

ADEQ Air Permit Screening Model Protocol

I. Introduction and Background

This protocol is general instructions for ADEQ, Office of Air Quality, Permit Branch staff, conducting screening modeling on air permit applications.

Modeling done in review of permit applications is generally limited to screening models to determine if additional refined modeling by the facility is necessary. This document outlines the general procedure for such a screening analysis. This is not to be used for PSD permits or other complex modeling situations.

In order for ADEQ to conduct the screening analysis, it is incumbent upon the facility to provide necessary information. Emission Rate Tables (ERTs) may not be a sufficient means of providing this information in that some sources and source types require additional information not provided by an ERT. Without this information, the ADEQ review will most likely be delayed and issuance of a permit decision could be affected. Such additional information should be submitted upon request or in advance if possible.

II. Scope

Non-Criteria Pollutant Control Strategy (NCAPCS)

Refer to the NCAPCS implementation guidance for information on when modeling is required or appropriate.

Criteria Pollutants

PSD permits will be modeled in accordance with Appendix W for all applicable pollutants and NAAQS.

For permits not subject to PSD, in accordance with Revisions to the Arkansas State Implementation Plan, National Ambient Air Quality Standards, Infrastructure SIPs and NAAQS SIP per Ark Code Ann. § 8-4-318, dated March 2017, unless an alternative demonstration method is approved by the Department, dispersion modeling is required for construction of new stationary sources with emission of, or existing stationary sources proposing a modification with emission increases of:

- 100 tpy or greater PM₁₀, for the 24-hour PM₁₀ NAAQS
- 100 tpy or greater SO₂, for the 1-hour SO₂ NAAQS. Modeling for the 3-hour SO₂ NAAQS is not required.
- 100 tpy or greater NO_x, for the 1-hour NO₂ NAAQS. Modeling for the annual NO₂ NAAQS is not required.

An emission increase is based on the differences between the sum of the proposed permitted rates for all emission units and the sum of previously permitted emission rates for all units.

III. Screening Procedures

- Model concentrations starting at the facility fence line, if the fence line information has been provided. Otherwise model without consideration of a fence line. Receptors should be spaced every 50 meters along the fence line and receptors located outside the fence line should be spaced 50 m out to 1.0 km and 100 m thereafter (or keep the 50 m spacing).
 - If fence line concentrations indicate a potential issue with non criteria pollutant impacts, consideration of (unfenced) property lines and areas where there will be no impact on human health can be considered. Generally, all facility property can be excluded from the model if there is no general access by the public. Other impacted areas, such as roads, rivers and other uninhabited property can be excluded as on a case by case basis.
- Include all terrain. The preferred terrain data is data from the National Elevation Dataset (NED). Other non-preferred sources of terrain data may include the Shuttle Radar Topography Mission (SRTM) and Digital Elevation Models (DEM). Use of non-preferred terrain requires Air Division approval and is on a case-by-case basis when such use can be demonstrated to be necessary.
- Model with no downwash.
- Model all sources, including facilities with significant unpaved/paved roads at paper mills, wood products facilities, power plants and quarries/mining or other facilities, as appropriate.
- Emergency generators do not need to be included in the model. This does not include engines used for peak shaving, load sharing or other non emergency power generation scenarios
- For criteria pollutants:
 - If using one year of met data, use highest results.
 - If using 5 years of met data, use the NAAQS averaging times as processed by the model software.
- Use of ambient ratios to estimate impact of NO_x sources on annual NO₂ concentrations (i.e. the 0.75 factor) may be used.
- For Non-Criteria Pollutants:
 - If using one year of met data, use highest results.
 - If using 5 years of met data, use 2nd high (highest of 2nd highest values).
- There are no background levels to consider for non-criteria pollutants.
- Concentration results flagged as containing calm or missing hours should not be excluded from the results. AERMOD accounts for calm and missing hours.

IV. Meteorological Data

Currently we have Little Rock, Fort Smith, and Shreveport, LA data. Other meteorological data may be used, subject to approval by ADEQ.

Effective 12-1-2012, for 5 year meteorological data sets use 2007-2011. For one year data, use 2011. This data range will be updated every 5 years and announced 3 months in advance of the effective date to use the data. Any applications received after the effective date should use the new data set. Pending applications will use the data in effect at the time of application receipt unless otherwise approved by ADEQ.

ADEQ Meteorological Data

Meteorological data sets are available online from ADEQ. Use of ADEQ data is not required, but the effective time periods must be met.

Land Use Parameters are obtained by using USGS land use maps, 30 degree sectors, the location of the surface observation station and are generated by AERSURFACE.

V. Refined Modeling

If these screening procedures indicate a possible problem, i.e. if the predicted concentrations are above established thresholds, a refined analysis may be needed. This is usually conducted by the permittee.

Though not specifically addressed in this protocol, refined modeling should:

- Include all downwash
- Include background. Background values should be determined on a case by case basis depending on the pollutant and the location and the history of monitoring data (not only the latest year).
- Not use the 20-D rule to exclude sources. See permit guidance manual for more information.

VI. Documentation/Files

The permit file should include printouts of the source parameters used in the model as well as a summary of the results. These generally can be found in the input file and summary table of the output file.

Electronic files should be saved on the e: drive. These files should include all site specific input files that include source parameters and building parameters.

| File Type | Lakes | BEEST | Breeze |
|-----------------------|--------------|--------------|---------------|
| AERMOD Input File | .adi | .dta | .ami |
| AERMOD Output File | .ado | .lst | .aml |
| Building File | .bpi | .pip | .bpi |
| Met Surface File | .sfc | .sfc | .sfc |
| Met Profile File | .pfl | .pfl | .pfl |
| Terrain/Receptor Data | .rou | N/A | N/A |