February 12, 2018

Mr. Sufi Mustafa

New Mexico Environment Department

Air Quality Bureau

525 Camino de los Marquez, Suite 1

Santa Fe, New Mexico 87505-1816

## Re: Air Dispersion Modeling Protocol

## Williams Four Corners LLC - Kutz Canyon Processing Plant

Dear Mr. Mustafa:

Williams Four Corners LLC (WFC) is preparing to submit a construction permit application to the New Mexico Air Quality Bureau (NMAQB) requesting a modification to the Kutz Canyon Processing Plant construction permit. In support of this application, air dispersion modeling will be conducted for the following pollutants: nitrogen dioxide (NO2), sulfur dioxide (SO2), and lead (Pb). The analysis will evaluate compliance with the National Ambient Air Quality Standards (NAAQS). This protocol outlines the proposed air dispersion modeling techniques that will be used to assess impacts surrounding the facility.

##### Introduction

The Kutz Canyon Processing Plant currently operates under a permit issued by the NMAQB, 0301-M9, dated January 27, 2016. The proposed modification will remove the following equipment from the current permit:

* Three Clark HRA-8 reciprocating internal combustion engines (Units 16-18);
* One Wheco heater (Unit 22);
* One Alcorn heater (Unit 23);
* One Parksburg ethylene glycol (EG) dehydrator (Unit 24);
* One Waukesha L5794LT or L7042GL RICE (Unit 37a or 37b); and
* One condensate storage tank and (Unit T6438) and associated EVRU (Unit 74).

The modification will add one new triethylene glycol (TEG) dehydrator (Unit 77), with a rated capacity of 20 million standard cubic feet per day (MMSCFD). Air dispersion modeling must be addressed, because the dehydrator reboiler will be equipped with a 1.48 million British thermal units per hour (MMBtu/hr) burner.

Note that the facility was modeled in 2015 for NO2, carbon monoxide (CO), SO2, total suspended particulate (TSP), particulate matter less than or equal to 10 microns in diameter (PM10) and particulate matter less than or equal to 2.5 microns in diameter (PM2.5). A modeling waiver has been obtained for all those pollutants and averaging periods included in the 2015 analysis. Since that evaluation did not include the NO2 and SO2 1-hour NAAQS and the Pb quarterly NAAQS, modeling for these pollutants and averaging periods is required for this current modification.

##### Facility

The Kutz Canyon Processing Plant is located approximately 3.5 miles south of Bloomfield, New Mexico, at approximately 235,316 meters Easting, 4,062,138 meters Northing, Zone 13, North American Datum 1983 (NAD83), at an elevation of approximately 5,787 feet above mean sea level. The facility is located in a rural area.

The facility is equipped to process pipeline quality natural gas. After the modification, the following NOX, SO2, and Pb sources (excluding exempt sources) will operate at the facility:

* Eight Solar Centaur 40 turbines (Units 1-6, 19 & 20);
* Three Solar Saturn 1200 turbines (Units 7, 8 & 29);
* One Born glycol heater (Unit 25);
* One Born hot oil heater (Unit 27);
* One plant flare (Unit 28);
* One Pesco fuel gas heater (Unit 30);
* One Caterpillar D343 standby generator (Unit 34)
* One Pesco TEG dehydrator reboiler (Unit 35b);
* One Zeeco flare (Unit 36);
* Three cooling towers (Units 39-41);
* One Kohler 8.5RES backup generator (Unit 76); and
* One TEG dehydrator reboiler (Unit 77b).

##### Standards

Table 1 identifies the applicable significant impact levels (SIL) and NAAQS NMAAQS:

###### Table 1

SIL, NAAQS and NMAAQS

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Pollutant | AveragingPeriod | SIL(μg/m3) | NAAQS(μg/m3) | NMAAQS(μg/m3) |
| Pb | Quarterly | 0.03 | 0.15 |  |
| NO2 | 1-Hour | 7.52 | 188.03 |  |
| SO2 | 1-Hour | 500 | 196.4 | -- |

It is planned that Pb impacts will be evaluated using the high monthly average impact. Post processing will be used to determine quarterly impacts, if necessary. The high-eighth-high daily maximum 1-hour NO2 concentration will be used to evaluate compliance with the NAAQS. The high-fourth-high daily maximum 1-hour SO2 concentration will be used to evaluate compliance with the NAAQS.

