

REGULATORY ASSISTANCE

Fenceline Benzene Monitoring Services

Founded in 1974, Trinity Consultants helps organizations overcome complex, mission-critical challenges in EHS, engineering, and science through expertise in consulting, technology, training, and staffing. We support clients in geographies worldwide and across a broad range of sectors including industrial, energy, manufacturing, mining, life sciences, and commercial/institutional.

Trinity Consultants provides comprehensive, turnkey fenceline benzene and related meteorological monitoring services. Our monitoring staff has more than 150 years of combined experience and have installed and operated approximately 1,000 meteorological and air quality monitoring sites nationwide including fenceline monitoring systems. Trinity's goal is to provide solutions that are technically proven, cost-effective, regulatory compliant, and designed to meet your specific monitoring requirements. Our solutions include automated canister sampling for true upwind background benzene concentrations, retrieval, analysis, reporting, and data presentation. Only instrumentation that has proven to be of the highest quality and reliability are recommended and installed by Trinity professionals.



Proposed Refinery Rule

EPA has proposed an amendment to 40 CFR Part 63, Subparts CC and UUU that requires all petroleum refineries to deploy passive time-integrated benzene samplers at the fenceline of their facility to identify fugitive emissions releases quickly so that corrective action can be implemented. The proposed amendment would also require the operation of an on-site meteorological monitoring system in conjunction with the fenceline benzene monitoring. Trinity is extremely proficient in conducting both the required sampling under the proposed rule and the meteorological measurements needed to accurately analyze the data collected.

Passive Time-Integrated Diffusive Tube Samplers

EPA has identified several methods for measuring fugitive emissions around petroleum refineries. However, for various reasons including cost, EPA is proposing to require refineries to deploy passive time-integrated samplers at the fenceline.

Passive time-integrated diffusive monitoring involves deploying a series of samplers at set intervals along the fenceline that measure the ambient air concentration at each sampling location. The samplers consist of a small tube filled with an adsorbent and capped with a special cover with small holes to allow the ambient air to diffuse into the tube at a small, fixed rate. A sampling event is conducted over a continuous 14 day period. A facility would exceed the concentration action level when the average fenceline benzene concentration corrected for background (which potentially includes off-site contributions) is greater than $9 \mu\text{g}/\text{m}^3$. Concentrations are based on a rolling annual average recalculated every two weeks.

Siting Requirements

EPA proposed the use of 12 to 24 passive samplers placed at 15 to 30 degree intervals along the perimeter of each refinery, depending on the size of the property. Passive samplers are placed along the fenceline in protected hoods to minimize effects of precipitation and solar heating. EPA has also included an alternative siting procedure where monitors can be placed every 2,000 feet along the fenceline, which may be easier to implement for sites with irregular footprints.

Trinity can assist refineries with the siting and placement of the fenceline monitors to comply with the proposed amendment, including complete sampling equipment siting services, equipment installation, and calibration.

Adjusting for Off-Site Contributions

EPA has proposed a default mechanism for adjusting measured fenceline concentrations to account for off-site contributions (OSCs), that involves subtracting the lowest measured concentration (LMC) at the facility fenceline from the highest measured concentration (HMC) at any individual sampling location. The adjusted fenceline concentration would then be compared to the concentration action level within 30 days after the completion of each 14 day period, and any exceedance would need to be addressed by:

- ▶ Initiating a root cause analysis within 5 days of making the comparison
- ▶ Completing the root cause analysis and implementing corrective action within 45 days of initiating the root cause analysis

There are significant risks associated with this simplified method for determining OSCs, particularly for refineries that are located in congested, industrial corridors where high readings could be primarily caused by benzene emissions from a neighboring chemical plant, tank farm, barge unloading operation, highway, etc. Therefore, it is important for facilities to more accurately quantify OSCs or at least have a plan in place in case a potential exceedance is indicated using the default method. In the proposed rule, EPA discusses other methods for quantifying OSCs including additional sampling, but this will require the development and submittal of a site-specific monitoring plan for EPA approval.

Trinity will work with refineries to develop site-specific monitoring plans which will help address the risk associated with the simplified OSC method. The site-specific monitoring plan defines the mechanics behind determining OSCs. This involves surveying the site to identify possible sources of OSCs as well as topographical and meteorological data that would assist in the siting of additional monitors. Trinity can also utilize air dispersion modeling to help identify the locations that will provide the most accurate OSC information. Here are some considerations when determining whether your refinery should develop a site-specific monitoring plan:

- ▶ Is the refinery close to a highway, nearby industrial facility, tank farm, etc.?
- ▶ Is the refinery located on or near a complex terrain that may contribute to non-uniform background concentrations?
- ▶ Given the relatively short corrective action timeline included in the proposed rule, how long will it take to develop, submit, and gain EPA approval on a site-specific monitoring plan that provides for a more accurate determination of OSCs?



Meteorological Monitoring Services

A critical component to a successful and robust benzene monitoring program includes the incorporation of an on-site meteorological measurements. Typically these measurements are collected on a tripod-based system; however, when appropriate Trinity also installs meteorological towers from tripod 2 meters to 100 meters in height to collect multi-level measurements of horizontal and vertical wind direction and speed, temperature, delta-temperature, relative humidity, barometric pressure, solar radiation, net radiation, and precipitation. Meteorological towers can be completely powered with solar panels allowing for operation in remote locations without the logistics and costs associated with power drops.

Why Choose Trinity

Trinity provides complete turnkey ambient air quality monitoring services including site selection, equipment procurement and acceptance testing, equipment installation and integration, routine field operations, training, calibration and maintenance, quality control checks, data management, data validation, data formatting and reporting, quality assurance performance and systems audits, and emergency trips.

Leveraging Trinity's 45+ year history of addressing air quality regulatory issues and deep and wide expertise in monitoring, Trinity is uniquely qualified to provide a fenceline benzene monitoring solution that is robust, accurate, and appropriate for specific client needs. For more information about how we can help your organization, please contact Trinity Consultants by calling 800.229.6655.

ISO 9001:2015 certified at our corporate office in Dallas, Texas