



DEPARTMENT OF THE NAVY

COMMANDER  
NAVY REGION HAWAII  
850 TICONDEROGA ST STE 110  
JBPHH, HAWAII 96860-5101

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5000-45A  
N45  
November 5, 2020

**CERTIFIED NO: 9489 0090 0027 6232 2379 75**

Mr. Richard Takaba  
Hawaii State Department of Health  
Solid and Hazardous Waste Branch  
Underground Storage Tank Section  
2827 Waimano Home Road #100  
Pearl City, HI 96782

Dear Mr. Takaba:

**SUBJECT: RED HILL TANK COMPLEX  
SOIL VAPOR SAMPLING RESULTS FOR SEPTEMBER 2020  
DOH FACILITY ID NO. 9-102271  
DOH RELEASE ID NO. 990051, 010011, 020028, AND 140010**

Soil vapor samples were collected from beneath all active and accessible Red Hill tanks on September 25, 2020. Tanks 1 and 19 are inactive and not included in the sampling network. Tank 17 is temporarily closed for clean, inspect, and repair (CIR) and was not accessible for sampling.

Soil vapor VOC concentrations were measured in the field using a photo-ionization detector. The soil vapor sampling results are presented graphically in Enclosure 1.

A conservative approach to assess the integrity of the associated tank system is to establish action thresholds for VOC concentrations in soil vapor monitoring points (SVMPs) beneath tanks as 50 percent of the calculated vapor concentration from fuel-saturated water. These action thresholds for SVMPs beneath tanks containing F-24 or JP-5 is 280,000 ppbv and 14,000 ppbv in SVMPs beneath tanks containing marine diesel fuel.

NAVSUP FLC Pearl Harbor Causative Research Report is submitted as Enclosure 2. This report provides causative research and findings to conclude there is no evidence of a leaking tank in the Red Hill Complex or evidence of a spill that may have contributed to elevated soil vapor VOC concentrations.

At Tank 5 (containing F-24), the concentrations of VOCs detected in the front, middle and outer edge soil vapor monitoring probes were 197, 2,260, and 923 ppbv, respectively. VOC concentrations in all down-gradient tank soil vapor monitors were below 424 ppbv.

All other VOC concentrations measured in September were from 17 to 2100 times below action levels, with only a slight increase trend in several tanks observed.

Soil vapor VOC concentration trends will continue to be monitored on a monthly basis. Soil vapor samples were collected on October 15, 2020 from beneath all active and accessible Red Hill tanks. Results will be submitted under a separate cover. The next soil vapor sampling event is scheduled for November 2020.

If there are any questions regarding this matter, or if more information is needed, please contact Ms. Susan Lohr at (808) 471-4619 or Ms. Dayna Fujimoto at (808) 471-1021.

Sincerely,



SHERRIL R. ENG

Director

Regional Environmental Department

By direction of the

Commander

- Enclosures: 1. Graphical Summary of Soil Vapor Sampling Results for Tanks 2 - 18 and 20 through September 2020 (18 pages)  
2. NAVSUP FLC Pearl Harbor Causative Research Report IRT Red Hill Soil Vapor Monitoring Report for September 2020

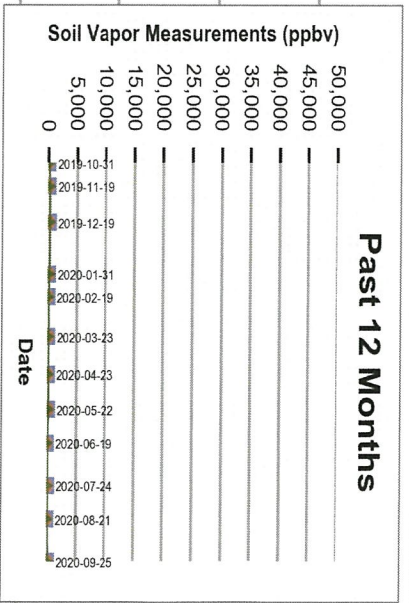
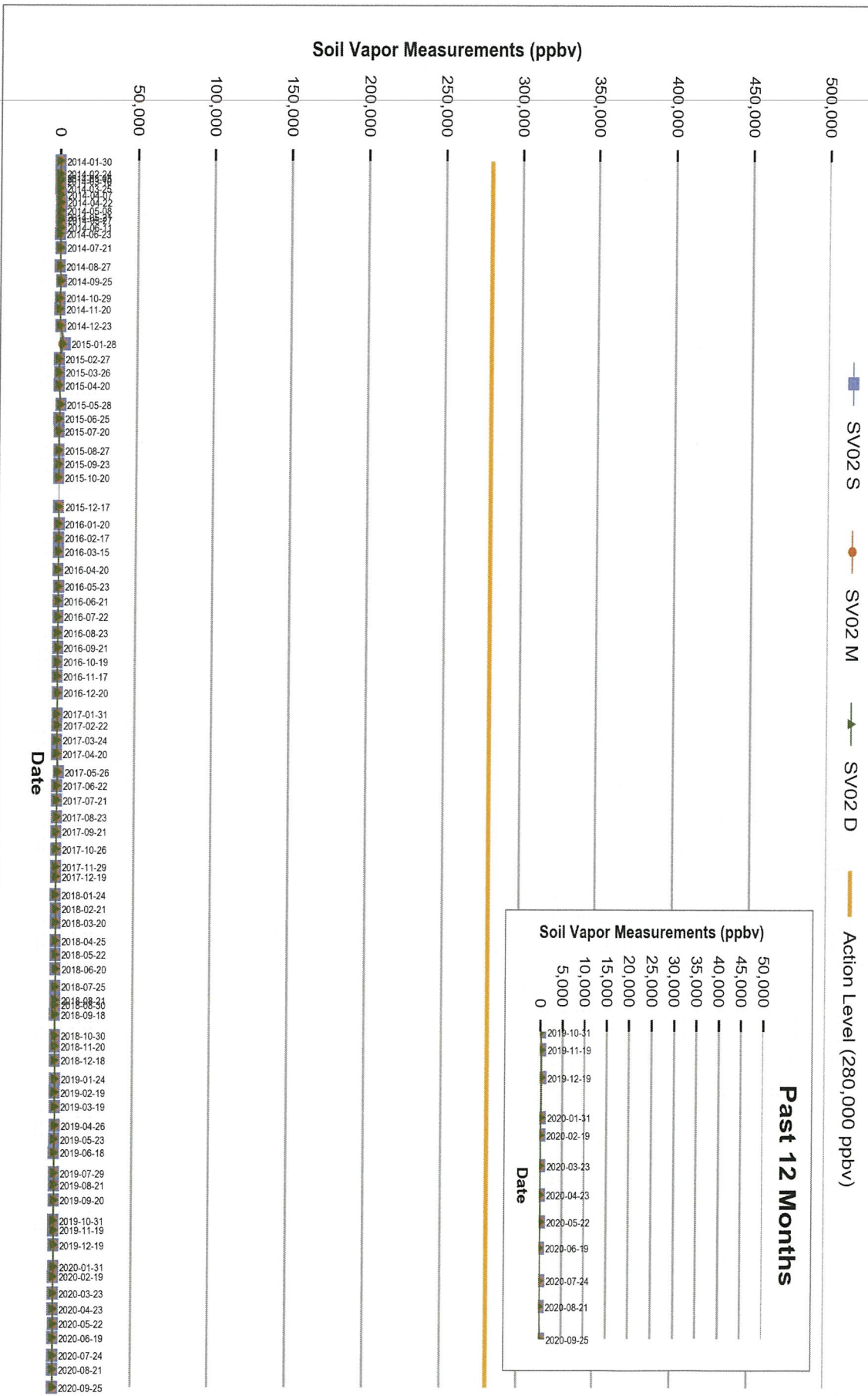
Copy to:

Mr. Steve Linder, U.S. EPA Region 9, Underground Storage Tank Program Office

Mr. John Floyd, NAVSUP FLC Pearl Harbor

Mr. Ralph Wells, DLA Energy Pacific

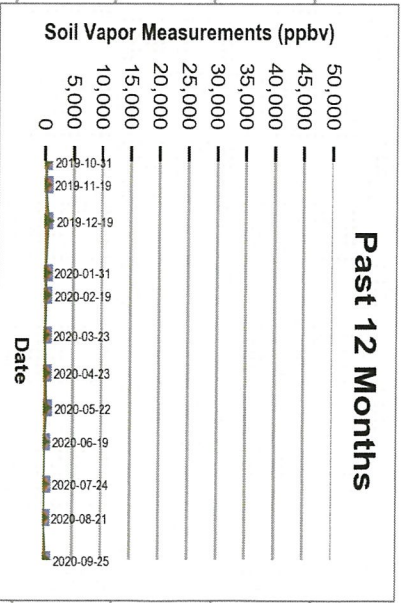
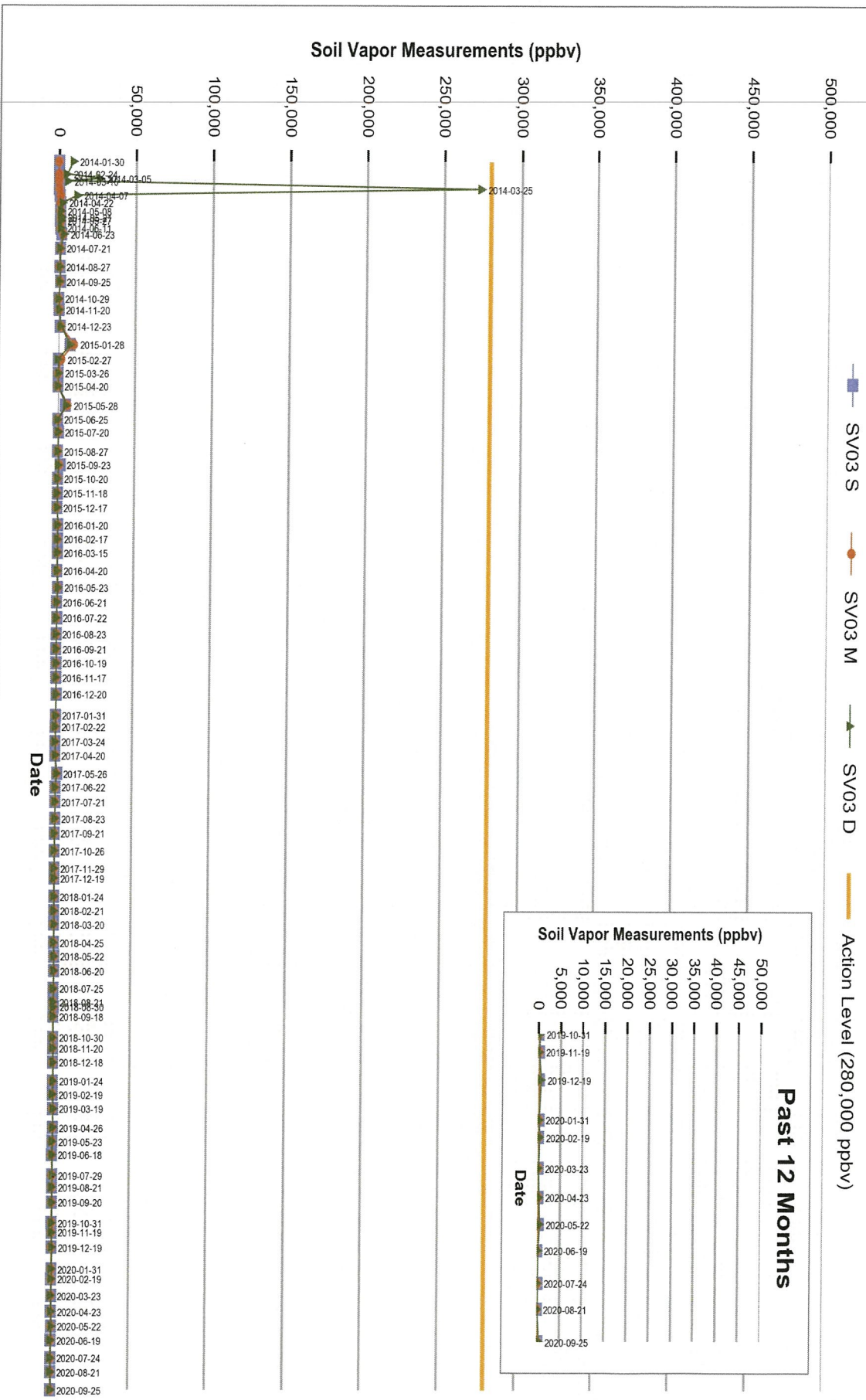
Figure 1  
Red Hill - Tank 02 (F-24)  
Soil Vapor Measurements (Jan 2014 to Sep 2020)



