

1. PSD ADDITIONAL IMPACTS ANALYSIS

All PSD applications must include an Additional Impacts Analysis based on existing air quality, the quantity of proposed emissions for pollutants subject to PSD review, the sensitivity of local soils and vegetation, and the visibility in the impact area. The analysis is divided into four parts:

1. Growth analysis
2. Soils and vegetation analyses
3. Visibility impairment analysis
4. Class I area analysis

1.1. GROWTH ANALYSIS

The purpose of the growth analysis is to predict quantitatively the amount of new growth likely to occur to support the source or modification under review and to estimate the emissions that will result from the associated growth. First, an assessment is made regarding the amount of residential growth the modified source will bring to the area. This depends on the size of the available work force, the number of new employees, and the availability of housing in the area. Associated commercial and industrial growth consists of new sources providing goods and services to the new employees and to the modified source itself. Once these anticipated growth effects have been considered, an estimate of the air pollutant emissions that would likely result from the associated growth is made.

XTO expects that most of the employees of the proposed facility will be existing residents of nearby towns/counties; therefore, residential growth is expected to be minimal. Further, XTO does not anticipate any associated industrial or commercial growth as a result of the new facility. For these reasons, any air quality impact resulting from industrial, commercial, and residential growth in the local area due to the proposed project will be negligible.

1.2. SOIL AND VEGETATION ANALYSIS

The secondary NAAQS were established to protect certain air quality-related values that were not sufficiently protected by the primary NAAQS. The secondary NAAQS represent concentration levels below which no harmful effects to either soil or vegetation are expected.¹ As demonstrated in this application, the proposed project will have no adverse impact on the NAAQS. Thus, it can be concluded that any impact on soil and vegetation will be negligible.

As part of the 2015 O₃ NAAQS rulemaking, EPA evaluated the vegetation-related effects of O₃ and the exposure limits needed to protect sensitive vegetation. The W126 exposure index is often used to assess the impacts of O₃ exposure on ecosystems and vegetation. The W126 exposure index is a cumulative seasonal aggregate of weighted hourly O₃ values observed between 8 am and 8 pm. EPA concluded that limiting cumulative seasonal exposures to 17 ppm-hours (ppm-hrs) or lower, in terms of a 3-year W126 index, would provide the required protection. EPA also concluded that this level of control could be achieved with the same standard as the primary O₃ NAAQS (0.070 ppm based on the annual fourth-highest daily maximum 8-hour concentration,

¹ U.S. EPA, Office of Air Quality Planning and Standards, *New Source Review Workshop Manual (Draft)*, (U.S. EPA, Research Triangle Park, NC), October 1990.

averaged over 3 years).² Therefore, the secondary standard was set equal to the primary standard. Section 23 of this application provides details on the O₃ analysis and shows the project will have no adverse impact on the O₃ NAAQS.

1.3. VISIBILITY IMPAIRMENT ANALYSIS

This A Class II Visibility Analysis is required to determine impact the facility will have upon Class II areas. The NMED Modeling guideline states to analyze the change in visibility of a nearby peak or mountain for this analysis, or in the absence of nearby mountains, analyze the visibility of clear sky from nearby state or local parks. Through email correspondence, the NMED has indicated that the VISCREEN analysis for clear sky at the Living Desert Zoo & Gardens is acceptable to assess the visibility impairment in the Class II area.

This analysis follows the prescription in the U.S. EPA's *Workbook for Plume Visual Impact Screening and Analysis*³ wherein three levels of screening procedures are outlined. If the criteria for the first (most conservative) screening level are met, no further analysis is required. The VISCREEN model is recommended for the first level (Level 1) screen. If calculated values from the VISCREEN model are greater than the standardized screening values, the emissions are judged to have the potential for visibility impairment. If the potential for visibility impairment is indicated, the next level analysis, Level 2 analysis, is required. The methods in this workbook are designed for Class I area impacts; however, the procedures are generally applicable to other areas and therefore are used in this analysis. The VISCREEN file is provided with the Class II modeling files on CD.

Results from a VISCREEN analysis are expressed in terms of perceptibility (ΔE) and contrast. The color contrast parameter, ΔE , is used as the primary basis for determining the perceptibility of plume visual impacts in screening analyses. ΔE provides a single measure of the difference between two arbitrary colors as perceived by humans. EPA guidance for plume visual impact screening suggests a critical value for ΔE of 2.0 for untrained observers under reasonable worst-case conditions. A green contrast value is also recorded because the human eye is most sensitive to intensity changes in green. The critical value for this contrast is 0.05.

