SOUTHERN UTE INDIAN TRIBE
AIR QUALITY PROGRAM
ANNUAL NETWORK REVIEW
CY2024

Prepared For:
United States Environmental Protection Agency
Region VIII
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Contents

Appendices

List of Tables

List of Figures

ACRONYMS AND ABBREVIATIONS

AQI	Air Quality Index
AQP	Air Quality Program
BCF	Billion Cubic Feet
CAA	Clean Air Act
CFR	Code of Federal Regulations
CH_4	Methane
CO	Carbon Monoxide
EPA	Environmental Protection Agency
FEM	Federal Equivalent Methods
FRM	Federal Reference Method
MET	Meteorological
MMS	Mobile Monitoring Station
NAAQS	National Ambient Air Quality Standards
NIST	National Institute of Standards and Technology
NMHC	Non-methane Hydrocarbon
NO_2	Nitrogen Dioxide
NO	Nitric Oxide
NO_x	Oxides of Nitrogen
NPAP	National Performance Audit Program
O_3	Ozone
$PM_{2.5}$	Particulate Matter less than or equal to 2.5 microns
PM_{10}	Particulate Matter less than or equal to 10 microns
PPB	Parts per Billion
PPM	Parts per Million
QAPP	Quality Assurance Project Plan
SLAMS	State and Local Air Monitoring Stations
SO_2	Sulfur Dioxide
SOP	Standard Operating Procedure
SPMS	Special Purpose Monitoring Station
SRM	Standard Reference Method
SUIT	Southern Ute Indian Tribe
ug/m^3	Micrograms per cubic meter
VOC	Volatile Organic Compound

CY2024 Network Review
Air Monitoring Program
Southern Ute Indian Tribe
July 2023

1.0 Introduction

The purpose of this Annual Network Review (ANR) document is to provide information concerning the operation of the ambient air monitoring network by the Southern Ute Indian Tribe's (SUIT) Air Quality Program (AQP) in calendar Year 2024.

In October 2006, US EPA issued final regulations concerning state and local agency ambient air monitoring networks. Under 40 CFR, Part 58, Subpart B, states applicable tribes are required to submit an annual monitoring network review to the Environmental Protection Agency (EPA) regional office. This network review is required to provide the framework for establishment and maintenance of an air quality surveillance system. This network plan is required to list any changes that are proposed to take place to the current network during the following year. The annual monitoring network review must be made available for public inspection for at least 30 days prior to submission to EPA.

1.1 Overview

Located in southwestern Colorado, the SUIT AQP regulates air quality through implementation of Clean Air Act programs to protect public health and the environment on the Southern Ute Indian Reservation. Air monitoring data are used (1) to determine compliance with U.S. EPA's National Ambient Air Quality Standards (NAAQS)and (2) for generation of real-time EPA Air Quality Index (AQI) air quality forecasts and public health notifications, (3) identification of localized air quality related health risk concerns, and (4) tracking long-term trends in air quality.

1.2 Personnel

In 2023, all air quality monitoring activities were conducted by the Tribe's Environmental Programs Division – AQP staff. Mr. Danny Powers, the Air Quality Program Manager, directs and provides managerial direction to the air quality programs. The Air Quality Technical Manager, Dr. John Volkerding, provides managerial and technical direction to the ambient monitoring program and verifies data quality. Mr. Jacob Henry implements the day-to-day activities of the ambient monitoring program as the Air Quality Technician.

1.3 Overview of Monitored Parameters – Criteria Pollutants

Nitrogen Dioxide
Nitrogen Dioxide (NO_2) is a reddish-brown gas that is a respiratory irritant that causes eye and sinus irritation. It is created primarily during fuel combustion from industrial sources and vehicles. It can react in the atmosphere to form nitrate aerosols that block sunlight and reduce visibility. Of most interest to the AQP, NO_2 is a precursor pollutant in the photochemical reaction between nitrogen oxides and volatile organic compounds (VOCs) and sunlight which is responsible for ground-level ozone formation. Monitoring of this pollutant could help the AQP estimate the influence of anthropogenic NO_2 emissions in the formation of ozone on the Reservation.

Carbon Monoxide
Carbone Monoxide (CO) is a colorless, odorless, and tasteless gas that is created primarily from incomplete fuel combustion and plays a small role in the formation of ground-level ozone. It is toxic to humans and animals as it readily attaches to hemoglobin in red blood cells that normally carry oxygen. Exposure to high levels of CO can be deadly. Exposure to low concentrations of CO can result in headaches, nausea, confusion, disorientation, syncope (fainting), and seizures.

Ozone
Ground-level ozone (O_3), a constituent of photochemical smog, is not emitted into the atmosphere directly, but rather is formed by the reactions of other pollutants. The primary precursor pollutants involved in this reaction are VOCs and oxides of nitrogen. These precursors form O_3 in the presence of sunlight. O_3 is a strong irritant of the upper respiratory system and causes damage to crops. Ozone is a pollutant of concern on the Reservation, as historically, O_3 concentrations on the Reservation have been relatively near the 2015 ozone NAAQS of 70 parts per billion (ppb)

Sulfur Dioxide
Sulfur Dioxide (SO_2) is a gaseous pollutant that is emitted primarily by industrial furnaces or power plants burning coal or oil containing sulfur. At high concentrations, breathing can be impaired. Damage to vegetation can also result. SO_2 data has been collected since June 2017 with consistently low readings. This annual network review suggests eliminating the collection of SO2 data.

Fine Particulate Matter
Fine particulate matter with a diameter of 2.5 microns or less (PM 2.5) is created primarily from industrial processes and fuel combustion. These particles can travel deep into the lungs. Exposure to particle pollution is linked to a variety of significant health problems ranging from aggravated asthma to premature death in people with heart and lung disease. Particulate matter 2.5 is of particular concern and interest of the AQP, due to the frequent occurrence of high PM 2.5 concentrations during local and regional forest fire events and dust storms.

Particulate Matter

Particulate matter with a diameter of 10 microns or less (PM 10) is emitted from mechanical processes in transportation and industrial sources. Dust storms and fires generate a significant number of particulates. Exposure PM_{10} can induce tissue damage, and lung inflammation. Particulate matter 10 is also of great concern and interest of the AQP, due to the frequent occurrence of high PM 10 concentrations during local and regional forest fire events and dust storms.

Methane (CH_4) and Non-Methane Hydrocarbons (NMHCs)

Although methane (CH_4) and Non-Methane Hydrocarbons (NMHCs)
Are not EPA NAAQS criteria pollutants, these pollutants are of interest to the SUIT air quality program due to previous scientific studies in the San Juan Basin by NOAA and NASA, which identified elevated background concentrations of methane. The studies identified natural leaks on the Fruitland Coal geologic outcrops and the oil and gas industry to be primary contributors of CH_4 emission on the Reservation. The AQP therefore monitors $CH_4$and NMHCs to establish trends and investigate the influence of the regional oil and gas production activities production. Non-methane hydrocarbons are also ozone precursors.

2.0 Monitoring Objectives

The monitoring program has been designed to respond to the needs of the Reservation, while adhering to strict EPA specifications and regulations, including the monitoring objectives of Appendix D of 40 CFR Part 58, Section 2. *General Monitoring Requirements* as required by 40 CFR Part 58.10. Monitoring is conducted to:

- Continuously collect ambient air pollutant and meteorological according to the quality assurance requirements of the Code of Federal Regulations, particularly, but not limited, to appendix A in 40 CFR Part 58.
- Submit all quality assurance reviewed data to the EPA Air Quality Systems database for use by the federal agencies, the State of Colorado, the Tribe or other outside agencies for air quality studies and air quality planning.
- Demonstrate compliance with the National Ambient Air Quality Standards (NAAQS).
- Help protect the health and welfare of all residents within the exterior boundaries of the Southern Ute Indian Reservation through population of real-time air pollution monitoring data and corresponding EPA Air Quality Index (AQI) health alerts on the Tribe's website.
- Identify localized health concerns and track long-term trends in air quality.

Although the reservation does not meet the requirement of a Metropolitan Statistical Area with a population greater than 350,000 in 40 CFR Part 58.50 AQI requirements, the AQP participates in AirNow. Data obtained from all 3 monitoring stations is uploaded and is viewable online for public access of the Air Quality Index on the reservation.

3.0 Air Monitoring Network

The SUIT has established three monitoring stations. Ute 1 is located in the town of Ignacio, Ute 3 is located on the central-western portion of the Reservation near Bondad, and the Mobile Monitoring Station (MMS) is currently located toward the northeastern corner of the Reservation, near Lake Capote. The SUIT AQP monitors five of the six NAAQS criteria pollutants. The regulatorily required pollutants are: NO_2 , O_3 and CO. The non-regulatorily required pollutants that are monitored for informing tribal members and the public of air quality health issues are: particulate matter (PM_{10} and $PM_{2.5}$) and SO_2. **(Table 1.)** The tribe does not monitor Lead as the reservation currently does not meet the criteria for monitoring this pollutant under the requirements of §4.1 *Lead (Pb) Design Criteria and* § 10(a)(4) of 40 CFR 58. Meteorological (MET) parameters are obtained at all three of the monitoring stations per §§1.2(c) of 40 CFR 58, Appendix D.

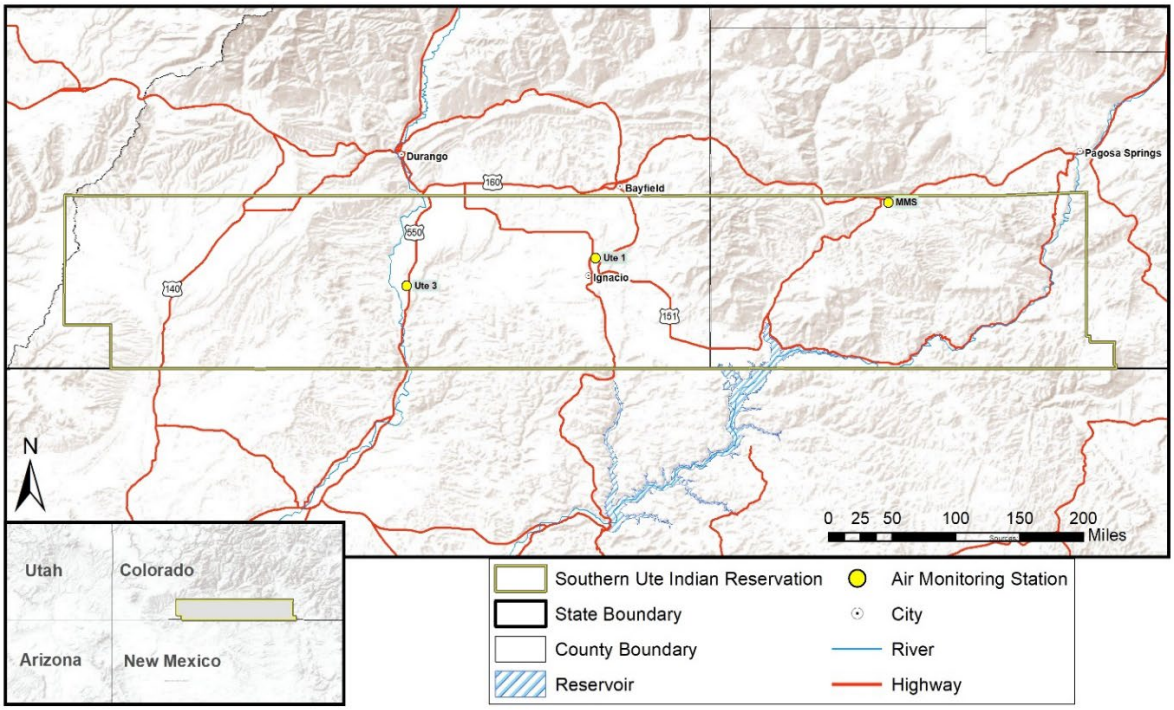

Figure 1 - Map of Southern Ute Reservation with Location of Air Monitoring Stations

All three monitoring stations are equipped with an Agilaire 8872 data acquisition system connected to the gaseous analyzers, PM instruments, MET sensors, and other diagnostic sensors. Gas analyzers are challenged regularly during automated calibration events that make use of Teledyne T700 calibrators, T701 Zero Air Generators, and NIST traceable calibration gas cylinders with known concentrations of each species. Continuous data for all parameters is recorded locally at each individual station and centrally on a main server located in Ignacio, CO. All historical data is stored on the central server and can be retrieved at will. This type of set-up has enabled the AQP to collect data with increased accuracy and precision and has reduced errors and system faults as they are now identified and corrected with minimal downtime.

The air monitoring data are used as a basis to improve environmental decision making and to further the understanding of the local air resources. These data also broaden awareness of air quality issues within the region.

The NetAssess2020 app, which was developed by the EPA's Office of Air Quality Planning and Standards (https://sti-r-shiny.shinyapps.io/EPA_Network_Assessment/), is used to determine the demographics and area served for the two SLAMS and one SPMS. This data is in each station's respective section and Appendix A.

The AQP has collected CO data at Ute 1 since 2004 with the highest 8-hour reading of 1.6 ppm observed in 2004 and the most recent three-year average of the highest 8-hour readings being 0.5 ppm as compared to the 9 ppm 8-hour NAAQS standard. The AQP is planning to cease collecting CO data at Ute 1 and moving the Thermo 48iQ to the Ute 3 station.

