

**Suncor Settlement Supplemental Environmental Project
APPLICATION COVER SHEET**

Project Title: The Suncor Refinery: A Comprehensive, Community-directed Health and Environmental Evaluation

Organization: Cultivando

Address: 7190 Colorado Blvd. Ste. 300

City, State, Zip: Commerce City, CO 80022

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Phone Number: 303-288-4783 x 101

Fax Number: n/a

Federal Tax Identification Number: 84-1499624

Legal Tax Status (check one): **Nonprofit*** **Governmental Entity/School**

Fiscal Sponsor organization, if applicable

Fiscal Sponsor contact name & information, if applicable

***If nonprofit, you must attach a copy of your IRS tax exempt letter to this SEP Application: Please see Exhibit K**

By signing and submitting this application, the applicant agrees to operate the program as described in the SEP Application and in accordance with the department's SEP Policy. The applicant agrees that the information provided in this application is, to the best of the applicant's knowledge and based on reasonable inquiry, true, accurate, and complete. The applicant understands that knowingly submitting any false information on this application could result in the project not being considered for funding or voiding any current or future contracts with the department of Public Health and Environment.

Print name of Authorized Official: Olga Gonzales _____

Signature of Authorized Official:



***Please insert electronic signature into the box to the right.**

Date: 1/11/21 **Title:** Executive Director _____

Project Manager or Main Project Contact:

Name: Olga Gonzalez

Title: Executive Director

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| Total Amount of SEP Funds Requested: | \$996,789 |
| Total Matching/In-Kind Contributions (if any): | \$126,800 |
| Total Project Cost: | \$869,989 |

**Suncor Settlement Supplemental Environmental Project
APPLICATION FORM**

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|--|---|
| Project Title | The Suncor Refinery: A Comprehensive, Community-Directed Health and Environmental Evaluation - Component A |
| Geographical Area to Benefit Most Directly From Project | The entire Denver Metro Area community will benefit directly. Particular emphasis will be given to understanding the health and environmental impacts on citizens living closest to the Suncor Refinery. |
| Community Applicant or Partnership | Cultivando, with a partial list of supporters, as detailed in Appendix A, Exhibit L |
| Eligible SEP Category | <input checked="" type="checkbox"/> Pollution Prevention <input checked="" type="checkbox"/> Environmental Restoration <input checked="" type="checkbox"/> Environmental Education and Training <input checked="" type="checkbox"/> Public Health and Safety |
| Project Summary | <p>This proposal is Component A of a two-part project. The project will, through continuous monitoring, characterize air pollution from the Suncor refinery, and the resulting health and societal impacts. In this component, two air pollution monitoring and reporting platforms will be deployed to identify and quantify the most concerning air pollutants that adversely affect public health and the environment, with a particular emphasis on pollutants escaping from the Suncor refinery.</p> <ul style="list-style-type: none"> • One monitoring site will be a fixed station close to the refinery to characterize source emissions. • The second platform will be a mobile van deployed in adjacent neighborhoods to evaluate the community’s exposure to the refinery’s emissions. • State-of-the-art regulatory and research grade instruments will be deployed so that data will have the quality to be fully recognizable by regulatory agencies. • Monitored pollutants will include ozone, methane, volatile organic compounds (VOCs; including the classes of hazardous air pollutants and BTEX species benzene, toluene, ethylbenzene, xylenes), hydrogen cyanide, carbon monoxide, carbon dioxide, hydrogen sulfide, sulfur dioxide, dimethylsulfide, nitric oxide, nitrogen dioxide, particulate matter (PM2.5 and PM10) and airborne radioactivity. <p>This project represents the most comprehensive air monitoring program ever conducted of the Suncor Refinery, and indeed the most comprehensive monitoring program ever conducted in the state.</p> <ul style="list-style-type: none"> • The measurements will be conducted by an independent party. • All monitoring will be continuous, with all pollution information and data interpretations becoming immediately available to the public free of charge on a user-friendly website. <p>As a result-citizens, the State’s regulatory agencies, and refinery operators will have the information required to make the refinery’s operation safe for the people in the surrounding communities as is required by state law.</p> |
| Project Narrative | <p>SUNCOR REFINERY, CORPORATE HISTORY AND BACKGROUND</p> <ul style="list-style-type: none"> • The Suncor refinery is 90 years old, beginning operations in 1930. • The refinery has undergone several ownership changes. The most recent is Suncor’s \$150 million purchase from Conoco Phillips in 2003. The parent company is |

the second largest corporation in Canada.

