



DORAL FLORIDA FACILITY FIRE

PRELIMINARY AIR MONITORING

SUMMARY

Doral, Florida

07:00 February 23 - 07:00 February 24, 2023

Project #025114

1.0 INTRODUCTION

On February 16, 2023, Covanta Energy requested that CTEH®, LLC provide air monitoring and air sampling support in response to a fire at a Covanta Energy facility in Doral, Florida. CTEH® personnel mobilized to the incident site and began real-time air monitoring in the surrounding community at approximately 0800 Eastern Standard Time (EST) February 23, 2023. This report summarizes the real-time air monitoring data collected from 0700 EST February 23 to 0700 EST February 24, 2023.

2.0 AIR MONITORING AND SAMPLING METHODS

Real-time air monitoring refers to the use of direct-reading instruments to provide a near-instantaneous readout of a chemical concentration in air. CTEH® personnel developed and implemented an Air Sampling and Analysis Plan (SAP), which was reviewed by the U.S. EPA Region 4 On-Scene Coordinator (EPA Region 4 OSC) and other members of Incident Command, to characterize the nature and extent of emissions from the fire. During this reporting period, CTEH personnel conducted real-time air monitoring in accordance with the Community Monitoring plan outlined in the SAP. Community Monitoring was conducted in the residential and commercial locations surrounding the incident site, not necessarily occupied by members of the community. All Community Monitoring was conducted at a height representative of the breathing zone.

During this reporting period, CTEH® personnel conducted handheld real-time air monitoring for carbon monoxide (CO), hydrogen sulfide (H₂S), hydrogen cyanide (HCN), atmospheric flammability measured as a percentage of the lower explosive limit (%LEL), particulate matter less than 2.5 microns (PM_{2.5}), and volatile organic compounds (VOCs). Real-time air monitoring was conducted using RAE Systems by Honeywell MultiRAE, TSI DustTrak, and TSI SidePak AM520 handheld instruments.

CTEH personnel also deployed stationary radio-telemetering real-time air monitoring instruments (RAE Systems by Honeywell AreaRAE instruments) at four fixed locations. AreaRAE instruments were used to monitor for CO, H₂S, %LEL, HCN, and VOCs every 15 seconds. In addition, four TSI SidePak AM520 instruments were deployed, co-located with AreaRAE instruments, to log PM_{2.5} data.

Please note that, in addition to fire smoke, automobile exhaust is another source of particulate matter that is detectable on PM_{2.5} instrumentation. PM_{2.5} in exhaust from cars and trucks onsite during response activities and on nearby roads may be associated with momentary elevated PM_{2.5} readings.

To supplement real-time air monitoring, analytical air samples were collected at discrete locations around the incident site, co-located with AreaRAE instruments. Samples were collected for asbestos, polynuclear aromatic hydrocarbons, and metals. All samples will be shipped under chain-of-custody to Pace Analytical, an American Industrial Hygiene Association-accredited laboratory for analysis.

3.0 AIR MONITORING RESULTS

A summary of handheld real-time readings by location is provided in **Table 1**. Radio-telemetering AreaRAE data is provided in **Table 2**. Data-logged PM_{2.5} readings are provided in **Table 3**. Real-time air monitoring action level references, selected in coordination with the EPA Region 4 OSC, are provided in **Table 4**. A PM_{2.5} action level sheet provided by the EPA Region 4 OSC is included as **Attachment A**. Maps of the incident location and air monitoring/sampling locations are provided in **Attachment B**. Graphical representations of radio-telemetering AreaRAE data are provided in **Attachment C**. Graphical representations of data-logged PM_{2.5} readings are provided in **Attachment D**.

Table 1: Community Handheld Real-Time Air Monitoring Results By Location[†]

| Location Code | Location Description | Analyte | Instrument(s) | Number of Readings | Number of Detections | Range of Detections* | Period Average* | Action Level |
|---------------|----------------------------------|-------------------|----------------|--------------------|----------------------|---------------------------|----------------------|------------------------------|
| FRT-001 | 107 and 66th | %LEL | MultiRAE | 2 | 0 | < 1 % | < 1 % | 10 % |
| | | CO | MultiRAE | 2 | 0 | < 1 ppm | < 1 ppm | 83 ppm |
| | | H ₂ S | MultiRAE | 2 | 0 | < 0.1 ppm | < 0.1 ppm | 0.5 ppm |
| | | HCN | MultiRAE | 2 | 0 | < 0.5 ppm | < 0.5 ppm | 2 ppm |
| | | PM _{2.5} | AM520/DustTrak | 17 | 17 | 13 - 43 µg/m ³ | 19 µg/m ³ | See PM2.5 Action Level Sheet |
| | | VOCs | MultiRAE | 2 | 0 | < 0.1 ppm | < 0.1 ppm | 1 ppm |
| FRT-002 | CVS at 107 and 74 | %LEL | MultiRAE | 2 | 0 | < 1 % | < 1 % | 10 % |
| | | CO | MultiRAE | 3 | 0 | < 1 ppm | < 1 ppm | 83 ppm |
| | | H ₂ S | MultiRAE | 3 | 0 | < 0.1 ppm | < 0.1 ppm | 0.5 ppm |
| | | HCN | MultiRAE | 2 | 0 | < 0.5 ppm | < 0.5 ppm | 2 ppm |
| | | PM _{2.5} | AM520/DustTrak | 17 | 17 | 12 - 38 µg/m ³ | 19 µg/m ³ | See PM2.5 Action Level Sheet |
| | | VOCs | MultiRAE | 2 | 0 | < 0.1 ppm | < 0.1 ppm | 1 ppm |
| FRT-003 | Ronald Reagan High School | %LEL | MultiRAE | 2 | 0 | < 1 % | < 1 % | 10 % |
| | | CO | MultiRAE | 2 | 0 | < 1 ppm | < 1 ppm | 83 ppm |
| | | H ₂ S | MultiRAE | 2 | 0 | < 0.1 ppm | < 0.1 ppm | 0.5 ppm |
| | | HCN | MultiRAE | 2 | 0 | < 0.5 ppm | < 0.5 ppm | 2 ppm |
| | | PM _{2.5} | AM520/DustTrak | 14 | 14 | 12 - 21 µg/m ³ | 17 µg/m ³ | See PM2.5 Action Level Sheet |
| | | VOCs | MultiRAE | 2 | 0 | < 0.1 ppm | < 0.1 ppm | 1 ppm |
| FRT-004 | 8400 102nd Ave, Southeast Corner | %LEL | MultiRAE | 2 | 0 | < 1 % | < 1 % | 10 % |
| | | CO | MultiRAE | 2 | 0 | < 1 ppm | < 1 ppm | 83 ppm |
| | | H ₂ S | MultiRAE | 2 | 0 | < 0.1 ppm | < 0.1 ppm | 0.5 ppm |
| | | HCN | MultiRAE | 2 | 0 | < 0.5 ppm | < 0.5 ppm | 2 ppm |
| | | PM _{2.5} | AM520/DustTrak | 14 | 14 | 13 - 20 µg/m ³ | 16 µg/m ³ | See PM2.5 Action Level Sheet |
| | | VOCs | MultiRAE | 2 | 0 | < 0.1 ppm | < 0.1 ppm | 1 ppm |

