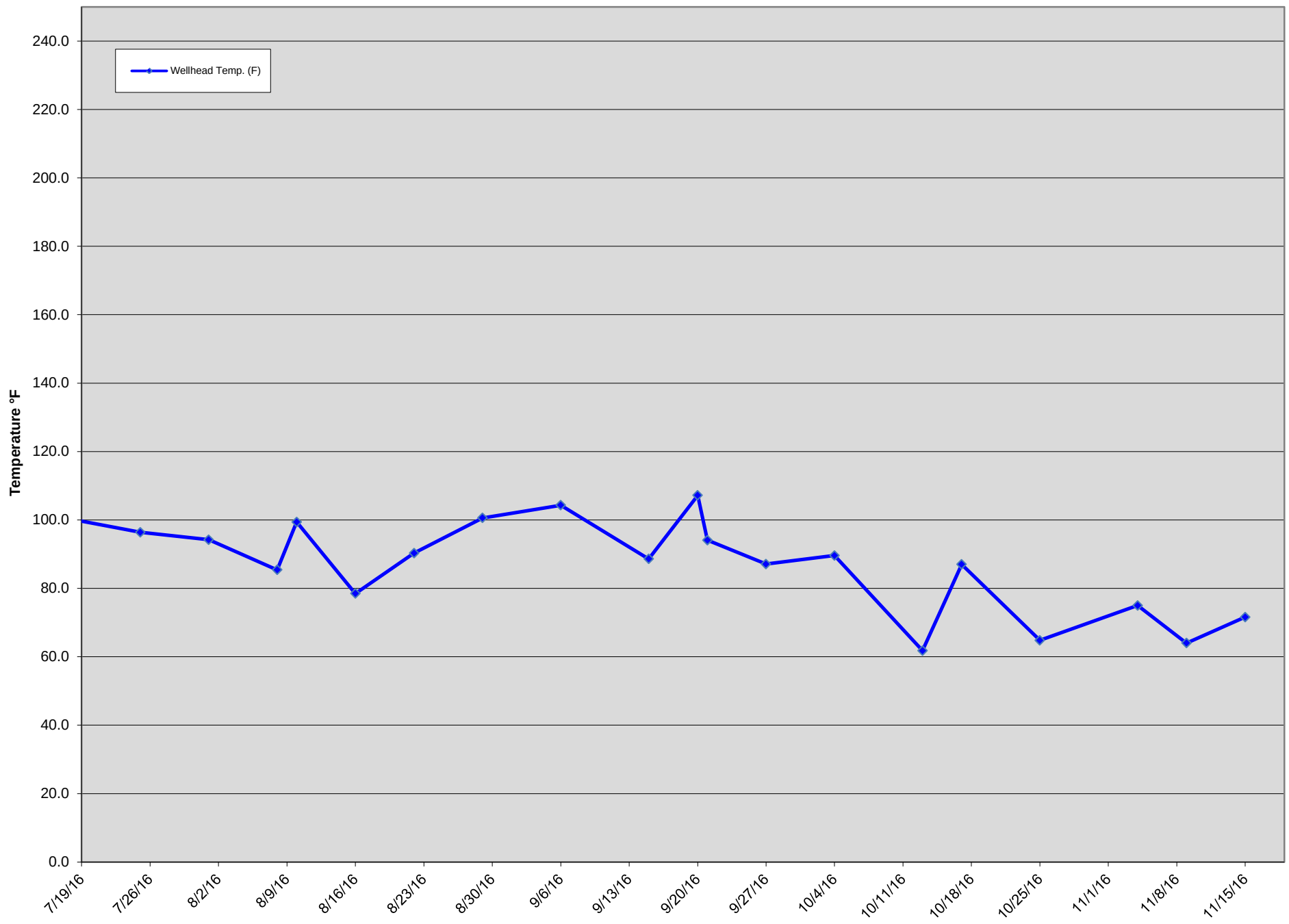


Gas Extraction Wells - Bridgeton Landfill

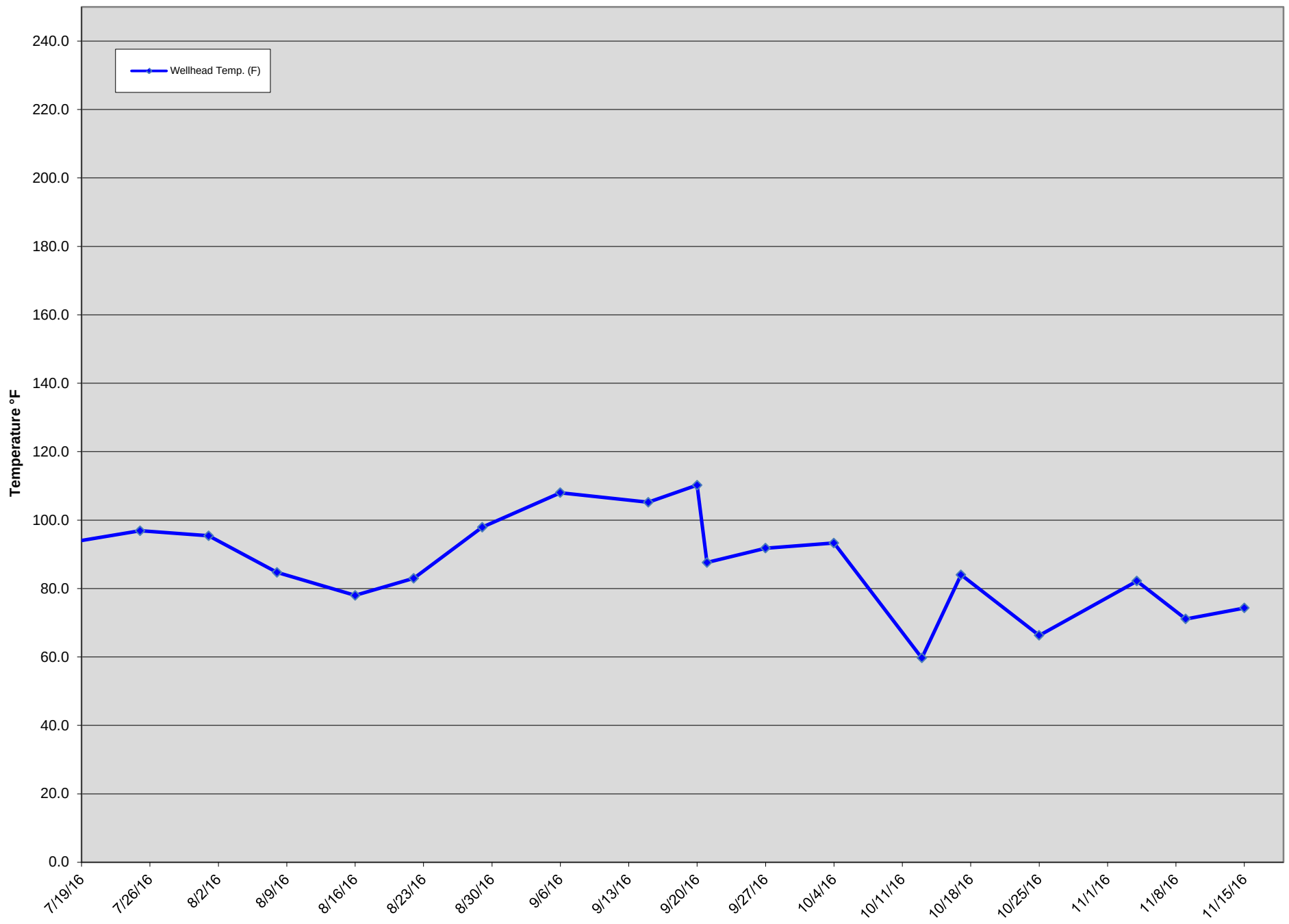
GIW-1 Wellhead Temperatures



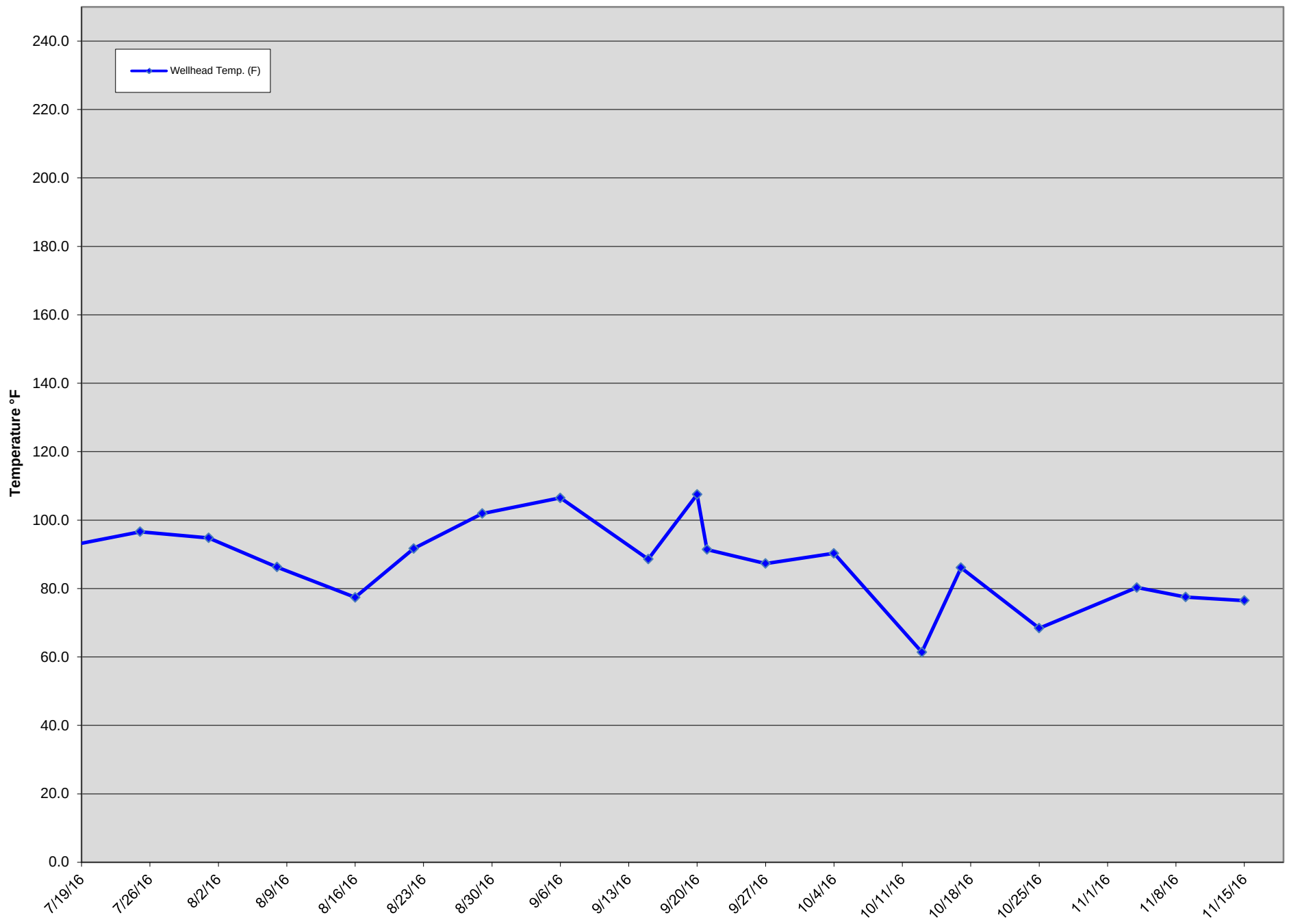
GIW-2 Wellhead Temperatures