- A principal area for Suncor’s oil and gas production is the boreal forest in Alberta Canada where the company runs the largest tar sands operation in the world. Its activity has contributed to toxic waste covering 90 square miles and costing \$56 billion clean up (estimated by the Canadian government).
- Suncor has spent about \$400 million retrofitting its Denver refinery to receive heavy tar sands from its mining operations in Ft McMurray, Canada. About 20 percent of the product at the refinery comes from F. McMurray.
- Suncor’s Commerce City refinery has the capacity to produce about 98,000 barrels a day. It is the only refinery in Colorado. It employs about 400 people.
- The refinery supplies about a third of the gasoline and most of the asphalt used in the State.

SUNCOR’S HISTORY OF POLLUTION AND SELF REGULATION

The Suncor refinery has never been subject to independent air monitoring. The current methodology involves self-regulation and self-reporting.

- The refinery has consistently exceeded its regulatory limits of pollutants over its operating history and has an imperfect record of self-reporting its pollution.
- The EPA conducts analyses of Suncor operations to predict pollution emissions as an added regulatory fact basis in addition to Suncor’s spot checking.

Overview

- The State’s Air Pollution Control Division (APCD) has given the refinery the right to emit 800,000 tons of pollutants into the Denver’s air annually, most of them poisonous, health threatening, and injurious to the earth’s climate.
- Suncor has exceeded these limits by its own admission. In 2019, according to articles in the Denver Post (DP), the refinery self-reported releasing “886,000 tons of greenhouse gases annually, along with 24 tons of sulfur dioxide, 12.5 tons of hydrogen sulfide, 25 tons of ozone-forming VOCs, 4 tons of carbon monoxide, 49 tons of nitrogen oxide and 55 tons of particulates.” [5, 6]
- Many of the refinery’s pollution permits have expired, some for over a decade. The state assigns the permit backlog to personnel shortages, ‘band-width,’ as it terms it, and regulatory loopholes. The State writes the regulations. [7]
- Garry Kaufman, director of the APCD, which has regulatory oversight of the refinery and pollution permitting, said in the DP exposé: “We will protect the health and well-being of the people we serve, and that means holding corporate polluters accountable...We don’t tolerate or accept violations of state or federal law or Suncor’s permitted emissions limits.” [5]
- A new study published in the December issue of the Journal of the National Cancer Institute states that people living within 5 to10 miles of an oil refinery in the United States have a much higher risk of multiple cancer types than those living more than 20 miles from a refinery. [8]
- Exhibit B in the Appendix shows that much of the Denver metro population resides within these impact markers. About 120,000 people live within a 5-mile radius. Approximately 875,000 people live within a 10-mile radius.
- A 2014 report by the Denver Department of Environmental Health found that residents of neighborhoods surrounding Suncor “experience a higher incidence of chronic health conditions such as cardiovascular disease, diabetes, obesity, and asthma than other Denver neighborhoods.” [9]
- In the last two years, Suncor has self-reported 49 malfunctions in its day-to-day operations and reported over 500 spikes in emissions above its permit limits.
- In 2019 Suncor reported 2,750 violations of their opacity limits, at one point vio-

lating them for more than seven days straight. Opacity is a measure of the thickness of air pollution from a smokestack and is monitored as an indicator of harmful emissions released therefrom. [28]