Notes (where applicable):  
ppbv: Parts Per Billion by Volume  
F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5  
F-76: Marine Diesel, Fuel Number 76

**Figure 2**  
**Red Hill - Tank 03 (F-24)**  
**Soil Vapor Measurements (Jan 2014 to Sep 2020)**

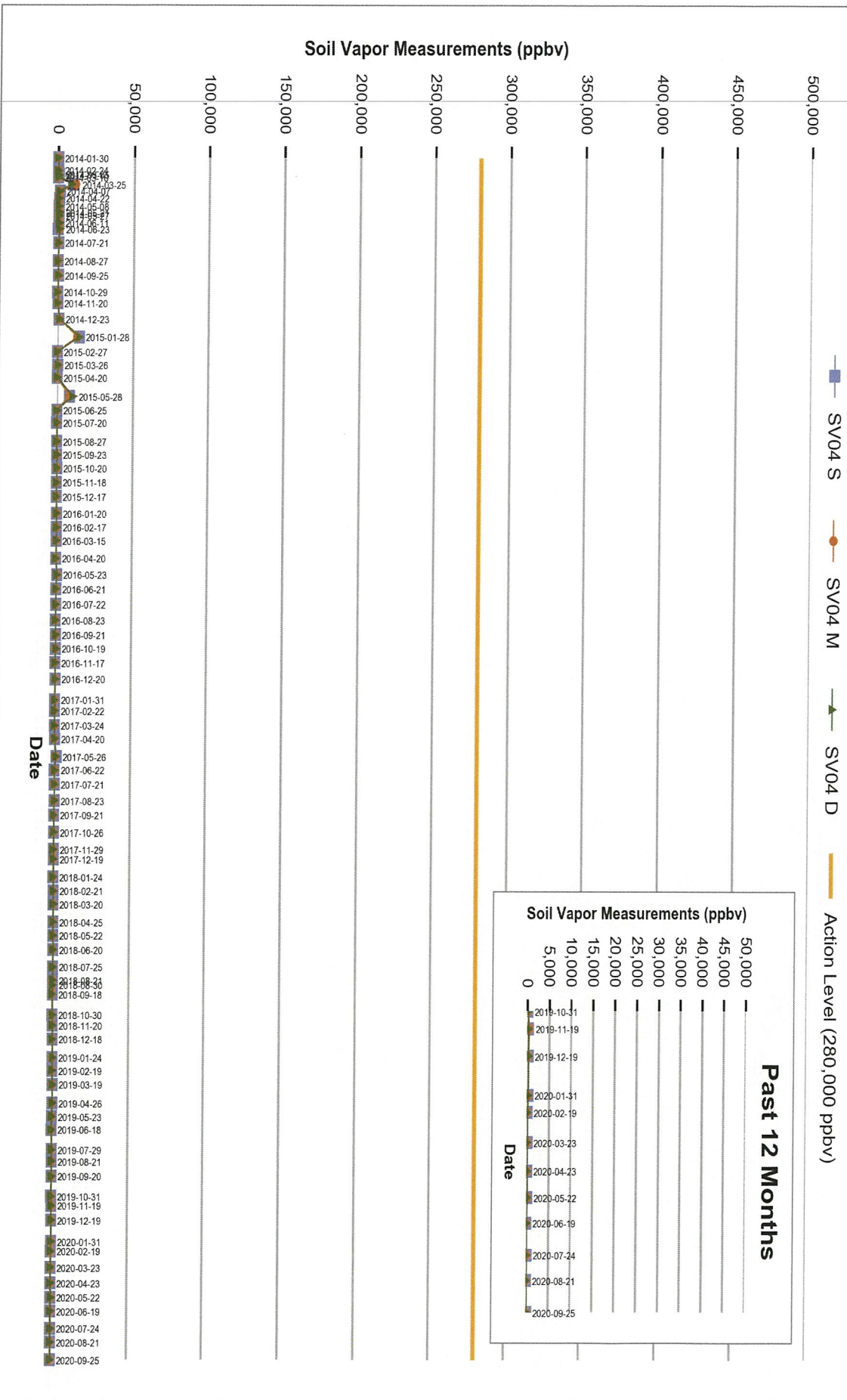


Notes (where applicable):  
 ppbv: Parts Per Billion by Volume  
 F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5  
 F-76: Marine Diesel, Fuel Number 76



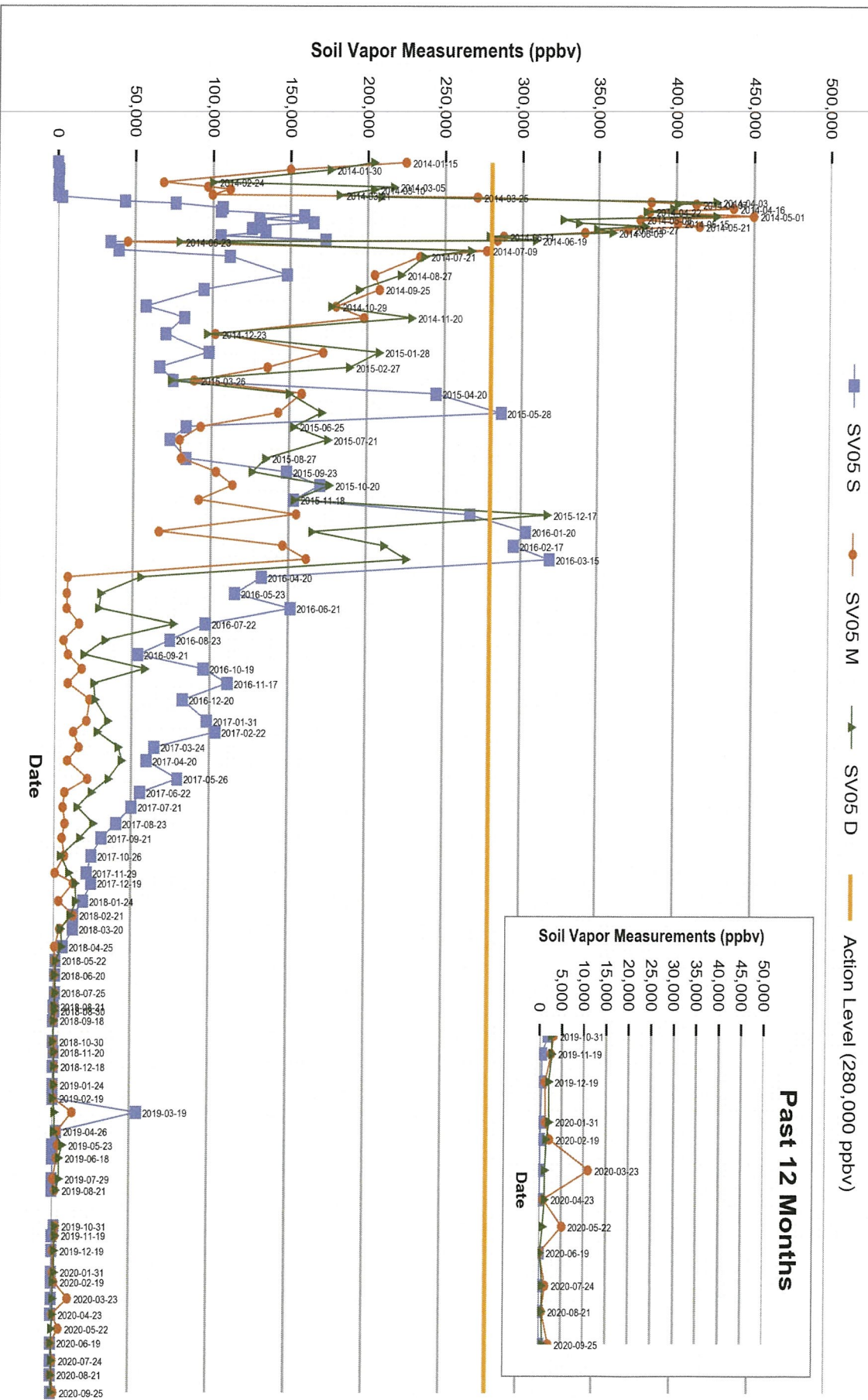
**Figure 3**  
**Red Hill - Tank 04 (F-24)**  
**Soil Vapor Measurements (Jan 2014 to Sep 2020)**



Notes (where applicable):  
 ppbv: Parts Per Billion by Volume  
 F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5  
 F-76: Marine Diesel, Fuel Number 76