| Location Code | Location Description | Analyte | Instrument(s) | Number of Readings | Number of Detections | Range of Detections* | Period Average* | Action Level |
|---------------|-------------------------------------|-------------------|----------------|--------------------|----------------------|---------------------------|----------------------|------------------------------|
| FRT-005 | Andrea Castillo Preparatory Academy | %LEL | MultiRAE | 2 | 0 | < 1 % | < 1 % | 10 % |
| | | CO | MultiRAE | 2 | 0 | < 1 ppm | < 1 ppm | 83 ppm |
| | | H ₂ S | MultiRAE | 2 | 0 | < 0.1 ppm | < 0.1 ppm | 0.5 ppm |
| | | HCN | MultiRAE | 2 | 0 | < 0.5 ppm | < 0.5 ppm | 2 ppm |
| | | PM _{2.5} | AM520/DustTrak | 16 | 16 | 12 - 34 µg/m ³ | 18 µg/m ³ | See PM2.5 Action Level Sheet |
| | | VOCs | MultiRAE | 2 | 0 | < 0.1 ppm | < 0.1 ppm | 1 ppm |
| FRT-006 | Baptist Health Hospital ER | %LEL | MultiRAE | 2 | 0 | < 1 % | < 1 % | 10 % |
| | | CO | MultiRAE | 3 | 0 | < 1 ppm | < 1 ppm | 83 ppm |
| | | H ₂ S | MultiRAE | 2 | 0 | < 0.1 ppm | < 0.1 ppm | 0.5 ppm |
| | | HCN | MultiRAE | 2 | 0 | < 0.5 ppm | < 0.5 ppm | 2 ppm |
| | | PM _{2.5} | AM520/DustTrak | 15 | 15 | 13 - 45 µg/m ³ | 21 µg/m ³ | See PM2.5 Action Level Sheet |
| | | VOCs | MultiRAE | 2 | 0 | < 0.1 ppm | < 0.1 ppm | 1 ppm |
| FRT-007 | Impact Centre at Doral Entrance | %LEL | MultiRAE | 2 | 0 | < 1 % | < 1 % | 10 % |
| | | CO | MultiRAE | 3 | 0 | < 1 ppm | < 1 ppm | 83 ppm |
| | | H ₂ S | MultiRAE | 2 | 0 | < 0.1 ppm | < 0.1 ppm | 0.5 ppm |
| | | HCN | MultiRAE | 2 | 0 | < 0.5 ppm | < 0.5 ppm | 2 ppm |
| | | PM _{2.5} | AM520/DustTrak | 14 | 14 | 12 - 25 µg/m ³ | 16 µg/m ³ | See PM2.5 Action Level Sheet |
| | | VOCs | MultiRAE | 2 | 0 | < 0.1 ppm | < 0.1 ppm | 1 ppm |
| FRT-008 | Aldi Parking lot | %LEL | MultiRAE | 2 | 0 | < 1 % | < 1 % | 10 % |
| | | CO | MultiRAE | 6 | 0 | < 1 ppm | < 1 ppm | 83 ppm |
| | | H ₂ S | MultiRAE | 2 | 0 | < 0.1 ppm | < 0.1 ppm | 0.5 ppm |
| | | HCN | MultiRAE | 2 | 0 | < 0.5 ppm | < 0.5 ppm | 2 ppm |
| | | PM _{2.5} | AM520/DustTrak | 16 | 16 | 13 - 38 µg/m ³ | 18 µg/m ³ | See PM2.5 Action Level Sheet |
| | | VOCs | MultiRAE | 2 | 0 | < 0.1 ppm | < 0.1 ppm | 1 ppm |
| FRT-009 | Side of 58th, Next to Golf Course. | %LEL | MultiRAE | 2 | 0 | < 1 % | < 1 % | 10 % |
| | | CO | MultiRAE | 4 | 0 | < 1 ppm | < 1 ppm | 83 ppm |
| | | H ₂ S | MultiRAE | 2 | 0 | < 0.1 ppm | < 0.1 ppm | 0.5 ppm |
| | | HCN | MultiRAE | 2 | 0 | < 0.5 ppm | < 0.5 ppm | 2 ppm |
| | | PM _{2.5} | AM520/DustTrak | 13 | 13 | 10 - 56 µg/m ³ | 22 µg/m ³ | See PM2.5 Action Level Sheet |
| | | VOCs | MultiRAE | 2 | 0 | < 0.1 ppm | < 0.1 ppm | 1 ppm |
| Station 1 | South Fenceline | PM _{2.5} | AM520/DustTrak | 8 | 8 | 13 - 20 µg/m ³ | 17 µg/m ³ | See PM2.5 Action Level Sheet |
| Station 2 | Southeast Corner of Stack | PM _{2.5} | AM520/DustTrak | 8 | 8 | 13 - 27 µg/m ³ | 20 µg/m ³ | See PM2.5 Action Level Sheet |

| Location Code | Location Description | Analyte | Instrument(s) | Number of Readings | Number of Detections | Range of Detections* | Period Average* | Action Level |
|---------------|----------------------|-------------------|----------------|--------------------|----------------------|---------------------------|----------------------|------------------------------|
| Station 3 | West Fenceline | HCN | MultiRAE | 1 | 0 | < 0.5 ppm | < 0.5 ppm | 2 ppm |
| | | PM _{2.5} | AM520/DustTrak | 8 | 8 | 14 - 26 µg/m ³ | 19 µg/m ³ | See PM2.5 Action Level Sheet |
| | | VOCs | MultiRAE | 2 | 0 | < 0.1 ppm | < 0.1 ppm | 1 ppm |
| Station 4 | North Fenceline | PM _{2.5} | AM520/DustTrak | 8 | 8 | 2 - 33 µg/m ³ | 18 µg/m ³ | See PM2.5 Action Level Sheet |

* Note: This is a preliminary data summary, indicating that the data provided have not undergone the full quality assurance and quality control (QAQC) process and should be considered preliminary at this time.

* If no detectable concentration was observed, the instrument detection limit preceded by a "<" is listed.

ppm = parts per million; µg/m³ = micrograms per cubic meter

Table 2: Radio-Telemetering Air Monitoring Results[†]

| Location Code | Location | Analyte | Number of Readings | Number of Detections | Concentration Range* | Period Average* | Action Level |
|---------------|---------------------------|------------------|--------------------|----------------------|----------------------|-----------------|--------------|
| Station 01 | South Fenceline | %LEL | 822 | 0 | < 1 % | < 1 % | 10 % |
| | | CO | 3,144 | 0 | < 1 ppm | < 1 ppm | 83 ppm |
| | | H ₂ S | 3,144 | 0 | < 0.1 ppm | < 0.1 ppm | 0.5 ppm |
| | | HCN | 3,144 | 0 | < 1 ppm | < 1 ppm | 2 ppm |
| | | VOCs | 3,144 | 108 | 0.1 - 0.2 ppm | 0.01 ppm | 1 ppm |
| Station 02 | Southeast Corner of Stack | %LEL | 3,460 | 0 | < 1 % | < 1 % | 10 % |
| | | CO | 3,460 | 0 | < 1 ppm | < 1 ppm | 83 ppm |
| | | H ₂ S | 3,460 | 0 | < 0.1 ppm | < 0.1 ppm | 0.5 ppm |
| | | HCN | 3,460 | 0 | < 1 ppm | < 1 ppm | 2 ppm |
| | | VOCs | 3,460 | 0 | < 0.1 ppm | < 0.1 ppm | 1 ppm |
| Station 03 | West Fenceline | %LEL | 1,728 | 0 | < 1 % | < 1 % | 10 % |
| | | CO | 1,728 | 42 | 2 - 10 ppm | 0.09 ppm | 83 ppm |
| | | H ₂ S | 1,728 | 0 | < 0.1 ppm | < 0.1 ppm | 0.5 ppm |
| | | HCN | 1,728 | 0 | < 1 ppm | < 1 ppm | 2 ppm |
| | | VOCs | 1,730 | 299 | 0.1 - 0.3 ppm | 0.05ppm | 1 ppm |
| Station 04 | North Fenceline | %LEL | 3,934 | 0 | < 1 % | < 1 % | 10 % |
| | | CO | 3,934 | 0 | < 1 ppm | < 1 ppm | 83 ppm |
| | | H ₂ S | 3,934 | 0 | < 0.1 ppm | < 0.1 ppm | 0.5 ppm |
| | | HCN | 3,934 | 0 | < 1 ppm | < 1 ppm | 2 ppm |
| | | VOCs | 3,934 | 0 | < 0.1 ppm | < 0.1 ppm | 1 ppm |

* Note: This is a preliminary data summary, indicating that the data provided have not undergone the full quality assurance and quality control (QAQC) process and should be considered preliminary at this time.