AIR POLLUTANTS OF CONCERN RELEASED BY THE REFINERY

Benzene

- The 25 tons of VOCs reported by Suncor include the cancer causing chemical benzene, as well as other dangerous compounds such as toluene. The World Health Organization says there is no safe level of benzene exposure. [19] The State of Colorado has established a liberal limit of 9 ppb. [20] Some states and nations have stricter limits. Similar levels are expected to occur for people living nearby.
- In 2012, Suncor received a fine for benzene violations of \$2.2 million.
- Benzene is not a compound that is specifically measured as a gaseous release to the metro area's air space. Benzene is a contributing component of estimated total VOC releases reported to the state's APCD.
- EPA and State records indicate Suncor's releases of VOCs may be radically under reported. EPA calculations suggest that Suncor may release up to 70 times more VOCs than it reports. An EPA 2017 analysis suggests that Suncor's operations may release over 2 tons of benzene annually. [22]

Particulates

- Suncor self-reports 55 tons of particulates as coming from the refinery. An article in the Proceedings of the National Academy of Science (PNAS) states that fine particle particulate (PM2.5) "exposure is a major health risk factor in the United States, responsible for 63% of deaths from environmental causes and 3% of deaths from all causes." [24]
- These health effects are not distributed equitably. Hispanic populations suffer the worst, proportionately, with Black populations second. The majority population near the plant is Hispanic with Black population in northeast Denver close by.
- A recent Harvard University study indicates that EPA's safe particulate pollution thresholds for fine particulates (PM2.5) from a public health perspective are inadequate. It found that a 10 µg/m³ increase in PM2.5 resulted in a profound increase in premature death rates.[21] For people on Medicare, about 14,000 people are predicted to die prematurely as a result of the increase. [10]
- EPA calculations suggest particulate releases from the plant could be as high as 1,072 tons, almost 20 times greater than the refinery self-reports.[22]

Hydrogen Cyanide

- Hydrogen cyanide gas was developed as a pesticide and later used for gas warfare in World War I and by the Nazis in the extermination camps. It has been used by the United States to carry out the death penalty. Even so, hydrogen sulfide is not regulated. EPA's 2017 toxic release inventory estimates over 9 tons of hydrogen cyanide could be released from the Suncor refinery annually.
- A hydrogen cyanide concentration of 2000 ppm (about 2380 mg/m³) will kill a human in about one minute. A hydrogen cyanide concentration in the range of 100–200 ppm will kill a human within 10 to 60 minutes. [18]
- Suncor releases large amounts of hydrogen cyanide gas. The DP related how the plant recently released a huge amount of the gas that neither the refinery nor the state revealed until months later. [11]
- State records show that tests conducted in September 2015 indicated the refinery's West Plant emits hydrogen cyanide at an estimated rate of 8.6 tons and the East Plant releases roughly 1.3 tons per year. These estimates derive from spot sampling, and are therefore highly suspect as accurately predictive of actual peak or annual releases.

- The CDPHE relied on emissions data Suncor reported in 2015 to calculate hydrogen cyanide air concentrations around the refinery at 5 ppb, more than seven times higher than the EPA's 0.7 ppb risk threshold. Nonetheless, the State Health Department and the EPA assert that Suncor's current permitted level of hydrogen-cyanide emissions is safe, though no direct, continuous measuring or exposure studies have been done. [12]
- The state has in the past granted Suncor's request to increase its hydrogen cyanide permitted releases. In 2018, the refinery requested a new pollution limit of 12.8 tons annually. The permit was granted in January 2019 without public input. The state did not consider health criteria in its permitting. [11]
- In July 2019, Suncor asked for another increase to its hydrogen cyanide emissions to 19.9 tons, after more testing indicated annual releases could be in the 14-ton range. Because of public clamoring the permit has not been granted. [23]
- Civic leaders have condemned the secrecy surrounding state awarded pollution increases. Congresswoman Diana DeGette authored legislation in 2019 requiring EPA to set a health-based limit for hydrogen cyanide. The legislation also requires fence line monitoring of the poison and notification to the public in real time. [17] It has not been acted upon. Local citizens brought a lawsuit. It lost because the court said the agency was administering the law properly.