The facility is located in Air Quality Control Region 014, an attainment area for all pollutants; therefore, non-attainment modeling impacts will not be considered.

**Dispersion Model**

Both significant and cumulative impact modeling will be conducted using the latest version of the AMS/EPA Regulatory Model (AERMOD). The Beeline Software BEEST for Windows modeling manager will be used to prepare the input files and manage processing. Environmental Protection Agency (EPA) recommended defaults will be used. As the station is located in a rural area, urban area modeling will not be conducted.

##### Methodology

The modeling will be conducted in accordance with this protocol and the NMAQB modeling guidelines. First, emissions from all new or modified Kutz Canyon Processing Plant sources will be modeled to determine if there are significant impacts. For pollutant averaging periods where impacts are less than the SIL, no additional modeling will be conducted.

*NO2 and SO2 Modeling*

Where impacts exceed the SIL, cumulative impacts for comparison with the NAAQS will be determined using one of the methodologies identified in the modeling guidelines (facility impacts plus background concentrations or facility plus neighboring source impacts).

*Pb Modeling*

Where impacts exceed the SIL, in accordance with direction provided in the NMAQB modeling guidelines, impacts for comparison with the NAAQS will be determined using all identified Pb emitting sources from the facility (no neighboring sources or background concentrations).

##### Facility Sources

The modeled emission rates will be the pounds per hour emission rates identified in the application (except as noted below). Modeling will be conducted using stack parameters provided by manufacturers as identified in the application.

There are no NOX, CO, SO2, or particulate startup, shutdown and maintenance (SSM) emissions associated with the sources.

The coordinate system used to reference source locations will be of the Universal Transverse Mercator (UTM) convention (NAD83). Terrain elevation data will be obtained from National Elevation Dataset (NED) data (1/3 second) taken from the United States Geological Survey (USGS) website.

##### Building Downwash

The EPA Building Profile Input Program -Prime (BPIP-Prime) will be used to evaluate structures for building downwash impacts. All structures close enough (of sufficient height and/or width) to produce downwash effects from the stacks will be included in the evaluation.

**Receptor Selection**

A Cartesian grid with variable receptor spacing will be used to evaluate significant impacts around the facility. The grid will contain receptors with 50-meter spacing around the fence line and from the fence line out to at least 500 meters, 100-meter spacing from the 500 meters beyond the fence line out to at least 1,000 meters, and 500-meter spacing from 1,000 meters beyond the fence line out to at least 5,000 meters. If significant impact areas extend beyond 5,000 meters from the fence line, the grid will also include receptors with 1,000-meter spacing sufficient to cover the entire significant impact area.

Cumulative impact modeling will be conducted using only those receptors from the grid defined in the paragraph above for which there were significant impacts. If maximum cumulative impacts greater than or equal to 75 percent of the applicable standard are calculated at receptors located in the 100-meter, 500-meter or 1,000-meter interval portions of the grid, then refined grids with 50-meter spacing will be centered on these receptors to identify the local high. These refined grids will be large enough to include adjacent receptors in all directions (200 meters square in the 100-meter interval portion of the grid, 1,000 meters square in the 500-meter interval portion of the grid and 2,000 meters square in the 1,000-meter interval portion of the grid).

The coordinate system used to reference receptor locations will be of the UTM convention (NAD83). Terrain elevation data will be obtained from NED data (1/3 second) taken from the USGS website. The AERMOD Terrain Preprocessor (AERMAP) will be used to calculate the receptor elevations and terrain maximums. The domain used to calculate terrain maximums will be sufficient to identify all terrain nodes that create a slope greater than or equal to 10 percent.