Operational issues with the Thermo Scientific 55i instrument relating to internal component failures have affected the capture of CH4/NMHC data at Ute 3. The AQP recommends relocating the Thermo Scientific 55i from the Lake Capote (MMS) monitoring station since Ute 3 is in closer proximity to oil and gas operations than MMS.

Operational issues with the Thermo Scientific 48i instrument relating to internal component failures have affected the capture of CO data at Ute 3. The AQP recommends relocating the Thermo Scientific 48iQ from the Ute 1 monitoring station since Ute 3 is in closer proximity to oil and gas operations and co-located with the Thermo Scientific 55i.

Table 1. Monitoring Site Identification

SUIT Site Designation	EPA-AQS Number	Type	Street Address	Geographic Coordinates	CY2023 Air Pollutants	Planned Cessation of Air Pollutants for CY2024	Planned Additional Air Pollutants for CY2024
Ute 1	08-067-7001	SLAM	1 MI. NE of Ignacio, County RD. 517. Ignacio, CO 81137	37.13678, -107.62863	NO_x, O_3, CO $PM_{2.5}$, PM_{10}	CO	N/A
Ute 3	08-067-7003	SLAM	7571 Hwy. 550. Ignacio, CO 81137	37.10258, -107.870219	NO_x, O_3, CO, $PM_{2.5}$, PM_{10}, CH_4/NMHC, Visibility	N/A	N/A
MMS	08-007-7004	SPM	398 CO-151, Pagosa Springs, CO 81147	37.205717, -107.254234	NO_x, O_3, SO_2, CH_4/NMHC	SO2, CH4/NMHC	N/A

3.1. Ute 1 (Ignacio) Air Monitoring Station

Ute 1 is located approximately one mile north of Ignacio, Colorado. The station is situated in the Pine River Valley, the most densely populated area of the Reservation **(Figure 1)**.

The Ute 1 station meets all siting criteria for an urban SLAMS for measuring typical pollutant concentration in an area of high population density area, as outlined by §§ 1.1.1.(b) & 1.2.(b)(4) of 40 CFR 58, Appendix D.

Ute 1 serves a population of 5,575 and an area of 204 mi^2 (528km^2) for NO_2, O_3, and PM2.5. Demographics of this area are in Appendix A of this ANR.

This station is in a secured area within the Southern Ute Indian Tribe Forestry complex and is thought to be representative of the air quality in and around the Ignacio community.

Figure 2 - *Northeastern view of the Ute 1 station*

The Ute 1 station **(Figure 2)** is likely to be most affected by local activities such as vehicle traffic, on-going building and road construction, and winter residential wood and coal burning. Residential burning and traffic are the most influential local sources that directly impact the air quality around the Ignacio community. The Ute 1 station serves a valuable purpose of providing real-time air pollutant concentrations and EPA AQI health advisories to residents of Ignacio on the Tribes website. The town of Ignacio is frequently impacted by high particulate concentrations from local, regional, and western forest fires and dust storms. Additionally, the region, at times, experiences elevated O_3 values.

40 CFR 58.10(a)(5)(i) outlines the requirement for nitrogen dioxide monitoring. The AQP utilizes a Thermo 42i analyzer following EPA Federal Reference Method (FRM) EQOA-0880-047 to monitor for NO2, NOx, and NO. Being that NO_2 is a precursor pollutant in the photochemical reaction between nitrogen oxides and volatile organic compounds (VOCs) and sunlight which is responsible for ground-level ozone formation. The AQP monitors this pollutant to help the AQP estimate the influence of anthropogenic NO_2 emissions in the formation of ozone on the Reservation as well as determining regulatory compliance with the NO_2 NAAQS.

40 CFR 58.10(a)(9) outlines the requirement for ozone monitoring. The AQP utilizes a Thermo 49i analyzer following EPA FRM EQOA-0880-047 to monitor for regulatory compliance with the O_3 NAAQS.

58.10(a)(9) CO outlines the requirement for carbon monoxide monitoring. The AQP utilizes a Thermo 48iQ analyzer following EPA FRM RFCA-0981-054 to monitor for regulatory compliance with the CO NAAQS.

A Teledyne T640 Federal Equivalent Method (FEM) sampler using EPA method EQPM-0516-236 collects continuous non-regulatory measurements of $PM_{2.5}$ and PM_{10} for the purpose of helping inform individual decision making that will lead to reduced PM exposure in the region from wildfire smoke and dust storms.

All criteria air pollutants currently measured at the monitoring station are listed in **Table 2** and have remained below the current NAAQS.

Table 2. Ute 1 CY202 measured ambient concentrations in comparison to the NAAQS

Instrument Type	Reference Method	Parameter	NAAQS	CY2022 * Concentrations
Thermo 42i	EQOA-0880-047	NO_2	53 ppb (annual)	3.4 ppb
			100 ppb (1-hour)	18.1 ppb
Thermo 48iQ ‡	RFCA-0981-054	CO ‡	9 ppm (8-hour)	0.3 ppm
			35 ppm (1-hour)	0.4 ppm
Thermo 49i	EQOA-0880-047	O_3	0.070 ppm (8-hour)	0.067 ppm
Teledyne T640 ⁂	EQPM-0516-236	$PM_{2.5}$	15 ug/m^3 (Annual)	4.4 ug/m^3
			35 ug/m^3 (24-hour)	23.3 ug/m^3

*** CY2023 data is not complete and validated by the date of this review**

‡ The AQP is proposing ceasing CO monitoring in CY 2024 and moving the Thermo 48iQ to Ute 3

⁂ PM2.5 measurements are non-regulatory and performed to provide air quality health information

The Ute 1 monitoring station continues to collect meteorological data for the following parameters: solar radiation, wind speed, wind direction, ambient temperature, humidity, and precipitation. All the meteorological instruments, except for the precipitation gauge, are located on the 30-foot tilt-over aluminum met tower. The peripherals of the meteorological instruments are housed in a weather-resistant, surge protected enclosure box affixed to the base of the tower (**Figure 3**).

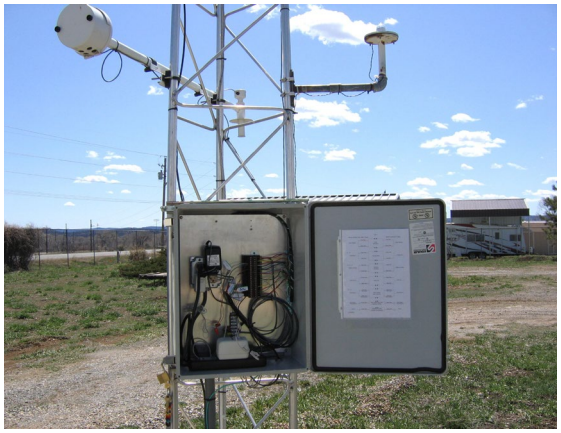

Figure 3 – Ute 1 ***Meteorological tower and weather resistant, surge protected enclosure box (left). The thirty-foot meteorological tower (right).***

3.1.1 2023 Recommendations for Ute 1

As stated previously, the AQP recommends ceasing collecting CO data at Ute 1 and moving the Thermo 48iQ to the Ute 3 station.

3.2. Ute 3 (Bondad) Monitoring Station

The Ute 3 station is located approximately twenty miles west of Ignacio, near Bondad, Colorado.

The Ute 3 station meets all siting criteria for an urban SLAMS for measuring typical pollutant concentration in an area of high population density area, as outlined by §§ 1.1.1.(b) & 1.2.(b)(4) of 40 CFR 58, Appendix D.

Figure 4 – ***Northern view of Ute 3 monitoring station***

Ute 3 serves a population of 46,774 and an area of 3,743 mi^2 (9,694 km^2) for NO_2. Although Ute 3 does not serve Ignacio, CO, due to the scarcity of SLAMS in western Colorado, the EPA's NetAssess2020 app includes Durango and the area north of it as the area served (Appendix A).

The Ute 3 monitoring station is located on Tribal land within a locked perimeter fence and the area is regularly patrolled by tribal rangers.

The station is situated along the eastern rim of the Animas River Valley near Highway 550, a major roadway that connects southwestern Colorado with northwestern New Mexico **(Figure 1.).**

The Ute 3 station **(Figure 2)** is likely to be most affected by activities such as highway vehicle traffic, road construction agricultural activities, and oil and gas production sites.

40 CFR 58.10(a)(5)(i) outlines the requirement for nitrogen dioxide monitoring. The AQP utilizes a Thermo 42i analyzer following EPA Federal Reference Method (FRM) EQOA-0880-047 to monitor for NO2, NOx, and NO. Being that NO_2 is a precursor pollutant in the photochemical reaction between nitrogen oxides and volatile organic compounds (VOCs) and sunlight which is responsible for ground-level ozone formation. The AQP monitors this pollutant to help the AQP estimate the influence of anthropogenic NO_2 emissions in the formation of ozone on the Reservation as well determining regulatory compliance with the NO_2 NAAQS.

40 CFR 58.10(a)(9) outlines the requirement for ozone monitoring. The AQP utilizes a Thermo 49i analyzer following EPA FRM EQOA-0880-047 to monitor for regulatory compliance with the O_3 NAAQS.

58.10(a)(9) CO outlines the requirement for carbon monoxide monitoring. The AQP utilizes a Thermo 48i analyzer following EPA FRM RFCA-0981-054 to monitor for CO. for the regulatory measurements of CO. This instrument was located at Ute 3 to investigate the localized CO concentrations relating to localized mobile and stationary sources associated with the nearby Highway 550 and oil and gas development as well as determining regulatory compliance with the CO NAAQS.

A Teledyne T640x sampler using EPA FEM EQPM-0516-236 collects continuous non-regulatory measurements of $PM_{2.5}$ and PM_{10} for the purpose of helping inform individual decision making that will lead to reduced PM exposure in the region from wildfire smoke and dust storms.

Given the proximity to oil and gas operations, a Thermo Scientific 55i methane (CH4) and non-methane hydrocarbon (NMHC) monitor is operated at Ute 3. During CY 2022, the CH4/NMHC monitor had an approximately 27% data completeness rate due to operational issues which is less than the EPA's 75% rate goal. The AQP recommends relocating the Thermo Scientific 55i methane (CH4) and non-methane hydrocarbon (NMHC) monitor from MMS to Ute 3, because Ute 3 has significantly more proximal oil and gas development than the MMS station.

The AQP recommends re-locating the Thermo Scientific 48iQ CO from Ute 1 to Ute 3 to be co-located with the Thermo Scientific 55i methane (CH4) and non-methane hydrocarbon (NMHC) monitor.

All and criteria air pollutants currently measured at this monitoring station are listed in **Table 3** and have remained below the current NAAQS.

Table 3. Ute 3 CY2023 measured ambient concentrations in comparison to the NAAQS

Instrument Type	Reference Method	Parameter	NAAQS	CY 2022 Concentrations *
Thermo 42i	EQOA-0880-047	NO_2	53 ppb (annual)	4.3 ppb
			100 ppb (1-hour)	18.2 ppb
Thermo 48i ◊	RFCA-0981-054	CO	9 ppm (8-hour)	0.3 ppm
			35 ppm (1-hour)	0.4 ppm
Thermo 49i ◊◊	EQOA-0880-047	O_3	0.070 ppm (8-hour)	0.066 ppm
Thermo 55i	---	CH_4 / NMHC	----	6.7 / 0.6 ppm
Teledyne T640x ⁂	EQPM-0516-236	$PM_{2.5}$	15 µg/m^3 (Annual)	4.3 µg/m^3
			35 µg/m^3 (24-Hour)	19.1 µg/m^3
Teledyne T640x ⁂	EQPM-0516-239	PM_{10}	150 µg/m^3 (24-Hour	67.5 µg/m^3
Ecotech Aurora Nephelometer⁂	---	Visibility in Miles	----	96 miles (annual avg)

*** CY2023 data is not complete and validated by the date of this review**

◊ The AQP is proposing replacing the Thermo 48i at Ute 3 with the Thermo 48iQ from Ute 1

◊◊ The AQP is proposing replacing the Thermo 55i at Ute 3 with the Thermo 55i from MMS

⁂ PM_{10}, $PM_{2.5}$, CH_4/NMHC and visibility measurements are non-regulatory and performed to provide air quality health information

Recommendations for Ute 3

As stated previously, the AQP recommends re-locating the Thermo Scientific 55i from the Lake Capote (MMS) monitoring station since Ute 3 is in closer proximity to oil and gas operations than MMS and recommends re-locating the Thermo Scientific 48iQ from the Ute 1 monitoring station since Ute 3 is in closer proximity to oil and gas operations and co-located with the Thermo Scientific 55i.

3.3. Lake Capote (MMS) Monitoring Station

Figure 5 - Mobile Monitoring Station

The Mobile Monitoring Station (MMS) is located on the northeastern portion of the Reservation near Lake Capote **(Figure 1).**

The current location of the MMS meets all siting criteria for an urban SLAMS for measuring typical pollutant concentration in an area of high population density area, as outlined by §§ 1.1.1.(b) & 1.2.(b)(4) of 40 CFR 58, Appendix D. While the siting criteria for a SLAMS is met at the current location, the station is operated as a SPMS given its nature of being mobile.

Lake Capote MMS is located on the least populated area of the reservation yet serves a population of 78,080 and an area of 15,023 mi^2 (38,910 km^2) for NO_2. Due to the scarcity of SLAMS in western Colorado, the EPA's NetAssess2020 app includes Pagosa Springs, Alamosa, and some parts of Northern New Mexico and the Jicarilla Apache Nation Reservation within the area served. A map containing the boundaries and demographics of this area are in Appendix A.

