2013 Southern Ute Indian Tribe Title V Point Source Air Emissions Inventory for Criteria and Hazardous Air Pollutants

Prepared for:
United States Environmental Protection Agency
Region VIII
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List of Acronyms

AP-42	Compilation of Air Pollutant Emission Factors
CAA	Clean Air Act
CO	Carbon Monoxide
CFR	Code of Federal Regulations
EI	Emissions Inventory
EPA	United States Environmental Protection Agency
HAP	Hazardous Air Pollutants
ITEP	Institute for Tribal Environmental Professionals
NEI	National Emissions Inventory
NMHC	Non-methane Hydrocarbons
NMOC	Non-methane Organic Compounds
NO_x	Oxides of Nitrogen
O_3	Ozone
PM_{10}	Particulate Matter 10 microns and smaller
$PM_{2.5}$	Particulate Matter 2.5 microns and smaller
QA	Quality Assurance
SO_2	Sulfur Dioxide
SUIT	Southern Ute Indian Tribe
TEISS	Tribal Emissions Inventory Software Solutions
THC	Total Hydrocarbons
TPY	Tons Per Year
VOC	Volatile Organic Compounds

I. Executive Summary

1.1 Purpose of Inventory

The purpose of this Emissions Inventory (EI) is to update baseline emissions data for the 2013 calendar year for all quantifiable air emissions from Title V sources located within the exterior boundaries of the Reservation. The data will be used for network review purposes as well as to track total emissions within the Reservation boundaries. It may also be used for future emissions modeling purposes and permitting fee analysis.

The primary air pollutants that are included in this EI are oxides of nitrogen (NO_x), Carbon Monoxide (CO), Particulate Matter (PM_{10}), Volatile Organic Compounds (VOCs), and Hazardous Air Pollutants (HAPs).

In addition to any regulatory requirements specified by the United States Environmental Protection Agency (EPA), this inventory was developed to meet the following objectives:

- Identify and quantify air emissions from Title V sources emitted within the Reservation boundary.
- Acknowledge EPA recommendation that tribes conduct an emissions inventory.
- Fulfill the Fiscal Year 2014 CAA §103 of the SUIT Air Quality Program's Work Plan Component 2.9, which reads:
    a) Collect CY2013 Title V EI and prepare a final 2013 Reservation Title V EI report for the EPA.
    b) Submit emissions data to the NEI.

1.2 General Methodology

Data for this EI were obtained from either the EPA administered 40 CFR Part 71 program or the Southern Ute Indian Tribe (SUIT) administered 40 CFR Part 70 fee calculation worksheets for calendar year 2013. The data collection responsibilities were divided among the SUIT Air Quality program staff: Brenda Jarrell, Air Quality Manager; Mark Hutson, Air Quality Technical Manager, Michael Freeman, Air Quality Compliance Specialist, and Andrew Switzer, Air Quality Technician. The Air Quality Program (AQP) collected data for all Title V sources operating within the Southern Ute Indian Reservation (Reservation) under Part 71 and 70 permits for the 2013 calendar year.

The AQP prepared a Microsoft Excel© spreadsheet, obtaining emission rates for each emission point from fee forms submitted by Title V sources. These data were then reviewed for quality assurance before being sent to the Institute for Tribal Environmental Professionals (ITEP) for additional quality review. Ms. Angelique Luedeker, ITEP, provided EI review comments on October 30, 2014, and the AQP accepted or addressed each of the review comments that were presented.

Ms. Luedeker requested of the AQP that we allow ITEP to upload the EI for quality assurance testing and verification to the EPA's National Emissions Inventory (NEI) database using the Tribal Emissions Inventory Software Solution (TEISS). The final report will be submitted once the Tribe has completed the Emissions Inventory Data Release Form.

1.3 Source Classification

Air pollutants within the exterior boundaries of the Reservation have been separated into two point source categories for the purpose of this inventory. Tables 1.1 and 1.2 explain the definitions for a point source for both criteria pollutants and HAPs.

Table 1.1. Point Source Definition for Criteria Pollutants.

