

**Site-Specific  
PM<sub>10</sub> Ambient Air  
Monitoring Plan**

**Great Plains Sand Processing  
Facility**

**Wenck File #2771-01**

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# 1.0 Introduction

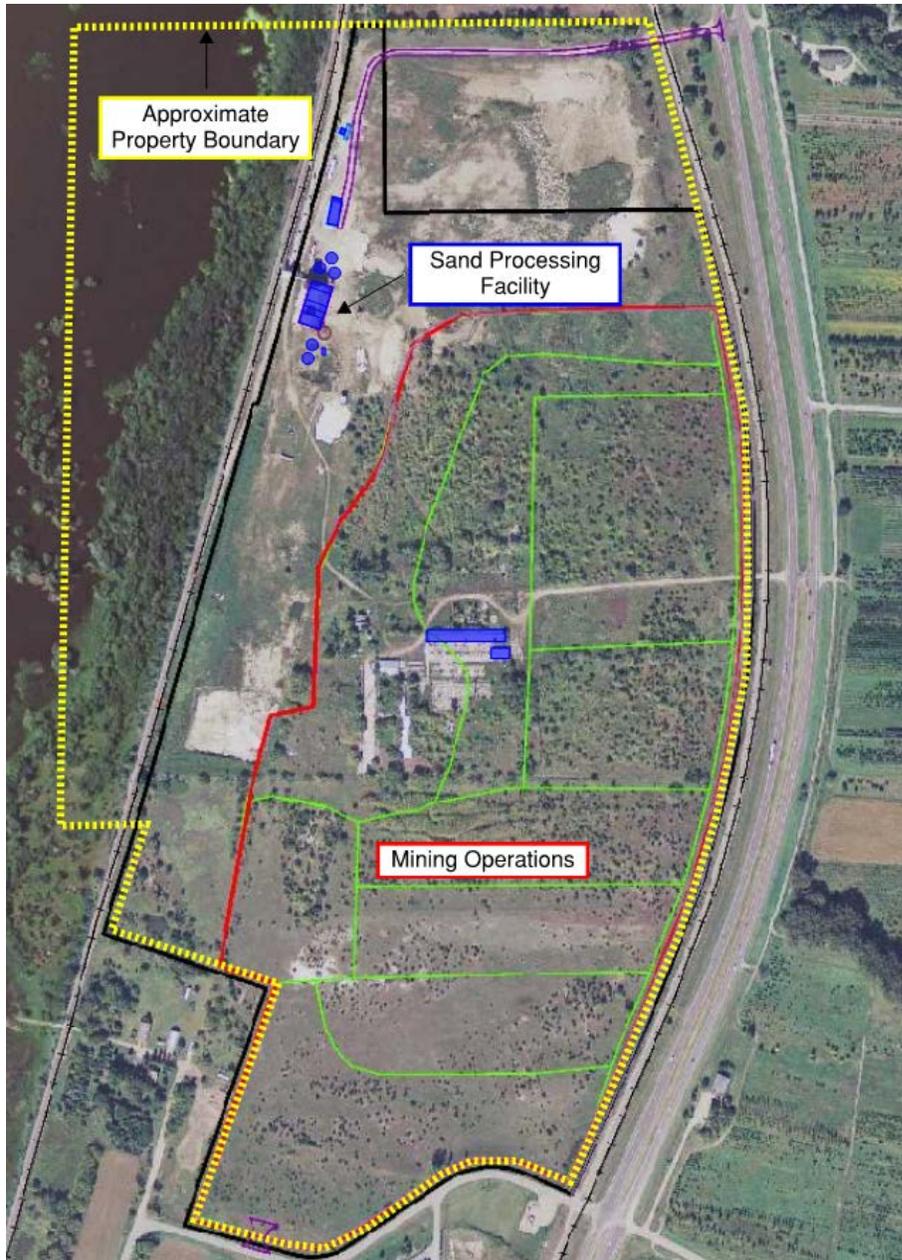
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On August 31, 2011, an Environmental Assessment Worksheet (EAW) was submitted to Scott County, the Responsible Government Unit (RGU), on behalf of Great Plains Sand, LLC (Great Plains). The EAW was mandatory according to Minn. 4410.4300, subp. 12. B – Non-metallic Mining Mineral.

