ENVIRONMENTAL CONSULTING CASE STUDY

Innovative Air Monitoring Ensures Compliance and Safety for Transportation Company

CHALLENGE

A transportation company needed a comprehensive air quality monitoring system to meet new permit requirements, ensuring accurate data collection and regulatory compliance.

SOLUTION

Trinity designed and installed a robust monitoring network complete with a Quality Assurance Project Plan (QAPP) to provide reliable data informing stakeholders on current air quality.

RESULT

The system provided precise and reliable data, enabling informed decision-making, ensuring regulatory compliance, and reinforcing the company's commitment to environmental responsibility.

A North America-based transportation company was required to update its State Permit with an environmental department. To comply with the new permit requirements, the company needed to implement a rigorous air quality monitoring system that would accurately track particulate matter (PM) and meet the stringent standards set by the U.S. Environmental Protection Agency (EPA). Recognizing the need for precise data to ensure both regulatory compliance and public health protection, the transportation company's team turned to Trinity Consultants to design and implement a cutting-edge Fence Line Monitoring Plan.

CHALLENGE

One of Trinity Consultants' materials transportation clients was required to update its State Permit. A new condition of the permit included the implementation of a detailed Fence Line Monitoring Plan that would include continuous monitoring of particulate matter with a diameter less than 10 microns (PM_{10}) and less than 2.5 microns ($PM_{2.5}$) around the perimeter of the facility to detect fugitive dust emissions. The challenge was heightened by the presence of community-led monitoring efforts that had produced data that did not adhere to EPA guidelines. The company needed a scientifically sound monitoring system that could provide accurate data to satisfy both regulatory requirements and public concerns.

SOLUTION

The transportation company partnered with Trinity Consultants, leveraging Trinity's extensive experience in environmental compliance and air quality monitoring, to design and implement the new plan. Trinity's system included two Federal Equivalent Method (FEM) monitors and eight low-cost sensors at various points along the fence line, to comprise a Quality Assurance Project Plan (QAPP). The strategic positioning and novel combination of high-precision monitors and supplemental sensors allowed the system to accurately capture data for both inbound and outbound wind scenarios, providing a complete picture of PM emissions under varying atmospheric conditions.

Trinity also installed a 10-meter (approximately 33 feet) meteorological tower equipped to measure wind speed, wind direction, humidity, temperature, barometric pressure, and precipitation. The data collected is critical for interpreting the PM monitoring results, which would help Trinity and the company understand the source and movement of PM detected by the system. For instance, wind speed and direction data could be used to trace the origin of dust plumes (whether from the facility or from other regional sources), while wind speed and precipitation data are used to determine when to activate dust suppression measures on storage piles.

Trinity also addressed technical challenges related to data accuracy. Low-cost sensors are less robust, and tend to report erroneous data during fog, high humidity, or precipitation events. To mitigate this, Trinity developed testing factors in conjunction with meteorological data to flag potential false positives, ensuring the integrity of the monitoring system.

RESULT

Today, the system provides the transportation company with precise, real-time data, enabling the company to make informed decisions about facility operations. Trinity's data management team monitors the data daily, flagging any discrepancies, and provides quarterly summary reports with refined and validated data to the company and the involved state environmental department, reinforcing the transparency and reliability of the monitoring process.

The company's monitoring network provides more accurate and reliable air monitoring data which is published to a website for all stakeholders (including community members) to access and understand the air quality in real time.

Trinity's expertise in instrumentation, data analysis, and regulatory compliance played a critical role in the success of the project, ensuring that the transportation company could meet its environmental responsibilities while maintaining efficient operations and assuaging community concerns. With many other states beginning to implement similar requirements, Trinity Consultants is well-positioned to support clients across the country in achieving compliance and protecting public health.

ABOUT TRINITY CONSULTANTS

Trinity Consultants, a leading global environmental consulting firm, provides services and solutions in the EHS Regulatory Compliance, Built Environment, Life Sciences, and Water & Ecology markets. Founded in 1974, Trinity has the technical expertise, industry depth, and capabilities to help clients achieve their goals across the natural and built environments.

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