Recommended Format for Four-Factor Analyses for Regional Haze Planning in New Mexico

Cover Page

Table of Contents

List of Acronyms

Summary

Include a table that summarizes the results of the four-factor analysis: Source Category; Regional Haze Pollutant Analyzed; Average Cost in 2019 Dollars (dollars per ton of pollutant reduction); Compliance Timeframe; Energy and Non-Air Quality Environmental Impacts; and Remaining Useful Life.

Source Category Analysis

Source Category Description

Clean Air Act and State Regulations Requiring Control for the Source Category

NO_X and SO_2 Emissions from the Source Category

NO_X and SO_2 Emissions and Control Options

Describe how NO_X and SO_2 are generated from the source category under consideration. For NO_X, include a discussion of the different categories of NO_X formation, as applicable (thermal NO_X, fuel NO_X, feed NO_X, and prompt NO_X), as well as how they relate to the particular source category.

Describe all of the existing and potential control options to be analyzed (e.g., combustion modifications, post-combustion NO_X controls, or fuel substitution; sulfur recovery units; acid gas injection; dry sorbent injection; and wet flue gas desulfurization for SO_2 removal). Provide a tabular summary of the potential NO_X and SO_2 control options: Technology, Description, Applicability, Feasibility, and Performance (percent reduction). Include a detailed discussion of all additional control options analyzed.

Four-Factor Analysis of Potential NO_X and SO_2 Control Scenarios for the Source Category

Factor I: Cost of Compliance

Control costs include both the capital costs associated with the purchase and installation of retrofit and new control systems, as well as the net annual costs (annual recurring costs) associated with system operation. The basic components of total capital costs are direct capital costs, which includes purchased equipment and installation costs, and indirect capital expenses.

Direct capital costs consist of such items as purchased equipment, instrumentation and process controls, ductwork and piping, electrical components, and structural and foundation costs. Labor costs associated with construction and installation are also included in this category.

Indirect capital expenses are comprised of engineering and design costs, contractor fees, supervisory expenses, and startup and performance testing. Contingency costs – which represent such costs as construction delays, increased labor and equipment costs, and design modifications – are an additional component of indirect capital expenses. Capital costs also include the cost of process modifications. Annual costs include amortized costs of capital investment, as well as costs of operating labor, utilities,

and waste disposal. For fuel switching options, annual costs include the cost differential between the current fuel and the alternate fuel.

Using the information collected and analyzed, provide a discussion of the cost effectiveness of the various control options for the source category. Include a table that summarizes the cost effectiveness of the options analyzed, and the following: Control Option, Specific Design Parameters, Cost Effectiveness (2019 $/ton), Factors Affecting Cost, and Potential Applicability to specific affected units.

NMED recommends that the accounting principles and generic factors from EPA's Control Cost Manual be used. EPA's Control Cost Manual provides guidance for the development of accurate and consistent costs for air pollution control devices. The Control Cost Manual focuses on point source and area source air pollution controls for volatile organic compounds (VOC), particulate matter (PM), oxides of nitrogen (NO_X), and some acid gases (primarily SO_2 and HCl).

EPA is currently updating the Control Cost Manual. EPA expects to complete the Seventh Edition by January 2022. A listing of EPA's Control Cost Manual chapters as well as other files related to the Control Cost Manual are available online at: https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution. Some updated sections are already finalized and available, and it is recommended that the most current information be used. The cost-estimation procedures are meant to support the calculation of the costs of purchasing, installing, operating, and maintaining pollution control equipment at a facility.

The estimating procedure used in the Manual consists of five steps: (1) obtaining the facility parameters and regulatory options for a given facility, (2) drafting the control system design, (3) sizing the control system components, (4) estimating the costs of these individual components, and (5) estimating the costs (capital and annual) of the entire system. These are detailed in Section 2 of the Control Cost Manual.

Factor 2: Time Necessary for Compliance

The time necessary for compliance is separate from the other three factors. The time necessary for compliance will depend on reasonable installation times and compliance deadlines for selected control measures rather than deciding whether to adopt the control measures. Prior experience with the planning and installation of new or retrofit emission controls is the best guide to how much time a particular source will reasonably need for compliance.

Sources are generally given between two and five years to implement changes for compliance with new regulations. For example, combustion modifications and post-combustion NO_X controls may require significant time for engineering, construction, and facility preparedness. Two to five years after SIP approval would typically be appropriate, depending on the size of the unit and control options selected. Less time would be required for boiler optimization and tuning, which can be implemented within a few months to one year.

Factor 3: Energy and Non-Air Impacts

Describe how the various controls may impact energy use; equipment efficiency; fuel usage; non-air impacts such as noise pollution, odor, climate impacts, and solid, liquid, or hazardous waste generation; and deposition of atmospheric pollutants on land or water.

Any energy impacts that result in any increase or decrease in energy use at the source should be part of the cost of compliance. Upstream energy impacts, like the energy used to produce construction materials, are already reflected in the price of those materials and should not be double counted. The analysis should consider ordinary non-air quality environmental impacts (such as water usage or waste disposal of spent catalyst or reagent) by accounting for them as part of the cost of compliance. In rare location-specific cases, the installation of a control measure may lead to adverse non-air quality environmental impacts that are unique or unusual for a particular type of source. These, if any, should be documented.

Factor 4: Remaining Useful Life of the Source

Provide a discussion of the remaining useful life of the NO_X and SO_2 emitting sources. The remaining useful life of individual emissions units can vary greatly depending on the age of the unit, size of the unit, maintenance frequency, and other factors. The Control Cost Manual provides guidance on typical values for the useful life of various emission control systems used at stationary sources.

References

Appendices