The proposed project (Project) is to acquire the Scott Land Company property and certain rights to the Q Prime property from Progressive Rail, Inc. and operate a sandstone mining facility to produce hydraulic fracturing sand (frac sand) for use in the natural gas and oil industry. The Project is located in Louisville and Sand Creek Townships in Scott County, Minnesota. A general site layout is shown in Figure 1.

Operations at the mine will consist of the excavation and mining of the sandstone, as well as blasting, drilling and hauling of sandstone. The mined material will be brought to a central processing area on the site where it will be crushed, screened, washed to remove silt and other impurities, dried and stored. Most of the finished product will be transported offsite via rail (a rail line currently serves the site). A small portion will be loaded out via trucks.

As identified in the EAW and in support of the Industrial Use Permit, Great Plains Sand, LLC (Great Plains) has agreed to conduct ambient air monitoring. This is to address concern regarding silica dust emissions from the site and to assess fugitive dust mitigation measures. There is no ambient air quality standard set for silica, and control of silica dust is the same control typically used for particulate matter (PM). Great Plains will conduct ambient air monitoring for particulate matter and for particulate matter less than 10 microns ( $PM_{10}$ ) to determine ambient concentrations and is submitting this site-specific ambient air monitoring plan (SSAAMP). For informational purposes only, Great Plains will conduct ambient monitoring for crystalline silica.



**Figure 1: Great Plains Project Site Layout**

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## **2.0 Process Description**

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Great Plains Sand, LLC is proposing to construct a facility to produce hydraulic fracturing sand (frac sand) for use in the oil and gas industry. This site has a history of mining and has adequate reserve to operate for another 15-20 years. Active mining on this site occurred in the 1980's. Since that time there have been other land use operations on site. Some equipment, processing buildings and rail load out facilities still exist and will be utilized in this operation. Processes at the mine will include the mining of sandstone, washing, drying, screening and loadout of the sand. These processes are described in further detail below.

### **2.1 MINING AND EXCAVATING**

Equipment to be utilized for mining and excavating includes a bulldozer, front-end loader, mine trucks, backhoe, drill and rock breaker. Drilling and blasting will be utilized where necessary to loosen the sandstone for excavation. Excavation takes place in two distinct areas. These areas are excavating above and below the water table. The above water table excavation will utilize a loader or backhoe to dig up the sand and load it into trucks for transport to the wet processing facility. The below water table excavation will utilize a backhoe, dredge or dragline to initially remove material from the water and prepare it for loading into trucks for transport to the wet processing facility. Activities with emissions at the mine will consist of mine equipment, fugitive road emissions and fugitive stockpile wind erosion emissions.

### **2.2 WET PROCESSING FACILITY**

The existing on site building will be renovated and utilized in the operation. Processing will take place both adjacent to and within the existing building. As part of the wet processing, there will be emissions from the crusher, unpaved roads, stockpiles, loader and conveyors. Once the sand has been washed, the high moisture content will cause control by wet suppression, and emissions from material handling associated with the washed sand will be negligible.

## **2.3 DRY PROCESSING FACILITY**

The dry processing portion of the facility will operate year round. Processing equipment that is located within or adjacent to the building include a dryer feed hoppers and conveyors. Loadout operations into the rail cars will operate 24 hours per day (8760 hours per year). This entire process from the point at which the sand exits the dryer through loadout will be controlled by a baghouse. The baghouse exhausts to the ambient air by a single stack.

Facility emissions will be caused by the material handling equipment (conveyors, belts, stackers, hoppers, screen, etc.), front-end loaders, the dryer (including emission from combustion) and the unpaved plant roads. Emissions from the unpaved roads will be controlled by watering.