The Lake Capote MMS site **(Figure 5)** is located within a locked perimeter fence and the area is regularly patrolled by tribal rangers as well as visited weekly by ambient air quality monitoring program staff.

The purpose of the Lake Capote MMS has been to assess pre-oil and gas development and ambient air quality conditions in the eastern portion of the Reservation and is likely to be most affected by activities such as highway vehicle traffic, road construction After completing an initial three-year background monitoring campaign from 2017 to 2020, the MMS has remained "stationed" at its current location at Lake Capote but may be periodically moved for special purpose monitoring projects or source surveillance.

40 CFR 58.10(a)(5)(i) outlines the requirement for nitrogen dioxide monitoring. The AQP utilizes a Thermo 42i analyzer following EPA Federal Reference Method (FRM) EQOA-0880-047 to monitor for NO2, NOx, and NO. Being that NO_2 is a precursor pollutant in the photochemical reaction between nitrogen oxides and volatile organic compounds (VOCs) and sunlight which is responsible for ground-level ozone formation. The AQP monitors this pollutant to help the AQP estimate the influence of anthropogenic NO_2 emissions in the formation of ozone on the Reservation as well determining regulatory compliance with the NO_2 NAAQS.

40 CFR 58.10(a)(9) outlines the requirement for ozone monitoring. The AQP utilizes a Thermo 49i analyzer following EPA FRM EQOA-0880-047 to monitor for regulatory compliance with the O_3 NAAQS.

40 CFR 58.10(a)(6) for sulfur dioxide monitoring. SO_2 is a gaseous pollutant that is emitted primarily by industrial furnaces or power plants burning coal or oil containing sulfur, neither of which are located in the area; thus, the SO_2 measurements have been non-regulatory in nature to provide a background for comparison in the event sources were to be constructed in the area.

The AQP has collected SO2 data at Lake Capote MMS since 2017 with the highest 1-hour reading of 15.1 ppb observed in 2019 and the highest design value being 8 ppb as compared to the 75 ppb NAAQS standard.

The AQP has collected methane and non-methane hydrocarbon data at Lake Capote MMS since 2017. The ambient background concentrations of methane prior to development of shale gas resources in the region range from 2.1 to 2.8 ppm. The ambient background concentrations of non-methane hydrocarbons prior to development of shale gas resources in the region range from 0.1 to 0.6 ppb. Given the collection of six years of ambient background data, the AQP recommends ceasing collecting methane and NMHC data at Lake Capote MMS and moving the Thermo Scientific 55i to Ute 3.

The Lake Capote MMS continues to collect meteorological data for the following parameters: wind speed, wind direction, ambient temperature, and humidity. All the meteorological sensors are located on an aluminum tower affixed to the station roof. All criteria air pollutants currently measured at the monitoring are listed in **Table 4** and have remained below the current NAAQS.

Table 4. MMS CY2023 measured ambient concentrations in comparison to the NAAQS.

Instrument Type	Reference Method	Parameter	NAAQS	CY2022 Concentrations *
Thermo 42i	EQOA-0880-047	NO_2	53 ppb (annual)	2.3 ppb
			100 ppb (1-hour)	15 ppb
Thermo 43i ‡‡ ⁂	RFCA-0981-054	SO_2 ‡‡ ⁂	75 ppb (1-hour)	12.4 ppb
Thermo 49i	EQOA-0880-047	O_3	0.070 ppm (8-hour)	0.067 ppm
Thermo 55i ‡	---	CH_4 / NMHC ‡	----	2.7 / 0.1 ppm

*** CY2023 data is not complete and validated by the date of this review**

‡ The AQP is proposing ceasing CH_4/NMHC monitoring in CY 2024 and moving the Thermo 55i to Ute 3

‡‡ The AQP is proposing ceasing SO2 monitoring in CY 2024

⁂ SO_2 and CH_4/NMHC are non-regulatory and are performed for establishment of background

3.3.1 2023 Recommendations for MMS

After a successful 6-year monitoring campaign, Tribal leadership has suggested relocating the MMS to another site on the Reservation. Because the MMS is a non-regulatory SPMS, relocation will not adversely affect the monitoring network and its commitments to the workplan. Viable sites are currently being surveyed.

The 6-year background monitoring study has provided adequate data to evaluate the pre-oil and gas development ambient air quality conditions in the eastern area of the Reservation. Continued real-time methane and NMHC monitoring is of greater importance in the area closer to oil and gas activity served by Ute 3. The AQP recommends relocating the Thermo Scientific 55i methane and non-methane hydrocarbon analyzer to Ute 3.

The Thermo Scientific 43i has provided background SO2 data showing the ambient concentration is far below the ambient air standard of 75 ppb and the monitor should be retired from service to allow resources for any new and upcoming monitoring needs.

4.0 Quality Assurance

Continuous Monitors

The Air Quality staff regularly assesses gaseous analyzer automated performance checks including: Zero, Span, and Precision checks. Calibrations are performed as needed or once per quarter to maintain accuracy, precision, and bias goals defined in the AQP's Quality Assurance Project Plan (QAPP). During these internal audits and checks, gas analyzers are challenged with NIST-certified gas cylinders containing known concentrations of the applicable pollutant gases, diluted with zero air using mass flow controllers. Every quarter, a third-party contractor performs system audits on all the gaseous analyzers and PM instruments.

The EPA's National Performance Audit Program (NPAP) is one of the major components in the quality assurance of the Nation's air monitoring program. Annually the EPA performs a NPAP audit at one the ambient air monitoring stations. The most recent was conducted at Ute 3 on September 20, 2022, with the facility passing. Ute 1 is scheduled for an NPAP audit in CY2023.

Particulate Monitors

Verification checks of the continuous particulate monitors have occurred semi-annually by a 3rd party contractor and consist of calibrated flow rate checks, as well as temperature, pressure, leak rate and flow rate verification checks. The AQP has purchased new calibration equipment, spe-

cifically a Teledyne T701 Zero Air Generator and a Teledyne API 700 Dynamic Dilution Calibrator, which allow internally performed monthly checks.

Meteorological Monitors

Semi-annual calibrations and audit checks are performed by a 3rd party contractor on the meteorological equipment to determine proper alignment and operation of the sensors. The details and minimum standards for this program are set out in the Code of Federal Regulations (Part 58 Ambient Air Quality Surveillance).

Quality Assurance Project Plan

The AQP always attempts to go above and beyond the minimum requirements. A complete description of these procedures is available in the SUIT AQP Quality Assurance Project Plan (QAPP) and the results are available from the AQP or through the national EPA AQS database. The QAPP is available on the AQP website at https://www.southernute-nsn.gov/wp-content/uploads/sites/15/2022/11/FY22-SUIT-AQP-QAPP-Final.pdf

EPA Technical System Audits

The U.S. EPA Region VIII performs a Technical Systems audit on the Southern Ute Indian Tribe's Air Monitoring Network every three years. The most recent was in September 2022. The Southern Ute Air Quality Program will conduct an internal systems audit every year that is not audited by the U.S. EPA. AQP staff conducts quality control checks at least once per week, and calibrations once every calendar quarter. The details and minimum standards for this program are set out in the Code of Federal Regulations (Part 58 Ambient Air Quality Surveillance).

5.0 Summary

The Southern Ute Reservation is located primarily within La Plata County with approximately 30% of the land located within Archuleta County. According to Colorado Oil and Gas Conservation Commission (COGCC), for calendar year 2022(CY22) the number of oil and gas wells located within Archuleta County was approximately 141 wells with an oil production totaling 1,014 barrels and 20.2 billion Cubic Feet (BCF) of gas production. The number of oil and gas wells within La Plata County for CY21 was approximately 3,148 wells with an oil and gas production totaling 13,605 barrels and 210.30 BCF, respectively (COGCC).

Per the SUIT Air Quality Program data, of the combined 3,289 wells in both counties, approximately 78% (2,565 active production) are located within the Reservation boundaries. Considering the large quantity of oil and gas wells in production within the Reservation boundaries and the operation of the SUIT AQP's air permitting programs, the AQP plans to continue operating the three air monitoring stations. The Air Quality Program has also incorporated one non-regulatory Purple Air PM sensors in the network to aid in research and further community outreach.

6.0 Final Comments

The Tribe's AQP has reviewed the ambient air quality data within the AQP monitoring network and compared those findings to other ambient air quality data generated from other monitoring stations operated by other agencies within the Four Corners area (Appendix B). The gaseous pollutant data for ozone, carbon monoxide and nitrogen oxides as well as monitoring practices from both monitoring sites, Ute 1, Ute 3, and MMS were examined in detail. The AQP has determined that all data pertaining to the AQP monitoring network for the 2023 calendar year meets all QA requirements for AQS, the AQP 2023 QAPP, and tribal standard operating procedures. All the data correlates well with other agencies' monitoring stations in southwestern Colorado and northeastern New Mexico that use similar sampling methodologies and have similar oil/gas operations.

A draft of this document was made available to the public June 23, 2023, at www.https://www.southernute-nsn.gov/justice-and-regulatory/epd/air-quality/ambient-monitoring/. Any comments pertaining to this document should be sent to the following contacts:

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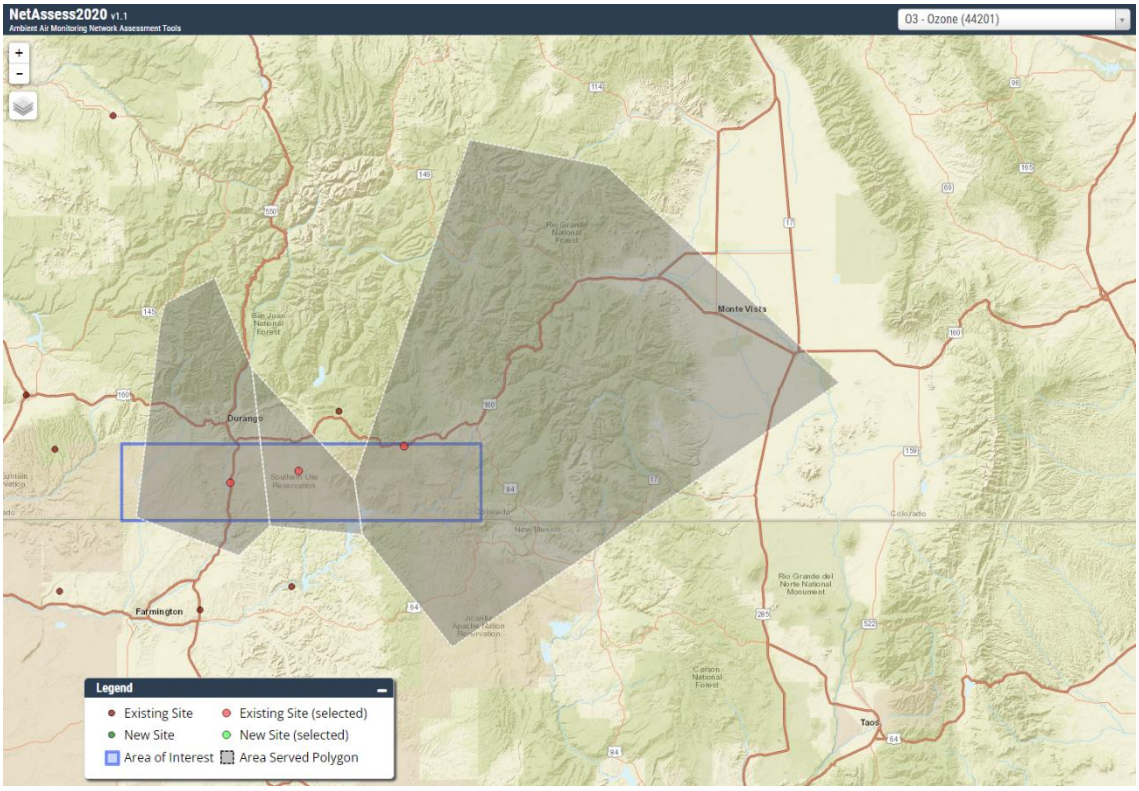
Appendix A:
Demographics and Areas Served by the SUIT Network

