

Bridgeton Landfill, LLC

Weekly Data Submittal

Week of March 19, 2017 – March 25, 2017

**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**

March 31, 2017

Commentary on Data

March 31, 2017

Attachment A – Leachate Levels in Leachate Collection Sumps

LCS-1D is equipped with a level sensor and a flow meter. Bridgeton Landfill confirmed that the flow meter on LCS-1D is operational and the flow was observed during the weekly reporting period. Liquid level was not recorded by the level sensor during the weekly reporting period. Bridgeton Landfill is currently looking into replacing the level sensor on LCS-1D.

The pump in LCS-2D was non-operational during the weekly reporting period.

The pump in LCS-3D was non-operational during the weekly reporting period. The transducer in LCS-3D continued to report liquid levels.

The level sensor in LCS-4B is currently operational and responsive. Liquid level was not recorded by the level sensor during the weekly reporting period. LCS-4B is equipped with a flow meter that displayed no flow during the weekly reporting period. Therefore, it can be concluded that the liquid level was below the bottom of the pump and level sensor in LCS-4B.

LCS-5B has been drilled and installed and the pump and level sensor were fully operational during the weekly reporting period. LCS-5B replaces LCS-5A as a compliance point.

LCS-6B was fully operational during the weekly reporting period.

Attachment B - Temperature Monitoring Probe Analytical Charts

The following Temperature Monitoring Probes (TMPs) indicated generally consistent profiles to previous observations: TMP-1, -2R, -3, -3R, -4, -4R, -6, -9, -10, -11R, -14R, -16, -17, -18, -21, -22, -23, -24, -25, -26, -27, -28, -29, -33, -34, -35, -36, -37, -38, -39, -40, -41, -42, -43, -44, -45, -46, -47, -48, and -49.

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

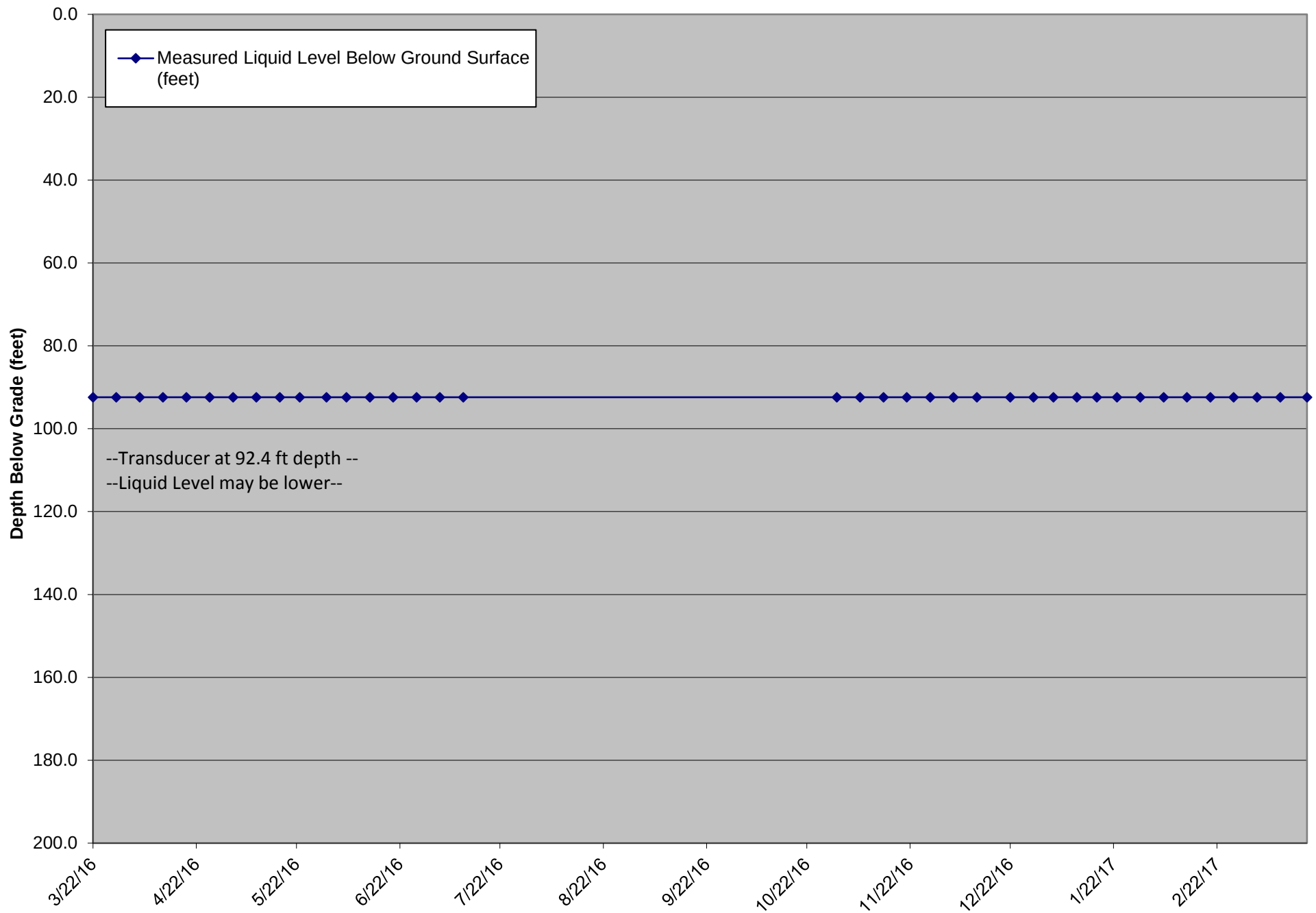
GEW-1A is noted as having an oxygen concentration greater than 1.5% since its installation in December 2015. Bridgeton has made MDNR and St Louis County's Air Pollution Control Program aware of this.

The area in which GEW-1A is installed is very saturated. Bridgeton has installed a sump near GEW-1A and will be increasing the force main capacity during the North Quarry capping projects in hope of lowering the potentiometric surface in the area to improve gas quality and reduce ambient air intrusion at the well.

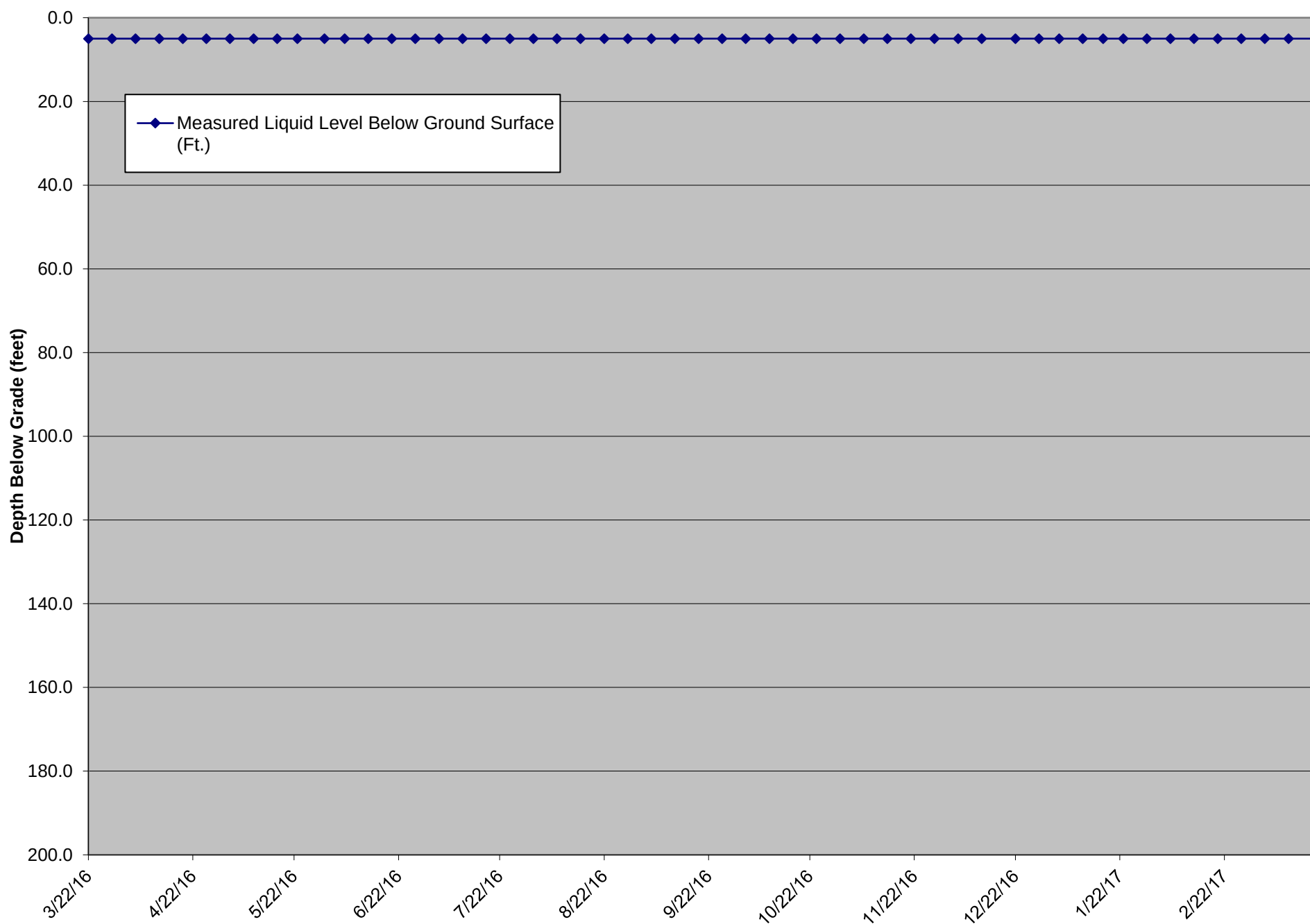
ATTACHMENT A

LEACHATE LEVELS IN LEACHATE COLLECTION SUMPS

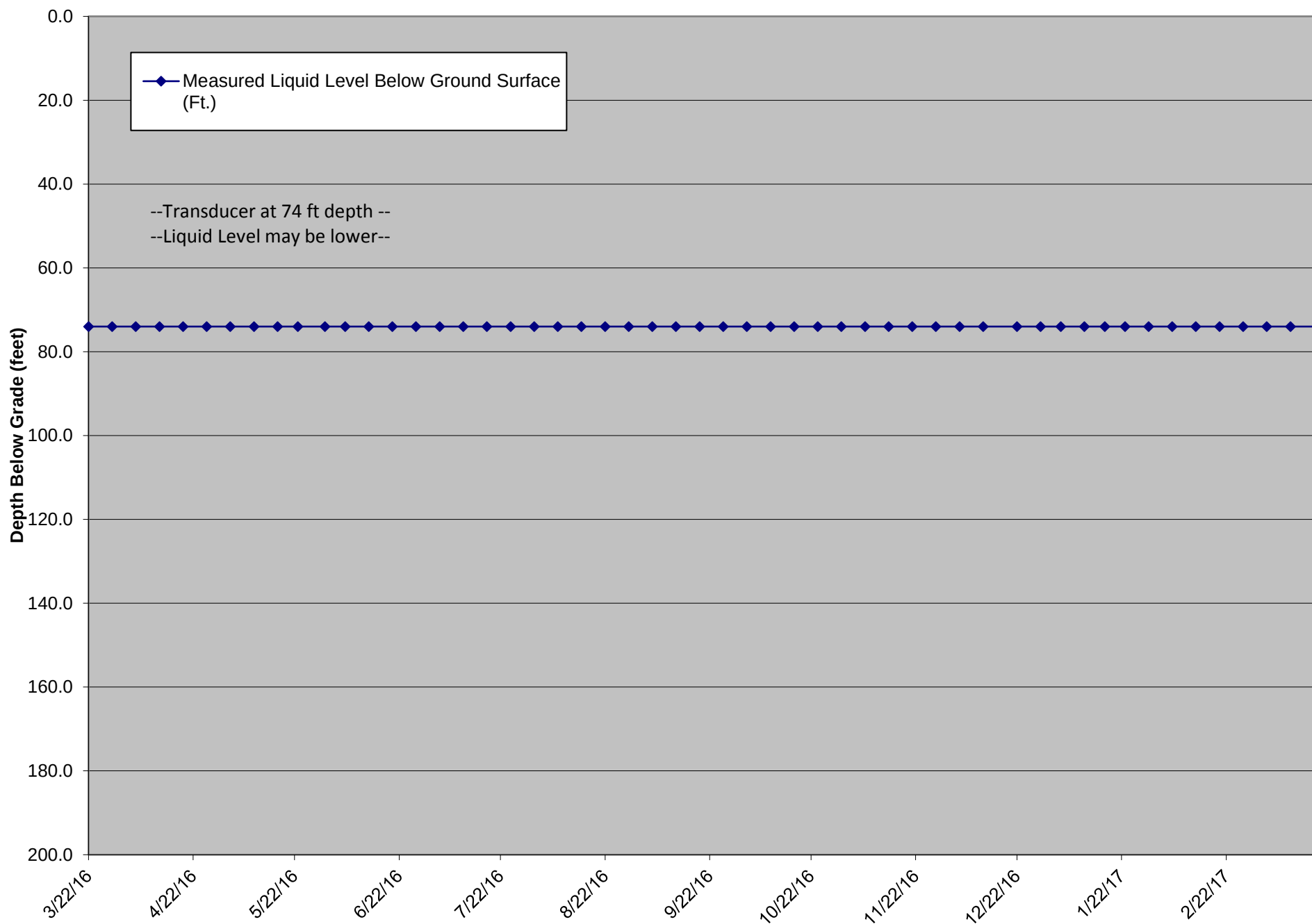
LCS-1D Liquid Level Below Ground Surface



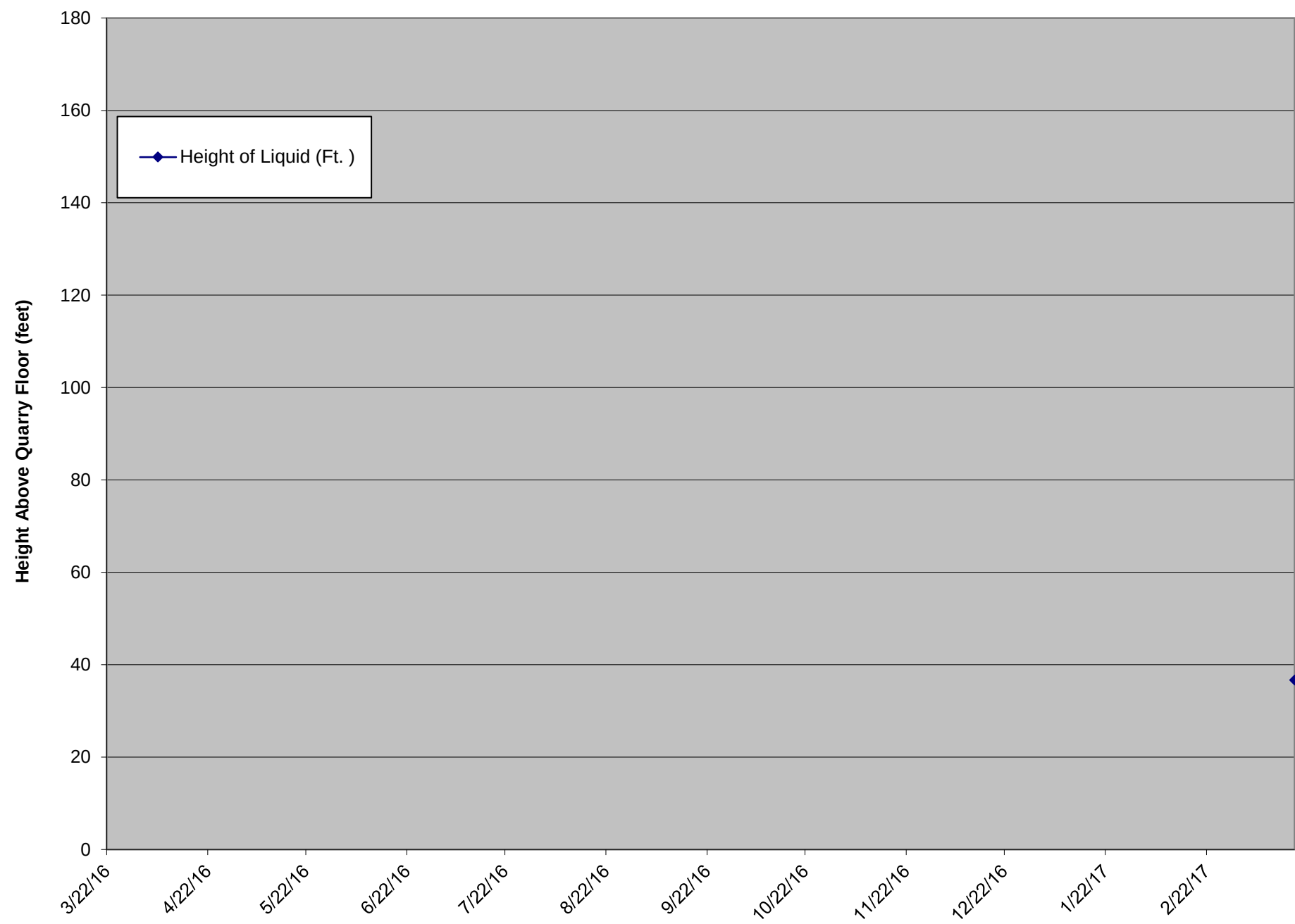
LCS-3D Liquid Level Below Ground Surface



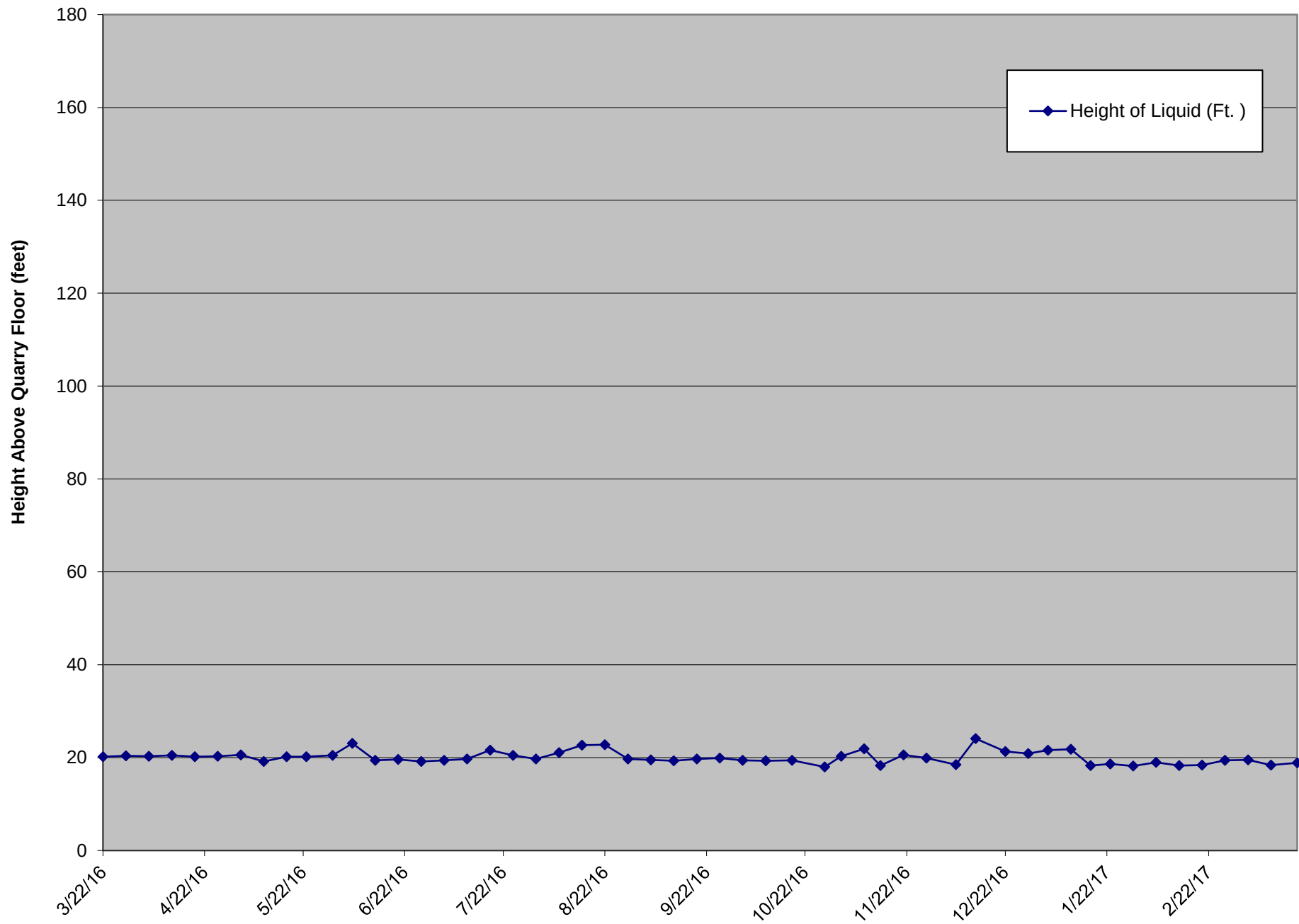
LCS-4B Liquid Level Below Ground Surface



LCS-5B Liquid Level Above Quarry Floor

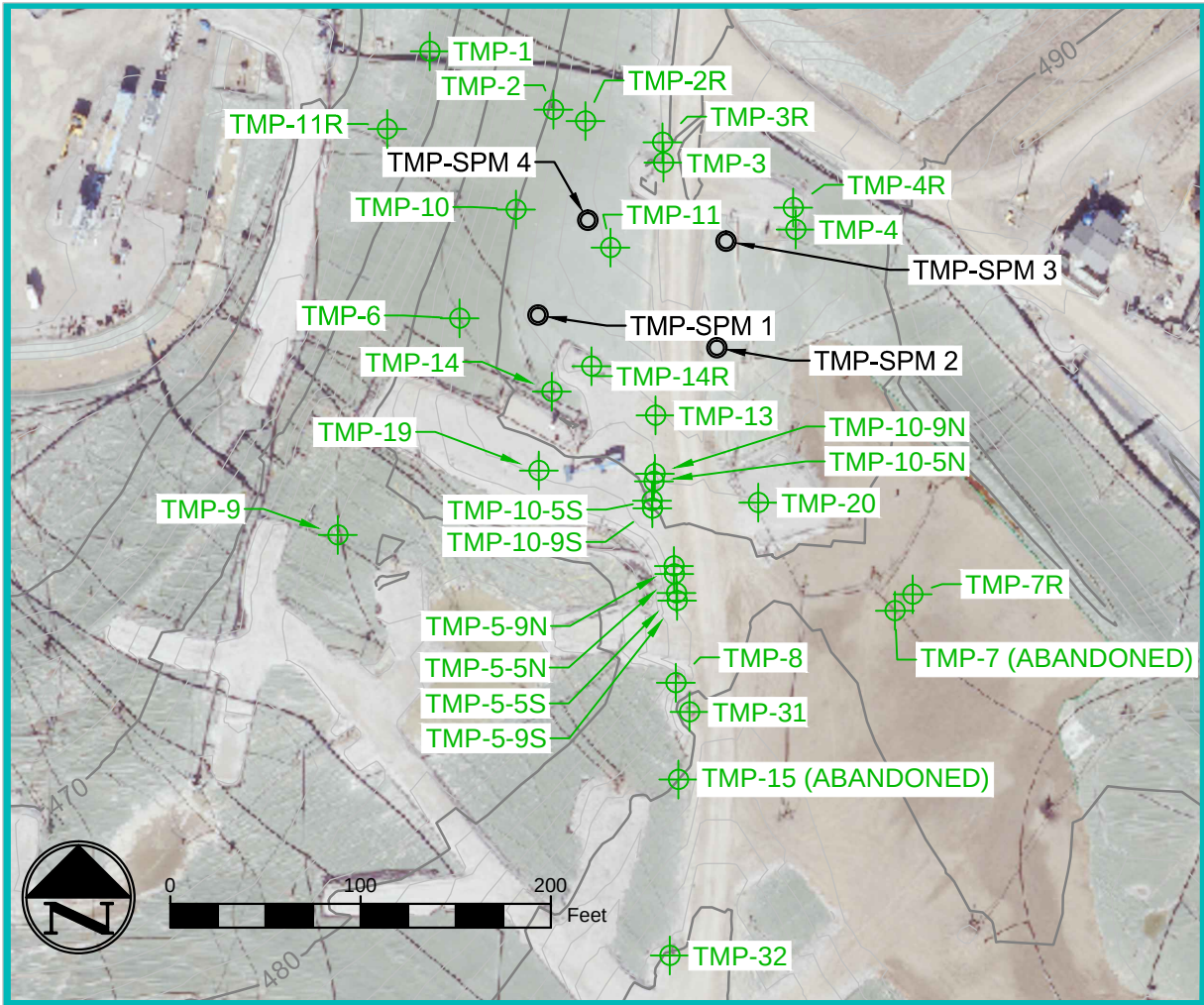
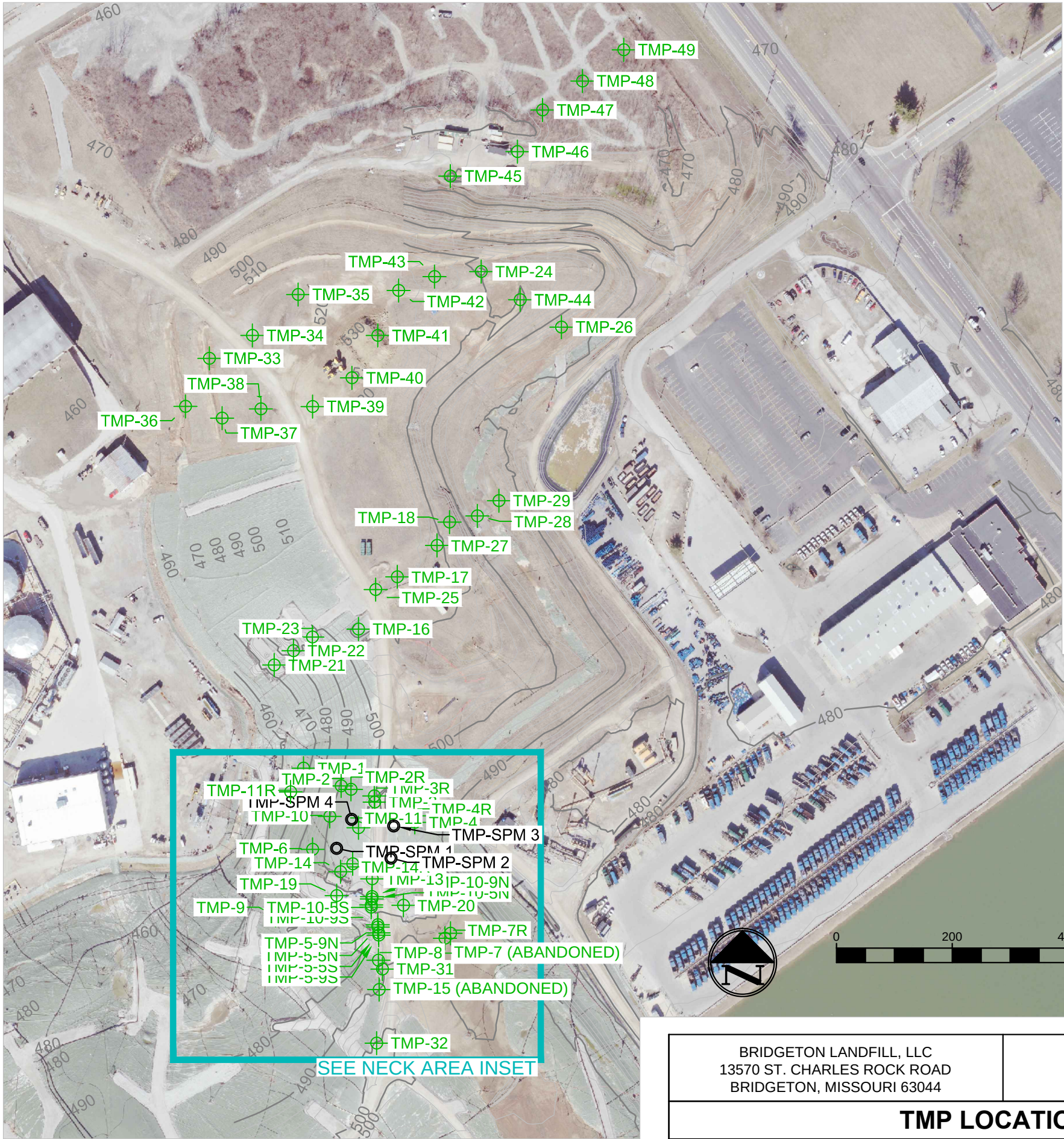


LCS-6B Liquid Level Above Quarry Floor



ATTACHMENT B

TEMPERATURE MONITORING PROBE ANALYTICAL CHARTS



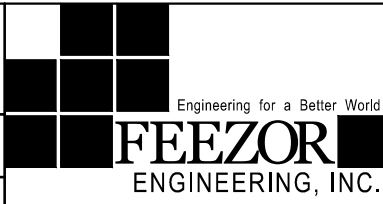
NECK AREA INSET

LEGEND

- 2016 AERIAL TOPOGRAPHY (2' CONTOUR)
- 2016 AERIAL TOPOGRAPHY (10' CONTOUR)
- 500
- INSTALLED TMP LOCATION
- TMP-SPM 1
- TMP-SPM (ASBUILT OCTOBER 13, 2016)

NOTE:

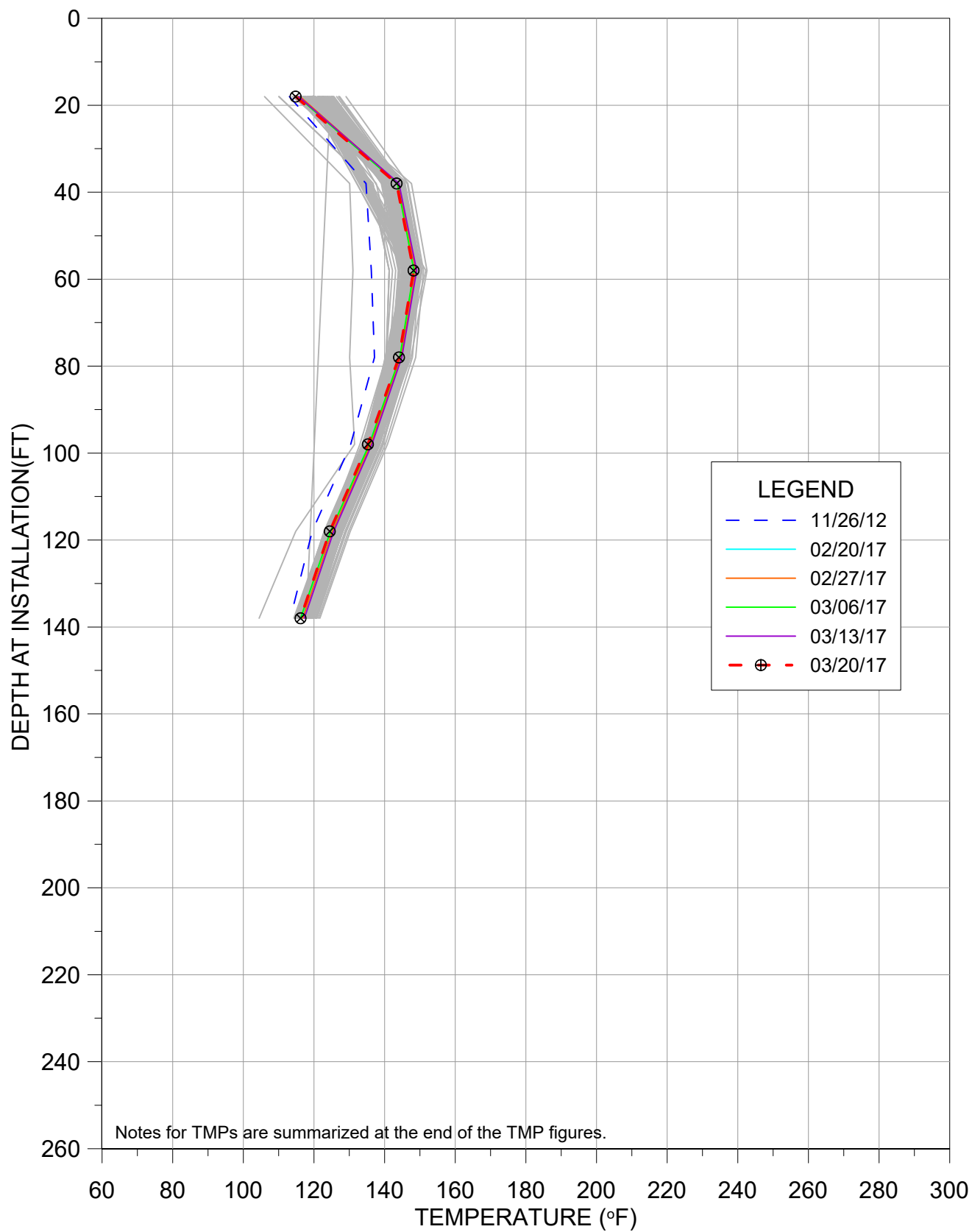
- 2016 AERIAL TOPOGRAPHY PROVIDED BY COOPER AERIAL SURVEYS, INC. AND IS DATED FEBRUARY 27, 2016

BRIDGETON LANDFILL, LLC 13570 ST. CHARLES ROCK ROAD BRIDGETON, MISSOURI 63044		BRIDGETON LANDFILL		 Engineering for a Better World		OCTOBER 2016		DRAWING NO.:	
						DESIGNED BY: PML			
						APPROVED BY: ---			
TMP LOCATIONS				 FEEZOR					
PROJECT NUMBER: BT-124		D:\Andrew-FEI-Documents\Dropbox (Feezor Engineering)\BT-113 Task - Action Plan Figure 3\Weekly Report Updated TMP Drawing		ENGINEERING, INC.		REVISION	DATE		

TMP LOCATIONS

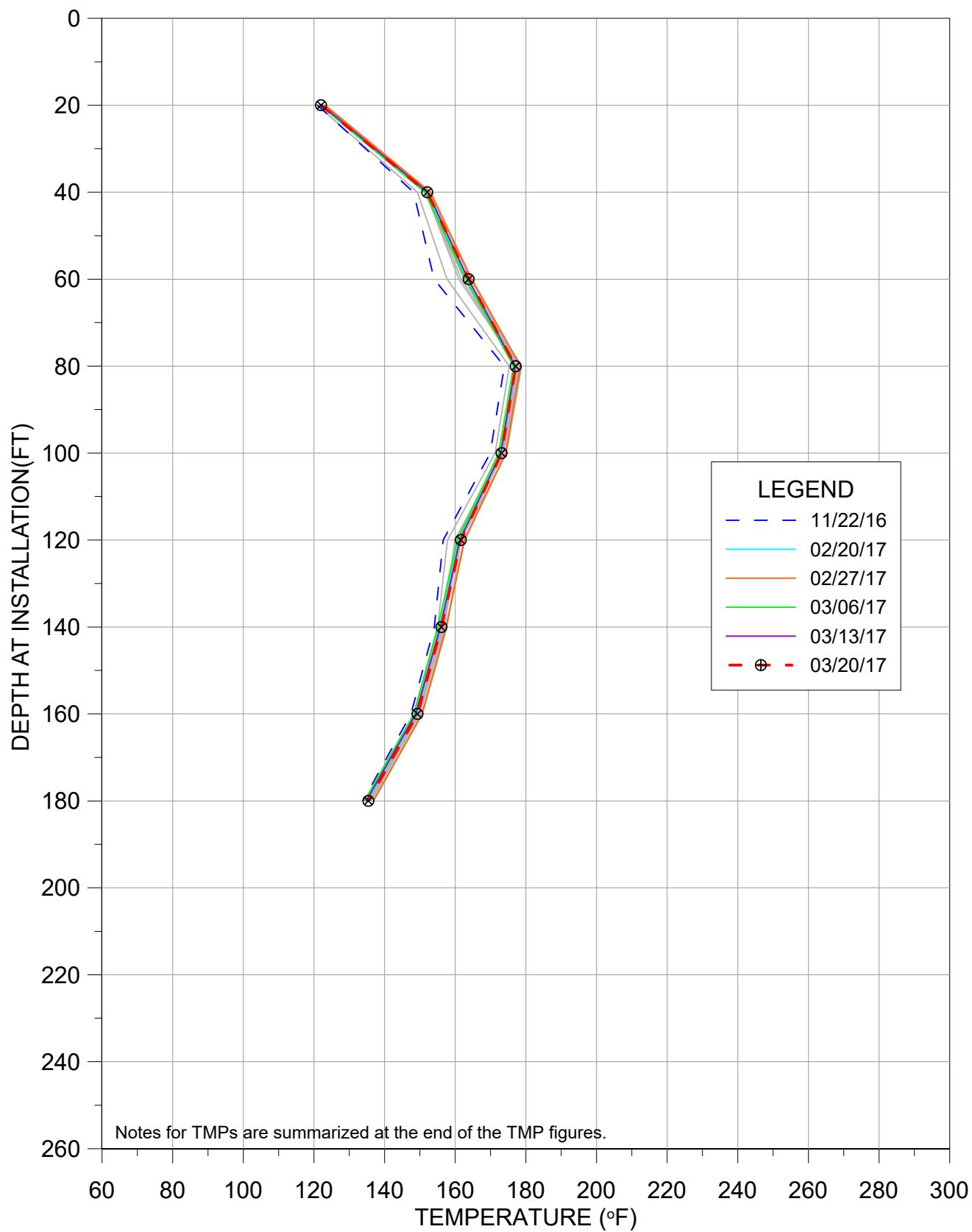
PROJECT NUMBER: BT-124 D:\Andrew-FEI-Documents\Dropbox (Feezor Engineering)\BT-113 Task - Action Plan Figure 3\Weekly Report Updated TMP Drawing