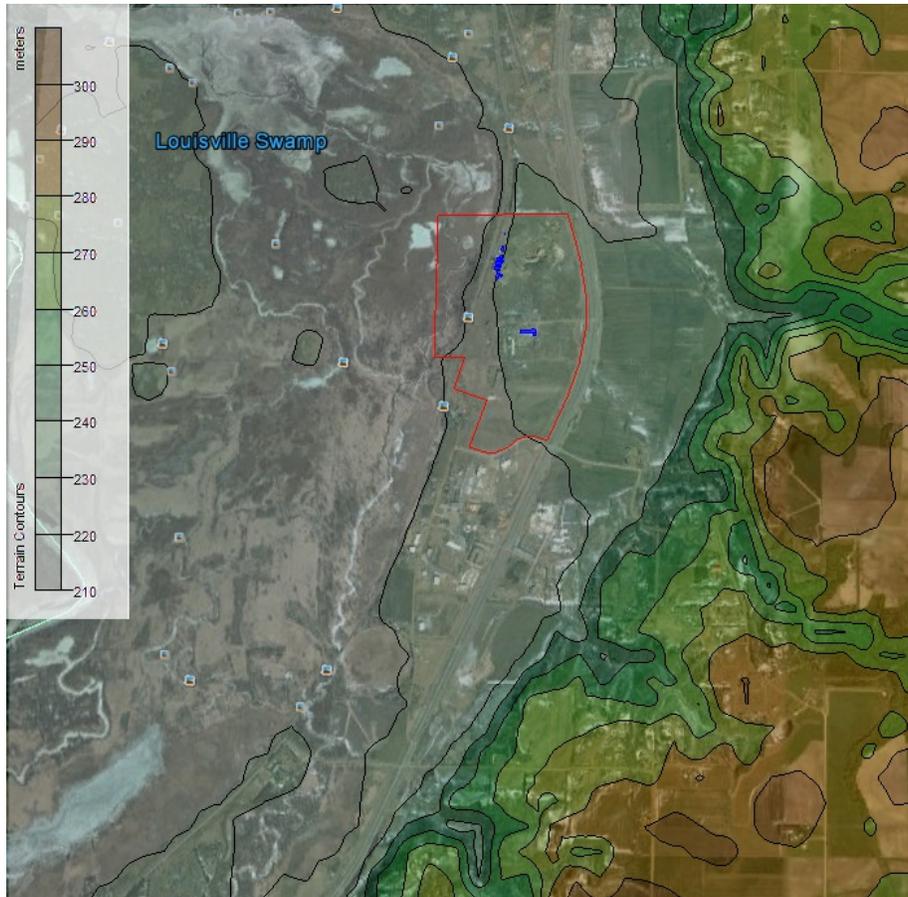
## **2.4 PROJECT LOCATION**

The project is located east of the Louisville Swamp in Jordan, Minnesota.

### **2.4.1 Topography**

The proposed sand processing facility will be located on the eastern side of Louisville Swamp, which is a floodplain forest. The terrain is fairly flat, with a slight rise in terrain east of the proposed facility as shown in Figure 2. According to the Minnesota Valley National Wildlife Refuge, the Louisville Swamp floods three out of every five years creating large surface water bodies west of the proposed facility.

The surface elevation of Great Plains ranges from approximately 700 feet above mean sea level (msl) to 775 feet above msl. The site generally slopes from the west to the east.