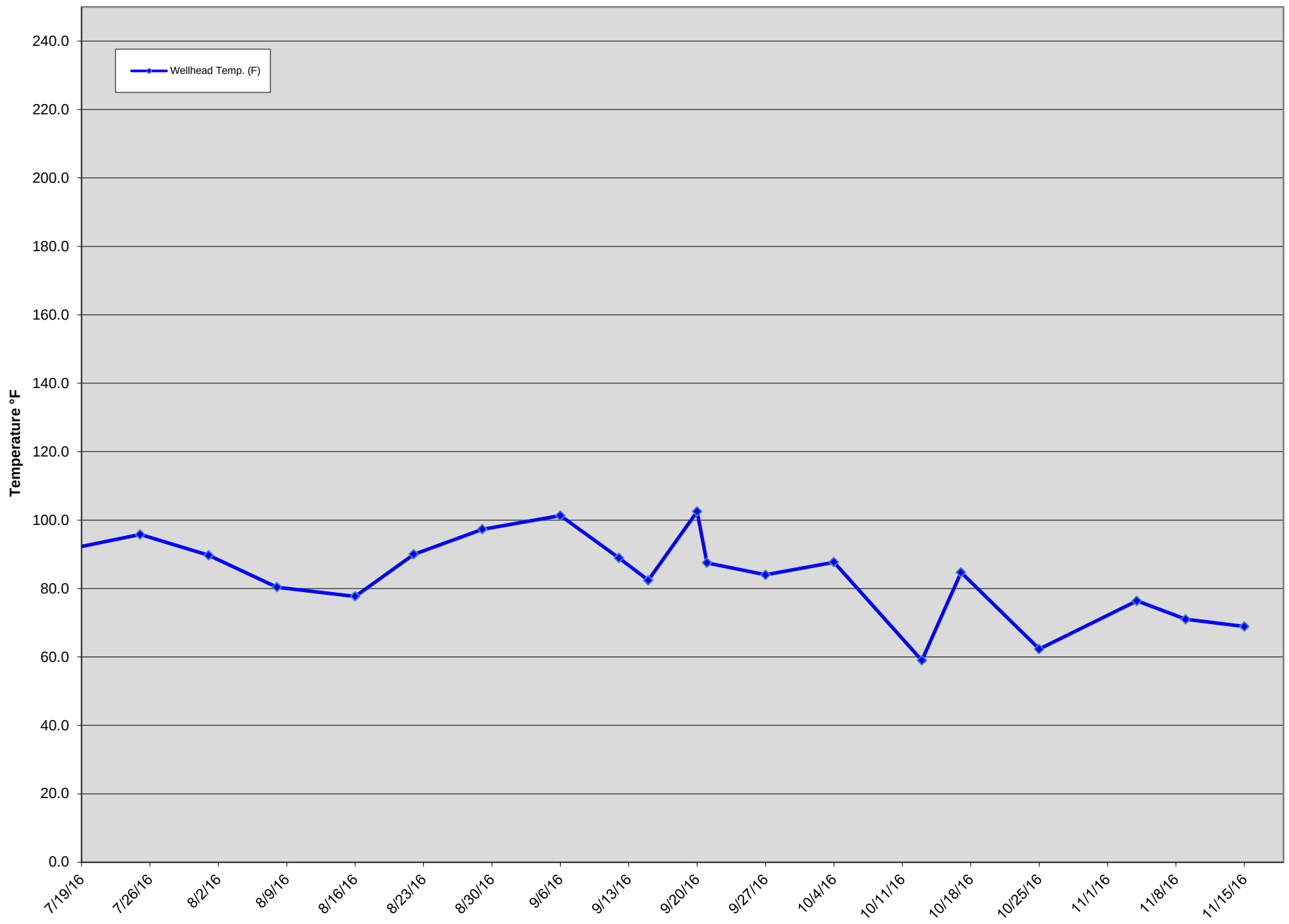
GIW-3 Wellhead Temperatures



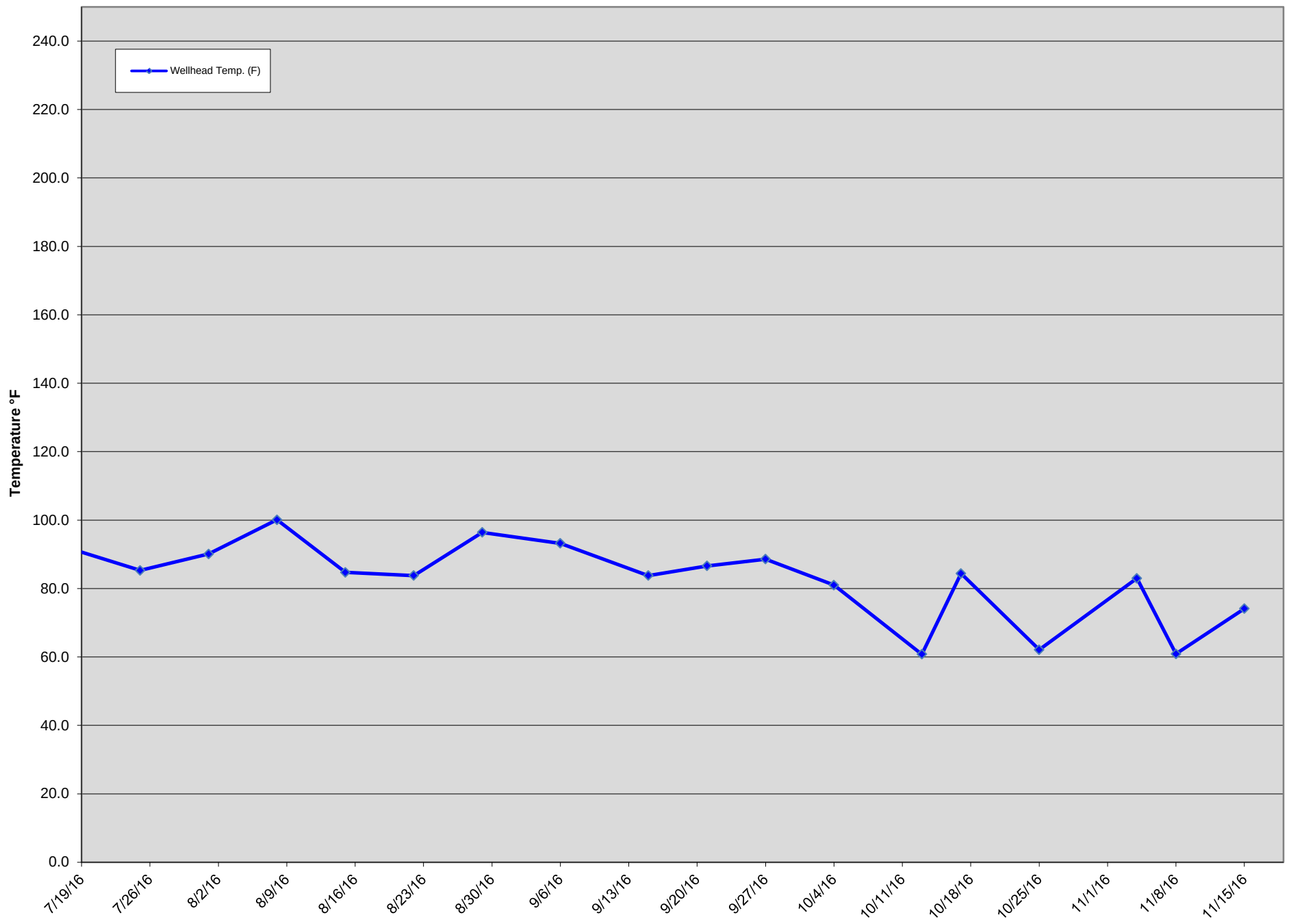
GIW-4 Wellhead Temperatures



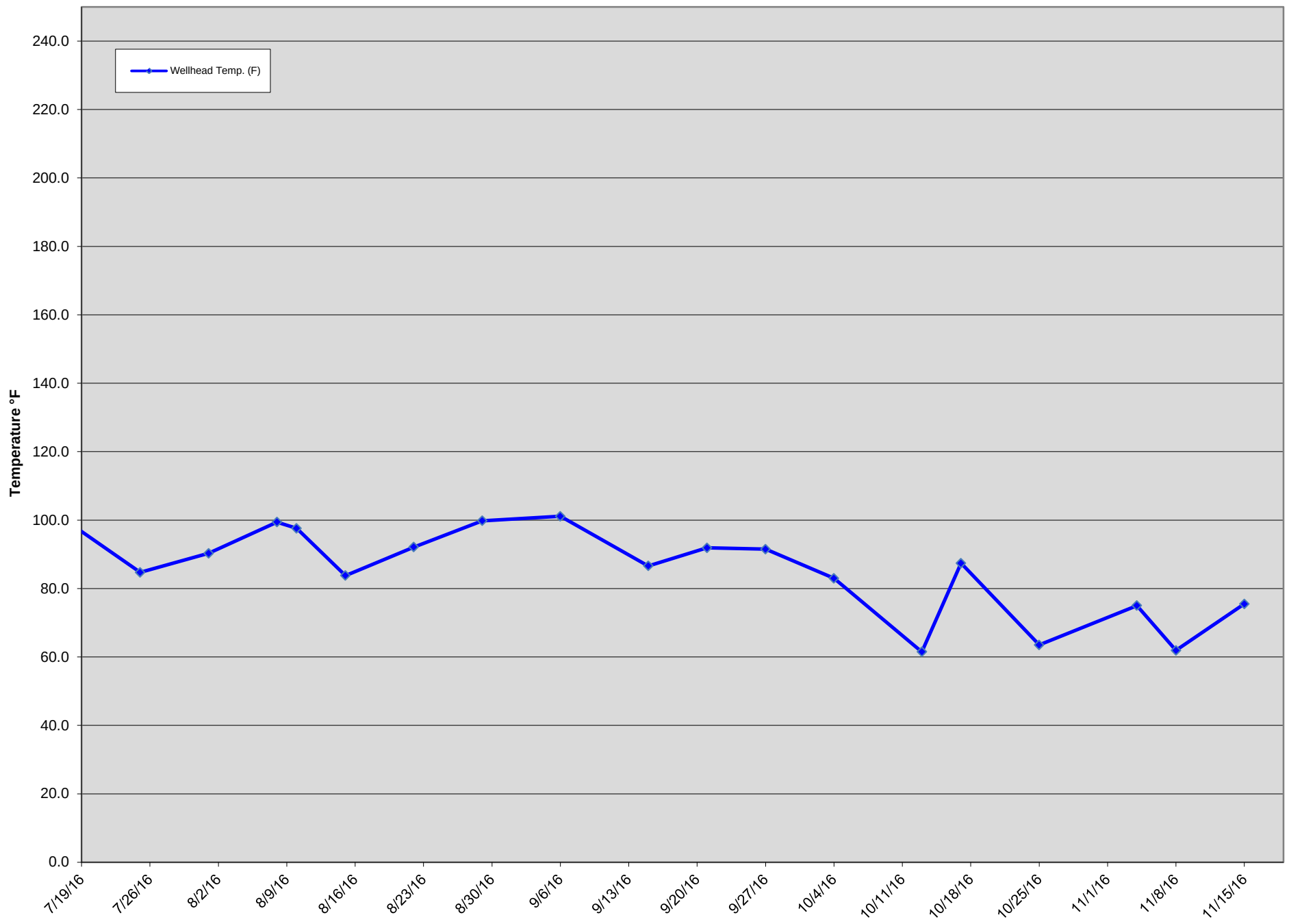
GIW-5 Wellhead Temperatures



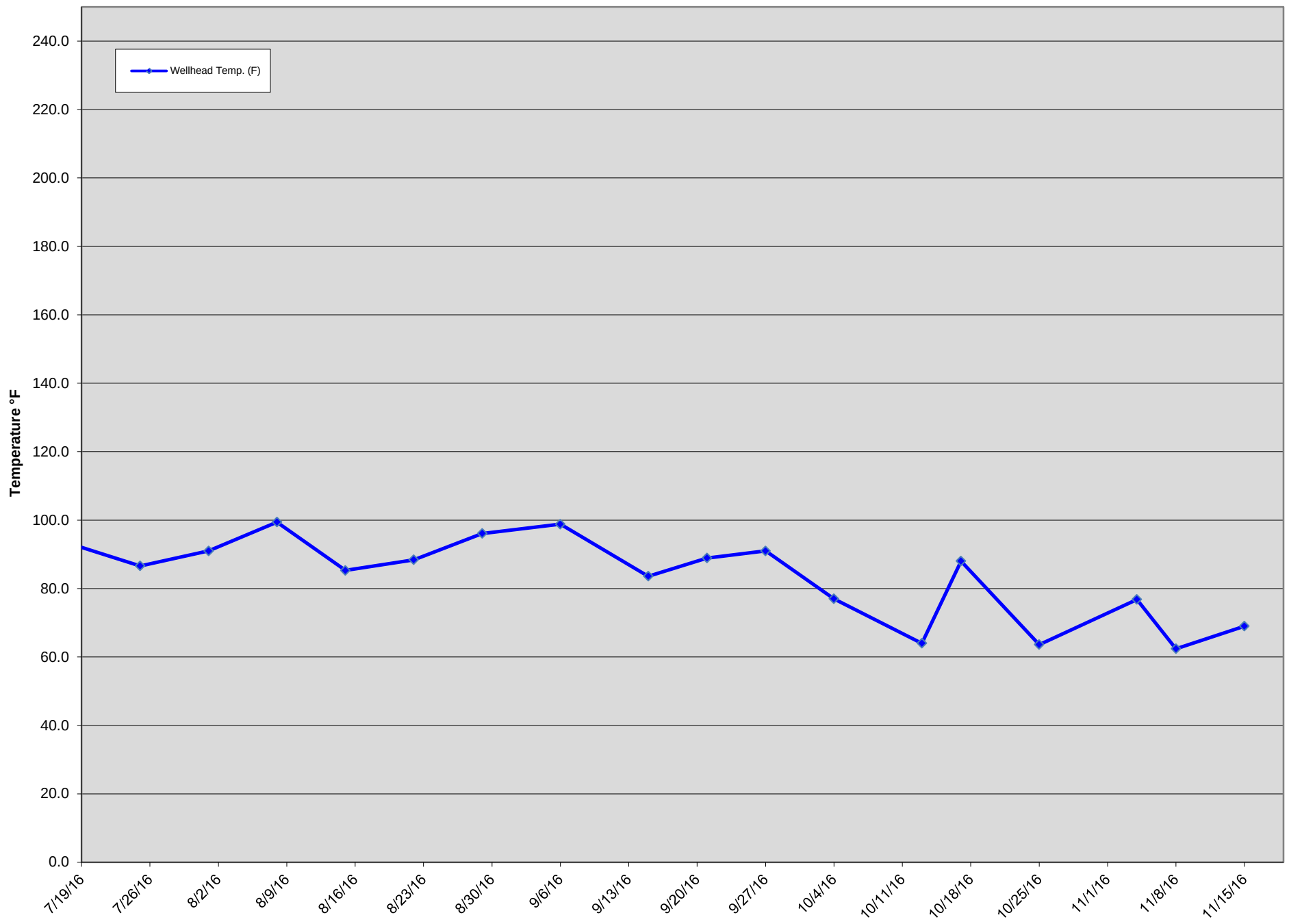