**Meteorological Data**

Modeling will be conducted using Val Verde meteorological data collected during 1993. The data will be obtained from the NMAQB web site. The profile base elevation will be set at 1,705 meters above mean sea level.

The San Juan River Valley is the most prominent terrain feature near the Kutz Canyon Processing Plant. The plant is located on the south slope of the valley, approximately 2.5 miles from the river. The general flow of the valley is from east to west. The plant also sits on top of the eastern slope of Kutz Canyon. Near the plant, the canyon is well over a mile wide and about 300 feet deep. The general flow of the canyon is from the south southeast to the north northwest.

Four meteorological data sets were considered for use with the modeling analysis: Val Verde data, San Juan Generating Station data, Bloomfield data, and Farmington data. The criteria used to select the appropriate meteorological data set are as follows:

* A wind rose plot of the 1993 Val Verde meteorological data shows predominant flows from the west, north, east northeast, and east. Collected near the plant, the strong west, north and east flows seem to best represent the terrain surrounding the plant.
* A wind rose plot of the 1997 Bloomfield meteorological data shows predominant flows from the north, north northeast, west, and west northwest. Though collected near the plant, the north flow seems exaggerated, while the east flows seem less than one would expect.
* A wind rose plot of the 1993-1994 San Juan Generating Station meteorological data shows predominant flows from the west northwest and southeast. It is lacking the strong east and west flows one would associate with the San Juan River Valley.
* Wind rose plots of the 2006-2010 Farmington meteorological data show predominant flows from the west and east. The Farmington data is collected at the airport which sits on top of a small mesa. There is little obstruction to the air flow for several miles in all directions around airport. This is similar to the area around the Kutz Canyon Processing Plant, however, the Farmington data lacks the northerly flow one would expect from the Bloomfield area.

##### Neighboring Sources

Cumulative impacts to demonstrate compliance with the NO2 and SO2 NAAQS may be calculated as facility impacts plus background concentrations or may be calculated as facility impacts plus neighboring source impacts. Therefore, neighboring sources may be used to evaluate compliance. For NO2 and SO2 NAAQS modeling, neighboring sources include all sources within 25 kilometers of the facility and all sources between 25 and 50 kilometers from the facility that are permitted to emit 1,000 pounds per hour or more.

Where used, neighboring sources will be obtained from the NMAQB.

##### Background Concentrations

Where impacts exceed the SIL, cumulative impacts for comparison with the NAAQS may be calculated as station impacts plus background concentrations as identified in the NMAQB modeling guidelines. If this method is utilized, background concentrations will be obtained from the modeling guidelines. Table 2 below identifies the applicable background concentrations that will be used.

**Table 2**

Background Concentrations

|  |  |  |  |
| --- | --- | --- | --- |
| Pollutant | Averaging Period | Background(μg/m3) | Source ID |
| NO2 | 1-Hour | 67.693 | 1ZB |
| SO2 | Annual | 13.9656 | 1ZB |

The NO2 data is obtained from Table 17 of the NMAQB modeling guidelines and is the 1-hour background 98th percentile concentration. Since it is nearest the plant, NO2 data is taken from the Bloomfield monitoring station.

The SO2 data is obtained from Table 21 of the modeling guidelines and is the 1-hour background 99th percentile concentration. Consistent with direction provided in the Table, the SO2 data is taken from the Bloomfield monitoring station.

If a more refined approach is needed to demonstrate compliance, it will be coordinated with the NMAQB.

# NOX TO NO2 CONVERSION

NOX impacts will be converted to NO2 impacts using the Ambient Ratio Method 2 (ARM2). If an NO2/NOX ratio of less than 0.5 is used, justification will be provided.

Thank you for your attention in this matter. If you have any questions or comments, please contact me at (801) 294-0454.

Sincerely,

## CIRRUS CONSULTING, LLC



James W. Newby

cc: Mitch Morris, WFC