Category	Definition
Criteria Pollutants	Six specific air pollutants for which the EPA has set national ambient air quality standards including oxides of nitrogen (NO_x), carbon monoxide (CO), ground-level ozone (secondary pollutant from the chemical reaction of VOC, NO_x and sunlight), sulfur dioxide (SO_2), lead (Pb), and particulate matter (PM).
Point sources	Stationary sources of air pollutants which directly emit or have the potential to emit 100 tons per year or more of any criteria pollutant, including volatile organic compounds (VOC).

Table 1.2. Point Source Definition for HAPs.

Category	Definition
HAPs	Hazardous air pollutants known, or suspected, to cause cancer or other serious health or environmental effects as identified under Clean Air Act Section 112(b).
Point sources	Stationary sources of air pollutants which directly emit or have the potential to emit 10 tons per or more of any single HAP or 25 tons per year of any combination of HAPs (a.k.a., Title V source).

1.4 Spatial Coverage

This inventory encompasses the Title V sources operating within the exterior boundaries of the Reservation in 2013 (Figure 1).

1.5 Base-Year

The Title V EI presented in this report spans the period from January 1, 2013, through December 31, 2013. There were 365 days in this period.

II. Introduction

2.1 General Description

The Reservation is located in southwestern Colorado. The Reservation land area covers 1,066 square miles in three counties (La Plata, Archuleta, and Montezuma) and borders New Mexico to the south. The total area covered by this inventory is approximately 682,590 acres, which encompasses all land within the external boundaries of the Reservation. The Tribe and/or Tribal

members own approximately 320,000 acres, while the remaining land mass is comprised of non-Indian and government land in a checkerboard fashion. The primary land use is agricultural and the predominant industry is natural gas production. As of December 2013, there were 41 permitted Title V sources within its exterior boundaries; this constitutes about one-third of all Title V sources located in Indian country in the U.S.

2.4 Geology

The Reservation is located at the northern edge of the San Juan Basin, an asymmetrical paleogeographic low measuring approximately 100 miles at its widest point. The basin is located in northwestern New Mexico and southwestern Colorado and encompasses an area of about 22,000 square miles. The basin is a tectonic feature that was formed as a result of crustal flexure. At its deepest point, in the northeastern corner, the sedimentary rocks of the San Juan Basin reach a thickness of approximately 15,000 feet. The San Juan and Rocky Mountain ranges, as well as other Larimide age uplifts, supplied the sediment from which the Mesozoic Age sedimentary rocks within the basin were formed. This sedimentary package contains both the source rocks from which the hydrocarbons were formed and the reservoir rocks in which the hydrocarbons are contained. Reservoir rocks have the ability to store hydrocarbons due to certain physical properties such as permeability and porosity.

The Tribe, while producing some oil and natural gas by conventional methods, garners most of its natural gas from unconventional coal bed methane production from the Fruitland Coal. The combination of the relatively shallow and geographically uniform Fruitland Coal beds makes the San Juan Basin unique.

2.5 Climate

The Reservation remains generally semi-arid throughout the year. Sitting directly north of New Mexico desert land and south of the Colorado alpines, the average temperature range during the winter months is between twenty and forty degrees Fahrenheit. Freezing temperatures are fairly common throughout the winter and during the 2013 calendar year the coldest month was January with a low of -15.1 degrees Fahrenheit and a monthly average of 17.2 degrees Fahrenheit. During the summer months the temperature usually remains in the high eighties to nineties. The warmest month of 2013 was June with a high of 93.9 degrees Fahrenheit, and a monthly average of 66.8 degrees Fahrenheit.

Snow is the dominant form of precipitation on the Reservation, though more snowfall is generally seen in the higher elevations. During the 2013 calendar year, the winter months on the Reservation recorded an average of 2.17 inches of precipitation. During summer months the rainfall precipitation average was approximately 4.15 inches, with August and September rainstorms carrying the majority of the moisture. The driest months for the 2013 calendar year were May, June and December.