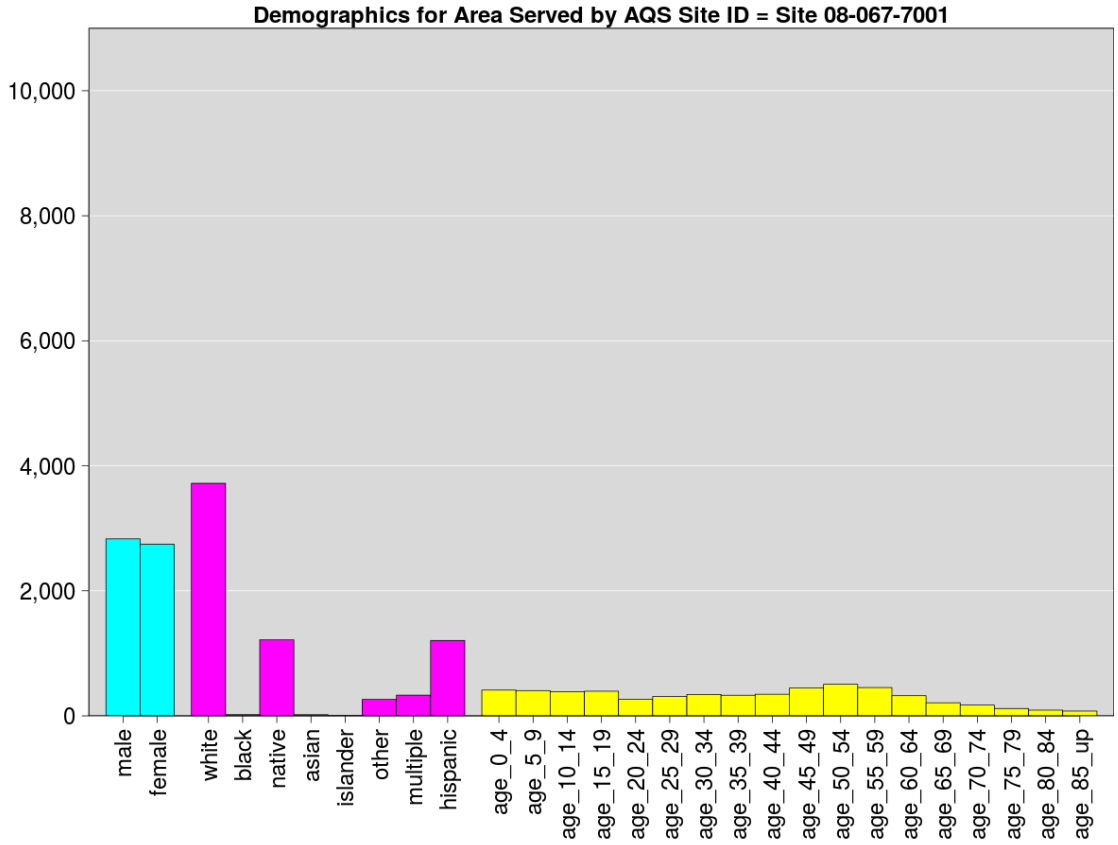
Contents

Ozone

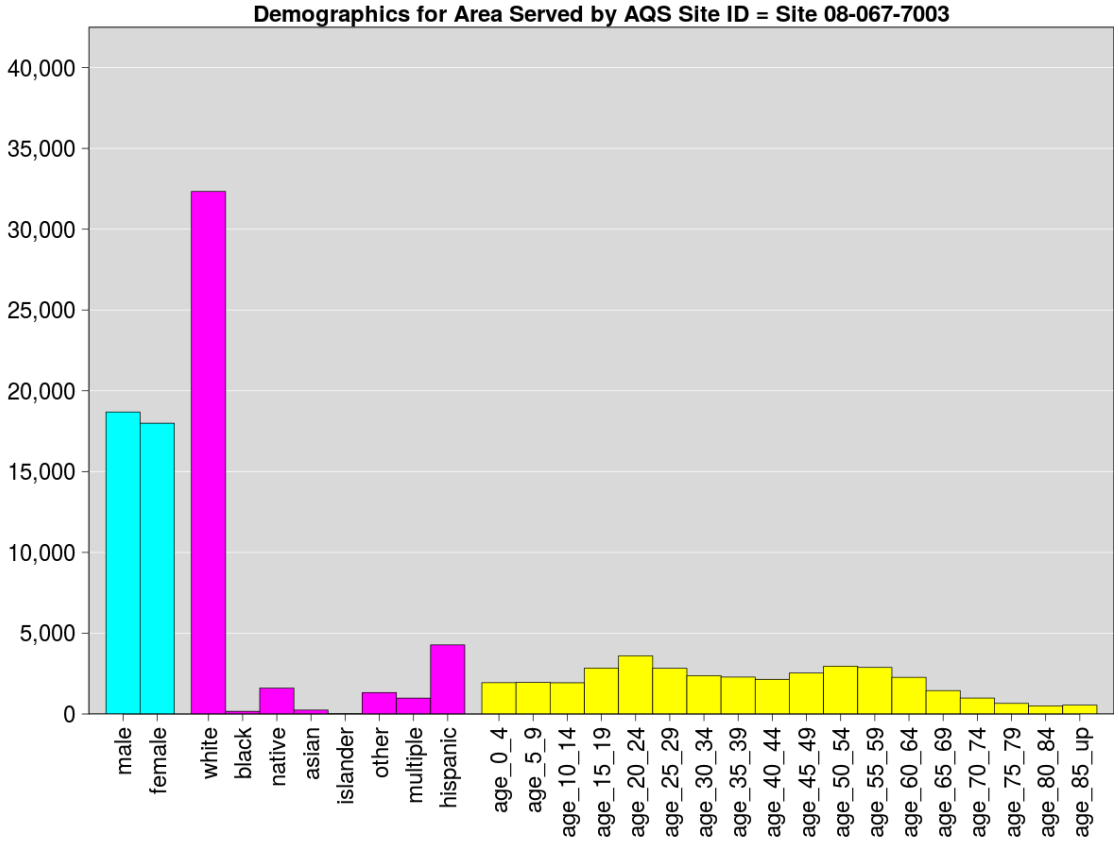
Areas Served for ozone:



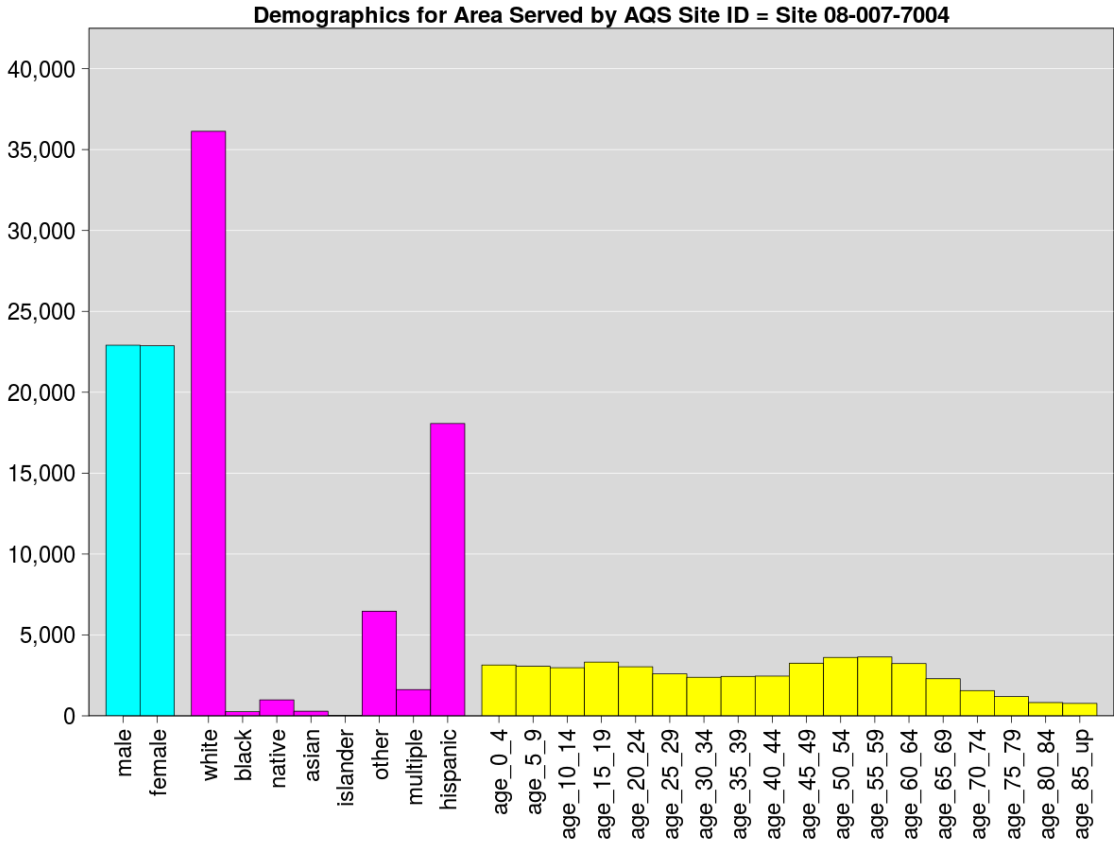
Ute 1 Ozone Monitoring Demographics:



Ute 3 Ozone Monitoring Demographics:

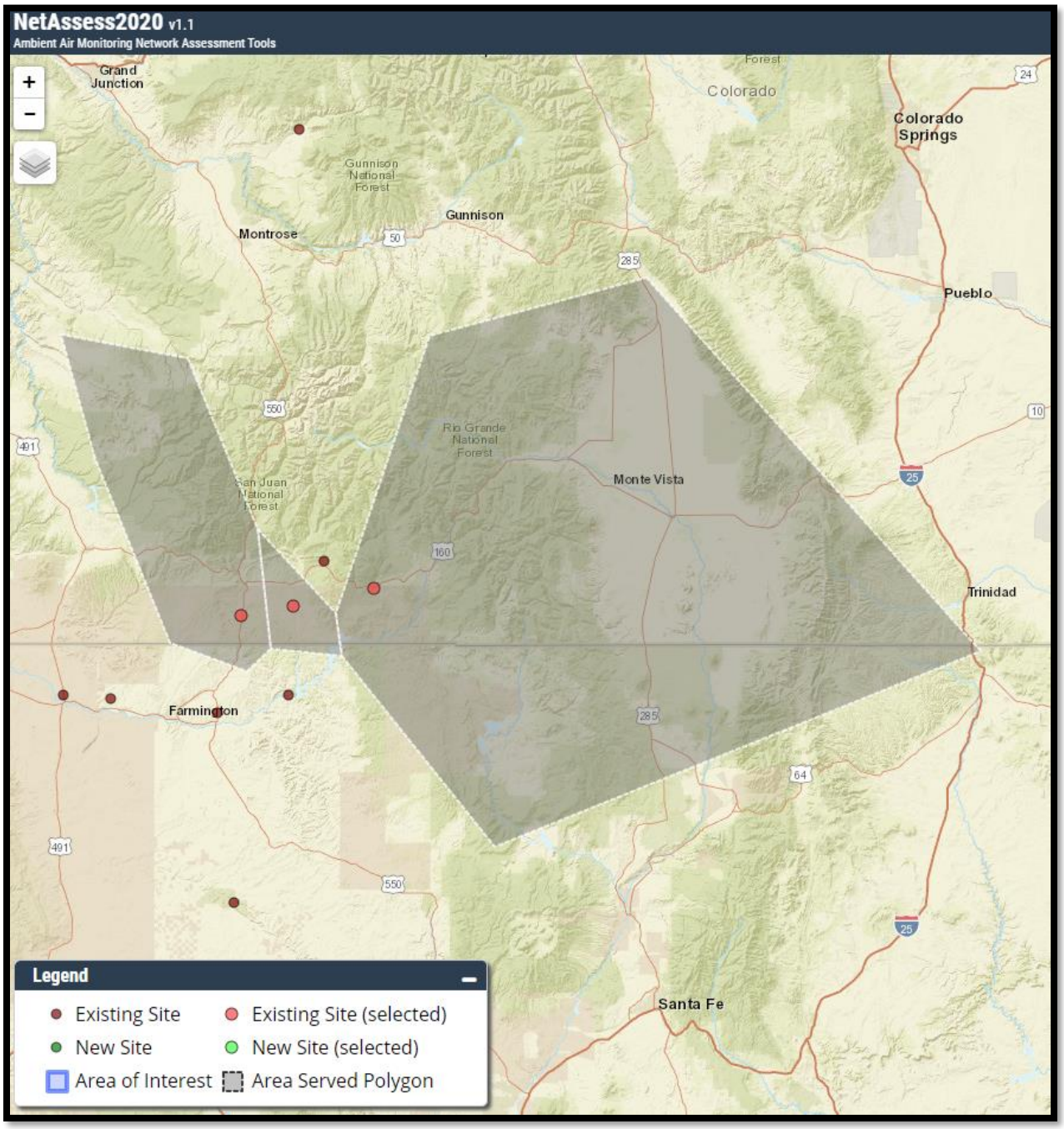


MMS Ozone Monitoring Demographics:

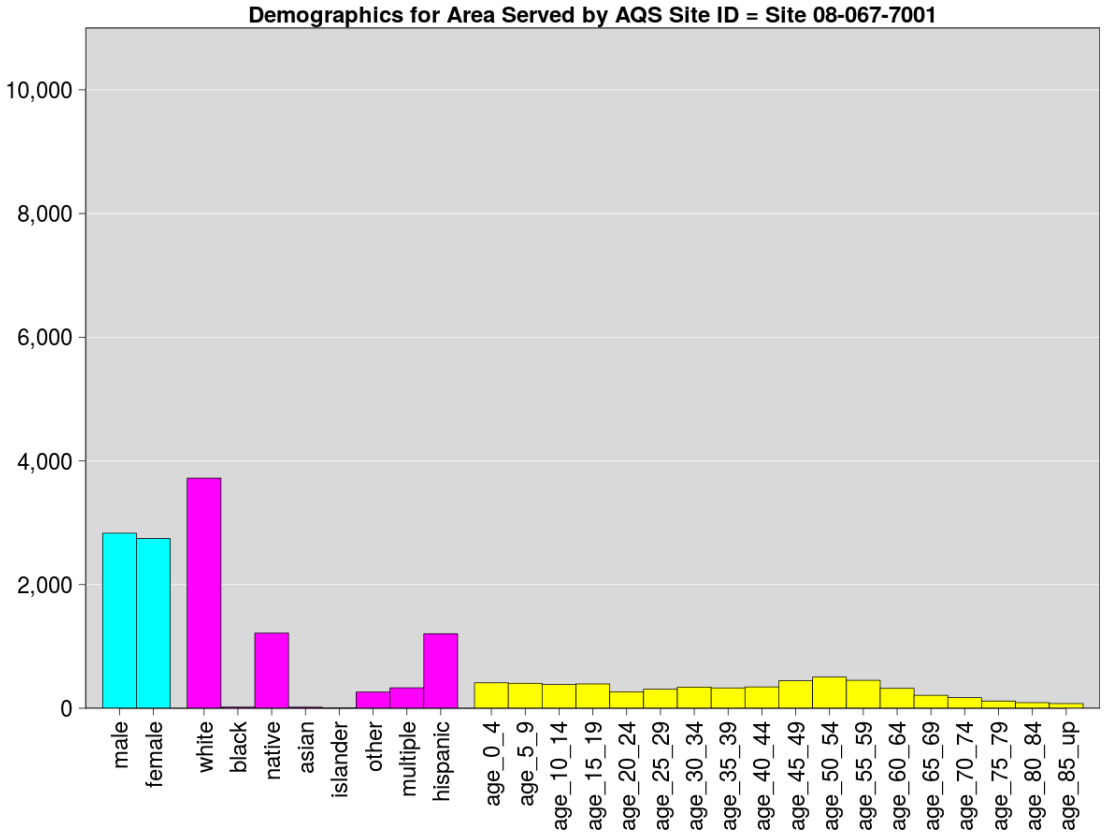


Nitrogen Dioxide

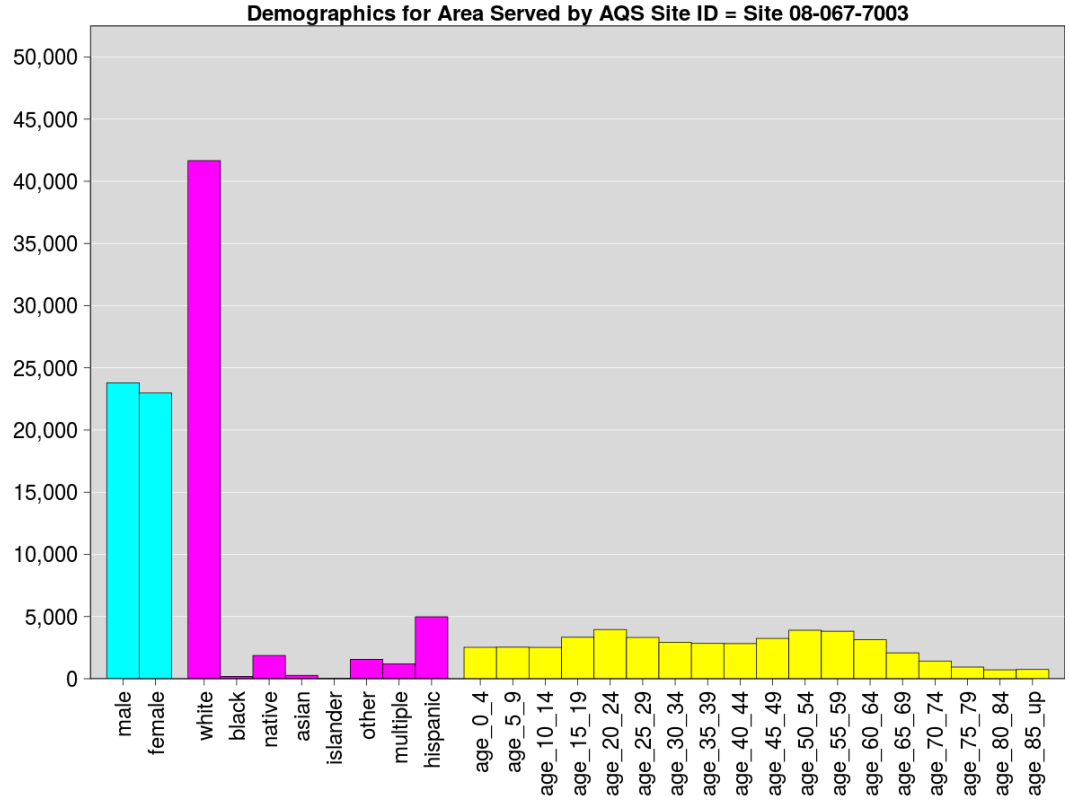
Areas Served for nitrogen dioxide:



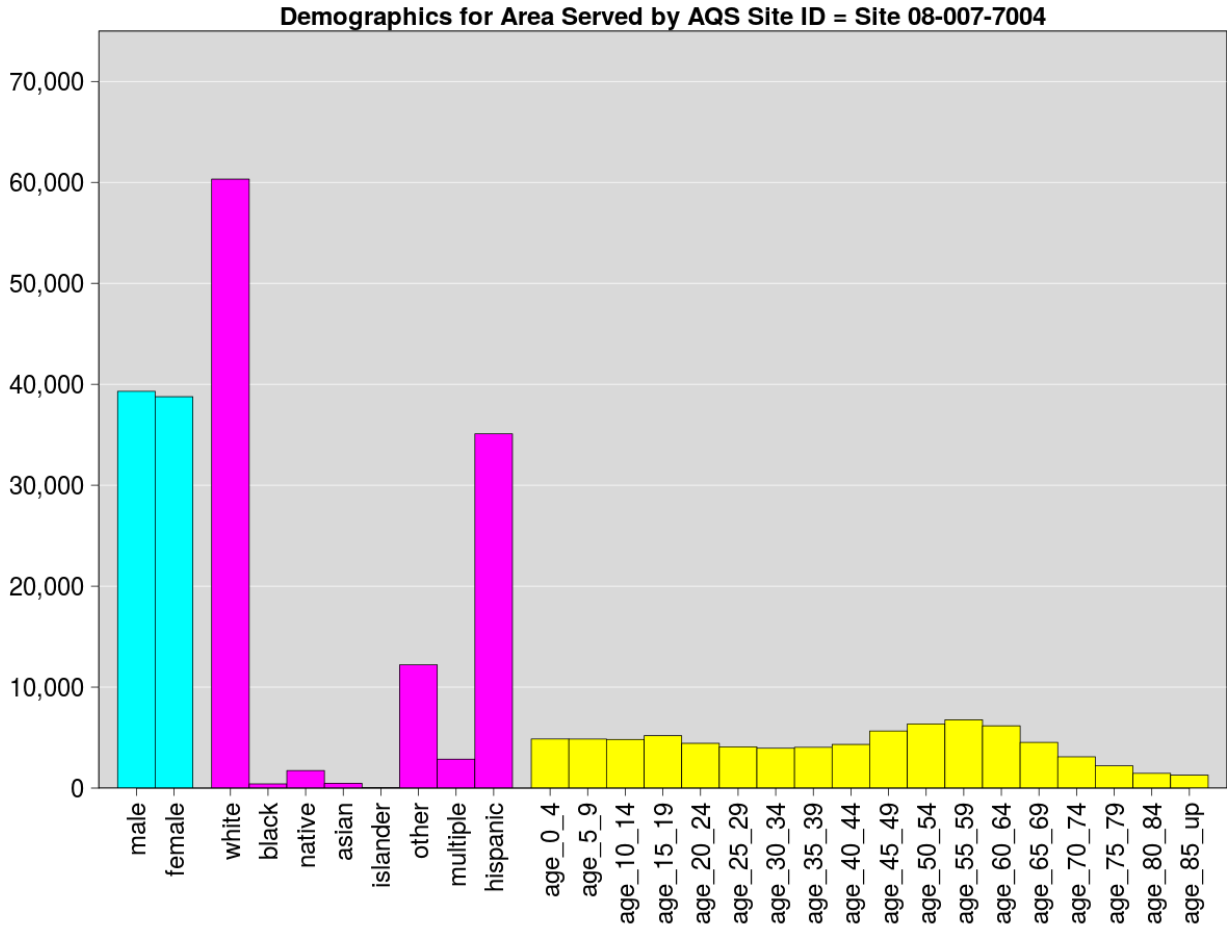
Ute 1 Nitrogen Dioxide Monitoring Demographics:



Ute 3 Nitrogen Dioxide Monitoring Demographics:

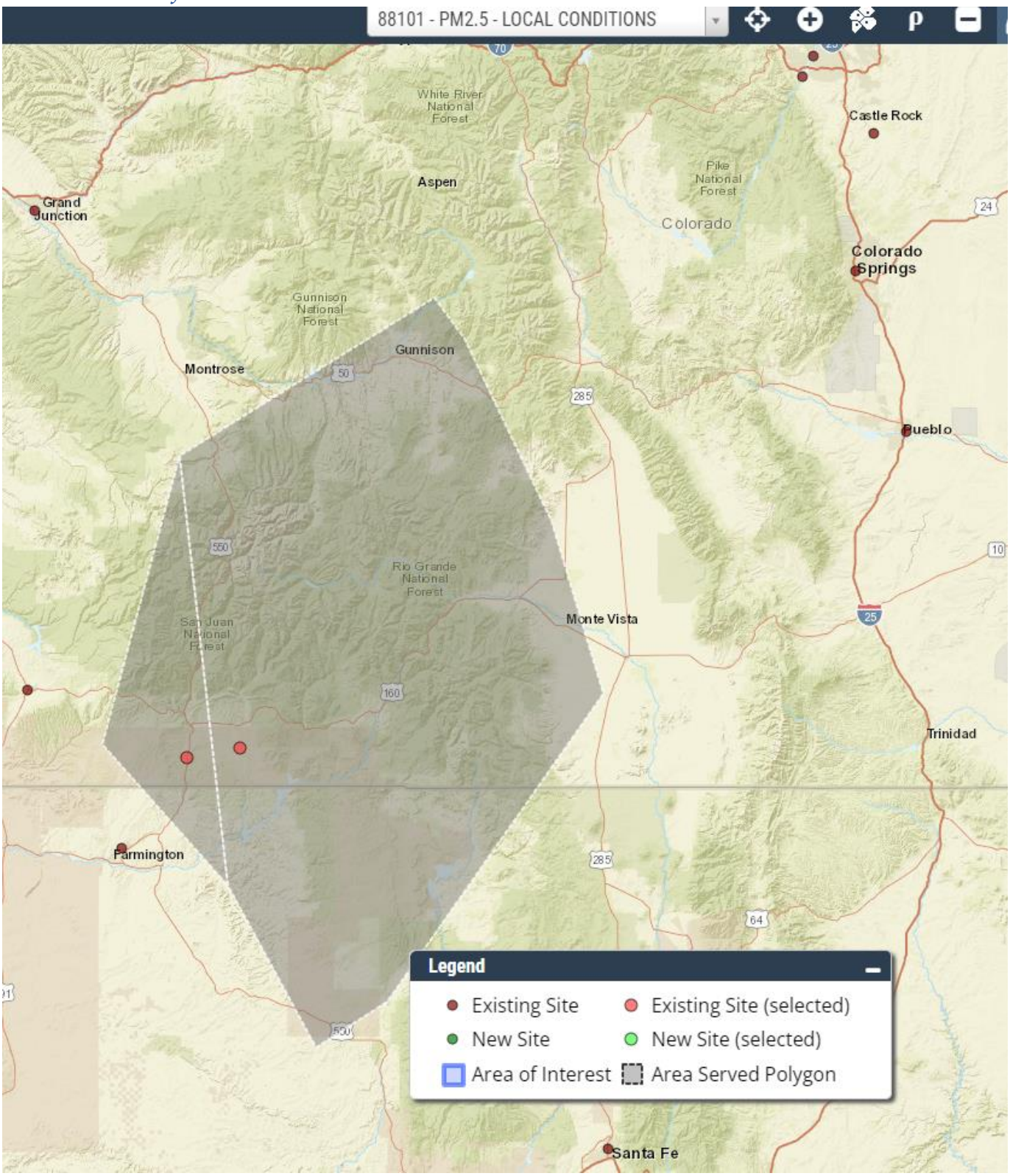


MMS Nitrogen Dioxide Monitoring Demographics:

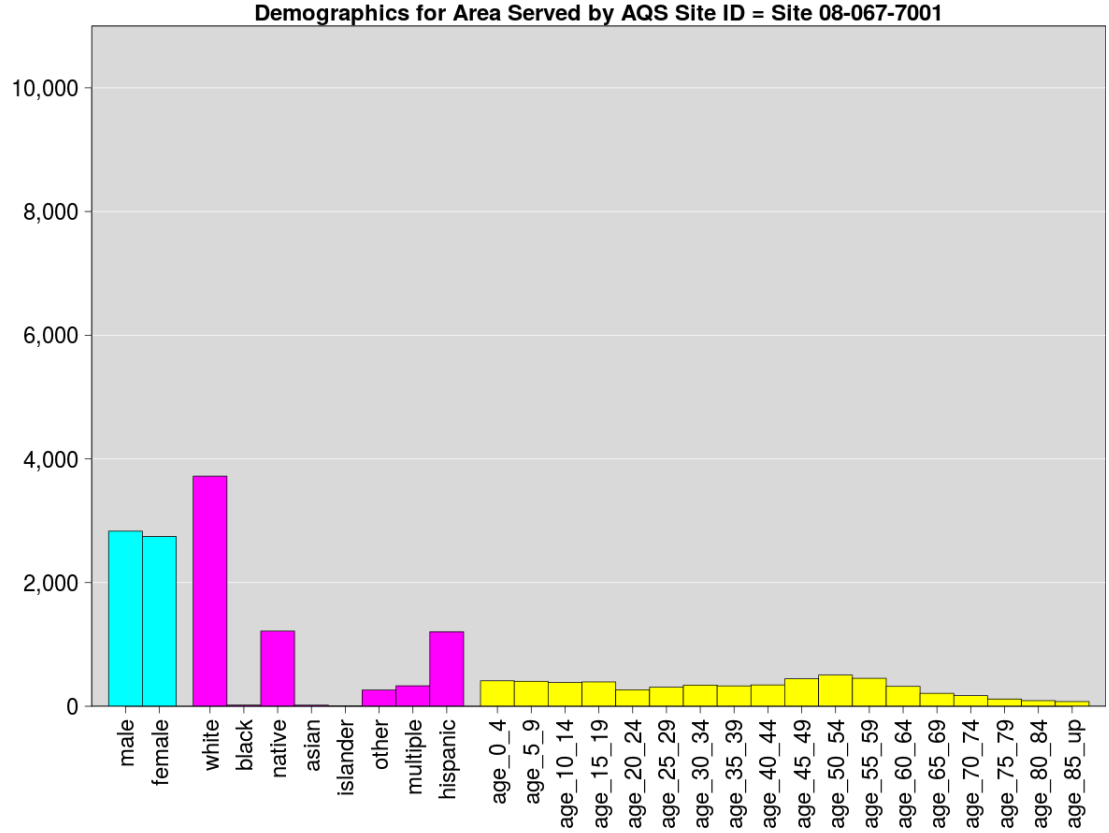


Particulate Matter

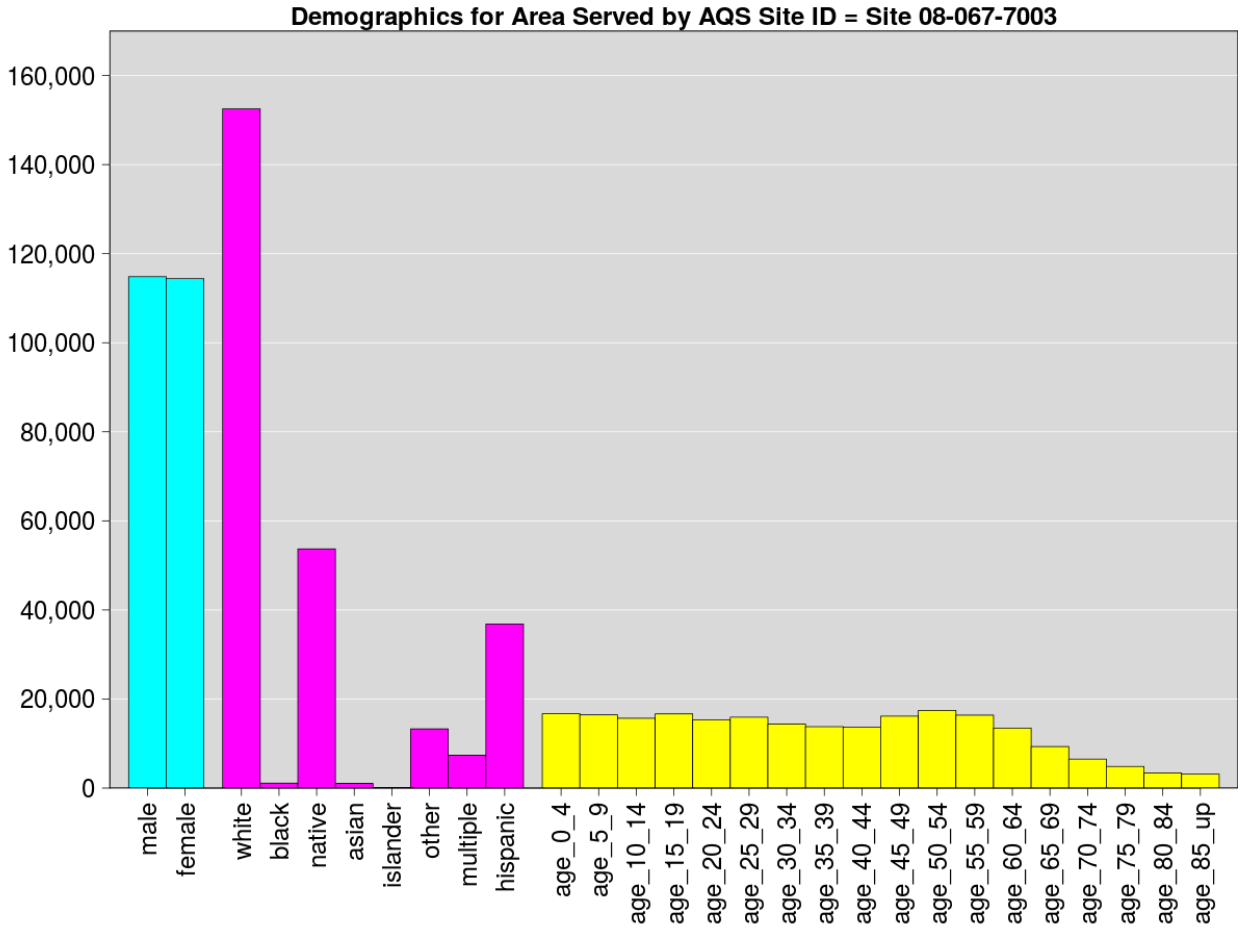
Area Served for $PM_{2.5}$:



Ute 1 $PM_{2.5}$ Monitoring Demographics:

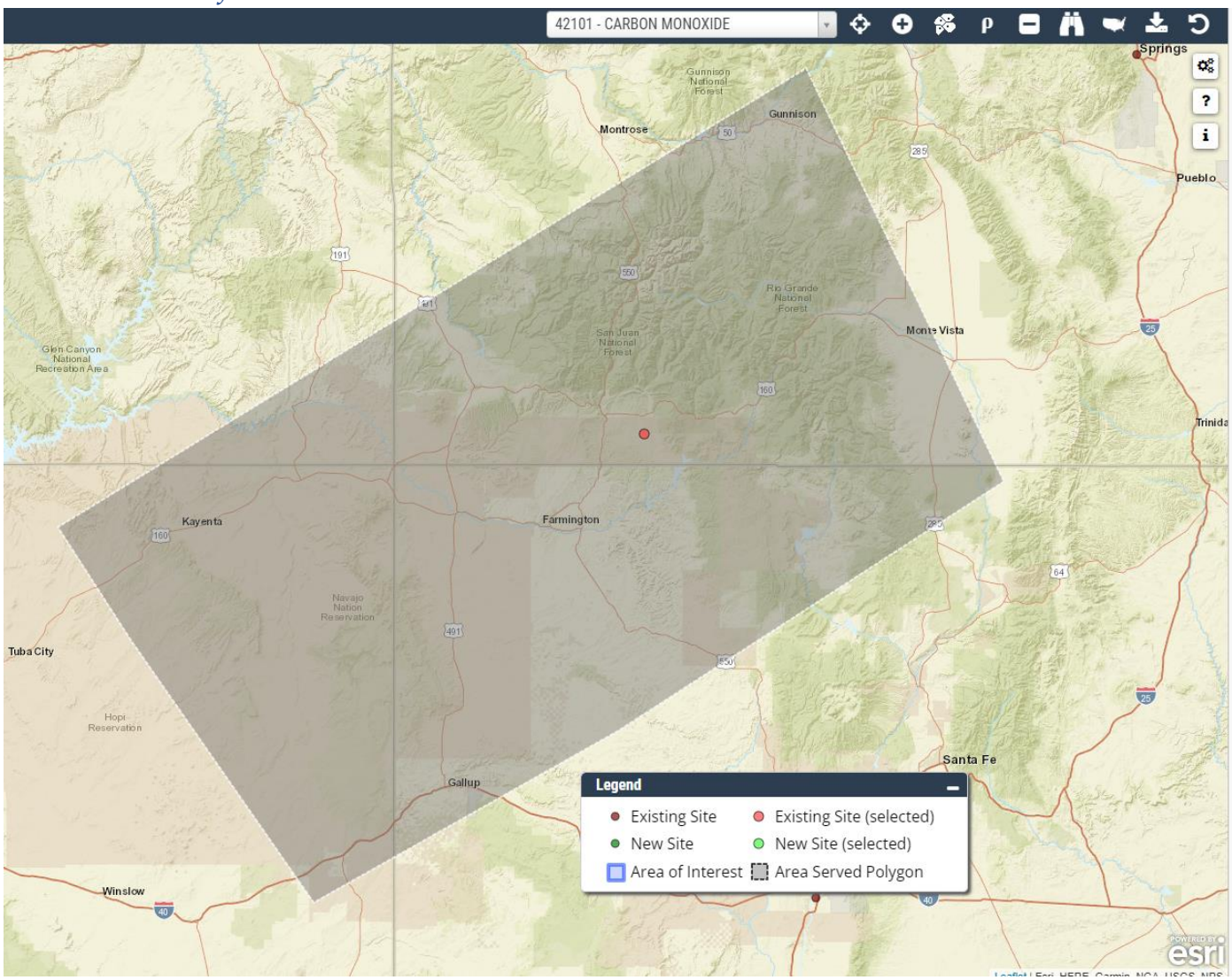


Ute 3 $PM_{2.5}$ Monitoring Demographics:

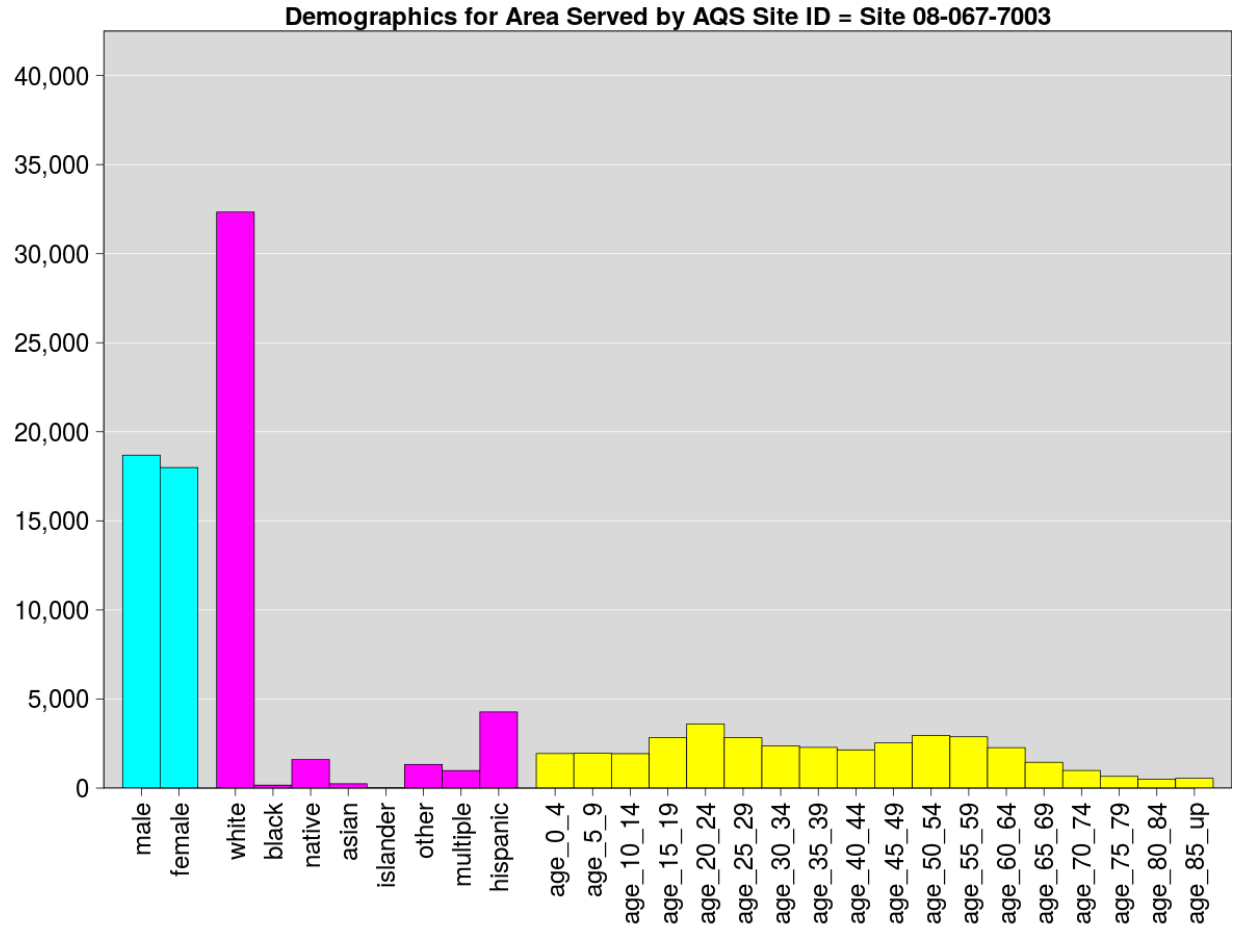


Carbon Monoxide

Area Served for carbon monoxide:

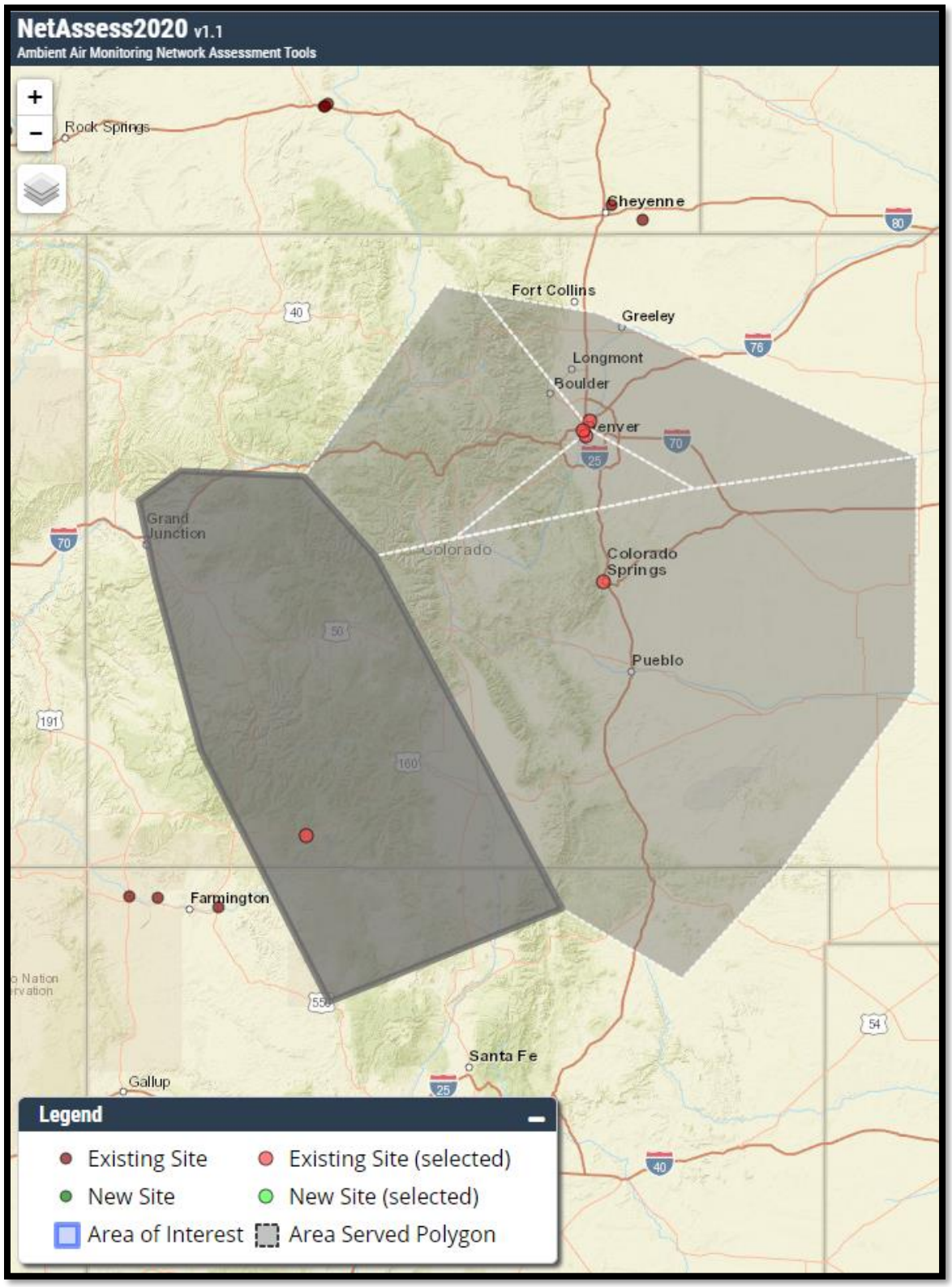


Ute 1 Carbon Monoxide Monitoring Demographics:

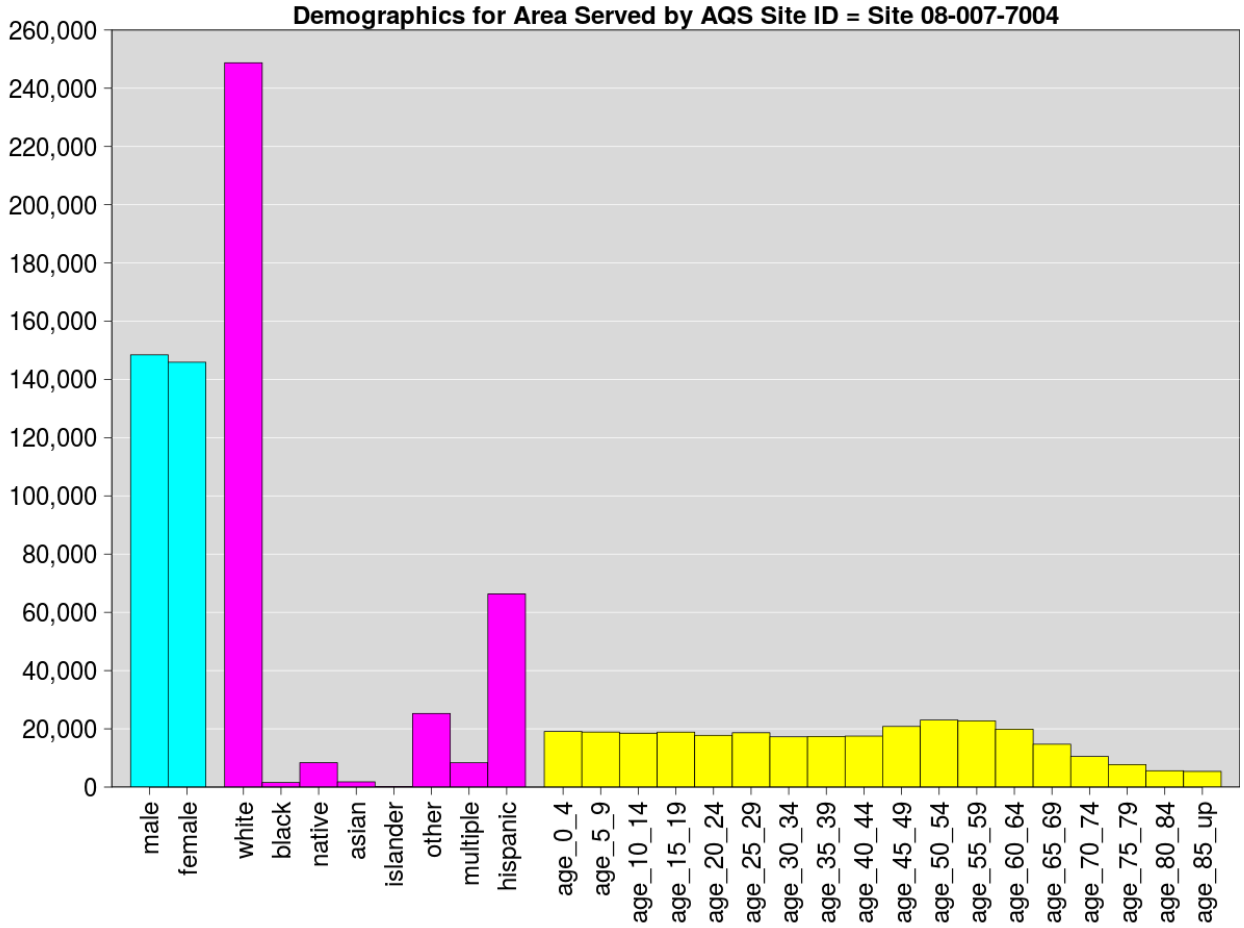


Sulfur Dioxide

Area Served for sulfur dioxide:

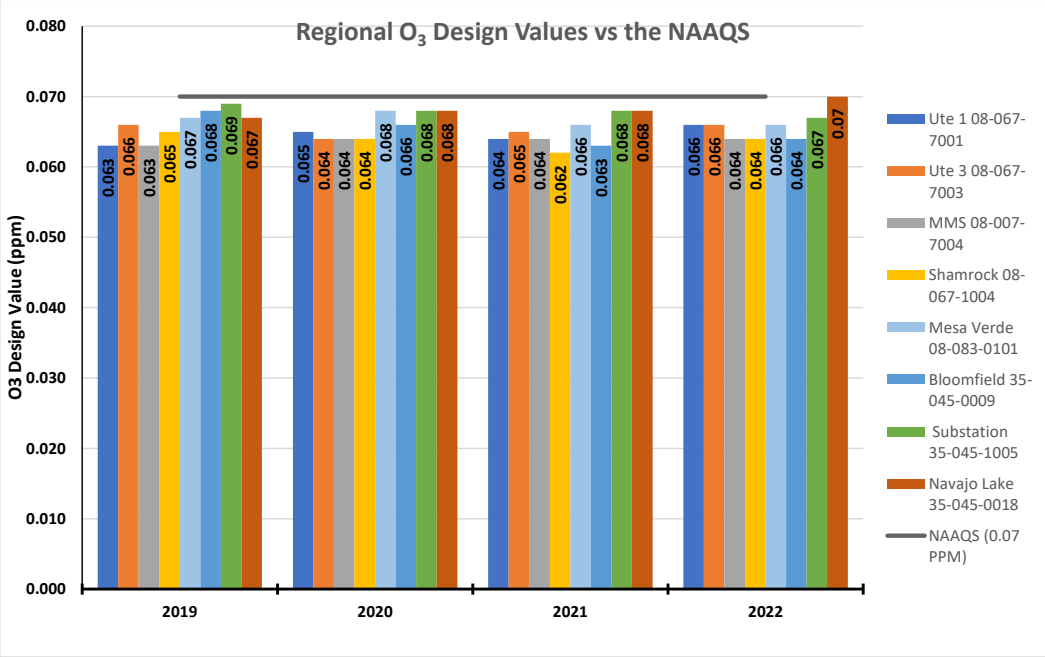


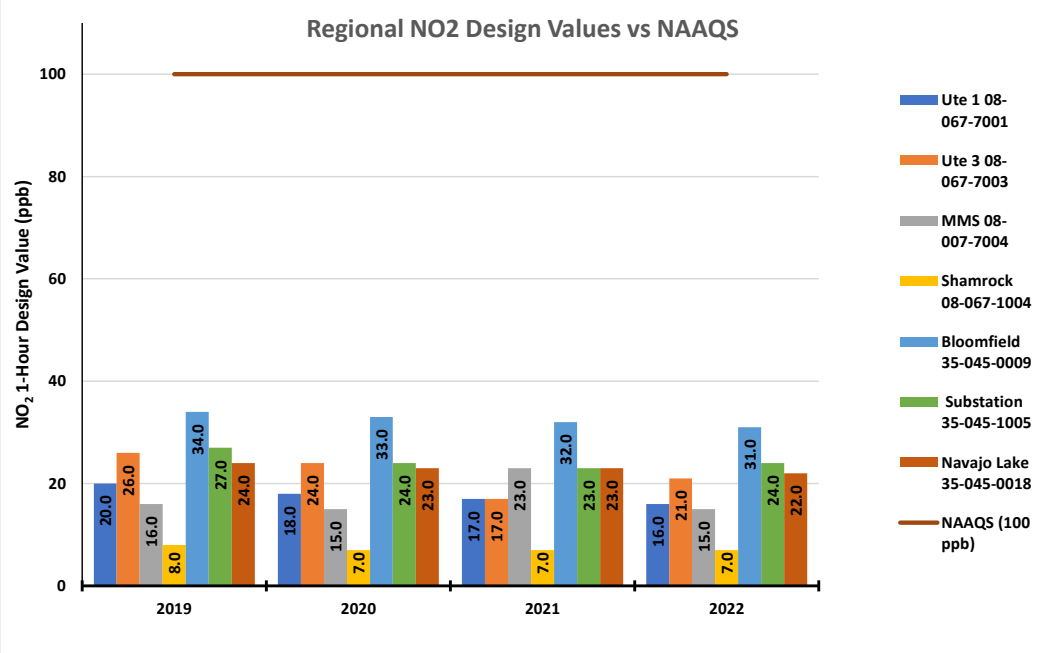
MMS Sulfur Dioxide Monitoring Demographics:

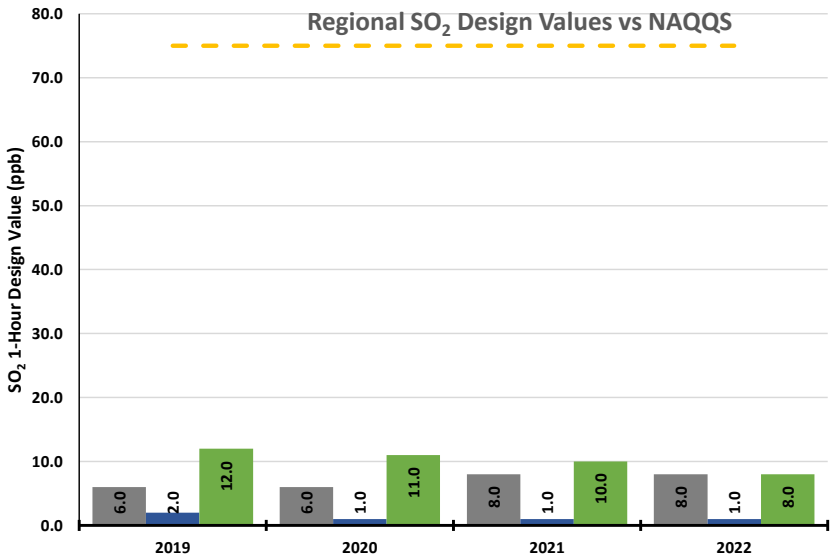


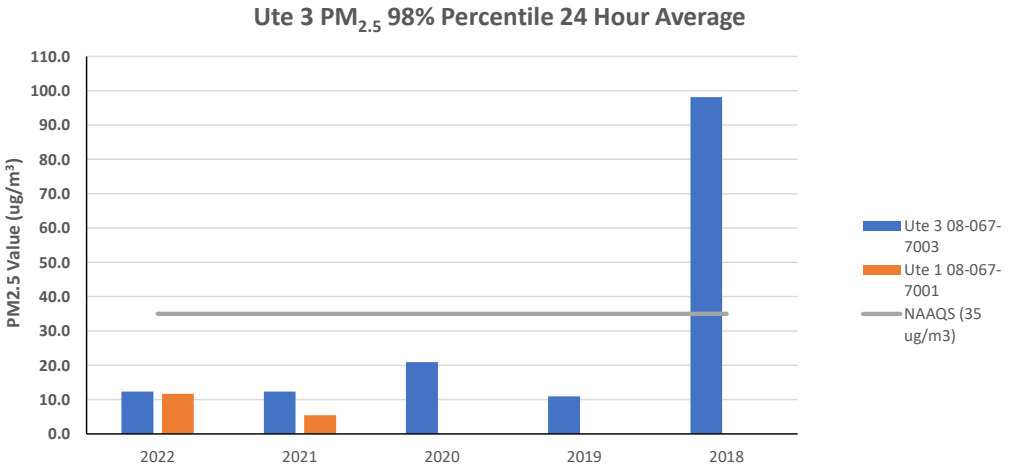
Appendix B

CY2022 Air Monitoring Data and Regional NAAQS Comparison.