GIW-6 Wellhead Temperatures



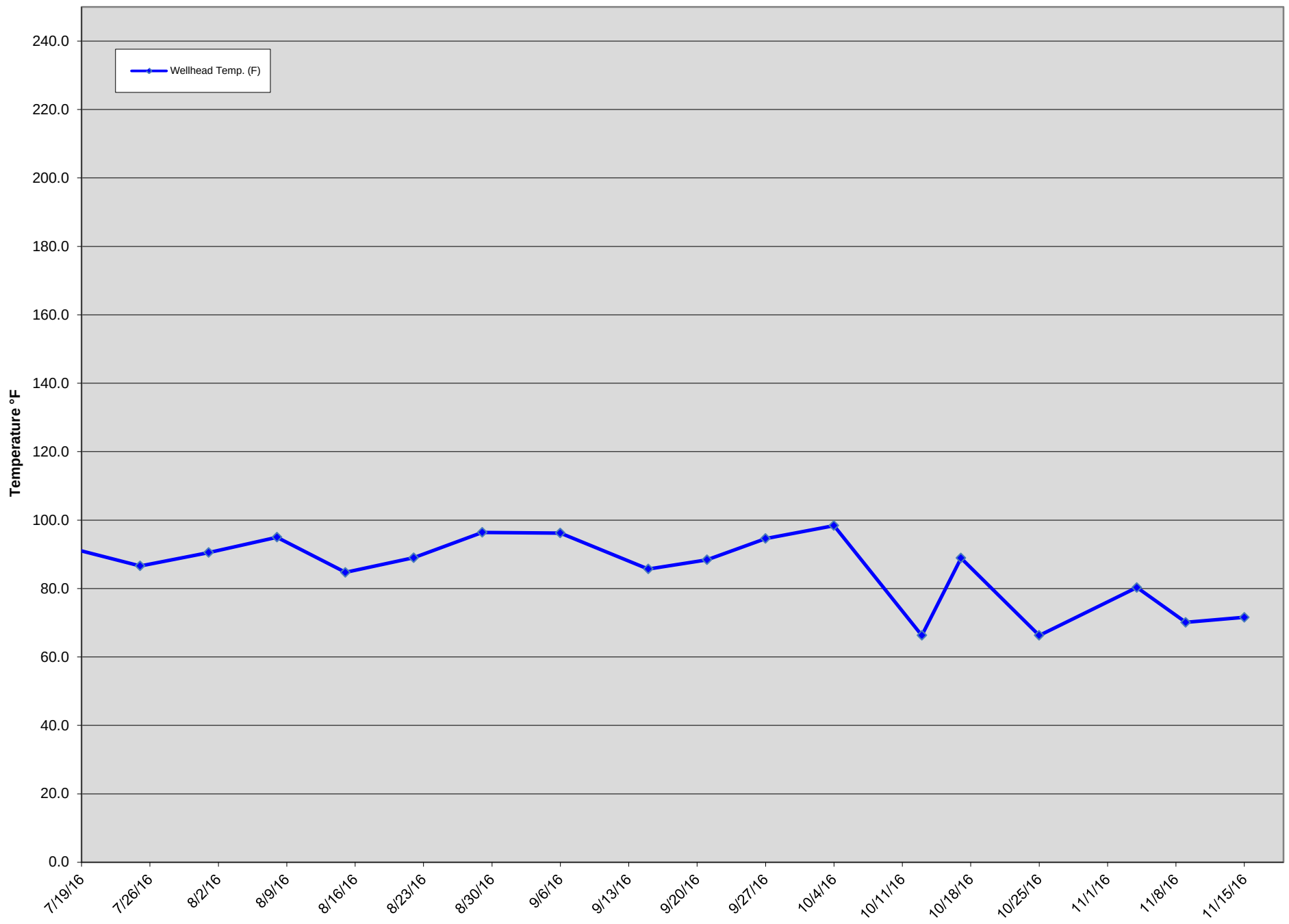
GIW-7 Wellhead Temperatures



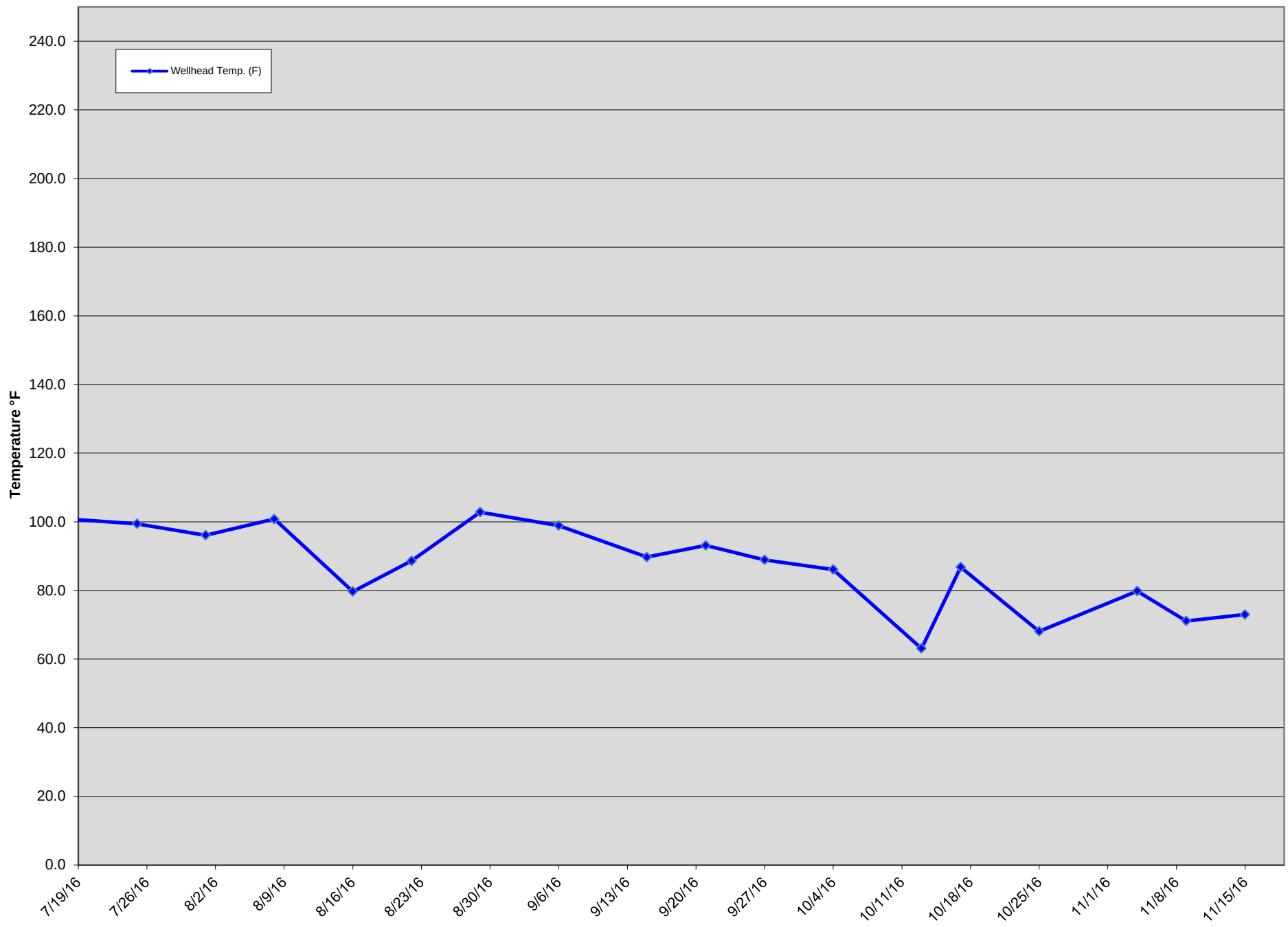
GIW-8 Wellhead Temperatures



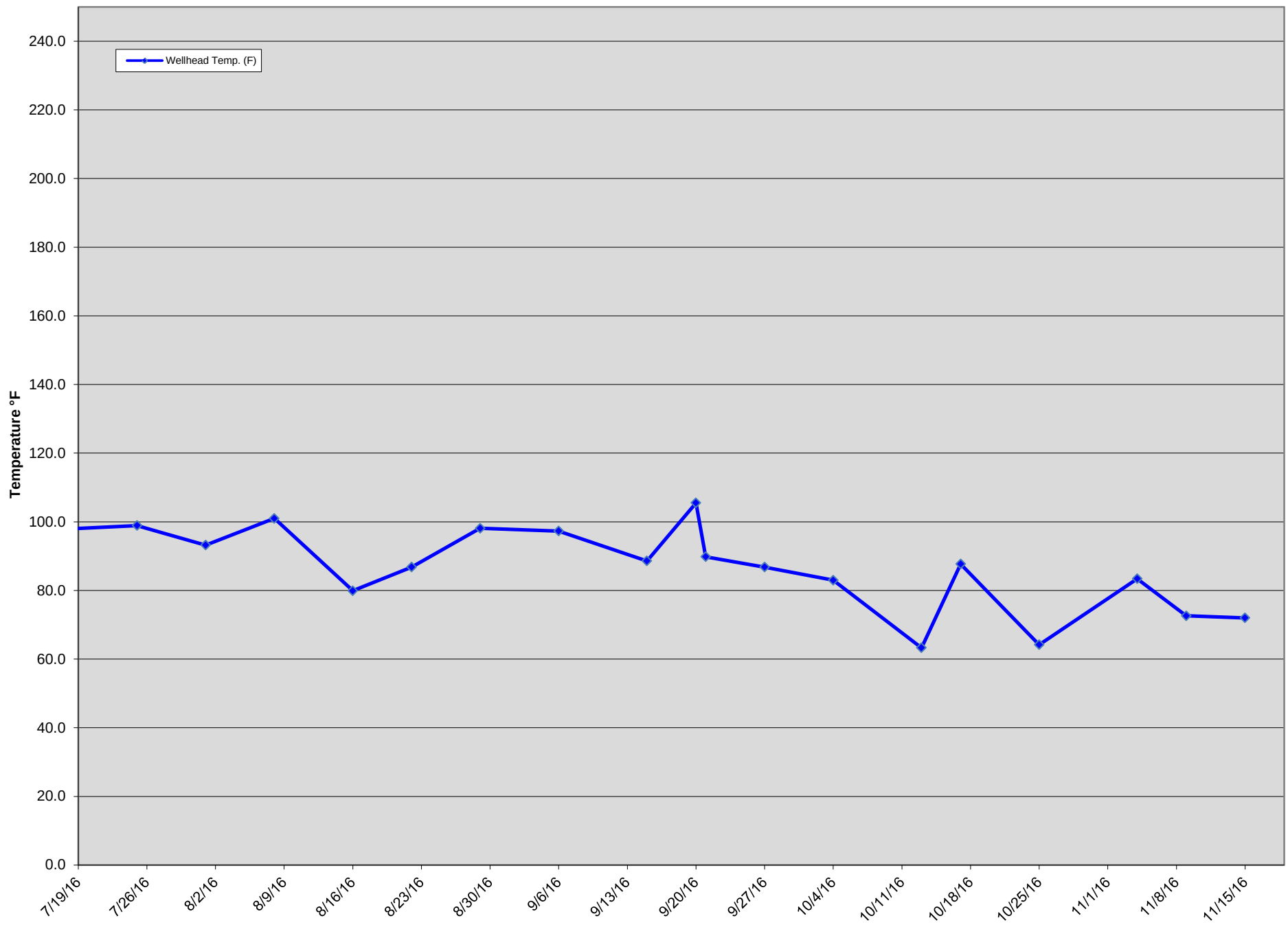
GIW-9 Wellhead Temperatures