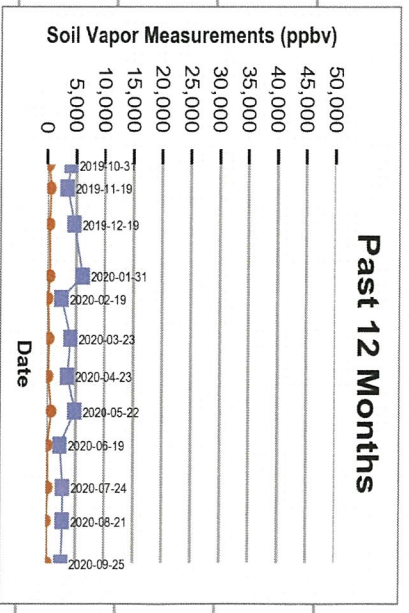
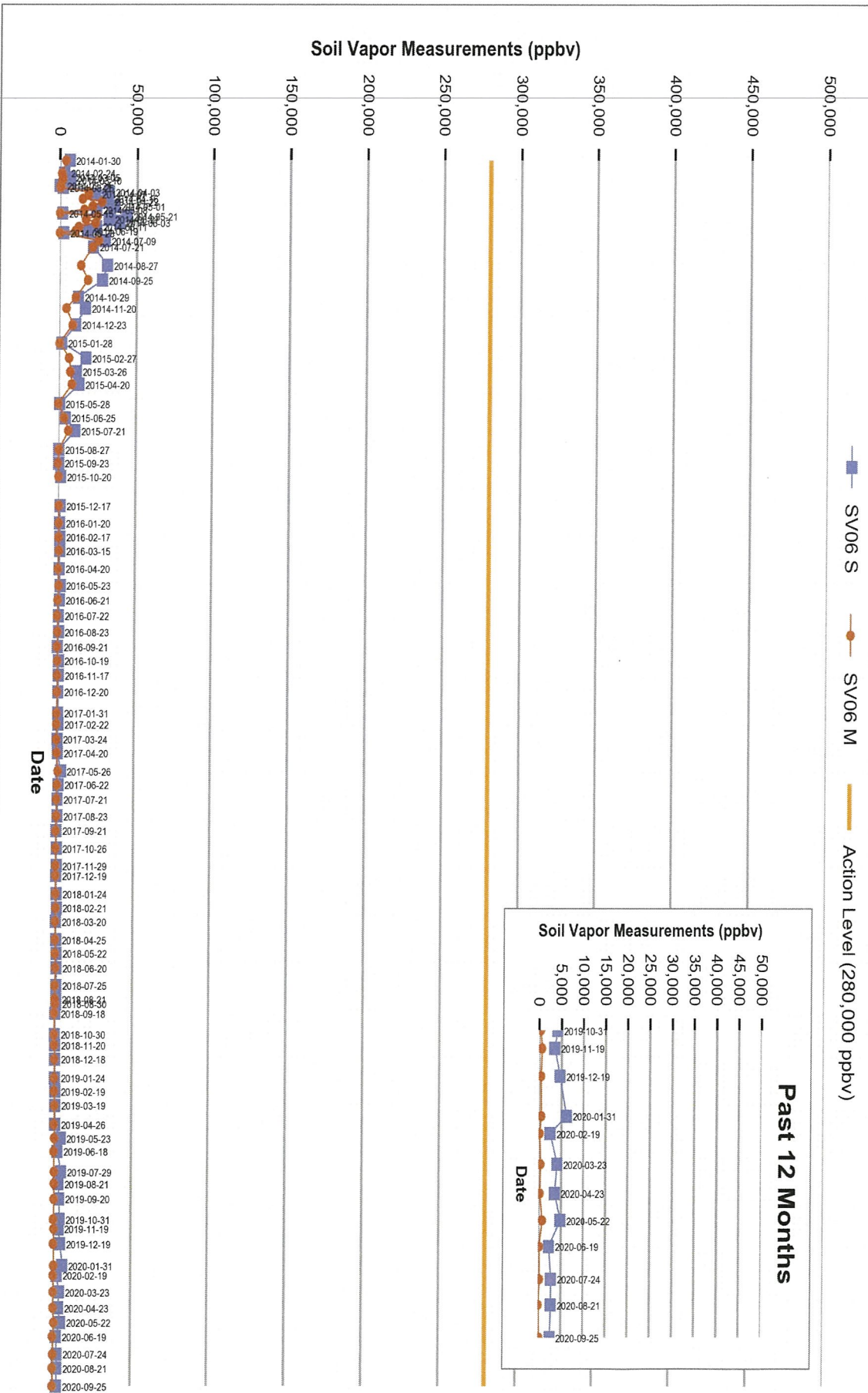
**Figure 4**  
**Red Hill - Tank 05 (F-24)**  
**Soil Vapor Measurements (Jan 2014 to Sep 2020)**



Notes (where applicable):  
 ppbv: Parts Per Billion by Volume  
 F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5  
 F-76: Marine Diesel, Fuel Number 76

**Figure 5**  
**Red Hill - Tank 06 (F-24)**  
**Soil Vapor Measurements (Jan 2014 to Sep 2020)**

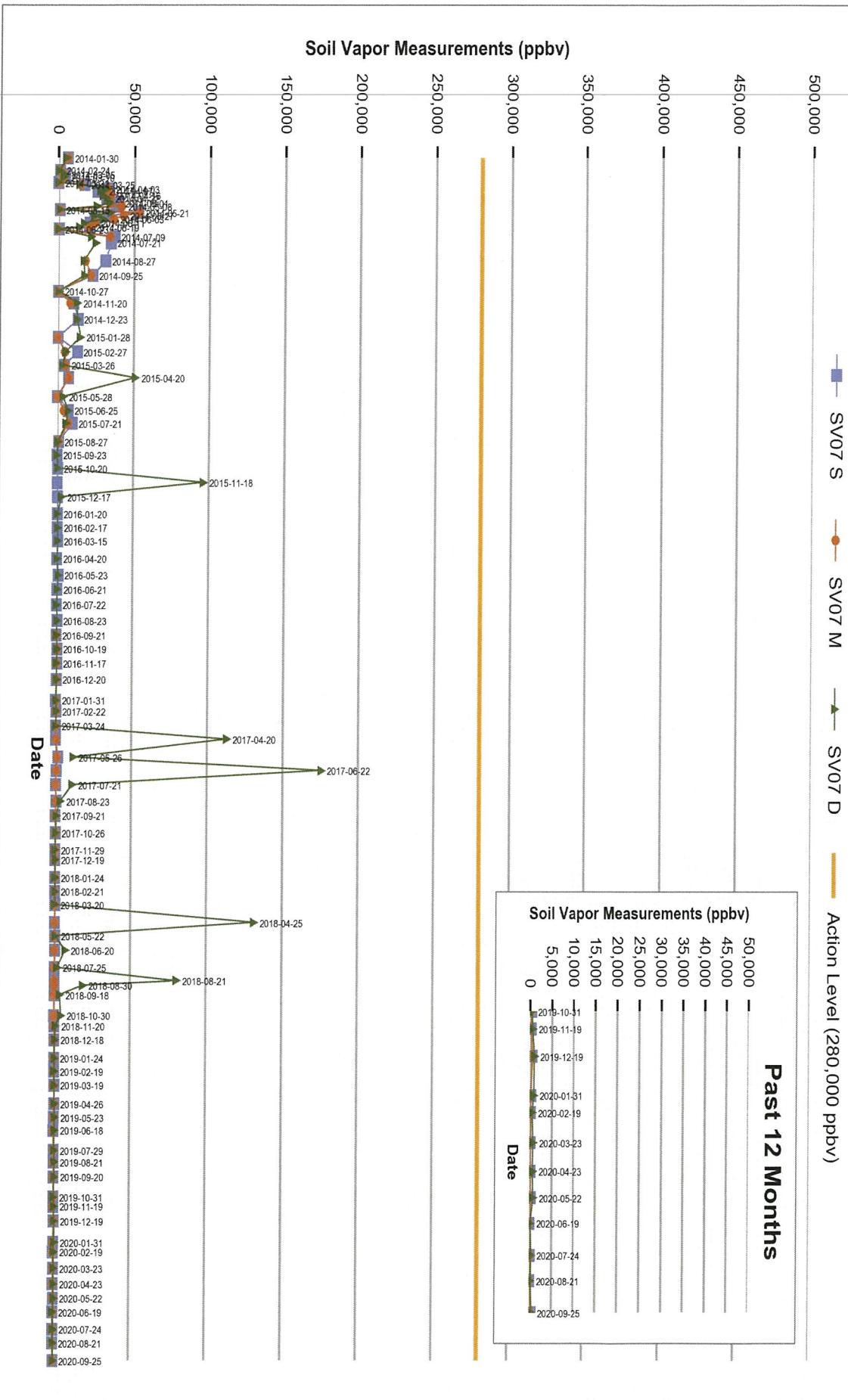


Notes (where applicable):  
 ppbv: Parts Per Billion by Volume  
 F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5  
 F-76: Marine Diesel, Fuel Number 76