Sulfur Dioxide

- Three large sulfur dioxide orange cloud releases have occurred since 2016, causing highway closures, school closures, residential and stay in place lockdowns, reverse 911 calls, and damage to physical property.
- The 2016 release involved 75,000 pounds, well above the 500 pound threshold reported as a potential health risk. The refinery said there was no danger.
- A 2019 event contained clay like particles that rained down on neighborhoods. The refinery said there was no danger but warned people to wash their clothes immediately and get a car wash.
- Another major event occurred in 2020 after Suncor agreed to a \$9 million fine for its violations. With this event, a part of the refinery was shuttered for several months. The state returned \$5 million of the fine to help the refinery identify and correct its operational problems.
- In the last two years Suncor has self-reported over 17,000 minutes when releases of sulfur dioxide and flared particulates exceeded the 20 percent opacity limit allowed under the Clean Air Act (CAA), to protect public health.

Radioactivity

- The primary gas of concern is radon (Radon-222), a highly volatile gas that gets released during 'fracking' of shale deposits and is subsequently transported to the surface associated with natural gas.
- Radon is the second leading cause of lung cancer in the U.S., causing about 15,000 lung cancer deaths per year.
- Radon is not destroyed during gas flaring. Being a non-combustible gas, it will get into the atmosphere un-altered. It will subsequently decay to Lead-210 and Polonium-210, which will emit harmful beta- and alpha-radiation.
- The Suncor refinery thus far has not been assessed for its emissions of radon and associated radioactivity by an independent study.

Other pollutants

- There is not space enough to discuss these pollutants individually. EPA modeling suggests those listed below can be found in Suncor releases — this list is partial. They are listed here in descending order according to their calculated releases measured in pounds: Propylene, 76,000 lbs; Hydrogen sulfide, 6,000 lbs; Tolu-

ene, 5,700 lbs; Xylene, 2,500 lbs; Ammonia 2,300 lbs; Ethylbenzene, 800 lbs; Lead compounds, 82 lbs; and Mercury compounds, 4 lbs.

FIRES AND EXPLOSIONS

- According to a lawsuit filed in 2018, “More than 2,291 chemical fires, explosions, or toxic releases occurred from 2004 to 2013.” [25]
- At least 33 fires, explosions and chemical releases occurred at U.S. oil refineries and industrial plants in 2017.
- In a recent refinery explosion northeast of Houston people in a four-mile radius of the plant were asked to evacuate.
- A 1978 explosion of the Suncor refinery killed three people, caused \$10 million in damages, launched an orange fireball over Denver and registered 1.5 on the Richter scale in Golden.

AIR POLLUTION STUDY DETAILS

The air pollution study will be contracted to Boulder A.I.R. [13]. Boulder A.I.R. has evolved out of a **25-year air quality research program at the Univ. of Colorado**. It was founded by Dr. Detlev Helmig, a recipient of an EPA Young Investigator Award.

- With funding from Boulder County, the City of Longmont, and the City and County of Broomfield, over the past 5 years, Boulder A.I.R. has implemented a comprehensive air monitoring program in the Colorado Front Range that currently encompasses five stations (Exhibit C). The monitoring proposed here will add two further observations to this network.
- One stationary platform (instrument trailer) will be located on the periphery of the Suncor refinery (Exhibit D), no further than ¼ mile from the premises. The trailer will require access to line power. The exact location will be determined in communication with Suncor and CDPHE.
- The second platform will be a mobile van (Exhibit D). Target deployment locations are residential neighborhoods, schools, childcare facilities, recreational areas, and any other locations that community members will bring forward as places of interest. We envision 1-week deployments at each site to capture a wide range of air pollution under varying meteorological conditions.
- The van will be able to operate for a few hours on its own power, but will require electrical hook-up for a full week’s deployment.
- On the order of 40 different site deployments are planned. Monitoring will all follow regulatory approved protocols, such as used by the EPA and CDPHE.
- Monitored pollutants will include ozone, methane, VOCs (including the classes of hazardous air pollutants (HAPs) and BTEX species (benzene, toluene, ethylbenzene, xylenes)), hydrogen cyanide, carbon monoxide, carbon dioxide, sulfur dioxide, dimethylsulfide, nitric oxide, nitrogen dioxide, particulate matter (PM2.5 and PM10) and airborne radioactivity.
- Both facilities will also be equipped with meteorological sensors to trace air transport. Particular instrument details are provided in Exhibits E.
- The monitoring data from both sites will be processed in real-time for posting within minutes to a public web portal (Exhibit F), similar to the current portals for the ongoing monitoring programs in the Colorado Front Range [4].
- Monitoring results will be summarized in tabulated format (Exhibit G), and in data graphs (Exhibit G). Monitoring data will be used to calculate and report the Air Quality Index (AQI), Exhibit H. The website will also provide outreach information to explain measurement methods and data, and observed levels in relation to health thresholds. A counter will record the number of site visits.
- Another website will in real time plot the data from the two Suncor project sites together with the concurrent recordings from the five Front Range sites (Exhibit I,