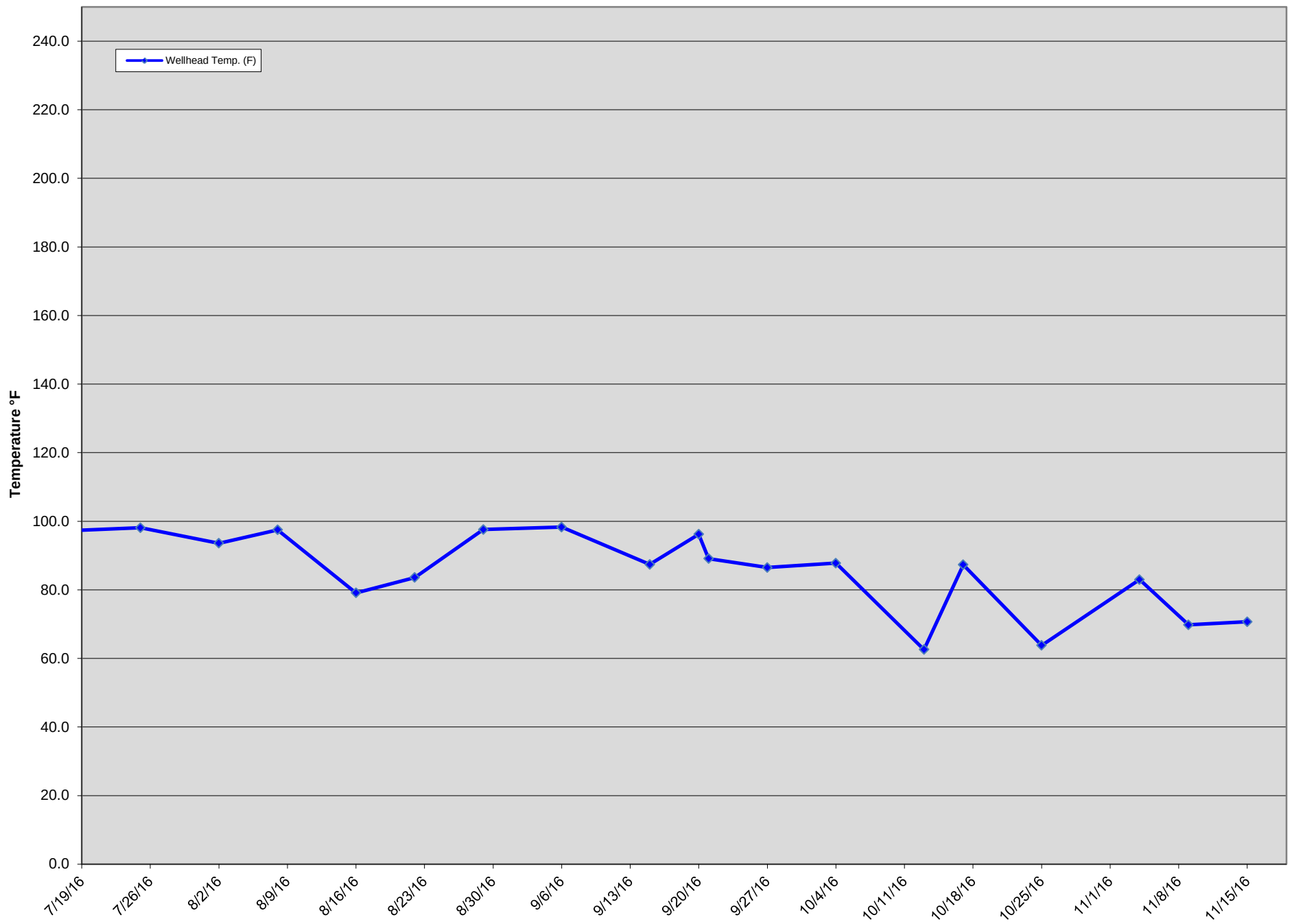
GIW-10 Wellhead Temperatures



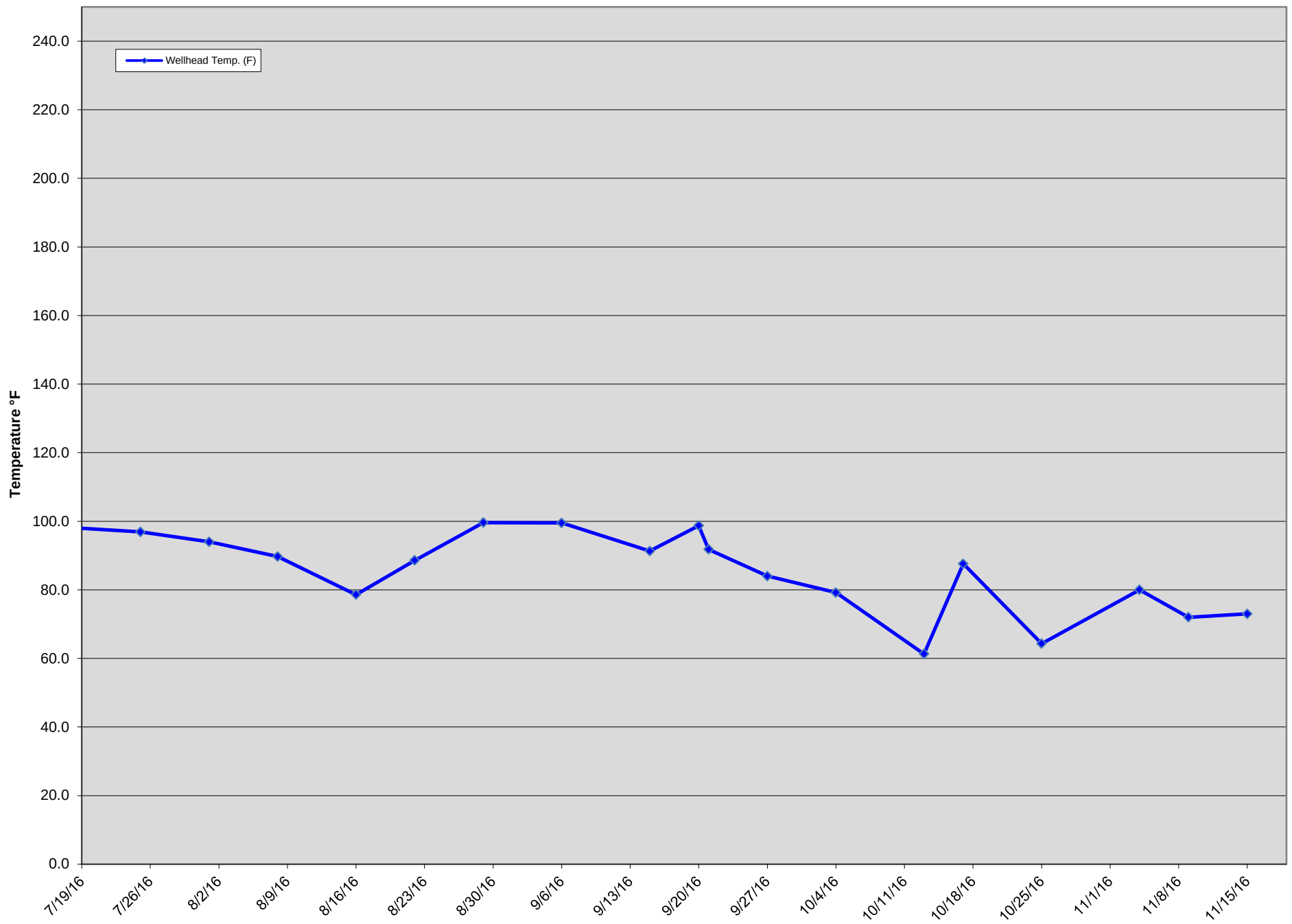
GIW-11 Wellhead Temperatures



GIW-12 Wellhead Temperatures



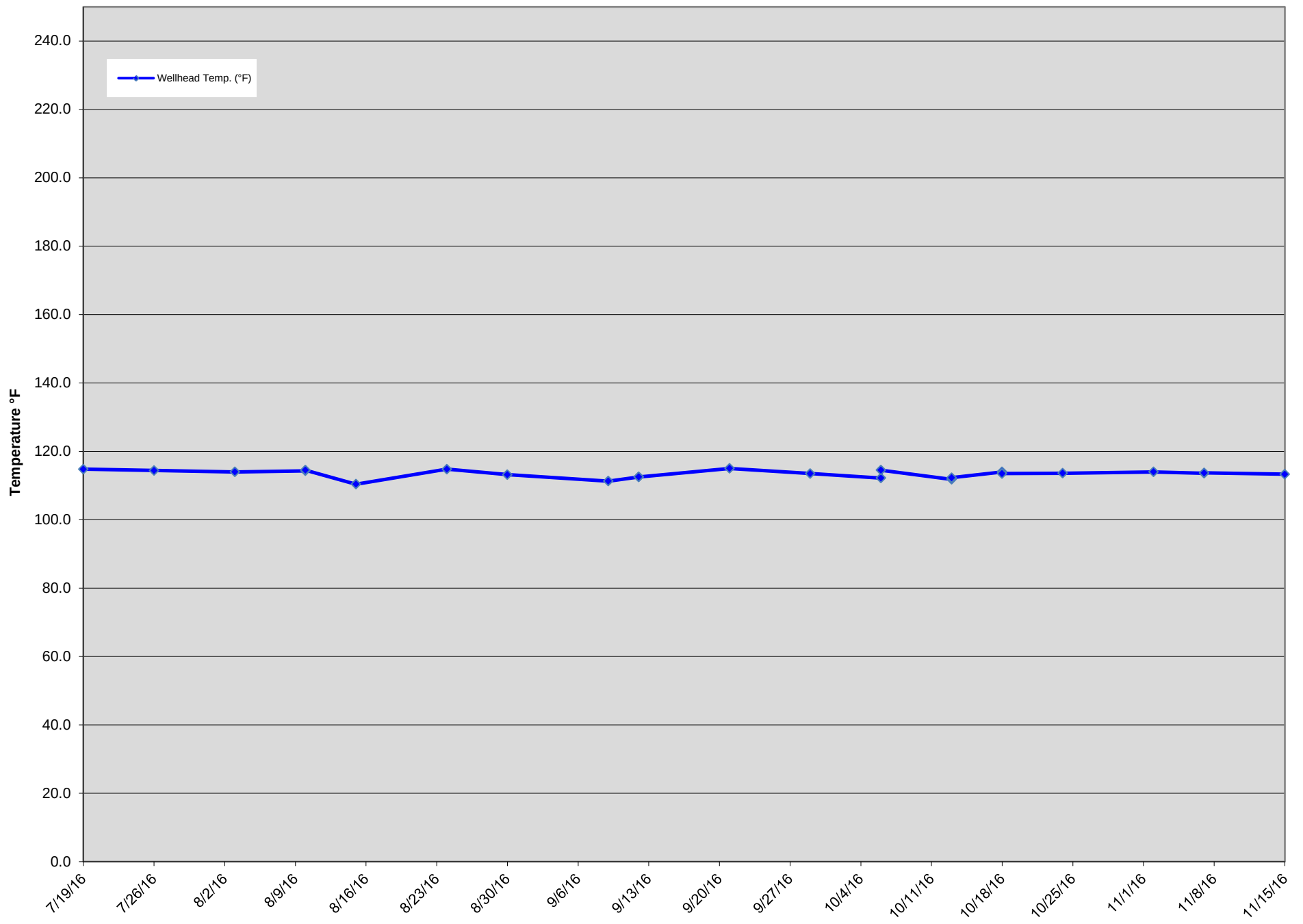
GIW-13 Wellhead Temperatures