**Figure 6**  
**Red Hill - Tank 07 (JP-5)**  
**Soil Vapor Measurements (Jan 2014 to Sep 2020)**

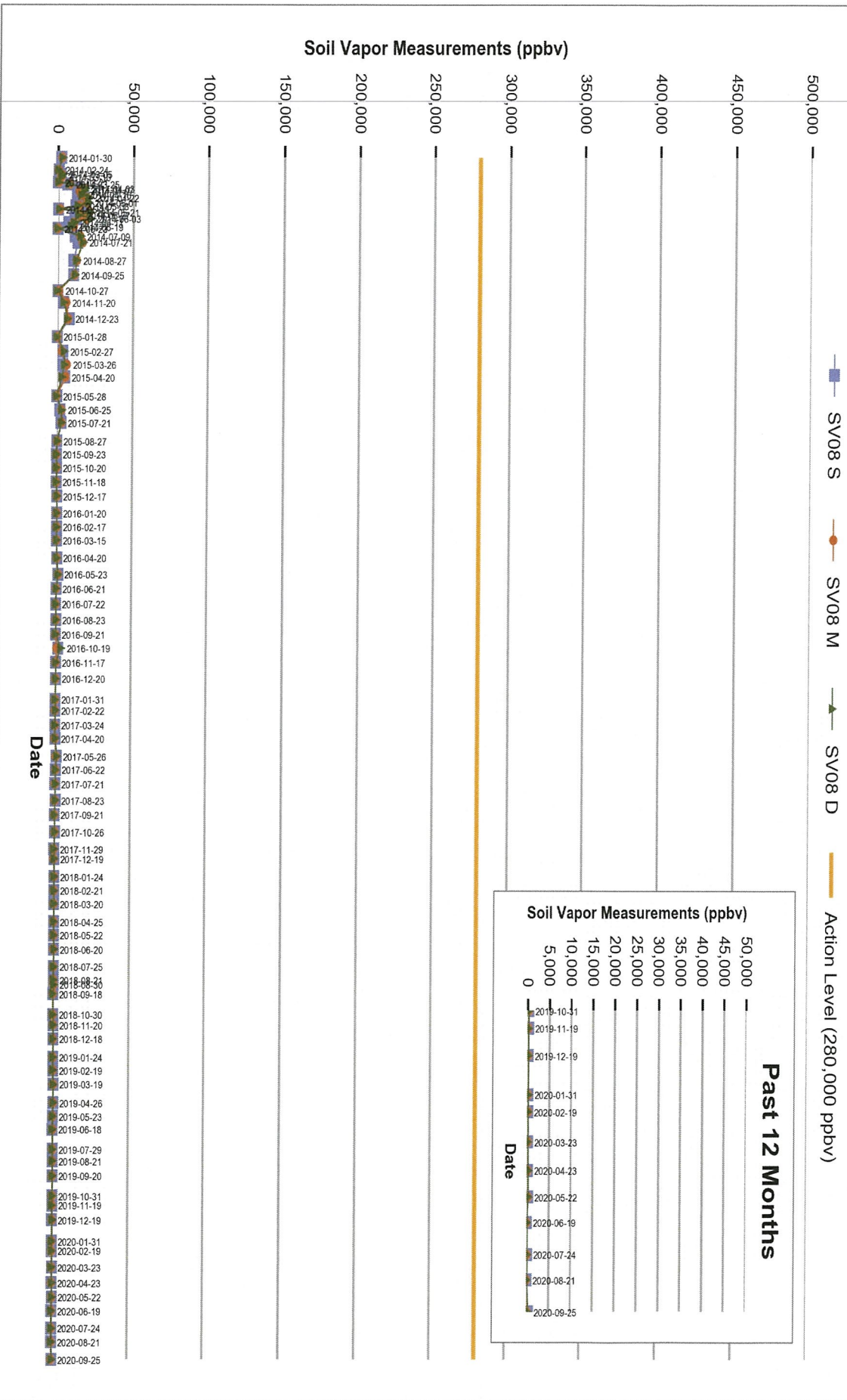


Notes (where applicable):  
 ppbv: Parts Per Billion by Volume  
 F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5  
 F-76: Marine Diesel, Fuel Number 76



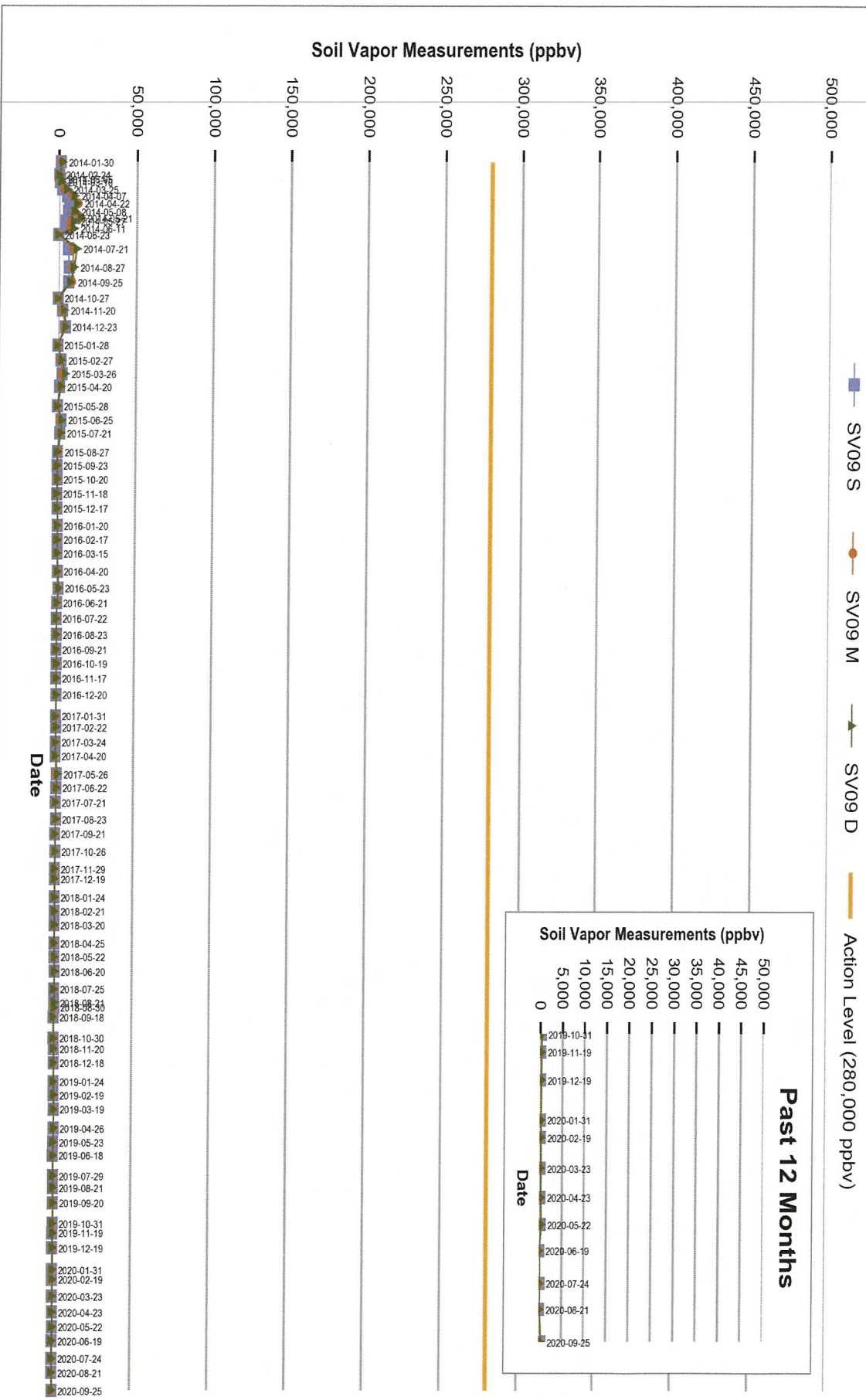
**Figure 7**  
**Red Hill - Tank 08 (JP-5)**  
**Soil Vapor Measurements (Jan 2014 to Sep 2020)**



Notes (where applicable):  
 ppbv: Parts Per Billion by Volume  
 F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5  
 F-76: Marine Diesel, Fuel Number 76

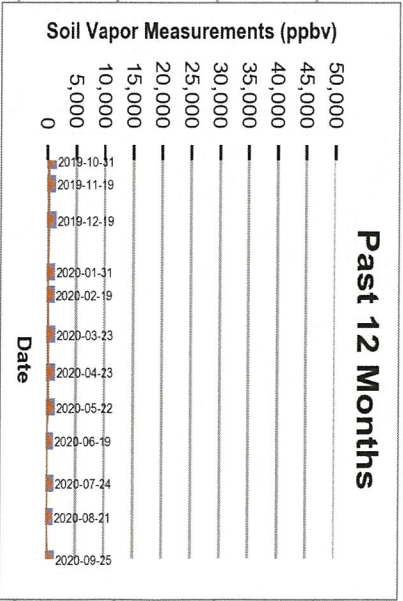
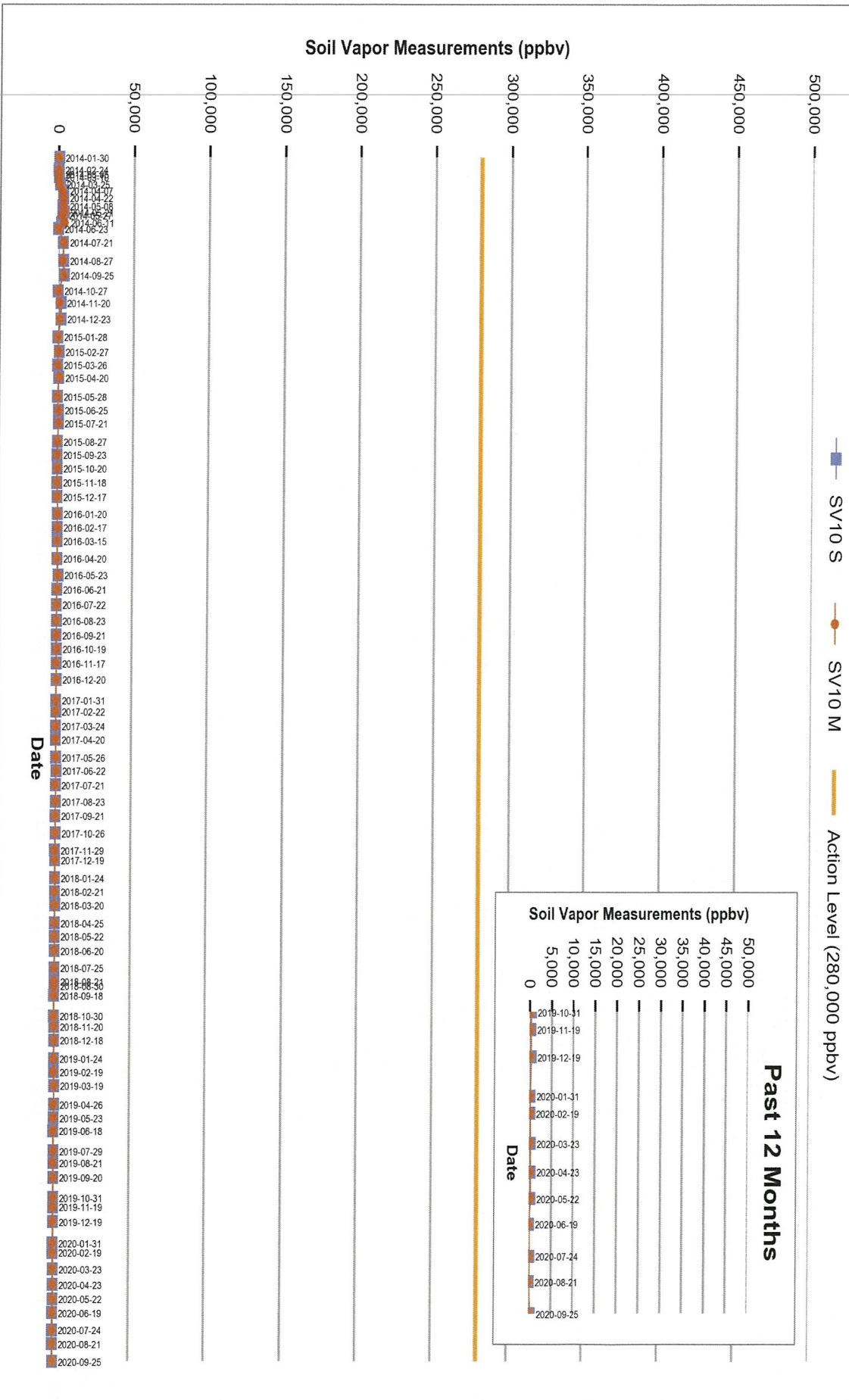
**Figure 8**  
**Red Hill - Tank 09 (JP-5)**  
**Soil Vapor Measurements (Jan 2014 to Sep 2020)**