* If no detectable concentration was observed, the instrument detection limit preceded by a "<" is listed

ppm = parts per million

Table 3: Data-Logged PM_{2.5} Real-Time Air Monitoring Results[†]

| Location Code | Location Description | Number of Readings | Concentration Range | Period Average* | Action Level |
|---------------|---------------------------|--------------------|----------------------------|----------------------|------------------------------|
| Station 1 | South Fenceline | 39,888 | 4 - 152 µg/m ³ | 13 µg/m ³ | See PM2.5 Action Level Sheet |
| Station 2 | Southeast Corner of Stack | 40,763 | 12 - 285 µg/m ³ | 31 µg/m ³ | See PM2.5 Action Level Sheet |
| Station 3 | West Fenceline | 41,213 | 10 - 580 µg/m ³ | 34 µg/m ³ | See PM2.5 Action Level Sheet |
| Station 4 | North Fenceline | 25,868 | 13 - 406 µg/m ³ | 37 µg/m ³ | See PM2.5 Action Level Sheet |

[†] Note: This is a preliminary data summary, indicating that the data provided have not undergone the full quality assurance and quality control (QAQC) process and should be considered preliminary at this time. PM_{2.5} in exhaust from cars and trucks onsite during response activities and on nearby roads may be associated with momentary elevated PM_{2.5} readings.

* Data collected from 07:00 February 23 to 06:07 on February 24, 2023. At approximately 13:09 on February 23, the instrument at Station 4 experienced a malfunction. Instrument activity was restored at approximately 21:54.

µg/m³ = micrograms per cubic meter

Table 4: Action Level References[†]

| Analyte | Definition | Action Level Reference |
|-------------------|----------------------------------|---|
| VOCs | Volatile Organic Compounds | Temporary Emergency Exposure Limit (TEEL-0) for Benzene |
| CO | Carbon Monoxide | Acute Exposure Guideline Level (AEGL-2) 1-hr |
| H ₂ S | Hydrogen Sulfide | AEGL-1, 1 hr |
| %LEL | Lower Explosive Limit | 29 CFR 1910.146, Confined Spaces |
| HCN | Hydrogen Cyanide | AEGL-1, 1 hr |
| PM _{2.5} | Particulate Matter < 2.5 Microns | See PM2.5 Action Level Sheet |

[†] Action levels selected in coordination with EPA Region 4 OSC

4.0 METEOROLOGICAL CONDITIONS

Attachment E contains a wind rose depicting wind speed and direction for this reporting period. Wind data is obtained from publicly available information collected at the Miami International Airport.

Attachment A

PM_{2.5} Action Level Sheet

Provided by EPA Region 4 OSC

PM_{2.5} (Particulate Matter ≤ 2.5 microns) Community Action Threshold Levels

| 1-Hour Average (µg/m ³) | 24-Hour Average (µg/m ³) | Level of Health Concern | Meaning | Action |
|-------------------------------------|--------------------------------------|---------------------------------------|--|--|
| 0.0 - 40.0 | 0.0-12.0 | Good | Air Quality is considered satisfactory, and air pollution poses little or no risk. | Implement communication plan. |
| 40.1 - 80.0 | 12.1 - 35.4 | Moderate | Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution. | Issue public announcement about health effects. Stay out of areas with visible smoke. |
| 80.1 - 175.0 | 35.5 - 55.4 | Unhealthy for Sensitive Groups | Members of sensitive groups may experience health effects. The general public is not likely to be affected. | Recommend evacuation or shelter-in-place for sensitive populations. |
| 175.1 - 300.0 | 55.5 - 150.4 | Unhealthy | Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects. | Consider closing schools and cancelling outdoor events. Recommend shelter-in-place for affected neighborhoods. |
| 300.1 - 500.0 | 150.5 - 250.4 | Very Unhealthy | Health warnings of emergency conditions. The entire population is more likely to be affected. | Consider closing schools and cancel all outdoor events. Recommend shelter-in-place and/or evacuation for affected neighborhoods. |
| > 500.0 | > 250.5 | Hazardous | Health alert: everyone may experience more serious health effects. | Recommend closing schools & cancel outdoor events. Recommend closing workplaces and evacuating affected neighborhoods. |