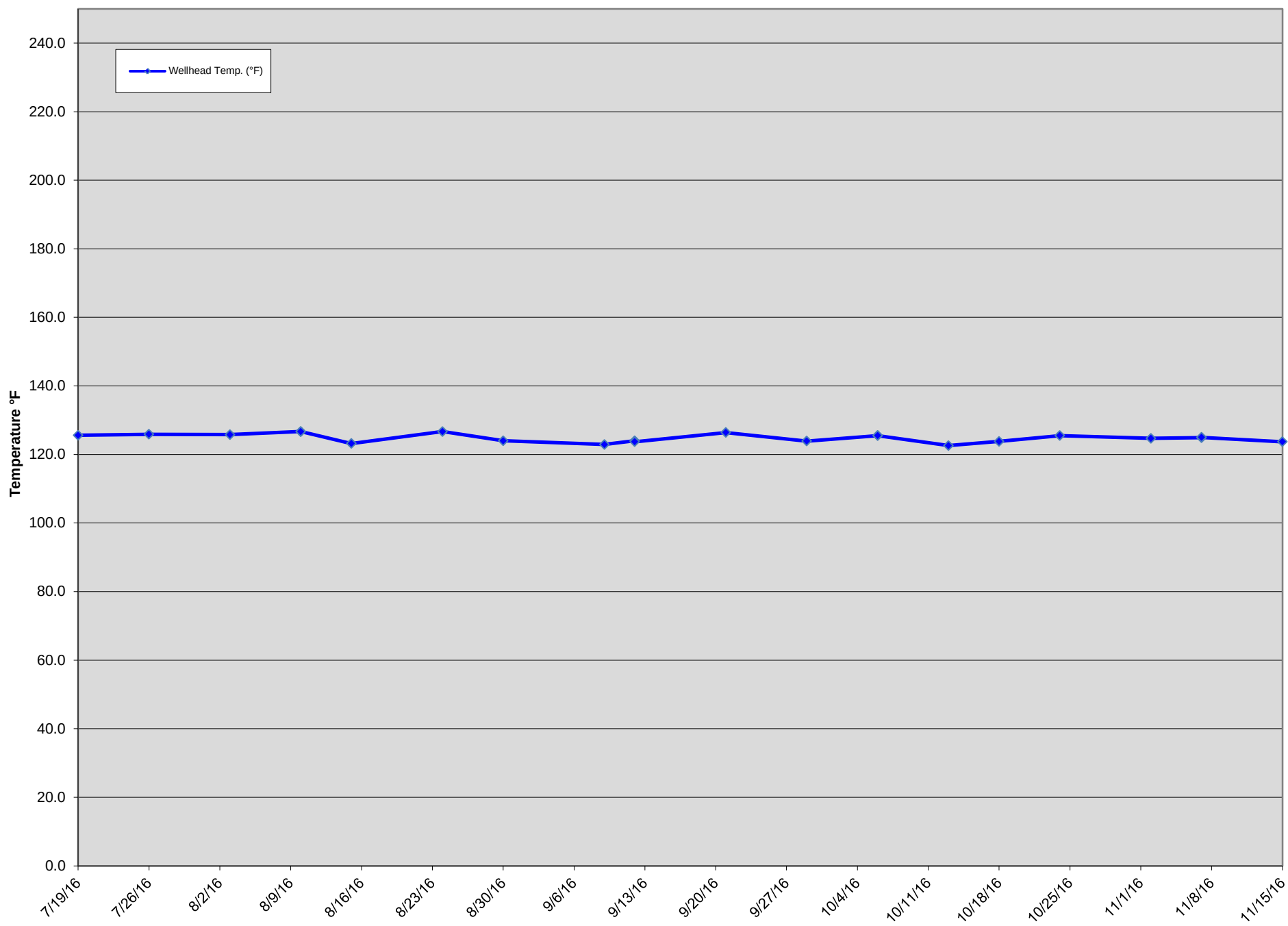
ATTACHMENT D

NECK-AREA GAS EXTRACTION WELL DATA

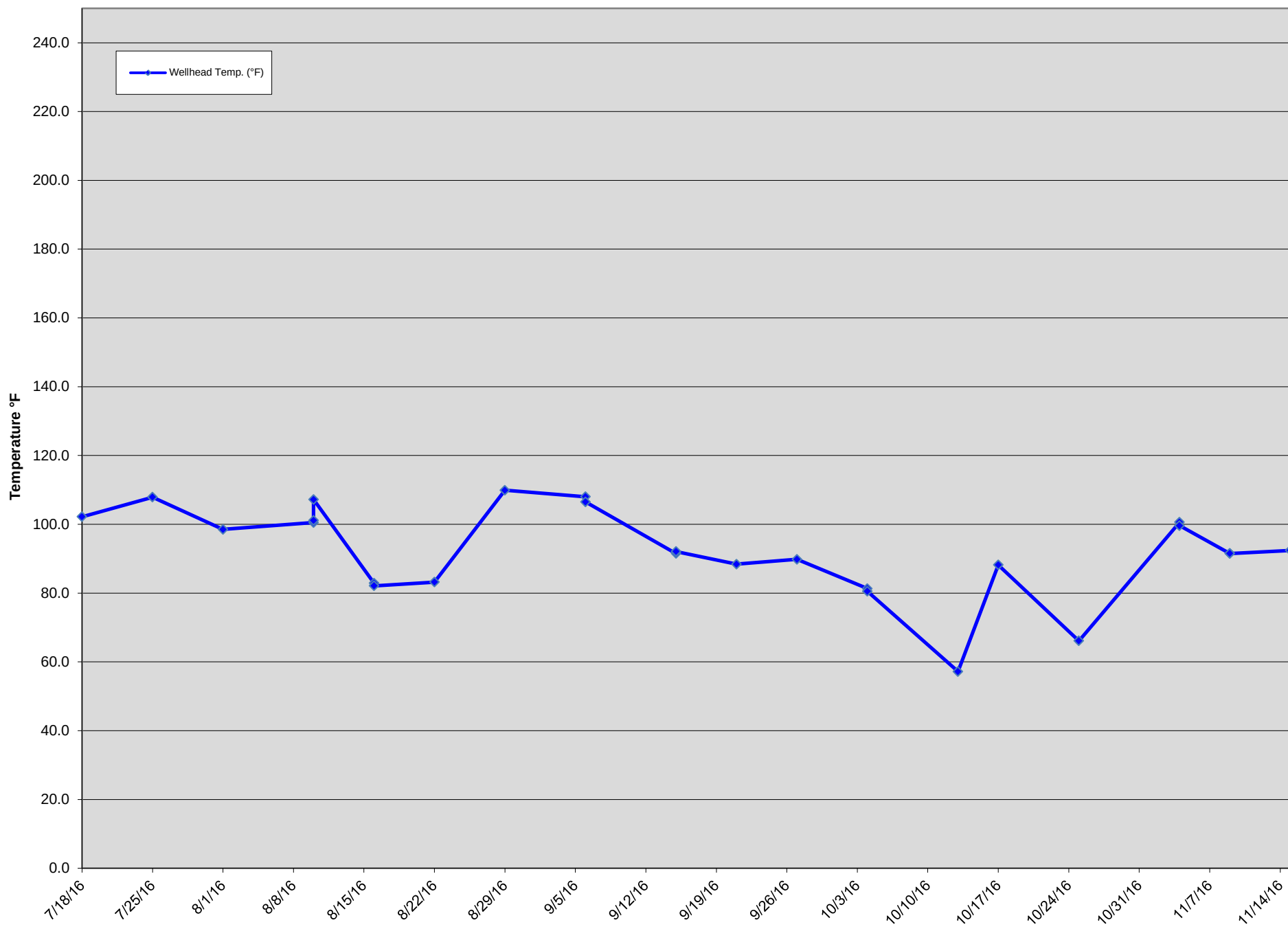
GEW-008 Wellhead Temperatures



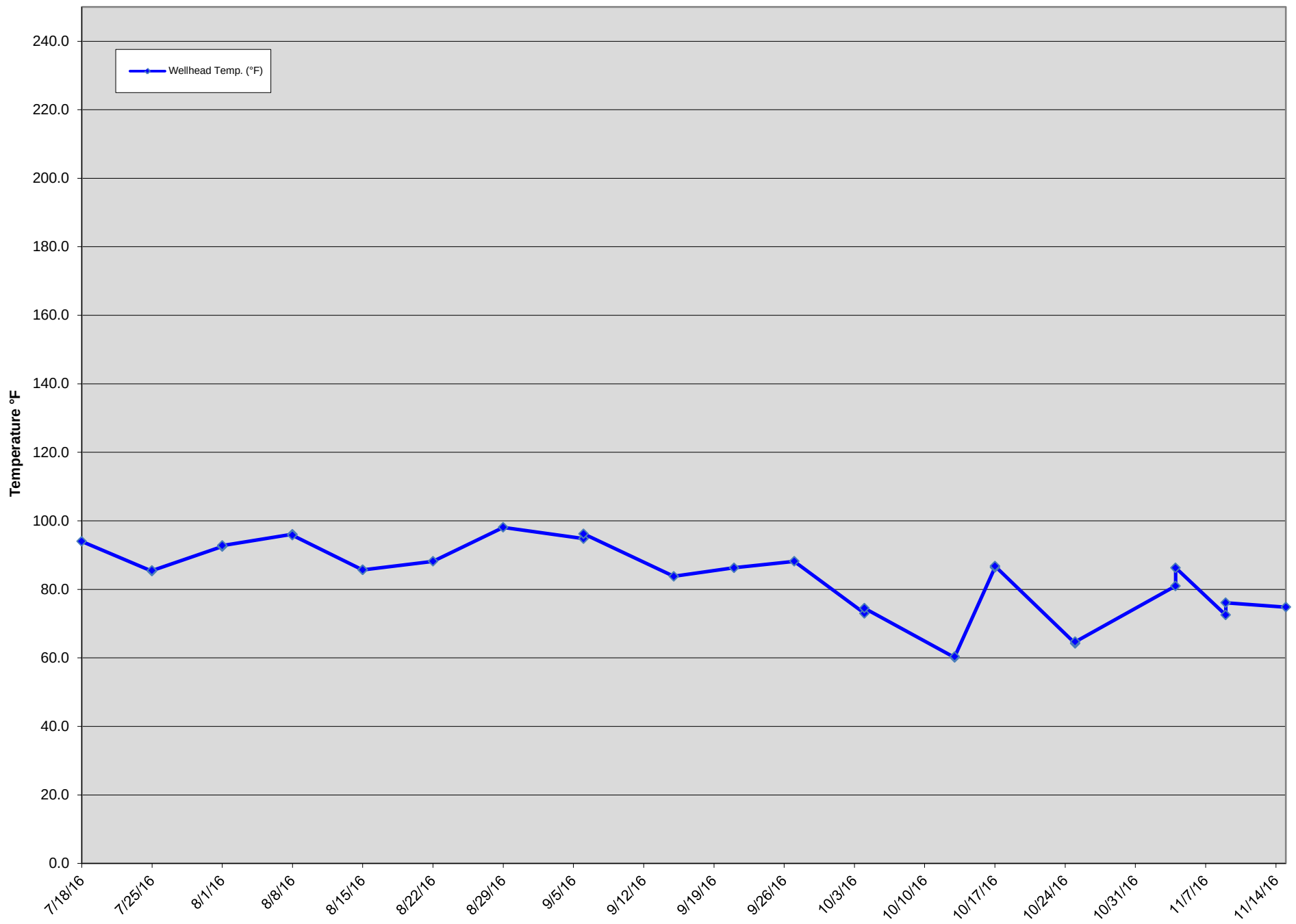
GEW-009 Wellhead Temperatures