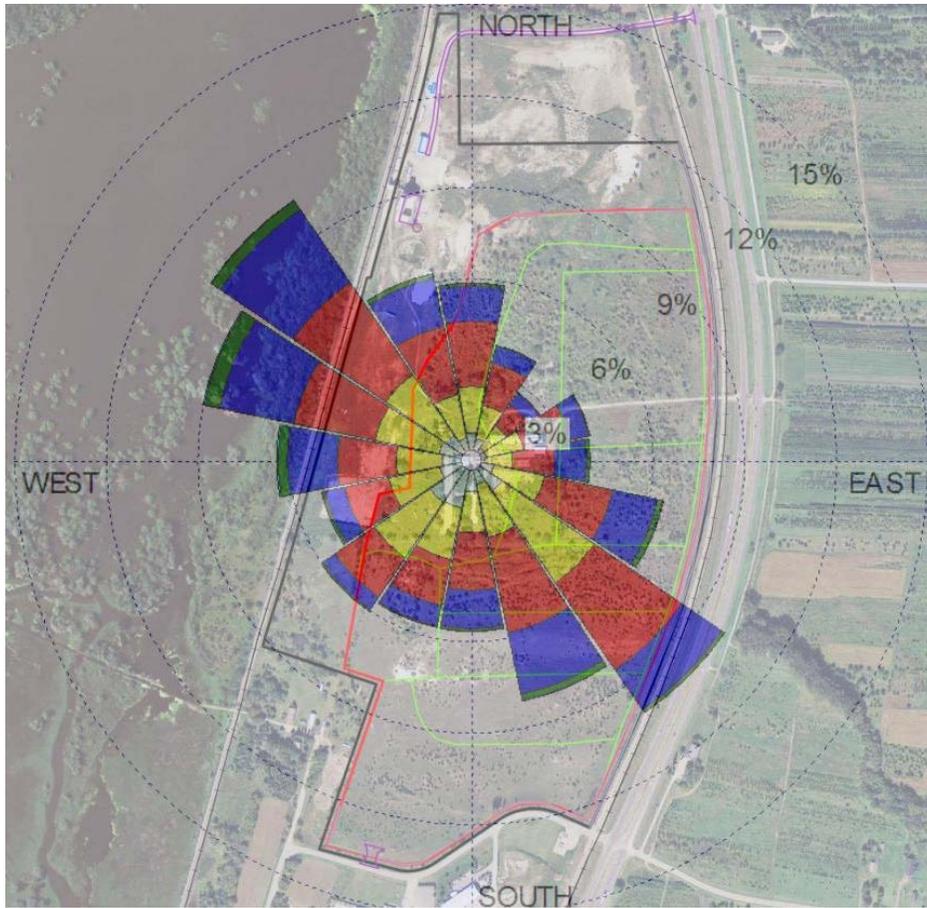


**Figure 2: Great Plains Terrain Contours**

### 2.4.2 Climate

The climate of this region varies greatly by season. The annual precipitation is 36.65 inches, with 50 percent of the rainfall occurring between June, July, and August. The mean annual average temperature is 46.4 °F. Seasonal average temperatures range from the upper teens in the winter to the low 70s in the summer. Mean annual evaporation is approximately 42.5 inches (pan measurement).

Average winds of 4.2 meters per second (m/s) (9.4 miles per hour (mph)) are predominantly from the northwest or the southeast as show in Figure 3. Discussion on representative meteorological data is found in Section 3.0.



**Figure 3: Wind Rose Overlaid on Proposed Great Plains Sand Mine Site**

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## 3.0 Monitoring Stations

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The overall strategy for assessing impacts from potential PM<sub>10</sub> emissions at Great Plains is to monitor ambient air between the site and nearby properties. Monitoring stations will be placed at two locations. One PM<sub>10</sub> monitoring station will be placed on the south-southeast corner of the property near the property line. Placing monitors near the facility property line will give the earliest possible indication of any airborne contaminant migration moving off property that may cause adverse impacts to human health. Another monitoring station will be placed on the eastern side of the property near the middle (office) access road. At this monitoring station, Great Plains will monitor for total particulate, PM<sub>10</sub> and crystalline silica.