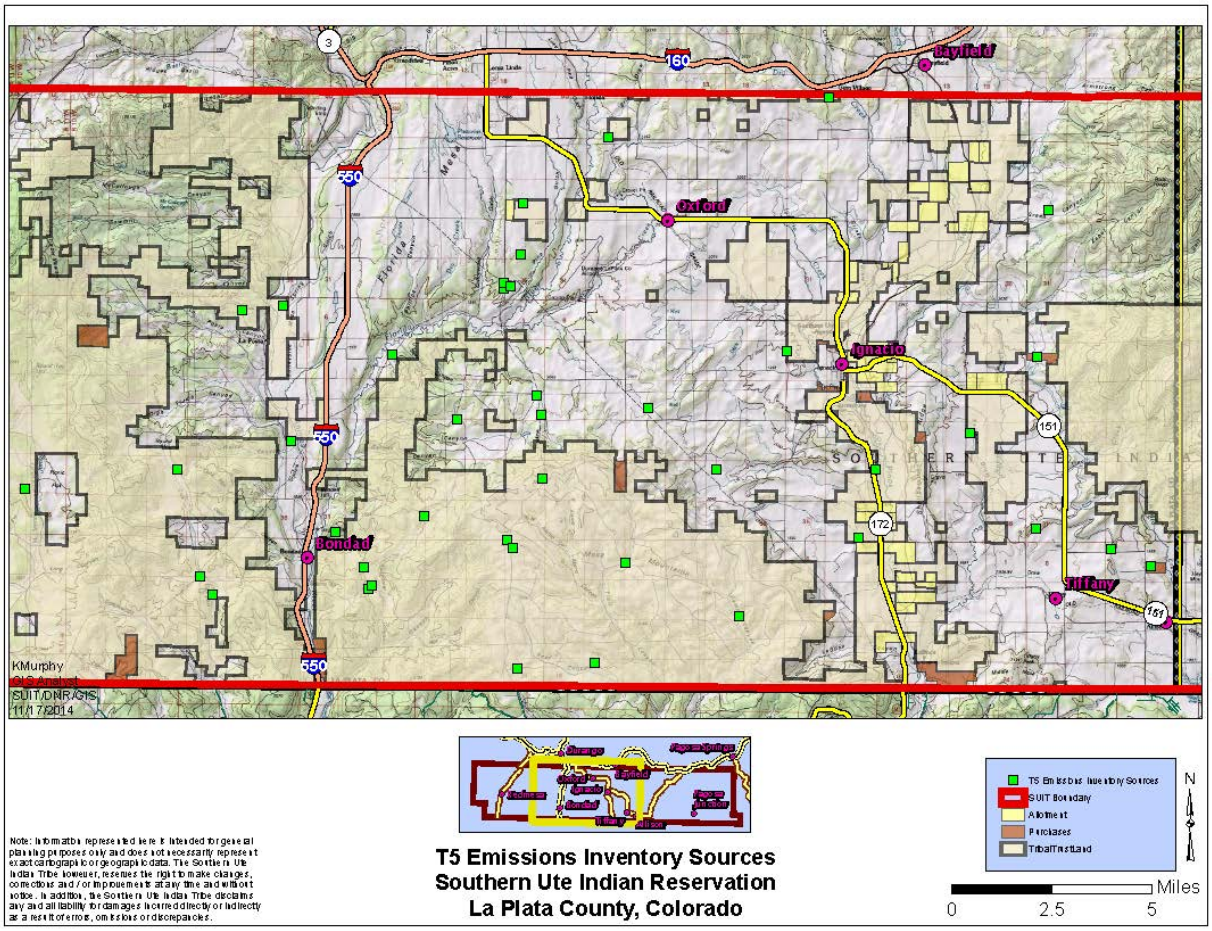

Figure 1. Title V sources located on the Southern Ute Indian Reservation (2013).

III. Point Sources

3.1 Title V Sources

There were 41 Title V sources operating on the Reservation as of the end of CY2013. These sources consist primarily of compressor stations and gas treatment facilities for natural gas production and distribution. There is one municipal waste landfill and one salt water disposal facility located within the Reservation subject to the requirements of the Title V Program. All of these sources operate either under the Part 71 program administered by EPA Region 8 or the Part 70 program operated by the Tribe (Appendix A).

3.2 Data Collection

The Title V source emissions for this report were collected from the fee calculation worksheets submitted by each source to EPA Region 8 for the 2013 calendar year. For all of the Title V sources emissions data, the compilation was done by Mark Hutson, Michael Freeman and Andrew Switzer. Actual emissions data for 2013 were available for most of the Title V sources.