TMP-1



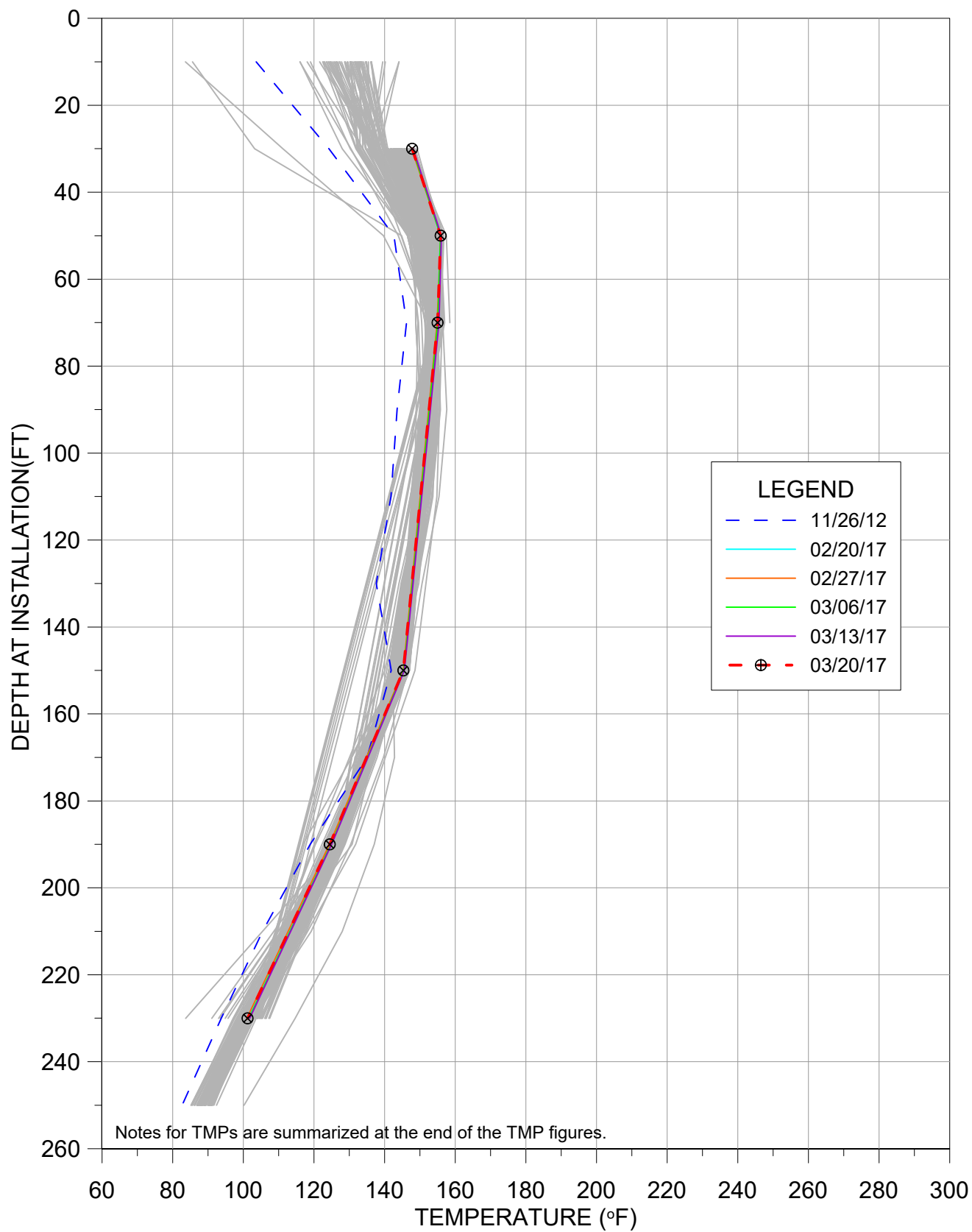
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-2R

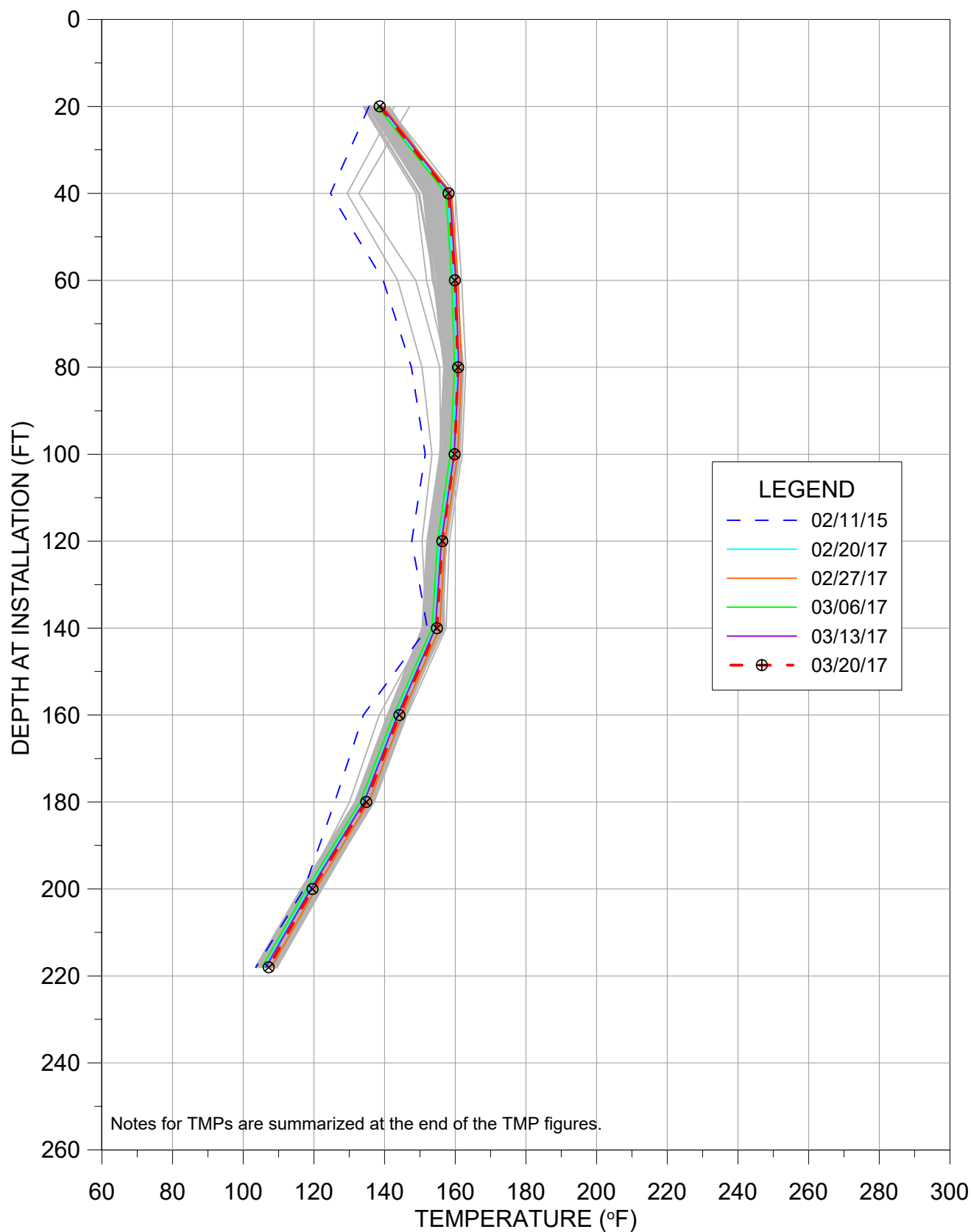


TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

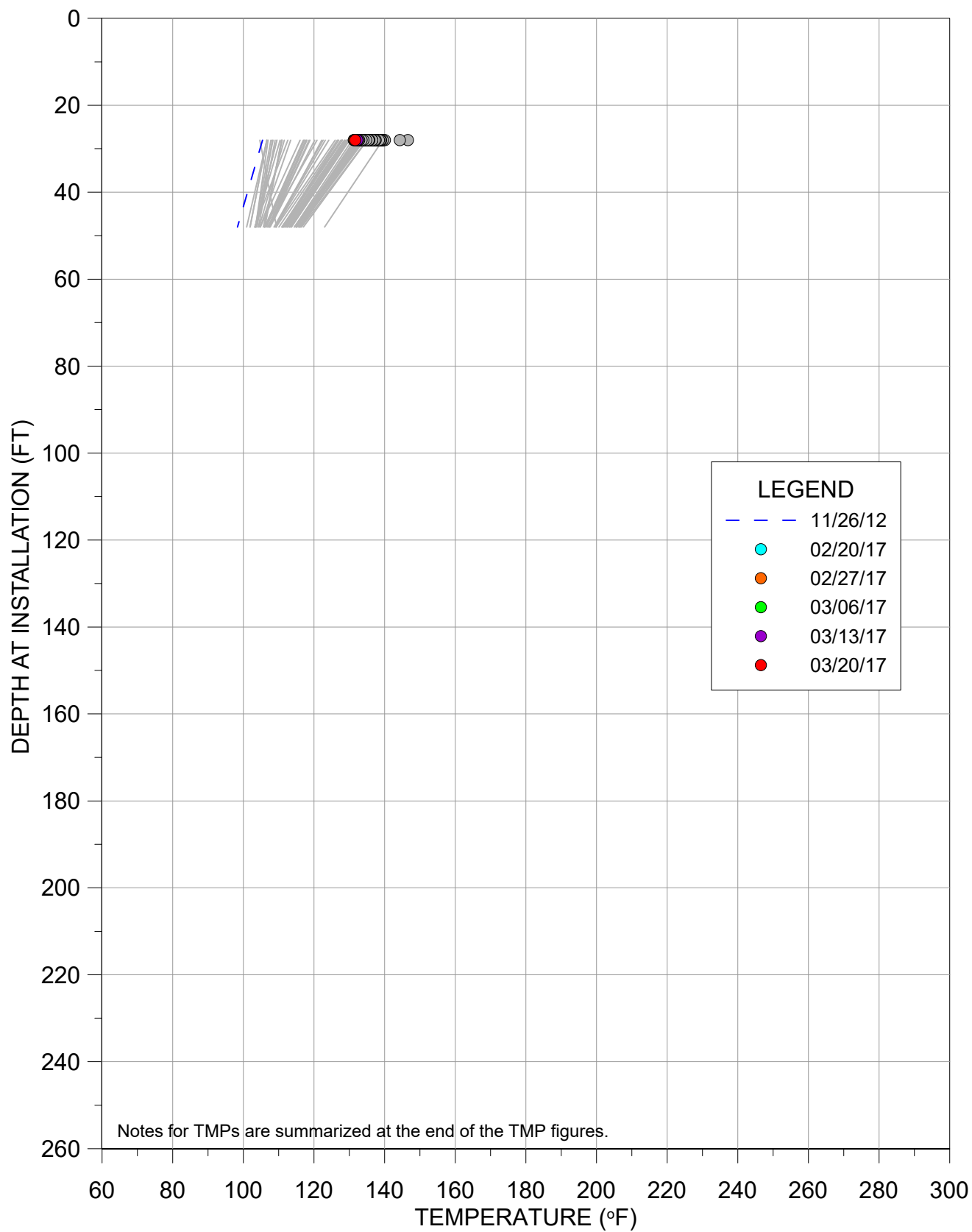
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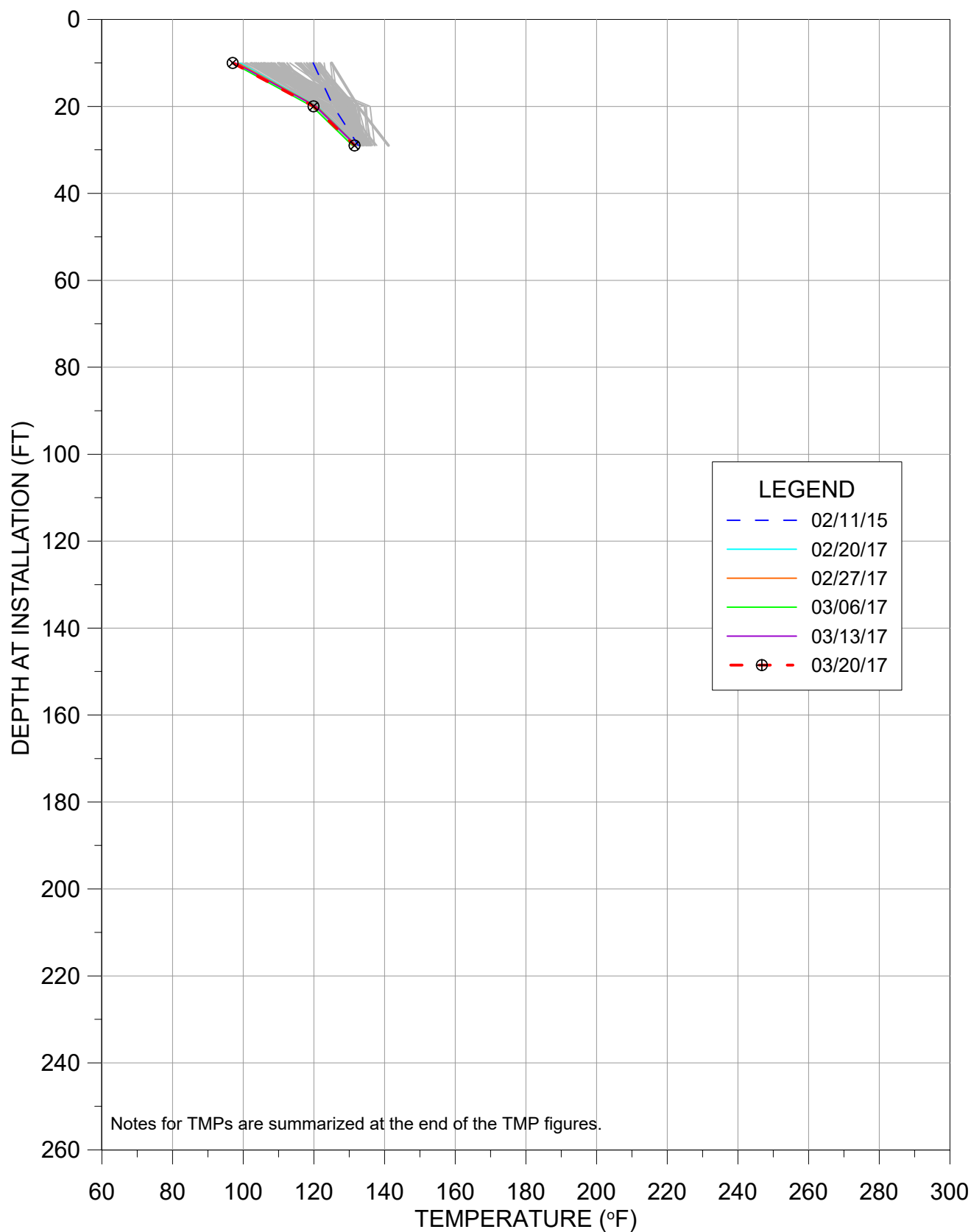
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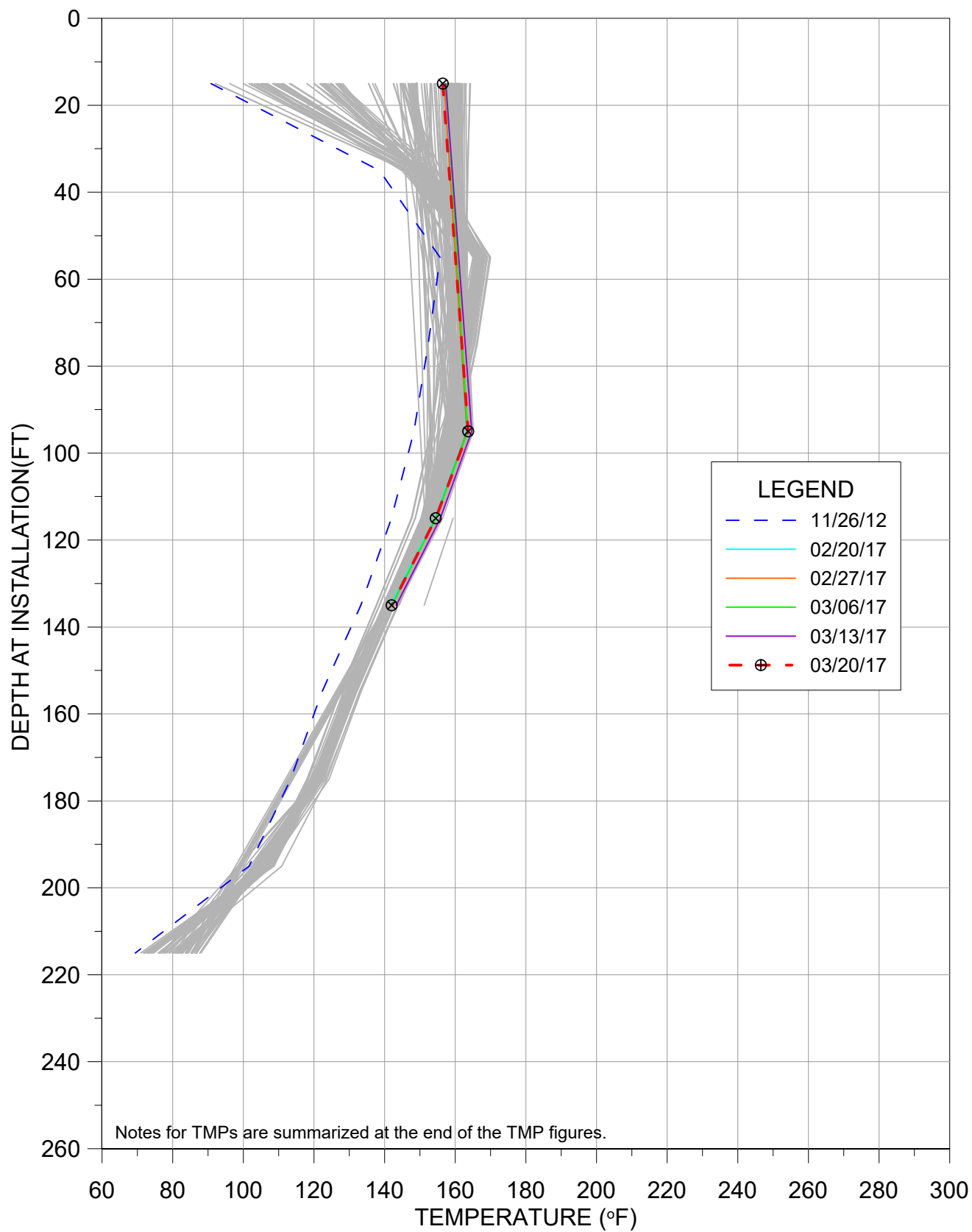
TMP-4



TMP-4R

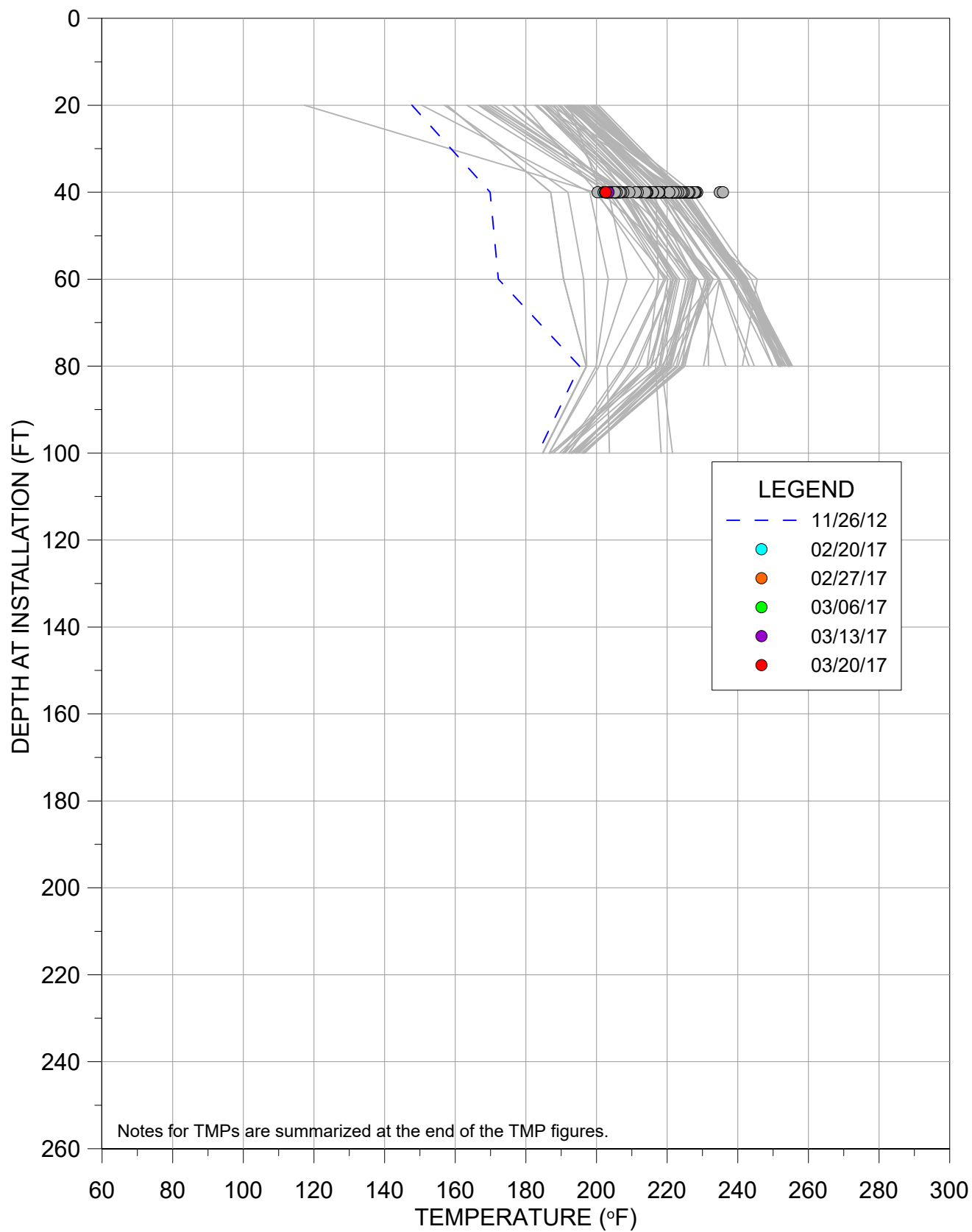


TMP-6



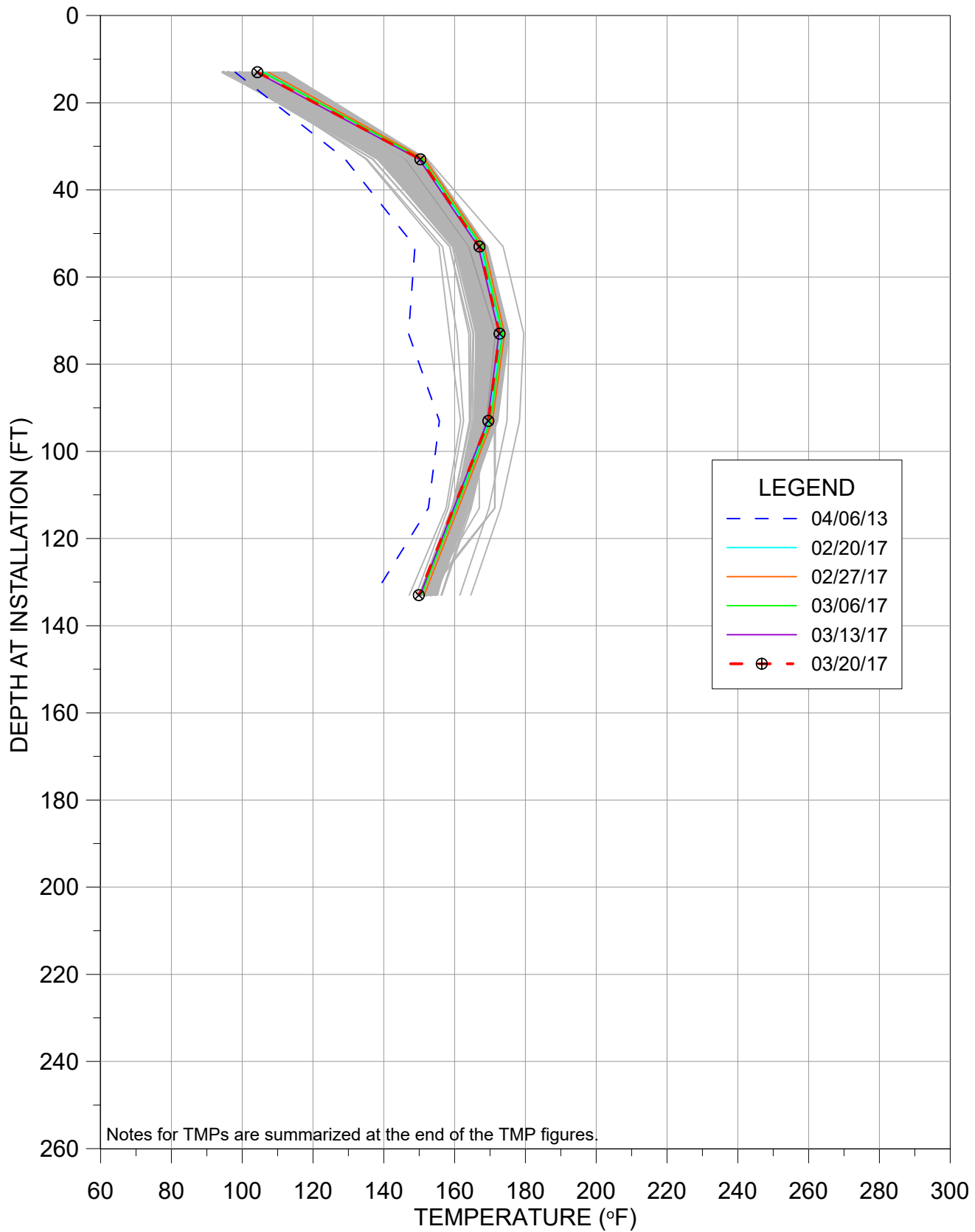
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-9