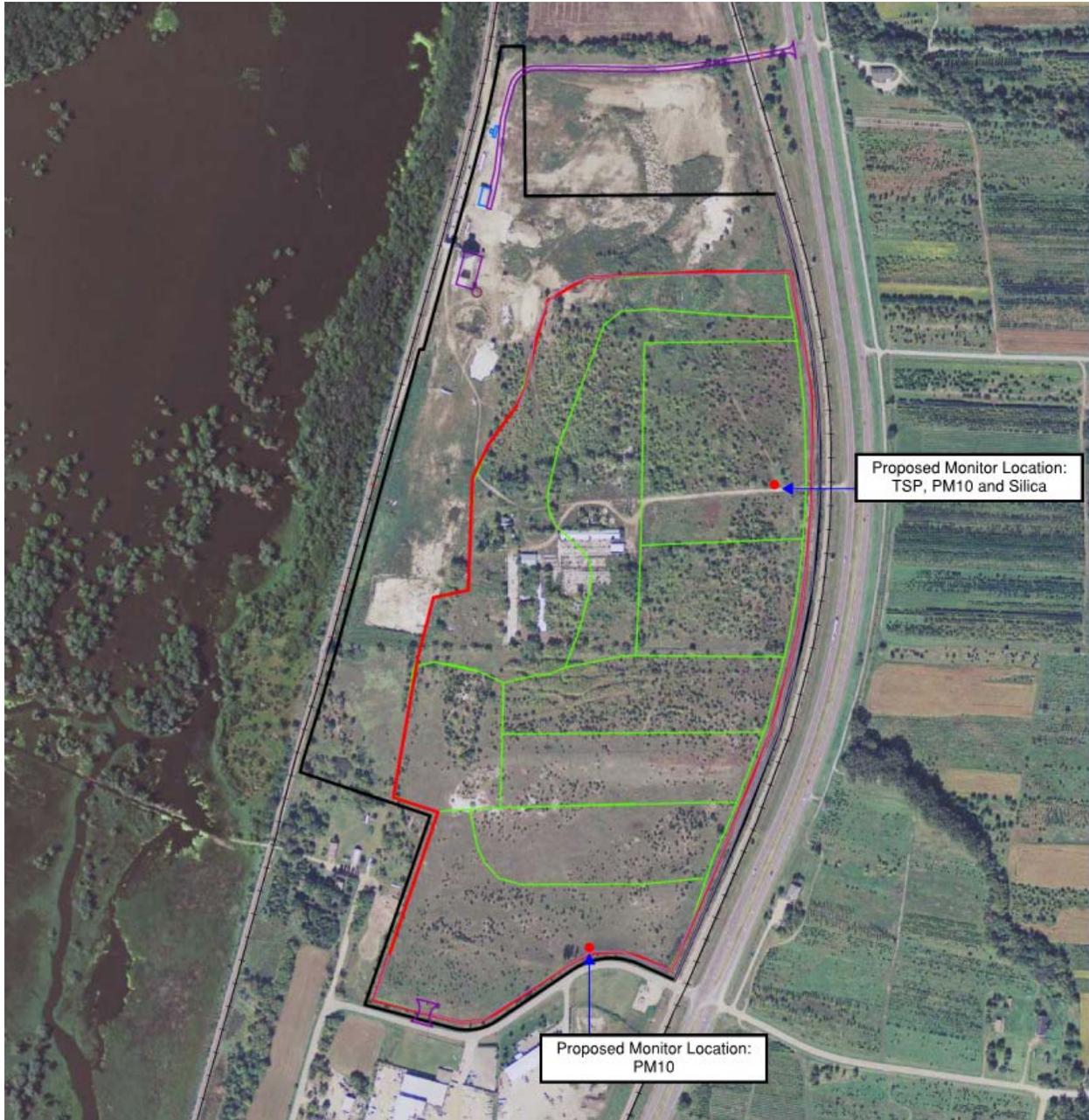
Wind data from two nearby meteorological stations was analyzed in order to determine the proper location for ambient air monitors at the Project site. The two sites, Flying Cloud Airport (FCM) in Eden Prairie, Minnesota and the Minneapolis - St. Paul International Airport (MSP) in St. Paul, Minnesota, are 10 and 22 miles from the project site respectively.