Title V sources are required to pay annual emission fees for each ton of regulated air pollutant, except for carbon monoxide. However, some of the Title V sources included the actual CO emissions in the supporting documents attached as appendices to the fee calculation worksheets. Therefore, CO emissions for 30 Title V sources were reported for the 2013 calendar year.

3.3 Results

Table 3.1 below shows the total criteria air pollutant and HAP emissions from Title V sources for the 2013 calendar year.

Table 3.1 2013 Title V Emissions on the Southern Ute Indian Reservation (tons)

Source Type	Emission Source	CO[1]	NOx	VOC	PM_{10}	SO_2	HAP[2]
Point Sources	Title V sources	2,059.2	4,814.7	1,945.9	65.3	18.2	396.5

[1] *The actual CO emissions were obtained from the fee calculation worksheet, if the Title V source included the CO actual emissions. There were 35 Title V sources that included the actual CO emissions for the 2013 calendar year.*

[2] *The total HAP emissions include any of the hazardous air pollutants listed under Clean Air Act Section 112(b) and emitted by the Title V sources. This does not include any THC, NMOC, or NMHC since these may consist of an unknown ratio of hazardous air pollutants and other compounds.*

Total criteria pollutant emissions from Title V sources for the 2013 year were 6,957.4 tons while VOC and HAP emissions were 1,945.9 tons and 396.5 tons, respectively. CO, VOC, and NOx emissions account for 22%, 21%, and 52%, of the sum of all Title V source emissions respectively (Figure 2). Most of the Title V sources within the Reservation contribute approximately 3% to 5% toward the total annual NO_X emission rate for the airshed. However, the Williams Ignacio Gas Plant alone contributed 1,924.4 tons of NO_X emissions. This annual emission rate is approximately 38% of the total 4,814.7 tpy of NOx emissions emitted from all Title V sources permitted on the SUIT Reservation and this equates to about an additional 13 Title V sources for emissions of NOx (Figure 3).

The Williams Ignacio Gas Plant completed a compression upgrade project in CY2014, opting to use gas-fired turbine technology for compression and retiring the aging two-cycle Clark engines previously used to compress the natural gas at the facility. Emissions of NOx from this facility are expected to decrease to a permitted potential to emit of 131.0 tpy.

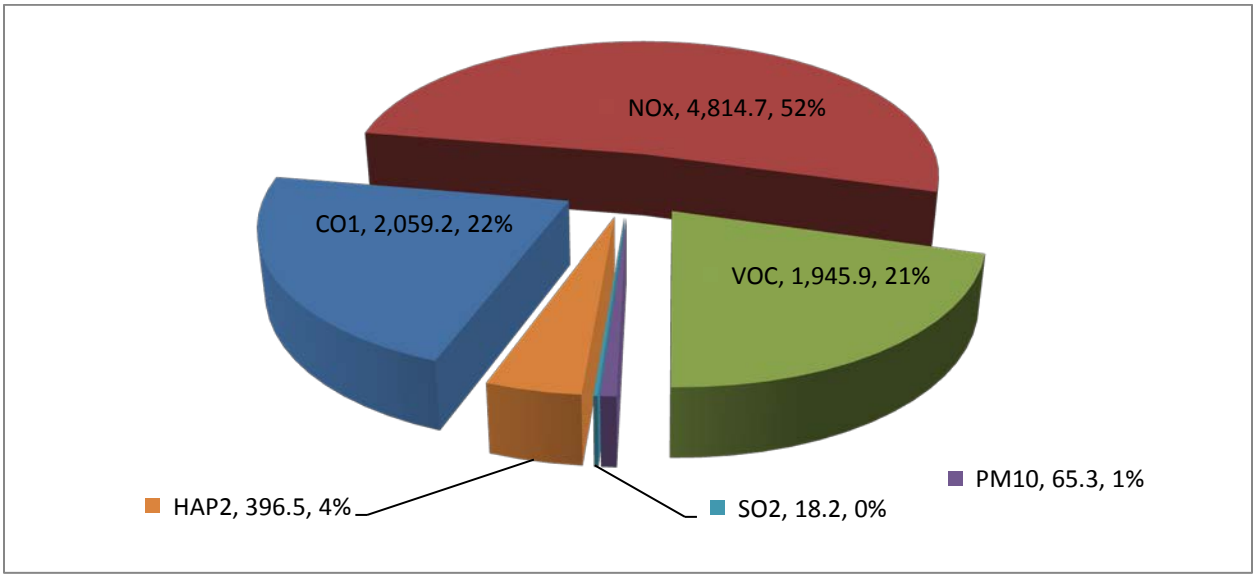

Figure 2. 2013 Title V criteria and HAP emissions on the Southern Ute Indian Reservation (tpy, % of total).