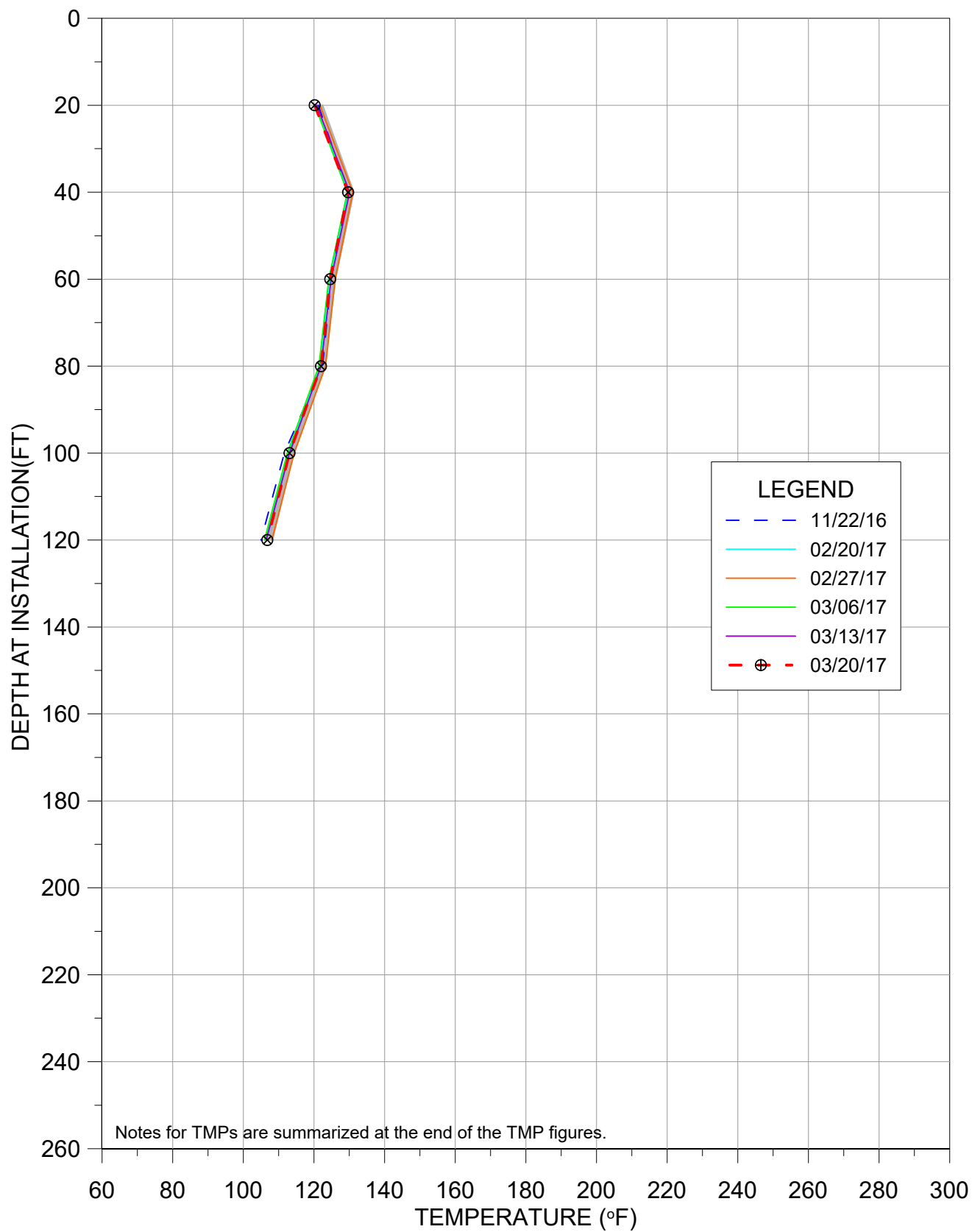


TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

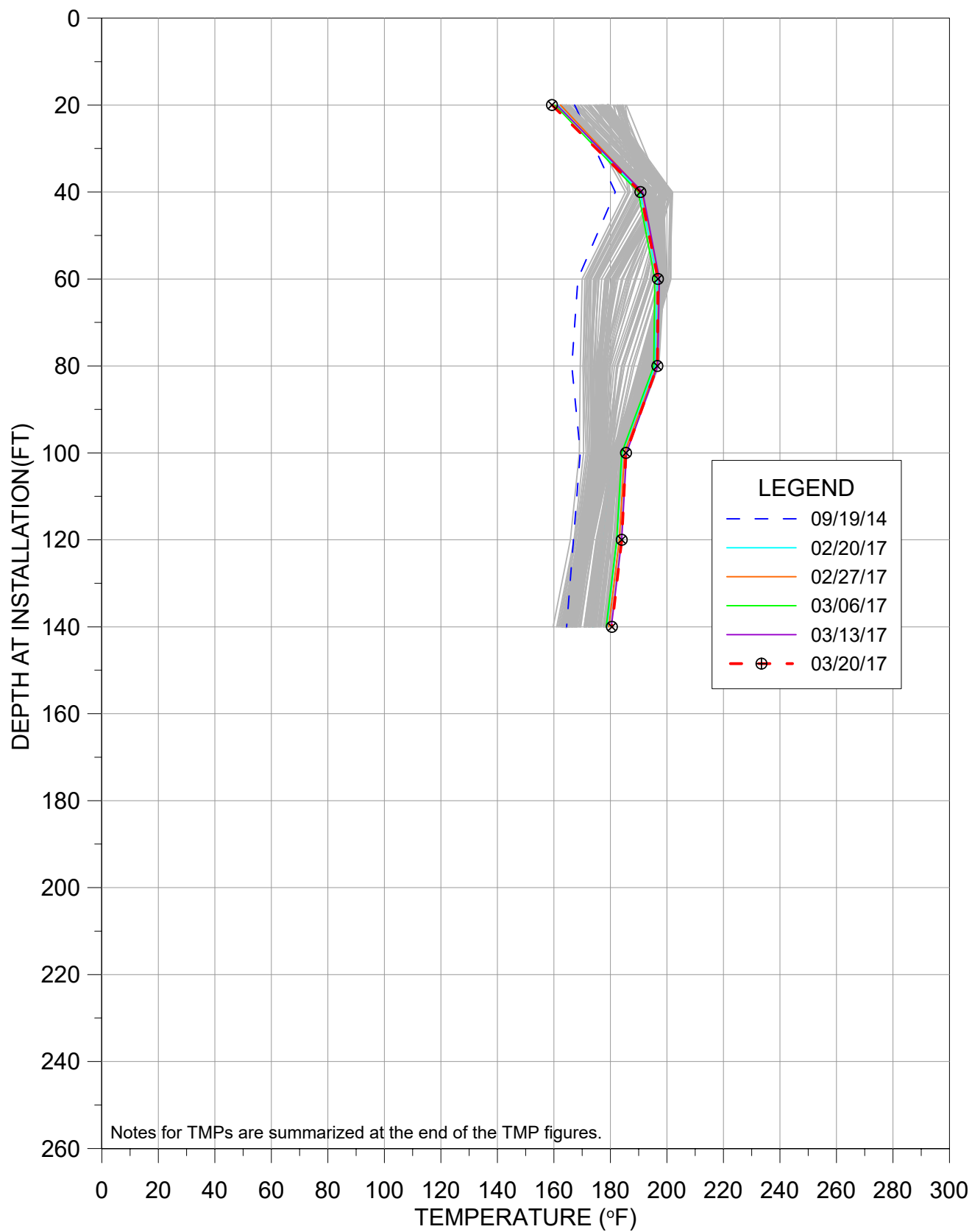
TMP-10



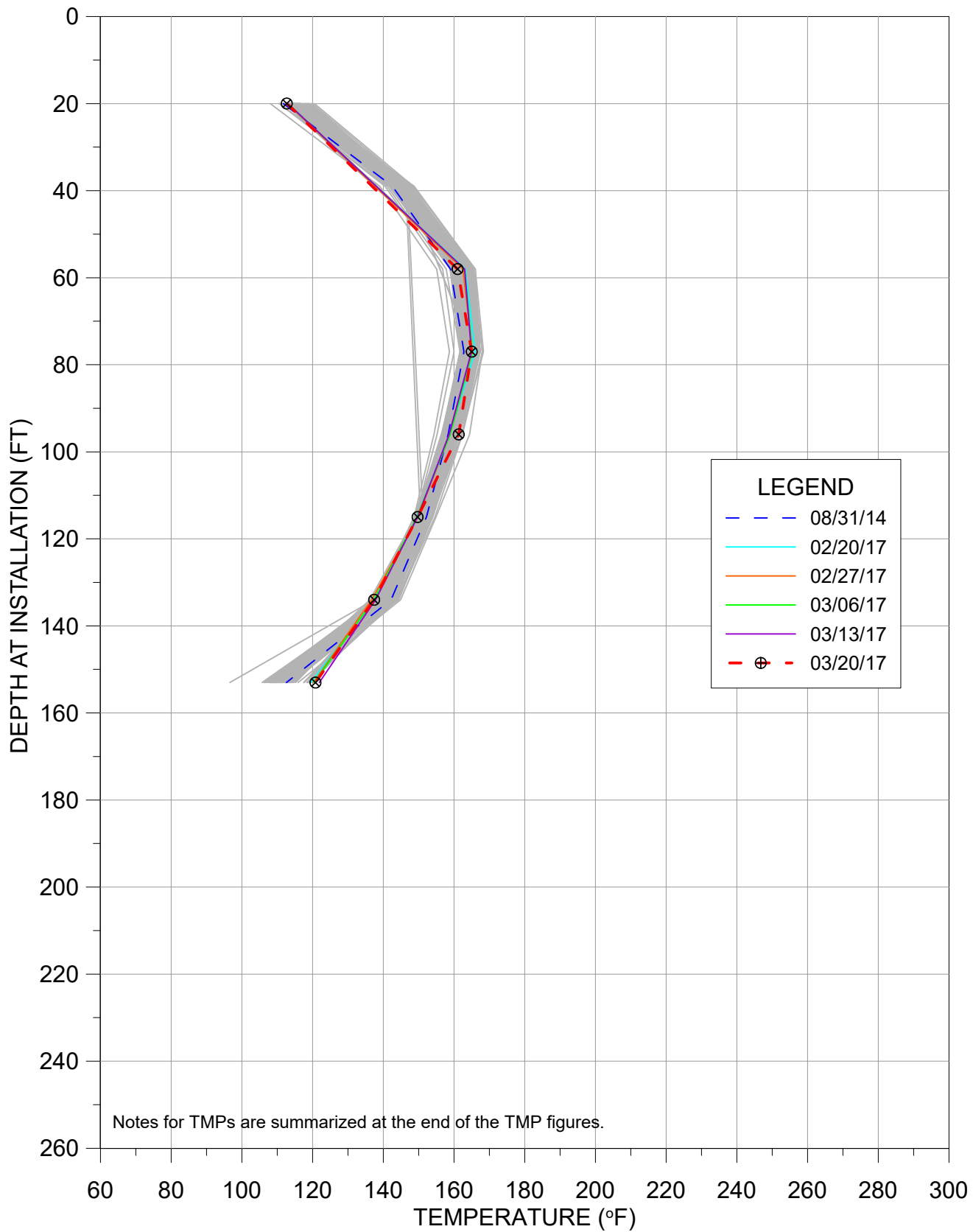
TMP-11R



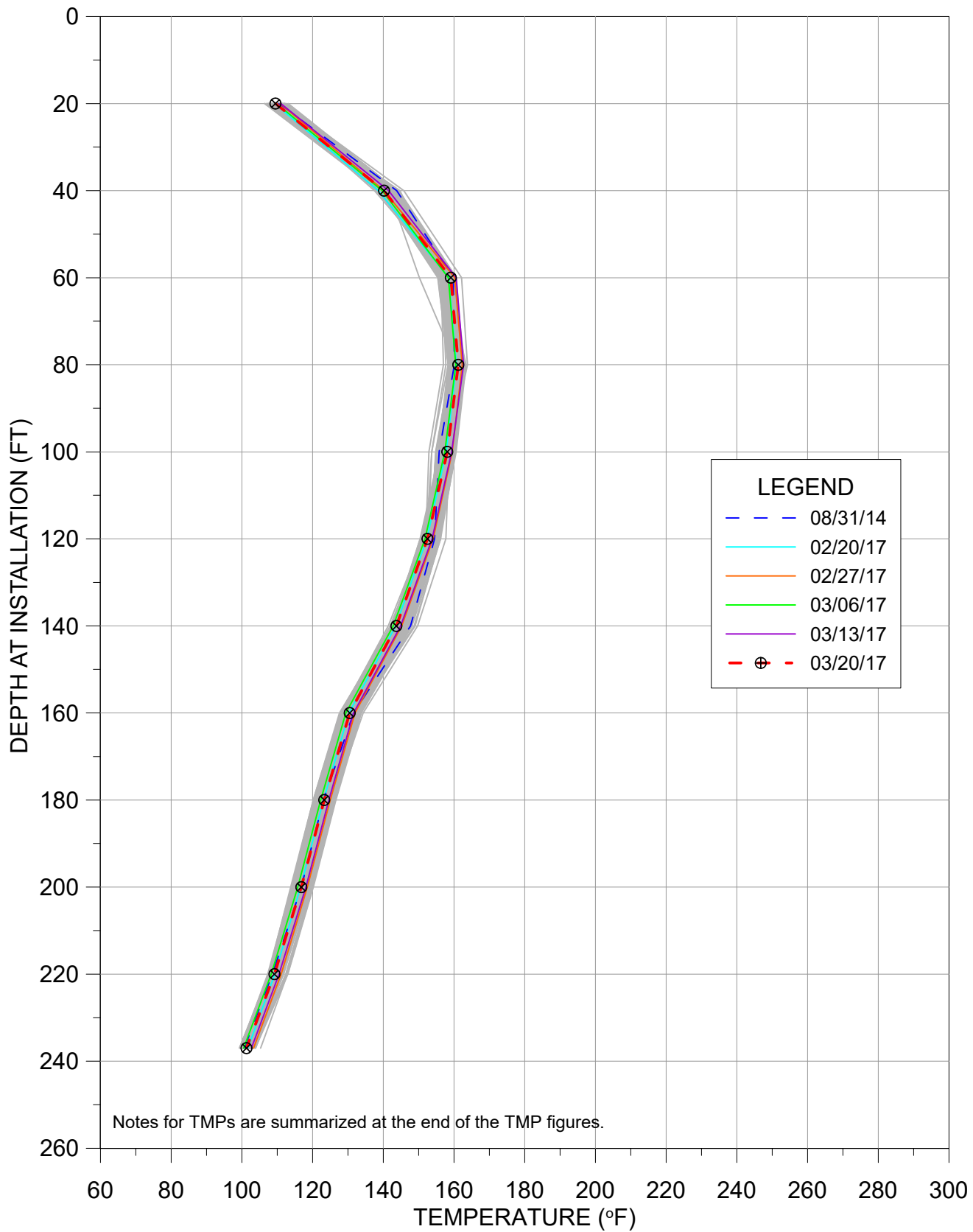
TMP-14R



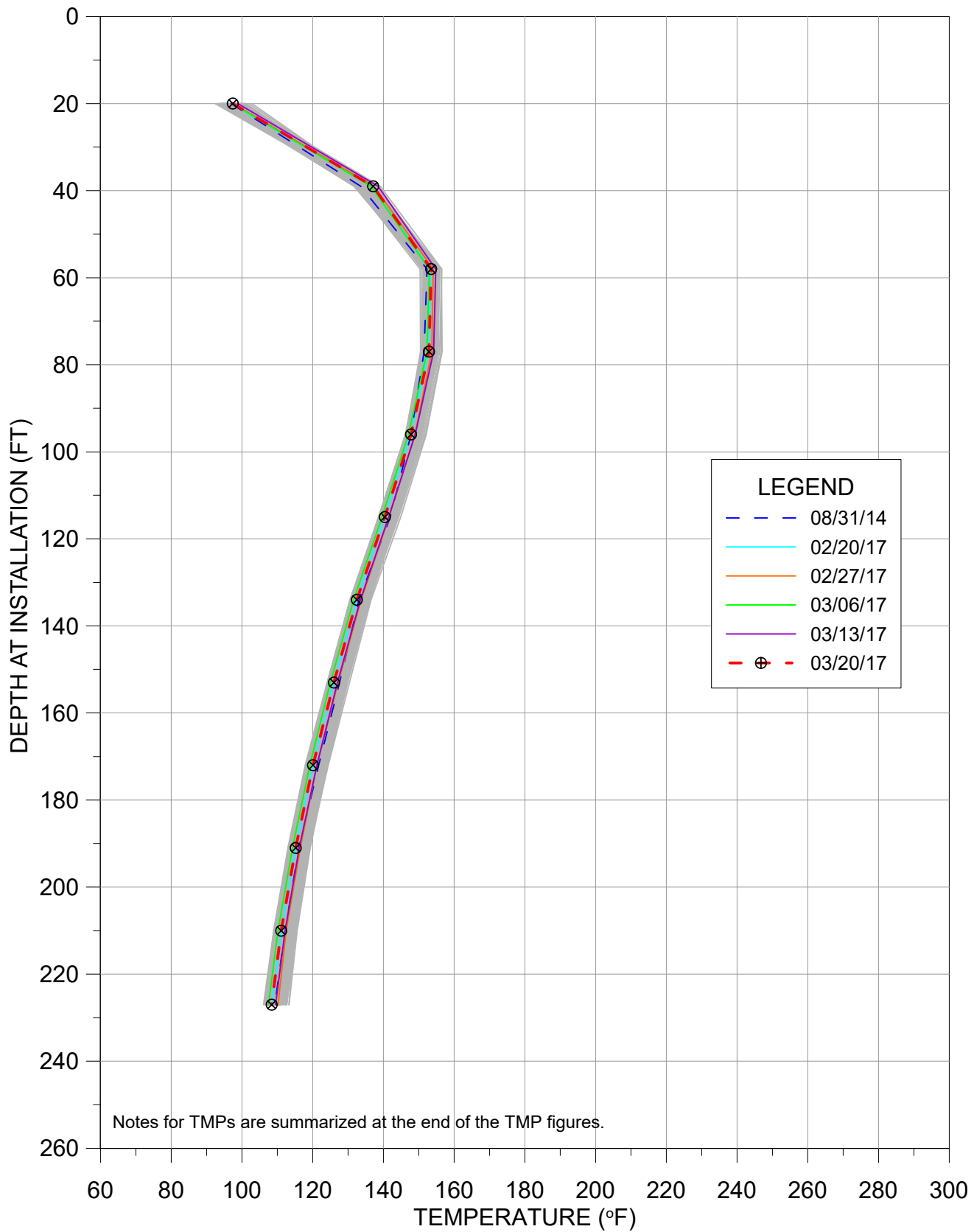
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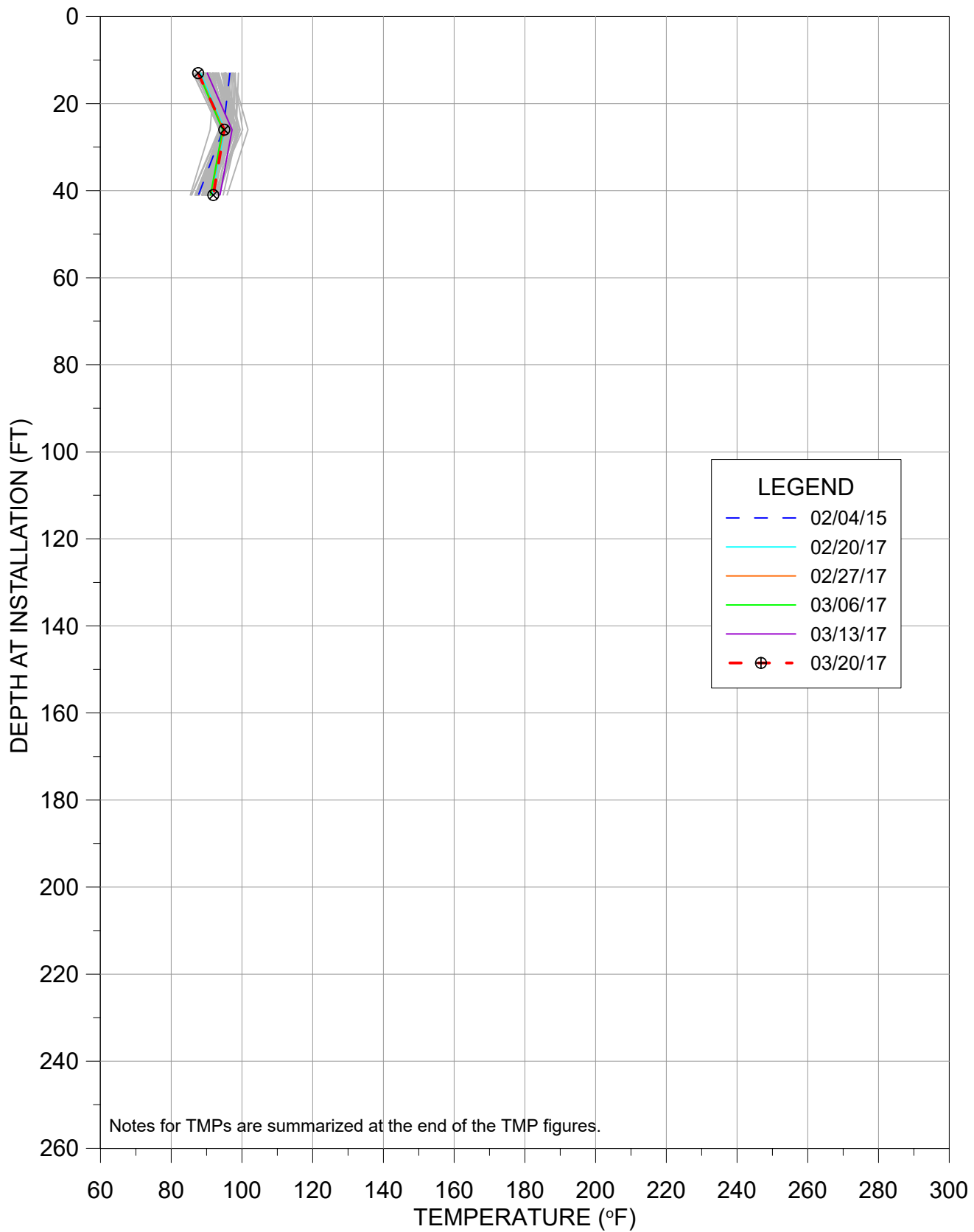
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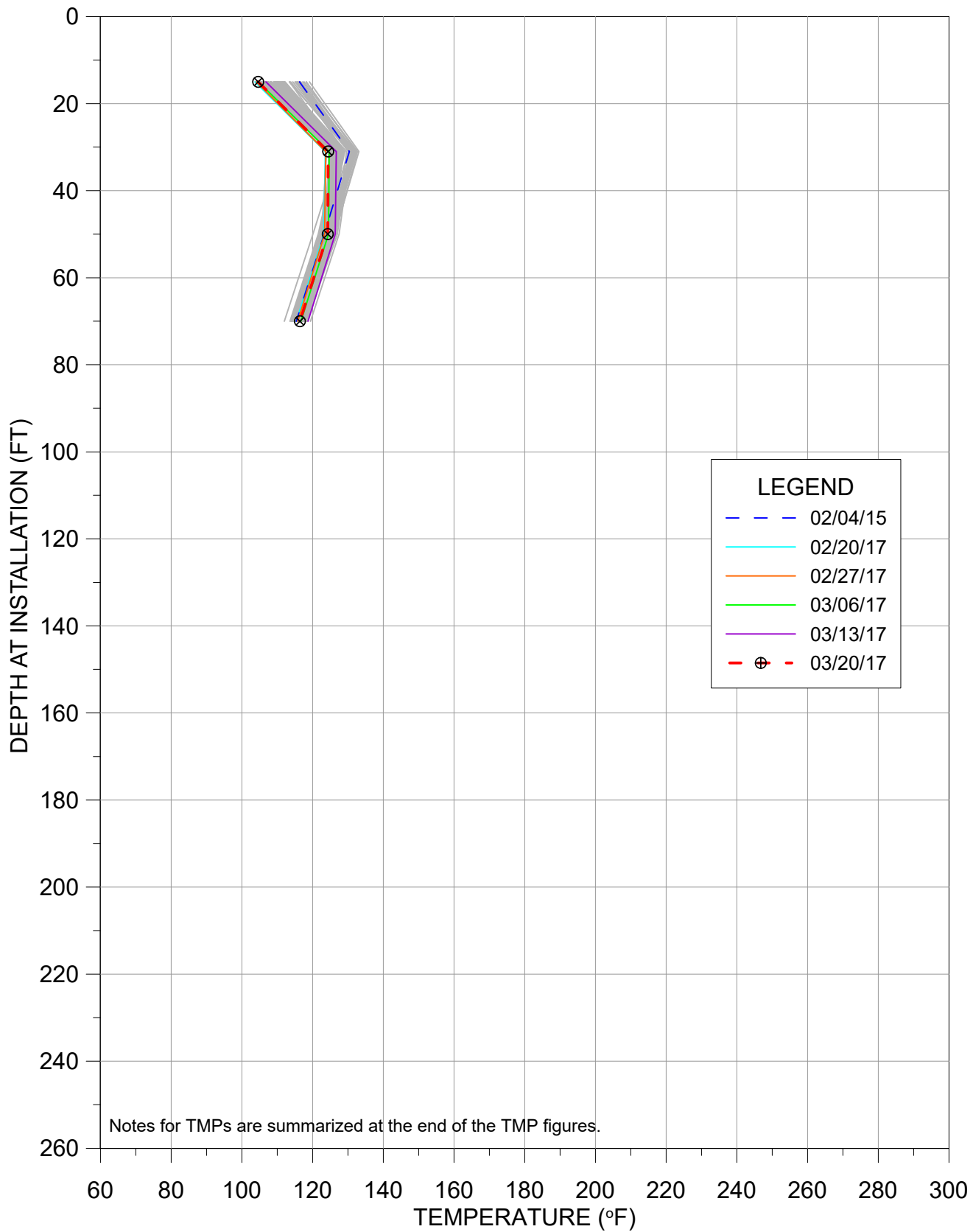
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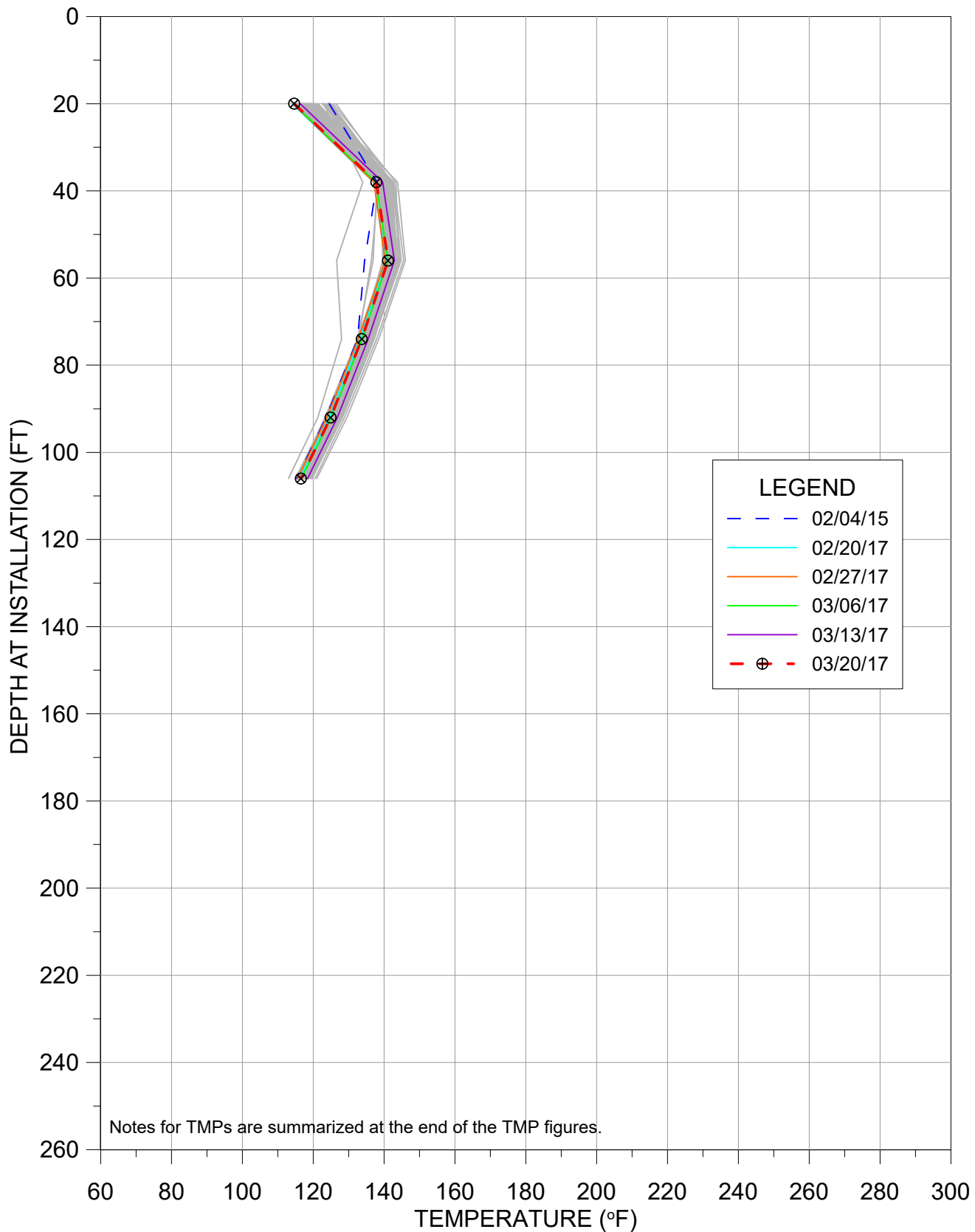
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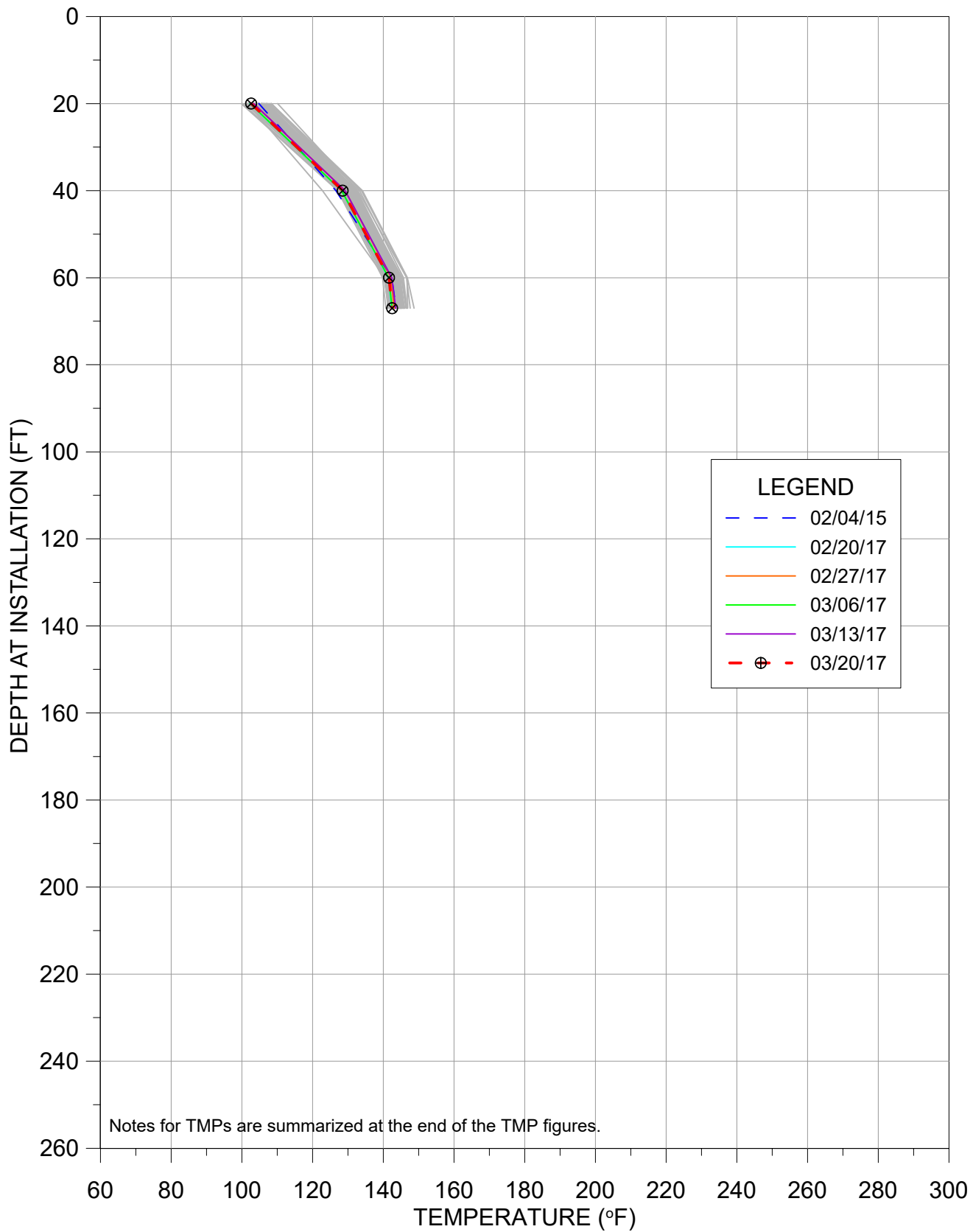
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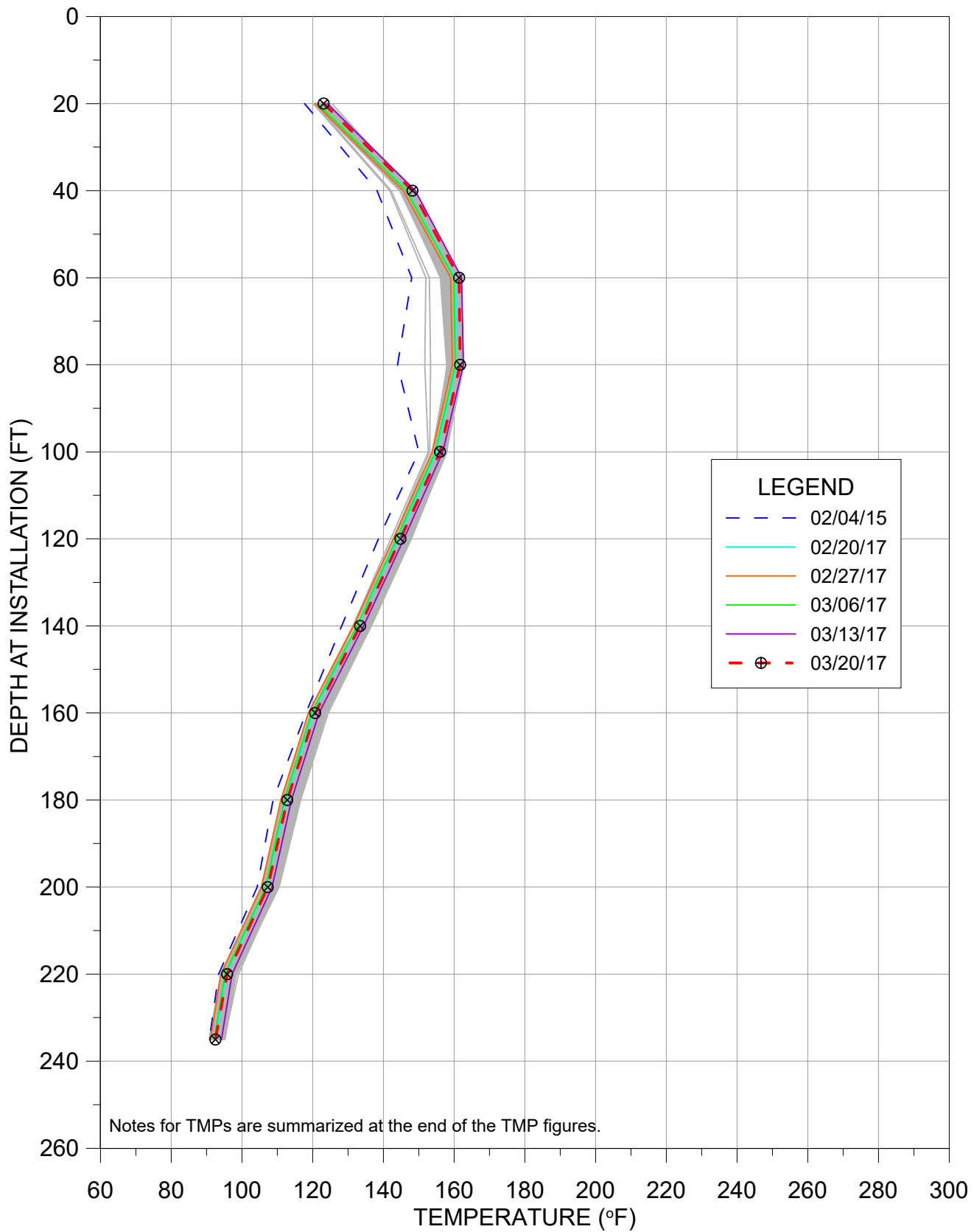
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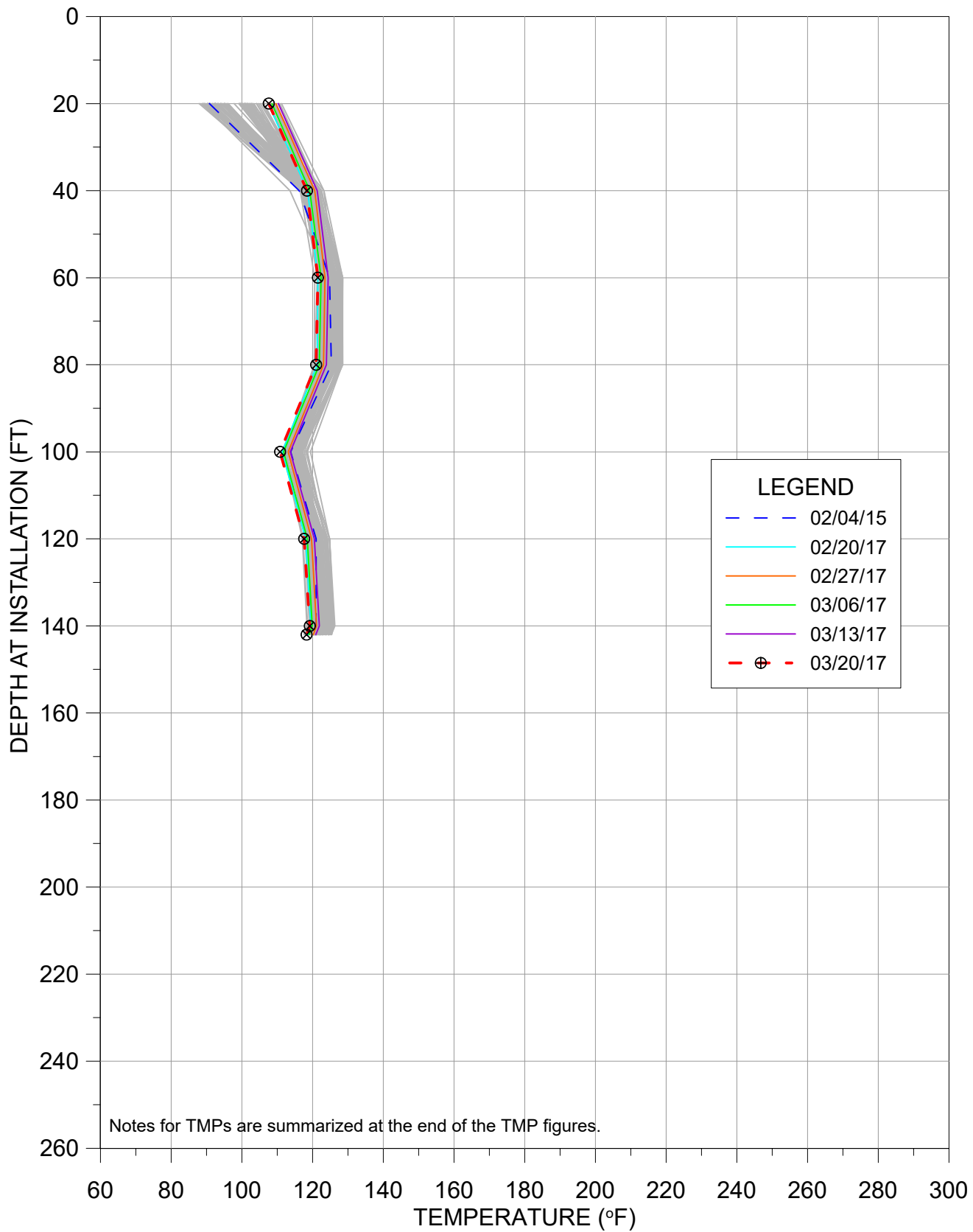
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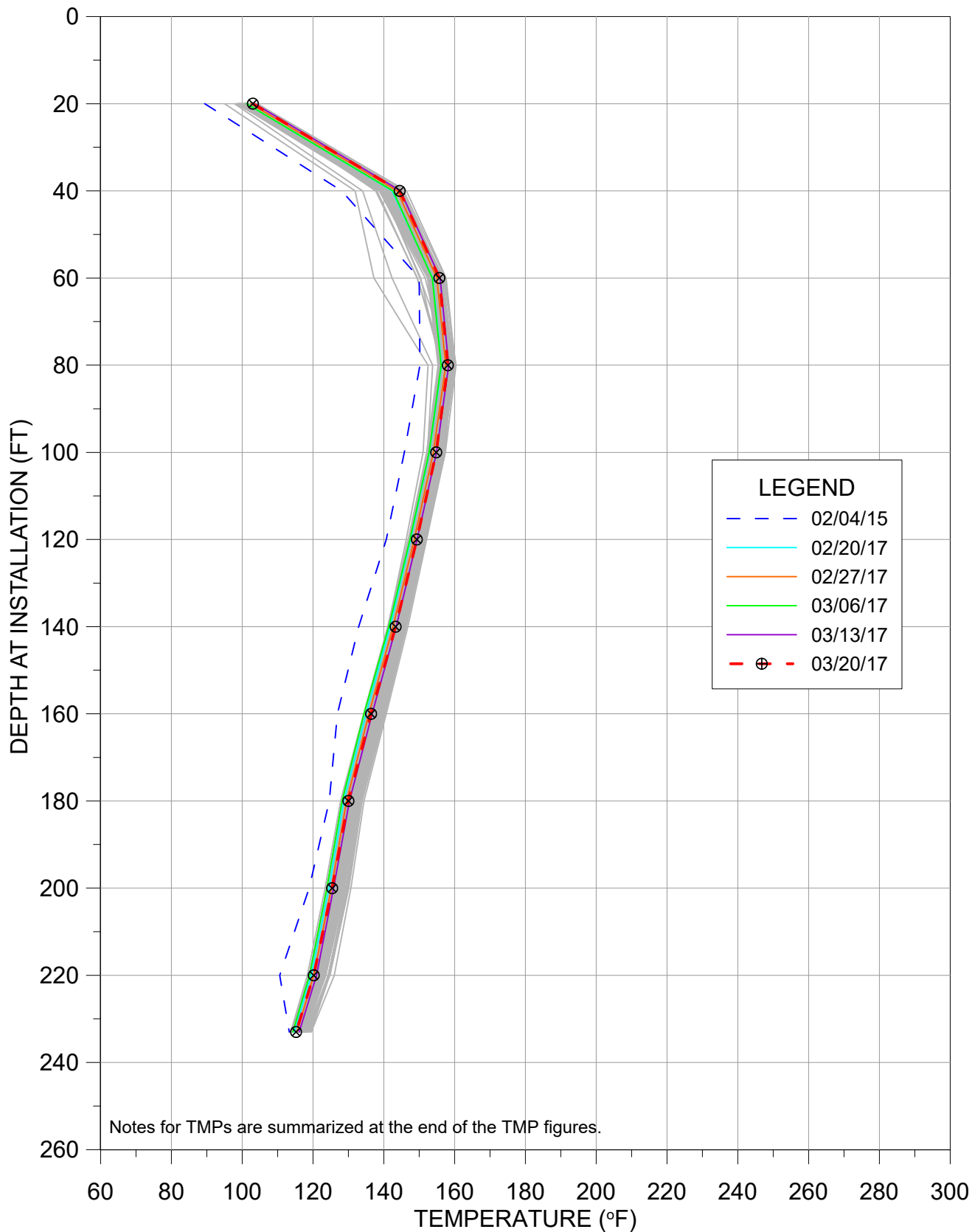
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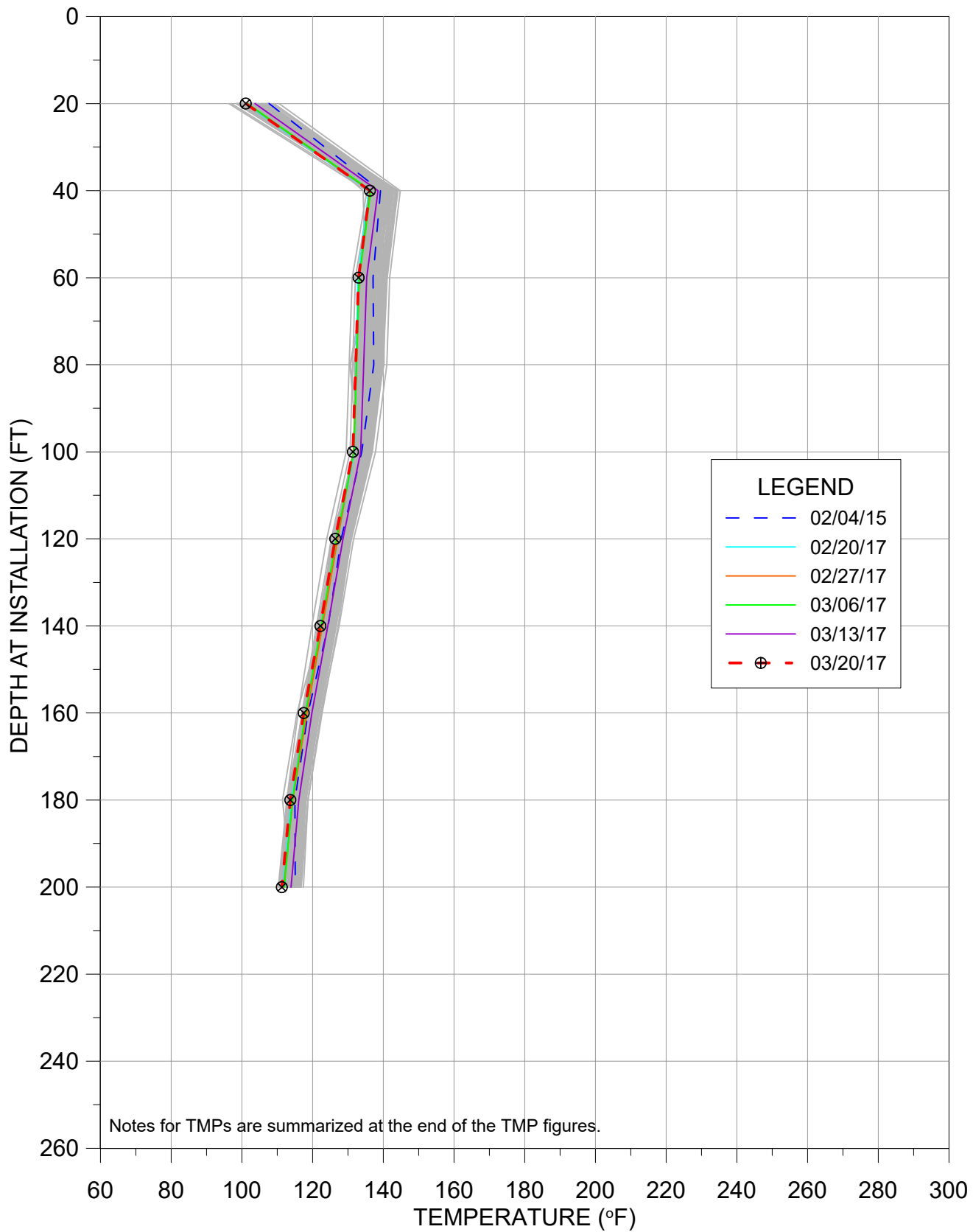
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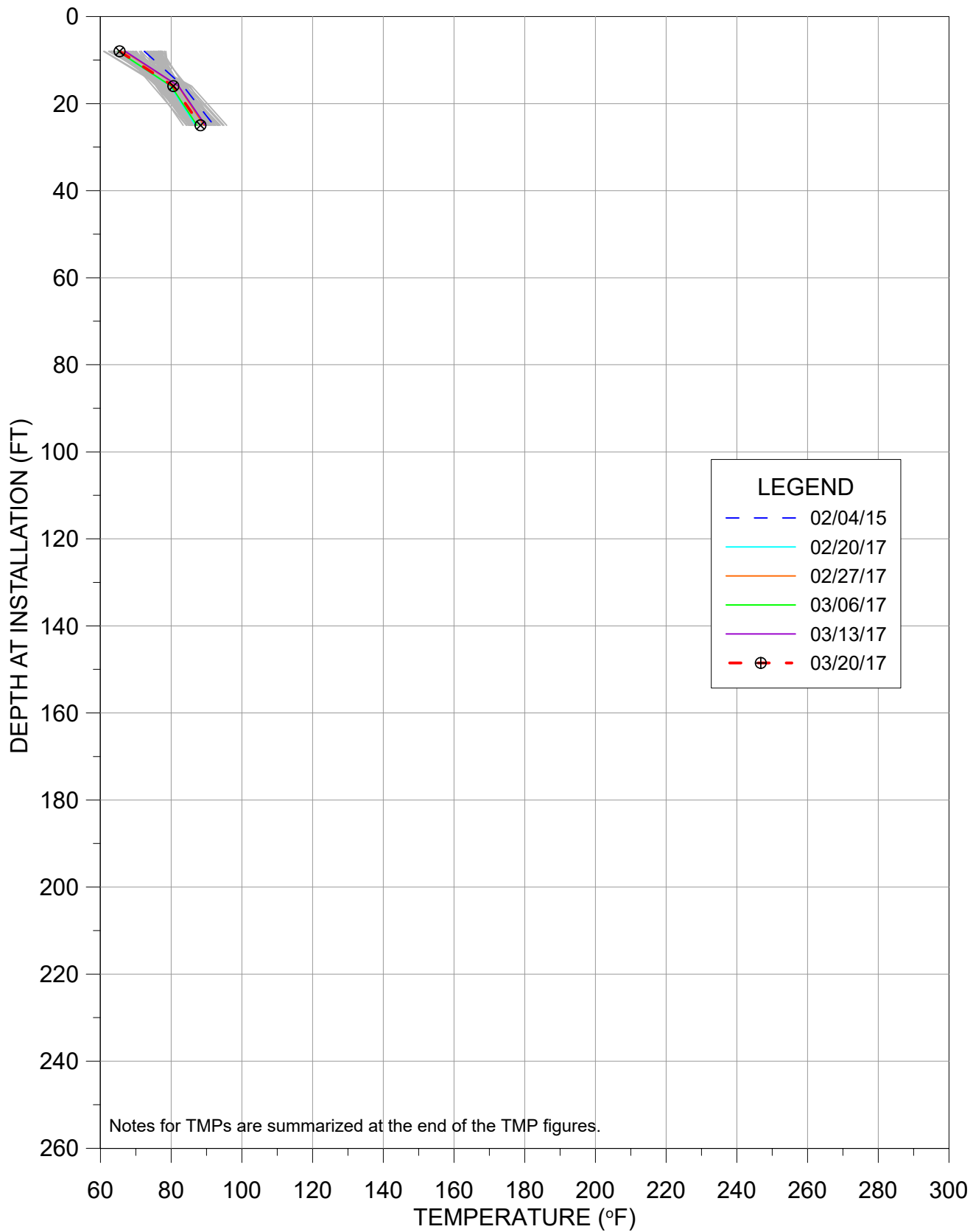
TMP-27



