

Tank 5 Quarterly Release Response Report Red Hill Bulk Fuel Storage Facility JBPHH, Oahu, Hawaii

DOH Facility ID No. 9-102271
DOH Release ID No. 140010

April 2019

Prepared by:



Commander
Navy Region Hawaii
Environmental Department, Code N45
850 Ticonderoga Street, Suite 110
JBPHH, Hawaii 96860-5101

Table of Contents

<i>Table of Contents</i>	i
<i>Executive Summary</i>	iii
<i>1.0 Introduction</i>	1
1.1 Statement of Purpose.....	1
1.2 Previous Reports	1
<i>2.0 Background</i>	2
2.1 Site Description.....	2
2.2 Facility Information.....	3
<i>3.0 Groundwater and Soil Vapor Monitoring</i>	3
3.1 Oil/Water Interface Measurements	3
3.2 Soil Vapor Monitoring	4
3.3 Groundwater Sampling and Analysis.....	4
3.4 Drinking Water Sampling	4
<i>4.0 Continued Groundwater and Soil Vapor Monitoring</i>	5
<i>5.0 Continued Drinking Water Sampling</i>	5
<i>6.0 Planned Future Release Response Actions</i>	5
<i>7.0 Public Notifications</i>	6
<i>8.0 Conclusions and Recommendations</i>	6
<i>9.0 References</i>	7

Appendix A – Oil/Water Interface Measurements, January 2014 through January 2019

Appendix B – Soil Vapor Sampling Results through February 2019

Appendix C – Red Hill Drinking Water Shaft Sampling

Appendix D – Public Notifications

This page intentionally left blank

Executive Summary

Navy Region Hawaii (NRH) prepared this Quarterly Release Response Report in accordance with the State of Hawaii Department of Health (DOH) Underground Storage Tank (UST) Technical Guidance Manual (DOH, 2000) and in response to the DOH release response letters dated February 12, 2014 and February 26, 2014 for the Red Hill Bulk Fuel Storage Facility (Facility). The objective of this report is to describe the actions taken by the Navy between January and March 2019 in response to the fuel reportedly released from Tank 5 in January 2014.

Soil vapor and groundwater samples continue to be collected from locations inside the Red Hill tunnel system. Groundwater samples are also collected from locations outside the Red Hill tunnel system. Laboratory analytical results continue to indicate the drinking water at Red Hill is in compliance with all Federal and State regulations and safe for human consumption.

The Navy continues to perform work to ensure the drinking water around the Facility remains safe. Future release response actions include determining the feasibility of alternatives for investigating and remediating releases from the Facility and continuing efforts to monitor and characterize the flow of groundwater around the Facility.

This page intentionally left blank

1.0 Introduction

As required by Hawaii Administrative Rules 11-280.1-65.2, Release Response Reporting, this Quarterly Release Response Report presents the following information:

- 1) All release response actions taken pursuant to subchapter 6 after the last reported date;
- 2) A plan for future release response actions to be taken; and
- 3) Information required pursuant to section 11-280.1-65.1.

This report presents a summary of the release response activities performed January 1 through March 31, 2018 at the Red Hill Bulk Fuel Storage Facility (hereinafter referred to as “the Facility”) located at Joint Base Pearl Harbor-Hickam (JBPHH), Oahu, Hawaii.

1.1 Statement of Purpose

Release response actions were performed to address a fuel release observed in Tank 5.

1.2 Previous Reports

The following documents were previously submitted to DOH:

- Release confirmation information for Tank 5 as Navy Region Hawaii (NRH) letter 5090 Ser N45/044 dated January 23, 2014
- Initial Release Response Report, enclosed with NRH letter 5090 Ser N45/320 dated April 24, 2014
- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/563 dated July 22, 2014
- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/929 dated November 10, 2014
- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/121 dated January 21, 2015
- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/322 dated April 20, 2015
- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/573 dated July 17, 2015
- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/812 dated October 16, 2015
- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/0411 dated January 13, 2016
- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/0508 dated April 13, 2016

-
- Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/0583 dated July 28, 2016
 - Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/0658 dated October 24, 2016
 - Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/0422 dated January 27, 2017
 - Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/0489 dated April 24, 2017
 - Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/0552 dated July 24, 2017
 - Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/0627 dated October 23, 2017
 - Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/0410 dated January 19, 2018
 - Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/0492 dated April 19, 2018
 - Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/0553 dated July 18, 2018
 - Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/0630 dated October 16, 2018
 - Quarterly Release Response Report enclosed with NRH letter 5090 Ser N45/0403 dated January 11, 2019

2.0 Background

The following sections provide a description of the site and information on the Facility.

2.1 Site Description

The Facility is located on federal government land (zoned a mix of F1- Military and Federal and P-1 Restricted Preservation districts) in south-central Oahu, approximately 2.5 miles northeast of Pearl Harbor. It is located on a low ridge on the western edge of the Koolau Mountain Range that divides Halawa Valley from Moanalua Valley. The Facility occupies 144 acres of land and the majority of the ground surface of the site lies at an elevation of approximately 200 to 500 feet above mean sea level (msl) (AECOM Technical Services, Inc., 2018).

The Facility is bordered on the southwest by residential neighborhoods and the United States (U.S.) Coast Guard reservation, on the southeast by residential neighborhoods in Moanalua Valley, and on the northeast by preservation land. The Facility is bordered on the north by

Halawa Correctional Facility and Halawa Industrial Park, which includes private businesses and a former bus facility. A quarry is located less than a quarter mile away to the northwest.

2.2 Facility Information

The Facility contains eighteen (18) active and two (2) inactive bulk fuel field-constructed underground storage tanks (USTs), which are operated by Naval Supply Systems Command (NAVSUP) Fleet Logistics Center (FLC) Pearl Harbor (formerly Fleet and Industrial Supply Center). The Facility was constructed by the U.S. Government in the early 1940s. Twenty (20) USTs and a series of tunnels were constructed to supply fuel to the Navy. Each UST has a capacity of approximately 12.5 million gallons. The Facility is located approximately 100 feet above the basal aquifer. The USTs currently contain Jet Fuel Propellant No. 5 (JP-5), North Atlantic Treaty Organization (NATO)-grade F-24 jet fuel, or Marine Diesel Fuel (F-76). Tank 5 was used to store Jet Fuel Propellant No. 8 (JP-8).

Four (4) groundwater monitoring wells (wells RHMW01, RHMW02, RHMW03, and RHMW05) are located within the lower access tunnel, and one (1) sampling point (RHMW2254-01) is located at Red Hill Shaft. Sampling point RHMW2254-01 is located inside the infiltration gallery of the Department of the Navy (Navy) Supply Well 2254-01.

Nine (9) groundwater monitoring wells (RHMW04, RHMW06, RHMW07, RHMW08, RHMW09, RHMW10, RHMW11, OWDFMW01, and HDMW2253-03) are located outside of the Facility tunnel system. Well OWDFMW01 is located at the former Oily Waste Disposal Facility, near Adit 3, and wells RHMW11 and HDMW2253-03 are located at the Halawa Correctional Facility (outside the Red Hill Facility).

3.0 Groundwater and Soil Vapor Monitoring

The following sections describe activities that were performed to monitor the groundwater and soil vapor beneath Tank 5 from January 1 through March 31, 2019.

3.1 Oil/Water Interface Measurements

The water level was gauged and measured for the presence of light non-aqueous phase liquids (LNAPLs) using an interface meter. The interface meter was lowered into the groundwater monitoring wells located within the lower access tunnel to determine the depth of water to the nearest 0.01 foot, and the existence of any immiscible layers (LNAPL).

Oil/water interface measurements were taken at groundwater monitoring wells RHMW01, RHMW02, RHMW03, and RHMW05 in January 2019. No LNAPL was observed. Following the oil/water interface measurements, transducers were installed in the monitoring wells for a synoptic water level survey. No oil/water interface measurements were taken in February and March due to the presence of the transducers.

A summary of interface measurements from January 2014 through January 2019 is presented in Appendix A.

3.2 Soil Vapor Monitoring

Soil vapor samples were collected and analyzed in the field for volatile organic compound (VOC) concentrations using a photo-ionization detector (PID). Soil vapor monitoring points (SVMPs) were given a SV prefix, followed by the associated tank number, and then the location under the tank: “S” for shallow or front of the UST, “M” for mid depth or middle of the UST, and “D” for deep or outer edge of the UST.

A conservative approach to assess the integrity of the associated tank system is to measure if VOC concentrations exceed 280,000 parts per billion by volume (ppbv) in soil vapor monitoring probes beneath tanks containing jet fuels (JP-5 or F-24), or 14,000 ppbv in soil vapor monitoring probes beneath tanks containing marine diesel fuel (F-76) (TEC, 2010). These values are 50 percent of the calculated vapor concentration from fuel-saturated water.

Soil vapor monitoring was performed at all active and accessible tanks in January, February, and March 2019. Soil vapor VOC concentrations at Tank 5 were below the action level of 280,000 ppbv during all three monitoring events. During the same monitoring events, soil vapor VOC concentrations at all other active and accessible tanks were below the action levels, with no consistent trending.

Soil vapor sampling results from January 2014 through February 2019 are presented in Appendix B. The results for March 2019 are being reviewed and will be submitted under separate cover.

3.3 Groundwater Sampling and Analysis

Groundwater samples were collected from 13 conventional monitoring locations and 1 multilevel monitoring location within the Red Hill groundwater monitoring network in January 2019. Groundwater samples were collected from sampling point RHMW2254-01 located at Red Hill Shaft, 11 monitoring wells within the Facility boundary (wells RHMW01 through RHMW10 and OWDFMW01), and the Halawa Deep Monitor Well (HDMW2253-03) located outside of the Facility. The multilevel monitoring location, RHMW11, is located outside of the Facility.

A groundwater monitoring report, which summarizes sampling activities and laboratory analytical results, will be submitted under separate cover.

3.4 Drinking Water Sampling

Drinking water samples were collected from the Red Hill Shaft post-treatment regulatory compliance sampling point (360-011, Tap Outside Chlorine Building) on January 23, 2019, March 1, 2019, and March 13, 2019. Samples were analyzed for Lead, JP-8/F-24, and contaminants listed in the Transition Plan.

U.S. Environmental Protection Agency (EPA) Methods 524.2 (VOCs), 525.2 (SVOCs), 8015B (JP-8/F-24 and TPH-o), and 200.8 (Lead) were used and all analyses were conducted by labs certified by the DOH State Laboratories Division.

All test results were below detectable levels. A summary of the drinking water sampling results is provided in Appendix C.

4.0 Continued Groundwater and Soil Vapor Monitoring

Continued monitoring of the groundwater and soil vapor will be conducted as follows:

- Oil/water interface measurements – quarterly
- Soil vapor sampling – monthly
- Groundwater sampling and analysis – quarterly

Monitoring results will be submitted to DOH for each sampling event.

5.0 Continued Drinking Water Sampling

Drinking water sampling will continue on a quarterly schedule in accordance with the approved Transition Plan. Samples will be taken at the entry point to the distribution system (360-011 Tap Outside Chlorine Building) and analyzed using the following analytical methods:

- VOCs – EPA 524.2
- SVOCs – EPA 525.2
- Gas Chromatography for JP-8/F-24 – EPA 8015
- Lead – EPA 200.8

6.0 Planned Future Release Response Actions

The Navy and DLA negotiated with the EPA and DOH (the “Regulatory Agencies”) release response actions that will be pursued. Future release response actions include determining the feasibility of alternatives for investigating and remediating releases from the Facility and continuing efforts to monitor and characterize the flow of groundwater around the Facility. A revised Work Plan/Scope of Work that describes the future release response actions was submitted pursuant to the Red Hill Administrative Order on Consent to the Regulatory Agencies in November 2016. Conditional approval was received from the Regulatory Agencies in December 2016.

The following documents were submitted for regulatory review:

- Monitoring Well Installation Work Plan Addendum No. 1 in January 2017
- Sampling and Analysis Plan in January 2017
- Existing Data Summary and Evaluation Report in March 2017
- Groundwater Flow Model Progress Report 01 in April 2017
- Sampling and Analysis Plan, Revision 01 in April 2017
- Data Gap Analysis Report in April 2017
- Monitoring Well Installation Work Plan Addendum No. 2 in August 2017
- Groundwater Flow Model Progress Report 02 in August 2017
- Groundwater Flow Model Progress Report 03 in December 2017
- Sentinel Well Network Development Plan in December 2017
- Risk Based Decision Criteria Development Plan in December 2017
- Technical Memorandum, Testing and Verification of Packer Integrity at RHMW11 in February 2018
- Seismic Profiling to Map Hydrostratigraphy in the Red Hill Area in March 2018
- Groundwater Flow Model Progress Report No. 4 in April 2018
- Conceptual Site Model Report and Groundwater Protection and Evaluation Considerations Report in July 2018
- Groundwater Flow Model Progress Report No. 5 in August 2018
- Groundwater Flow Model Progress Report No. 6 in December 2018

Approval by the Regulatory Agencies of the documents will guide future release response actions.

7.0 Public Notifications

The Navy provided notifications to the public through the following documents:

- Red Hill Statement of February 25, 2019
- City Council Testimony with US INCOPACOM letter of March 8, 2019
- Hawaii Senate Red Hill Testimony of March 20, 2019

Copies of these documents are included in Appendix D.

8.0 Conclusions and Recommendations

Results of groundwater sampling and analysis and drinking water sampling and analysis indicate the release of JP-8 from Tank 5 has not impacted the Red Hill Shaft.

Additional release response actions have been negotiated with the EPA and DOH to protect the drinking water sources near the Facility.

The next quarterly release response report will be submitted in July 2019 and will cover the release response actions completed between April and June 2019.

9.0 References

AECOM Technical Services, Inc., 2018, Final First Quarter 2018 – Quarterly Groundwater Monitoring Report, Red Hill Bulk Fuel Storage Facility, Prepared for Department of the Navy, Naval Facilities Engineering Command, Hawaii, JBPHH, Hawaii, July 2018.

DOH, 2000, Technical Guidance Manual for Underground Storage Tank Closure and Release Response, Environmental Management Division, Solid and Hazardous Waste Branch, Underground Storage Tank Section, March 2000.

DOH, 2013, Technical Guidance Manual for the Implementation of the Hawaii State Contingency Plan, Office of Hazard Evaluation and Emergency Response, Interim Final, March 2013.