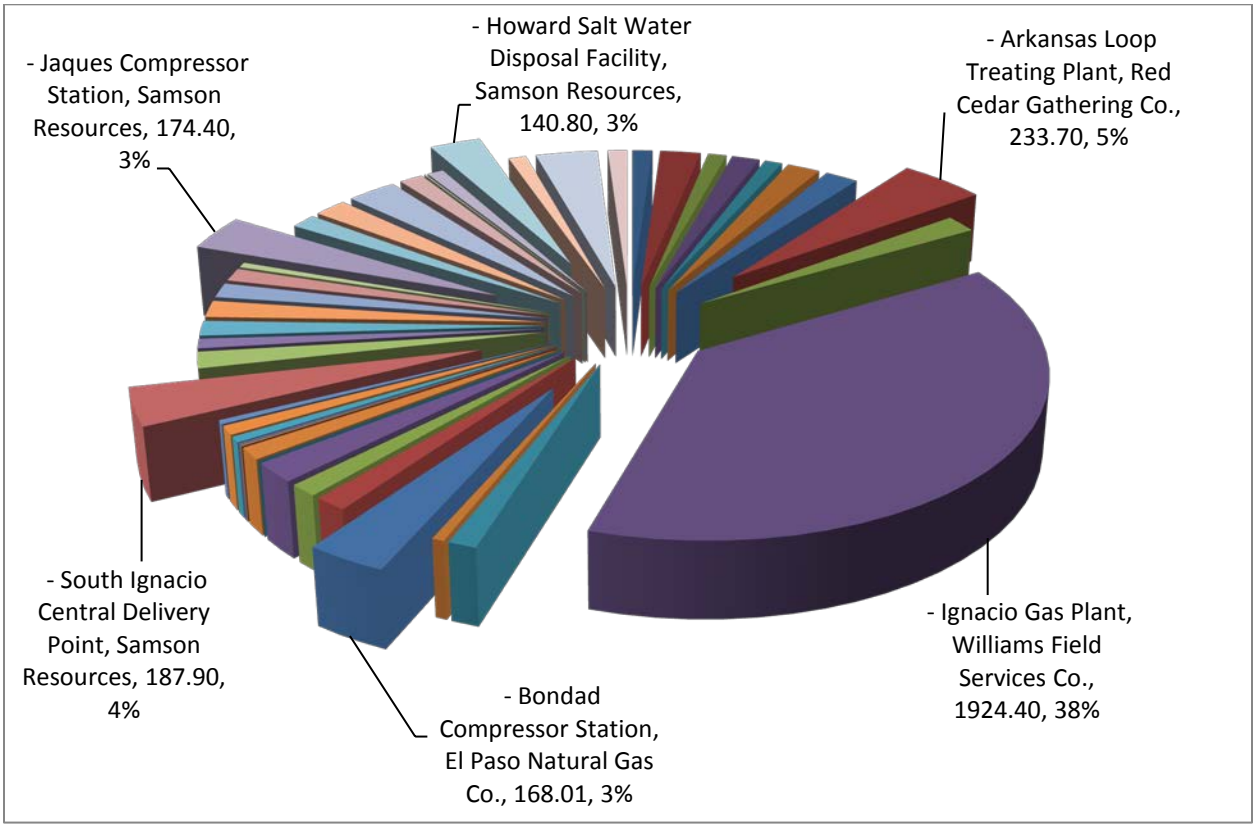

Figure 3. 2013 Title V NOx emissions by source on the Southern Ute Indian Reservation (tpy and % total NOx emissions).

Title V HAP emissions for the 2013 calendar year were estimated at 396.5 tons. Formaldehyde, Toluene, Xylene, and Benzene account for 55%, 9%, 11%, and 3% respectively (Figure 4).