Attachment B

Maps

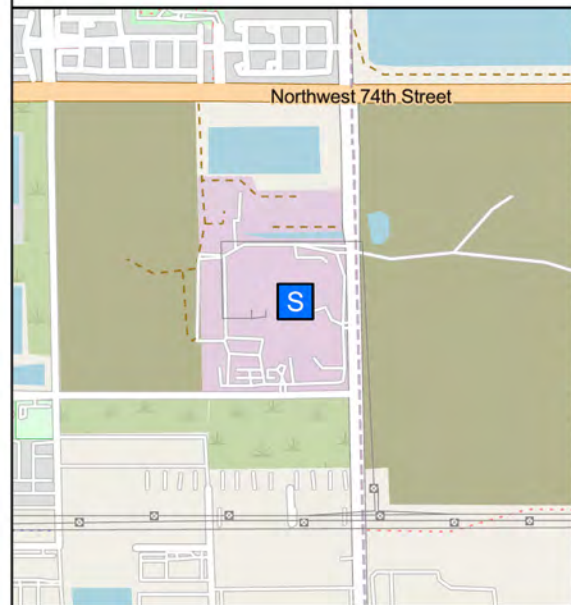


Doral Florida Facility Fire

Incident Location

Doral, FL | Miami-Dade County

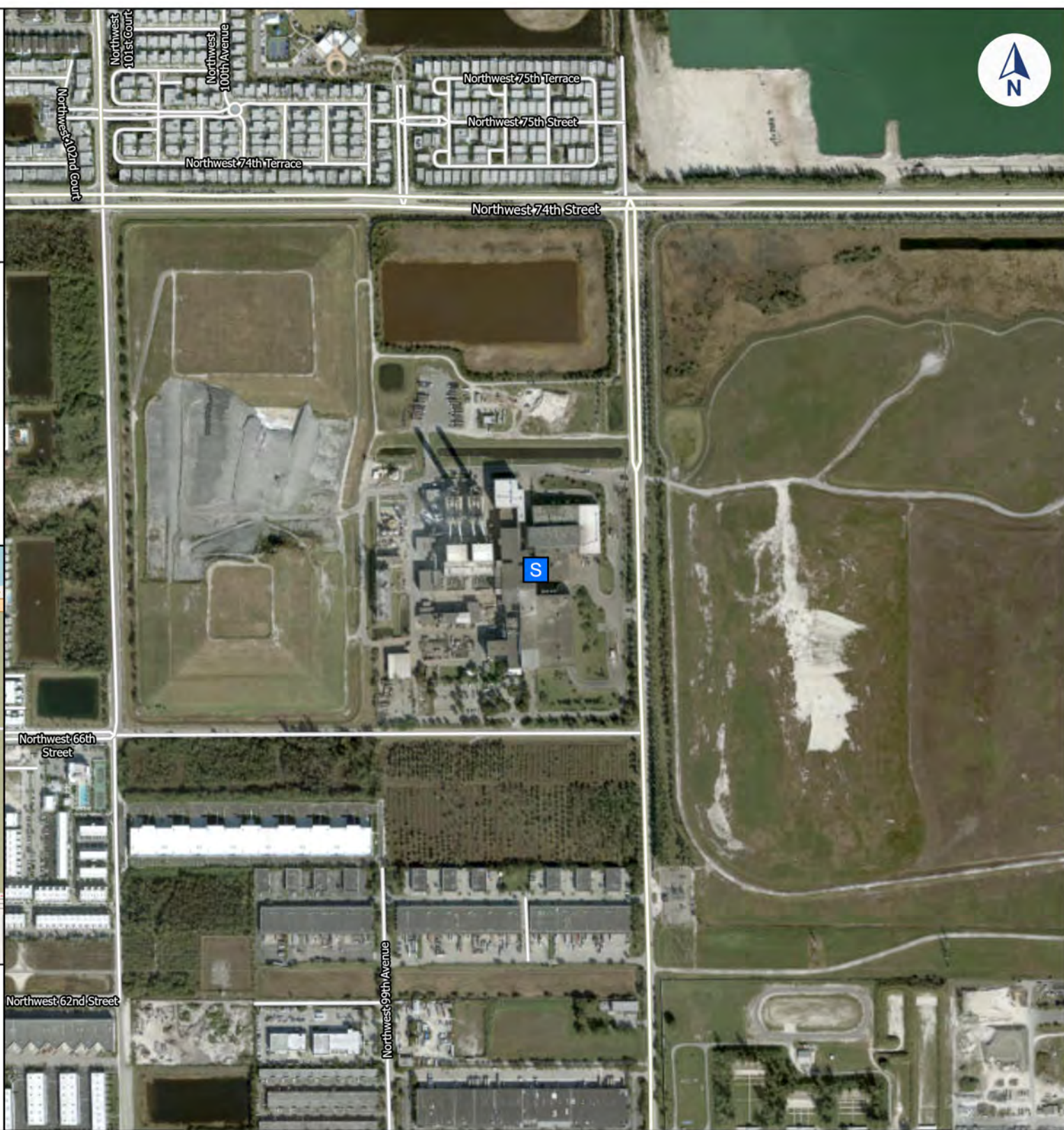
PROJ-025114

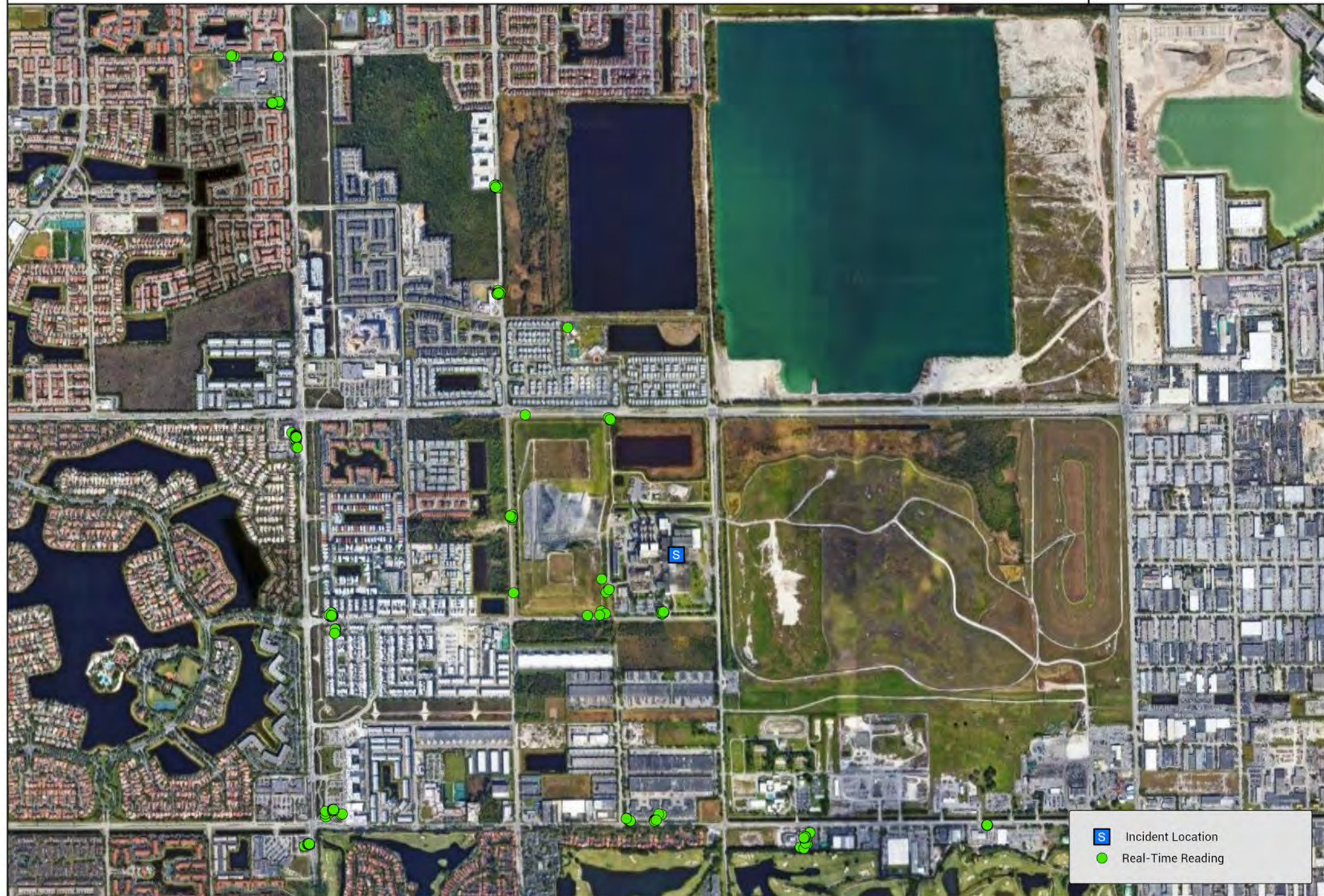