TMP-28

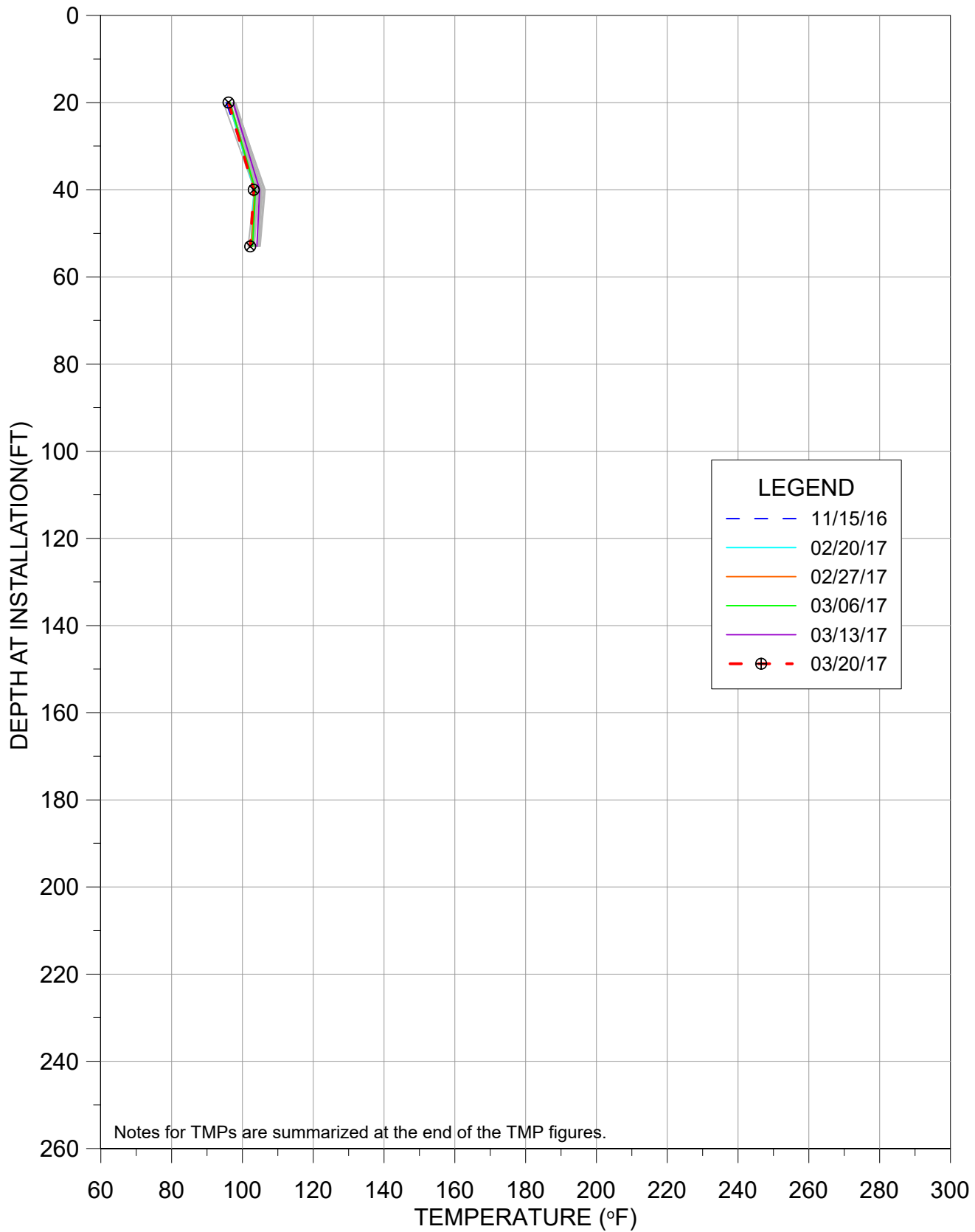


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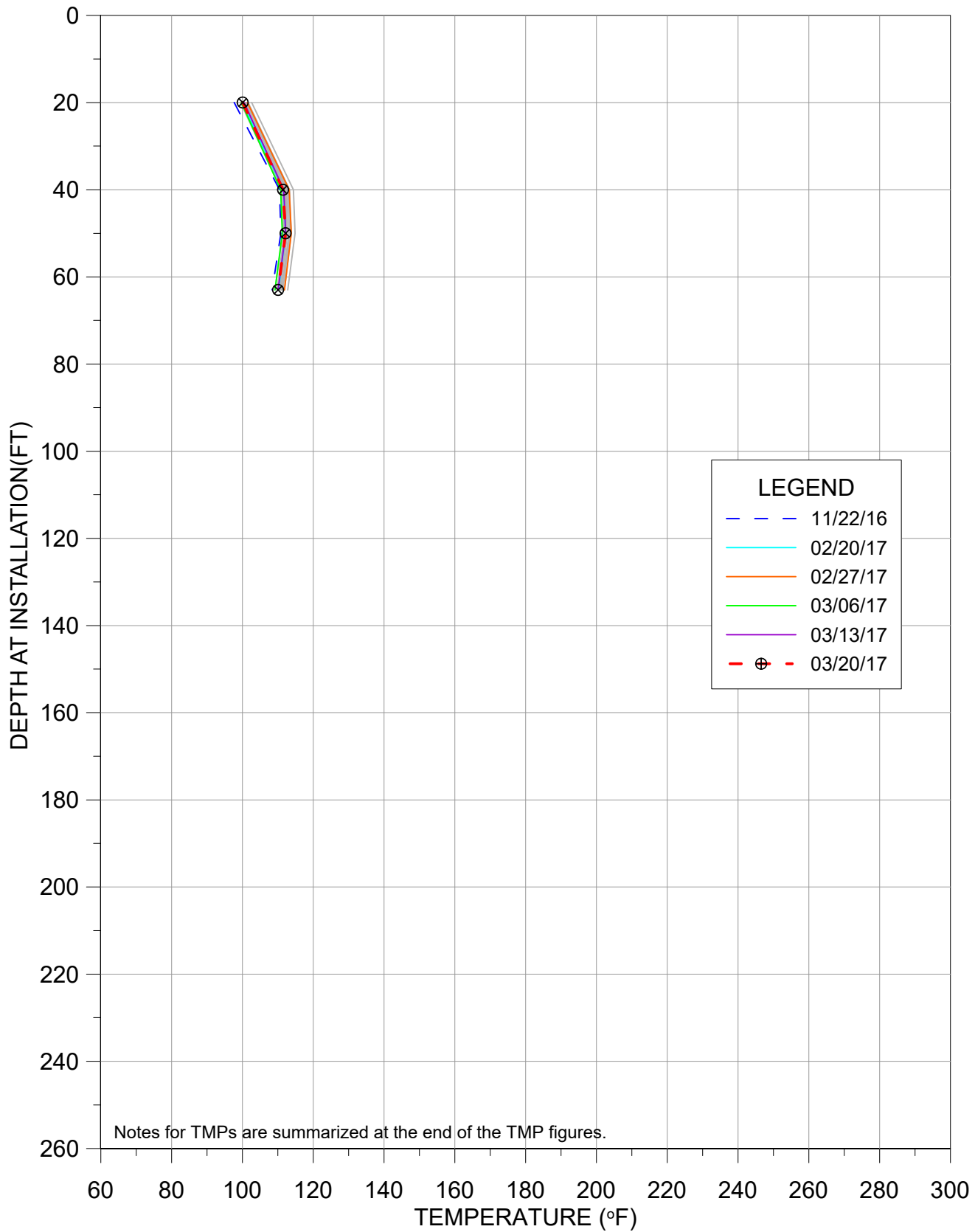


TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

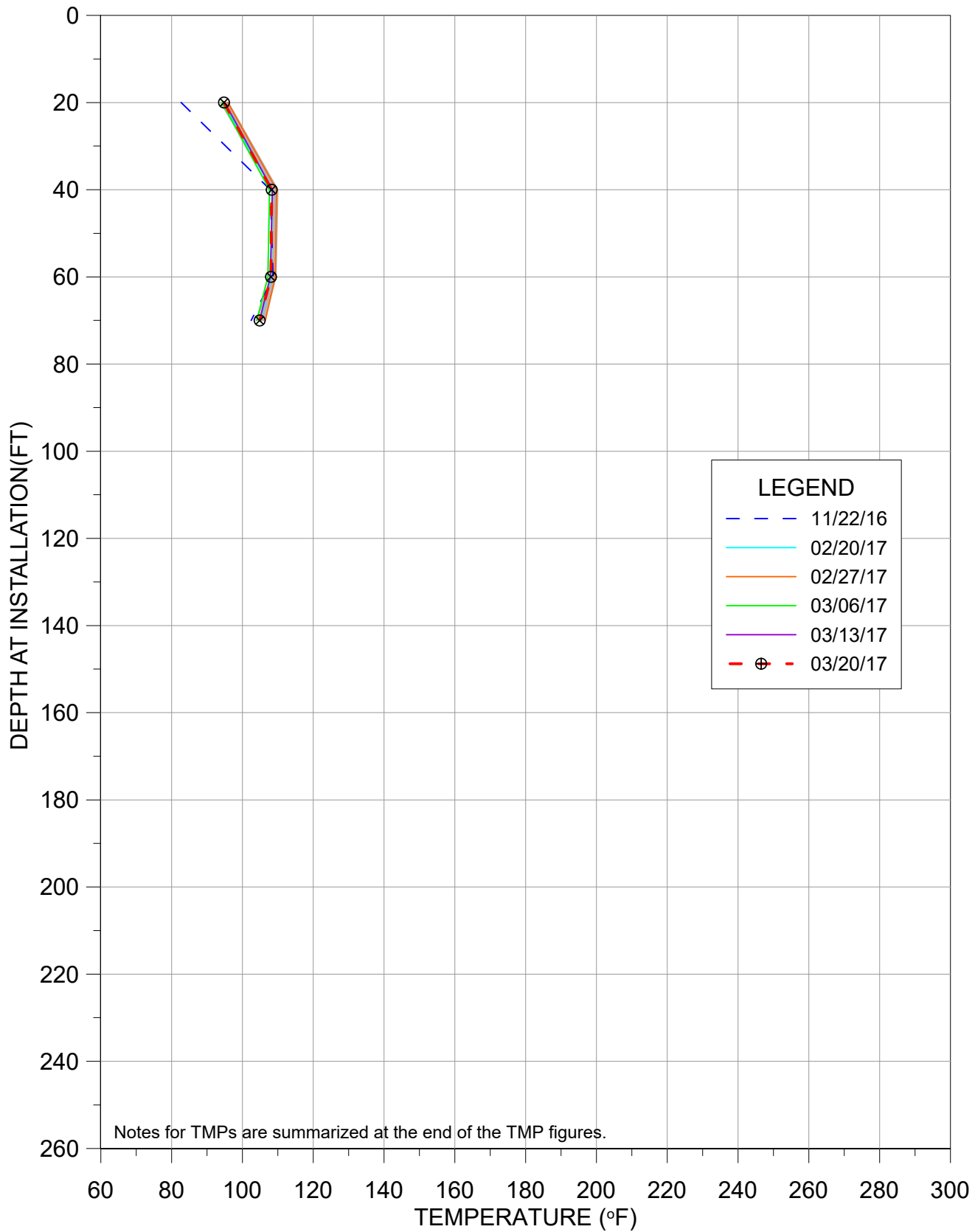
TMP-33



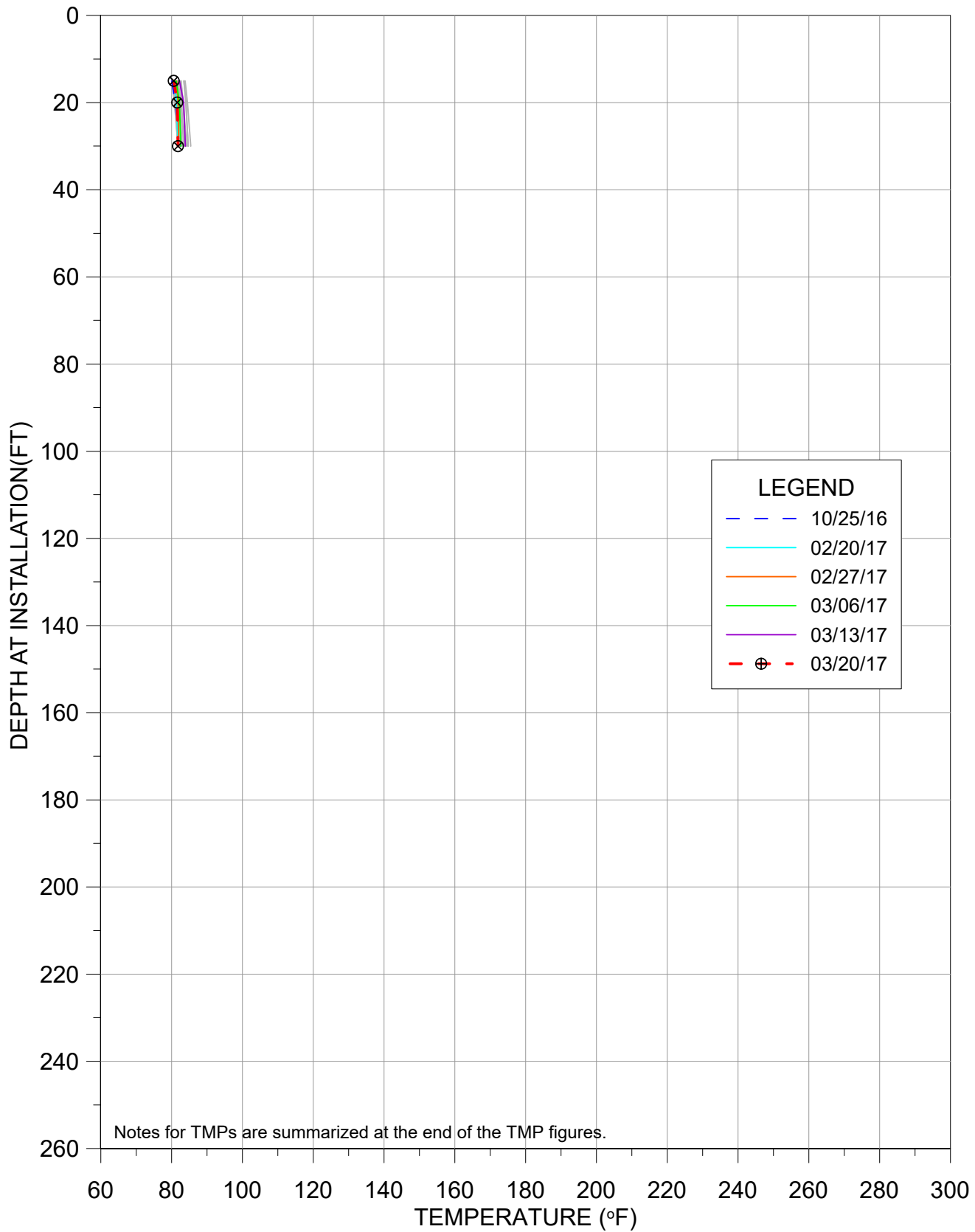
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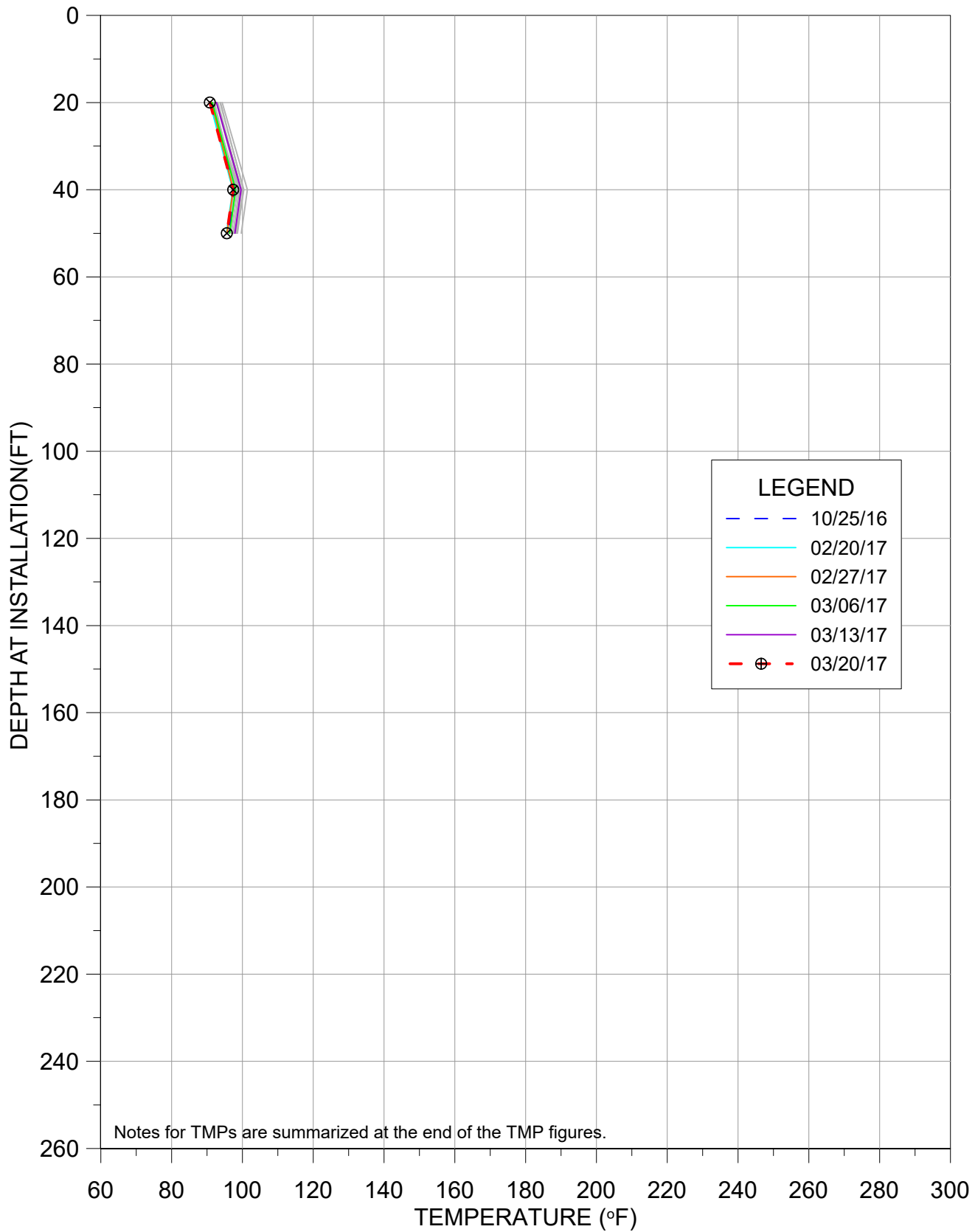
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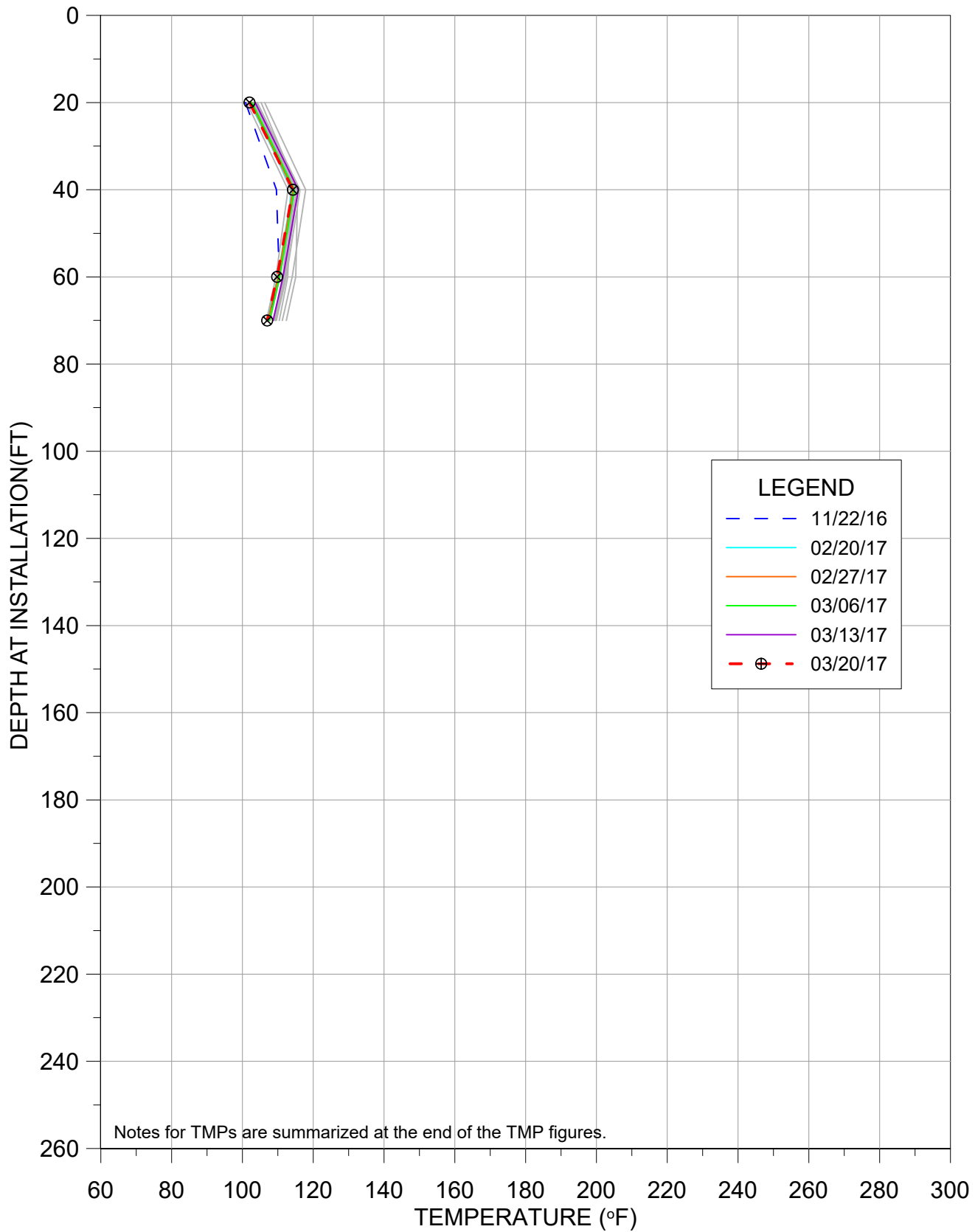
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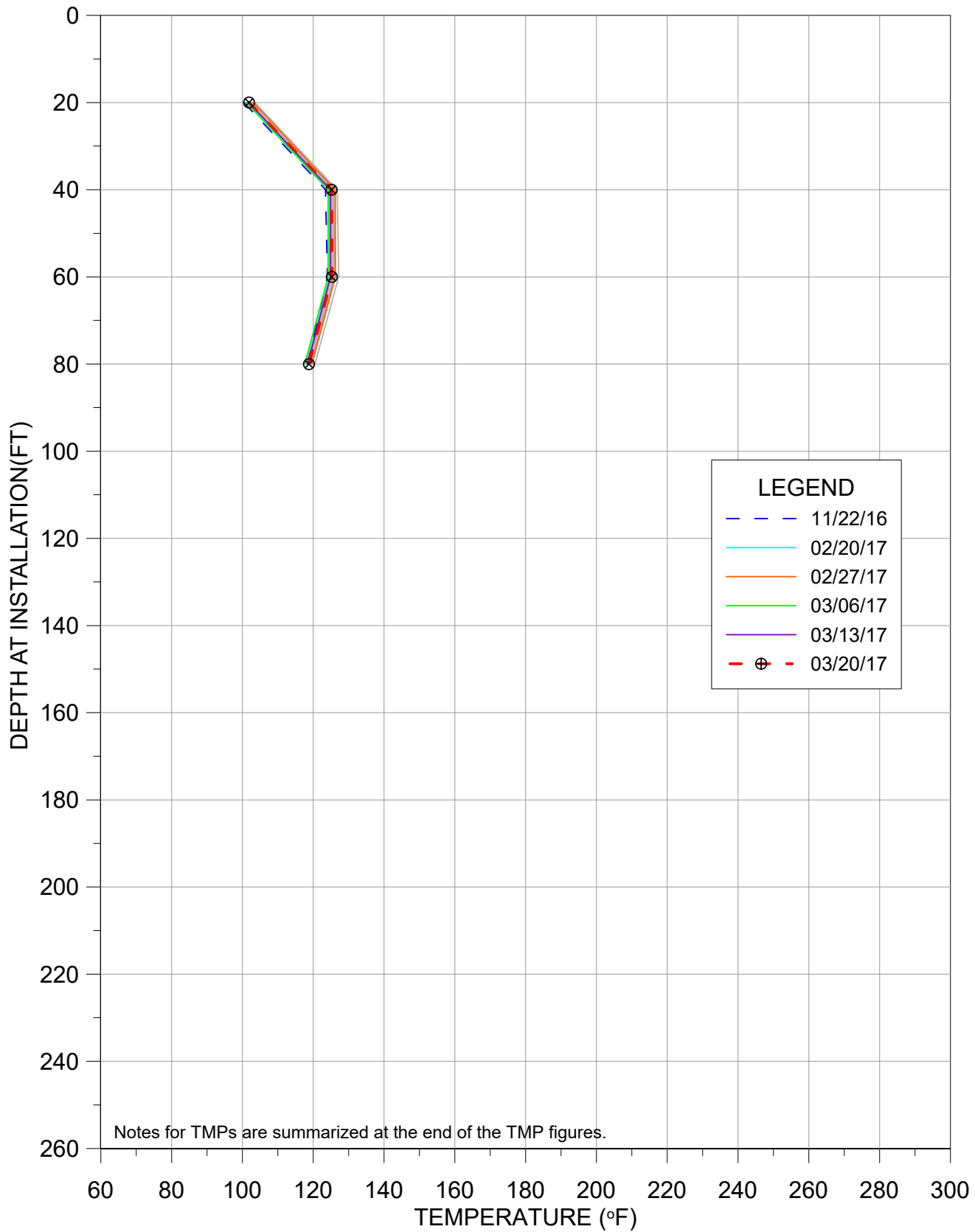
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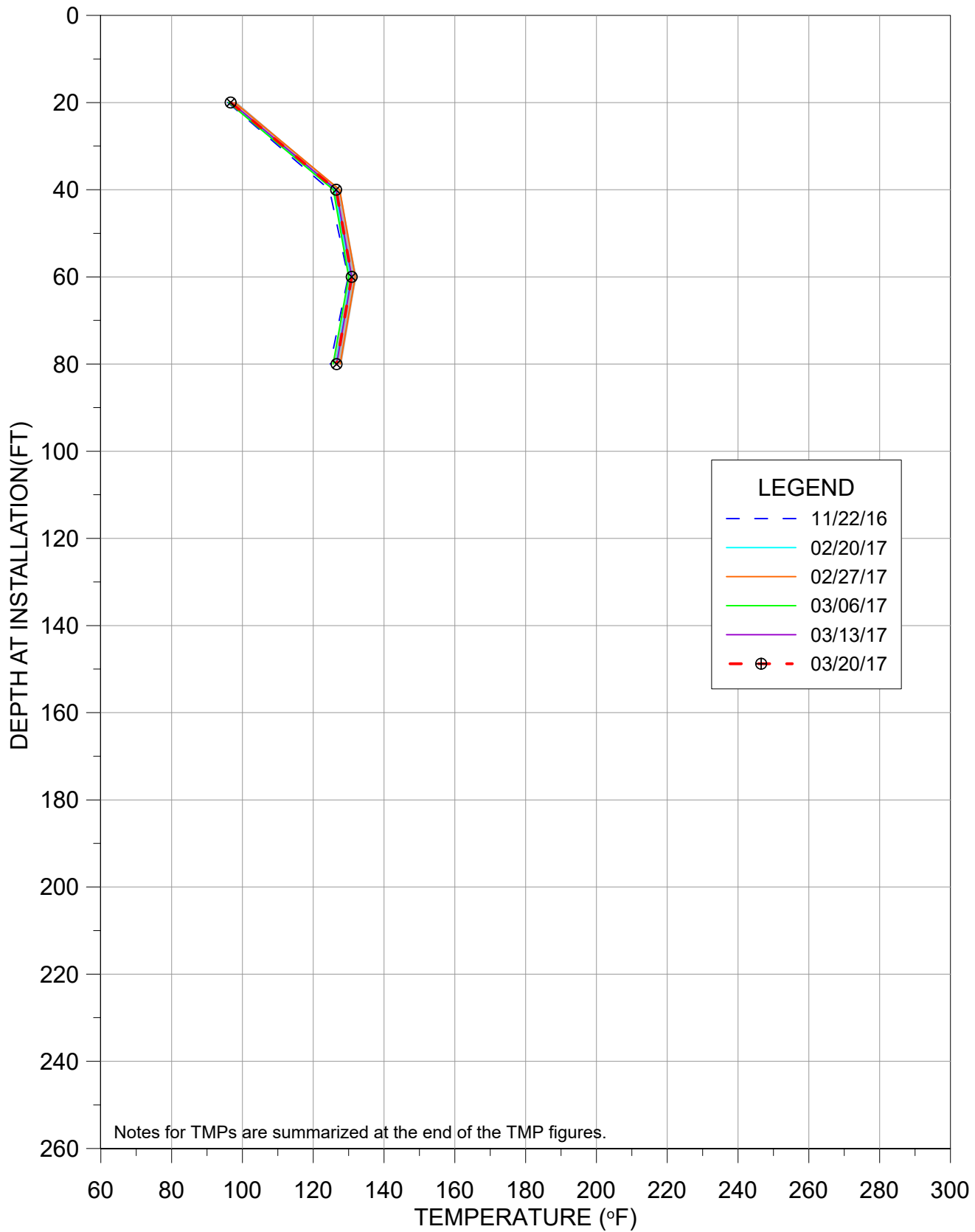
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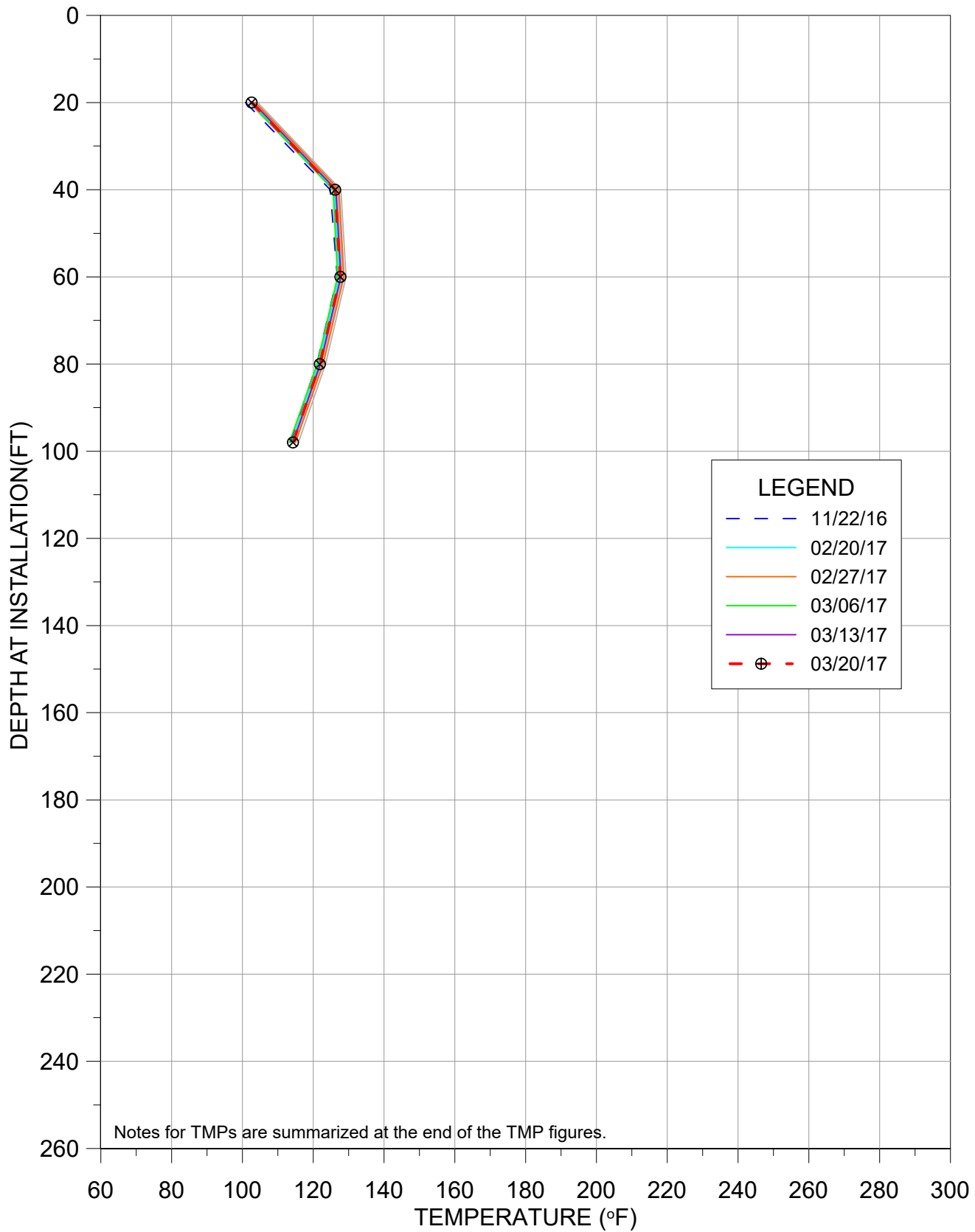
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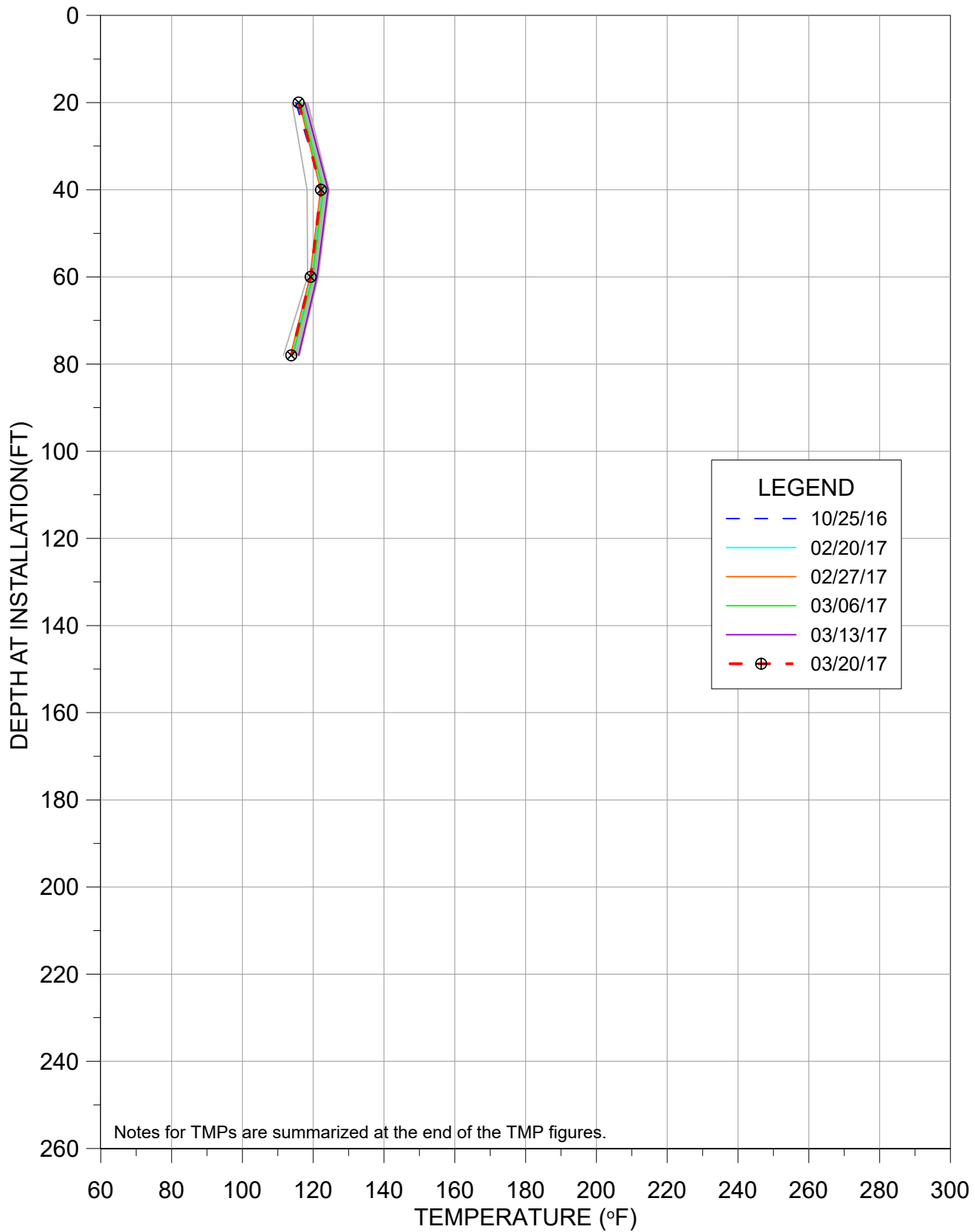
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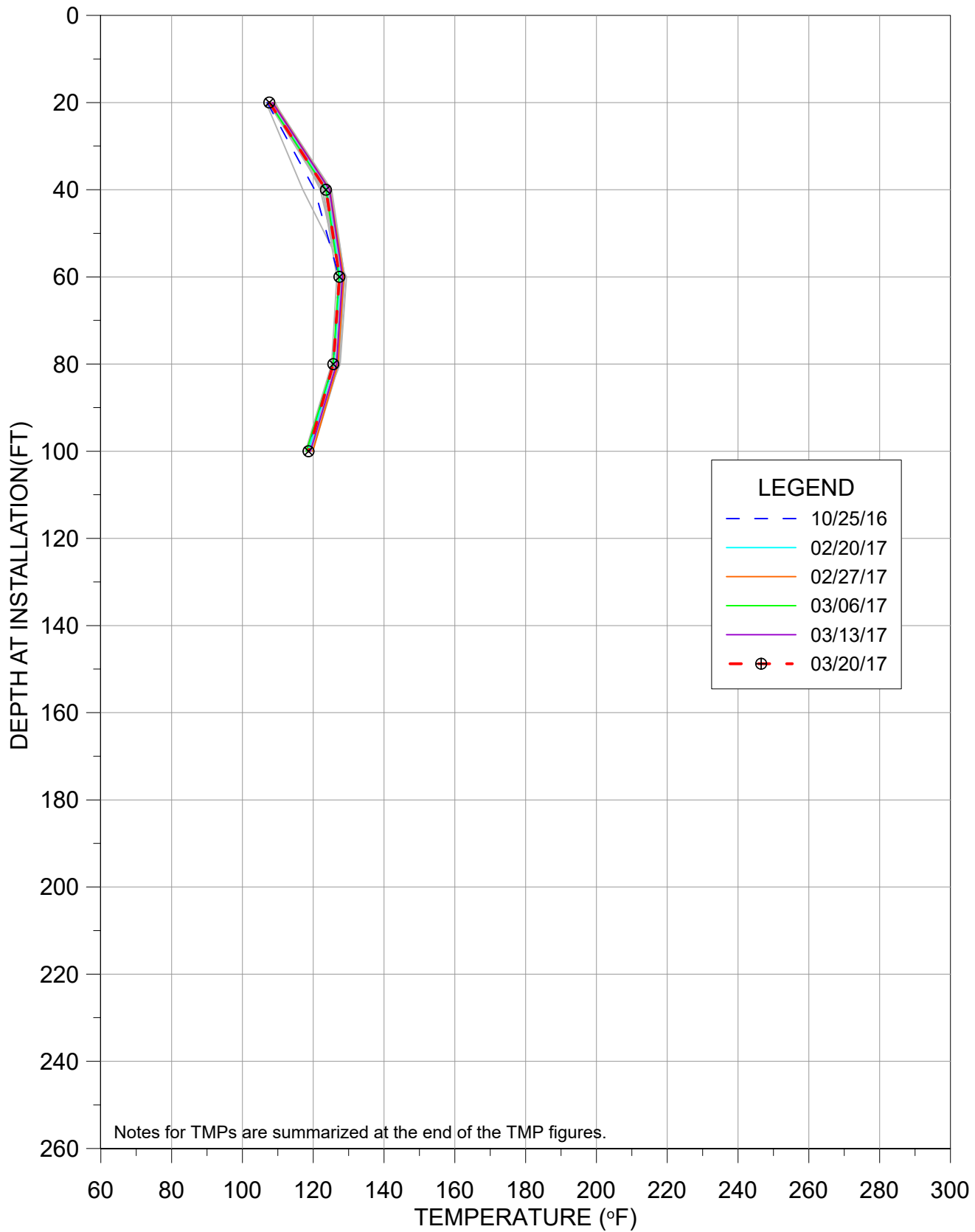
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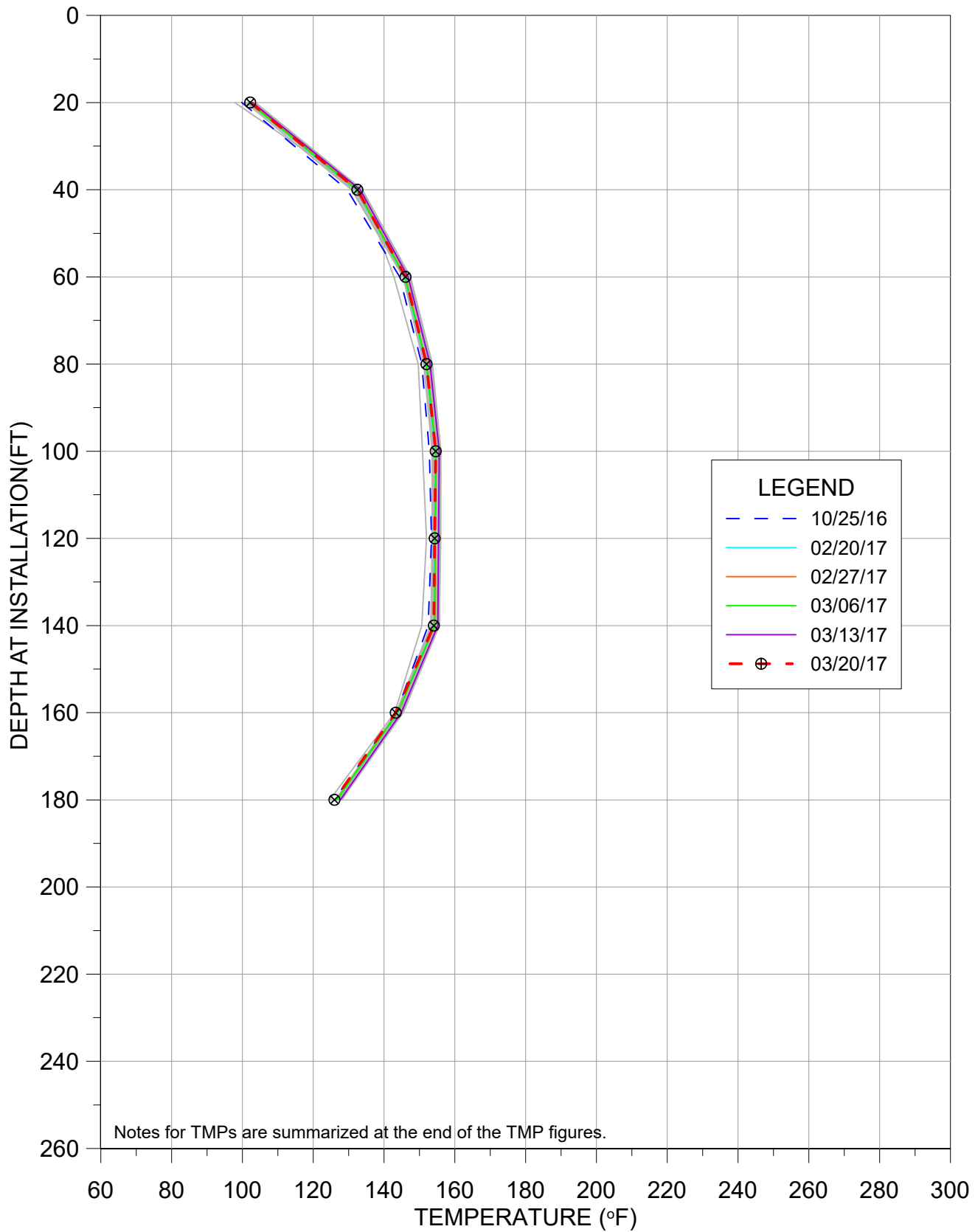
TMP-42