DOH, 2017, Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater, Environmental Management Division, Fall 2017.

Hawaii Administrative Rules, Title 11, Chapter 280.1, Underground Storage Tanks, July 2018.

TEC, 2007, Final Technical Report, Red Hill Bulk Fuel Storage Facility, Prepared for Department of the Navy, Commander Naval Facilities Engineering Command, Pacific, Pearl Harbor, Hawaii, August 2007.

TEC, 2008, Final Groundwater Protection Plan, Red Hill Fuel Storage Facility, prepared for Navy Region Hawaii, Pearl Harbor, Hawaii, January 2008, revised December 2009 and August 2014.

TEC, 2010, Final Soil Vapor Sampling Monitoring Analysis Letter Report, February 1, 2010.

Appendix A
Oil/Water Interface Measurements
January 2014 through January 2019

Red Hill Oil/Water Interface Measurements January 2014 through January 2019

Date	RHMW01			RHMW02			RHMW03			RHMW05		
	Elevation = 102.27 ft ¹			Elevation = 104.76 ft ¹			Elevation = 121.06 ft ¹			Elevation = 101.55 ft ¹		
	DTW (TOC)	SWL	LNAPL	DTW (TOC)	SWL	LNAPL	DTW (TOC)	SWL	LNAPL	DTW (TOC)	SWL	LNAPL
15-Jan-14	83.94	18.33	0	86.62	18.14	0	NT	NT	NT	NT	NT	NT
16-Jan-14	NT	NT	NT	NT	NT	NT	NT	NT	NT	83.09	18.46	0
22-Jan-14	83.53	18.74	0	86.20	18.56	0	NT	NT	NT	82.87	18.68	0
23-Jan-14	83.58	18.69	0	86.24	18.52	0	NT	NT	NT	82.94	18.61	0
24-Jan-14	83.57	18.70	0	86.23	18.53	0	NT	NT	NT	82.93	18.62	0
27-Jan-14	83.55	18.72	0	86.23	18.53	0	NT	NT	NT	82.93	18.62	0
28-Jan-14	83.56	18.71	0	86.25	18.51	0	102.52	18.54	0	82.94	18.61	0
29-Jan-14	83.56	18.71	0	86.22	18.54	0	NT	NT	NT	82.94	18.61	0
30-Jan-14	83.53	18.74	0	86.21	18.55	0	NT	NT	NT	82.93	18.62	0
31-Jan-14	83.53	18.74	0	86.19	18.57	0	NT	NT	NT	82.88	18.67	0
3-Feb-14	83.54	18.73	0	86.20	18.56	0	NT	NT	NT	82.91	18.64	0
4-Feb-14	83.54	18.73	0	86.20	18.56	0	NT	NT	NT	82.89	18.66	0
10-Feb-14	84.49	17.78	0	86.16	18.60	0	102.47	18.59	0	82.83	18.72	0
24-Feb-14	83.54	18.73	0	86.24	18.52	0	102.47	18.59	0	82.97	18.58	0
4-Mar-14*	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
13-Mar-14*	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
28-Mar-14	83.76	18.51	0	86.42	18.34	0	102.65	18.41	0	83.18	18.37	0
7-Apr-14*	83.42	18.85	0	86.43	18.33	0	NT	NT	NT	83.21	18.34	0
21-Apr-14	83.93	18.34	0	86.58	18.18	0	102.80	18.26	0	83.27	18.28	0
8-May-14*	84.03	18.24	0	86.68	18.08	0	NT	NT	NT	83.46	18.09	0
22-May-14*	83.81	18.46	0	86.47	18.29	0	NT	NT	NT	83.15	18.40	0
27-May-14	83.91	18.36	0	86.60	18.16	0	102.85	18.21	0	83.31	18.24	0
10-Jun-14*	83.93	18.34	0	86.55	18.21	0	NT	NT	NT	83.34	18.21	0
23-Jun-14	84.06	18.21	0	86.72	18.04	0	103.99	17.07	0	83.54	18.01	0
21-Jul-14	84.13	18.14	0	86.80	17.96	0	102.98	18.08	0	83.49	18.06	0
27-Aug-14	84.01	18.26	0	86.65	18.11	0	102.87	18.19	0	83.04	18.51	0
25-Sep-14	84.64	17.63	0	87.27	17.49	0	103.51	17.55	0	84.10	17.45	0
28-Oct-14	83.79	18.48	0	86.51	18.25	0	102.78	18.28	0	83.21	18.34	0
20-Nov-14	83.87	18.40	0	86.56	18.20	0	102.78	18.28	0	83.35	18.20	0
23-Dec-14	83.67	18.60	0	86.37	18.39	0	102.64	18.42	0	83.05	18.50	0
28-Jan-15	83.63	18.64	0	86.35	18.41	0	102.63	18.43	0	83.03	18.52	0
27-Feb-15	83.68	18.59	0	86.28	18.48	0	102.52	18.54	0	83.06	18.49	0
26-Mar-15	83.83	18.44	0	86.04	18.72	0	102.79	18.27	0	83.24	18.31	0
21-Apr-15	84.33	17.94	0	86.97	17.79	0	103.18	17.88	0	83.72	17.83	0
28-May-15	84.29	17.98	0	86.97	17.79	0	103.24	17.82	0	83.95	17.60	0
25-Jun-15	84.58	17.69	0	87.28	17.48	0	103.57	17.49	0	83.75	17.80	0
21-Jul-15	84.58	17.69	0	87.24	17.52	0	103.44	17.62	0	83.76	17.79	0
27-Aug-15	84.44	17.83	0	87.13	17.63	0	103.41	17.65	0	83.69	17.86	0
23-Sep-15	84.26	18.01	0	86.91	17.85	0	103.21	17.85	0	83.63	17.92	0
20-Oct-15	84.00	18.27	0	86.38	18.38	0	103.38	17.68	0	Obstructed	NT	NT
18-Nov-15	84.25	18.02	0	86.93	17.83	0	103.24	17.82	0	84.62 ²	16.93	0
17-Dec-15	83.76	18.51	0	86.36	18.40	0	102.56	18.50	0	83.18	18.37	0
20-Jan-16	83.31	18.96	0	85.97	18.79	0	102.21	18.85	0	Obstructed	NT	NT
17-Feb-16	83.17	19.10	0	85.81	18.95	0	102.10	18.96	0	Obstructed	NT	NT
15-Mar-16	82.89	19.38	0	85.60	19.16	0	101.82	19.24	0	82.26	19.29	0
20-Apr-16	82.97	19.30	0	85.63	19.13	0	101.91	19.15	0	82.31	19.24	0
23-May-16	83.14	19.13	0	85.81	18.95	0	102.03	19.03	0	82.50	19.05	0
21-Jun-16	83.16	19.11	0	85.77	18.99	0	10.03	111.03	0	82.54	19.01	0
20-Jul-16	83.32	18.95	0	85.99	18.77	0	102.31	18.75	0	82.63	18.92	0
23-Aug-16	83.27	19.00	0	85.96	18.80	0	102.20	18.86	0	82.63	18.92	0
21-Sep-16	83.13	19.14	0	85.74	19.02	0	102.06	19.00	0	82.44	19.11	0
19-Oct-16	83.01	19.26	0	85.69	19.07	0	101.95	19.11	0	82.39	19.16	0
17-Nov-16	82.92	19.35	0	85.56	19.20	0	101.82	19.24	0	82.24	19.31	0
20-Dec-16	82.67	19.60	0	85.36	19.40	0	101.61	19.45	0	82.01	19.54	0
31-Jan-17	82.45	19.82	0	85.13	19.63	0	101.46	19.60	0	82.04	19.51	0
22-Feb-17	82.37	19.90	0	85.01	19.75	0	101.31	19.75	0	81.72	19.83	0
24-Mar-17	82.49	19.78	0	85.19	19.57	0	101.45	19.61	0	81.84	19.71	0
20-Apr-17	82.59	19.68	0	85.25	19.51	0	101.5	19.56	0	81.94	19.61	0
26-May-17	82.45	19.82	0	85.13	19.63	0	101.39	19.67	0	81.80	19.75	0
22-Jun-17	82.94	19.33	0	85.59	19.17	0	101.89	16.17	0	82.30	19.25	0
21-Jul-17	83.43	18.84	0	86.5	18.26	0	Transducer Installed	NT	NT	82.81	18.74	0
20-Mar-18	83.56	18.71	0	86.24	18.52	0	102.55	18.51	0	82.89	18.66	0
25-Apr-18	83.47	18.80	0	86.14	18.62	0	102.38	15.68	0	82.86	18.69	0
22-May-18	83.61	18.66	0	86.28	18.47	0	102.56	15.68	0	82.86	18.69	0
20-Jun-18	83.63	18.64	0	86.28	18.47	0	102.57	18.49	0	82.99	18.56	0
25-Jul-18	83.55	18.72	0	86.33	18.43	0	102.58	18.48	0	82.90	18.56	0
21-Aug-18	Transducer Installed	NT	NT	86.32	18.44	0	102.58	18.48	0	Transducer Installed	NT	NT
30-Oct-18	82.64	19.63	0	85.34	19.42	0	101.58	19.48	0	81.99	19.56	0
24-Jan-19	82.3	19.97	0	84.96	19.80	0	101.22	19.84	0	81.66	19.89	0

Notes:

1 - Elevations were updated based on the Groundwater Flow Direction/Gradient and Tier 3 Risk Assessment Re-evaluation Letter Report, Red Hill Bulk Fuel Storage Facility, Pearl Harbor, Hawaii, Contract No. N47408-04-D-8514, Task Order 54, dated April 15, 2010.

2 - Dedicated groundwater pump was obstructing the path of the interface meter probe. Depth measured was based on the elevation of water when pump was removed from the monitoring well (RHMW05).

Measurements recorded by Environmental Science International from January 2014 to August 2015, unless otherwise noted.

Measurements recorded by Element Environmental, LLC from September 2015.

* - Measurements recorded by NAVFAC HI.

All units in feet (ft).