Incident Location

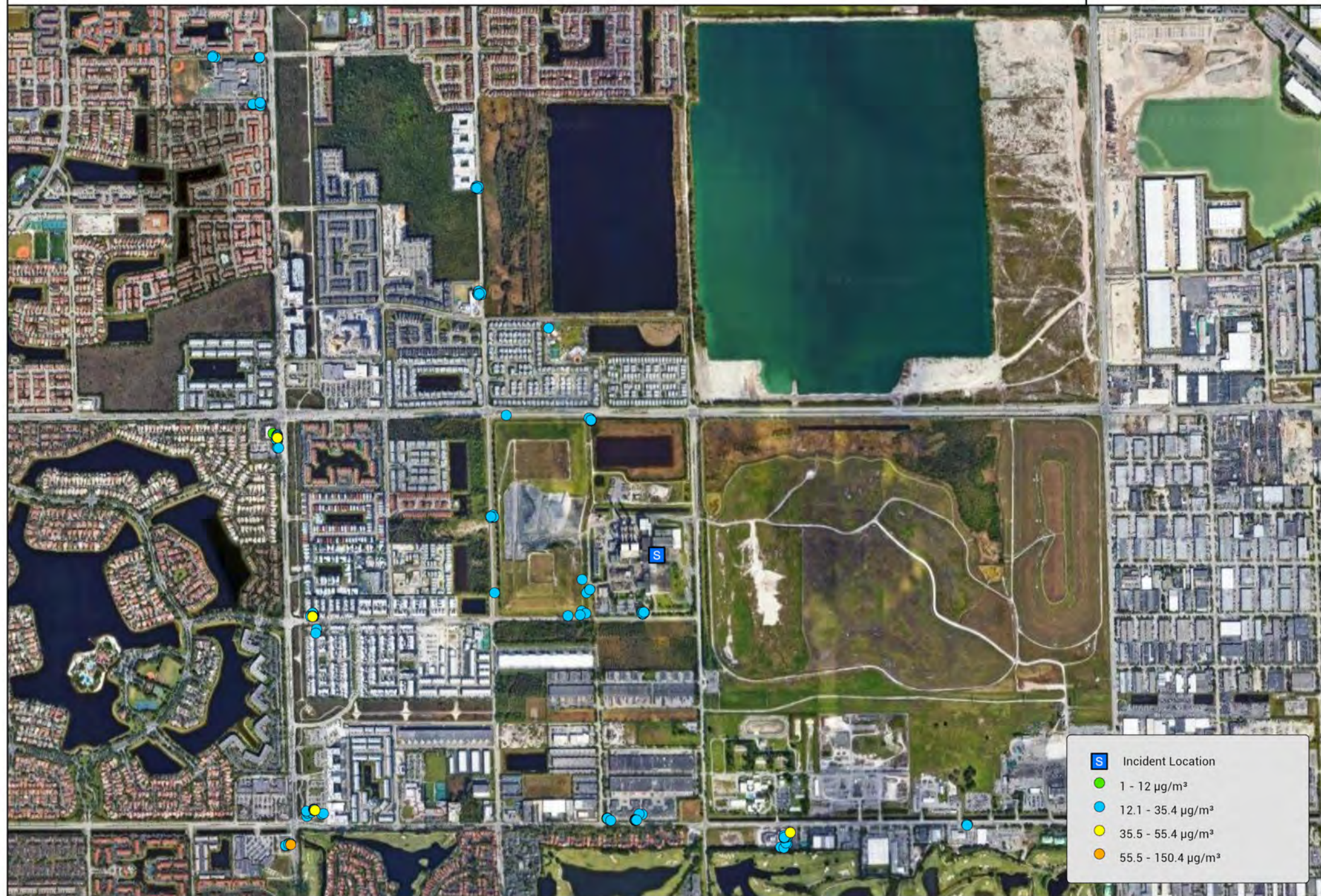
Updated At: 2/18/2023 8:51 AM

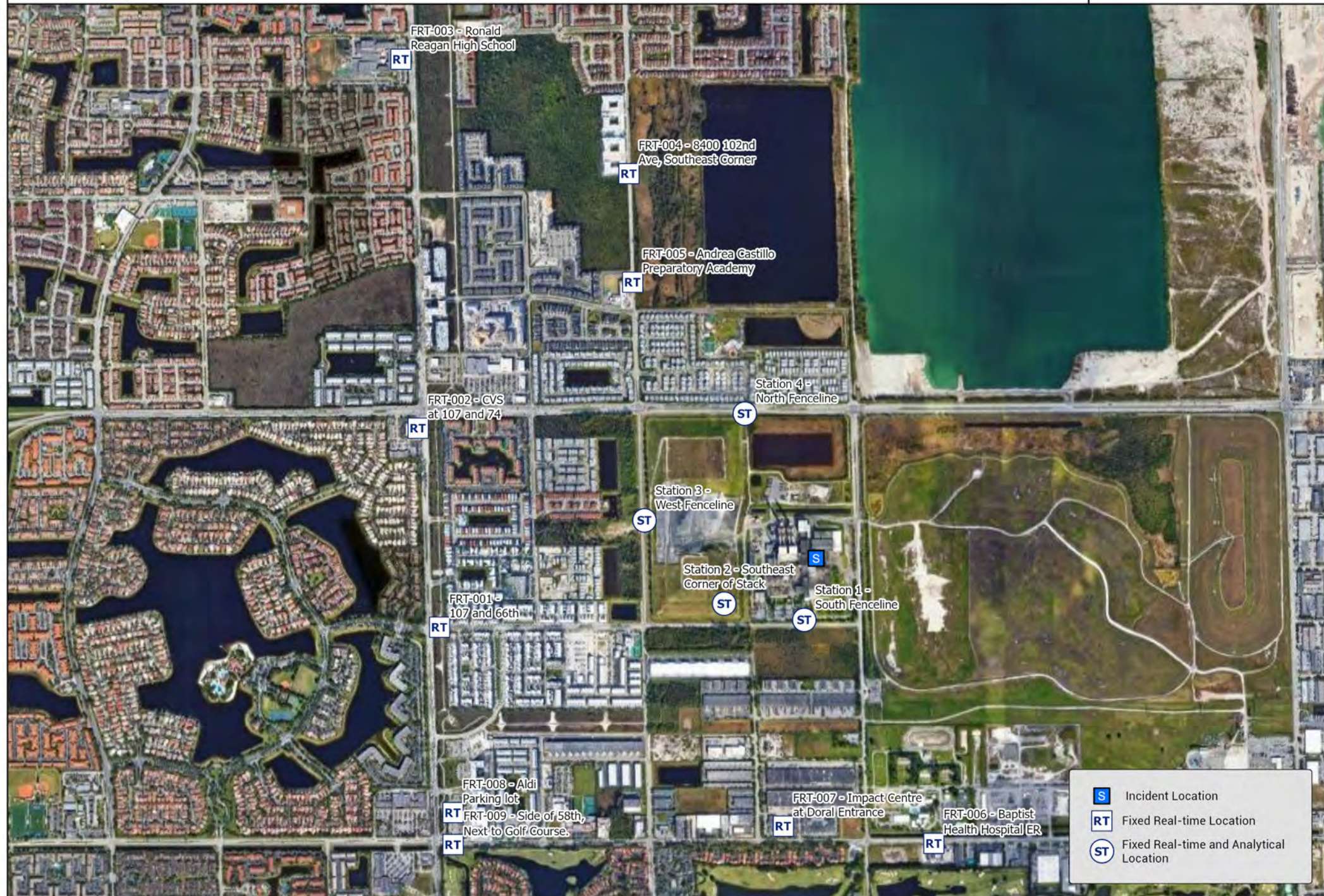
Projection: GCS WGS 1984





- S Incident Location
- Real-Time Reading





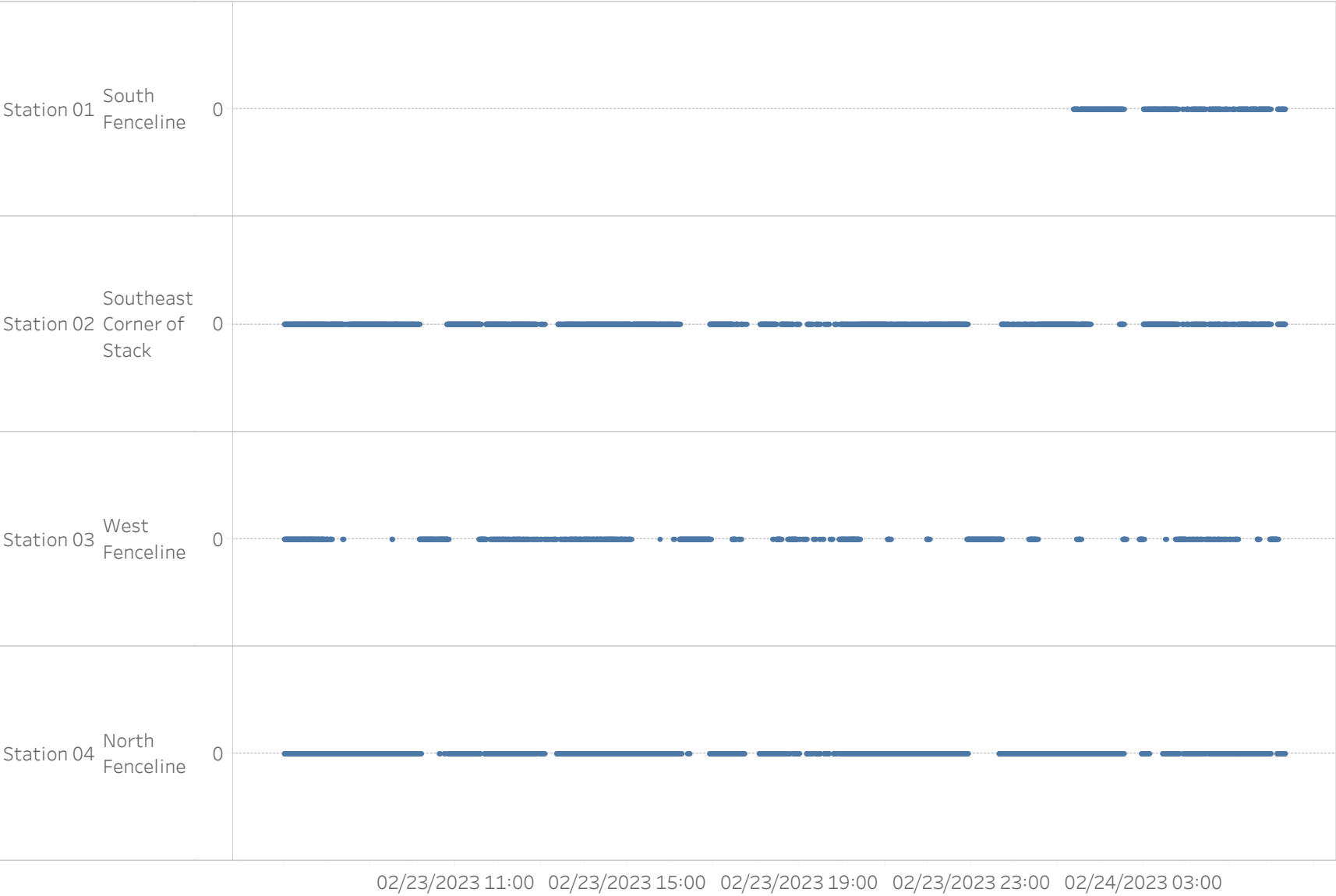