TMP-43

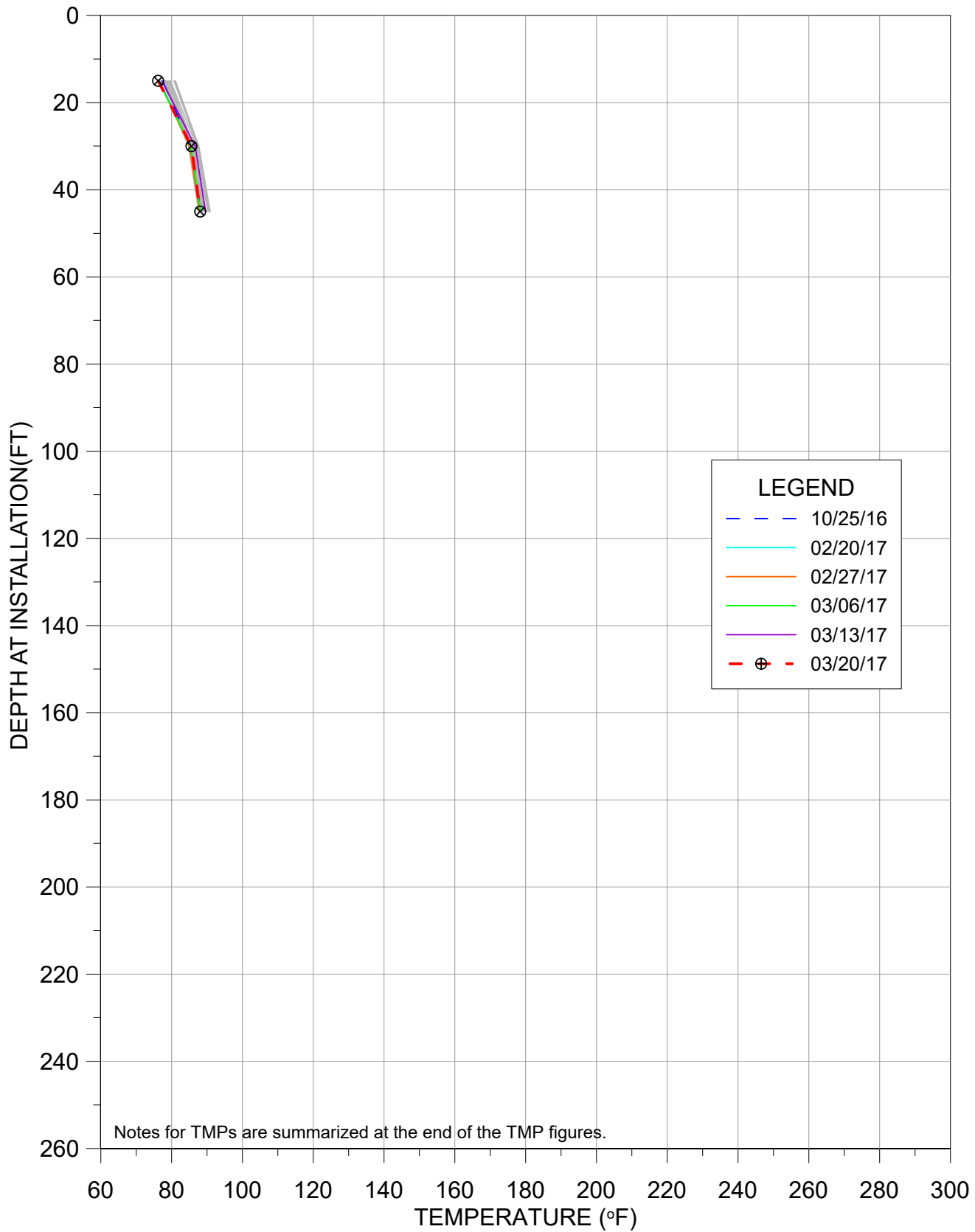


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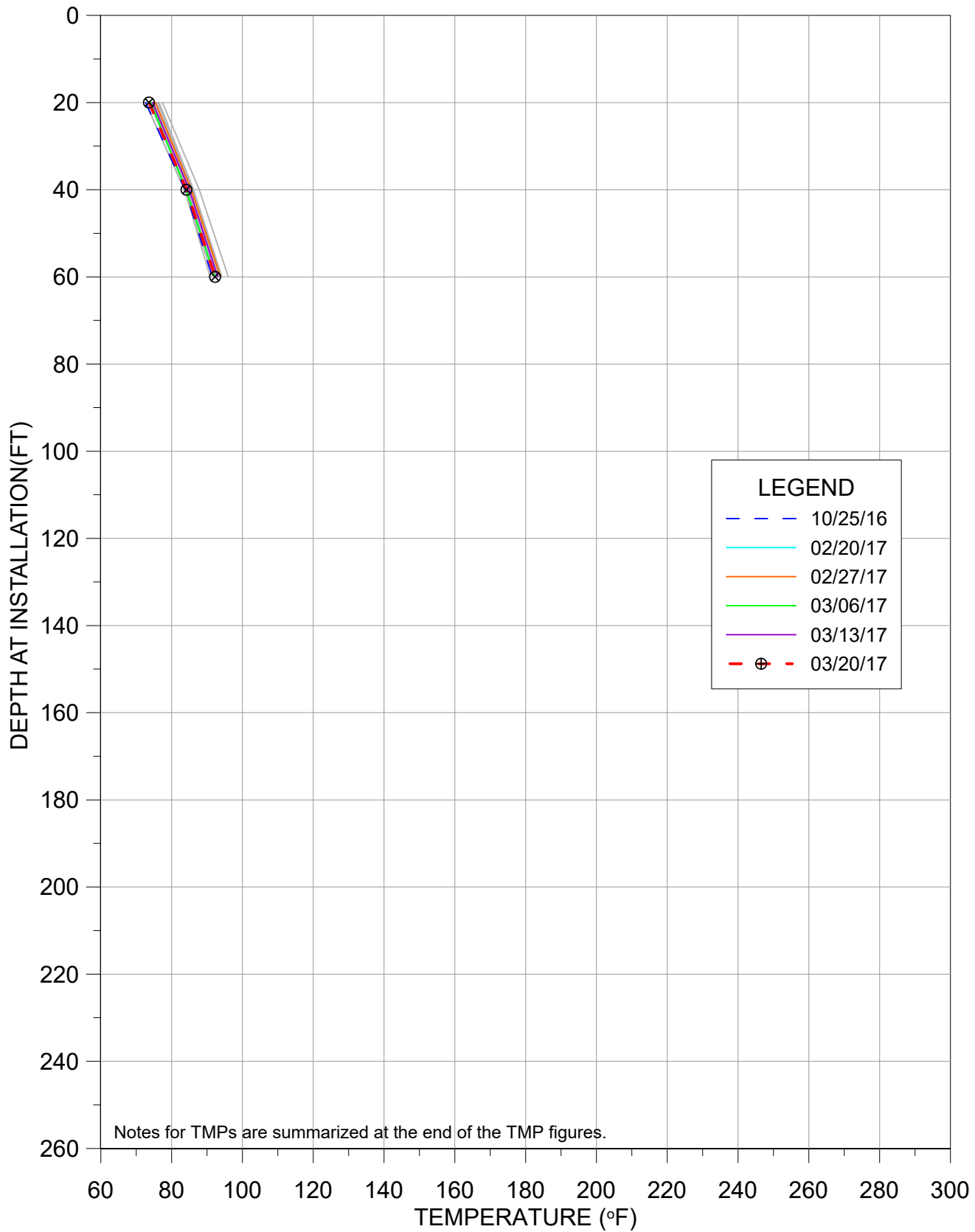
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-45

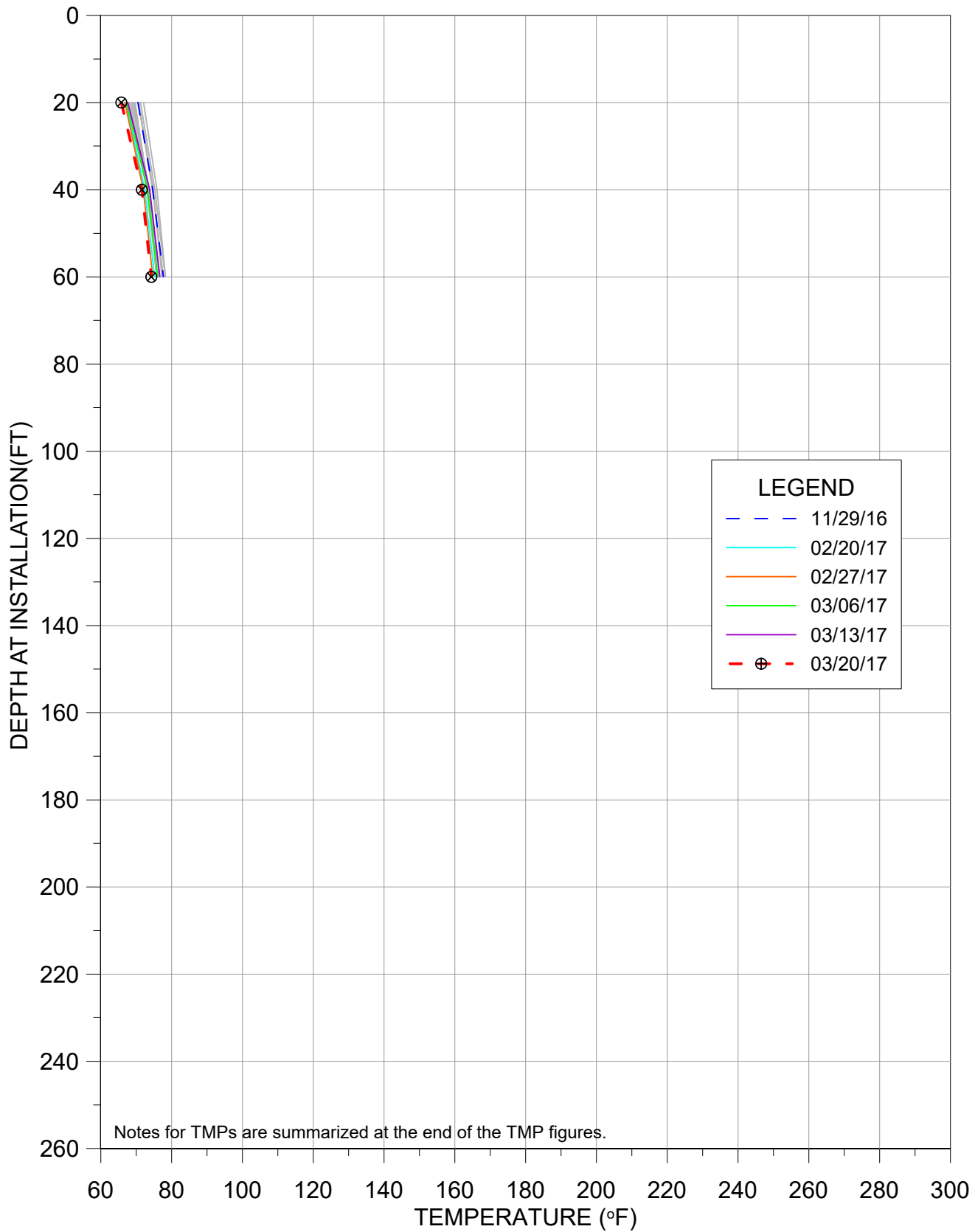


TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-46

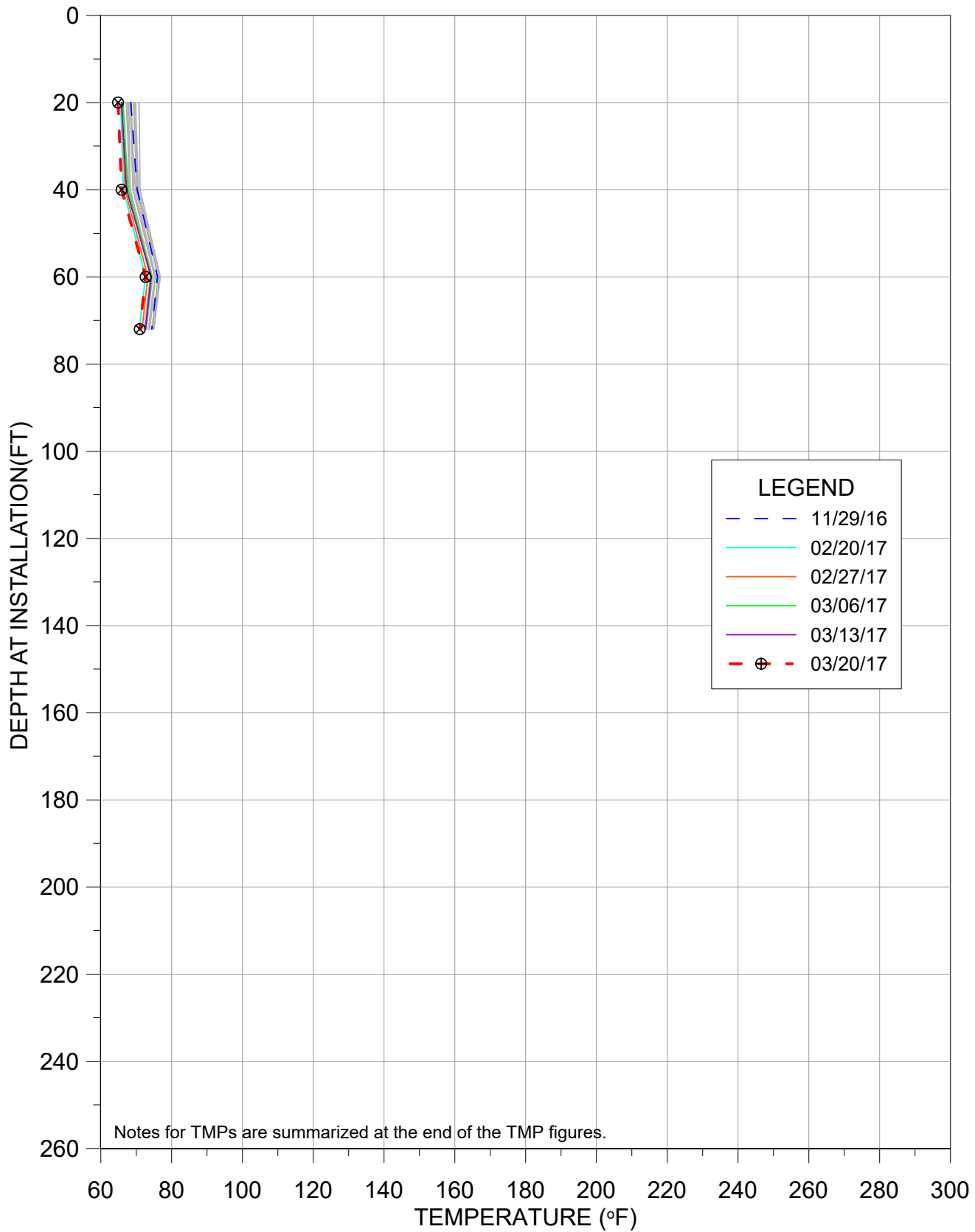


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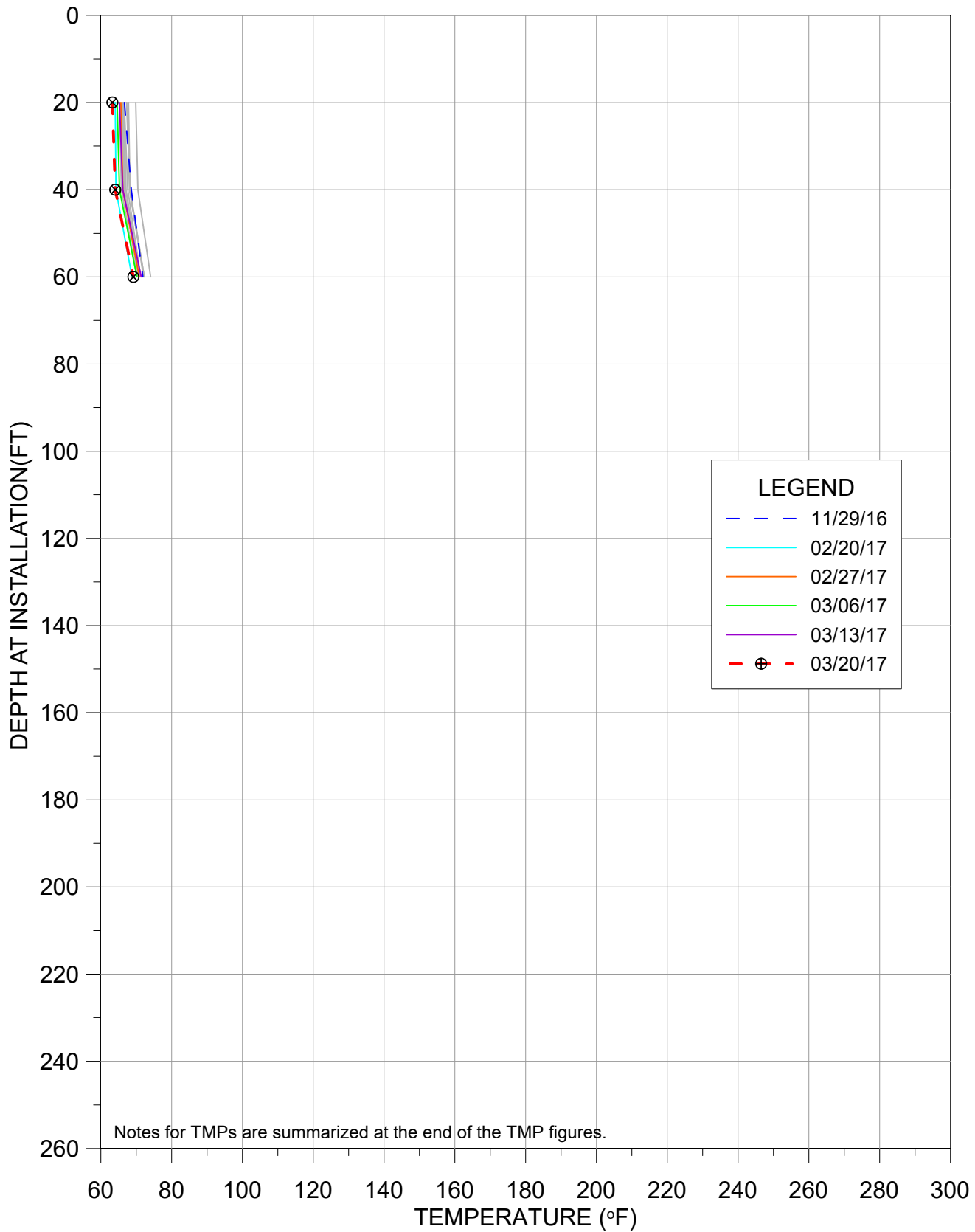


TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

TMP-48

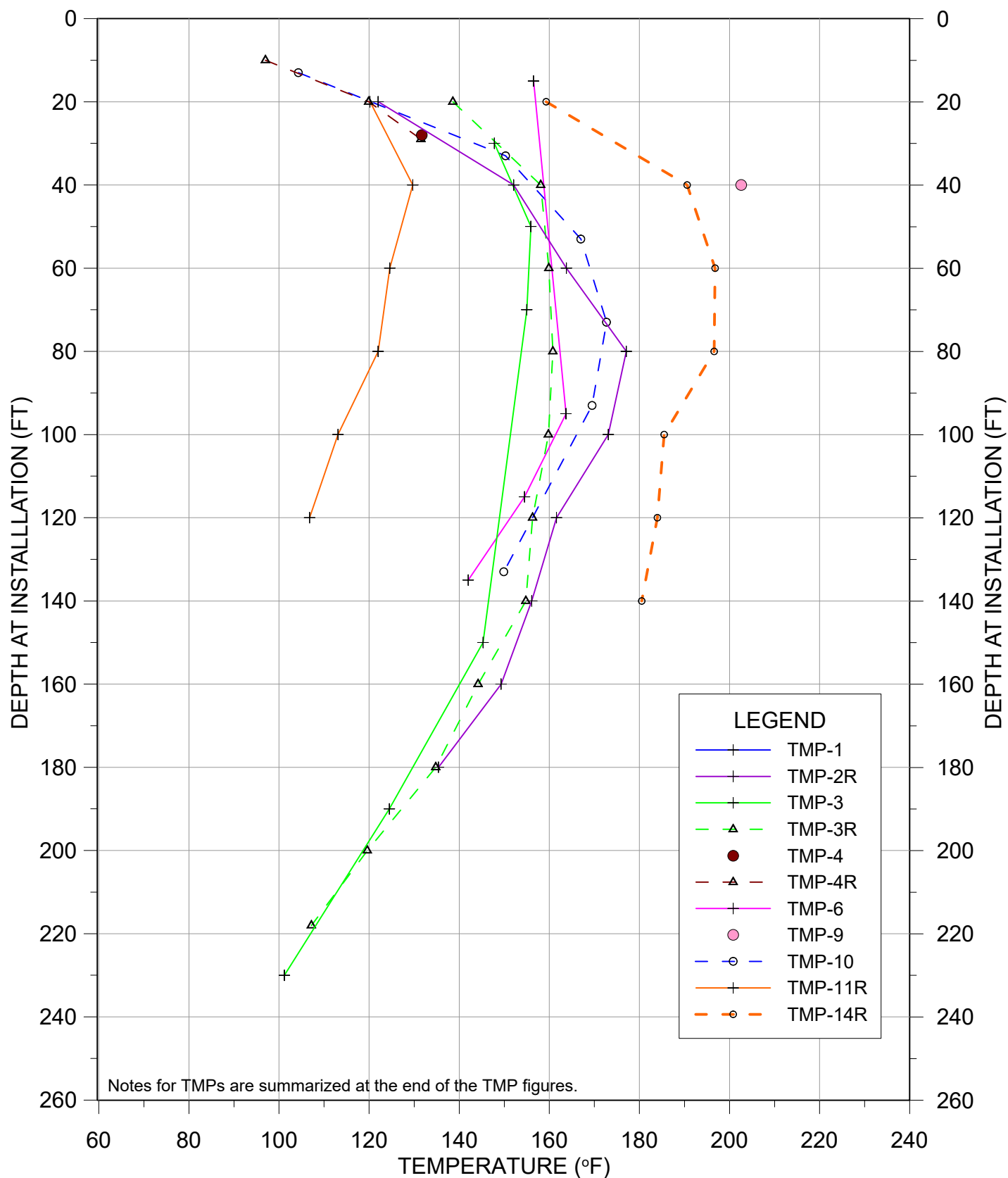


TMP-49



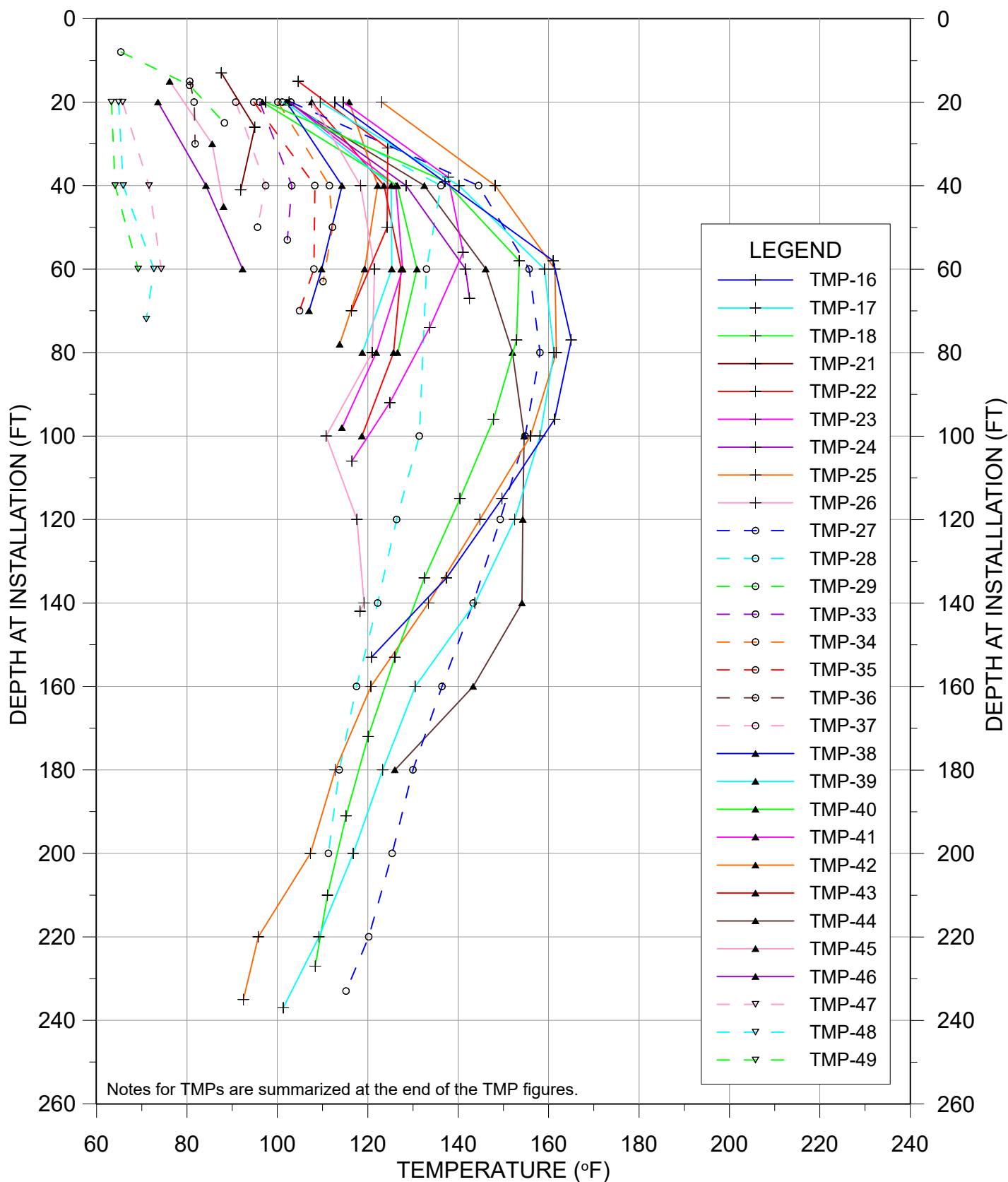
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

3/20/2017



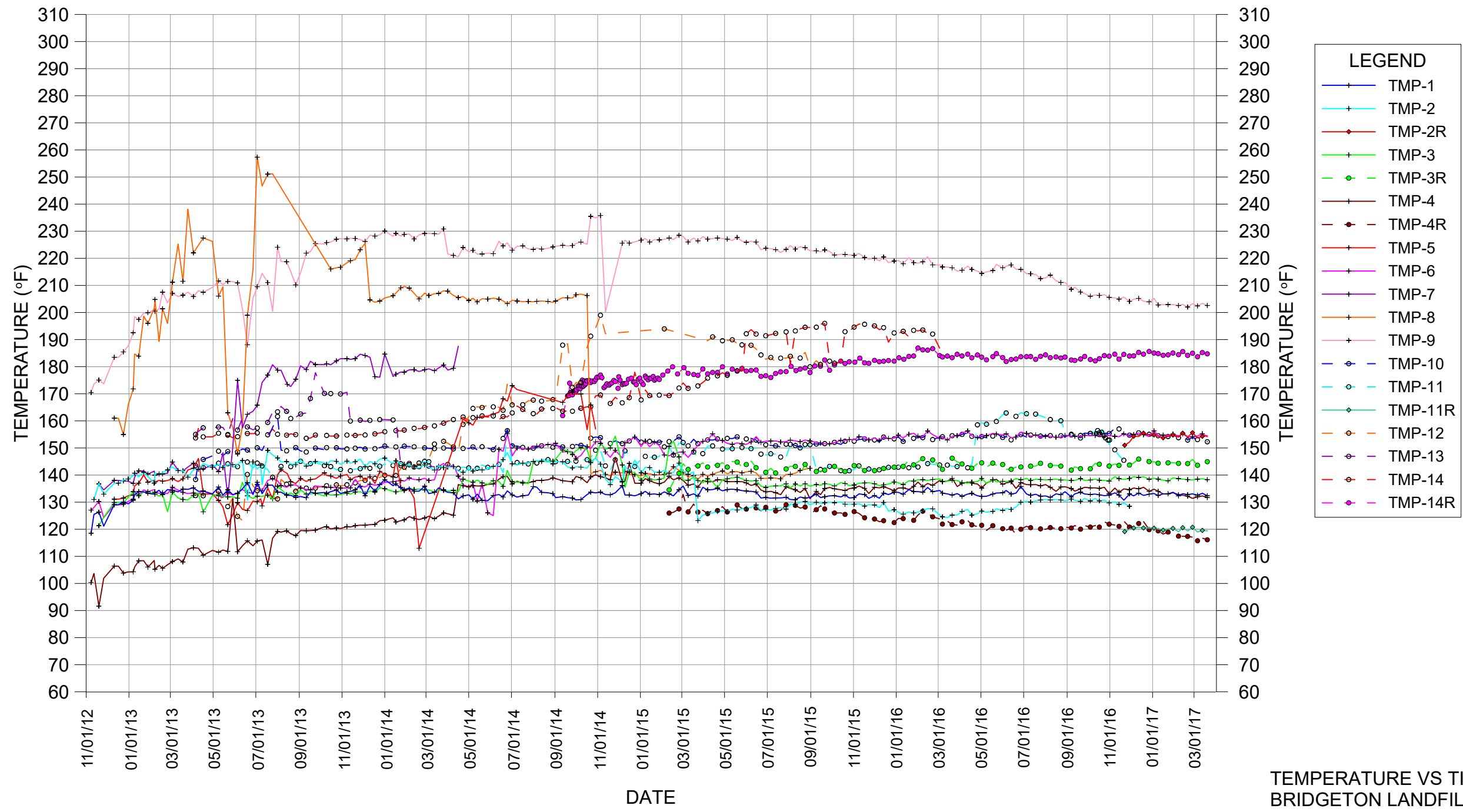
TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