DTW (TOC) - depth to water from top of well casing

LNAPL - light non-aqueous phase liquid

NT - measurement not taken

SWL - static water level

Appendix B
Soil Vapor Sampling Results through February 2019

Figure 1
Soil Vapor Measurements
SV02

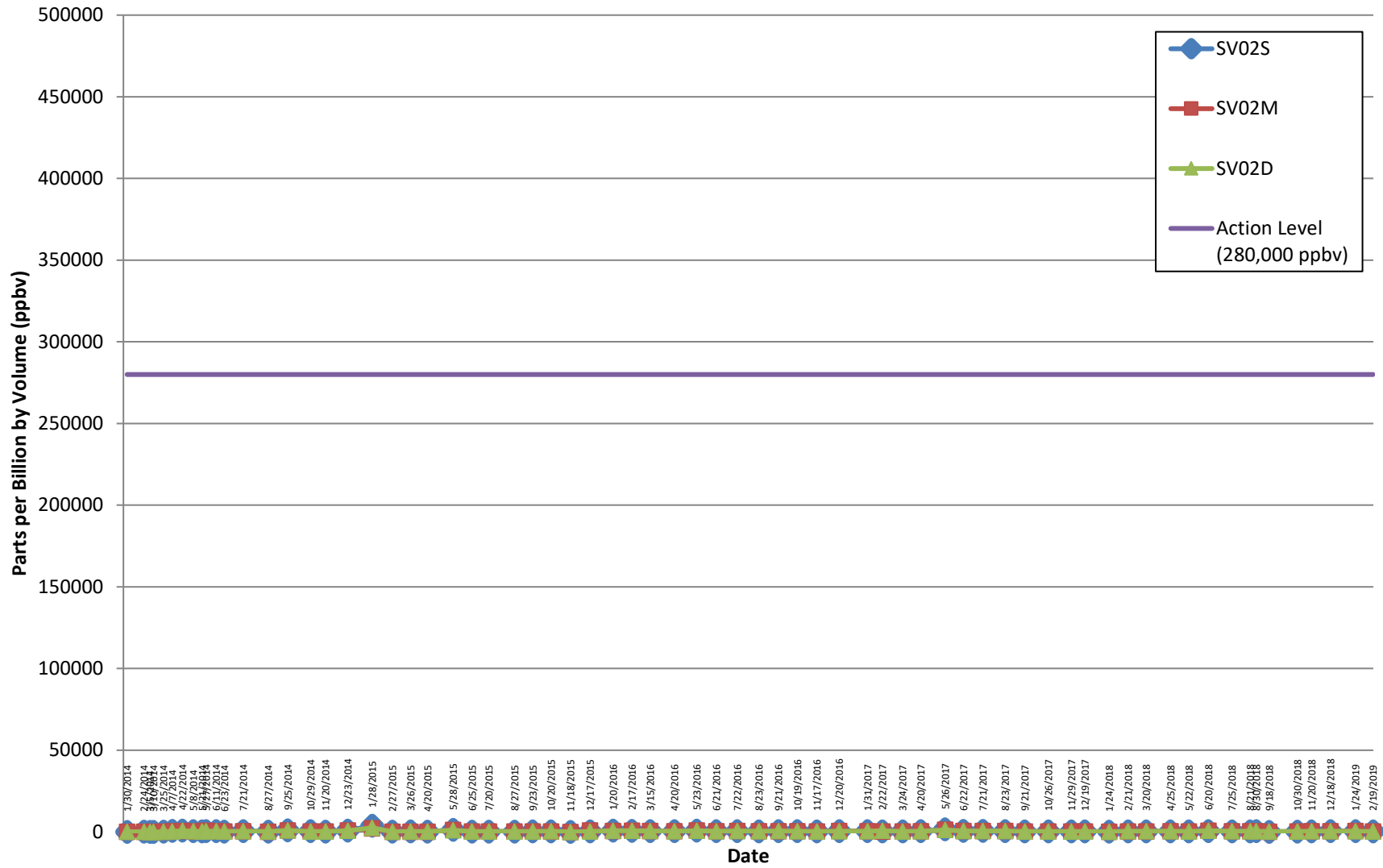


Figure 2
Soil Vapor Measurements
SV03

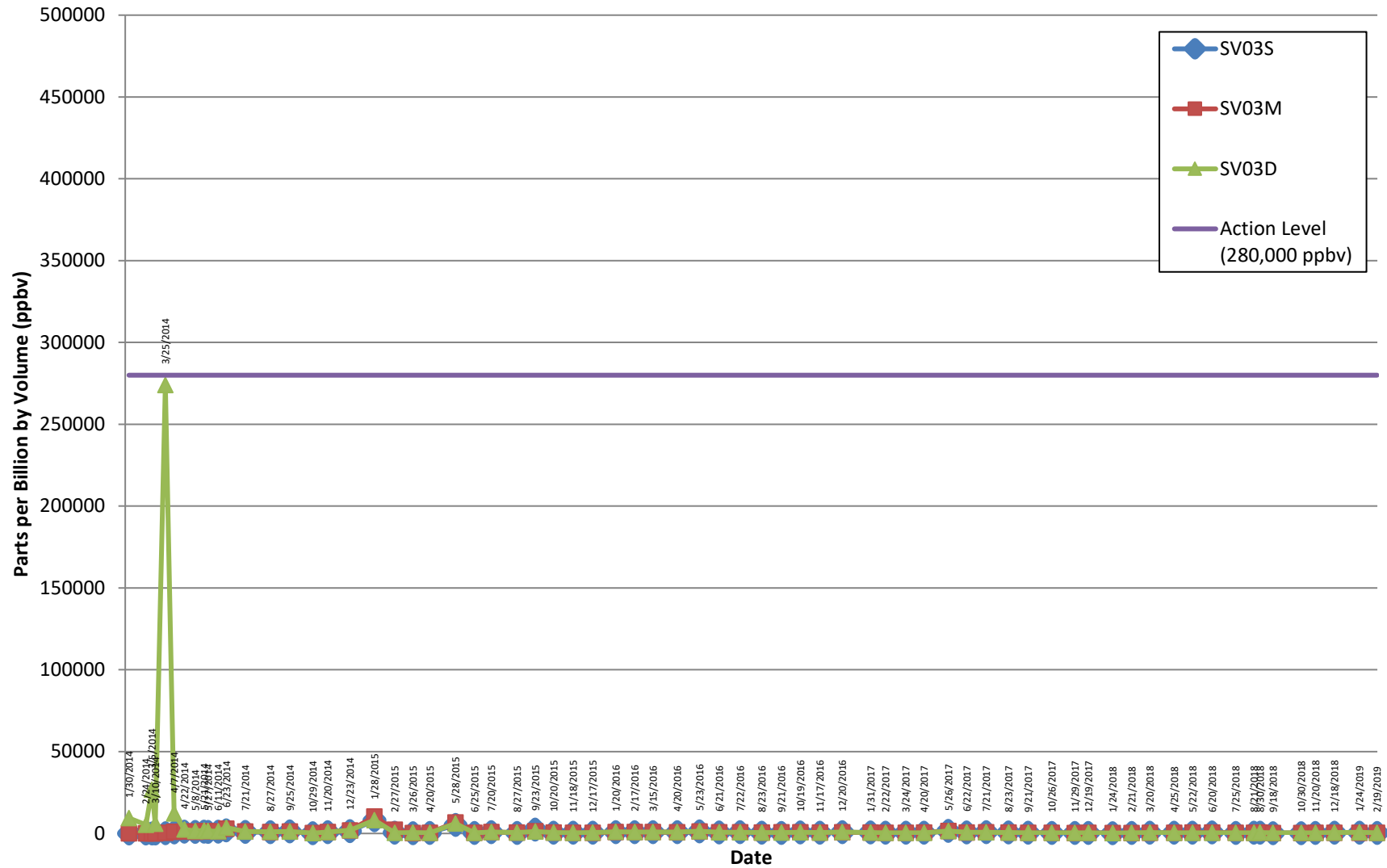


Figure 3
Soil Vapor Measurements
SV04

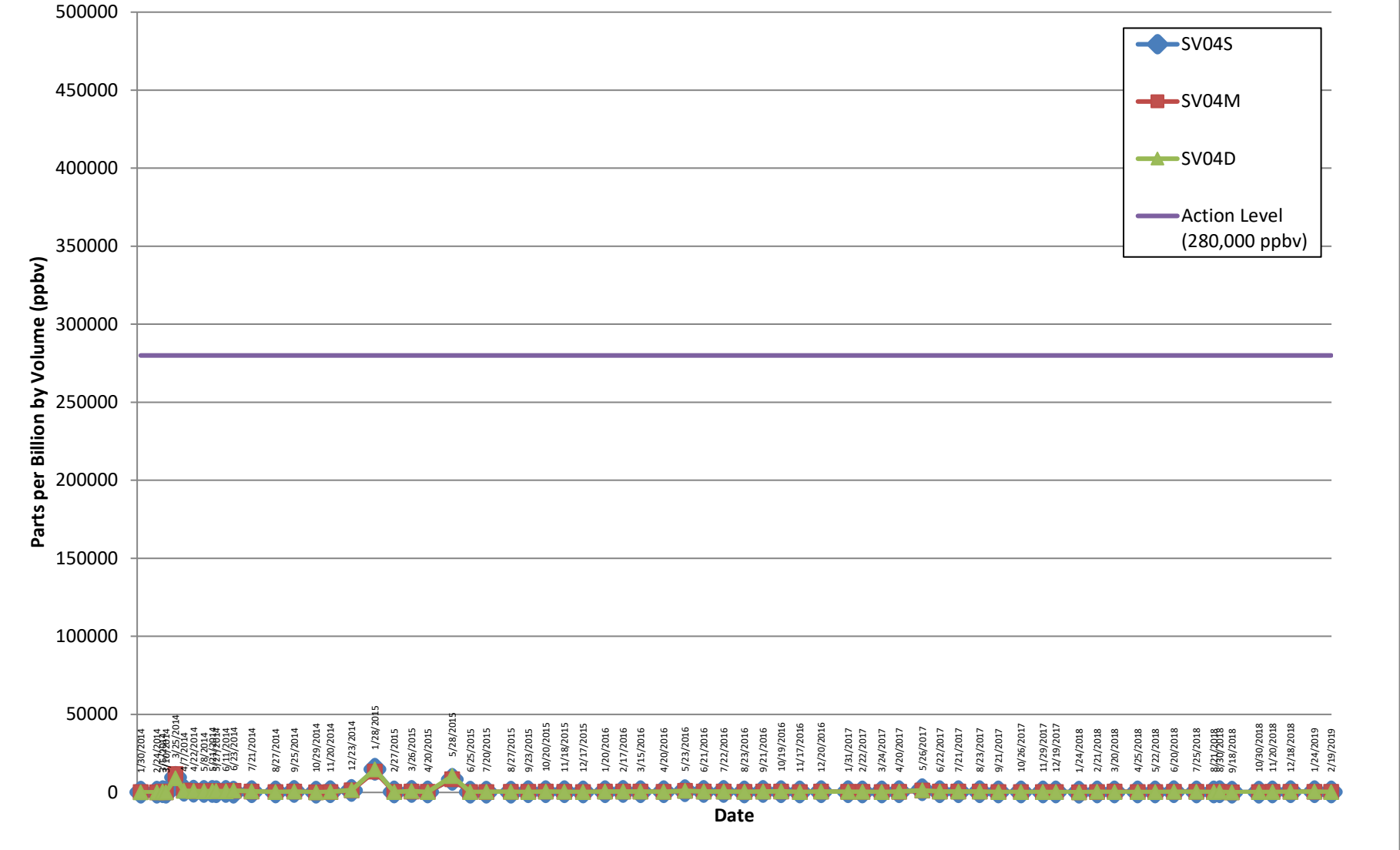


Figure 4 Soil Vapor Measurements SV05

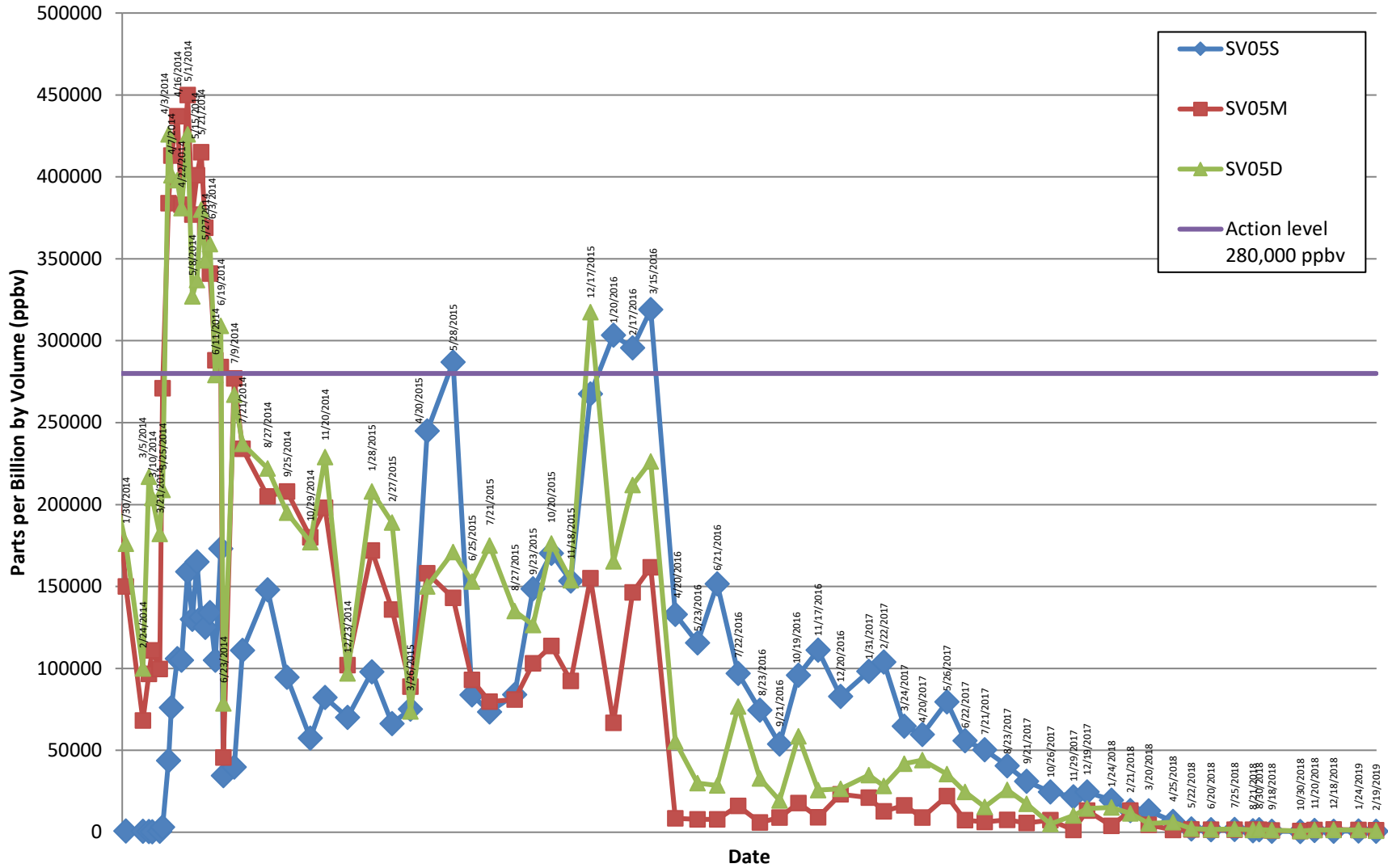


Figure 5
Soil Vapor Measurements
SV06

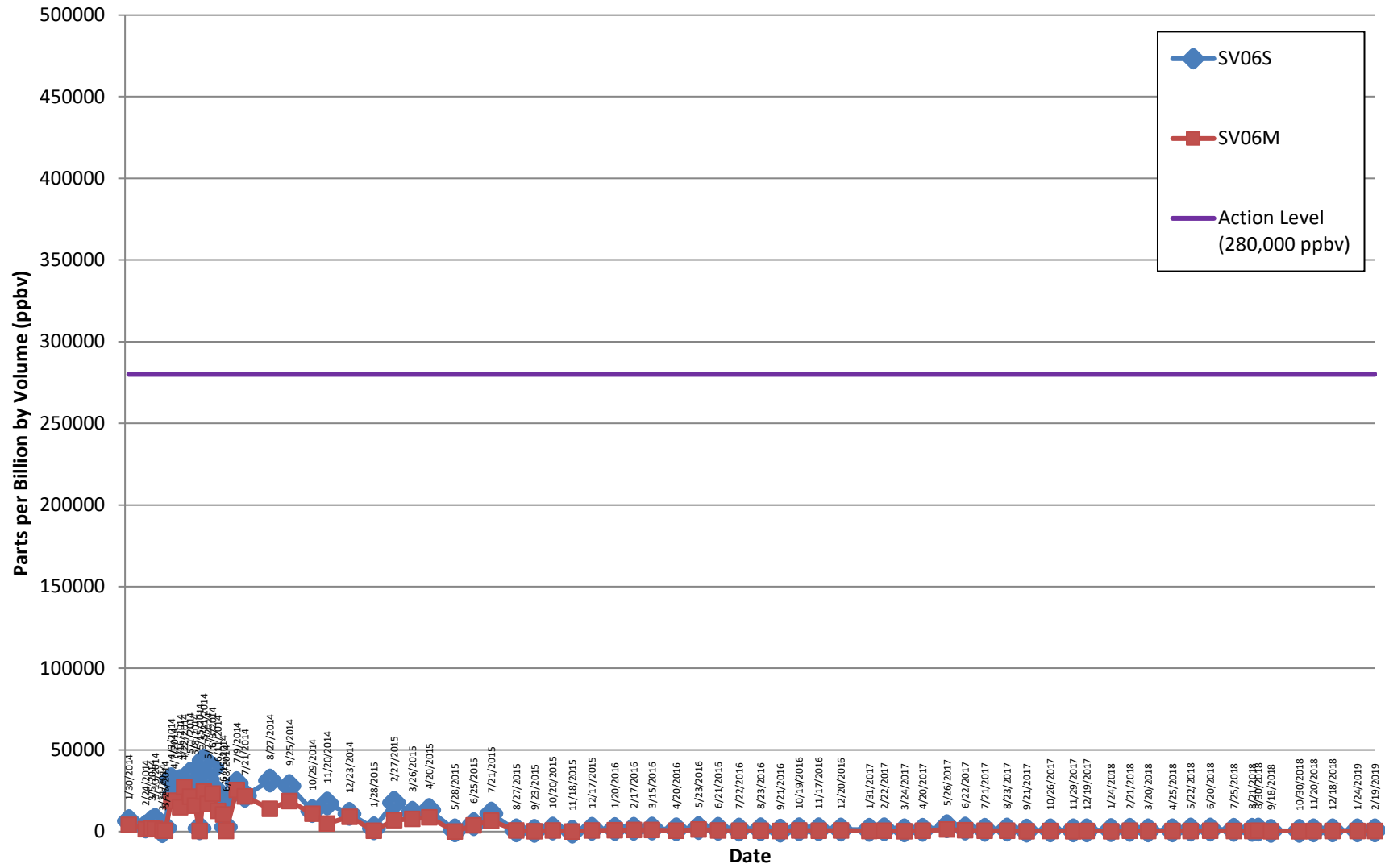


Figure 6
Soil Vapor Measurements
SV07

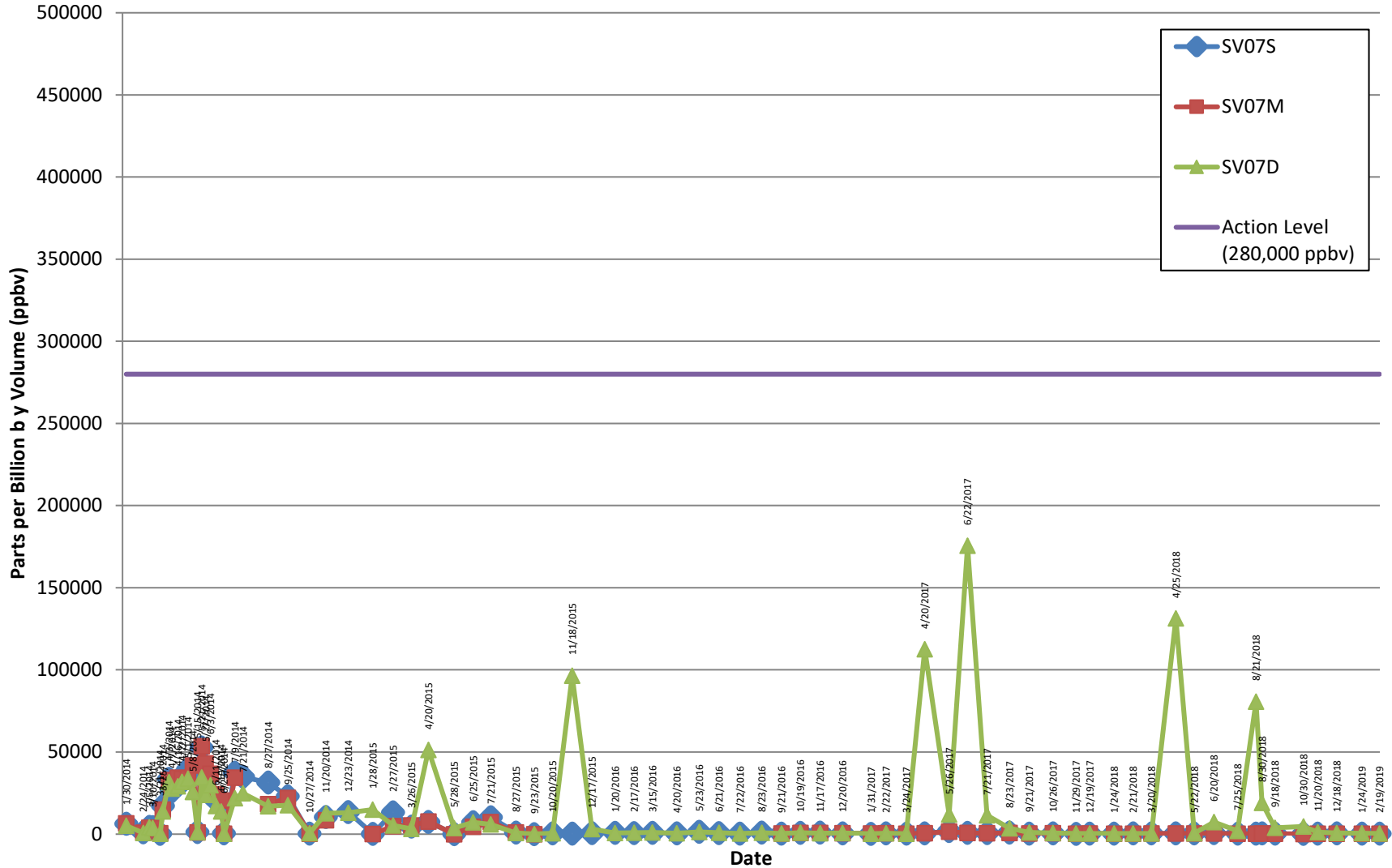


Figure 7
Soil Vapor Measurements
SV08

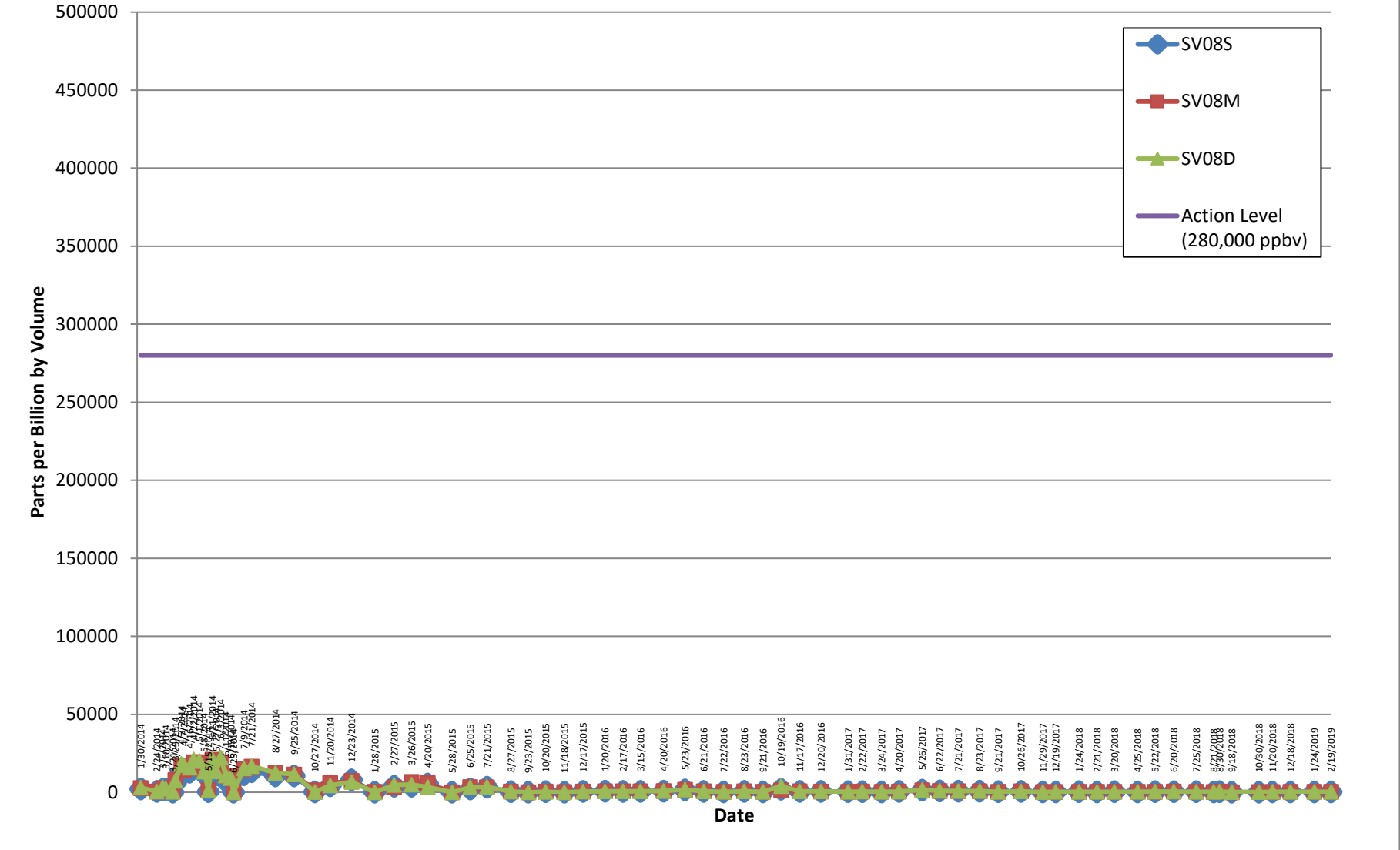


Figure 8
Soil Vapor Measurements
SV09

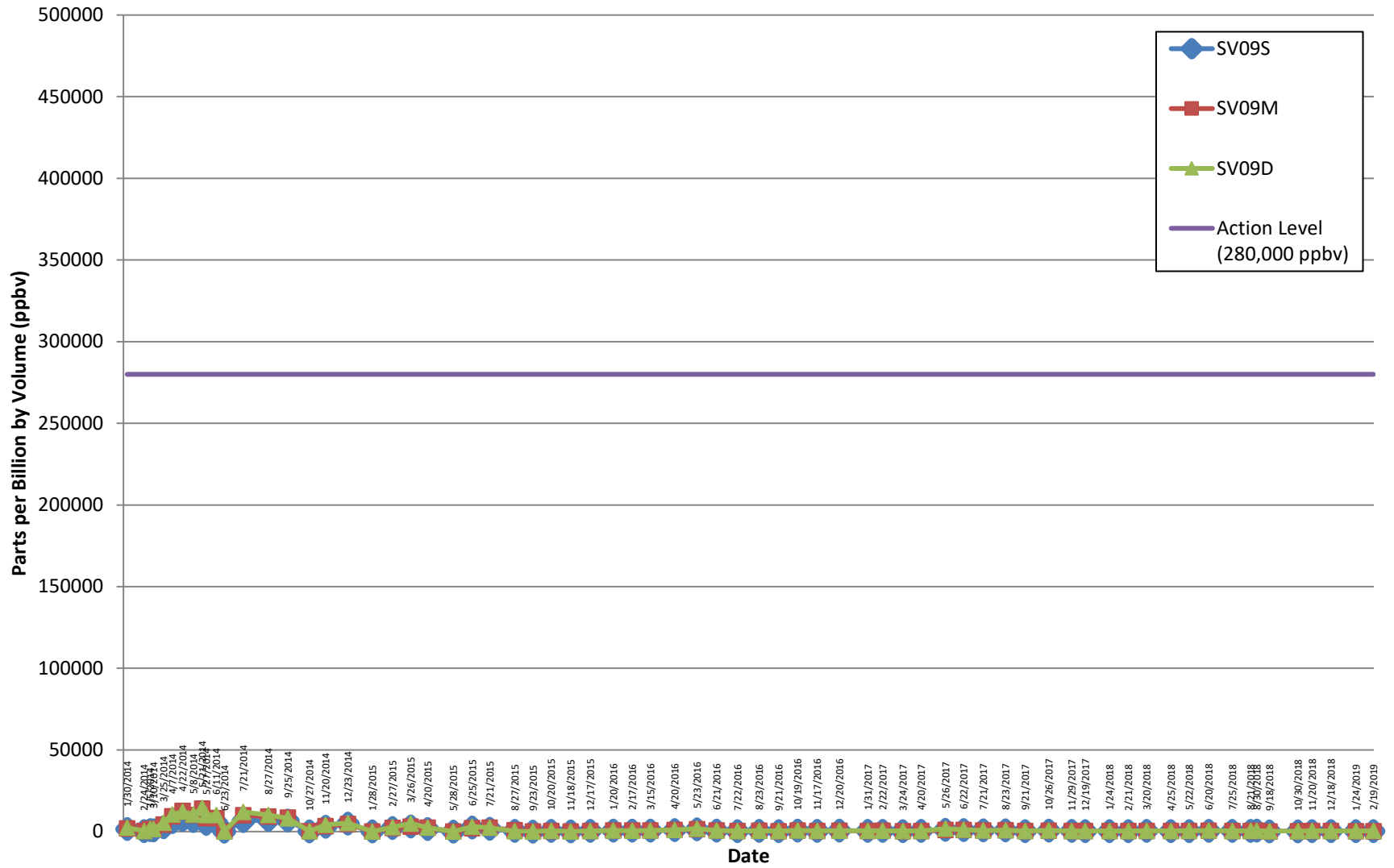


Figure 9 Soil Vapor Measurements SV10

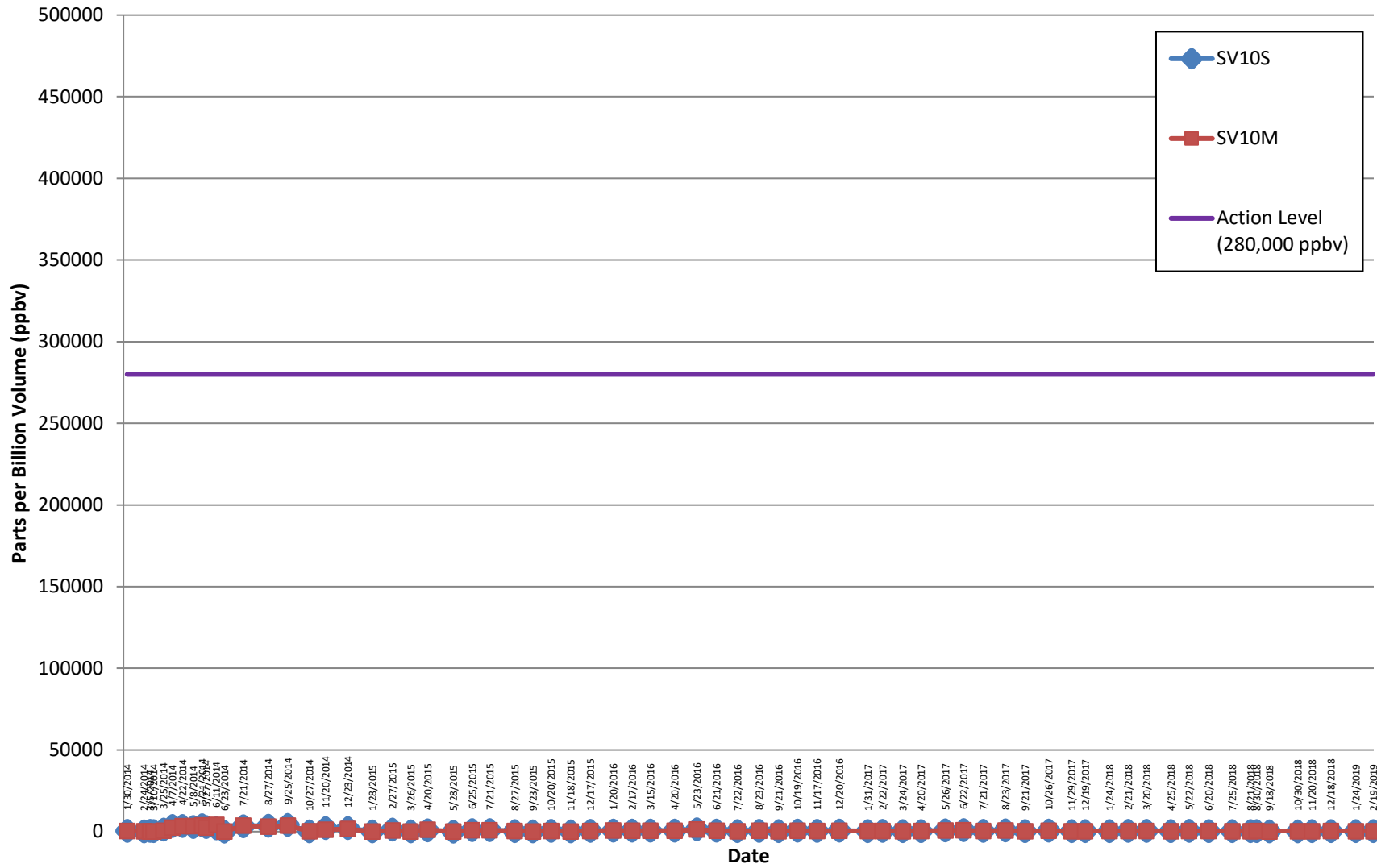


Figure 10
Soil Vapor Measurements
SV11

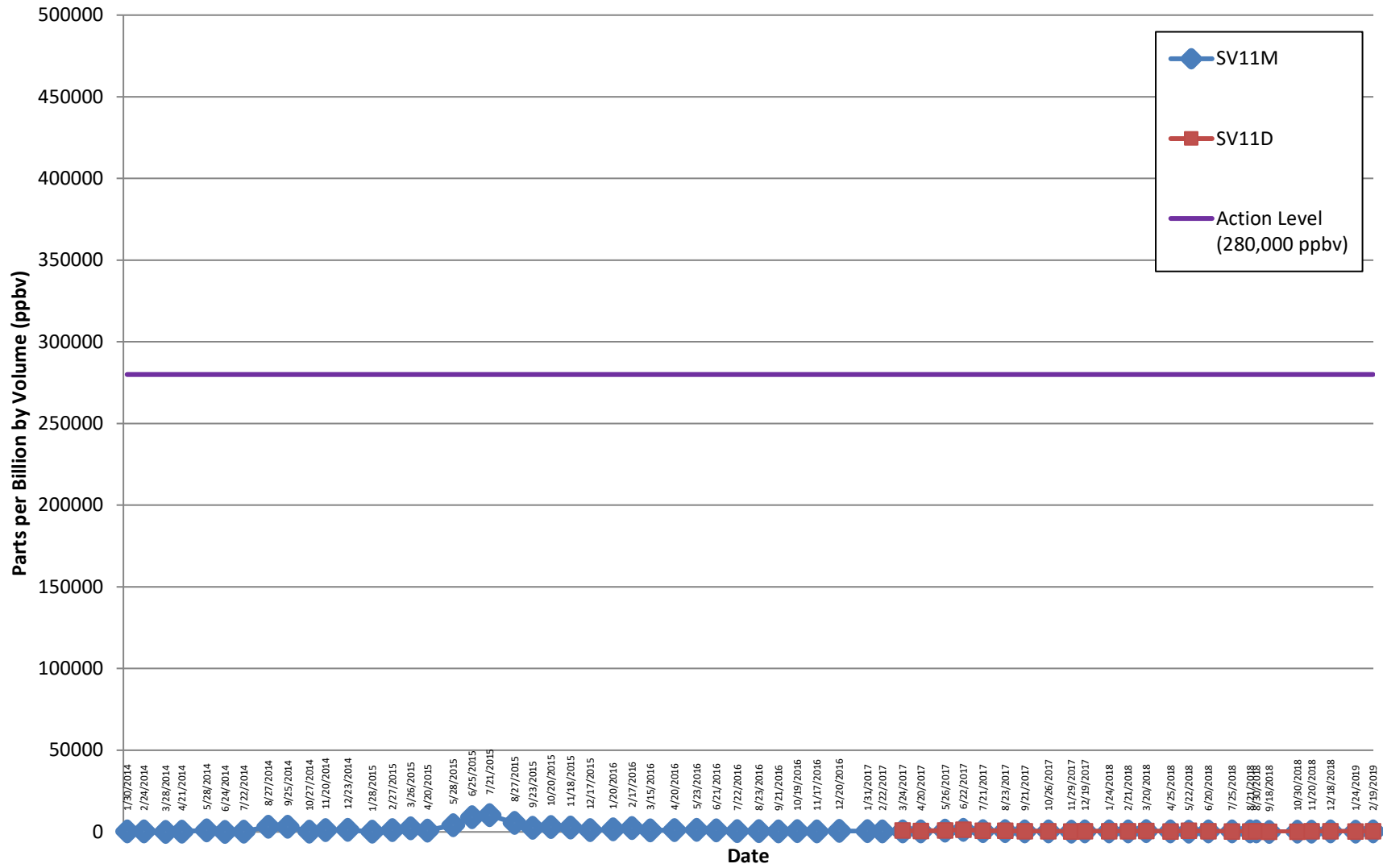


Figure 11
Soil Vapor Measurements
SV12

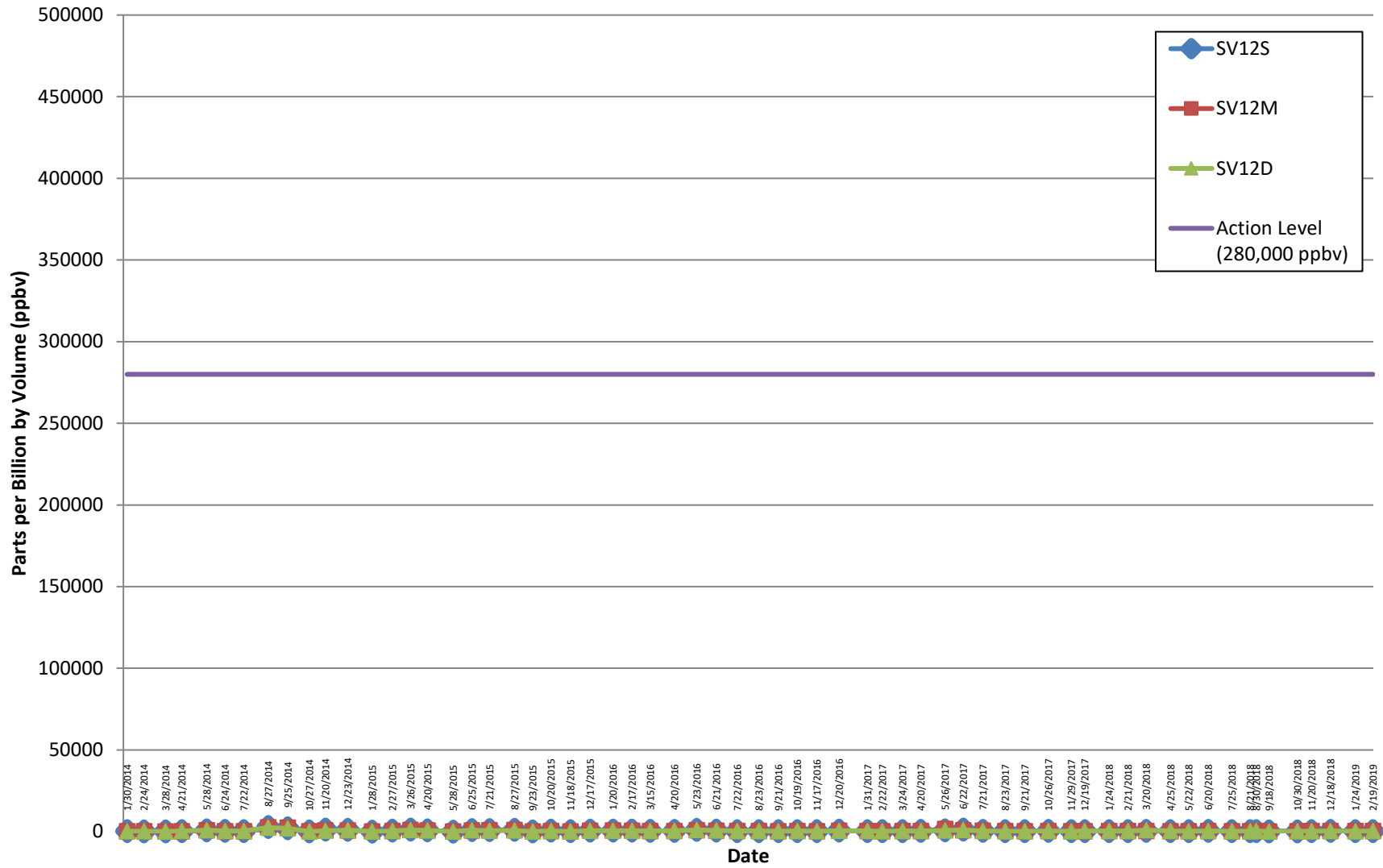


Figure 12
Soil Vapor Measurements
SV13

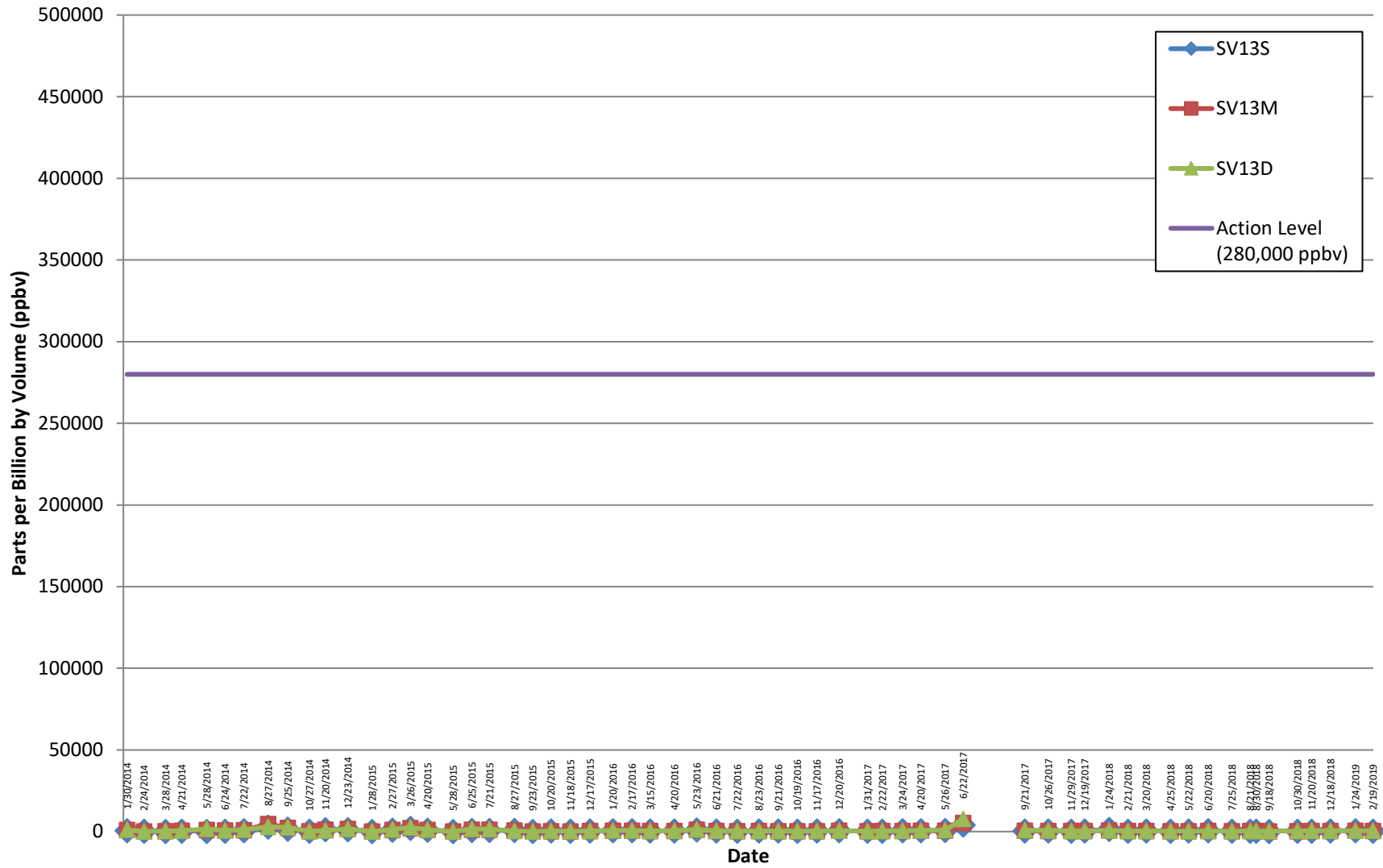


Figure 13
Soil Vapor Measurements
SV14

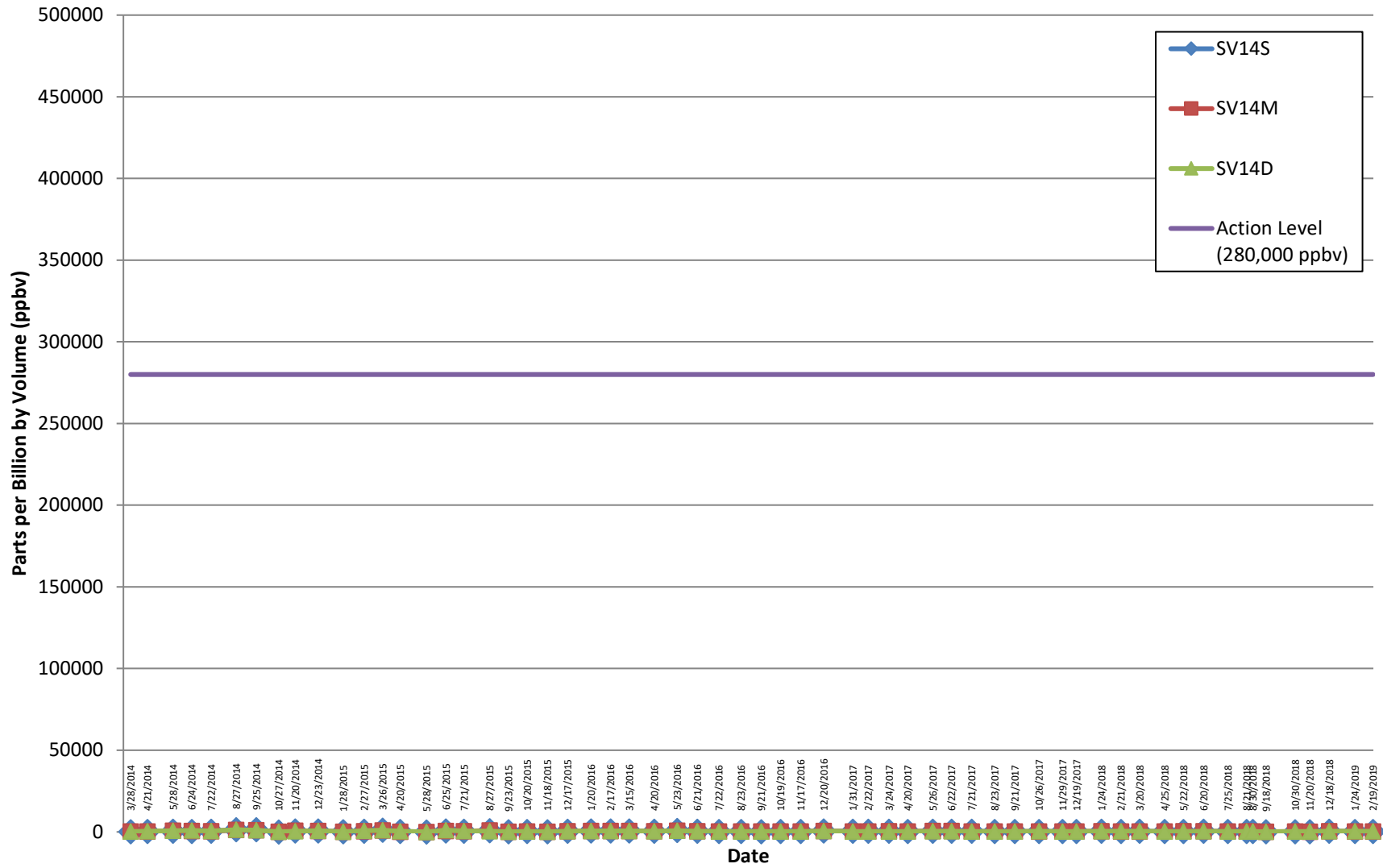


Figure 14
Soil Vapor Measurements
SV15

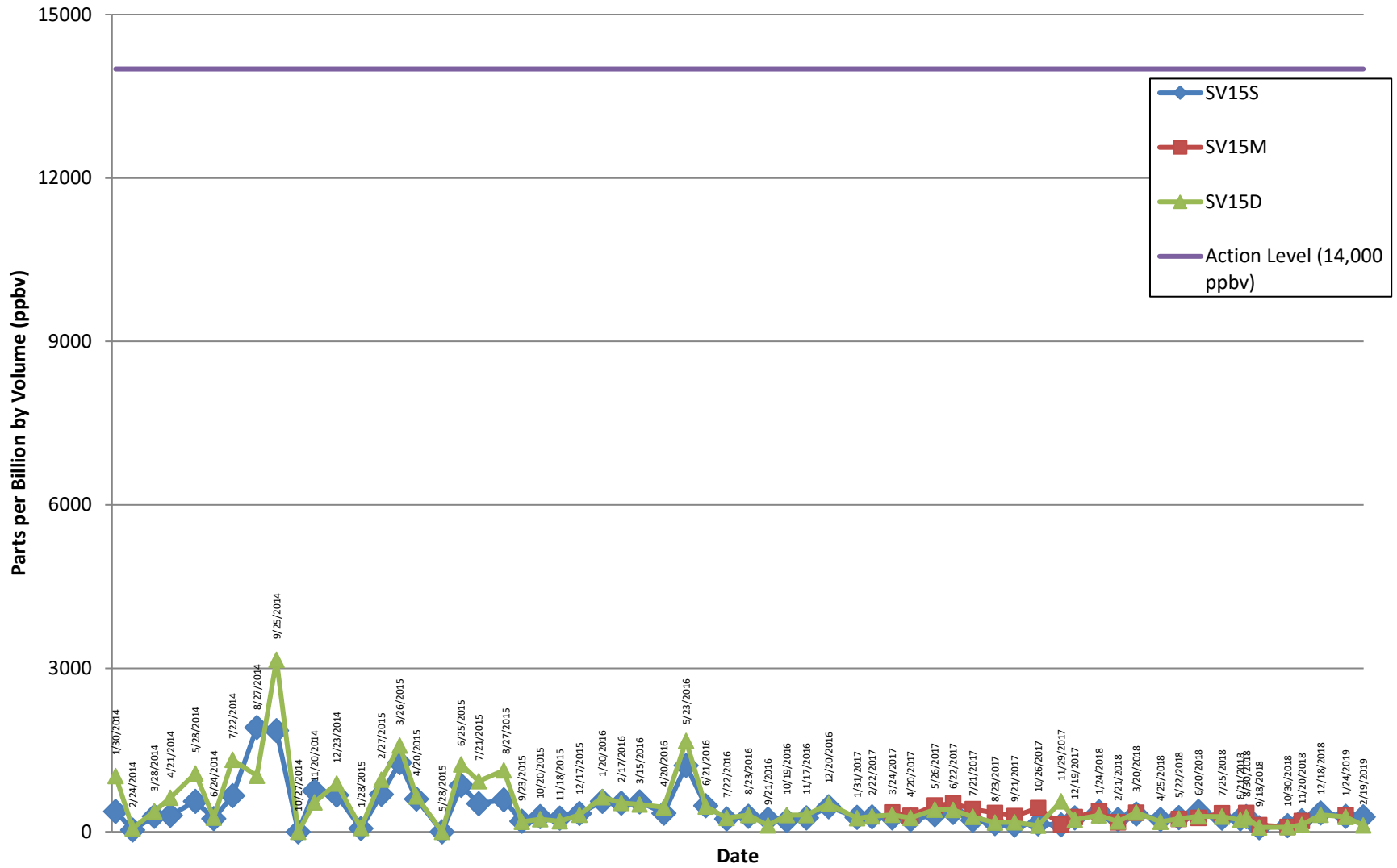


Figure 15
Soil Vapor Measurements
SV16

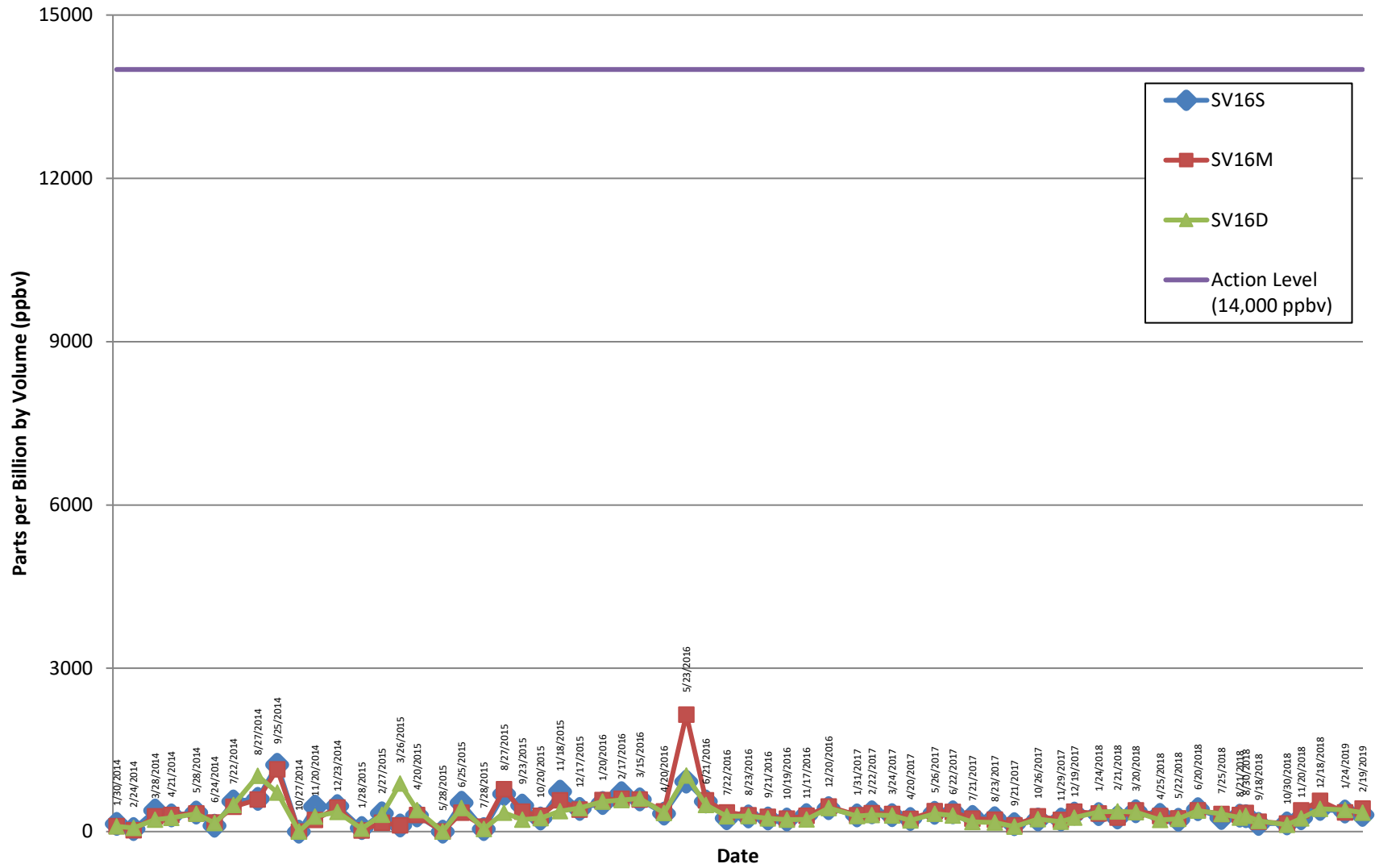


Figure 16
Soil Vapor Measurements
SV17

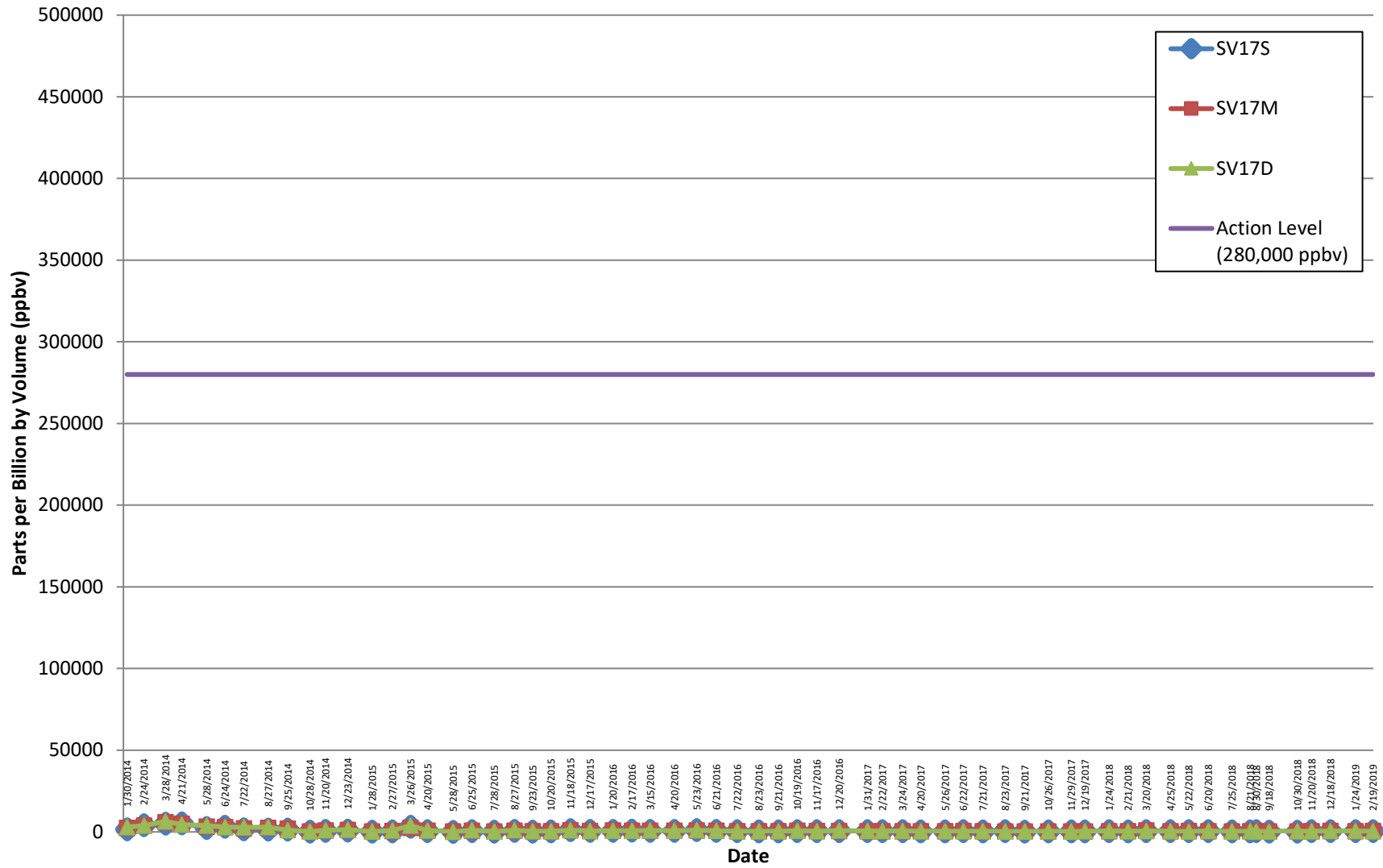


Figure 17
Soil Vapor Measurements
SV18

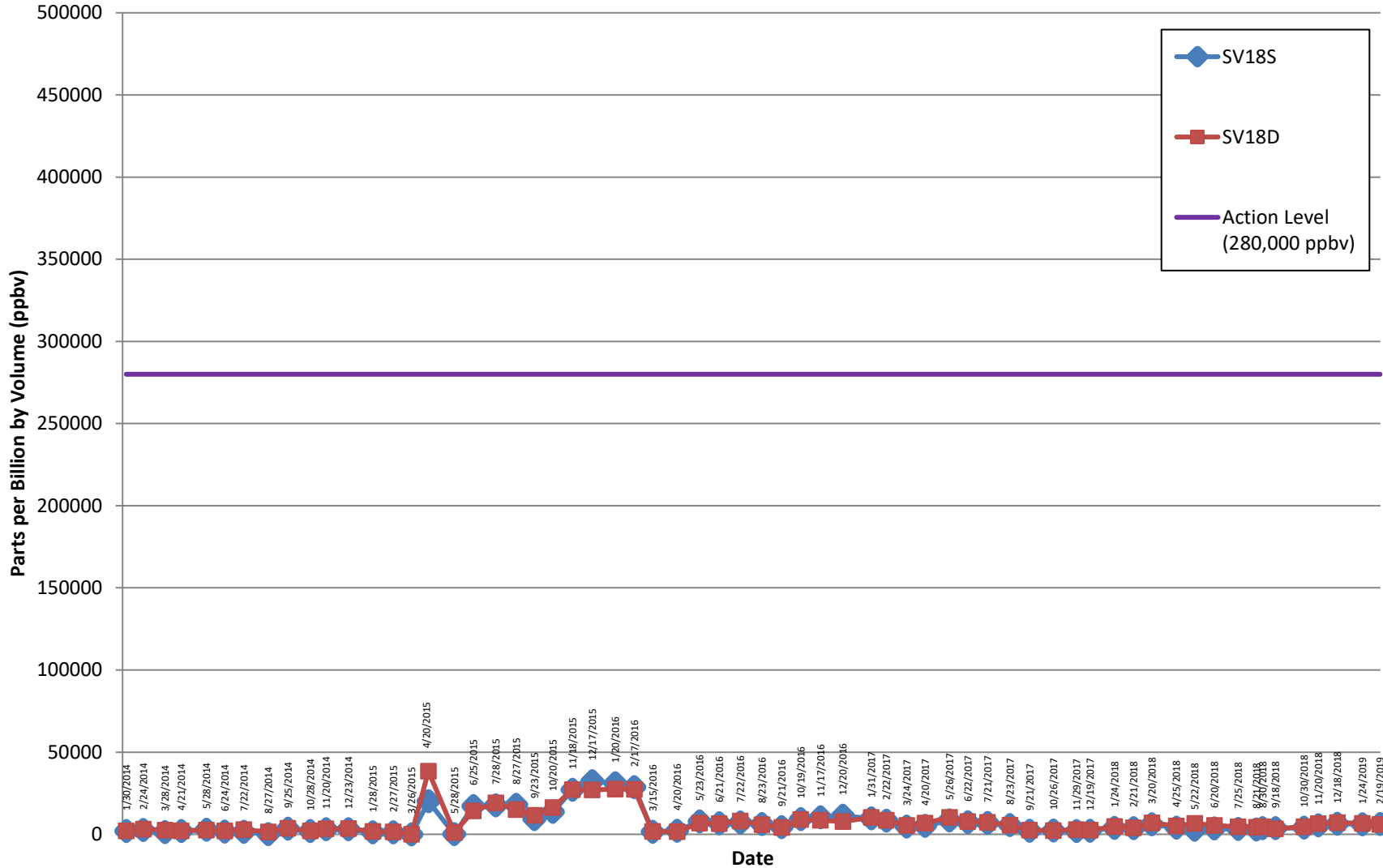
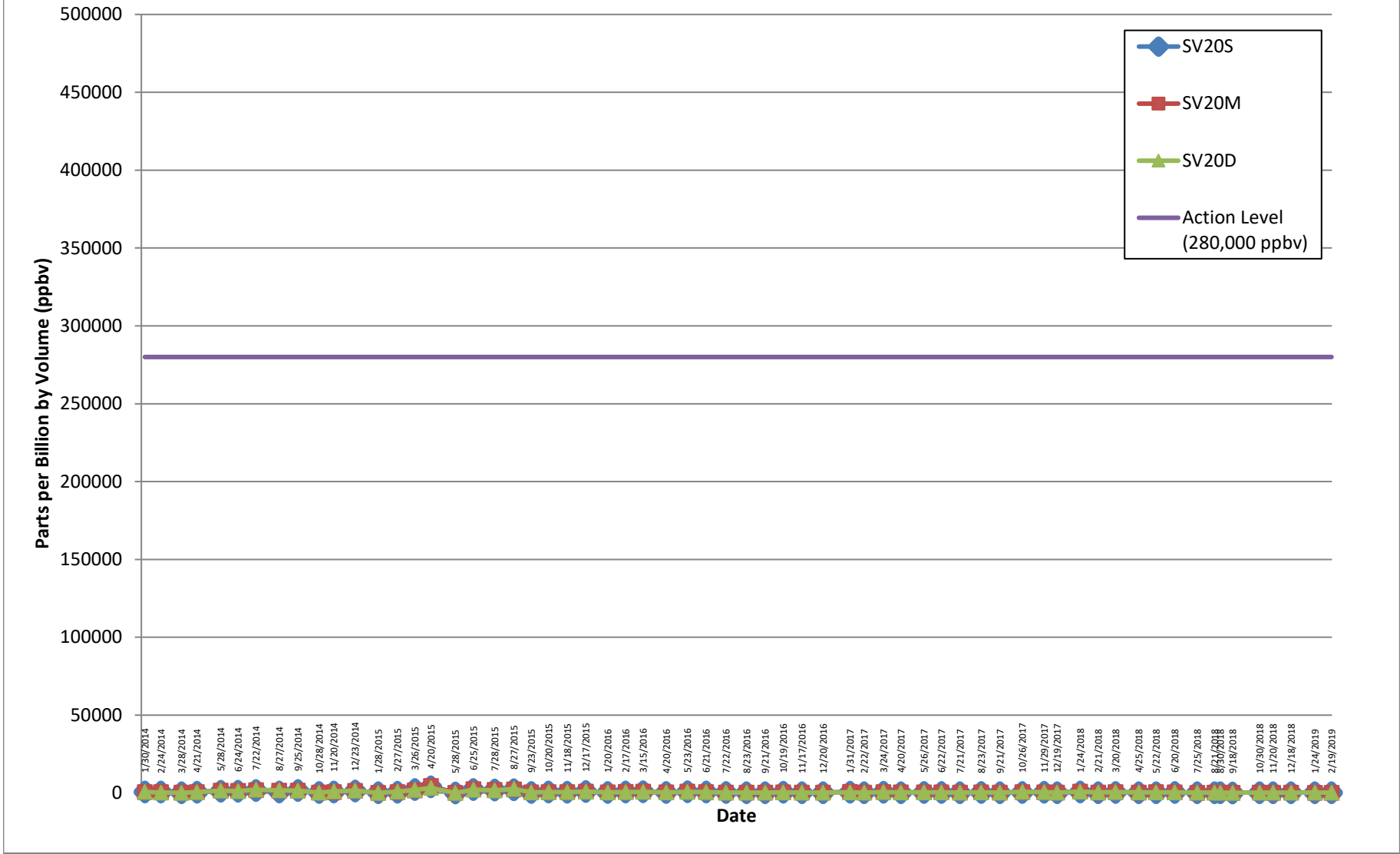


Figure 18
Soil Vapor Measurements
SV20



Appendix C
Red Hill Drinking Water Shaft Sampling