Notes (where applicable):  
 ppbv: Parts Per Billion by Volume  
 F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5  
 F-76: Marine Diesel, Fuel Number 76

**Figure 9**  
**Red Hill - Tank 10 (JP-5)**  
**Soil Vapor Measurements (Jan 2014 to Sep 2020)**

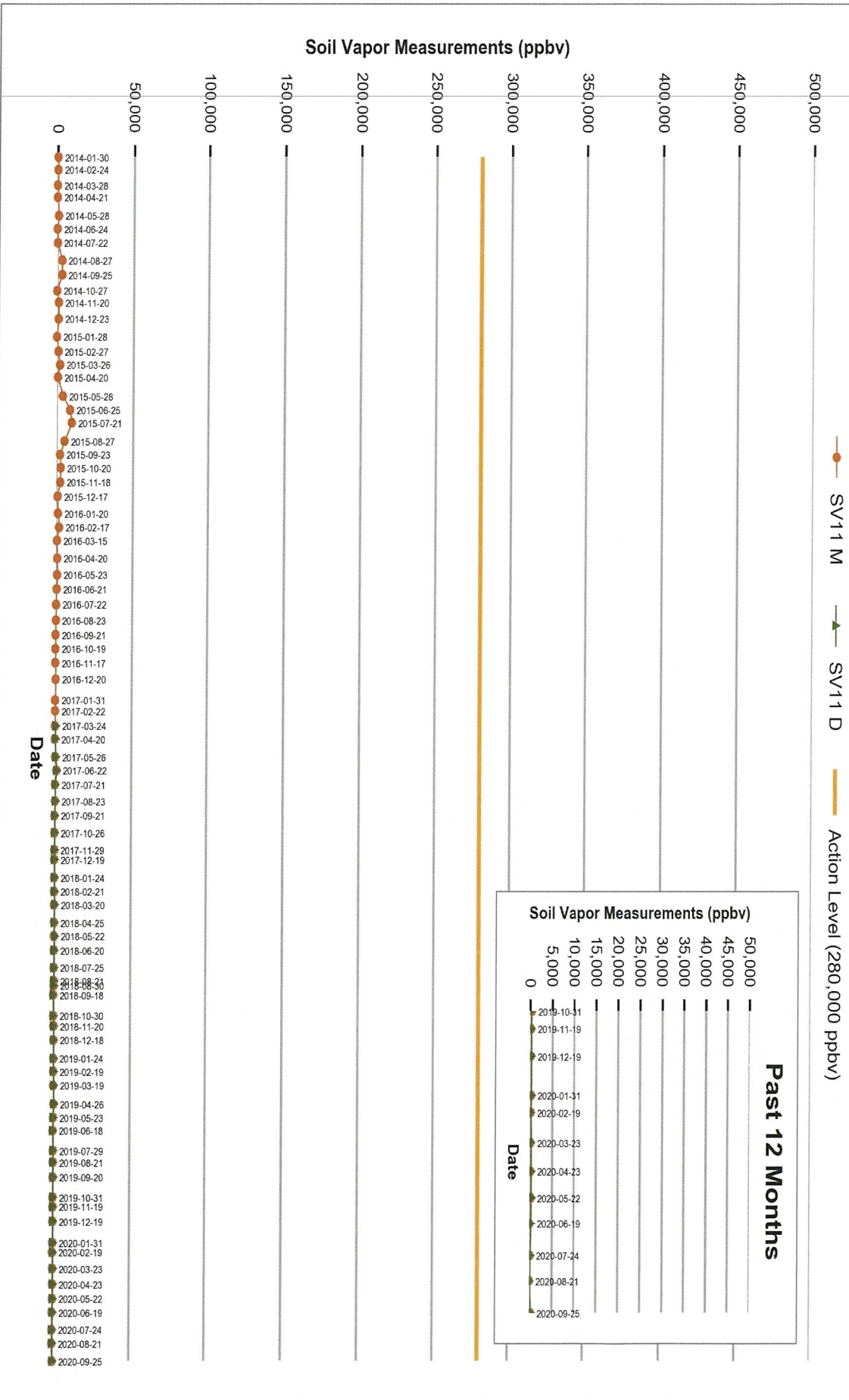


Notes (where applicable):  
 ppbv: Parts Per Billion by Volume  
 F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5  
 F-76: Marine Diesel, Fuel Number 76



**Figure 10**  
**Red Hill - Tank 11 (JP-5)**  
**Soil Vapor Measurements (Jan 2014 to Sep 2020)**

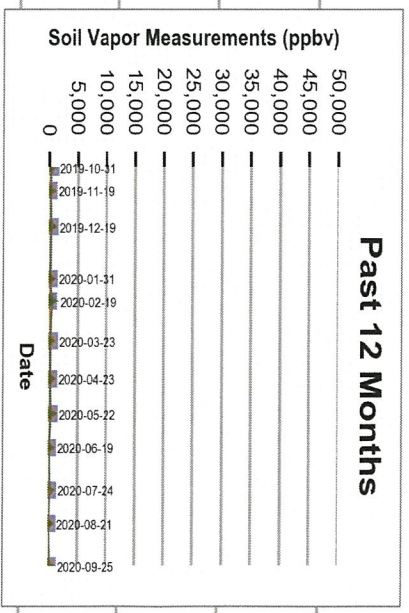
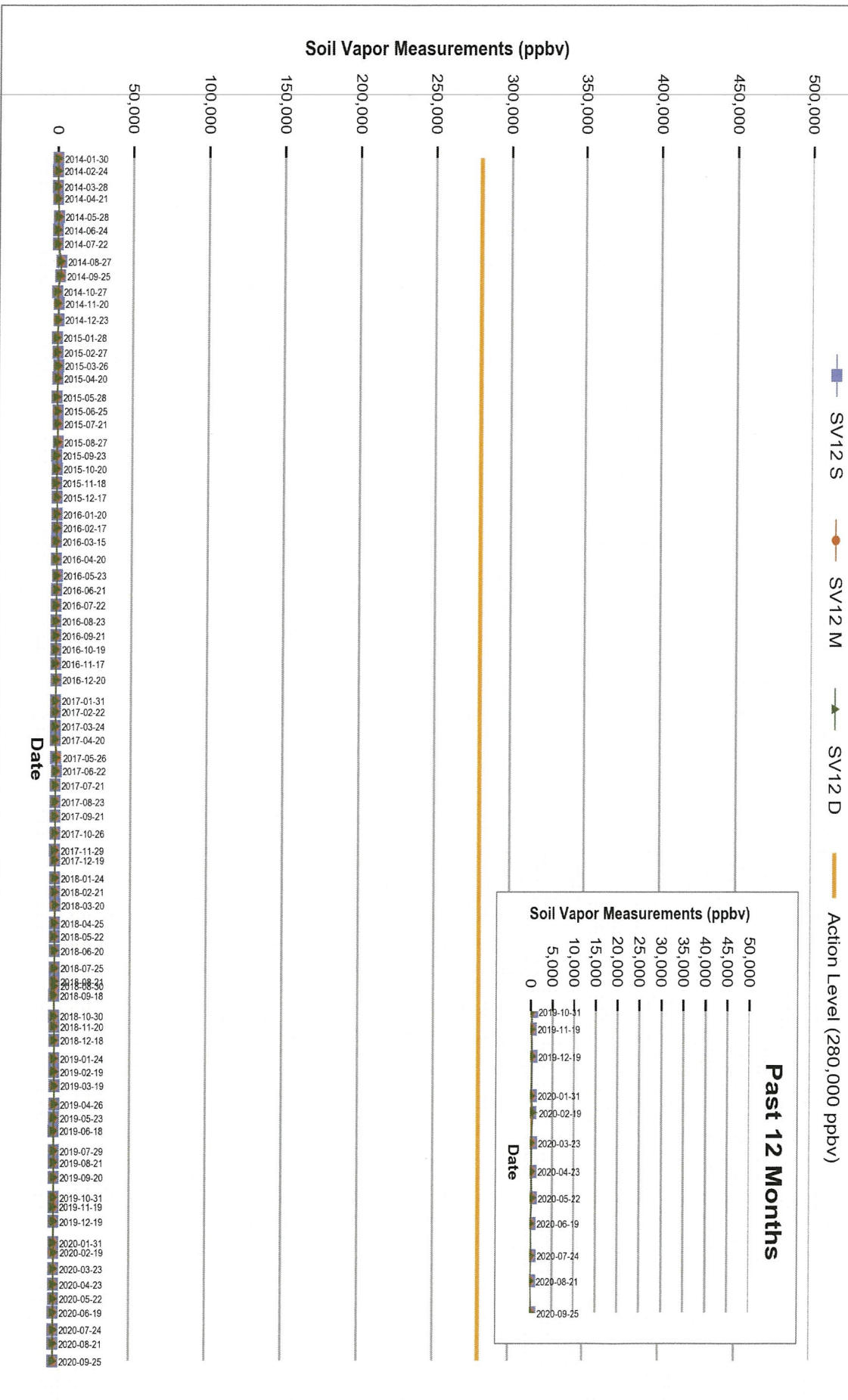


Notes (where applicable):  
 ppbv: Parts Per Billion by Volume  
 F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5  
 F-76: Marine Diesel, Fuel Number 76