Attachment C

AreaRAE Graphs

Preliminary Remote-telemetered Real-time Air Monitoring Readings

PROJ-025114 | Doral Florida Facility Fire | Doral, FL

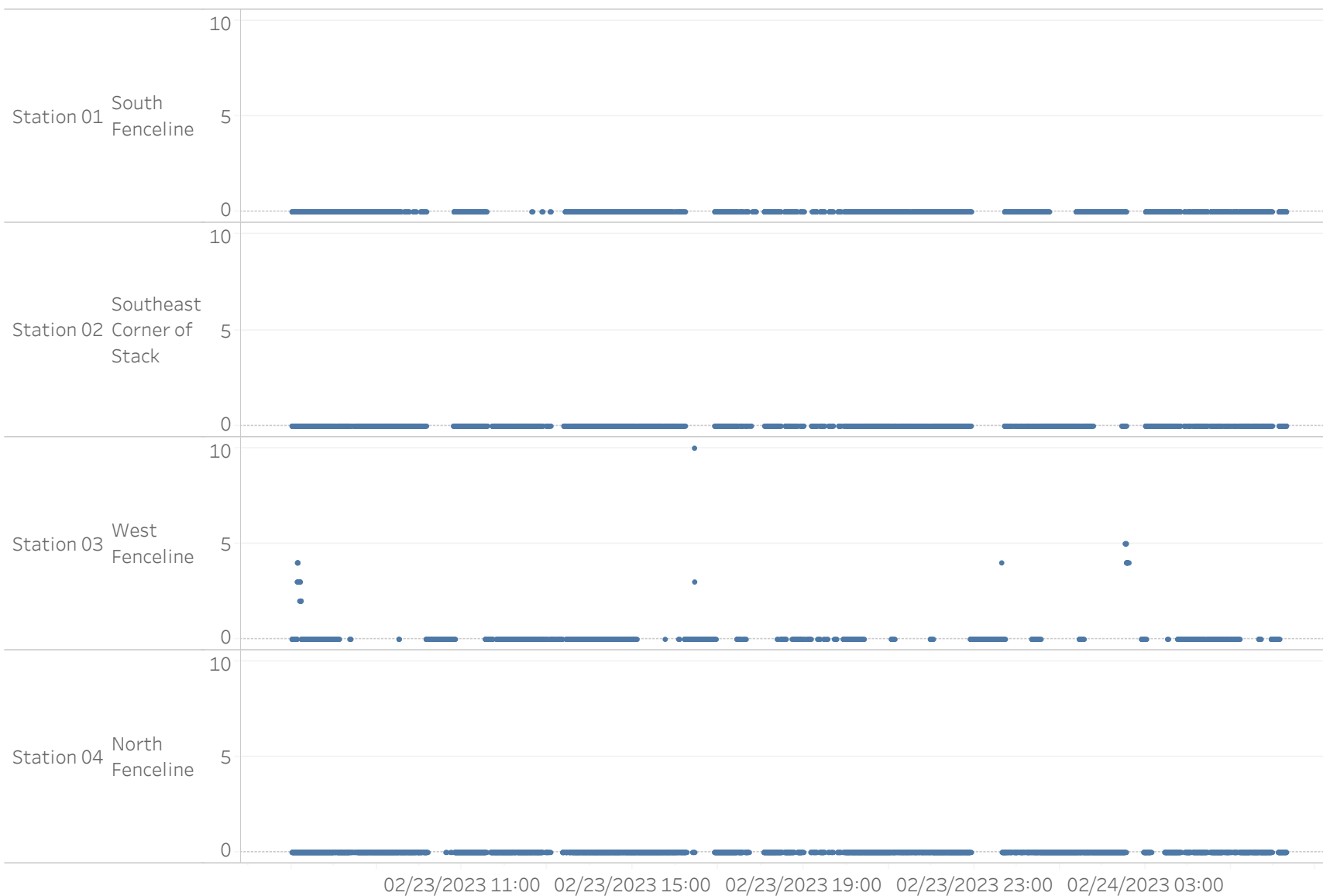
02/23/2023 07:00 to 02/24/2023 06:17 | **Analyte: %LEL**



