

SAN JUAN NM REGIONAL SCIENCE & ENGINEERING FAIR

JUNIOR AND SENIOR DIVISION

ABSTRACT & CERTIFICATION

TITLE: Methane Assessment in the Four Corners Region

Name: Kandis Antonio

School: Navajo Preparatory School

Grade Level: 10th

Type the Body of Your Abstract Here (250 Word Maximum)

Methane is a powerful greenhouse gas with a 100-year global warming potential 28-34 times that of CO₂. Measured over a 20-year period, that ratio grows to 84-86 times. About 60% of global methane emissions are due to human activities. The main sources of anthropogenic (people created) methane emissions are the oil and gas industries, agriculture (including fermentation, manure management, and rice cultivation), landfills, wastewater treatment, and emissions from coal mines. Fossil fuel production, distribution and use are estimated to emit 110 million tons of methane annually.

Because of the disastrous effects of global warming, the methane parts per million (PPM) was measured by an MQ-4 methane sensor attached to an Arduino UNO microprocessor. The data, in PPM, was displayed on the serial monitor of my laptop. If the methane density exceeded a preselected value, indicating dangerous conditions, a red alarm LED lit, indicating the need to leave immediately and possibly seek medical attention.

With the data taken from this experiment, it shows that there are higher methane concentrations in the air near abandoned methane gas wells. There is also high methane concentrations near coal mines, such as in Black Mesa and Kayenta. It has also been shown that mine areas, have higher methane concentrations in the air than oil drilling areas do. The data also shows that there is high methane levels near gas stations, which is predictable considering that vehicles release methane into the air regularly

1. The student independently performed all procedures as outlined in this abstract Yes No
2. This project is a continuation. Yes No
3. This project is being presented at SJRSEF NMJAS Paper Competition

I hereby certify that the above statements are correct and the information provided in the Abstract is the result of one year's research. I also attest that the above properly reflects my own work.

Kandis Antonio

Student's Signature

02/16/22

Date