**RED HILL DRINKING WATER SHAFT SAMPLING
TRANSITION PLAN FOR TANK 5 RED HILL RELEASE FROM EMERGENCY RESPONSE TO REMEDIATION AS AMENDED ON FEBRUARY 13, 2014**

Date	JP-8	Lead	Benzene	Carbon tetrachloride	Chlorobenzene	1,2-Dichlorobenzene (o-Dichlorobenzene)	1,4-Dichlorobenzene (para-Dichlorobenzene)	1,2-Dichloroethane	1,1-Dichloroethylene	cis-1,2-Dichloroethylene	trans-1,2-Dichloroethylene	Dichloromethane (Methylene Chloride)	1,2-Dichloropropane	Ethylbenzene	Naphthalene (unregulated)	Styrene	Tetrachloroethylene	Toluene	1,2,4-Trichlorobenzene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethylene	Vinyl chloride	Xylenes, Total	Acenaphthene (unregulated)	Acenaphthylene (unregulated)	Anthracene (unregulated)	Benzo(a)pyrene	Di(2-ethylhexyl)adipate	Di(2-ethylhexyl)phthalate	Fluoranthene (unregulated)	Phenanthrene (unregulated)	Pyrene (unregulated)				
MCL (ug/L)¹	-	15 (action level)	5	5	100	600	75	5	7	70	100	5	5	700	-	100	5	1,000	70	200	5	5	2	10000	-	-	-	0.2	400	6	-	-	-				
DW Toxicity (ug/L)²	190	15	5	5	100	600	75	0.15	7	70	100	4.8	5	700	17	100	5	1,000	70	200	5	5	2	10000	370	240	1800	0.2	400	6	1500	240	180				
Final Grdwater AL (ug/L)²	100	5.6	5	5	25	10	5	0.15	7	70	100	4.8	5	30	17	10	5	40	25	62	5	5	2	20	20	30	0.73	0.014	6	8	4.6	2					
MRL³	100	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.2	0.5	0.1	0.1	0.1	0.02	0.6	0.6	0.1	0.1	0.1				
360-011, Tap Outside Chlorine Building (After Treatment)																																					
1/14/2014	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			
1/16/2014	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
1/21/2014	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
1/28/2014	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
2/11/2014	ND	5.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
2/28/2014	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