[2]), to allow easy comparison of observed pollutant levels.

Besides the real-time reporting, Boulder A.I.R. will also conduct in depth analysis of the data, where correlation analyses and statistical tools are used to investigate the origin and sources of pollutants.

- Examples of the types of data analysis to be conducted is provided in Exhibit I. The monitoring data from this project will be essential for the work proposed in the companion proposal: “The Suncor Refinery: A Comprehensive, Community-Directed Health and Environmental Evaluation, Component B.”
- Monitoring will provide the input for the dispersion modeling and the anchor site data for the community monitoring of Air Toxics by passive adsorption samplers, the community monitoring of Particulate Matter with Purple Monitors, and for the community monitoring of VOCs with Summa canisters.

Voices of the People

- “Suncor does an amazing job of covering up their spills. This government is here to protect corporations, but they call it American interest. My relatives, my neighbors, and I don’t have a voice in the process. We have to continue to endure what decision-makers chose for us.” Statement of Jenny Santos, long-time Globeville resident. [14]
- Two blocks from the refinery, north Denver resident Robin Reichhardt, 38, who has lived in the area for three years, worried about possible health harm. He was near a school on the day of the malfunction that led to “shelter in place” orders. “I could taste it, taste that something was in the air,” Reichhardt said. “We love our neighborhood, but this is one of the reasons why we would leave it. It feels like we’re always getting choked out. We’re just always feeling, have a cough, a lot of respiratory illness through the year that won’t go away,” he said. “We feel pretty impotent about it. We’re really concerned. We feel like there’s nobody. Who do we go to?” [14]
- “If this isn’t environmental injustice, I don’t know what is. It’s like we’re not worth it, little brown communities and low-income families here, left behind after 70 years. It’s really unfair,” she said. “Every time we smell that pollution, I think: We just died a little. It’s like we are closer to death.” “After we moved to this part of town, my older son Ruben started developing Asthma. Olivia had to go on medicines at the age of 1. My youngest was kind of born into it. Now we all have asthma ... asthma is a normal thing in this part of town. ... You are most definitely afraid of the air you are breathing in. Though you need it to survive, that same air is killing you, and your family.” [15]
- “Kids have all their little boxes.” They come in “4 times a day, 5 if they are sick. I’ve been a school nurse for 18 years. There is a definite increase in identified kids with asthma. You see a lot more asthma attacks in areas with higher pollution levels. For most asthmatics the pollution is a major trigger.” [15].

Voices of Civic Leaders

- “We cannot sit back and allow our community’s health to be placed in jeopardy like this. Suncor was able to tell the state how much it intended to pump into the air (of hydrogen cyanide) each year, adding a little bit more to give themselves a buffer. To me, that’s ludicrous. Let’s find out what’s safe and what’s not. They said, well, nobody knows the exact limit, so let’s just go ahead and pump as much as you want.” Congresswoman Diane DeGette concerning the hydrogen cyanide releases at a conference in Elyra-Swansea [17].
- “The state health officials are completely failing to protect these neighborhoods. And they are disregarding the cumulative impact of the many pollutants in the area.” Denver City Council woman Candi CdeBaca [11].