Regional O_3 Design Values vs the NAAQS
O3 Design Value (ppm)
0.080
0.070
0.060
0.050
0.040
0.030
0.020
0.010
0.000
2019
2020
2021
2022
0.063 0.066 0.063 0.065 0.067 0.068 0.069 0.067
0.065 0.064 0.064 0.064 0.068 0.066 0.068 0.068
0.064 0.065 0.064 0.062 0.066 0.063 0.068 0.068
0.066 0.066 0.064 0.064 0.066 0.064 0.067 0.07
Ute 1 08-067-7001
Ute 3 08-067-7003
MMS 08-007-7004
Shamrock 08-067-1004
Mesa Verde 08-083-0101
Bloomfield 35-045-0009
Substation 35-045-1005
Navajo Lake 35-045-0018
NAAQS (0.07 PPM)

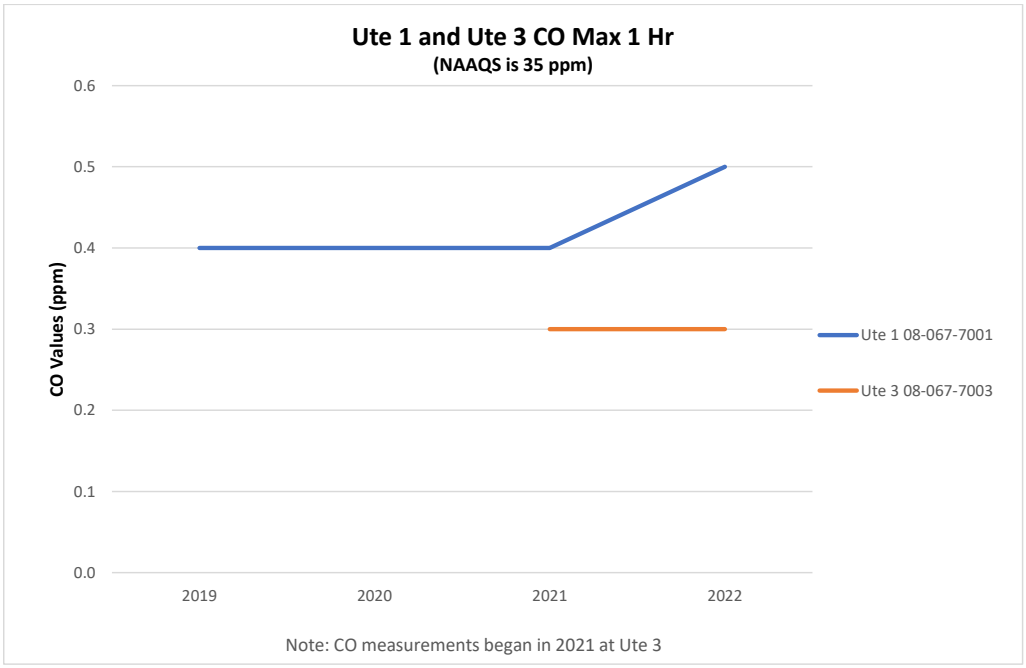

Regional NO2 Design Values vs NAAQS
NO_2 1-Hour Design Value (ppb)
100
80
60
40
20
0
2019
2020
2021
2022
20.0 26.0 16.0 8.0 34.0 27.0 24.0
18.0 24.0 15.0 7.0 33.0 24.0 23.0
17.0 17.0 23.0 7.0 32.0 23.0 23.0
16.0 21.0 15.0 7.0 31.0 24.0 22.0
Ute 1 08-067-7001
Ute 3 08-067-7003
MMS 08-007-7004
Shamrock 08-067-1004
Bloomfield 35-045-0009
Substation 35-045-1005
Navajo Lake 35-045-0018
NAAQS (100 ppb)



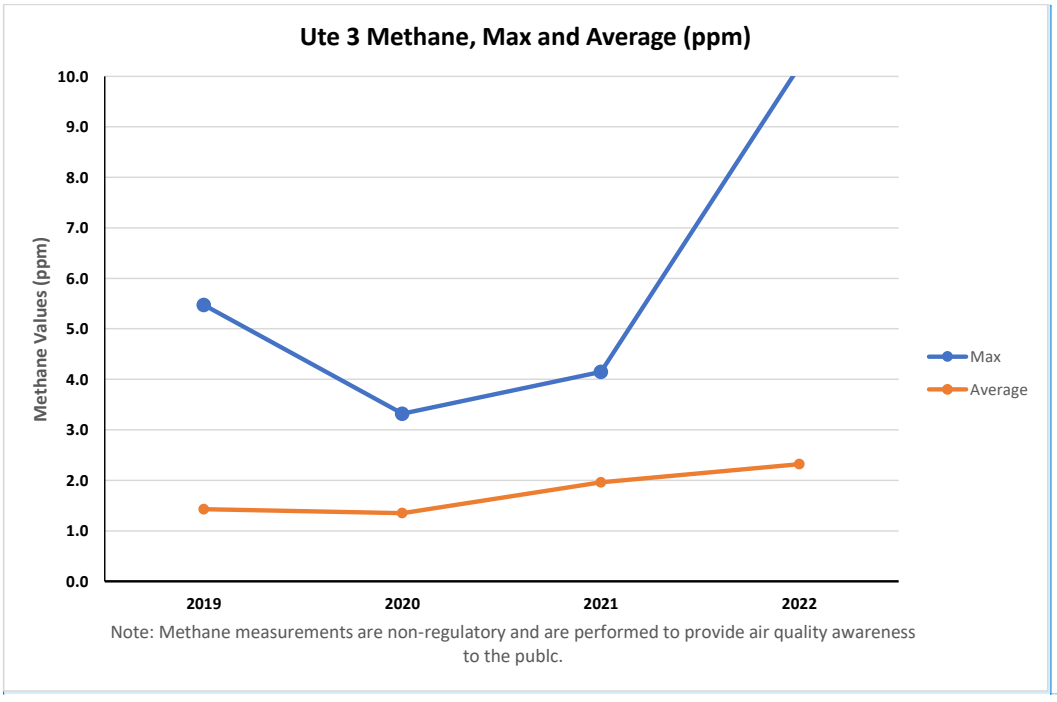


Note: The PM measurements are non-regulatory and are performed to provide air quality awareness to the publc. The elevated values are the result of regional and western forest fires and dust storm exceptional events, including the 416 Fire in 2018. $PM_{2.}$

Commented [PD1]: This caption on this table looks like it might have an incomplete sentence at the end. It also references the 416 fire in 2018 but no 2018 data is included in Appendix B (probably be good to remove the spot for 2018 data in this graph) I also revised the language to make it known that fire and dust exceptional events contributed to the graphed values and what look to be exceedances of the PM NAAQS. We might even want to strengthen it even more to avoid any misunderstandings about this. Thoughts?



Note: CO measurements began in 2021 at Ute 3



Note: Methane measurements are non-regulatory and are performed to provide air quality awareness to the publc.

Commented [PD2]: I updated the caption on the bottom of this graph (it said PM instead of methane). We might also consider adding that there is no air standard for methane.

Appendix C

2024 Equipment List - Southern Ute Indian Tribe Air Monitoring Stations.

Gas Analyzers

Parameter	Reference Method
NO	Thermo Model 42*i* RFNA-1289-074
NO_2	
NOx	
CO ‡	Thermo Model 48i RFCA-0981-054
CO	Thermo Model 48iQ RFCA-0981-054
O_3	Thermo Model 49*i* EQOA-0880-047
SO_2 ‡	Thermo Model 43*i* EQSA-0276-009
Methane and NMHC	Thermo Model 55i

‡ **The AQP is proposing retiring the Thermo 48i and the Thermo 43i**

PM Instruments

Parameter	Reference Method
PM_{10}	**Teledyne API T640x** (16.71 L/min) EQPM-0516-239
$PM_{2.5}$	**Teledyne API T640x** (16.71L/min) EQPM-0516-238
$PM_{2.5\ LC}$	**Teledyne API T640 (operational November 2021)** (5L/min) EQPM-0516-236

Calibration Equipment

Equipment Used to Calibrate Monitoring Equipment	Acceptance Criteria
Regional Standard Reference Photometer (Level One Ozone Transfer Standard)	Regression slope = 1.00 ± 0.01ppb Intercept ≤ 1.00ppb
Level Two Ozone Transfer Standard (Ute 1 Teledyne API T700)	±4% or ±4ppb (whichever is greater)
Level Three Ozone Transfer Standard (Ute 3 and MMS Teledyne API T700)	±4% or ±4ppb (whichever is greater)
Cylinder of Compressed Gases Gas standard	NIST Traceable (e.g., EPA Protocol Gas)
Standardized Mass Flow Calibrator BIOS Dry Cal220 H and 220 L	±2% of NIST-traceable standard

Meteorological Equipment:

Parameter	Sensor	Manufacturer
Temperature	Fan aspirated radiation shield, Model 8152	RM Young
Wind Speed and Direction	Wind Monitor-AQ, Model 05305	RM Young
Precipitation	Tipping Bucket Rain Gauge, Model 52202	RM Young
Solar Radiation	Silicon cell pyranometer Model LI-200RSMV-15	Li-Cor
Relative Humidity	Capacitive sensor Model: HUMICAP 180	Vaisala

Meteorological verification equipment:

Parameter	Sensor	Manufacturer
Temperature	Traceable Digital Thermometer Model 51 Series II	Fluke
Wind Speed and Direction	Anemometer Drive, Model 18801 Torque Disc, Model 18310 Vane Angle Fixture, Model 18212 Vane Torque Gauge, Model 18331 Vane Angle Bench Stand, Model 18112 Vane Alignment Rod, Model 18301	RM Young
Precipitation	Calibration bottle, Model 260-2595	Nova Lynx
Solar Radiation	Pyranometer verifier Model LI-200SA	Li-Cor
Relative Humidity	Digital Sling Psychrometer Model SAM 990D	Mannix

Critical Supplies and Consumables

Point of Use	Item	Description	Vendor
Documentation	Site logbook	AirVision digital logbook	Agilaire
Analyzer/sampler	Fuses	In analyzers & PM2.5 samplers	Thermo Scientific, local electronic store
Data retrieval	Flash drive	USB	Electronics store
Analyzer/Calibrator	Replacement parts	In analyzer	Thermo Scientific, Teledyne API
Meteorological instruments	Replacement parts	In instrument	Campbell Scientific, RM Young, Vaisala, Weathertronics, Nova Lynx, LI-COR, Ecotech
Zero Air Supplies	Purafil or Charcoal columns	Refillable cartridges in the front of the machine	Teledyne API
Instrument Plumbing	Stainless Steel Fittings and tubing	For plumbing upstream of calibrator and downstream of instruments	Swagelok

Instrument Plumbing	Teflon tubing and fittings	For plumbing downstream of the calibrator and upstream of instruments	Savillex
Analyzer	Teflon particulate filters	Analyzer/sample line filters	Savillex
GAST Compressor	Replacement parts	In compressor	FIERO Fluid Power, Inc.
Field operation use	Low-lint wipes	Cleaning wipes	Local hardware store
T640 & T640x	Filters	47 mm Glass fiber whatman filter	Teledyne API
T640 & T640x	Vacuum pump kit	Rotary vane rebuild kit	Teledyne API
Calibration	Calibration Gas	NO/CO/SO2 CH4/C3H8 CO2	Praxair
55i GC-FID Instruments	Support Gases	Ultra high purity N2 & H2	Four Corners Welding and Gas
Flow Verification	Flow Meters	BIOS Definers and DeltaCal	Mesa Labs
Temp/RH Verification	Temperature, Pressure, and RH Transfer Standards	Druck DPI 105 Barometer, SAM 990 DW RH	Chinook Engineering/Inter-Mountain Labs
H2 Generator	DI water filtration and separation	Parker H2 generator service kit	Webster Associates
Manifold	Teflon tubing manifold and supporting fittings and items	Teflon tubing, gaskets, fittings	Savillex