3/20/2017 - NORTH QUARRY

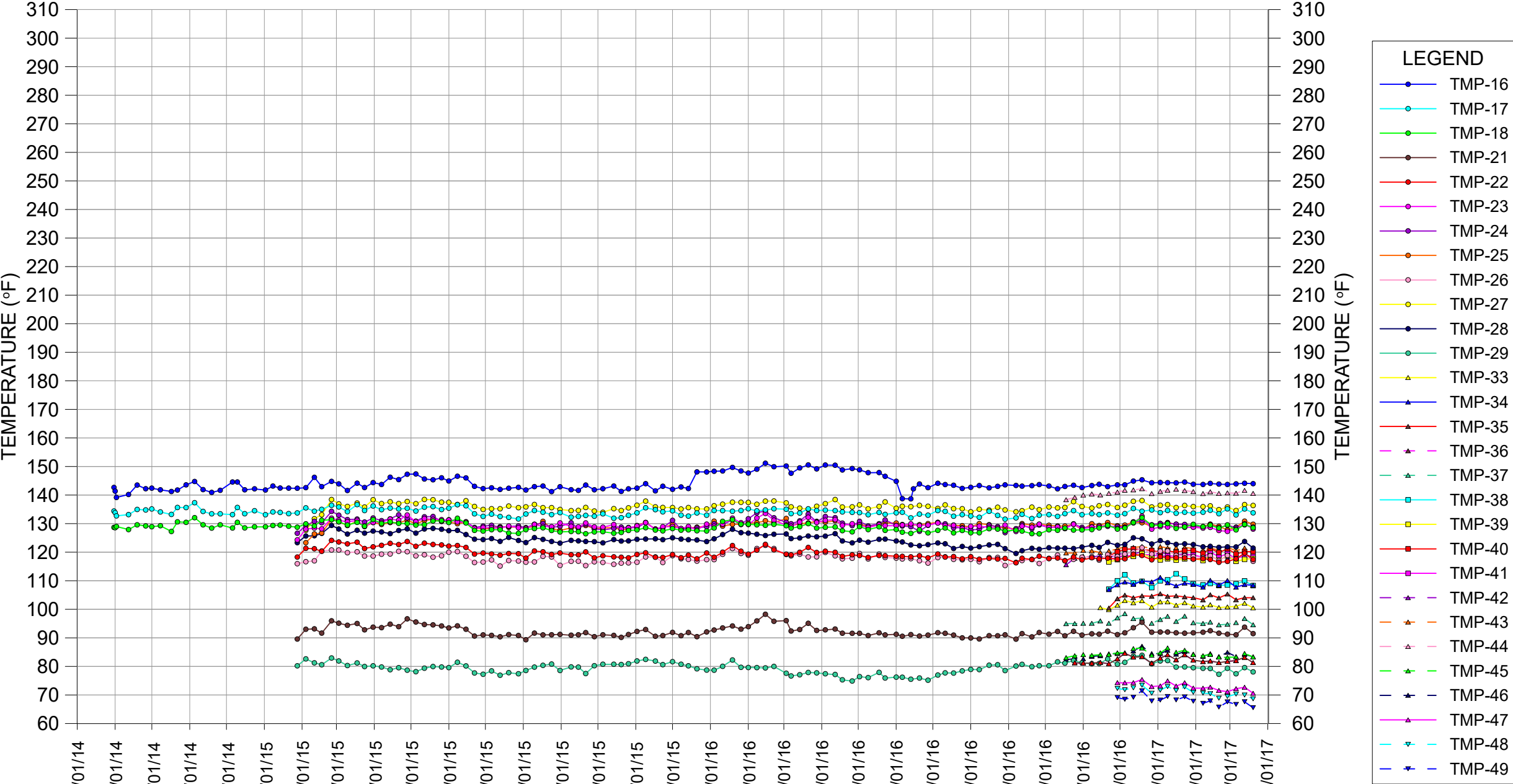


TEMPERATURE VS DEPTH
BRIDGETON LANDFILL

AVERAGE TEMPERATURES

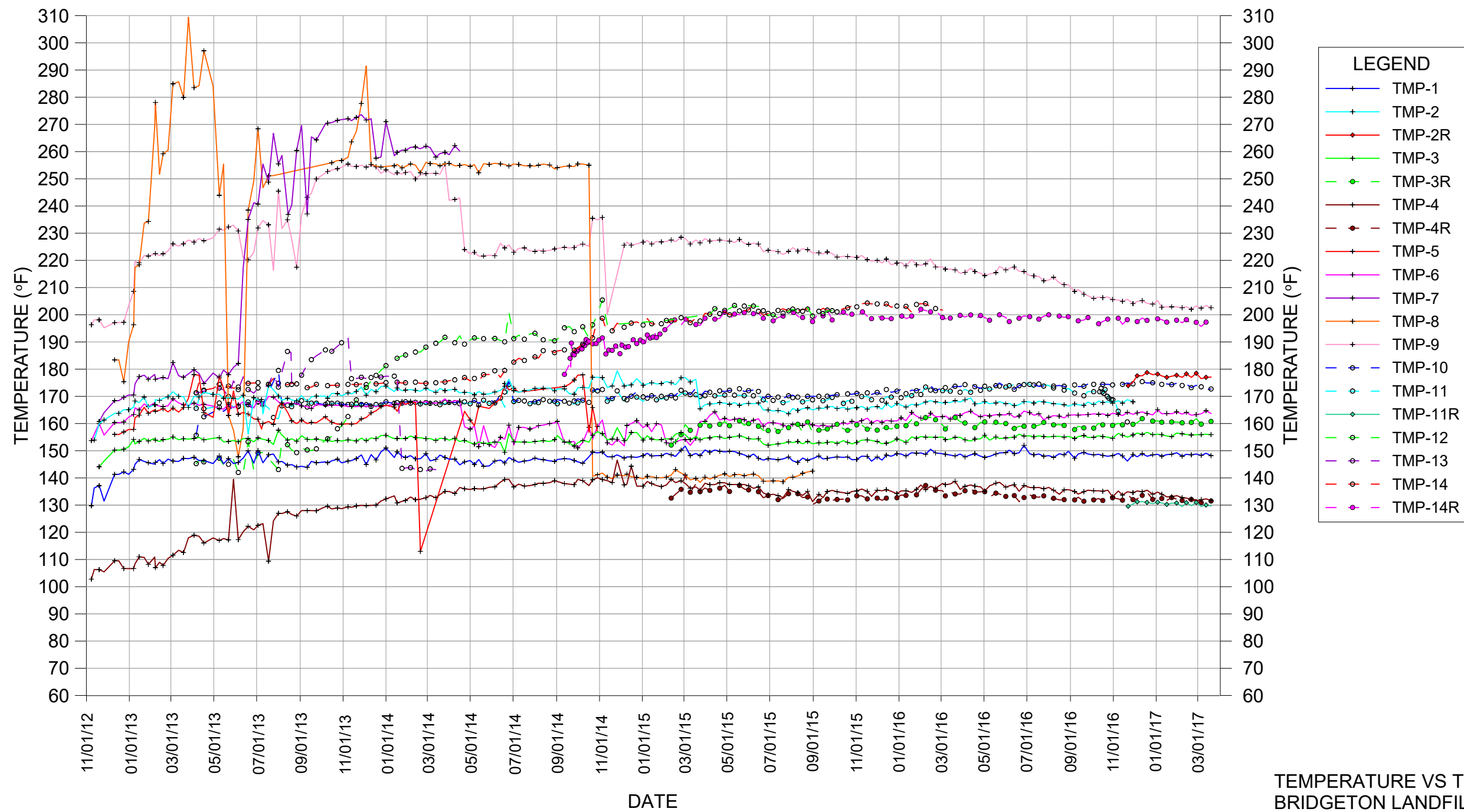


AVERAGE TEMPERATURES - NORTH QUARRY

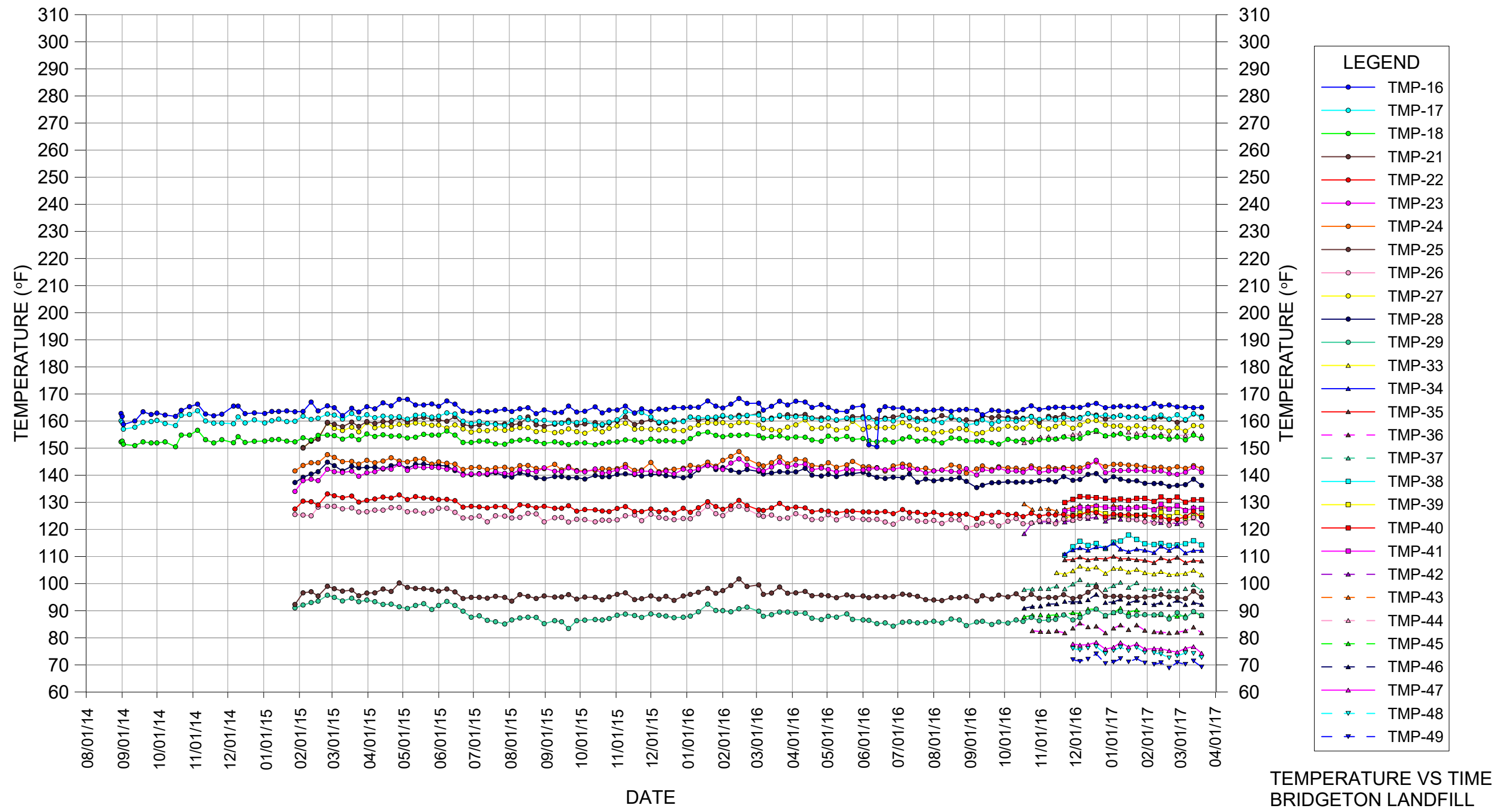


TEMPERATURE VS TIME
BRIDGETON LANDFILL

MAXIMUM TEMPERATURES



MAXIMUM TEMPERATURES - NORTH QUARRY



TMP BRIDGETON LANDFILL NOTES

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

TMP-1: NONE

TMP-2:

1. TMP-2 has been replaced by TMP-2R and will no longer be monitored or included in the presentation.

TMP-2R:

1. Data reported on 11/29/2016 was inadvertently left as the 11/22/2016 data. This was corrected on 12/5/2016 reading submittal.

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:

1. Unit at 113 ft had resistance below the minimum level, change in resistance occurred as of 11/08/16 and has remained below acceptable level.

TMP-11:

1. All units were verified by connectivity testing by Feezor Engineering on 11/23/2016 to be unreliable.
2. TMP-11 is no longer in service and will not be included in the presentation.

TMP-11R: NONE

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.

3. The unit at 39 ft depth had a higher than acceptable resistance reading and unreliable temperature since 2/7/2017.

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-34: NONE

TMP-35: NONE

TMP-36: NONE

TMP-37: NONE

TMP-38: NONE

TMP-39: NONE

TMP-40: NONE

TMP-41: NONE

TMP-42: NONE

TMP-43: NONE

TMP-44: NONE

TMP-45: NONE

TMP-46: NONE

TMP-47: NONE

TMP-48: NONE

TMP-49: NONE

TMP vs DEPTH and TMP vs ELEVATION (for **03/20/17**):

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.
7. There were no reliable temperature readings for TMP-11 as determined by the connectivity test on 11/23/2016.
8. TMP-2 has been replaced by TMP-2R and will no longer be monitored.
9. TMP-11 is no longer in service and will not be included in the presentation.

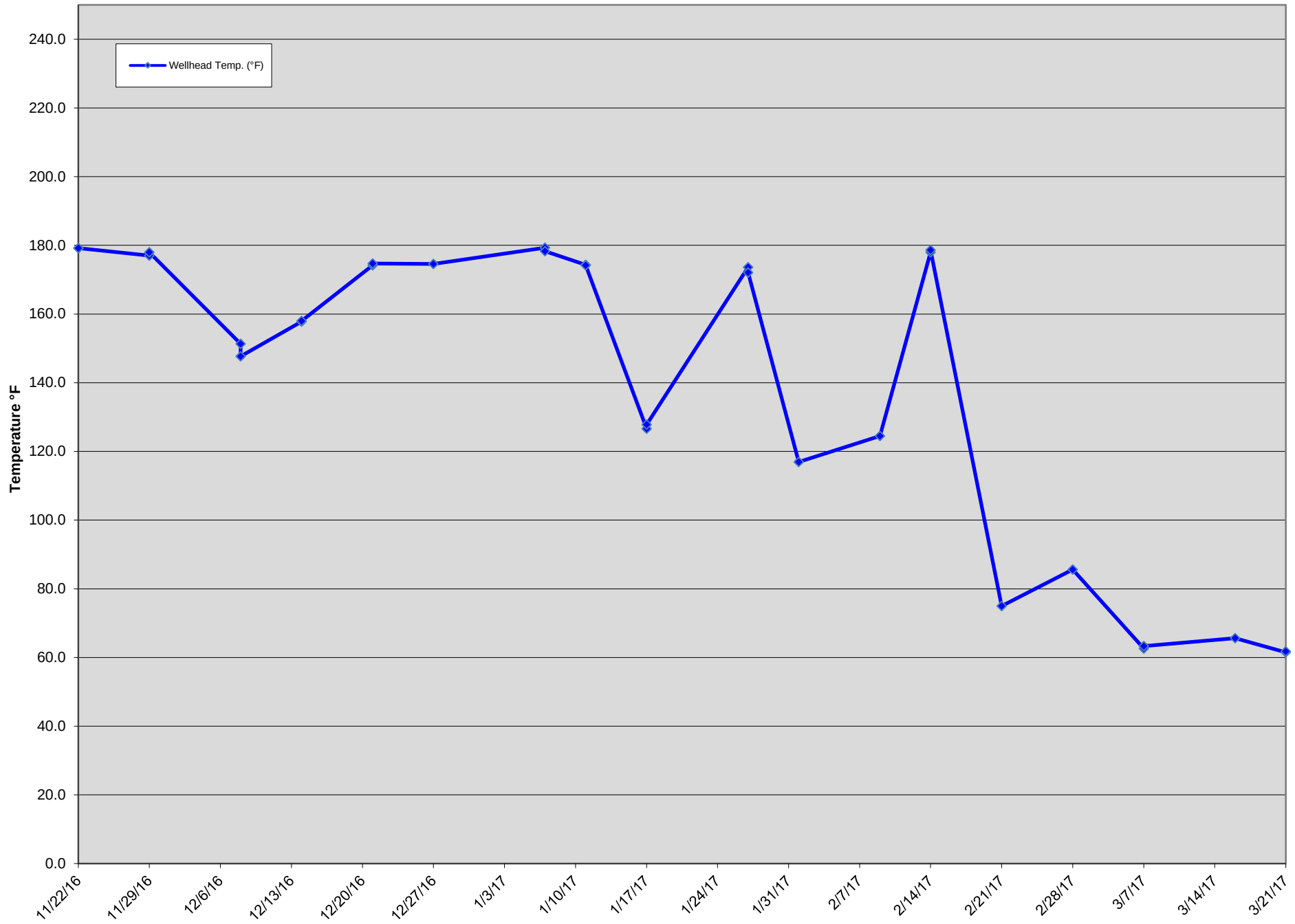
ATTACHMENT C

GAS INTERCEPTOR WELLHEAD TEMPERATURE GRAPHS

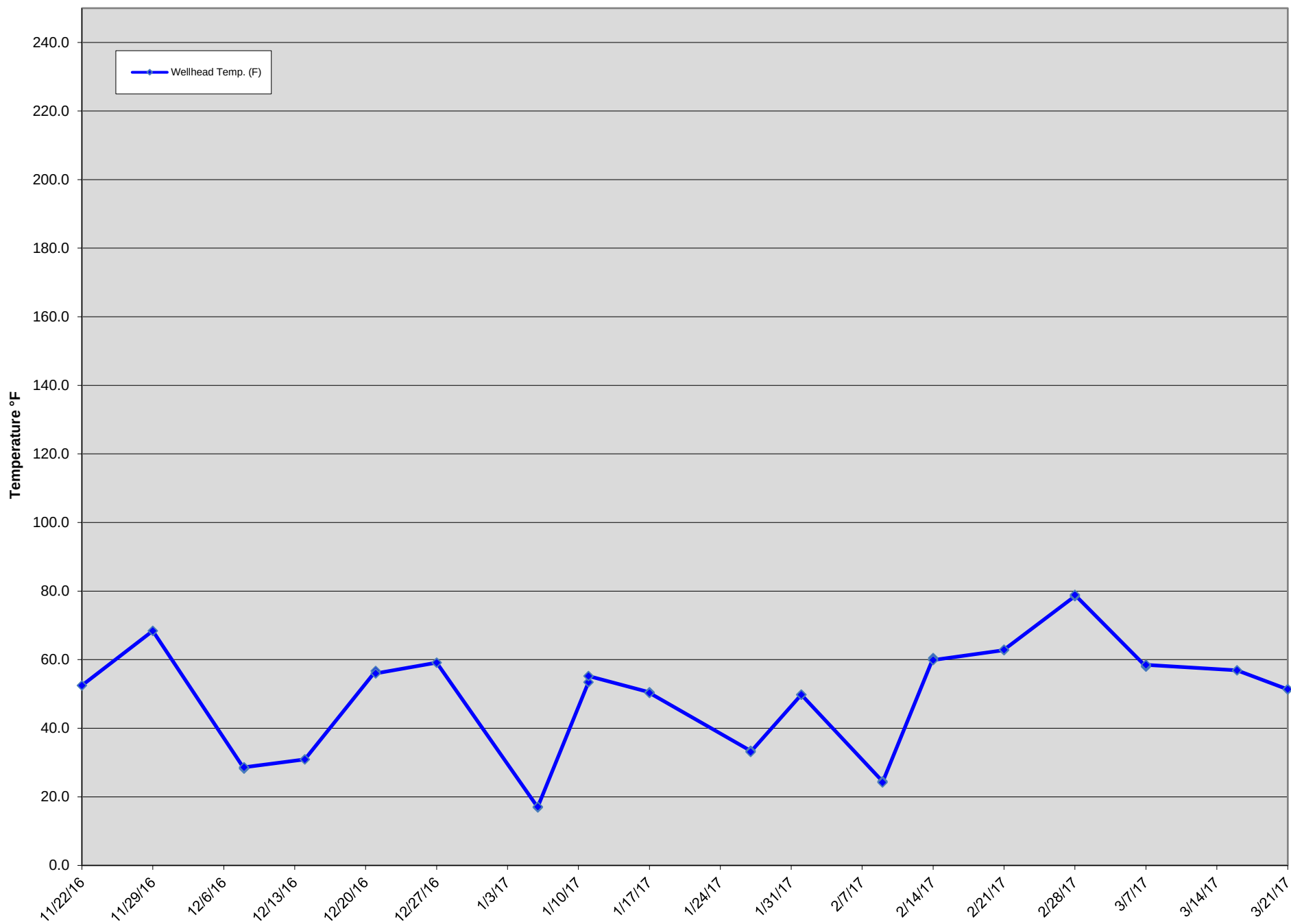


Gas Extraction Wells - Bridgeton Landfill

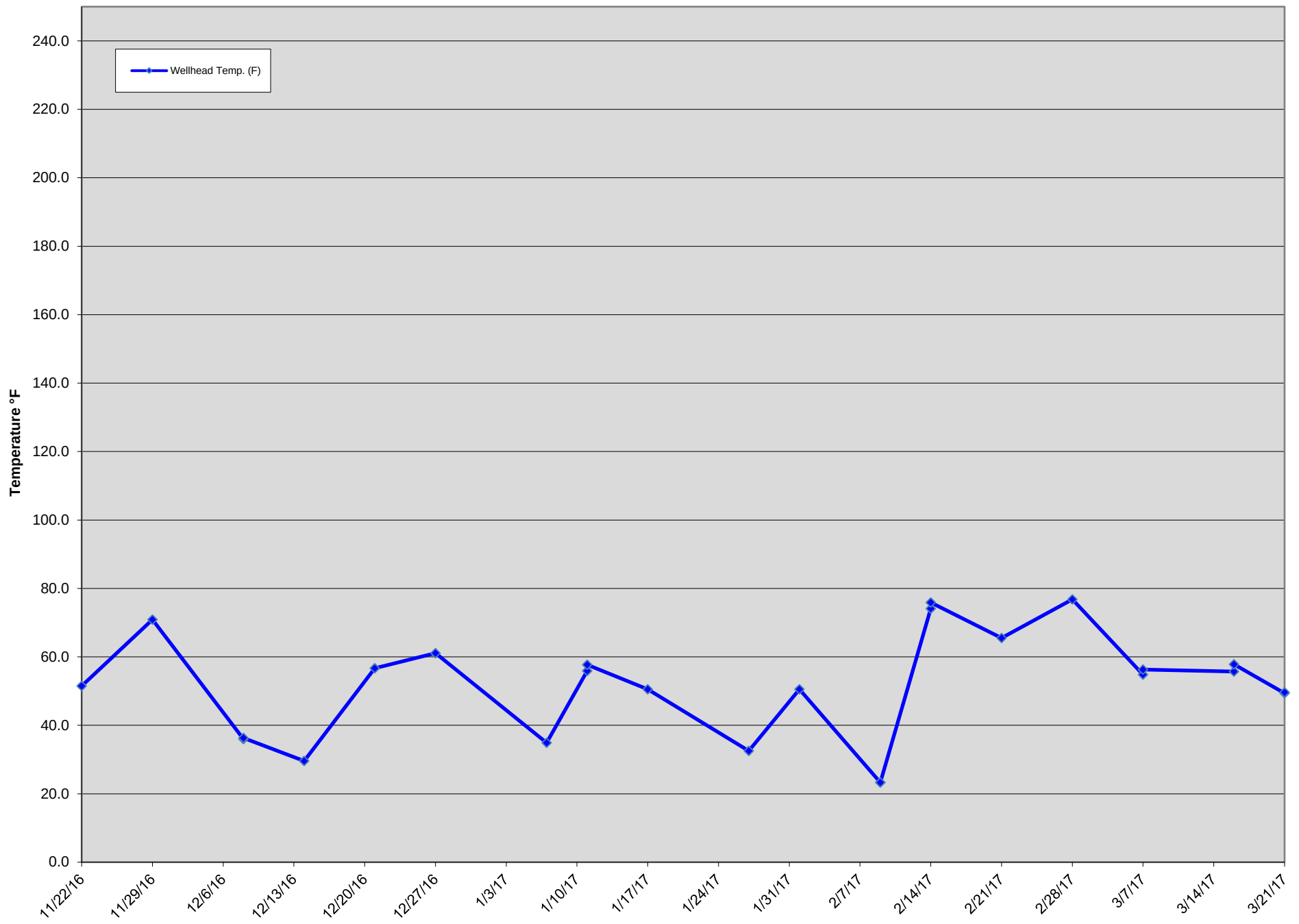
GIW-1 Wellhead Temperatures



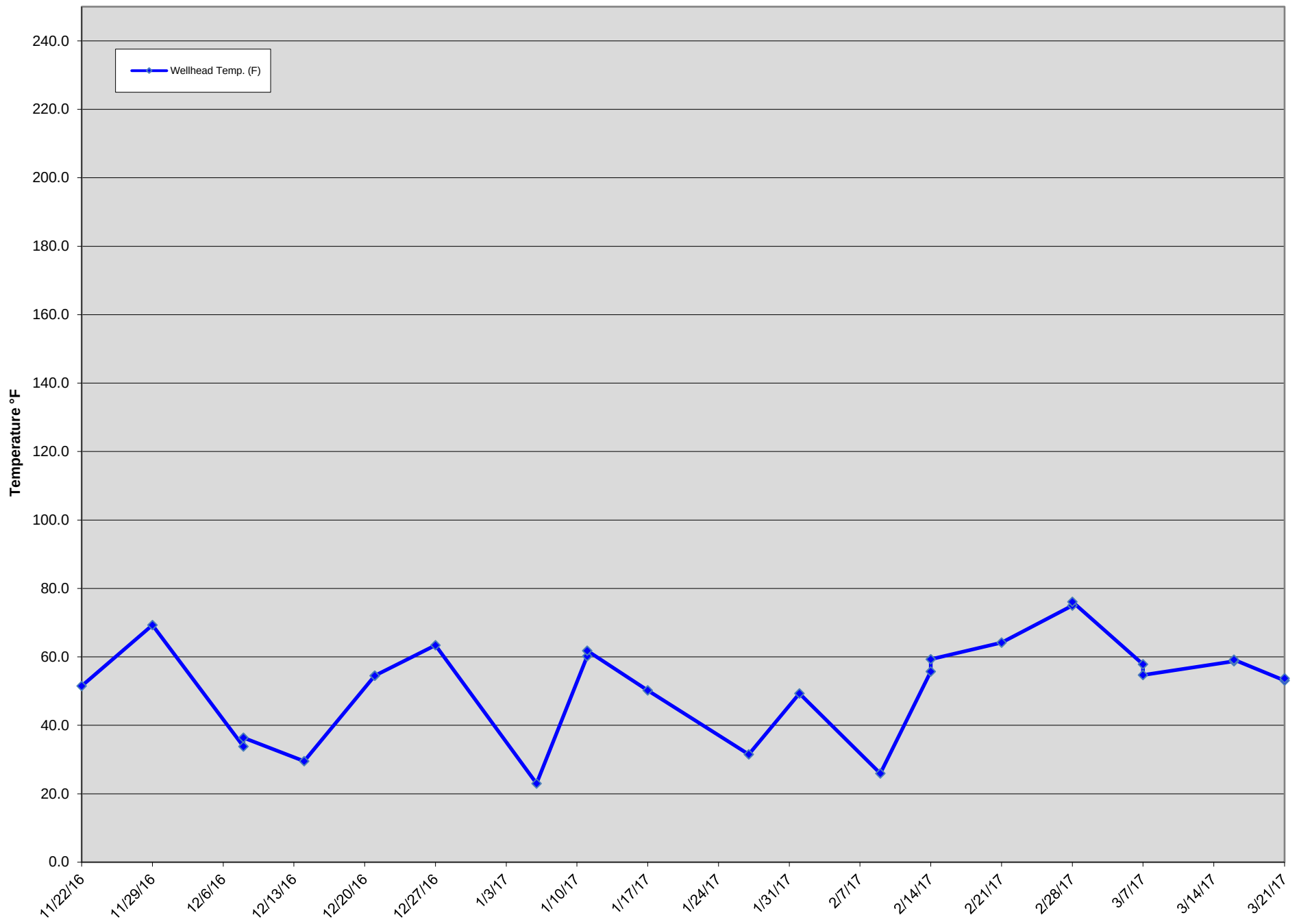
GIW-2 Wellhead Temperatures



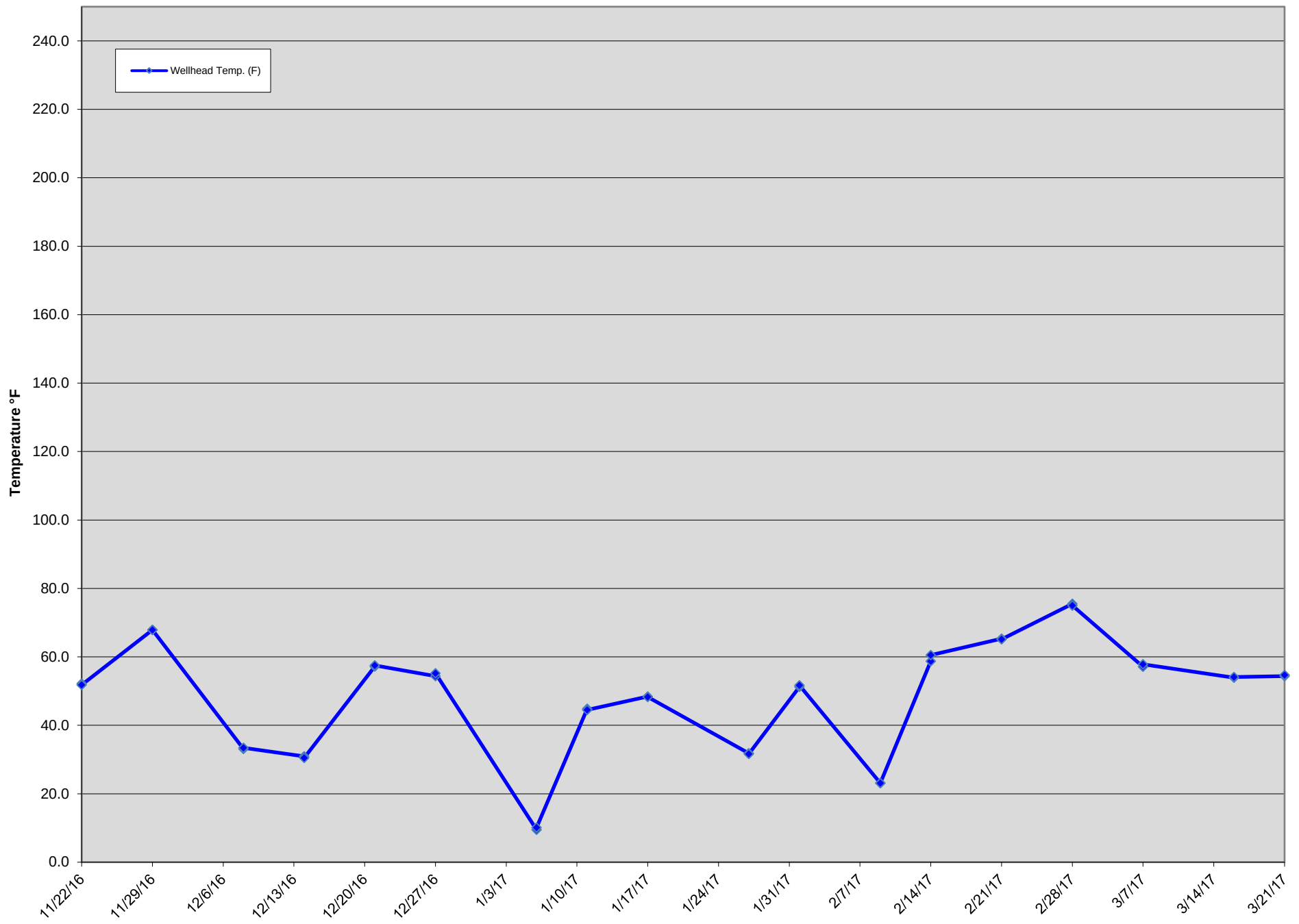
GIW-3 Wellhead Temperatures



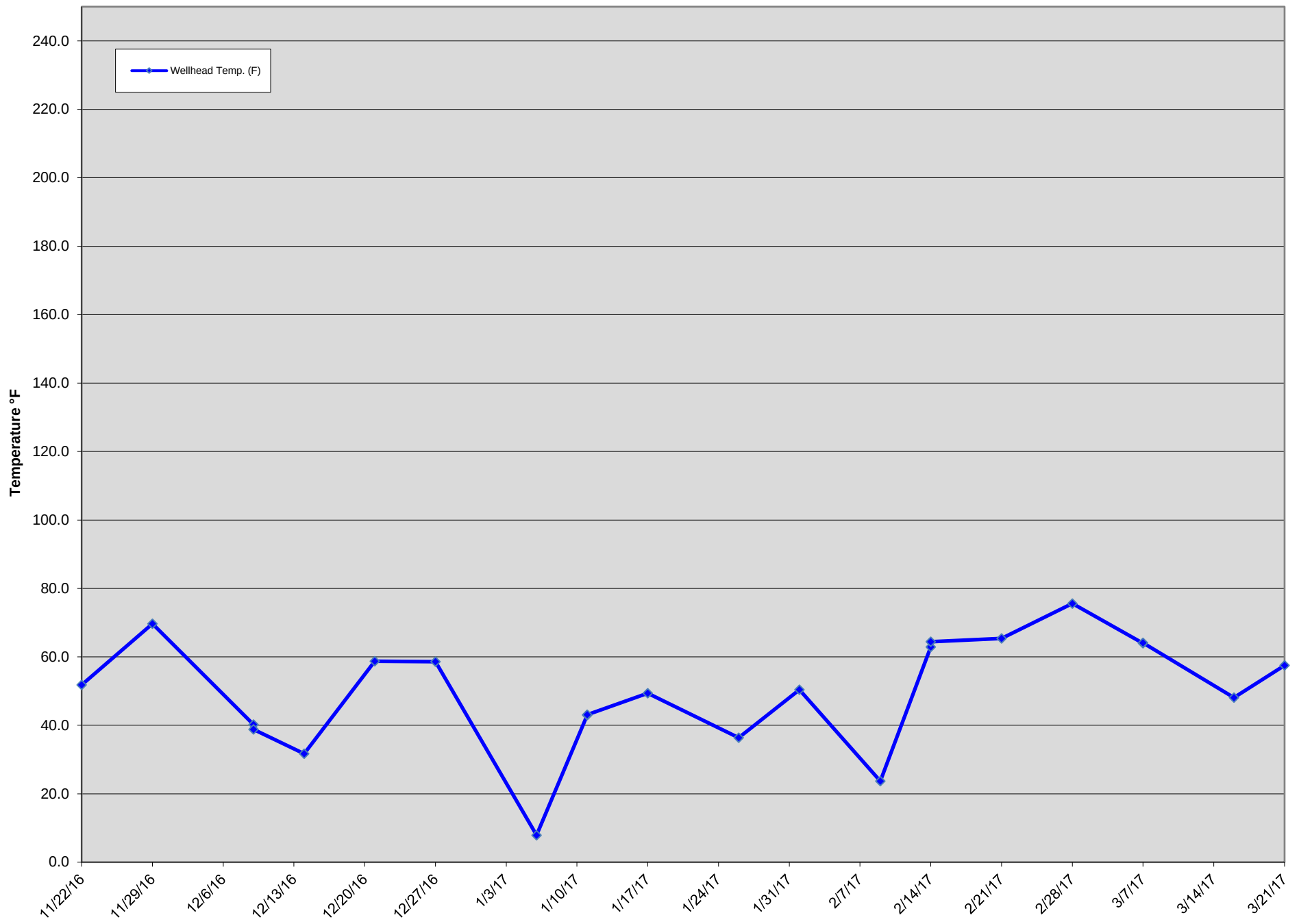
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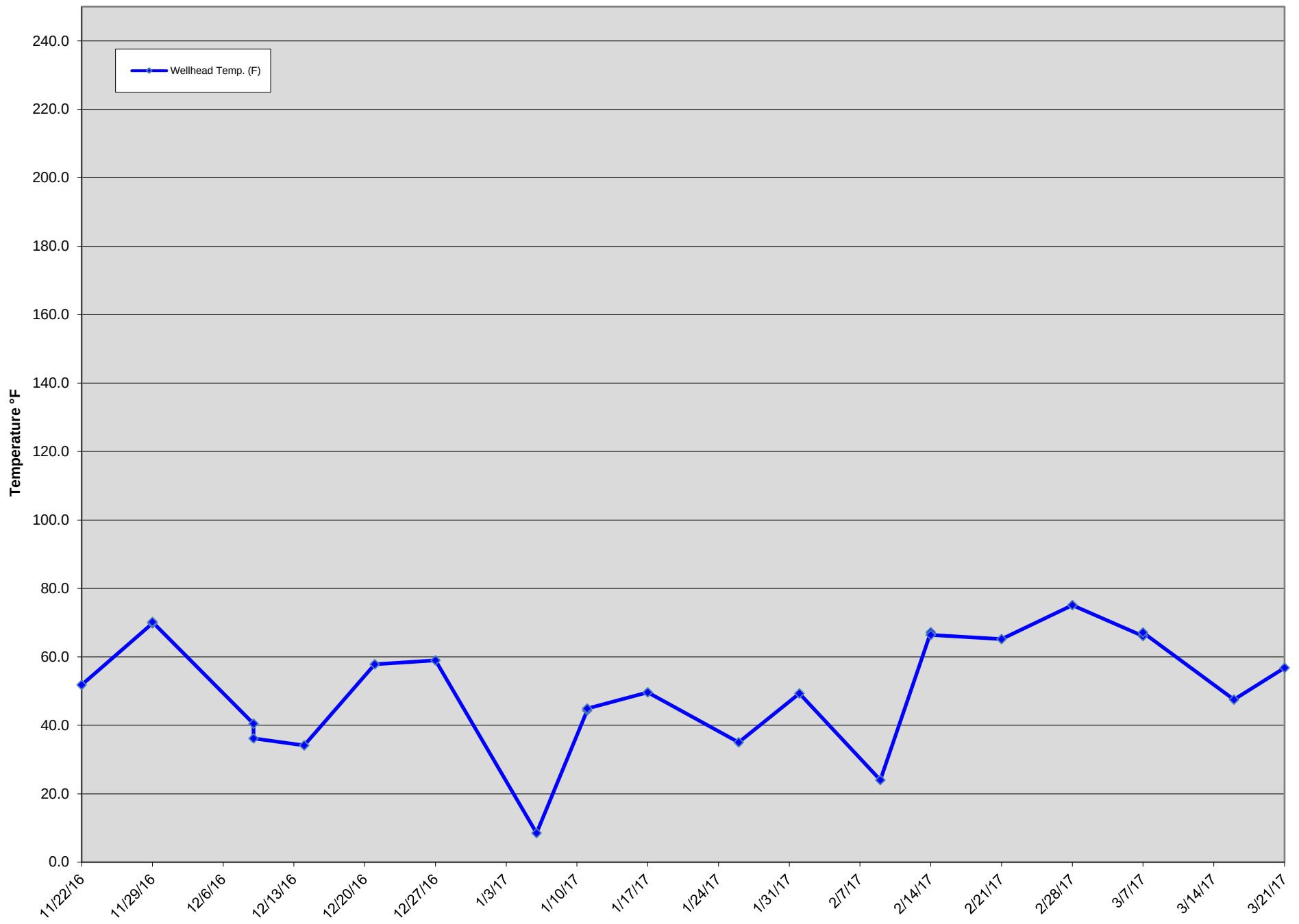
GIW-5 Wellhead Temperatures