3/11/2014	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
4/8/2014	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
5/13/2014	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
6/10/2014	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
7/8/2014	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
10/7/2014	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1/21/2015	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
4/7/2015	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
6/16/2015	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
9/15/2015	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
12/15/2015	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
12/21/2015	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3/22/2016	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
6/21/2016	ND	1.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
9/20/2016	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
11/15/2016 ⁷	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
12/13/2016	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1/17/2017 ⁷	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
2/21/2017 ⁷	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3/21/2017	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/18/2017 ⁷	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
6/20/2017	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/19/2017	ND	1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
12/19/2017	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3/20/2018	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
6/19/2018	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/18/2018	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
11/14/2018 ⁷	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
12/12/2018	ND	1.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1/23/2019 ⁷	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3/1/2019 ⁷	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
360-001, Pumphead																																					
1/16/2014	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
2/11/2014	-	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2/28/2014	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3/11/2014	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4/8/2014	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Method	8015B	200.8	524.2																				525.2														

- NOTES:**
- MCLs are drinking water maximum contaminant levels per 40 CFR 141 and HAR 11-20.
 - Action levels from "Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater, Hawaii Edition", Fall 2011 (revised January 2012), Hawaii Department of Health Hazard Evaluation and Emergency Response
 - MRL is the Minimum Reporting Level
 - One time sample to analyze for TPH-o. Detection levels less than or equal to MRLs
 - ND - not detected at the minimum reporting level (MRL)
 - Method 8260B, MRL=0.25 ug/L
 - Voluntary sample. Not required by Transition Plan.

HISTORICAL DRINKING WATER RESULTS AT RED HILL SHAFT:

- Lead, VOCs and SVOCs regulated by HAR 11-20 and are monitored every 3 years. All petroleum-related contaminants were ND since 2000 (monitoring data not available prior to 2000).
- UEM conducted additional monitoring for benzene, toluene, and xylene quarterly and benzo(a)pyrene twice a year from mid 1990's - 2013. Results not available prior to 2002. All results from 2002 were ND.
- UEM also conducted additional quarterly monitoring for lead from mid 2012 - 2013. Lead was detected on:

8/17/12	6 ppb
11/27/12	1 ppb
8/22/13	1.9 ppb
11/19/13	1.8 ppb

Appendix D
Public Notifications



