

1.0 INTRODUCTION

Recent natural resource development proposals for Powder River Basin projects have required preparation of Environmental Impact Statements (EISs). As part of the EIS process, impacts on regional air quality and visibility have been assessed. Current methodology for such assessments, as specified by regulatory agencies and Federal Land Managers, calls for use of the CALPUFF long-range air pollution transport computer model (see section 4.1), with specific assumptions and inputs. Recent CALPUFF regional analyses for the Wyodak Coal Bed Methane (CBM) and Horse Creek Coal Lease Application Environmental Impact Statements ⁽¹⁾ have indicated potentially large regional haze impacts in National Parks and other sensitive areas far from the Powder River Basin (PRB), as a result of emissions associated with future PRB coal mining activities. The realism of these projected impacts, and their magnitude relative to those of other air pollution sources, are of obvious importance to the coal industry.

The CALPUFF modeling methods are relatively new, the models themselves are still evolving, and there have been few systematic comparisons of predicted air quality impacts in pristine areas far from pollution sources to actual measurements of pollutant concentrations and visibility. The present investigation was carried out to examine in detail the results and implications of CALPUFF modeling of coal mining emissions.

Badlands National Park (BNP) in South Dakota is one of the closest Class I areas to the Powder River Basin and it is downwind of the Basin for large portions of the time. Detailed data on pollutant concentrations and visibility have been collected at BNP since 1989. Therefore, the study focused on pollutant impacts in BNP. Since both PRB pollutant emissions and BNP air quality can be established with some confidence for the time period from 1989 to the present, it was possible to

¹ The Wyodak CBM EIS focused on impacts of coal bed methane development in the Powder River Basin. The Horse Creek EIS was prepared to assess impacts of a coal lease application adjacent to the Antelope Mine in the Southern Powder River Basin.

analyze predicted and observed trends in air quality parameters. Results of the analyses, along with related investigation of the CALPUFF modeling methodology and impact assessment procedures, are presented in this report.