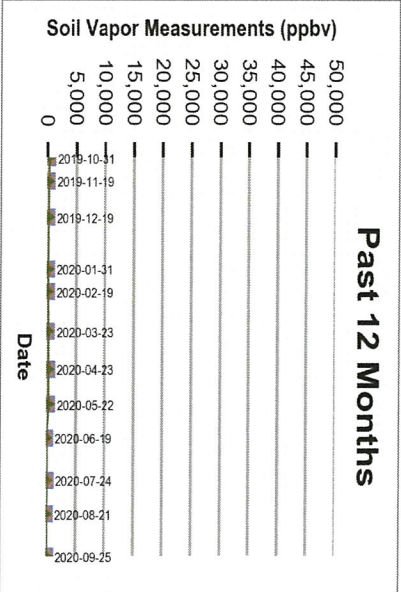
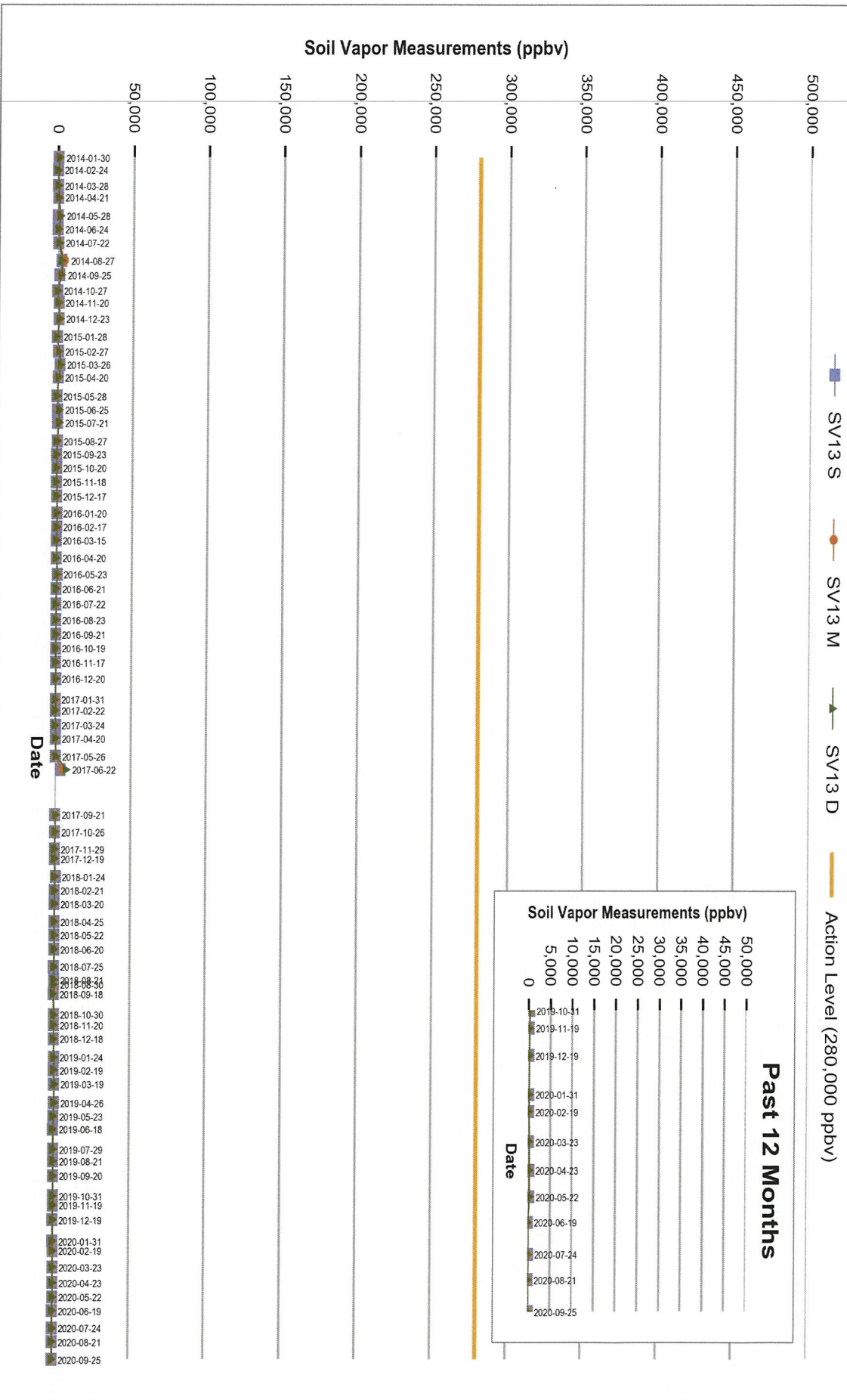
**Figure 11**  
**Red Hill - Tank 12 (JP-5)**  
**Soil Vapor Measurements (Jan 2014 to Sep 2020)**



Notes (where applicable):  
 ppbv: Parts Per Billion by Volume  
 F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5  
 F-76: Marine Diesel, Fuel Number 76

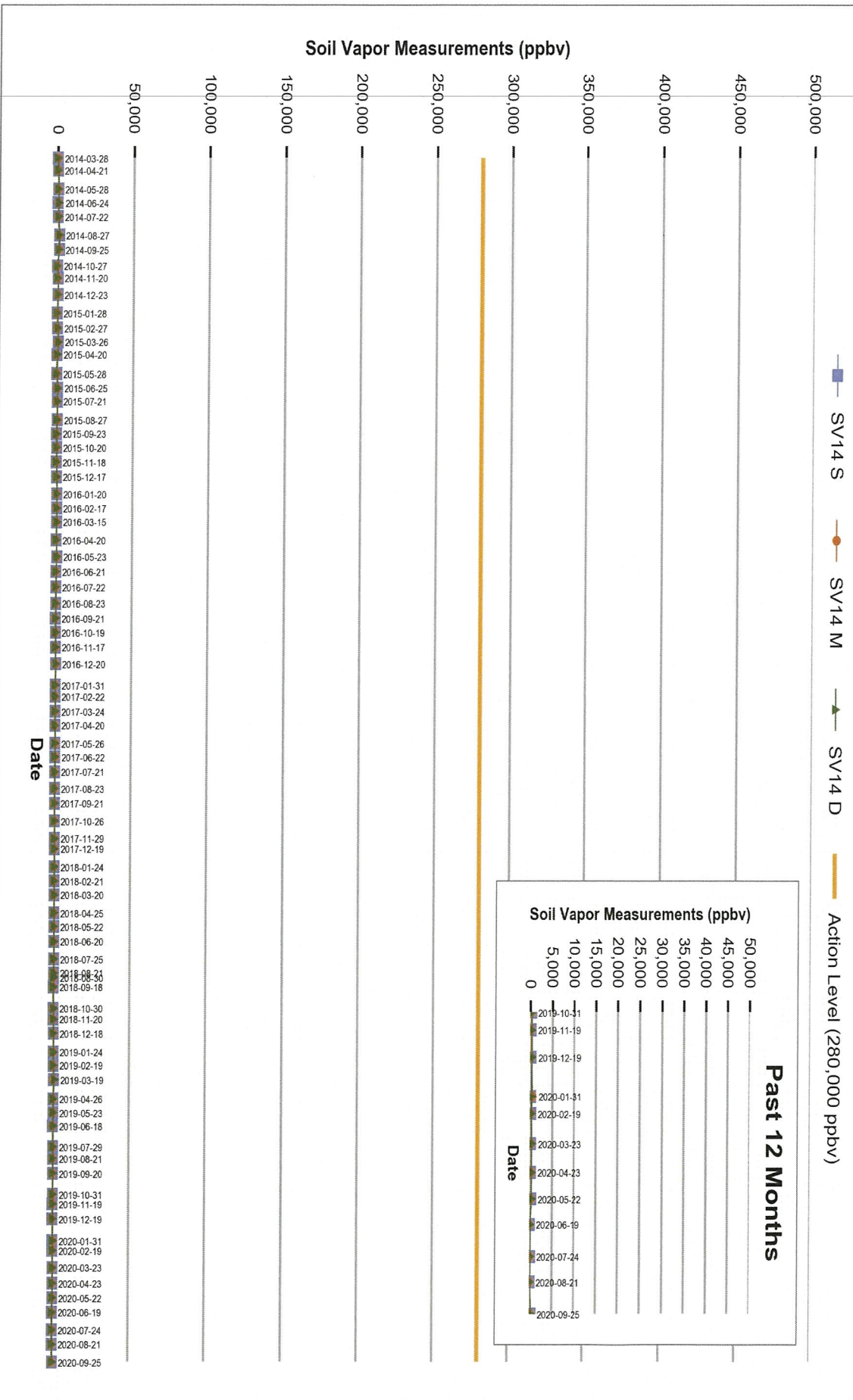
**Figure 12**  
**Red Hill - Tank 13 (JP-5)**  
**Soil Vapor Measurements (Jan 2014 to Sep 2020)**



Notes (where applicable):  
 ppbv: Parts Per Billion by Volume  
 F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5  
 F-76: Marine Diesel, Fuel Number 76