Preliminary Remote-telemetered Real-time Air Monitoring Readings

PROJ-025114 | Doral Florida Facility Fire | Doral, FL

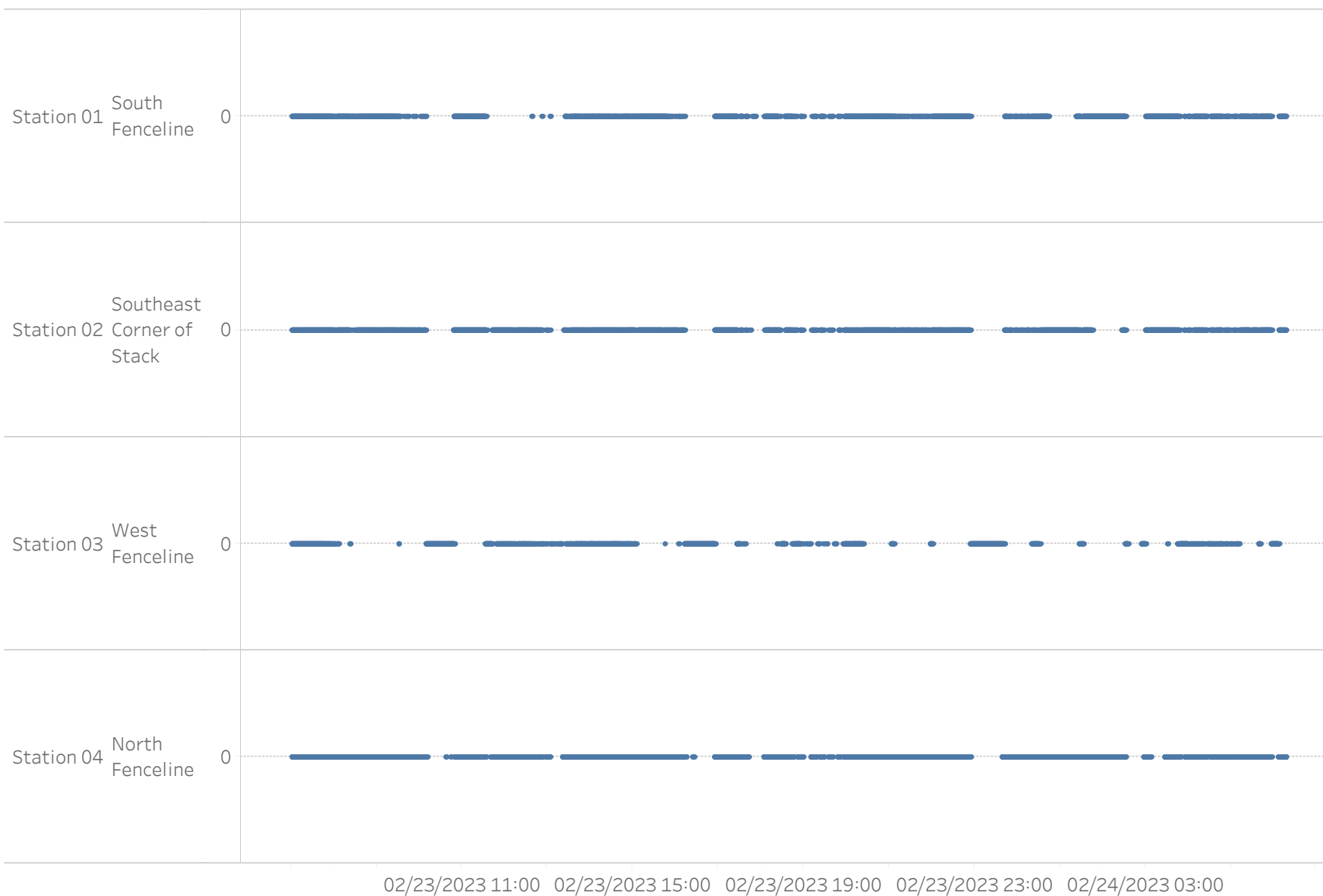
02/23/2023 07:00 to 02/24/2023 06:17 | **Analyte: CO (ppm)**



Preliminary Remote-telemetered Real-time Air Monitoring Readings

PROJ-025114 | Doral Florida Facility Fire | Doral, FL

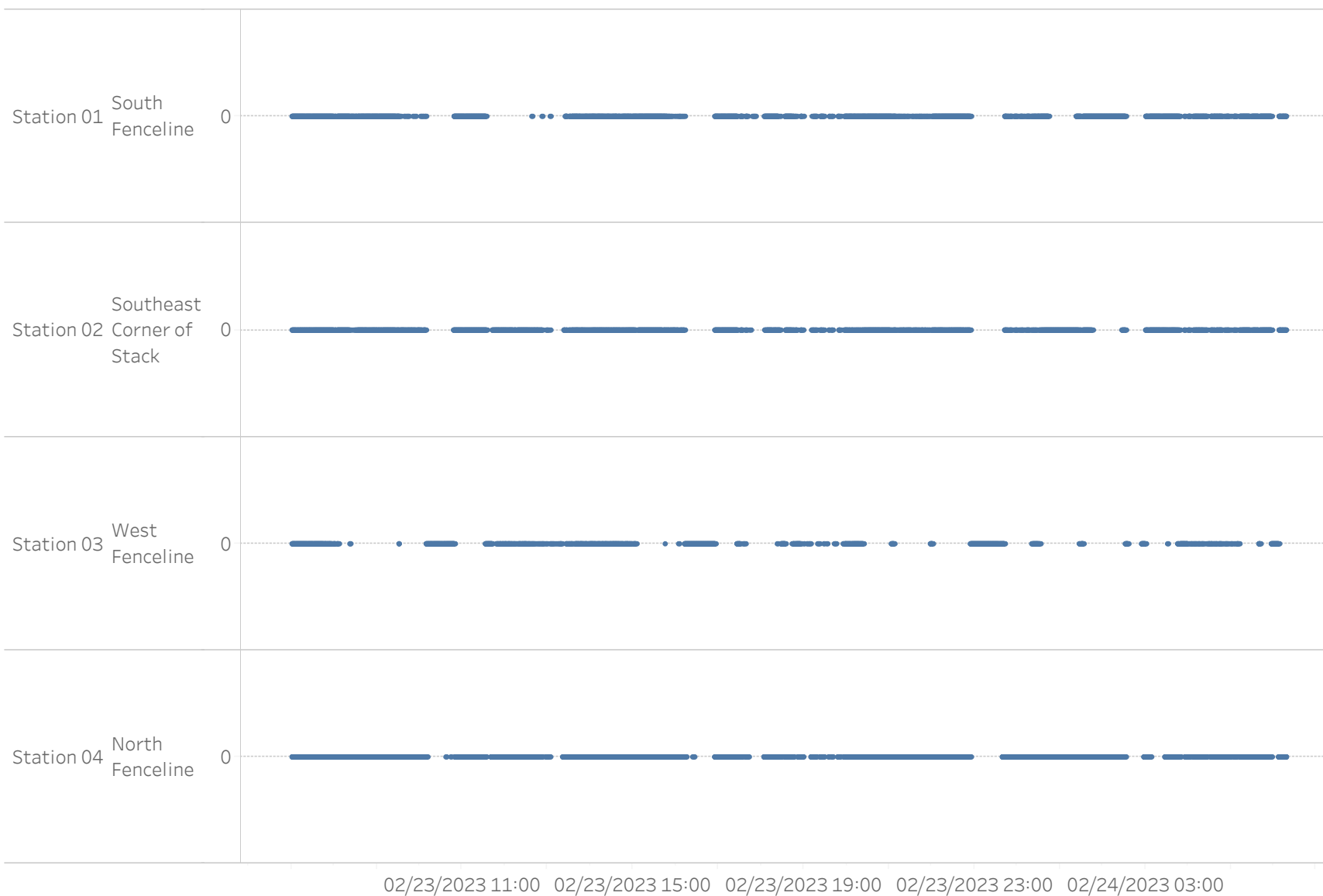
02/23/2023 07:00 to 02/24/2023 06:17 | Analyte: H2S (ppm)