COMMANDER, NAVY REGION HAWAII
PUBLIC AFFAIRS OFFICE
850 TICONDEROGA STREET, SUITE 110
JBPHH, HAWAII 96860
PHONE: 808-473-2888 FAX: 808-473-2876
www.cnrc.navy.mil/hawaii



Feb 25, 2019

Statement: Navy releases test results on Red Hill Bulk Fuel Facility tanks

(Navy Region Hawaii) – Tested sections of the Navy’s Red Hill underground fuel tanks are still twice as thick as the petroleum industry’s closest comparable minimum standard for tank walls, according to a laboratory analysis report released recently to the State of Hawaii Department of Health and the Environmental Protection Agency.

The report provided results on the condition of 10 steel liner plate samples, also called coupons, that were cut from one of the 20 underground tanks. The Navy’s preliminary assessment shows it validates the accuracy of earlier electromagnetic and ultrasonic scans the Navy did to assess the condition of a tank liner and determine areas in need of repair.

“That was the whole purpose of these tests, to evaluate the effectiveness of the earlier scanning data,” said Mark Manfredi, Navy Region Hawaii’s Red Hill Program Director. “The liner sample tests were not meant to evaluate the condition of the tank liner.”

Contrary to previous non-Navy reports that offered premature and incorrect analysis of tank-wall thinning based on subjective observations and imprecise measurements, the tank’s quarter-inch-thick steel liner samples were thicker than estimated by the non-Navy sources.

The Navy doubles an American Petroleum Institute’s minimum thickness standard for above ground storage tanks as a best practice. After collaborating with third-party engineering experts, the Navy designated the higher minimum thickness for the whole tank surface, with the measurement for repair being obviously higher.