**Figure 13**  
**Red Hill - Tank 14 (JP-5)**  
**Soil Vapor Measurements (Jan 2014 to Sep 2020)**

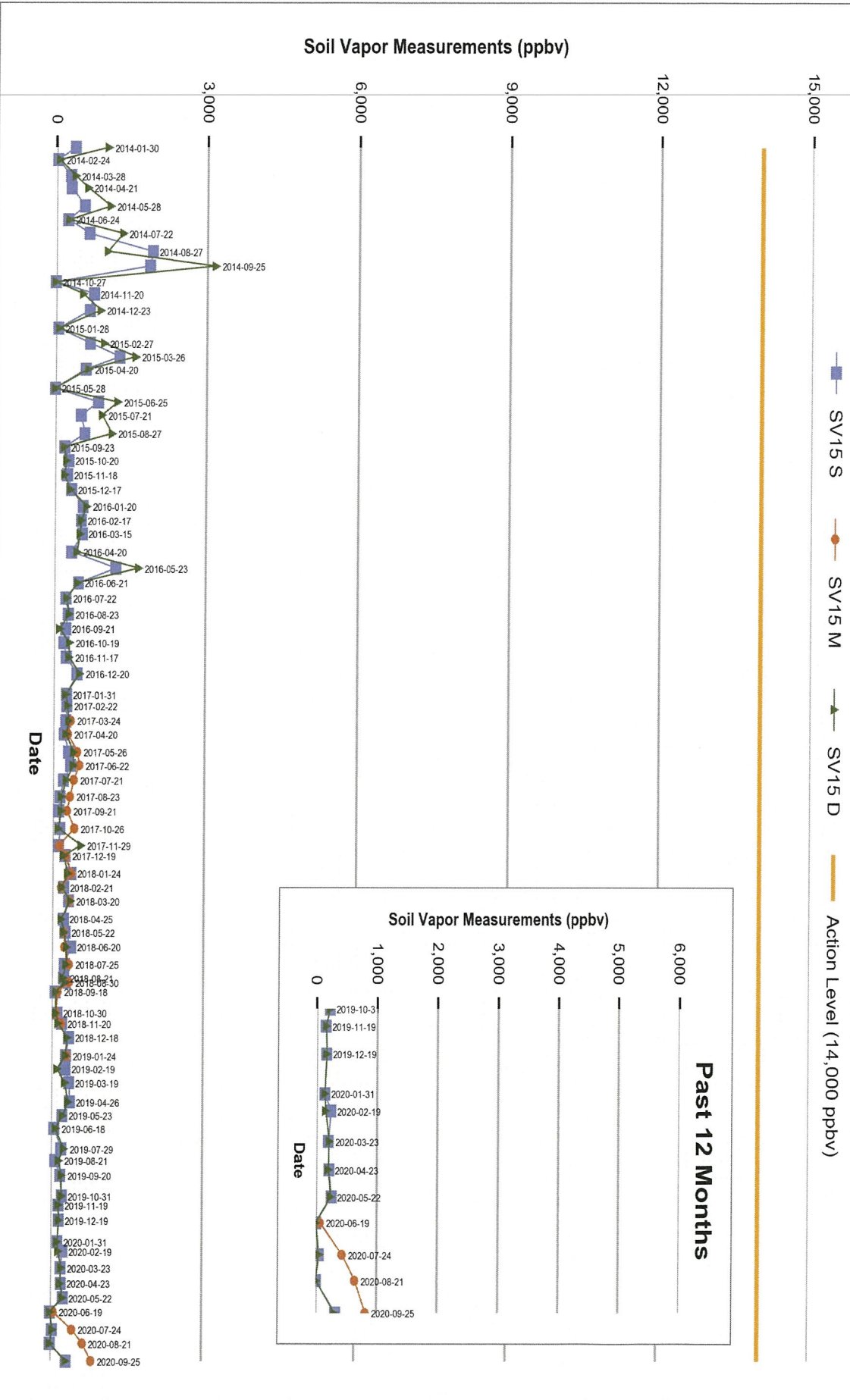


Notes (where applicable):  
 ppbv: Parts Per Billion by Volume  
 F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5  
 F-76: Marine Diesel, Fuel Number 76



**Figure 14**  
**Red Hill - Tank 15 (F-76)**  
**Soil Vapor Measurements (Jan 2014 to Sep 2020)**

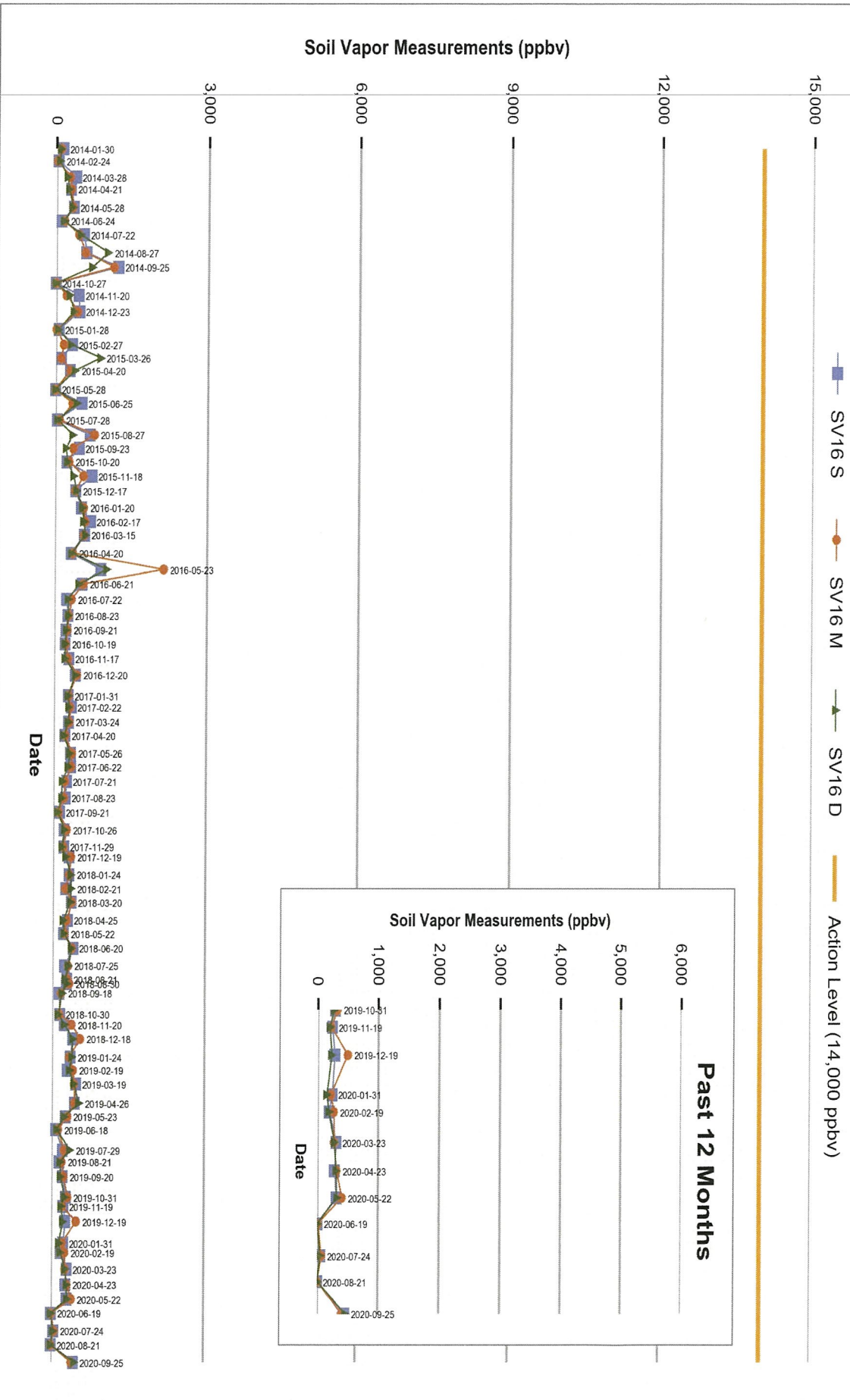


Notes (where applicable):  
 ppbv: Parts Per Billion by Volume  
 F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5  
 F-76: Marine Diesel, Fuel Number 76



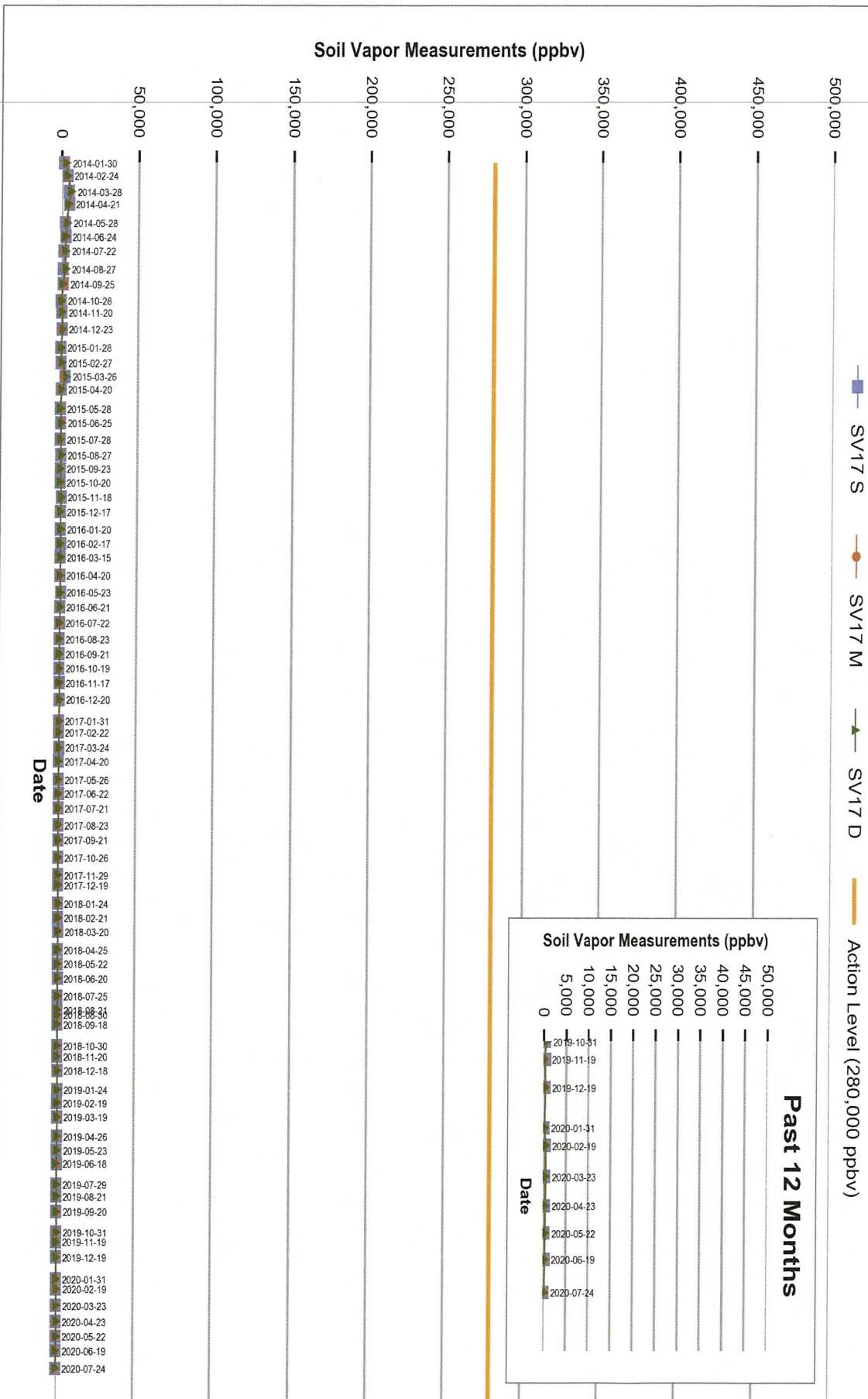
**Figure 15**  
**Red Hill - Tank 16 (F-76)**  
**Soil Vapor Measurements (Jan 2014 to Sep 2020)**



Notes (where applicable):  
 ppbv: Parts Per Billion by Volume  
 F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5  
 F-76: Marine Diesel, Fuel Number 76