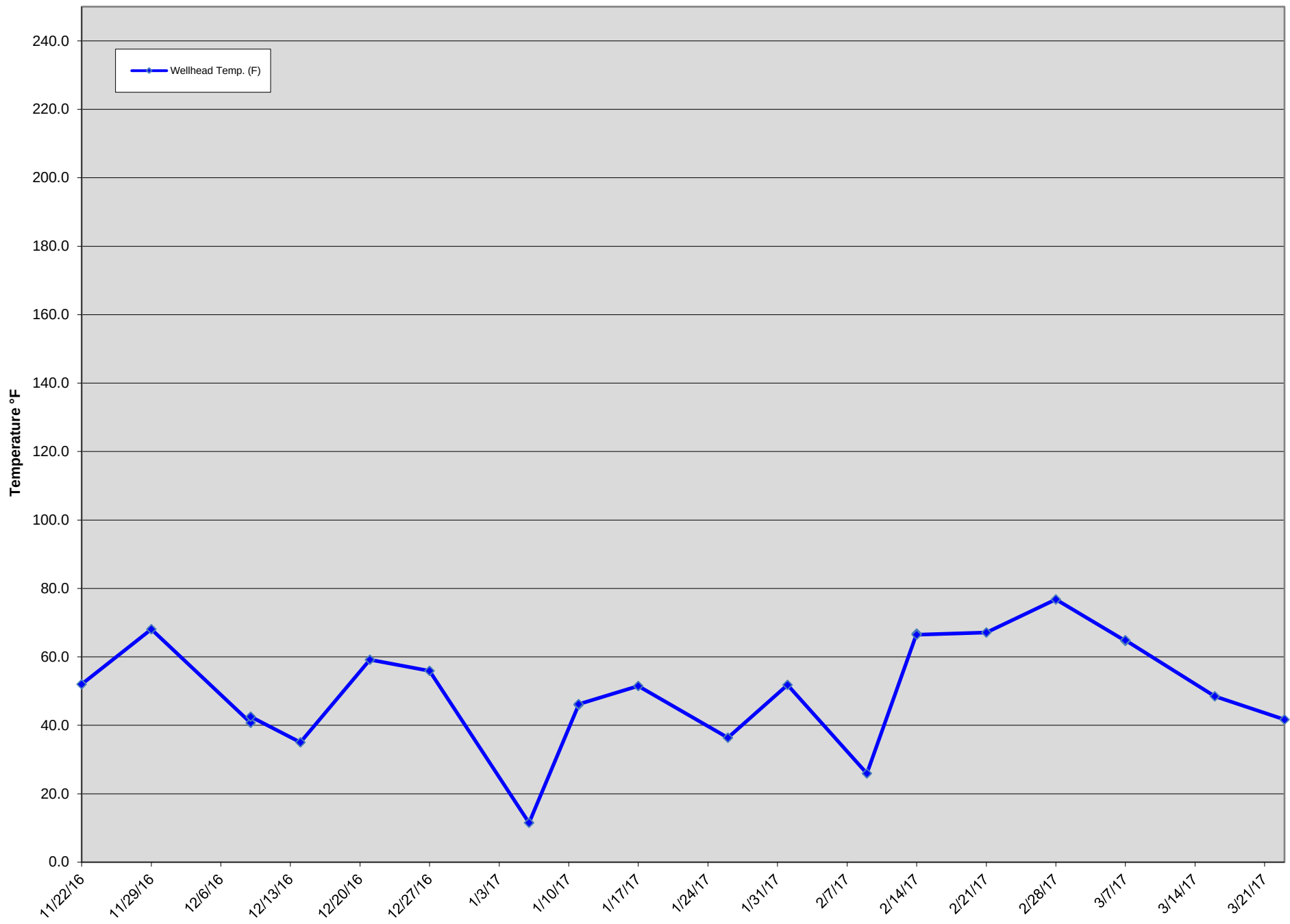
GIW-6 Wellhead Temperatures



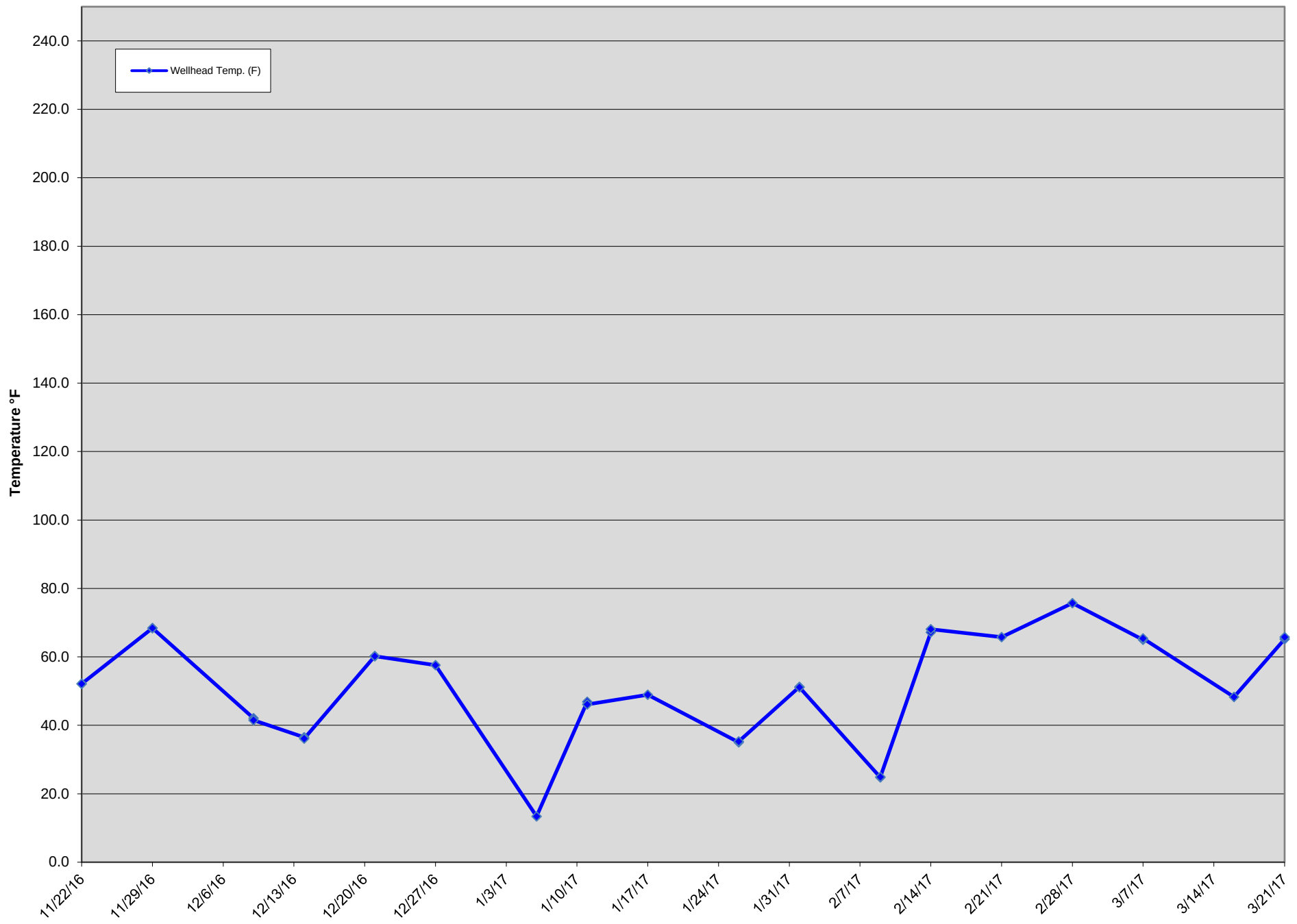
GIW-7 Wellhead Temperatures



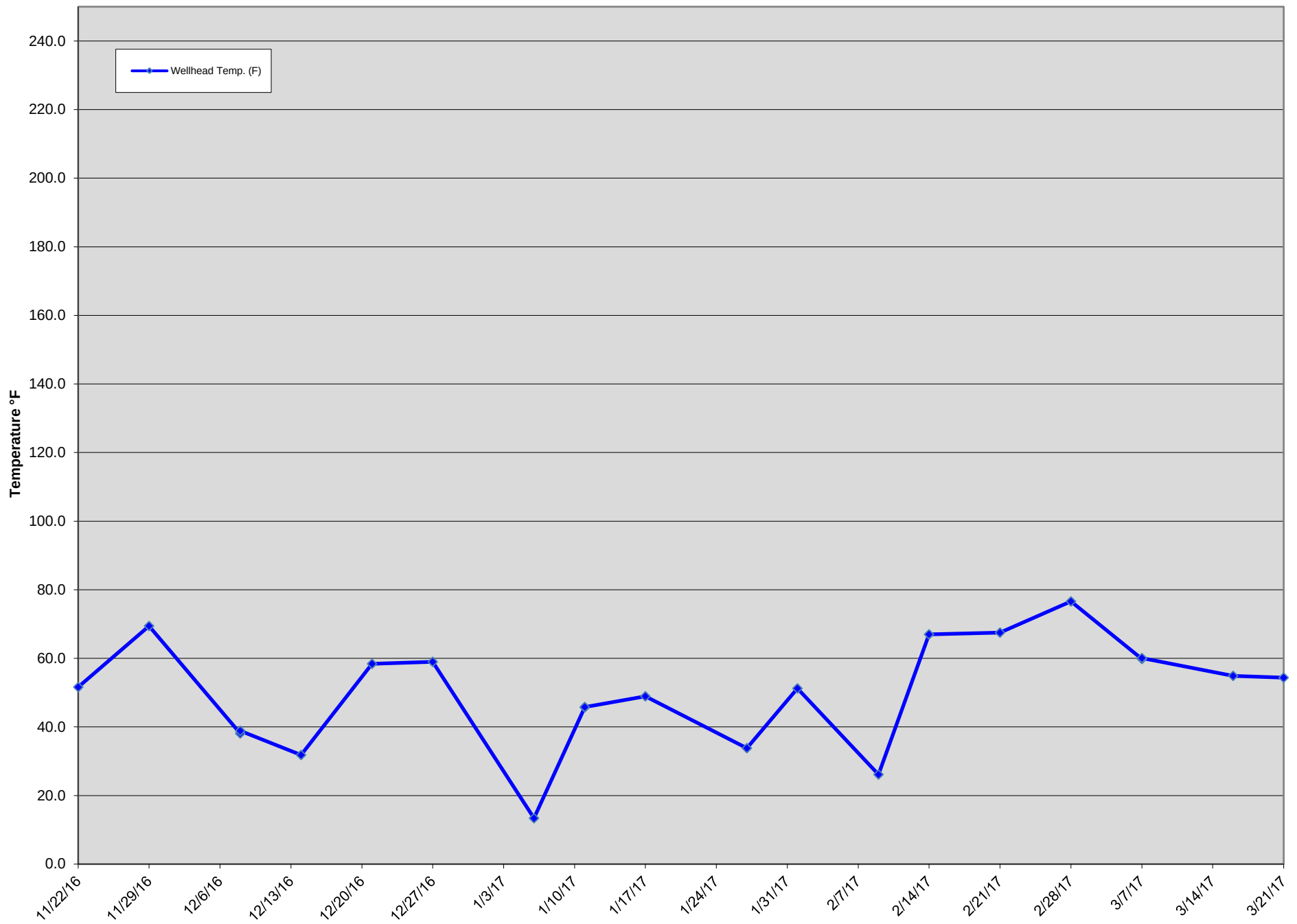
GIW-8 Wellhead Temperatures



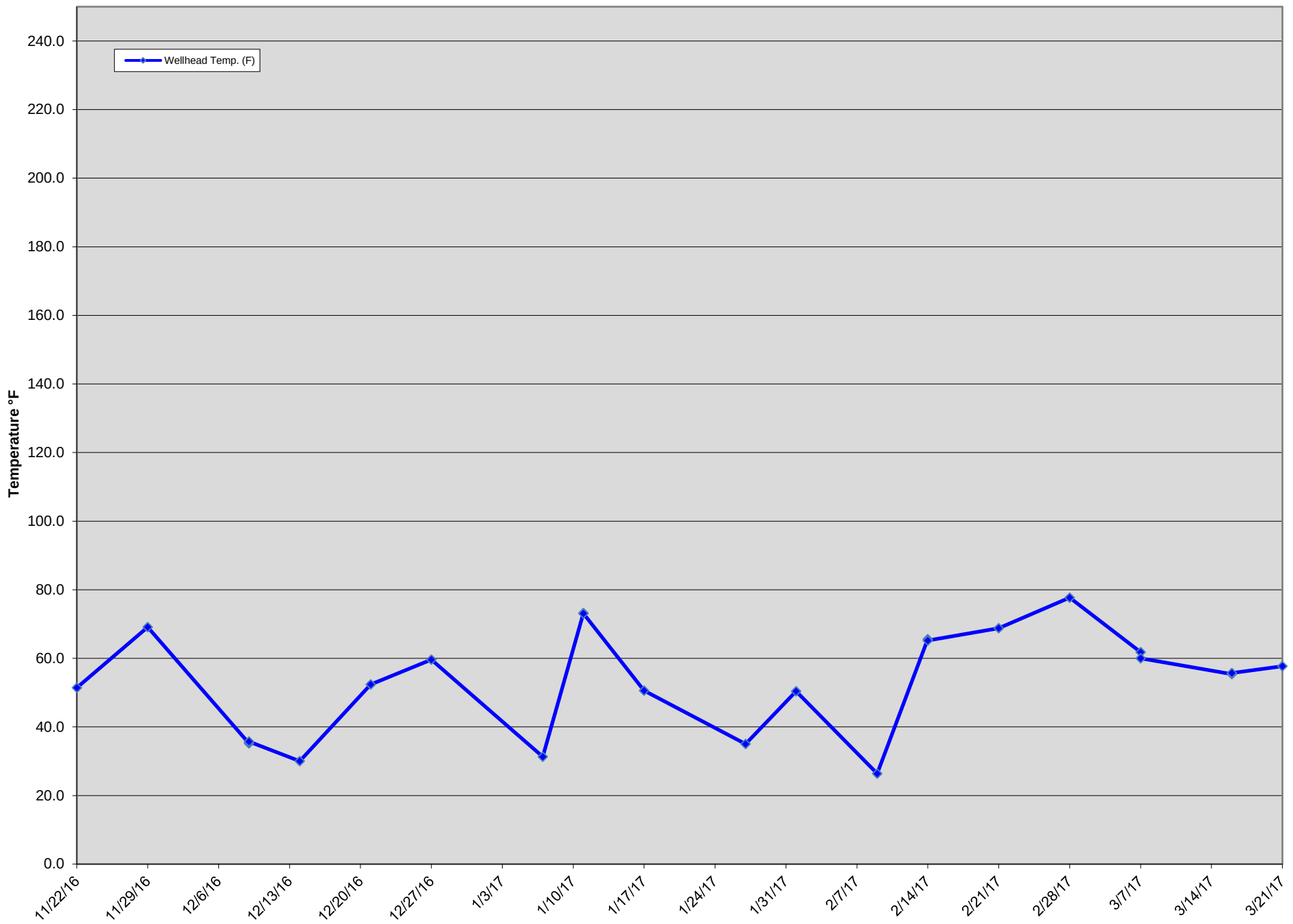
GIW-9 Wellhead Temperatures



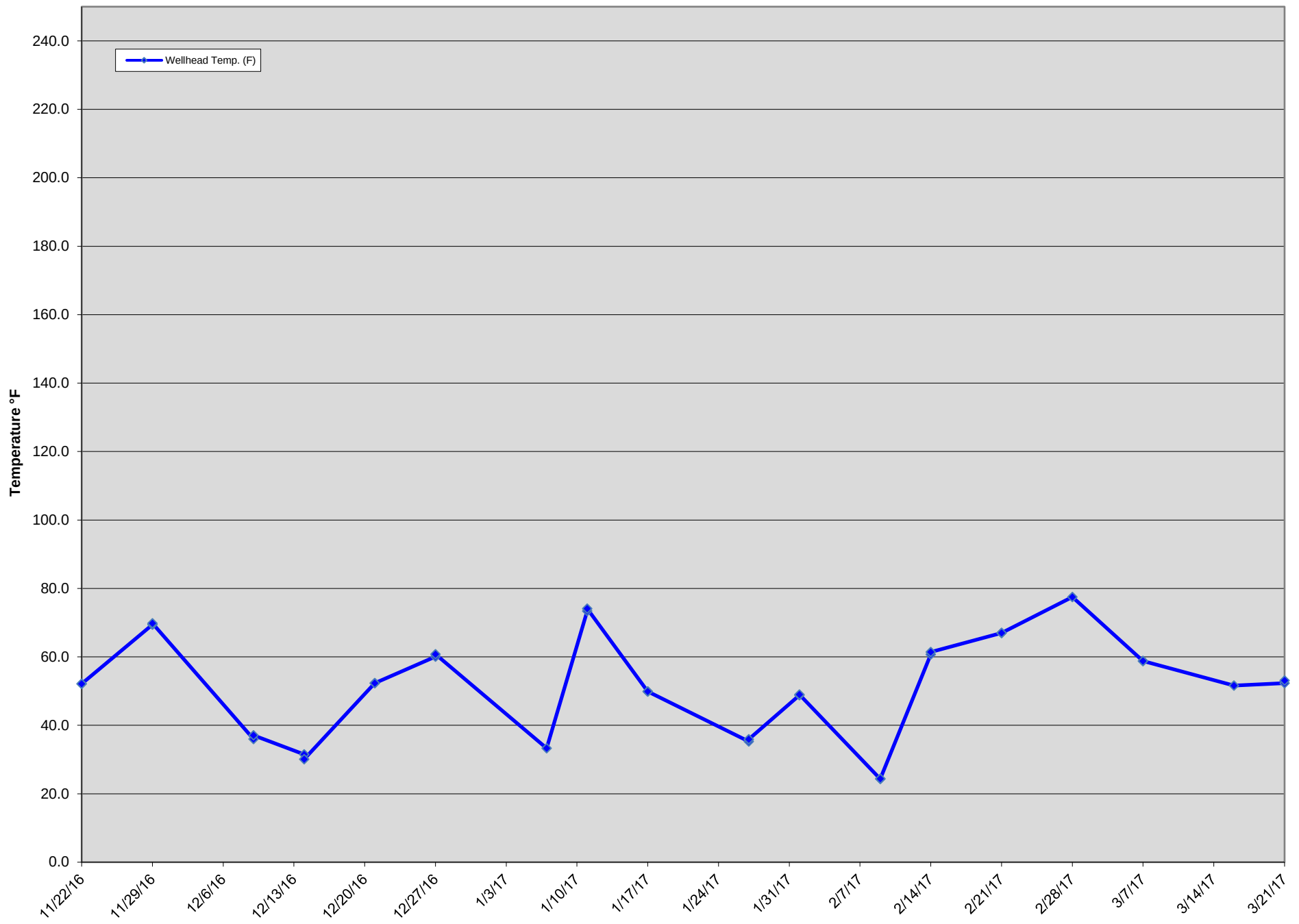
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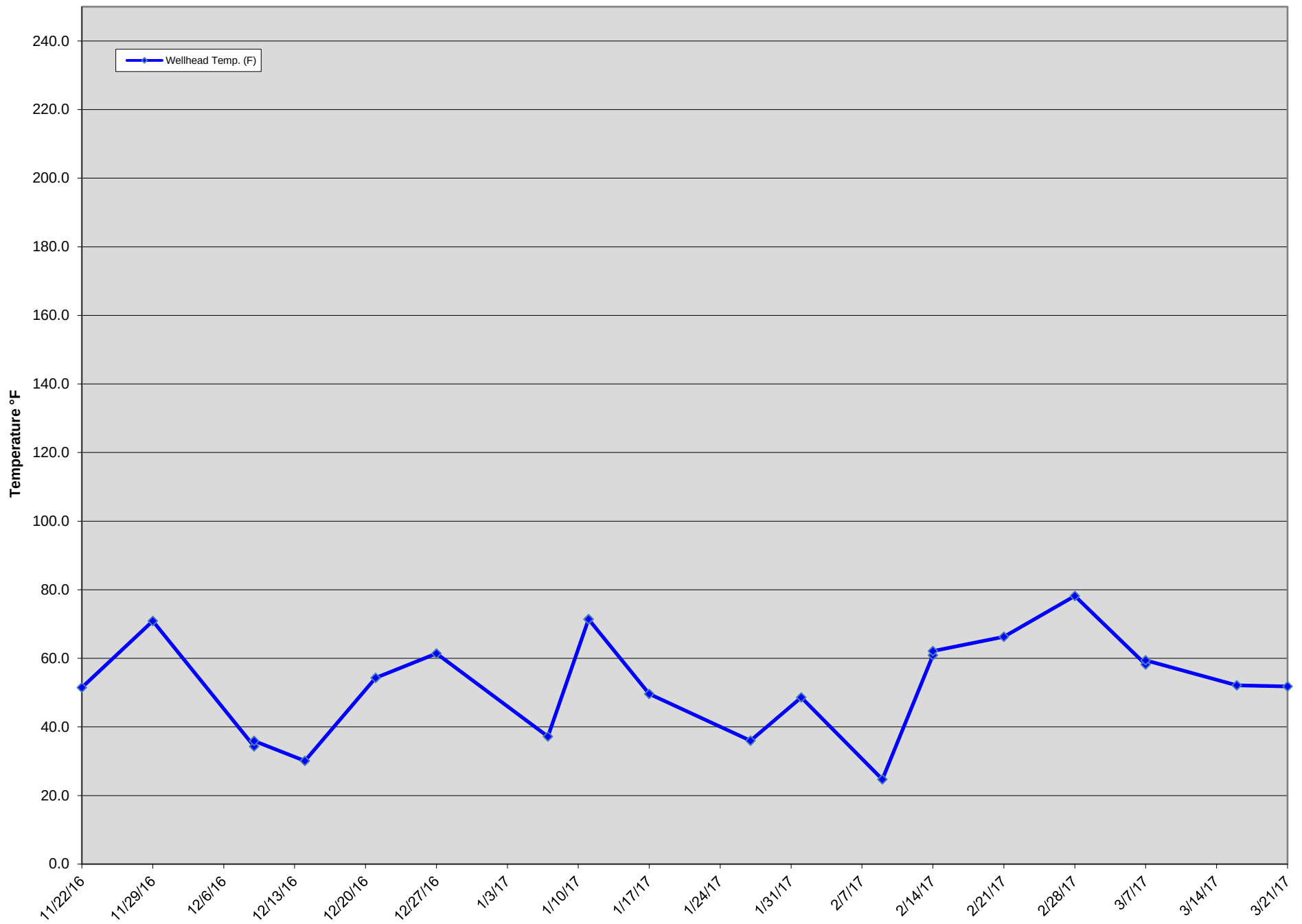
GIW-11 Wellhead Temperatures



