

AIR QUALITY MODELING

In some instances, air quality modeling may be required to demonstrate compliance with applicable air quality regulations, such as for some states' air toxics regulations. Leaf Environmental & Engineering, P.C. supports our clients with the skilled modeling capability of our engineers who are well qualified in dispersion modeling and understand the scientific and engineering principles of modeling. This combination of engineering and modeling expertise enables LEAF to minimize the impact of modeling requirements on our clients, or in some instances, be able to eliminate the need for modeling and permit limitations through process or other operational changes. Following are several representative modeling projects performed for LEAF clients.

CLIENT: Plastic Components Manufacturer
PROJECT: Modeling in Mountainous Location

LEAF was requested to prepare an application for an air permit for this new facility. Because of emissions from a plastic molding operation and parts coating operation, the plant was subject to the state air toxics regulation, and was required to demonstrate compliance with the ambient standards by dispersion modeling. Our engineers performed dispersion modeling using the plant design parameters for production, stacks and exhaust equipment, which initially indicated that the ambient standards would be exceeded. Because of mountainous terrain, several options were evaluated by LEAF to remodel the emissions. Our engineers then evaluated different stack parameters, working closely with the spray booth vendors and plant personnel, and recommended new stack design parameters in conjunction with some coating reformulations. Our engineers then remodeled the plant to successfully demonstrate compliance with the ambient standards.

CLIENT: University
PROJECT: Campus-wide Modeling

Our client contacted us regarding a Director's Call from the NCDEQ requesting air dispersion modeling of toxics from all sources at the university. LEAF gathered stack data from all boilers, emergency generators (>50 units), and sterilizers for use in the modeling. LEAF also gathered site specific data required for the modeling (i.e. all building dimensions, site specific terrain data, etc.). Site receptors were placed throughout campus to determine worst-case ambient concentrations of toxics throughout the campus. A modeling report was prepared and submitted to North Carolina demonstrating there were no ambient issues of note on or outside the campus. The modeling was conducted on a tight time schedule to meet the demands of the university and the state.

CLIENT: Knit Fabrics Manufacturer
PROJECT: Modeling Compliance and Facility Changes

Our client contacted us regarding installation of a new finishing range, and the need for an air permit modification. Because the facility modification triggered the state air toxics regulation, an air toxics evaluation was required. Due to the large increase in one air toxic, dispersion modeling was required. Our engineers developed a modeling protocol for the facility, and conducted the mandated facility-wide dispersion modeling for the applicable toxics. Modeling showed that the plant would exceed the ambient standard for one air toxic. LEAF evaluated each emission unit to determine which sources would have the necessary impact on reduced ambient levels, if modified. Based on our engineering assessment, we recommended replacement of traditional fixed rain caps with butterfly-style operating rain caps. With these relatively inexpensive changes to several plant stacks, we successfully modeled the plant to meet the ambient standards. The modeling results were submitted to the state agency along with the completed air permit application and a modification to the air permit was issued in time to meet the scheduled startup of the new finishing range.

CLIENT: Industrial Equipment Manufacturer
PROJECT: Criteria and Toxics Modeling

In order to demonstrate compliance with South Carolina air toxics regulations and with criteria pollutant NAAQS and increments, our engineers developed a complete modeling protocol and conducted modeling for all emission sources at this facility. This involved comprehensive emission characterization studies as well as performing the dispersion modeling for the site, in order to demonstrate compliance with the state ambient standards for air toxics and for criteria pollutant standards.

CLIENT: Textile Dyeing and Finishing Facility
PROJECT: Update Title V and Dispersion Modeling

This South Carolina facility is a major source that consists of large coal-fired boilers and numerous process unit operations and had a previously prepared Title V application and dispersion model. LEAF was retained by the client to conduct a comprehensive review of emission factors, emission calculations and to review the existing Title V application and dispersion model. Our engineers revised the Title V application to provide a more simplified application that will allow for easier revision to accommodate any future plant modifications, as well as to provide for a document that lends itself to an easier regulatory review. As part of this overall effort, LEAF also reviewed emission data and the protocol for the existing dispersion model, and revised it as necessary to reflect accurate emission information and modeling changes.