The pollutant input used for the Level 1 analysis was 177tpy PM₁₀ and 269.2 tpy NO_x which represent the maximum daily emissions. The background visual range of 110 km was selected from Figure 9 of the Workbook for Plume Visual Impact Screening and Analysis. The distance to the Class II area was found to be 34.4 km and was used for the distance inputs in VISCREEN. The VISCREEN analysis for clear sky indicates that the perceptibility is below the screening value of 2.0 at 1.9 and the contrast is below the screening value of 0.05 at 0.031. The Level 1 VISCREEN results indicate no potential adverse visibility impact is projected for inside the Living Desert State Park.

In addition to the VISCREEN analysis, the Class II ambient impact modeling analysis indicates that visibility at the Living Desert Zoo & Gardens will not be impacted. The Class II impacts for the project were found to be below the secondary NAAQS. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. Project ambient impacts were found to be below the modeling significance levels for the Cogen and non-Cogen scenarios, indicating that visibility in the Living Desert Zoo & Gardens would not be impaired.

² 80 FR 65292 – *National Ambient Air Quality Standards for Ozone (Final Rule)*

³ U.S. EPA, *Workbook for Plume Visual Impact Screening and Analysis*, EPA-454/R-92-023, October 1992.

1.3.1. Class Area I Analyses

One of the purposes of the PSD program is “to preserve, protect, and enhance the air quality in national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreational, scenic, or historic value.” Under the PSD provisions, Congress established a land classification scheme for these areas of the country (Class I), specifically including:

1. International parks;
2. National wilderness areas which exceed 5,000 acres in size;
3. National memorial parks which exceed 5,000 acres in size; and
4. National parks which exceed 6,000 acres in size.

Class I area analyses, when necessary, typically include a Class I PSD Increment Assessment for NO_x, SO₂, and PM₁₀, and an Air Quality Related Values (AQRV) assessment including a visibility analysis for increases in visibility impairing pollutants and a deposition analysis for nitrogen and sulfur.

NMED requires Class I Area analyses for proposed PSD projects that are less than 100 km from a Class I Area. The Class I Areas nearest the proposed site are the Carlsbad Caverns National Park in southern New Mexico, Guadalupe Mountains National Park in western Texas, Salt Creek Wilderness Area in southeast New Mexico, and White Mountain Wilderness Area in central New Mexico. Two of the Class I Areas are within 100 km of the site: Carlsbad Caverns National Park, which is approximately 50.8 km from the site, and Guadalupe Mountains National Park, which is approximately 92.8 km from the site.

1.3.2. Class I Area AQRV Analysis

A threshold ratio of emissions to distance, below which AQRV review is not required for sources located greater than 50 km from a Class I area, was established in October 2010.⁴ Specifically, if Q (tpy) / d (km) is less than 10, no AQRV analysis is required. Q is the combined emissions increase (based on 24-hour maximum emissions) of SO₂, NO_x, PM₁₀, and sulfuric acid mist (H₂SO₄) in tpy and d is the distance to the nearest Class I area in km.

For the proposed project, Q is 487.6 tpy⁵ and d is 50.57 km; therefore, Q/d is 9.64. Thus, XTO assumes the requirement for assessing the impact to AQRVs is satisfied. Distance (d) was determined as the distance from the edge of the Husky CDP facility pad location (32°25'6"N, 103°54'25"W) to the boundary of each Class 1 Area. The combined emissions increase (Q) was determined in tons per year, based on 24-hour maximum allowable emissions. For all emission sources other than SSM flaring activities (SSM/Emergency Flare1 –SSM/Emergency Flare3) at the Husky CDP, the maximum hourly emissions for 24 hours per day were considered for Q . Each SSM flaring activity will be limited to two (2) hours per 24 hour period, and both categories of SSM flaring activities cannot occur within a 24 hour period.

1.3.3. Class I Increment Analysis

If the proposed construction of a PSD major source is within 100 km of a Class I area, then the NMED guideline requires an assessment of the PSD increment consumption at the Class I area. The Carlsbad Caverns and Guadalupe Mountains Class I areas are within 100 km of the Husky CDP site; however, these areas are outside the extent of the near field model. The Appendix W guideline provides a screening approach in which the

⁴ U.S. Department of the Interior, *Federal Land Managers' Air Quality Related Values Work Group (FLAG) Phase I Report – Revised (2010)*, Natural Resource Report NPS/NRPC/NRR—2010/232, October 2010.

⁵ Based on 24-hour maximum emissions of 250.8 tpy of NO_x, 47.4 tpy of SO₂, 175.0 tpy of PM₁₀, and 14.4 tpy of H₂SO₄.

ambient impacts at or about 50 km from the new or modifying source are evaluated to determine if significant impacts beyond 50 km are indicated. Receptors were placed at 50 km from the Husky CDP location in the direction of the Carlsbad Caverns and Guadalupe Mountain Class I areas. The impacts at this location were below the Class I significant impact levels and indicate that impacts beyond 50 km in the Class I areas will be below the Class I significant levels.