While some irregularities showed up in the different scans and tests run for the report, this confirms the Navy’s decision to conduct multiple test, scans, and reviews to determine the tanks’ condition. None of the variations in the steel samples tested would have resulted in any fuel leaking, according to Manfredi.

Although the laboratory testing largely confirmed its predictions, the Navy continues working with industry experts to evaluate cutting-edge technologies and procedures to improve the ability to “see” the backside of the reinforced concrete tanks’ steel liner to further protect the environment and drinking water.

The Navy is actively engaged in monitoring and inspecting sections of the tanks to ensure it identifies potential issues early and has multiple systems that inspect, monitor and evaluate all aspects of the Red Hill fuel facility system. After nearly 75 years in service, no more than 1 to 2 percent of each tank’s surface area requires repair.

The Navy continues to work with the EPA and Health Department under an Administrative Order on Consent to improve the facility and protect the environment. Since 2006, the Defense Department has invested more than \$260 million in Red Hill, and modernization continues in oversight, technology, operating procedures and the means to protect our shared drinking water. Public records confirm that all drinking water near Red Hill remains safe, and the Navy is committed to keeping it safe. Red Hill continues to be a national strategic asset that provides power for peace, stability, humanitarian assistance and continued prosperity in the Indo-Pacific region.



DEPARTMENT OF THE NAVY
COMMANDER NAVY REGION HAWAII
850 TICONDEROGA ST STE 110
JBPHH HI 96860-5101

HONOLULU CITY COUNCIL

Testimony on Resolution 18-266 CD1, Urging the United States Environmental Protection Agency and the Hawai'i State Department of Health to reject the approval of a single wall tank upgrade alternative option for the Red Hill Bulk Fuel Storage Facility and to reject the conclusions presented in the Groundwater Protection and Evaluation Considerations for the Red Hill Bulk Fuel Storage Facility Report dated July 27, 2018.

Hearing Date and Time: Friday, March 8, 2019 at 10:00 a.m.

Testimony on behalf of Navy Region Hawaii by CAPT Marc Delao,
Commander, Naval Facilities Engineering Command Hawaii

Aloha Chair Kobayashi, Vice Chair Menor, and Council Members,

Thank you for the opportunity to submit testimony on Proposed Resolution 18-266 CD1. The Navy fully recognizes and respects the Council's and the public's concern in protecting the fresh water aquifer at Red Hill. We not only share that concern, but work every day to ensure this important facility is monitored and operated to protect against any release of fuel. We all want to protect our aquifer and we are working under the oversight of the State Dept. of Health (DOH) and Environmental Protection Agency (EPA) in an Administrative Order on Consent (AOC) to do just that.

But we fear there are portions of the resolution that are inconsistent with the carefully negotiated AOC, and intervening with the AOC could complicate the ongoing process between the Navy and regulators. We again extend an invitation to all of the members of the City Council to tour our facility and meet the individuals who are responsible for keeping our storage facility environmentally safe and ready for any emergency. The Navy believes we fill an important role in the protection of our country and Hawaii. To help ensure you have all the facts and see for yourselves, rather than take our word for it, we ask the Council again to tour the Red Hill facility before your final decision on this resolution.

We are concerned that there have been non-Navy reports that offered a premature and incorrect assessment of tank-wall thinning based on subjective observations and imprecise measurements. For example, a recent laboratory analysis on the condition of steel plate samples, called coupons, showed that the thickness of the underground fuel tanks is greater than twice the industry minimum standard, as expected. The preliminary assessment of the report, which we provided to the DOH and EPA, also shows that it validates the accuracy of earlier electromagnetic and ultrasonic scans we

performed to assess the condition of a tank liner and determine areas in need of repair. The report is an interim product that will be further evaluated and used to form the content of a larger report due in July as part of the Administrative Order on Consent between Navy, EPA and DOH.

The Navy continues working with industry experts to evaluate cutting-edge technologies and procedures to improve the ability to “see” the backside of the steel to further protect the environment and drinking water. The DOH and EPA host a groundwater working group which evaluates input from a variety of data and experts.

The drinking water is safe. The Board of Water Supply and other independent tests confirm drinking water meets all applicable standards. Tests performed every six months confirm the tanks are “tight” and not leaking. Each Red Hill tank is made of several feet of reinforced concrete with a steel liner. The tanks also have been secured into basalt rock with Gunitite, a type of cement that is pressure injected to fill the space between the outer tank wall and the basalt rock. Effectively, the liner, cement walls, Gunitite and the basalt rock become the tank that holds the fuel.

Many people understand what a vital strategic asset Red Hill is for the military’s mission, just as Pearl Harbor Naval Shipyard and the Pacific Missile Range Facility on Kauai are. But not many realize how fully committed the Navy is to serving as the safety net for Hawaii’s energy needs under the Defense Support for Civil Authorities.

We are capable of delivering fuel from Red Hill to Honolulu Harbor, the Daniel K. Inouye International Airport, Barbers Point and Hawaiian Electric Company for commercial ships, airplanes and generating electricity, all via existing fuel lines. The delivery system is through gravity feed and does not require any additional energy, which is important in any emergency when the power goes out.

Thank you for the opportunity to submit this testimony today.



**U.S. INDO-PACIFIC COMMAND
(USINDOPACOM)
CAMP H.M. SMITH, HAWAII 96861-4028**

March 5, 2019

Testimony on the Red Hill Bulk Fuel Storage Facility

Aloha and thank you for the opportunity to submit written testimony about Red Hill.

USINDOPACOM, commanded by Admiral Phillip S. Davidson, is the highest level DoD headquarters in the Indo-Pacific region. It provides command and control of assigned forces from the Army, Navy, Air Force, and Marines operating in the Indo-Pacific. The Red Hill Fuel Storage Facility is owned and maintained by the U.S. Navy, with support by the Defense Logistics Agency (DLA).

The purpose of my testimony is to inform the Committees of the vital strategic significance of the Red Hill Fuel Storage Facility, and to communicate USINDOPACOM's resolve and commitment to conduct operations in an environmentally responsible and compliant manner.

The Red Hill facility holds a significant percentage of petroleum war reserves required to defend national security interests in the Indo-Pacific region. As our strategic reserve, it supports all U.S. military forces throughout the theater, including those stationed in and transiting through Hawaii. It also supports the Hawaii Army and Air National Guard and is available to support civil authorities, should circumstances dictate. Its hardened, underground, cyber-protected, gravity-fed system to Joint Base Pearl Harbor-Hickam is unique, and there is no comparable U.S. owned facility anywhere from India to mainland USA.

Admiral Davidson maintains Red Hill is a "vital strategic asset" to USINDOPACOM and Service components "during contingency operations" throughout the Indo-Pacific region. He also fully supports the Navy and DLA's commitment to be good stewards of the environment and protect the water we all drink on Oahu. Therefore, USINDOPACOM will continue to support the binding Administrative Order on Consent and its objectives to ensure the groundwater is protected and Red Hill is operated and maintained in an environmentally protective manner.

I am happy to provide additional information as necessary.

A handwritten signature in black ink, appearing to read "Susan Davidson", is positioned above the typed name.

SUSAN A. DAVIDSON
Major General, U.S. Army
Director for Logistics, Engineering and
Security Cooperation



DEPARTMENT OF THE NAVY
COMMANDER NAVY REGION HAWAII
850 TICONDEROGA ST STE 110
JBPHH HI 96860-5101

SENATE COMMITTEE ON AGRICULTURE AND THE ENVIRONMENT
SENATE COMMITTEE ON PUBLIC SAFETY, INTERGOVERNMENTAL, AND
MILITARY AFFAIRS

Additional Testimony on Senate Concurrent Resolution 35, Urging the United States Environmental Protection Agency and the Hawai'i State Department of Health to reject the approval of a single wall tank upgrade alternative option for the Red Hill Bulk Fuel Storage Facility and to reject the conclusions presented in the Groundwater Protection and Evaluation Considerations for the Red Hill Bulk Fuel Storage Facility Report dated July 27, 2018.

Hearing Date and Time: Wednesday, March 20, 2019 at 1:15 p.m.

Testimony on behalf of Navy Region Hawaii by CAPT Marc Delao,
Commander, Naval Facilities Engineering Command Hawaii

Aloha Chair Gabbard, Chair Nishihara, and Committee Members,

Thank you for the opportunity to submit testimony on Senate Concurrent Resolution 35. The Navy fully recognizes and respects the public and legislative concern in protecting the fresh water aquifer at Red Hill. We not only share that concern, but work every day to ensure this important facility is monitored, operated and upgraded to protect against any release of fuel. We all want to protect our aquifer and we are working under the oversight of the State Dept. of Health (DOH) and Environmental Protection Agency (EPA) in an Administrative Order on Consent (AOC) to do just that.

The AOC process is working. The Navy and Defense Logistics Agency (DLA) have invested significantly and faithfully in the carefully negotiated AOC, expending over \$45 million complying with the AOC and over \$260 million in Red Hill since 2006. We again extend an invitation to all of the members of the legislature to tour our facility and meet the individuals who are responsible for keeping our storage facility environmentally safe and ready for any emergency. The Navy believes we fill an important role in the protection of our country and Hawaii. To help ensure you have all the facts and see for yourselves, rather than take our word for it, we ask legislators again to tour the Red Hill facility before your final decision on this resolution.

We are concerned that there have been non-Navy reports that offered a premature and incorrect assessment of tank-wall thinning based on subjective observations and imprecise measurements, derived outside of the AOC process. For example, earlier media reports indicated that the ten steel samples, called coupons, removed from tank

No. 14 demonstrated that the corrosion was far worse than the Navy expected. Laboratory measurements found no area on any of the coupons to be less than twice the industry minimum standard. Last week the Navy met with the Regulators where the laboratory results of these coupons were thoroughly scrutinized. For the coupon questioned in the media, the Regulators probed the laboratory in detail. The laboratory confirmed that the area of the coupon depicted in the newspaper was inaccurate. Included below is a copy of the non-Navy photo (with the ruler, Figures 1 and 2) which was used to allege that corrosion of this coupon was worse than the Navy anticipated. Also included is a laboratory photo (Figure 3) of the same coupon which show, after proper preparation and precise measurements, significant metal thickness remains in this area.

The laboratory report is an interim product that will be further evaluated and used to form the content of a larger report expected to be submitted in July as part of the Administrative Order on Consent between Navy, EPA and DOH.

The Navy continues working with industry experts to evaluate cutting-edge technologies and procedures to improve the ability to “see” the backside of the steel to further protect the environment and drinking water. For example, on March 14, the Navy hosted a leading robotics firm to conduct a live demonstration at Red Hill of their company’s capabilities to scan tank walls using robotic techniques. The demonstration looked promising and the Navy will be pursuing this concept in greater detail.

The drinking water is safe. The Board of Water Supply and other independent tests confirm drinking water meets all applicable standards. Tests performed every six months confirm the tanks are “tight” and not leaking. Each Red Hill tank is made of several feet of reinforced concrete with a steel liner. The tanks also have been secured into basalt rock with Gunitite, a type of cement that is pressure injected to fill the space between the outer tank wall and the basalt rock. Effectively, the liner, cement walls, Gunitite and the basalt rock become the tank that holds the fuel.

Many people understand what a vital strategic asset Red Hill is for the military’s mission, just as Pearl Harbor Naval Shipyard and the Pacific Missile Range Facility on Kauai are. But not many realize how fully committed the Navy is to serving as the safety net for Hawaii’s energy needs under the Defense Support for Civil Authorities. We are capable of delivering fuel from Red Hill to Honolulu Harbor, the Daniel K. Inouye International Airport, Barbers Point and Hawaiian Electric Company for commercial ships, airplanes and generating electricity, all via existing fuel lines. The delivery system is through gravity feed and does not require any additional energy, which is important in any emergency when the power goes out.

Thank you for the opportunity to submit this testimony today.



Figure 1: Edge of Coupon #7. Image from non-Navy source alleging the thickness of the remaining steel at the location shown alleging thickness less than the Navy's predictions.



Figure 2: Image taken after coupon removal, prior to receipt by lab. What appears to be a deep corrosion pit was actually rust-covered staining of the edge surface.



Figure 3: Detail of sandblasted surface. The sandblasting revealed that the feature was not a corrosion pit, as shiny metal was revealed when the red-colored staining was removed.



**U.S. INDO-PACIFIC COMMAND
(USINDOPACOM)
CAMP H.M. SMITH, HAWAII 96861-4028**

March 5, 2019

Testimony on the Red Hill Bulk Fuel Storage Facility

Aloha and thank you for the opportunity to submit written testimony about Red Hill.

USINDOPACOM, commanded by Admiral Phillip S. Davidson, is the highest level DoD headquarters in the Indo-Pacific region. It provides command and control of assigned forces from the Army, Navy, Air Force, and Marines operating in the Indo-Pacific. The Red Hill Fuel Storage Facility is owned and maintained by the U.S. Navy, with support by the Defense Logistics Agency (DLA).

The purpose of my testimony is to inform the Committees of the vital strategic significance of the Red Hill Fuel Storage Facility, and to communicate USINDOPACOM's resolve and commitment to conduct operations in an environmentally responsible and compliant manner.

The Red Hill facility holds a significant percentage of petroleum war reserves required to defend national security interests in the Indo-Pacific region. As our strategic reserve, it supports all U.S. military forces throughout the theater, including those stationed in and transiting through Hawaii. It also supports the Hawaii Army and Air National Guard and is available to support civil authorities, should circumstances dictate. Its hardened, underground, cyber-protected, gravity-fed system to Joint Base Pearl Harbor-Hickam is unique, and there is no comparable U.S. owned facility anywhere from India to mainland USA.

Admiral Davidson maintains Red Hill is a "vital strategic asset" to USINDOPACOM and Service components "during contingency operations" throughout the Indo-Pacific region. He also fully supports the Navy and DLA's commitment to be good stewards of the environment and protect the water we all drink on Oahu. Therefore, USINDOPACOM will continue to support the binding Administrative Order on Consent and its objectives to ensure the groundwater is protected and Red Hill is operated and maintained in an environmentally protective manner.

I am happy to provide additional information as necessary.

A handwritten signature in black ink, appearing to read "Susan Davidson", is positioned above the typed name.

SUSAN A. DAVIDSON
Major General, U.S. Army
Director for Logistics, Engineering and
Security Cooperation