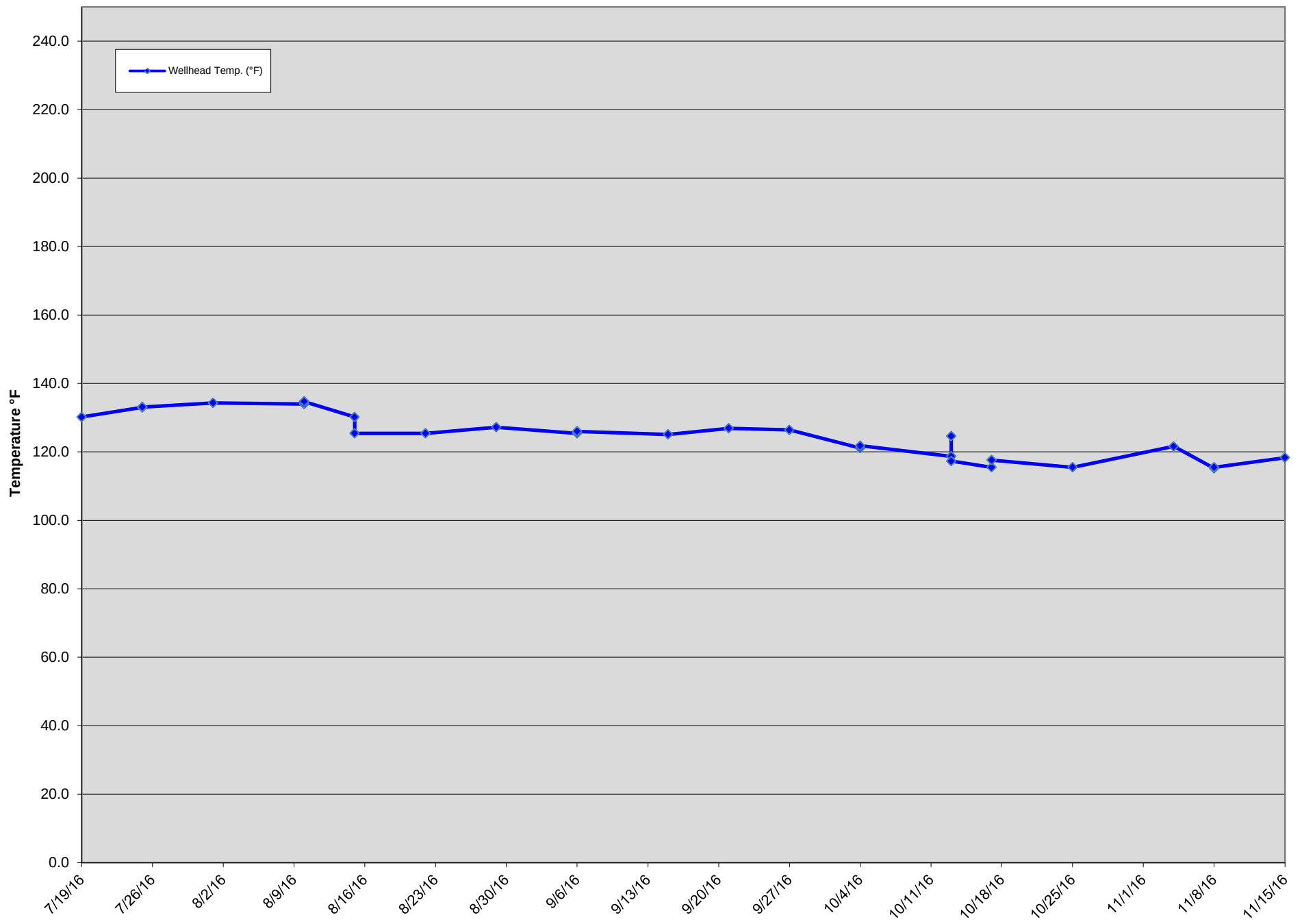
GEW-010 Wellhead Temperatures



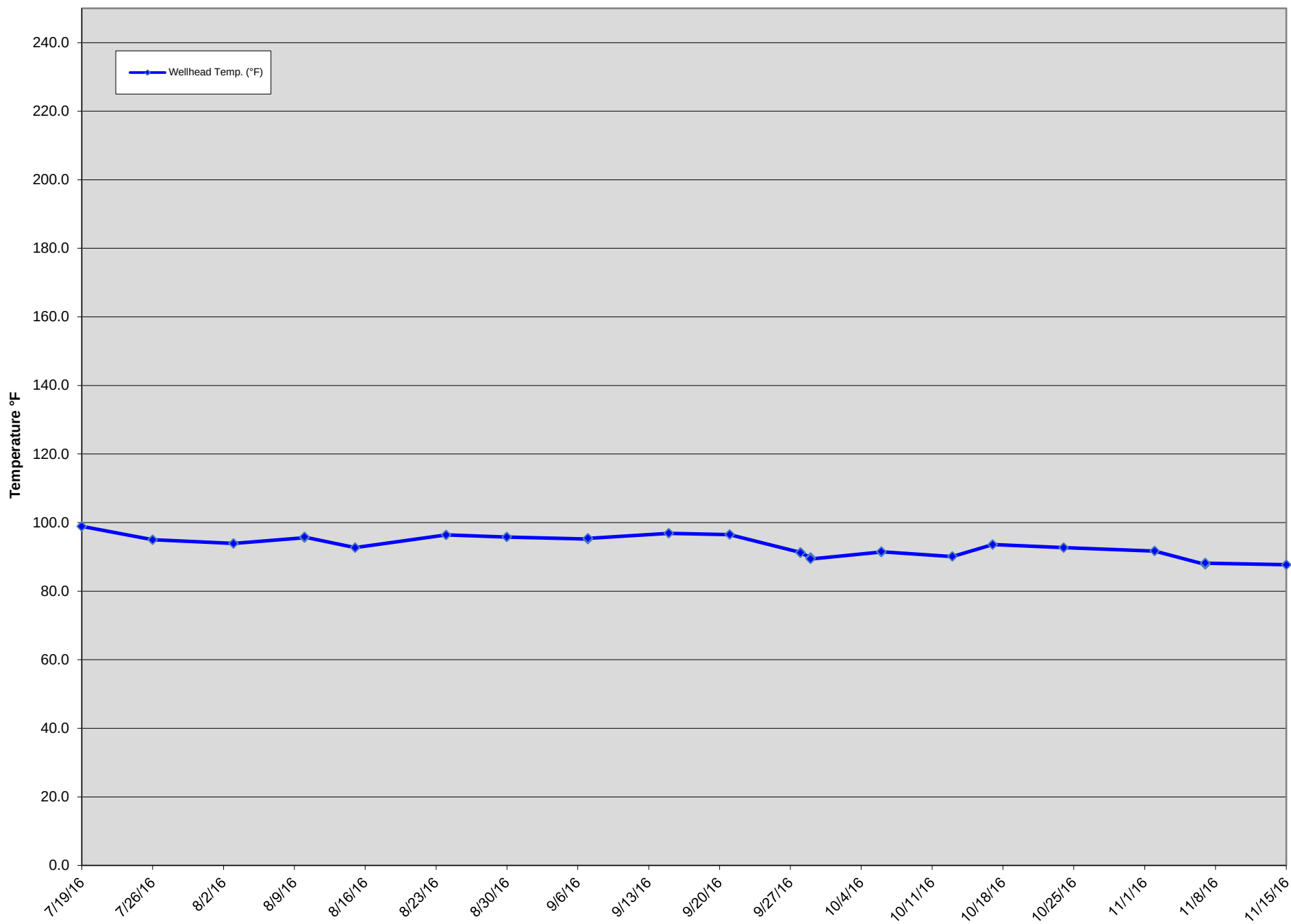
GEW-038 Wellhead Temperatures



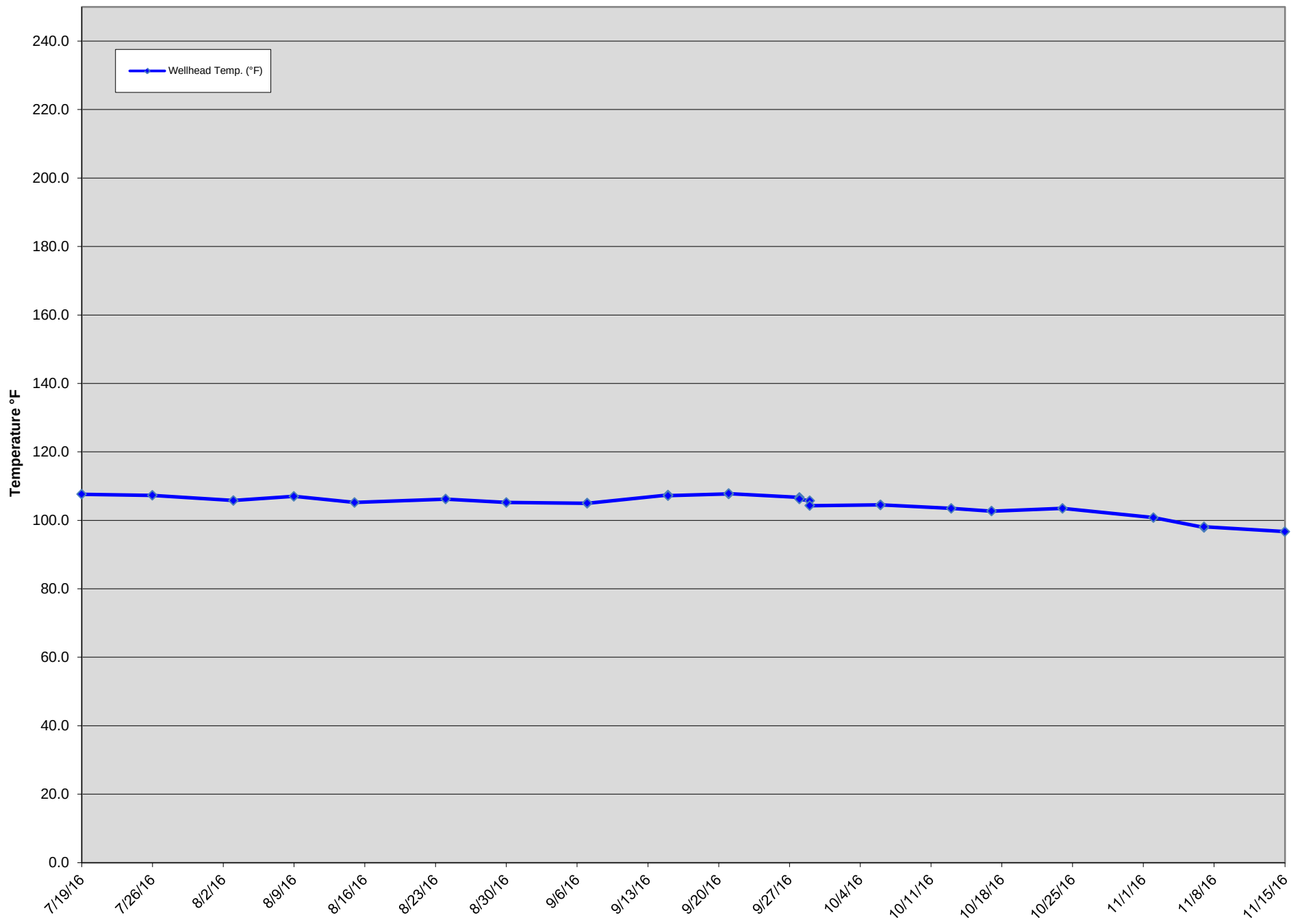
GEW-039 Wellhead Temperatures



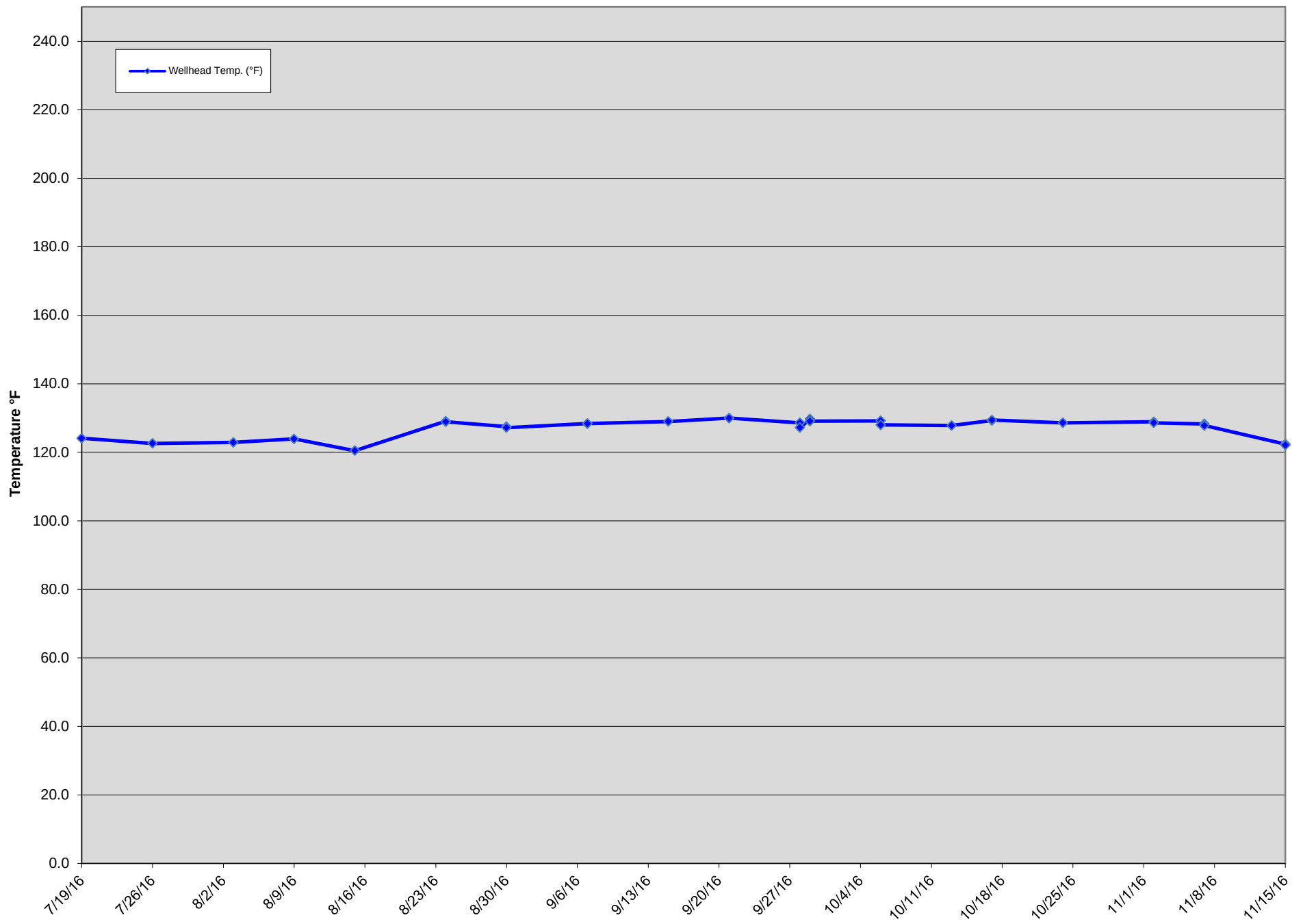