Preliminary Remote-telemetered Real-time Air Monitoring Readings

PROJ-025114 | Doral Florida Facility Fire | Doral, FL

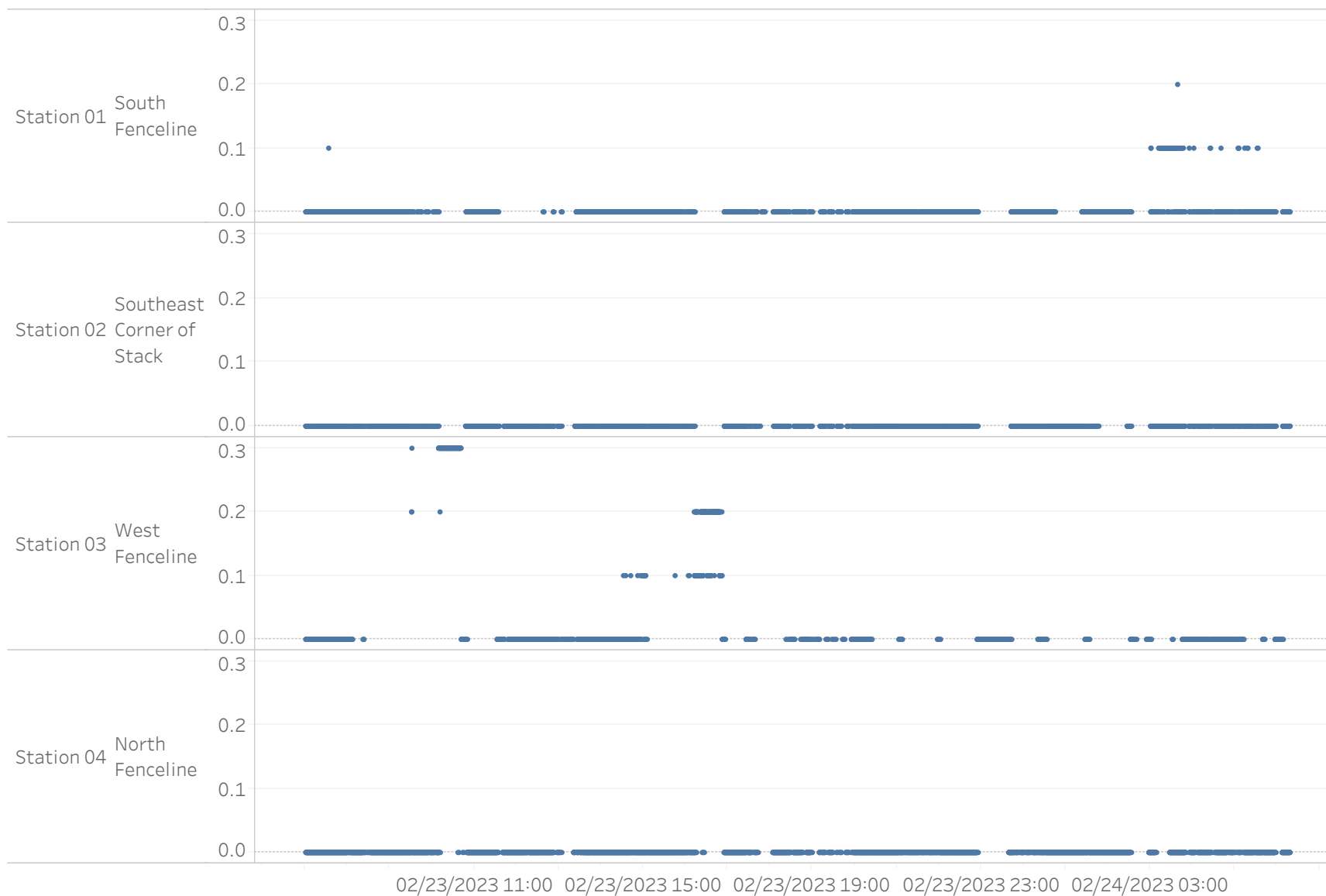
02/23/2023 07:00 to 02/24/2023 06:17 | Analyte: HCN (ppm)



Preliminary Remote-telemetered Real-time Air Monitoring Readings

PROJ-025114 | Doral Florida Facility Fire | Doral, FL

02/23/2023 07:00 to 02/24/2023 06:17 | Analyte: VOCs (ppm)



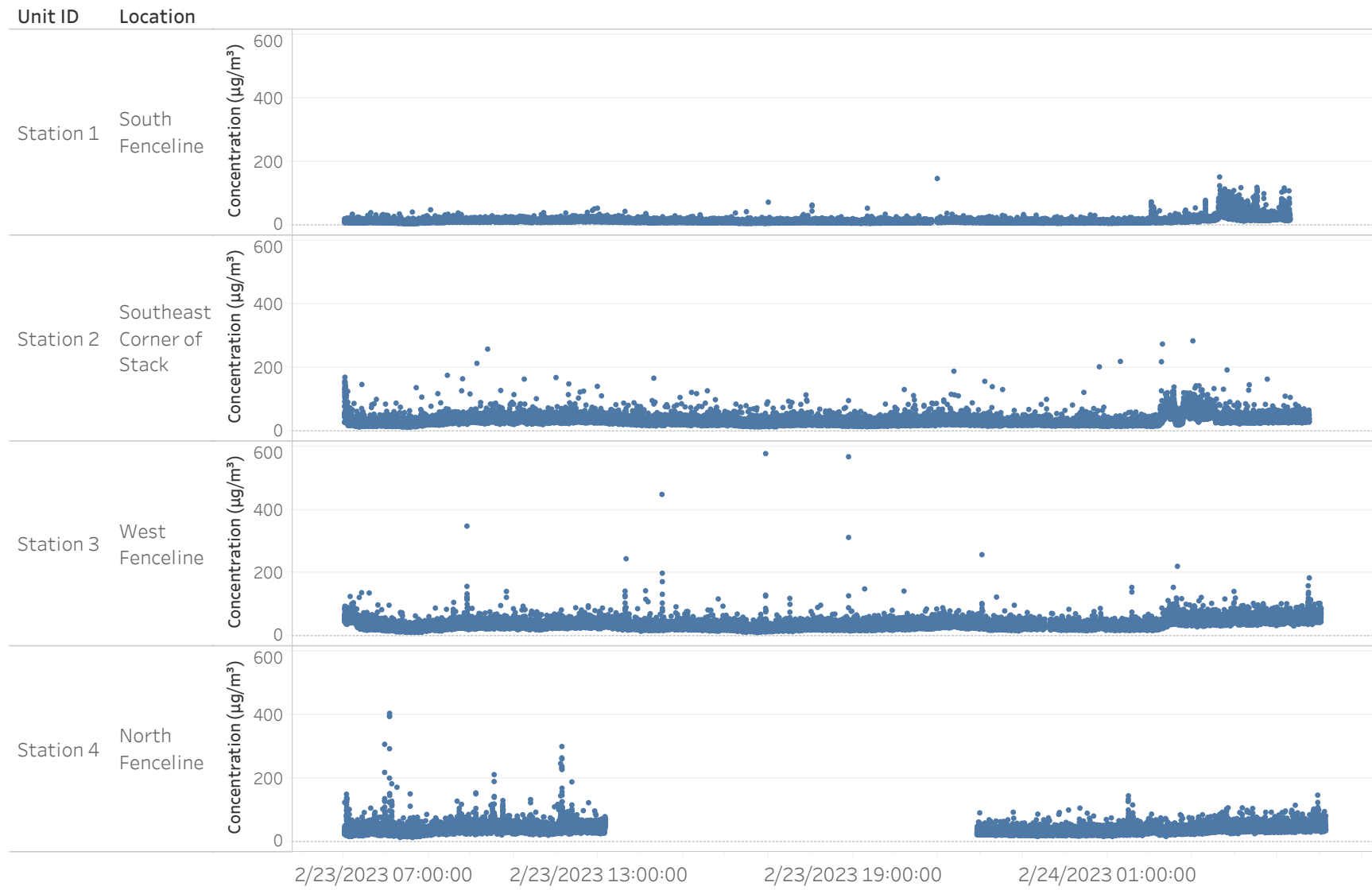
Attachment D

AM520 Graphs

Datalogged PM2.5 Air Monitoring Results*

PROJ-025114 | Doral Florida Facility Fire | Doral, FL

2/23/2023 07:00:01 to 2/24/2023 06:07:37



*At approximately 13:09, the instrument at Station 4 experienced a malfunction. Instrument activity was restored at approximately 21:54.

Attachment E

Meteorological Conditions

Weather Station: MIAMI INTL AIRPORT
02/23/2023 07:00 TO 02/24/2023 07:00