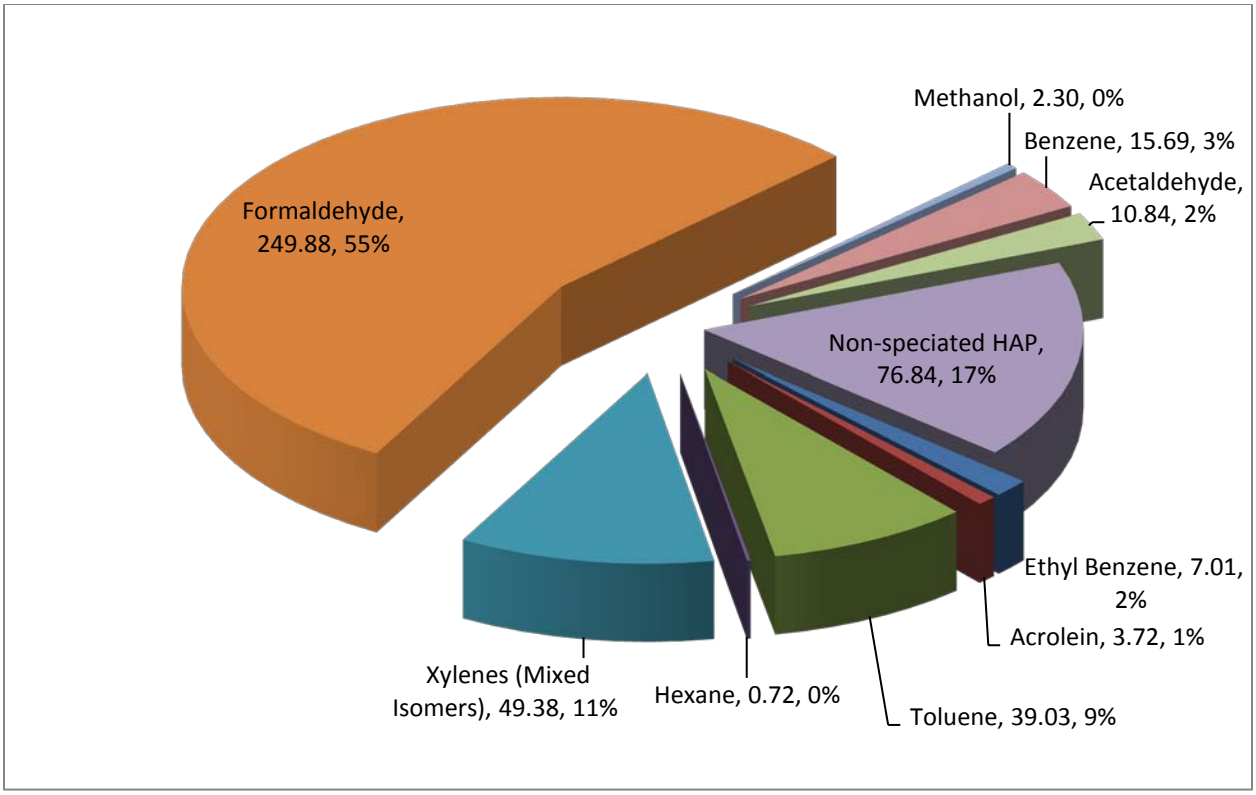

Figure 4. 2013 Title V HAP emissions (tpy, % total HAP emissions).

IV. Quality Assurance

Quality assurance procedures for this EI consist of the following:

- Check of emissions factors and calculations used for appropriateness
- Review of either 2013 Part 71 or Part 70 fee calculation worksheets completed by source operator
- Completeness checks of fee calculation worksheets
- Reality checks (believability in a real world setting)
- Double checking calculations for accuracy and reproducibility
- Reviewed by ITEP staff

4.1 Point Source QA Methodology

All the Title V source emissions data were collected from either Part 71 or Part 70 fee calculation worksheets completed by source operators and submitted to either the EPA Region 8 of SUIT AQP, respectively. The emission inventory data were compiled by the SUIT AQP staff Mark Hutson, Air Quality Technical Manager, and Michael Freeman, Air Quality Compliance Specialist. The data were sent to ITEP staff for quality assurance review, ensuring data compiled by the AQP were accurate and correct.

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