GIW-12 Wellhead Temperatures



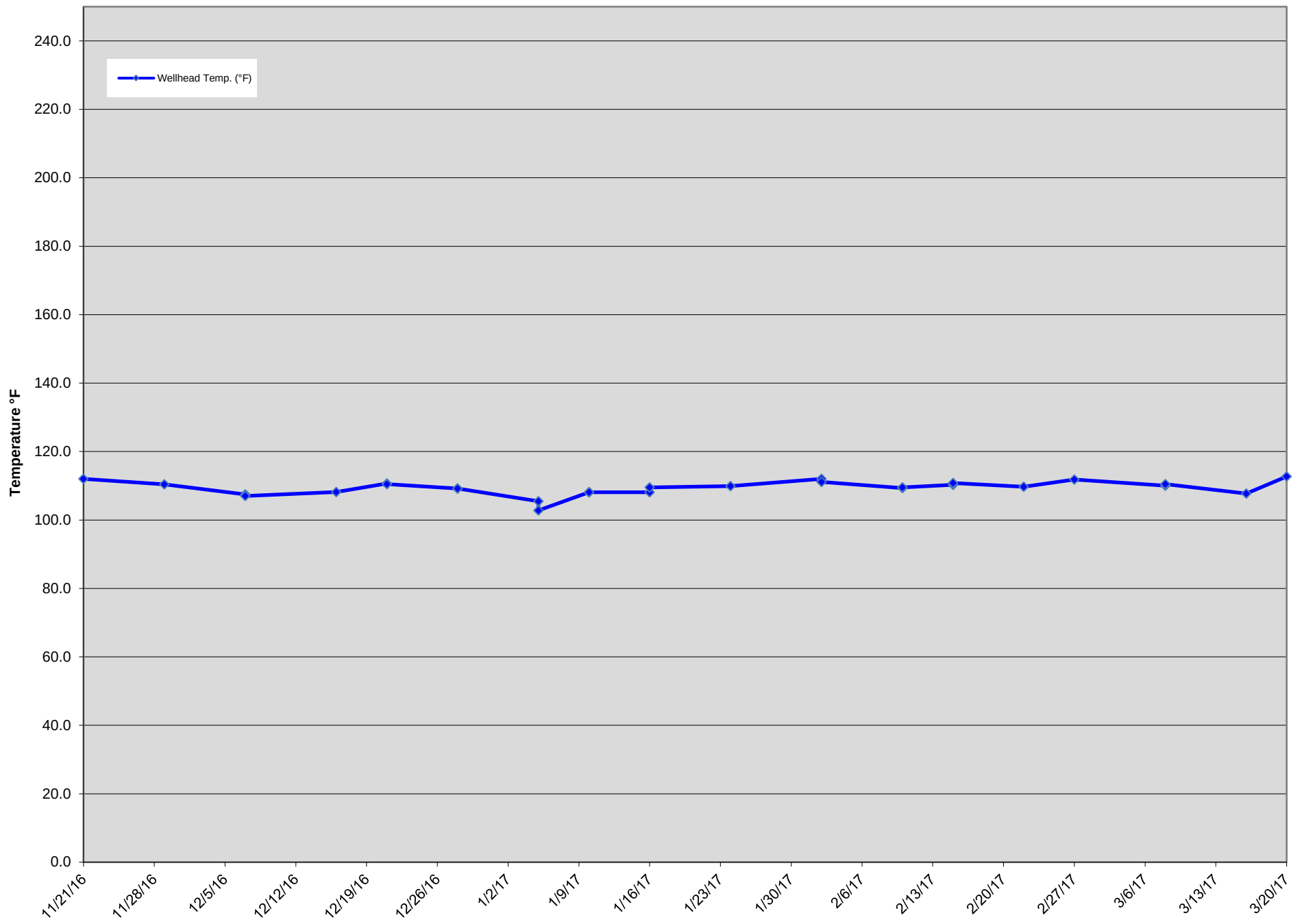
GIW-13 Wellhead Temperatures



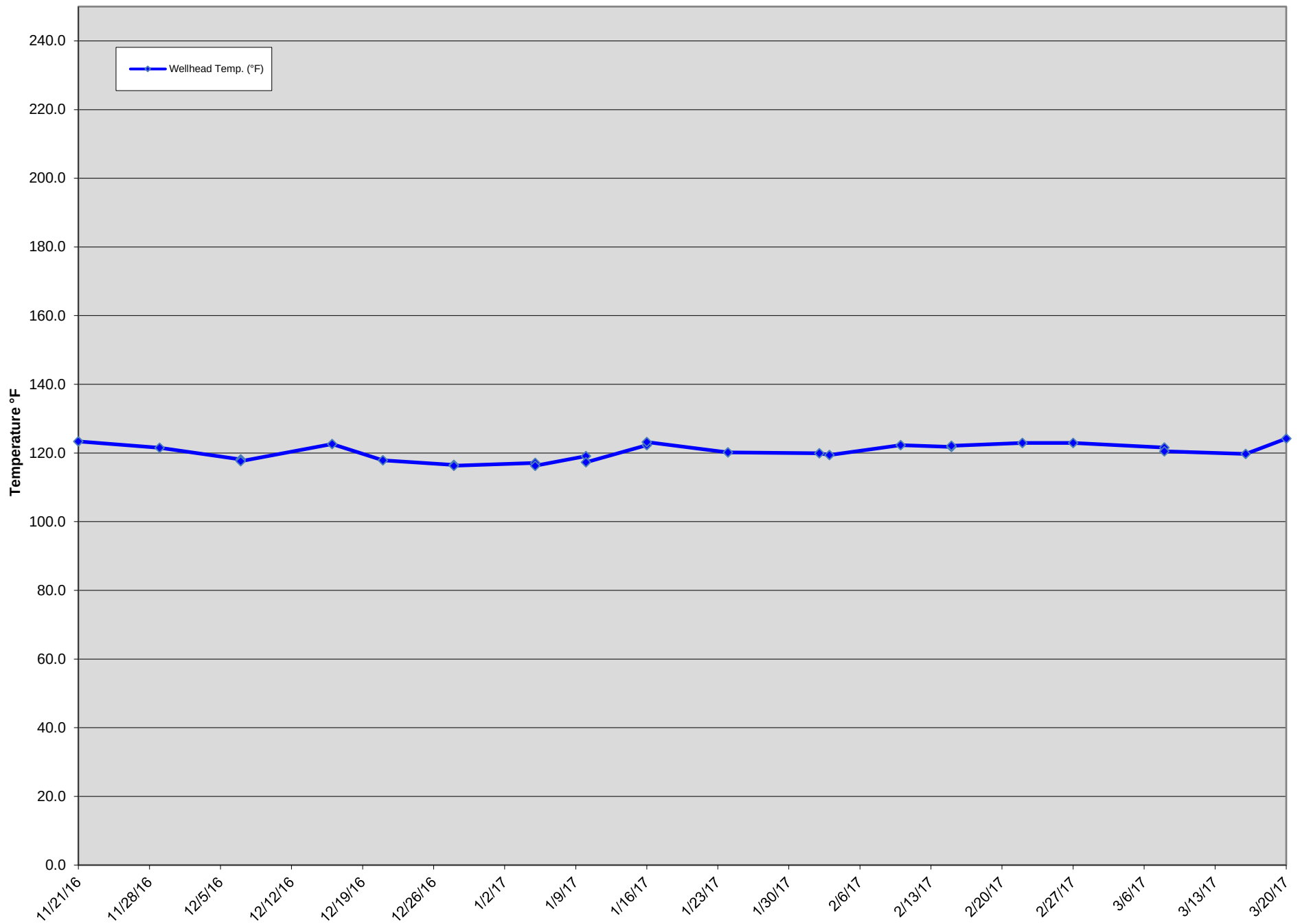
ATTACHMENT D

NECK-AREA GAS EXTRACTION WELL DATA

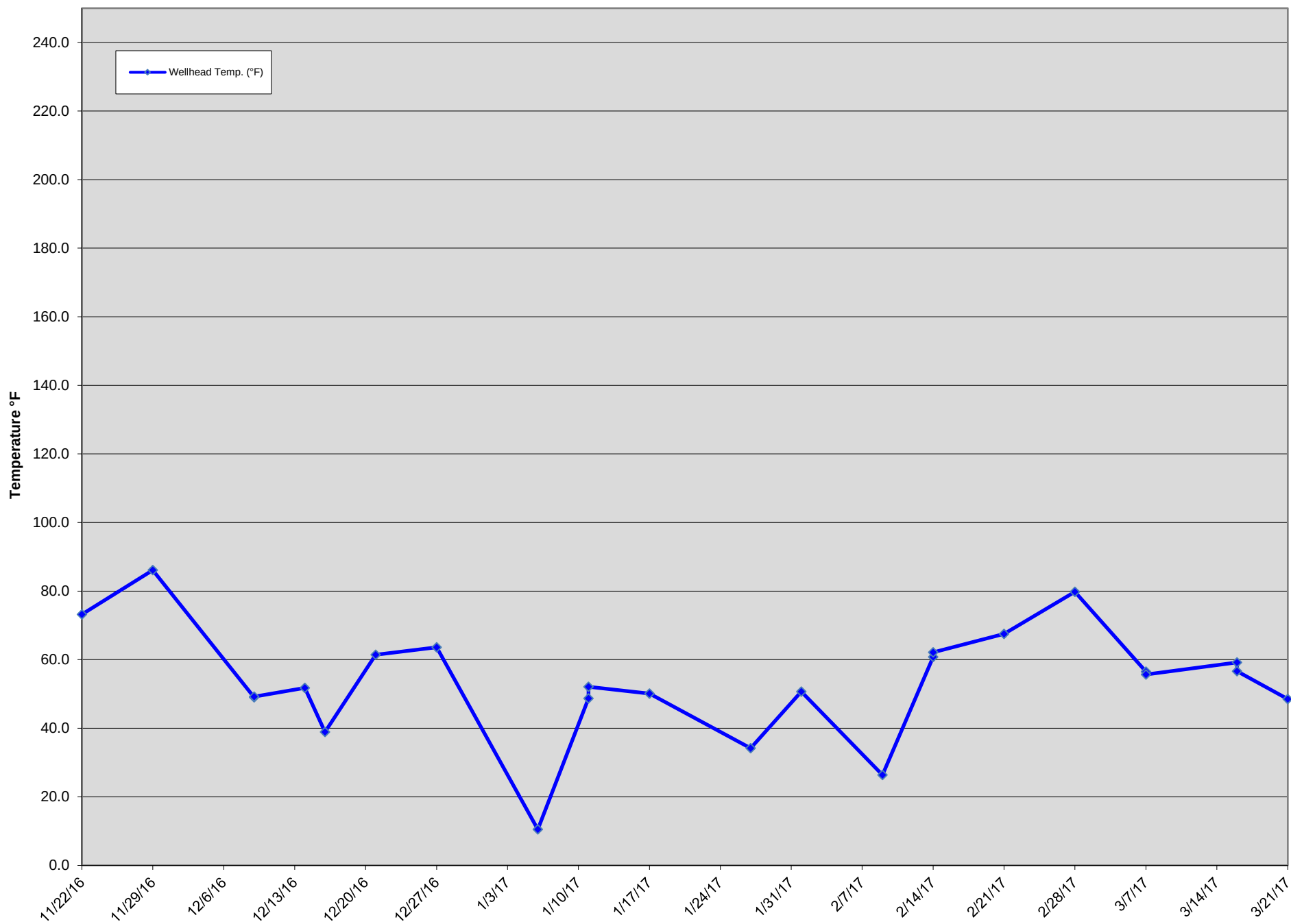
GEW-008 Wellhead Temperatures



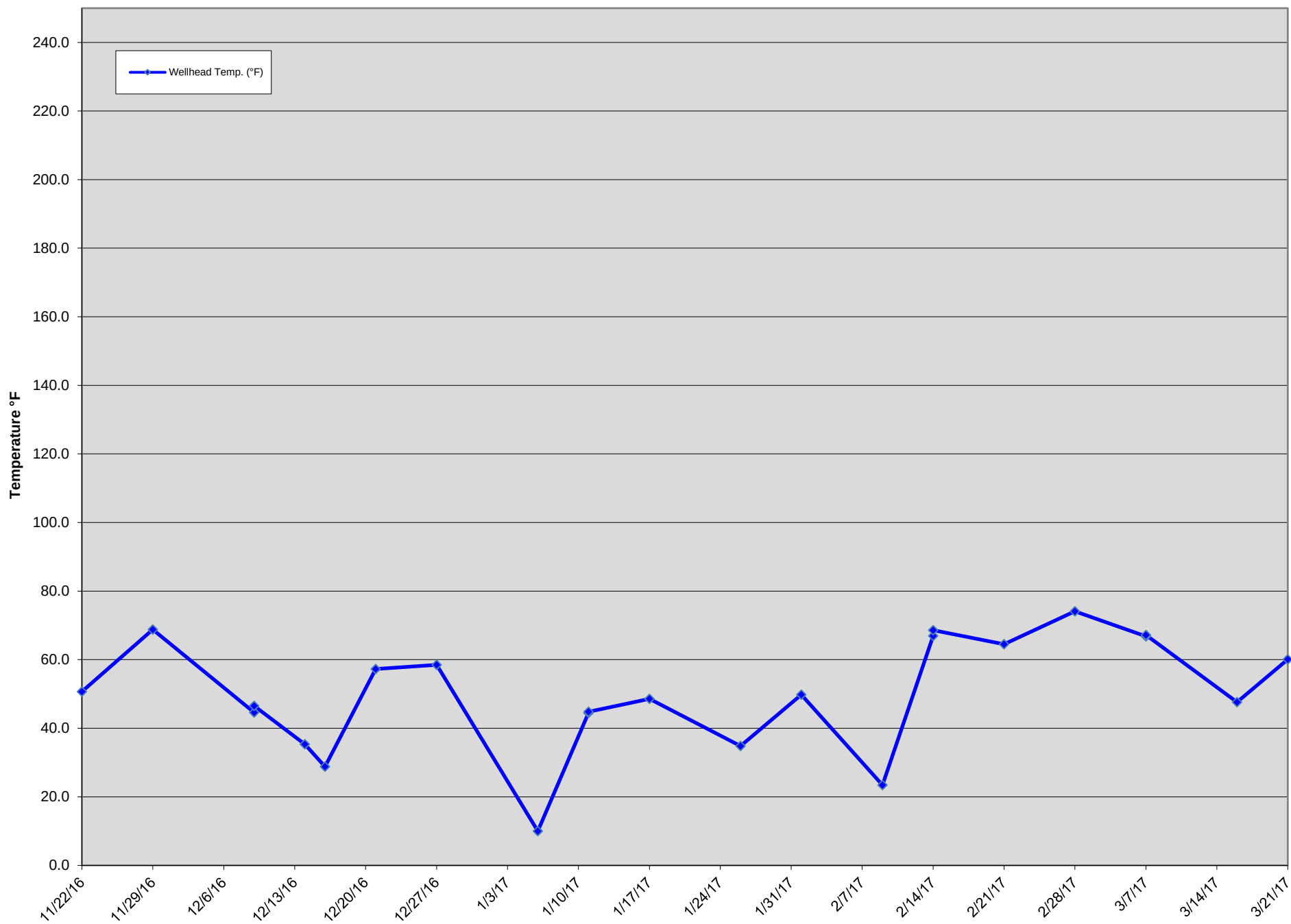
GEW-009 Wellhead Temperatures



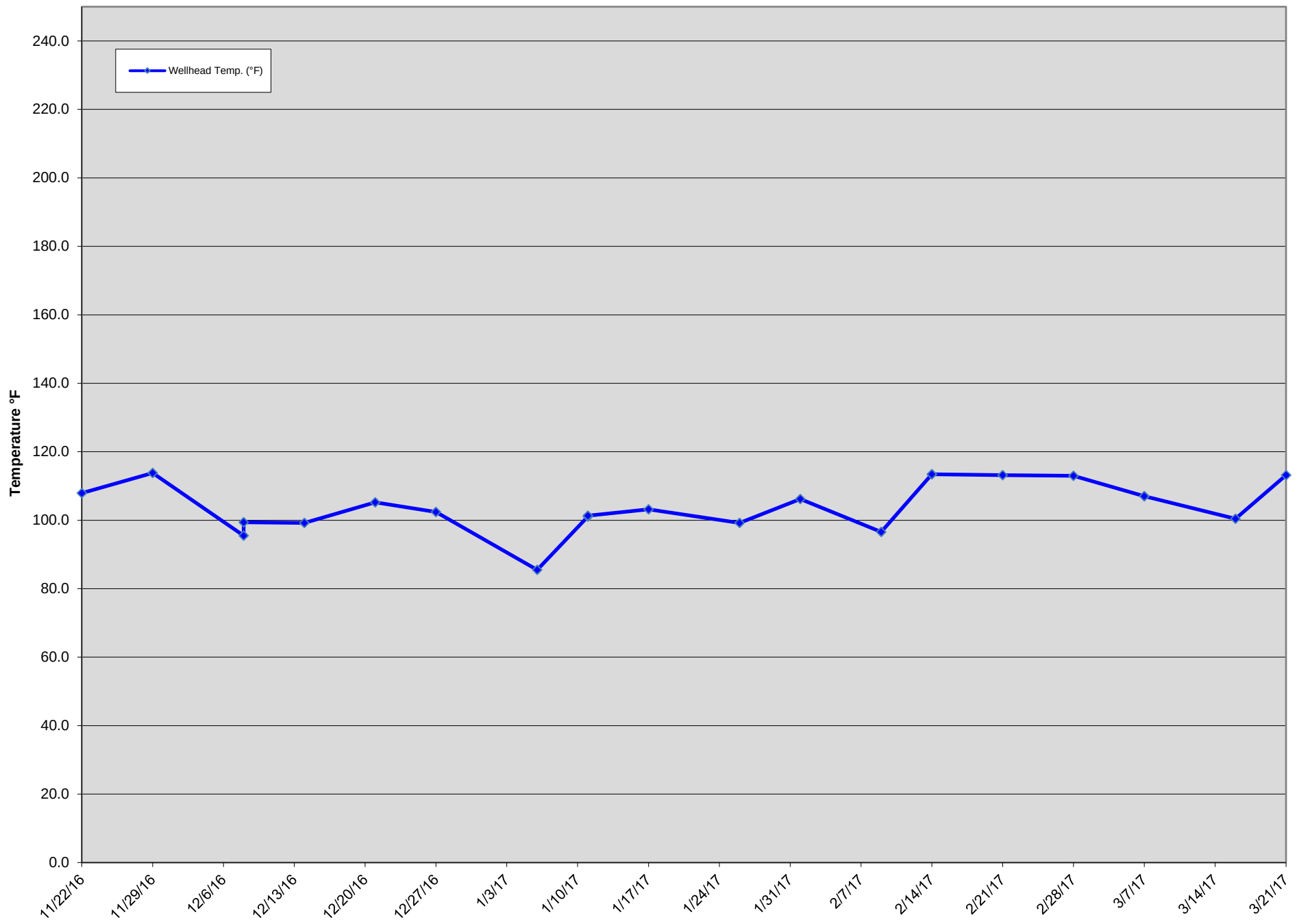
GEW-010 Wellhead Temperatures



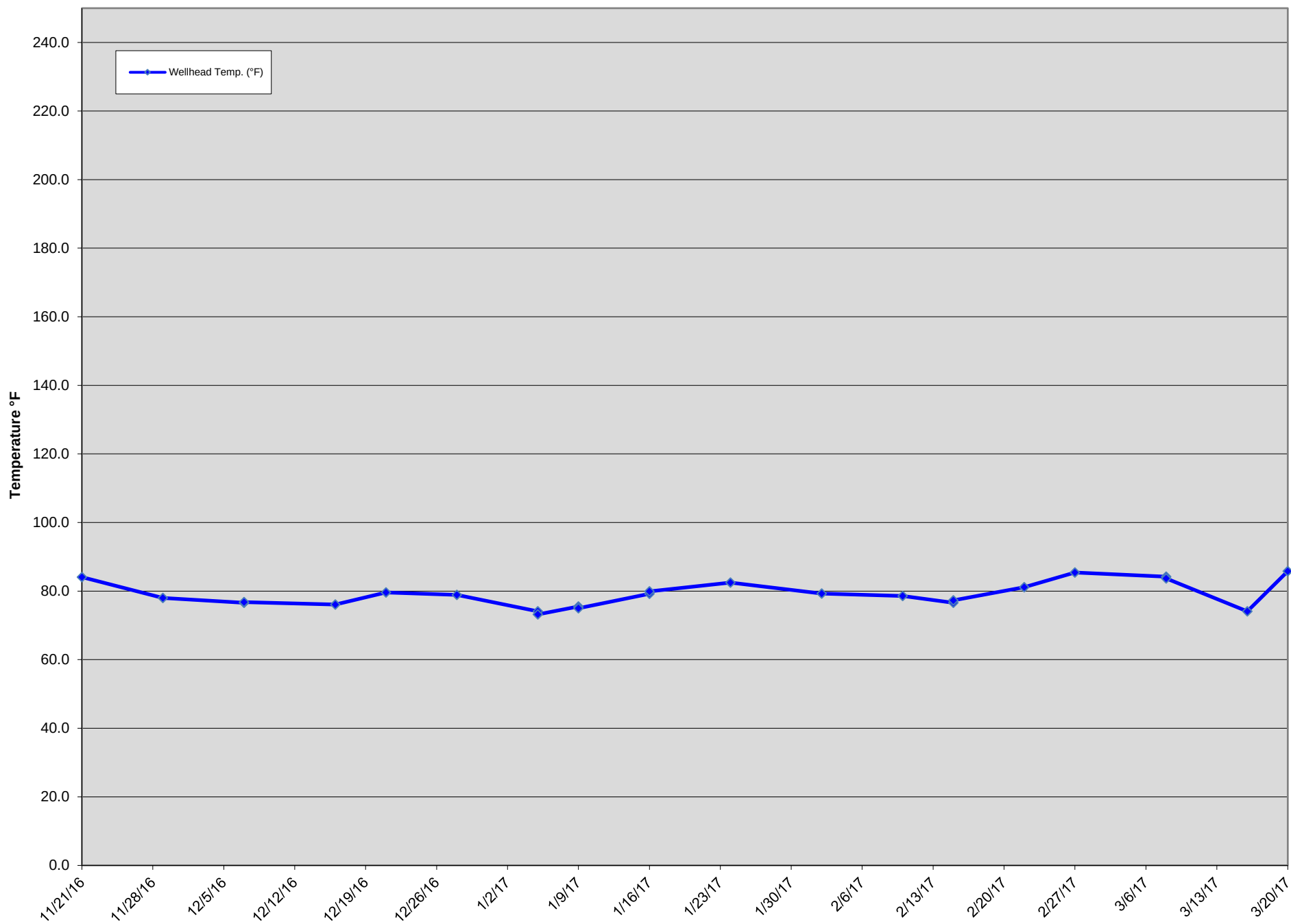
GEW-038 Wellhead Temperatures



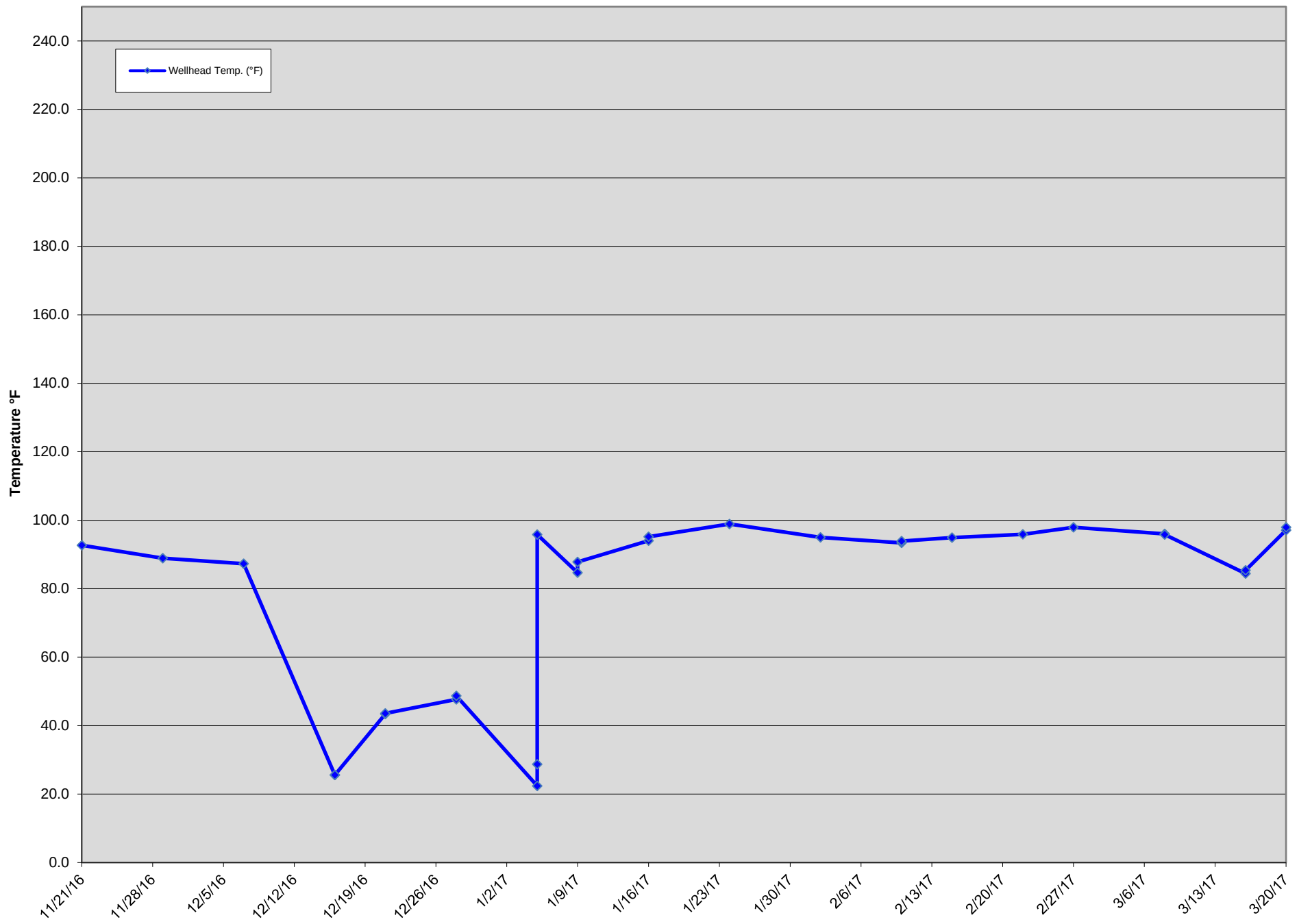
GEW-039 Wellhead Temperatures



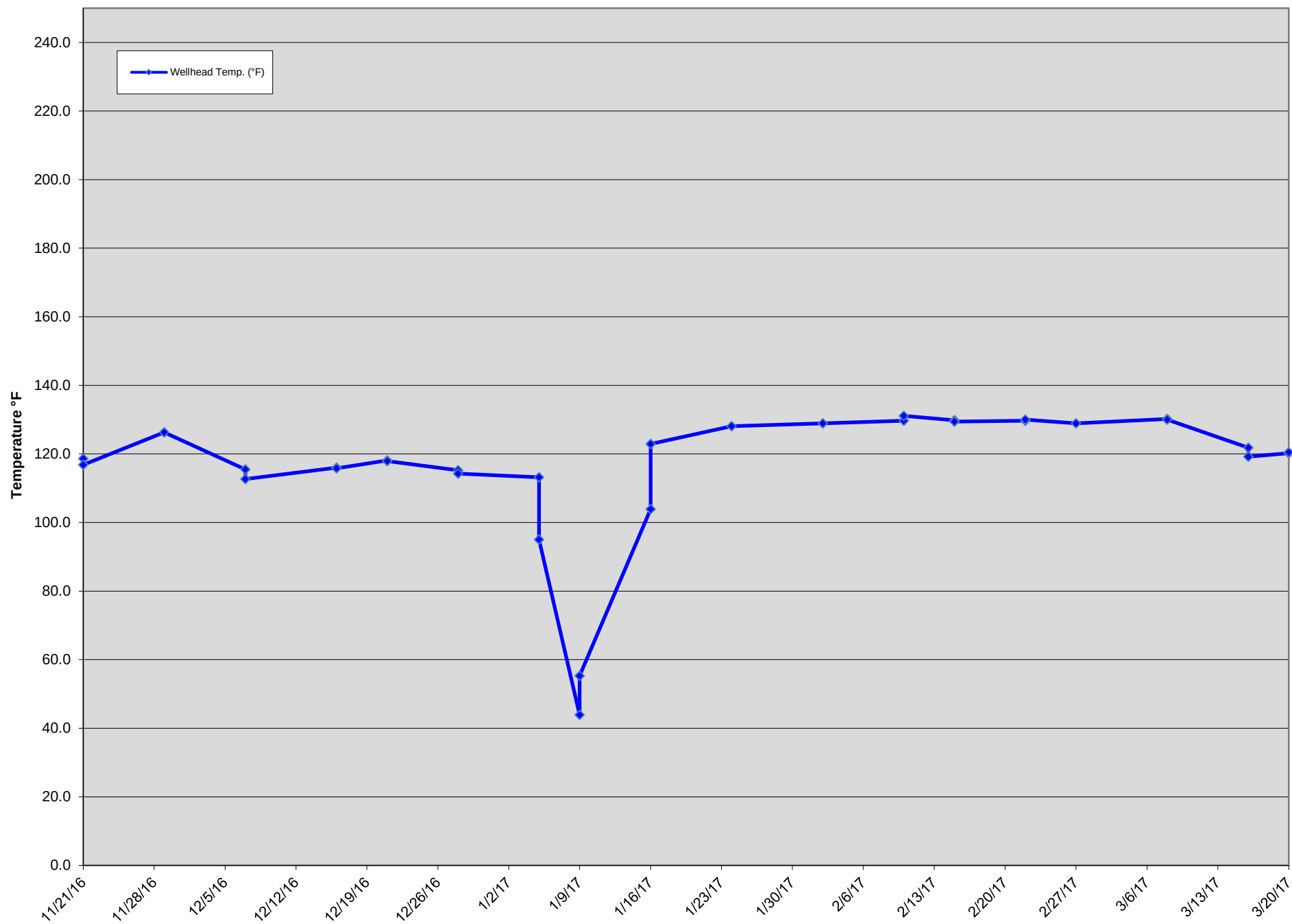
GEW-040 Wellhead Temperatures



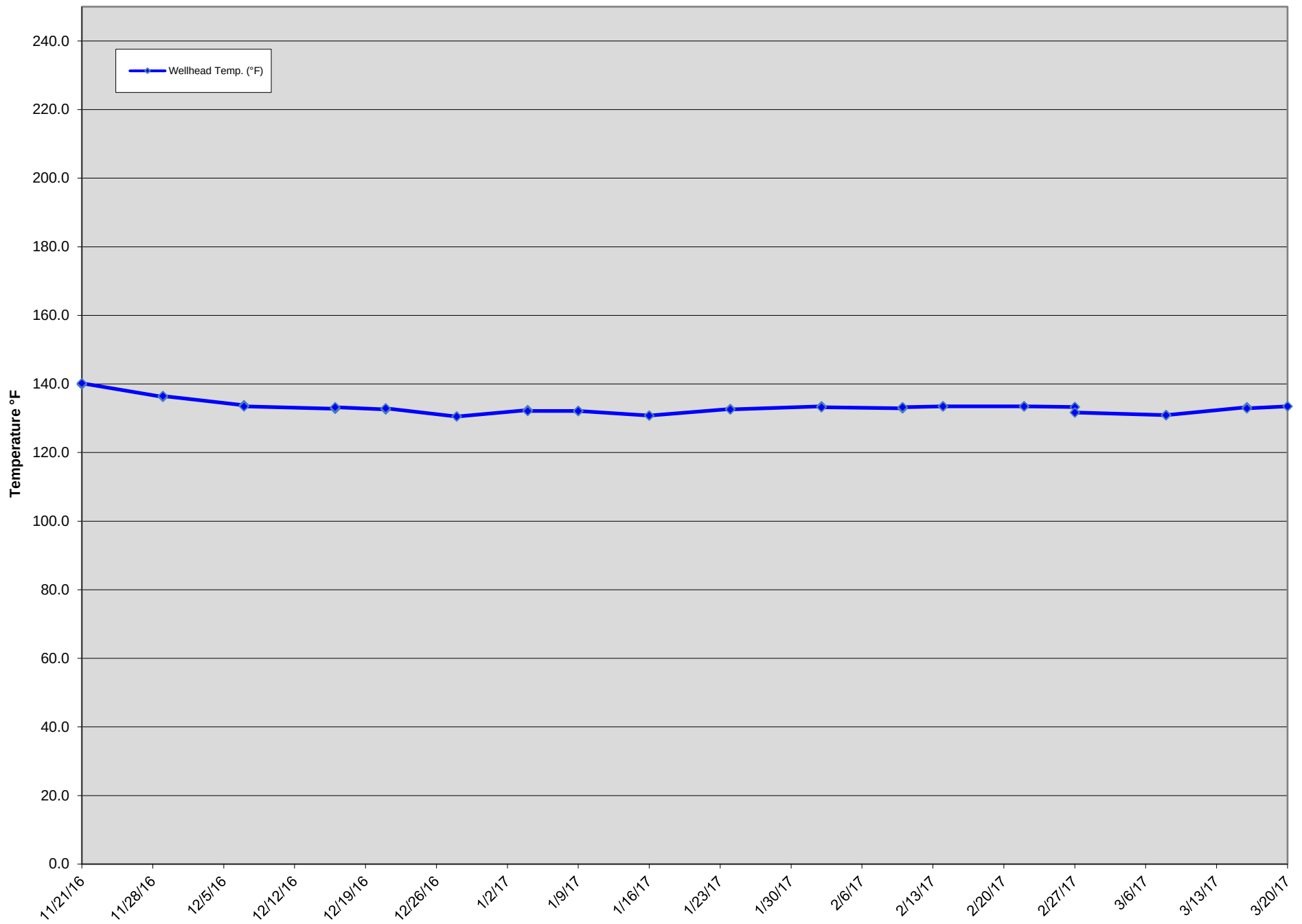
GEW-041R Wellhead Temperatures



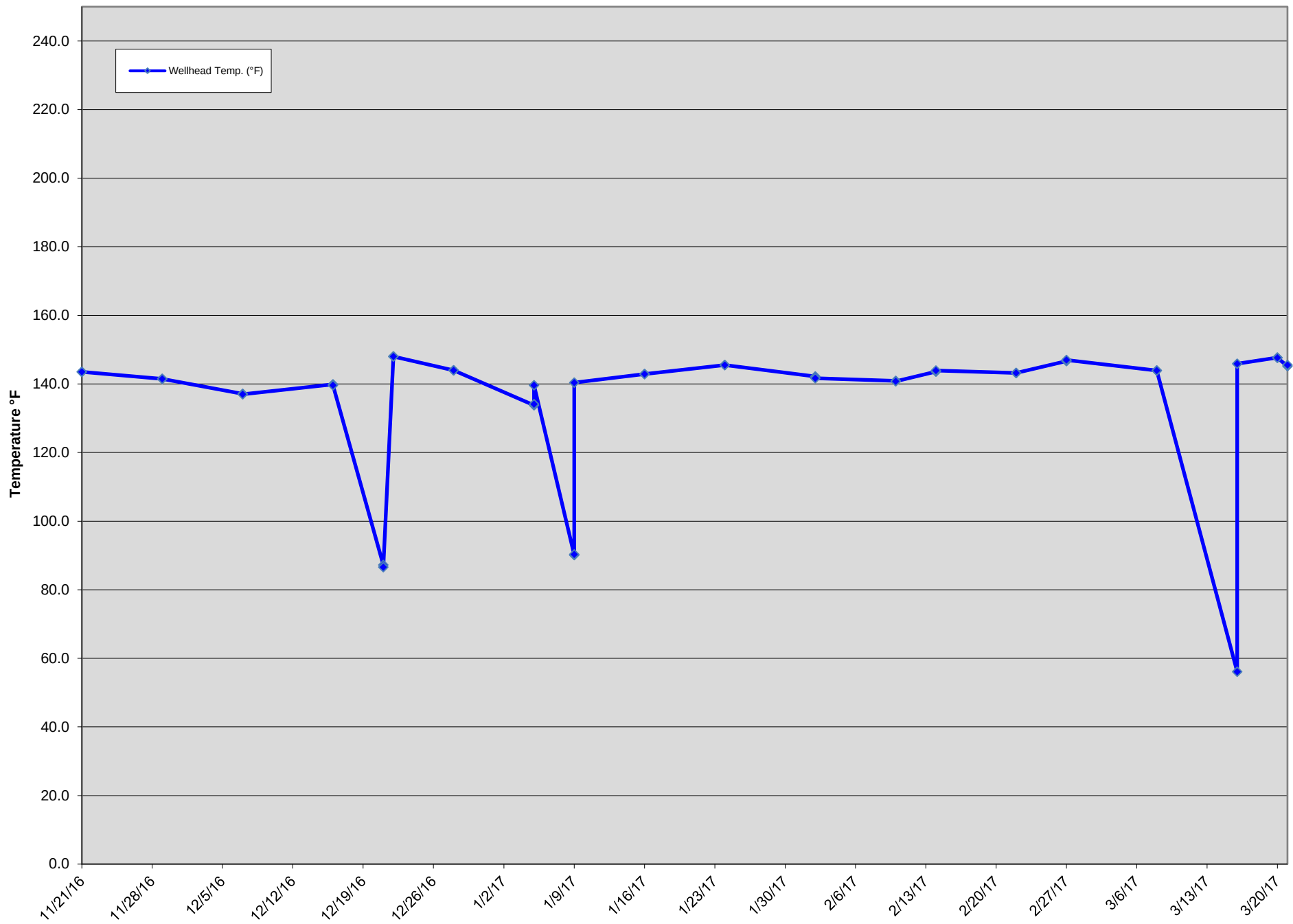
GEW-043R Wellhead Temperatures



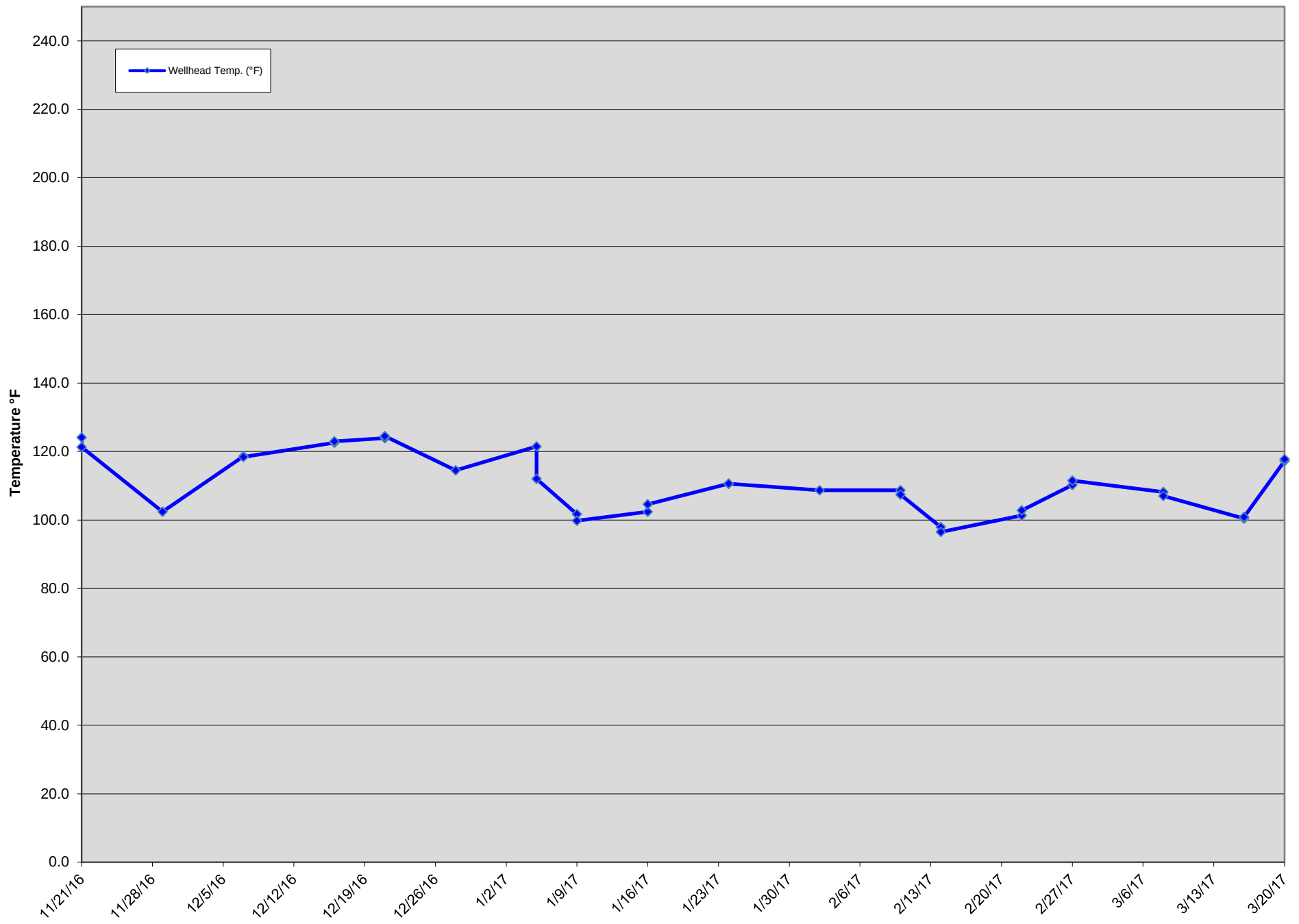
GEW-053 Wellhead Temperatures



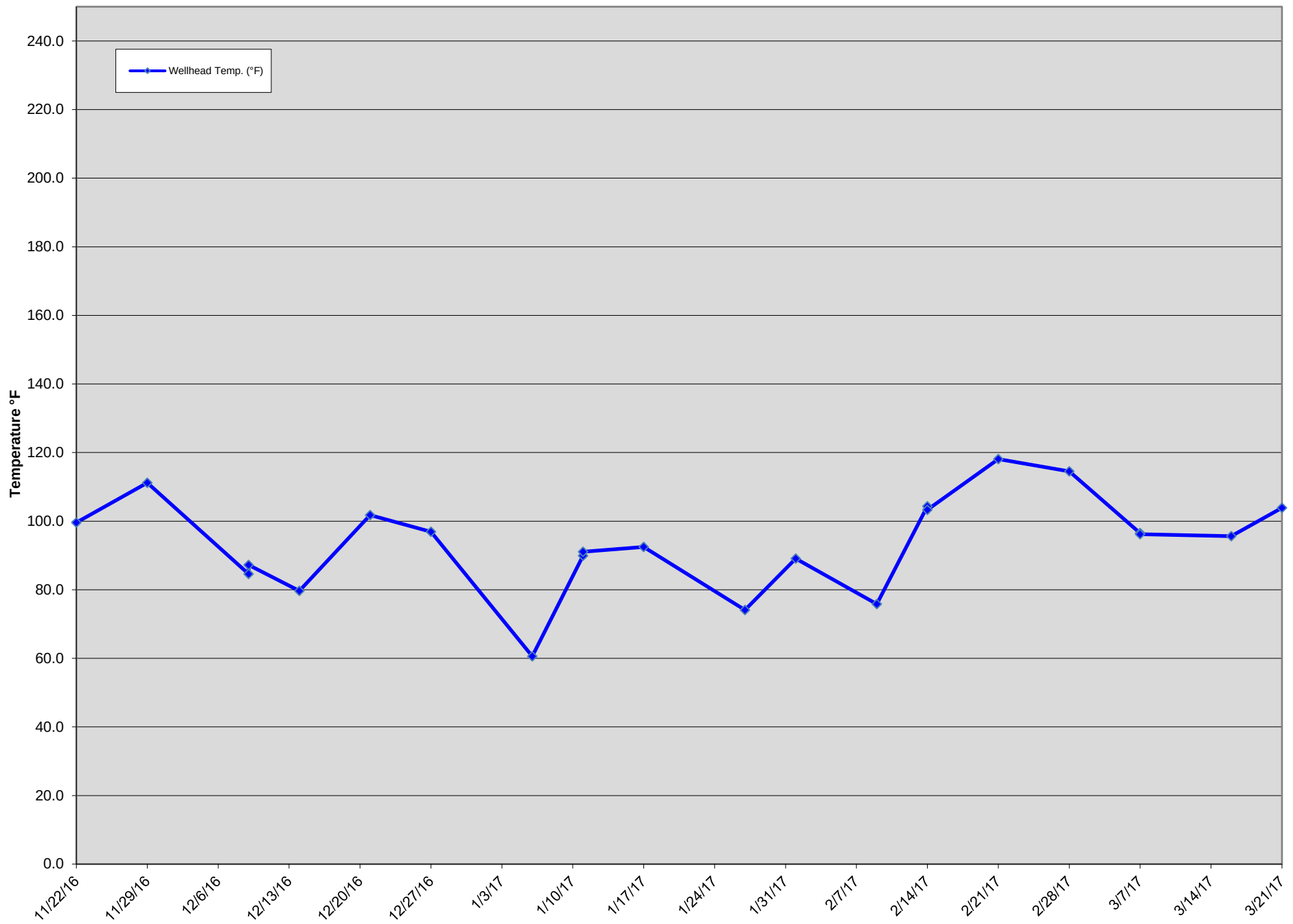
GEW-054 Wellhead Temperatures



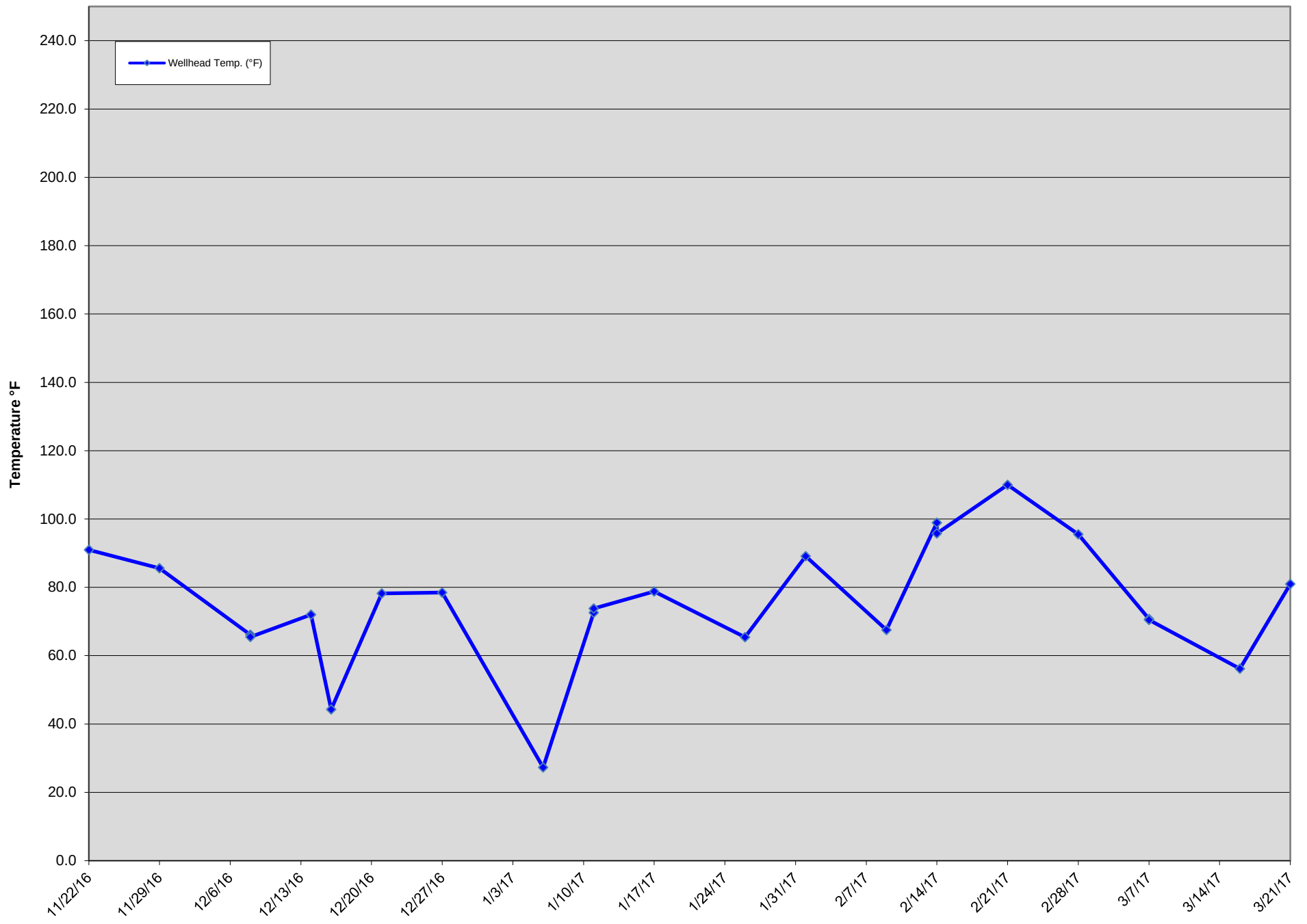
GEW-055 Wellhead Temperatures



GEW-056R Wellhead Temperatures



GEW-109 Wellhead Temperatures



GEW-110 Wellhead Temperatures