GEW-040 Wellhead Temperatures



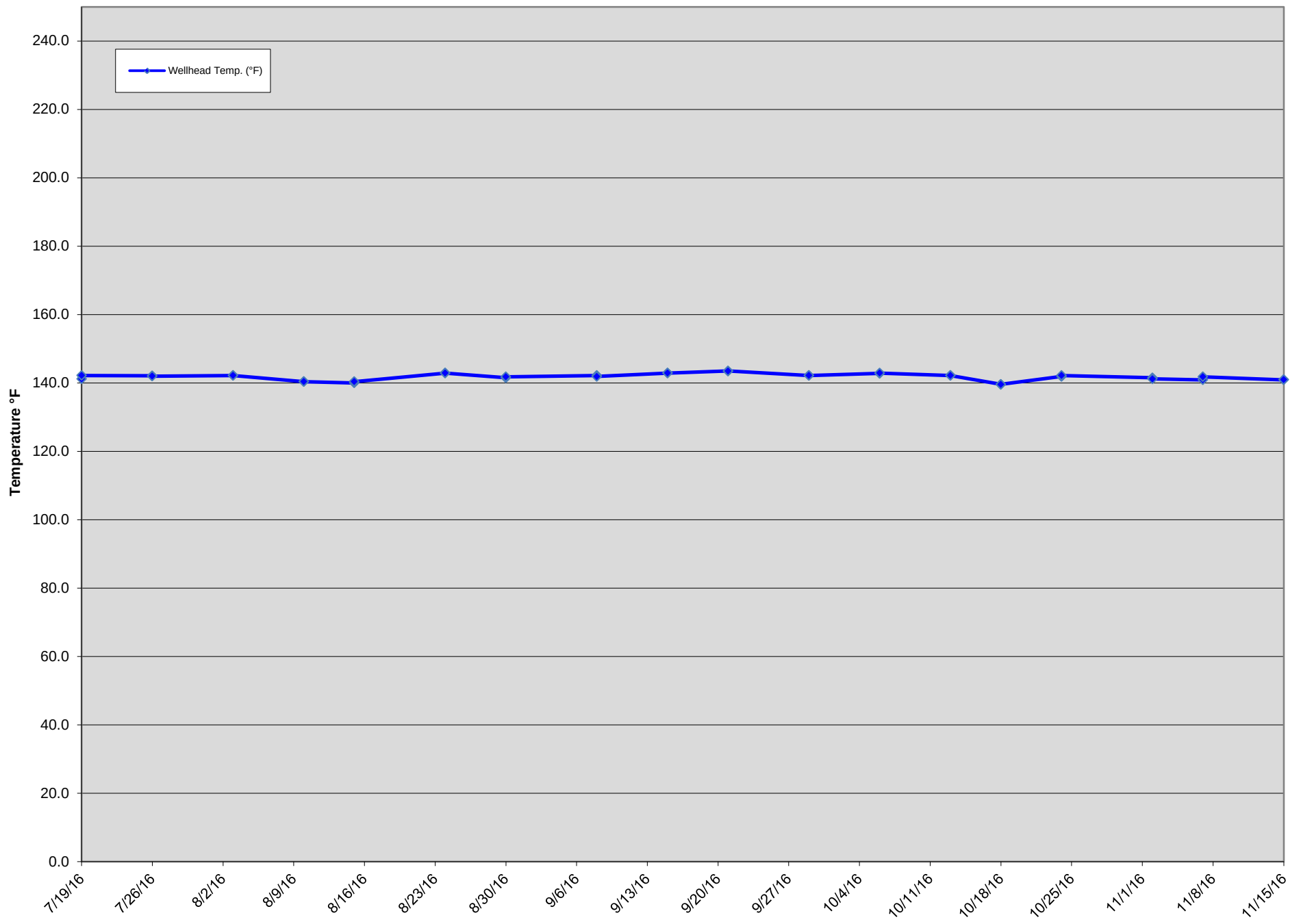
GEW-041R Wellhead Temperatures



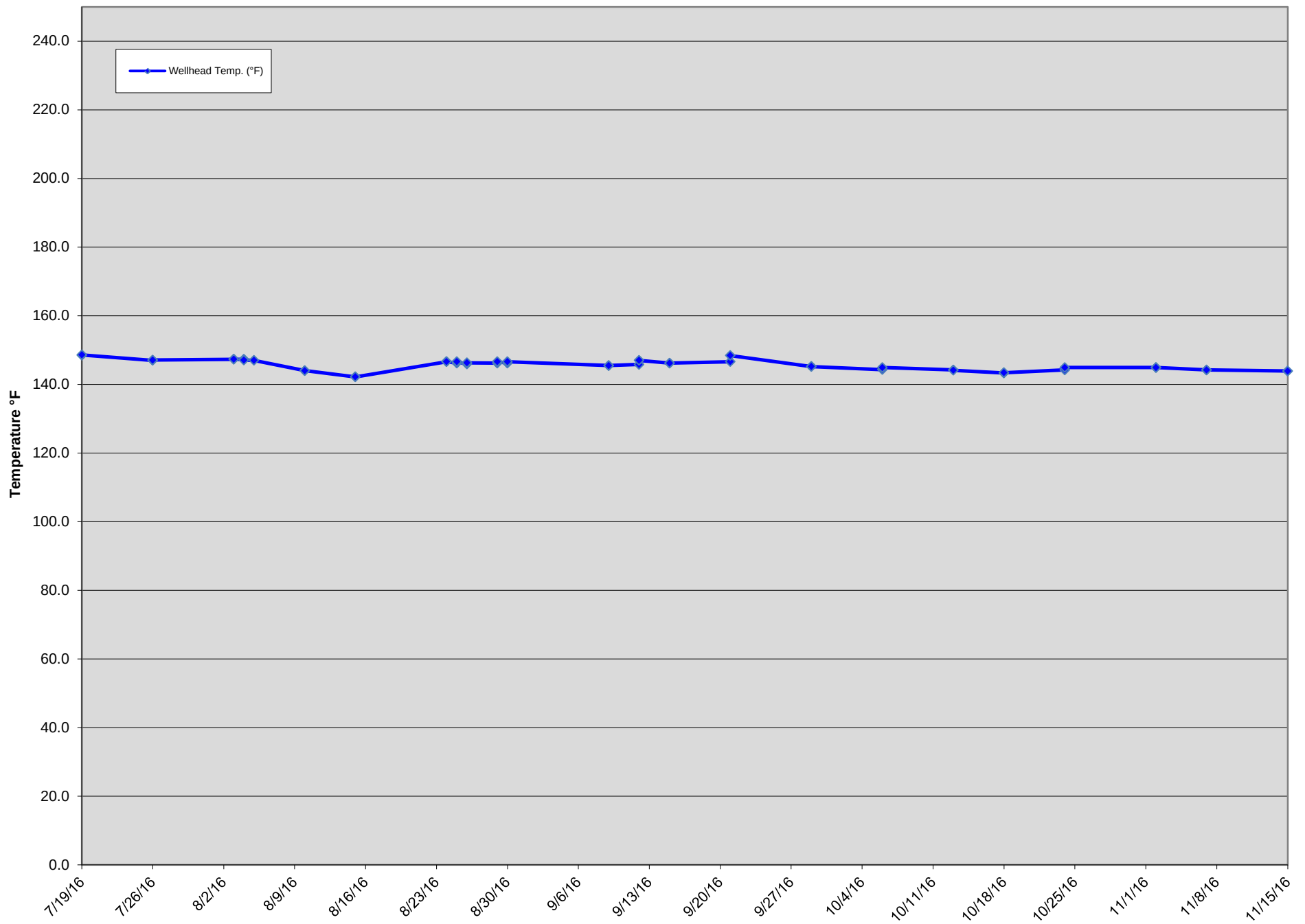
GEW-043R Wellhead Temperatures



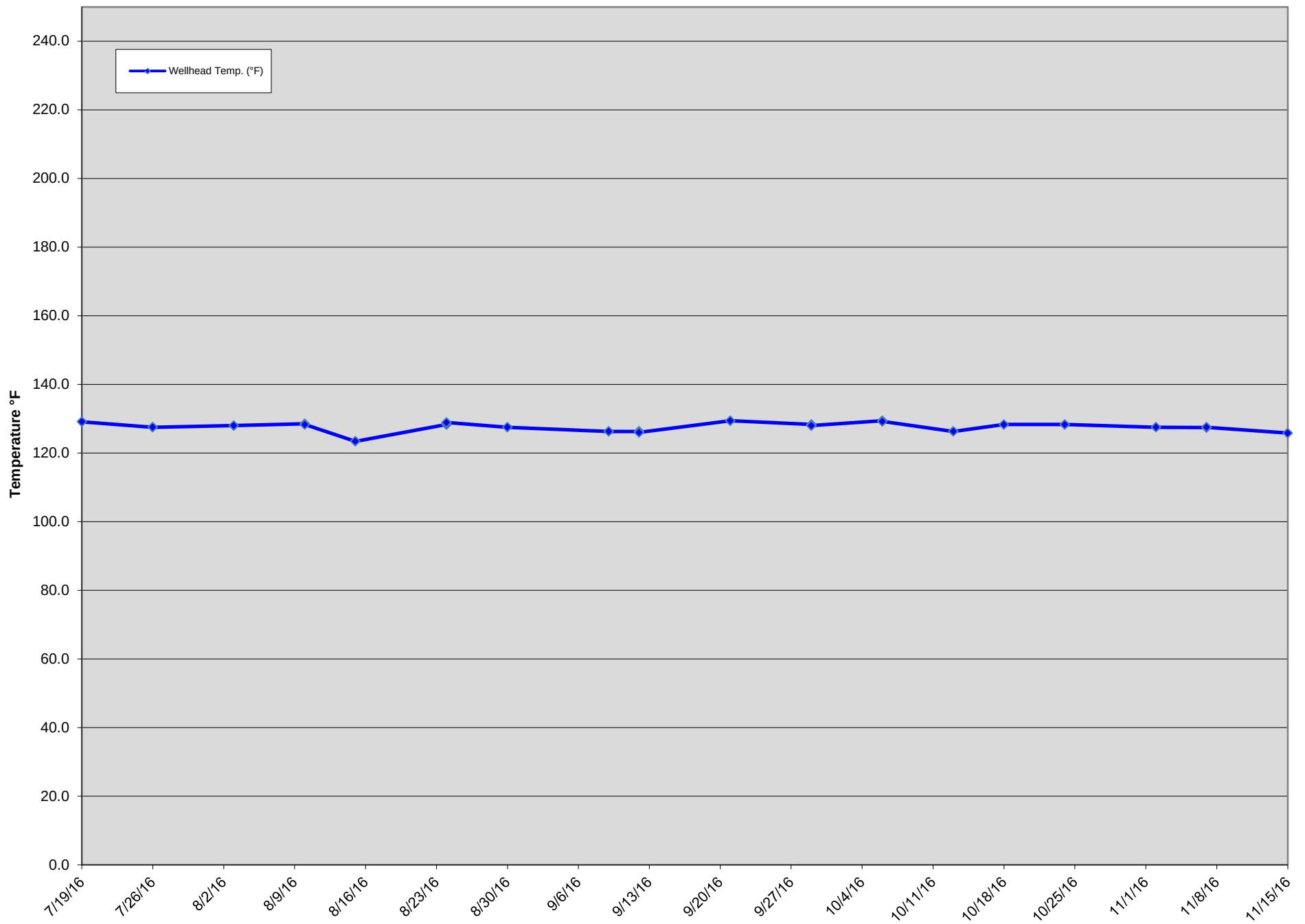
GEW-053 Wellhead Temperatures