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| | <ul style="list-style-type: none"> • “There’s no free lunch from an environmental perspective. These are the sorts of things we have to balance... If they are closed down, we’re going to have a bigger fight, and may end up in a situation where we’re going to have an insolvent entity. If we have to (close the refinery), we will.”“We definitely hear them. And I understand their concern. That’s one of the reasons why we are trying to collect more data — so that we can make the science-based decisions we are required to make under the law. We are not ignoring those concerns. We are collecting the data so that we can understand: Is there a change needed? We do know there are air quality issues that are disproportionate in the Commerce City area.” [7] |
| <p style="text-align: center;">Expected Environmental or Public Health Benefits</p> | <p>Cultivando’s Suncor Project, Component A, will constitute the first ever independent, continuous, detailed monitoring of pollution from the Suncor refinery.</p> <ul style="list-style-type: none"> • The state-of-the-art, high-resolution monitoring systems will allow citizens to observe the actual level of individual chemicals and overall pollution being released from the refinery precisely as those releases occur. • This information will be immediately available to these citizens on a user-friendly platform. • Alerts will be sent out when any chemical or combination of chemicals reach what is generally considered a danger level. This information is essential to citizens’ wellbeing and gives them the information needed to make informed decisions about protecting their health and the health of their family. • This website will also provide local and state governments with new, precise scientific data, data or information they do not now have otherwise and have never had. This is information CDPHE Deputy Director Putnam claims the State needs to determine the health and environmental impacts of the refinery. • New state law, SB 19-181, has required the State since April of 2019 to determine through scientific evaluation that all oil and gas operations, whether new or existing, are not injurious to public health and the environment. The State has not yet satisfied the law, claiming lack of budget and lack of staff. This project will show the State how the law can be satisfied from the standpoint of gathering scientific evidence upon which to make regulatory decisions. • One aspect of Component B, the public outreach and education component, will be the evaluation of this information by health scientists for their health and environmental impacts. |
| <p style="text-align: center;">Inclusion of Priority Communities</p> | <ul style="list-style-type: none"> • This Cultivando project will engage community members in Tier I communities (south Commerce City, Globeville, Elyria-Swansea, Cole, Clayton and unincorporated western Adams County) by educating the citizens of these communities about the chemicals released by Suncor. Community schools, with the assistance of teachers who have promoted this study, will be able to guide students through the websites. Outreach from Cultivando to residents will increase the understanding of the citizens. • Tier II cities and communities include the Denver Metro area as well as the entire northern Front Range which has been out of compliance with federal air standards for ozone pollution for over a decade. Suncor is a major emitter of VOCs, which are essential to the formation of ozone. This project will help define just how great the refinery’s emissions are in the creation of ozone in the Northern Front Range. Moreover, project dispersion mapping will inform citizens of the Denver Metro area how far the reach of pollution from the Suncor refinery actually is on any given day dependent on wind speed and direction. |