Surface roughness is the most sensitive surface characteristic in determining meteorological characteristics that will affect ambient air concentration. Land cover data was compared at these two meteorological stations with land cover data from areas in the vicinity of the Great Plains site. MSP had more similar land features to Great Plains than FCM. The reason for this is the floodplain (which often causes a smooth body of water east of the proposed project location) is best represented by the smooth surface area that represents MSP. Even though FCM is closer to the site, the surface characteristics of MSP are more representative of Great Plains and therefore used in the meteorological analysis.

The proposed monitoring locations in conjunction with the weather station will enable measurement of particulate concentrations caused by the facility. WRPLOT View version 7.0 from Lakes Environmental was used to create Figure 3 in order to display wind patterns for MSP. MSP surface data is from 2006 through 2010 and was processed by the Minnesota Pollution Control Agency (MPCA) using AERMET version 11059.

The approximate locations of the proposed ambient air monitors are shown in Figure 4.

The proposed monitors are to be placed at the two locations as proposed on Figure 4. The purpose of the east monitoring site is to measure concentrations in the direction of neighboring properties. It will be placed at a distance from Highway 169 to minimize traffic impacts. An on-site meteorological station will also be installed to continuously collect hourly wind speeds and wind direction.



**Figure 4: Proposed Monitor Locations**

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## **4.0 Sampling and Analytical Methods**

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### **4.1 ANALYTICAL METHODS**

EPA guidance on sampling methods for particulate matter is outlined in 40 CFR Part 58. Great Plains will follow this guidance in developing ambient air sampling methods and amend this document as necessary when sampling methodology has been determined in more detail. Great Plains will consult with MPCA ambient monitoring staff on equipment specifics prior to sourcing ambient monitoring equipment.

The sampler height will be 2-7 meters above the ground, and at least 20 meters away from the nearest street or trees, which meets the EPA specification for such a monitor. Specifics for the meteorological stations (met station) will be determined when an equipment manufacturer and specific parameters have been defined.

Crystalline silica will be measured utilizing NIOSH Method 7602.

### **4.2 SAMPLING FREQUENCY**

It is expected that  $PM_{10}$  concentrations identified from the downwind monitor will be below 80 percent of National Ambient Air Quality Standards (NAAQS). For  $PM_{10}$  samplers and the total particulate sampler, a 24-hour sample will be taken from midnight to midnight (local standard time) every sixth day to ensure consistency.

Great Plains will increase the monitoring frequency for total particulate or  $PM_{10}$  if a monitor measures a concentration from Great Plains of greater than 0.8 but less than 0.9 times the applicable ambient standard. If one of the  $PM_{10}$  monitors measures a concentration from Great Plains of greater than 0.9 times the ambient standard Great Plains will continue monitoring using a continuous monitor. Great Plains can reduce the monitoring frequency back to the base timing (24-hour sample taken from midnight to midnight (local standard time) every sixth day) when three consecutive months of sampling results are less than 0.8 times the applicable standard.

Great Plains will begin total particulate and PM10 monitoring upon the start of mining and will continue to monitor for a minimum time period of three years from the start of operation or for three years after having exceeded an ambient standard at a downwind ambient monitor, whichever is longer.

Great Plains will collect crystalline silica sample once every 12th day. Monitoring will commence upon the commencement of mining and will continue to monitor for silica for a period of 12-months.

### **4.3 REPORTING REQUIREMENTS**

Great Plains will submit quarterly reports to Scott County and to the Minnesota Pollution Control Agency summarizing the ambient monitoring results. The reports will be due within 45 days of the end of the calendar quarter.

Great Plains will notify Scott County staff within 24 hours of receiving sample results exceeding the ambient PM10 standards. The notification can be electronically or verbally and will include the date of the exceedance, the highest concentration and a summary of the measures taken to reduce emissions at the plant.

Great Plains will periodically revisit the SSAAMP with the Great Plains Sand Review Committee to address any potential issues, specific details, and/or schedule updates, etc. as needed while performing ambient air monitoring.