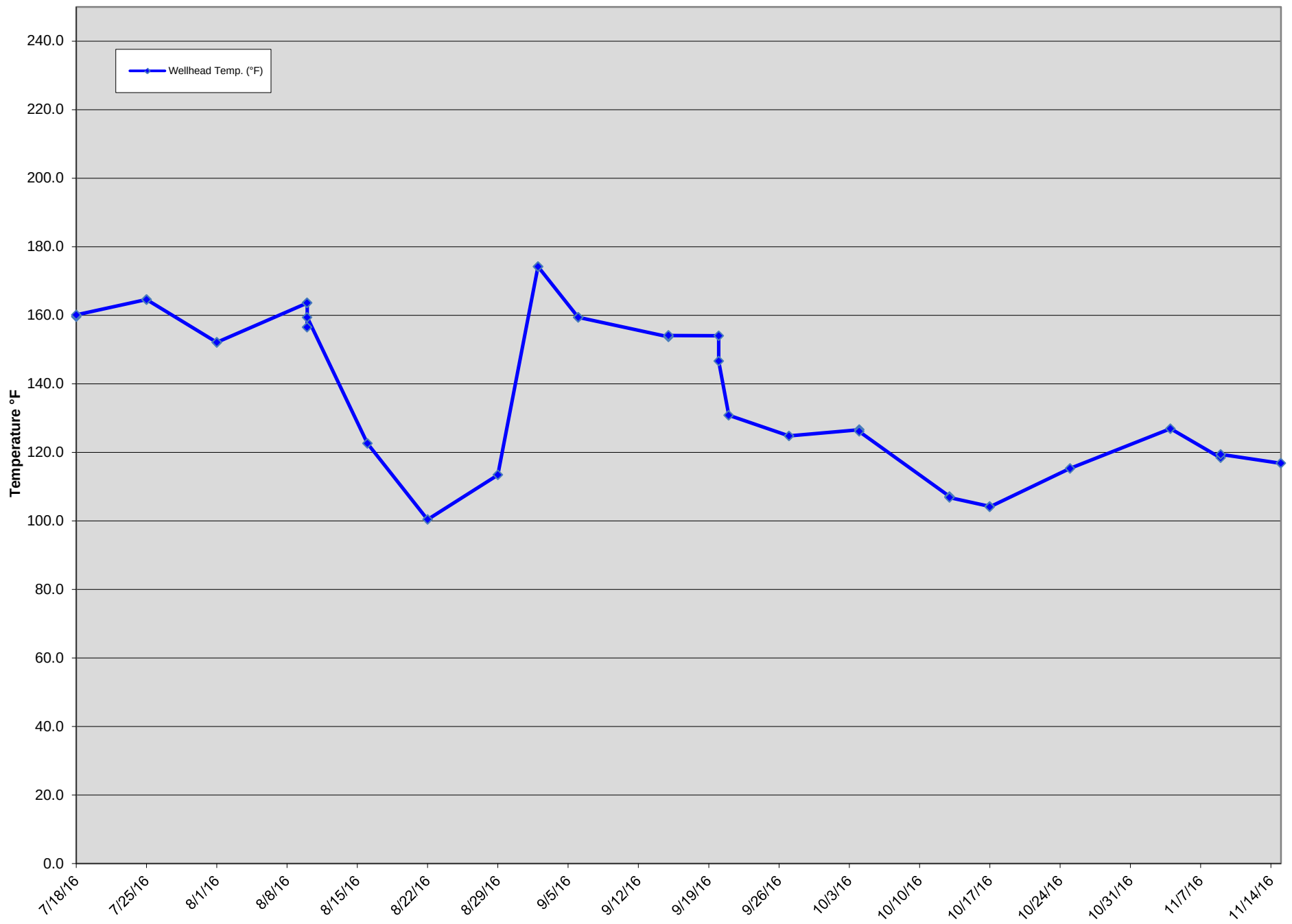
GEW-054 Wellhead Temperatures



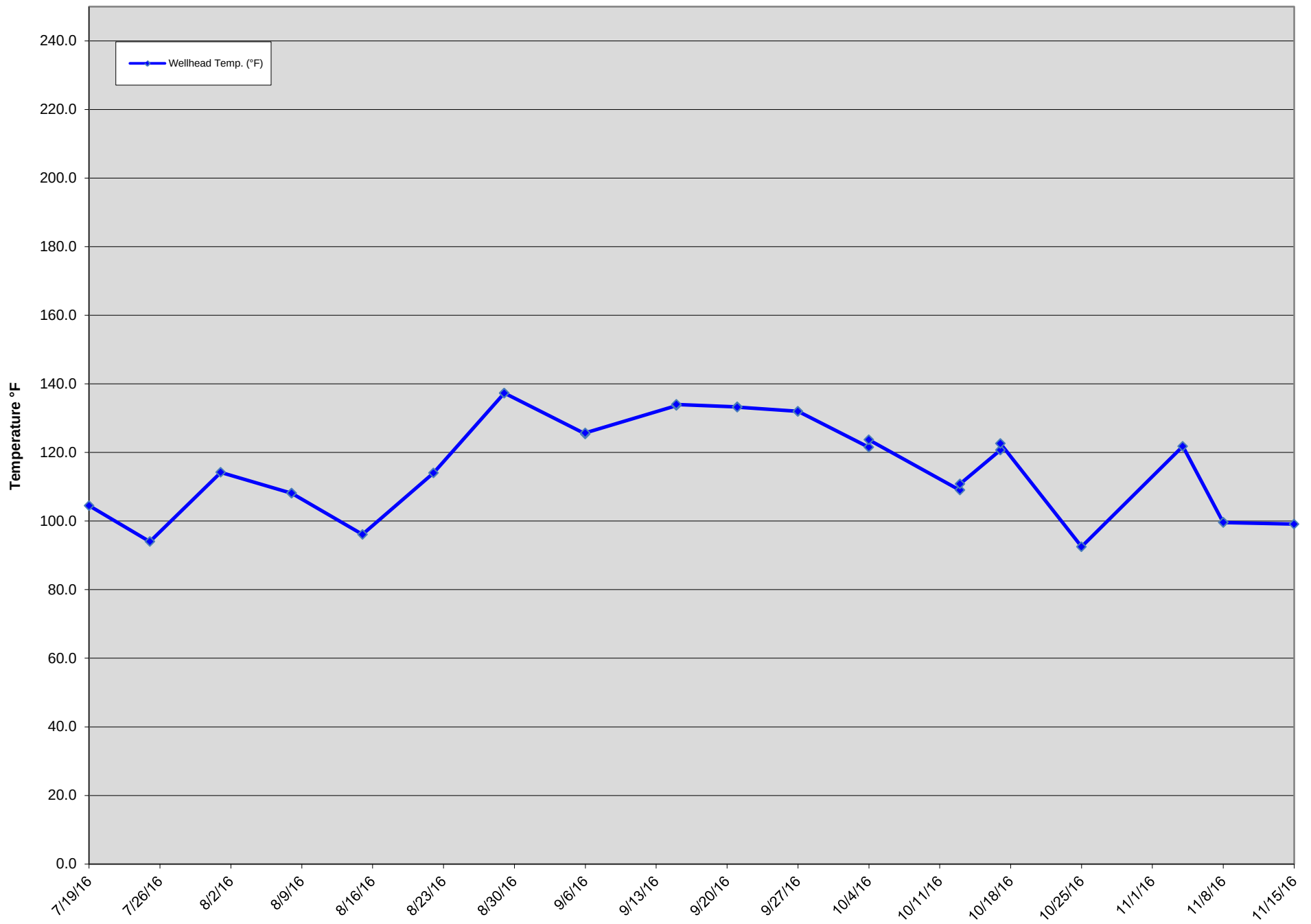
GEW-055 Wellhead Temperatures



GEW-056R Wellhead Temperatures



GEW-109 Wellhead Temperatures



GEW-110 Wellhead Temperatures