**Figure 16**  
**Red Hill - Tank 17 (JP-5)**  
**Soil Vapor Measurements (Jan 2014 to Sep 2020) \***

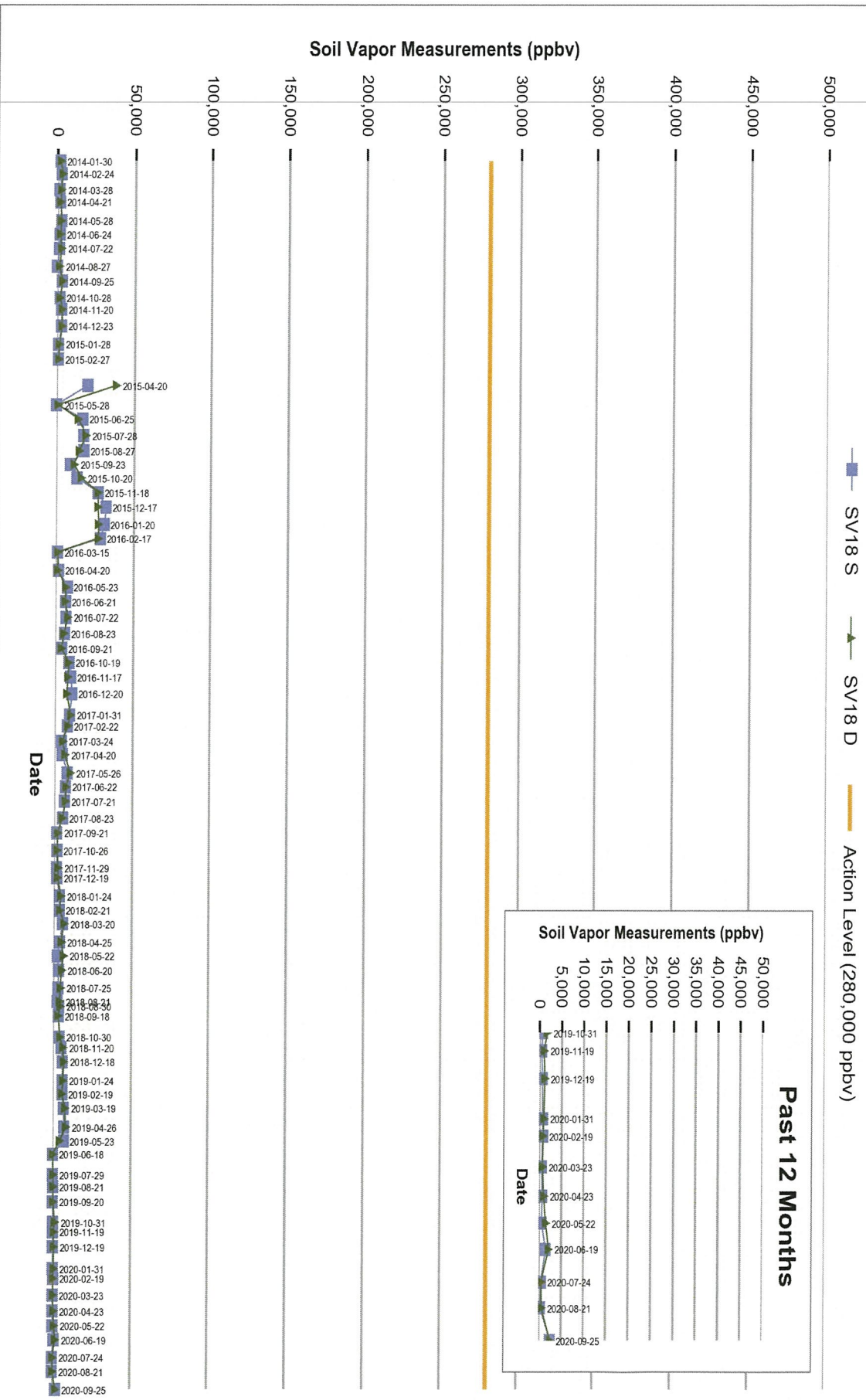


Notes (where applicable):  
 ppbv: Parts Per Billion by Volume  
 F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5  
 F-76: Marine Diesel, Fuel Number 76

\* Tank 17 is undergoing clean, inspect & repair (CIR) and has not been accessible during the August and September monitoring events.

**Figure 17**  
**Red Hill - Tank 18 (JP-5)**  
**Soil Vapor Measurements (Jan 2014 to Sep 2020)**

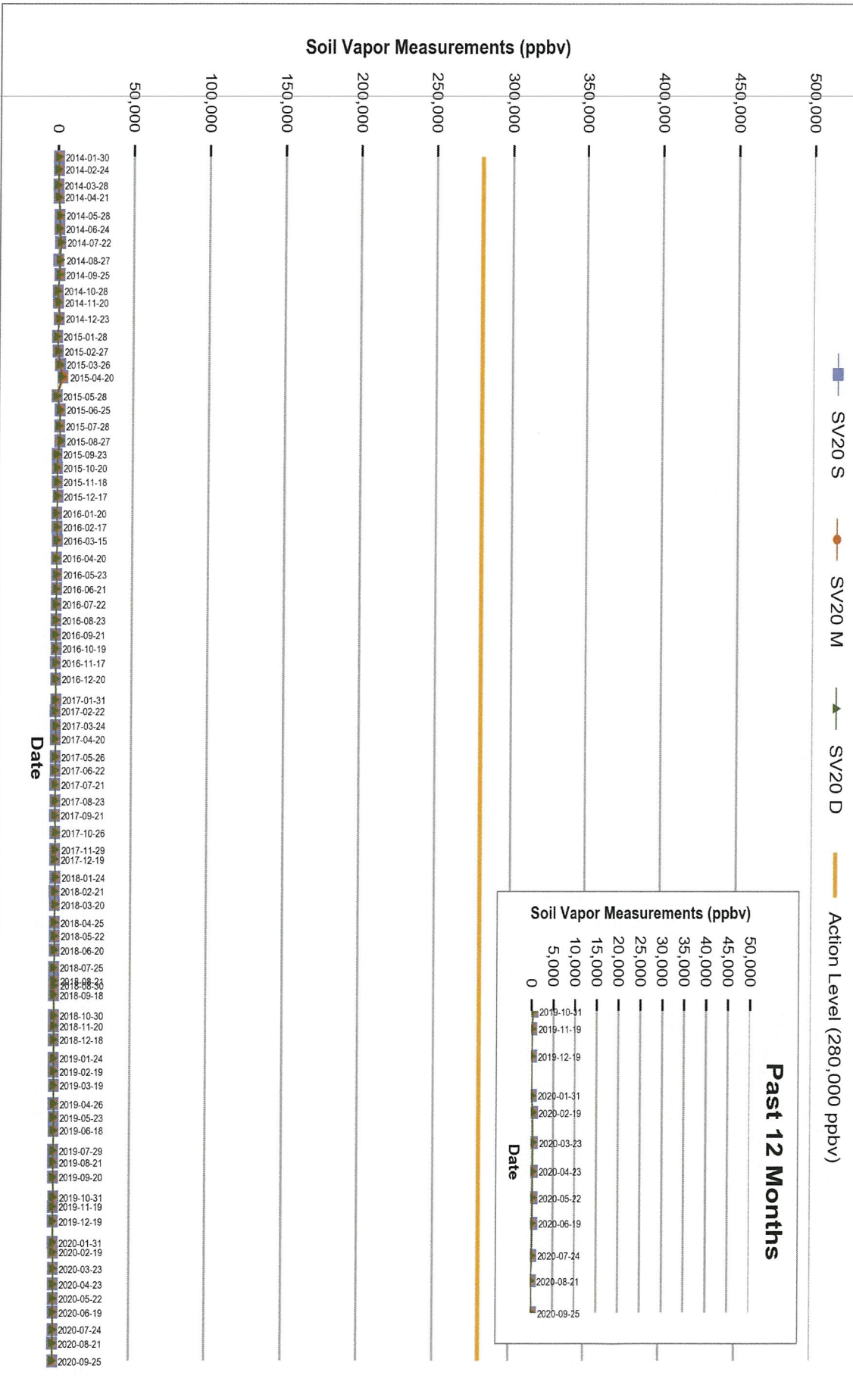


Notes (where applicable):  
 ppbv: Parts Per Billion by Volume  
 F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5  
 F-76: Marine Diesel, Fuel Number 76



**Figure 18**  
**Red Hill - Tank 20 (JP-5)**  
**Soil Vapor Measurements (Jan 2014 to Sep 2020)**



Notes (where applicable):  
 ppbv: Parts Per Billion by Volume  
 F-24: Jet Fuel, Fuel Number 24

JP-5: Jet Fuel, Propellant Number 5  
 F-76: Marine Diesel, Fuel Number 76



29 October 2020

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From: Fuel Department Deputy Director, NAVSUP FLC Pearl Harbor, HI  
To: Environmental Department, NAVFAC Pearl Harbor, HI

Subj: NAVSUP FLC PEARL HARBOR CAUSATIVE RESEARCH REPORT IRT RED HILL  
SOIL VAPOR MONITORING REPORT FOR SEPTEMBER 2020

Ref: (a) Red Hill Bulk Fuel Storage Facility Groundwater Protection Plan  
(b) Red Hill Soil Vapor Monitoring Report for Round 150, dated 02 Oct 2020

1. Ref (a) requires NAVSUP FLCPH investigate possible fuel leaks. Ref (b) reported the following soil vapor monitoring results at the Red Hill Fuel Storage Facility:

- Slight increase in trend in VOC concentrations at Tanks 02 to 06, 07 to 10, 11, 12, 13 to 16, and 18.

- A moderately increasing trend at Tank 5.

2. FLCPH causative research and findings:

- a. The following Red Hill Fuel Storage Facility Underground Storage Tanks (USTs) are Out of Service: Tanks 1, 13, 14, 17, 18, 19.

- b. Reviewed all AFHE Unscheduled Fuel Movement (UFM) Alarm Summaries and UFM Reports. There was a total of one (1) UFM recorded between sampling events 149 and 150 during the period of 21 August 2020 – 25 September 2020:

- 01 Sep 20 – RH20: A low level UFM alarm occurred on RH20 after creating an evolution. The UFM occurred due to “operator error”, when the Control Room Operator set an evolution and didn’t initiate the evolution in time to issue to a commercial truck. Dispatched Rover to tank to investigate tank, pipeline, and manually gauge the tank. All conditions were normal. Investigative actions confirmed no release of fuel from the tank occurred. No trouble ticket required. UFM alarm was result of operator error.

- c. Red Hill maintenance and repair contractors did not report any factors that could have influenced increase in trends.

- d. Reviewed Red Hill Inventory Trend Analysis Reports for August and September 2020; reports did not reveal evidence of a loss of fuel in any Red Hill tank.

- e. Inspection of the area surrounding all Red Hill tanks did not show evidence of a fuel leak or evidence that any fuel had spilled in the area.

- f. All active tanks have passed tank tightness testing within the required periodicity.

**ENCLOSURE(2)**

3. There is no evidence of a leaking tank in the Red Hill Complex or evidence of a spill that may have contributed to elevated soil vapor VOC levels in the area of elevated VOC concentrations.

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WIS.1064149357    Date: 2020.10.29 12:57:35 -10'00'  
John Floyd