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| <p style="text-align: center;">Community Impact</p> | <p>For most pollutants, concentration levels decrease as polluted air is transported over the terrain, due to dilution, deposition, and chemical reaction. There are also pollutants, such as ozone and aerosols (fine particulate matter) that are formed as secondary products as a pollution plume ages and gets blown away. Therefore, the study will benefit communities nearby the refinery as well as those further away.</p> <ul style="list-style-type: none"> Residents and workers within the immediate surroundings of the refinery, a two-mile radius (Exhibit B), will likely benefit the most, as they are exposed to the highest levels of primary pollutants. This concerns to a large degree lower income and Hispanic communities and workers who are employed and spend their day-time hours at or near the refinery. With increasing distance, the relative importance will shift towards the higher importance of secondary pollutants. The Denver Metro Area and Colorado Front Range have been designated a non-compliance area for the National Ozone Air Quality Standard. Emissions from the refinery are suspected of contributing significantly to regional ozone production. For instance, a National Center for Atmospheric Research Study [16] identified Commerce City as a hotspot for regional ozone emission. Results from this study, including the characterization of emissions from the Suncor refinery, will benefit communities on large spatial scales, from the nearby residential areas, including Globeville, Elyria-Swansea, North Washington, and Commerce City, to the wider Denver Metro and Northern Colorado Front Range areas. | | | | |
| <p style="text-align: center;">Project Evaluation and Communication</p> | <p>Project progress and outcomes will be 100% transparent to the public, CDPHE, and Suncor, as all essential air monitoring results will be posted online on a public website within minutes after they were recorded.</p> <ul style="list-style-type: none"> Biannual progress reports will be publicly posted to the project website. The report will contain the data, statistical analyses, and data interpretations. A final report will be submitted after the conclusion of the study. Dr. Helmig will give project summary presentation at 6 months into, and at the conclusion of the monitoring phase. Additional presentations will be considered as desired by citizens and the agency. Cultivando and Boulder A.I.R. will set up an inquiry e-mail portal where citizens can submit questions pertaining to the project and monitoring results. During the last (6 months) phase of the project, a questionnaire will be distributed to citizens soliciting their feedback on how the study met or did not meet their expectation. The survey results will be posted to the study website. Feedback received throughout the study will be used to fine tune and correct, as needed, the study to maximize its value to the concerned communities and CDPHE. | | | | |
| <p style="text-align: center;">Project Budget</p> | <p style="text-align: center;">Budget Category</p> | <p style="text-align: center;">Description</p> | <p style="text-align: center;">SEP Cost</p> | <p style="text-align: center;">Matching or In-kind Funds</p> | <p style="text-align: center;">Total Cost</p> |
| <p style="text-align: center;">Personnel (Salaries, Benefits, Wages)</p> | <p style="text-align: center;">n/a</p> | <p style="text-align: center;">n/a</p> | <p style="text-align: center;">n/a</p> | <p style="text-align: center;">n/a</p> | <p style="text-align: center;"></p> |
| <p style="text-align: center;">Materials and Supplies</p> | <p style="text-align: center;">n/a</p> | <p style="text-align: center;">n/a</p> | <p style="text-align: center;">n/a</p> | <p style="text-align: center;">n/a</p> | <p style="text-align: center;"></p> |
| <p style="text-align: center;">Major Equipment</p> | <p style="text-align: center;">n/a</p> | <p style="text-align: center;">n/a</p> | <p style="text-align: center;">n/a</p> | <p style="text-align: center;">n/a</p> | <p style="text-align: center;"></p> |
| <p style="text-align: center;">Contractors/ Subcontractors</p> | <p style="text-align: center;">n/a</p> | <p style="text-align: center;">n/a</p> | <p style="text-align: center;">n/a</p> | <p style="text-align: center;">n/a</p> | <p style="text-align: center;"></p> |
| <p style="text-align: center;">Other Direct Costs</p> | <p style="text-align: center;">n/a</p> | <p style="text-align: center;">n/a</p> | <p style="text-align: center;">n/a</p> | <p style="text-align: center;">n/a</p> | <p style="text-align: center;"></p> |

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|-----------------------------------|--|--------------------------|----------------------------------|-----------|-----------|
| | | n/a | n/a | n/a | |
| | Indirect Costs (limited to no more than 10%) | n/a | n/a | n/a | |
| | | Total: | \$996,789 | \$126,800 | \$869,989 |
| Budget Narrative | <p>This funding request is for the acquisition of gas and particle monitors and their installation into one fixed and one mobile air monitoring stations to facilitate one year of continuous air quality observations.</p> <ul style="list-style-type: none"> The budget will primarily cover the expenses by the Cultivando subcontractor Boulder A.I.R. to conduct the core of the study. The cost proposal by Boulder A.I.R. is based on a per sample analysis rate that matches the charges in the ongoing programs in the neighboring communities. Adjustments were made for expected downtimes (such as by power outages, instrument service/repair) and time to relocate the mobile platform (van). These downtimes were estimated at 5% for the stationary and 20% for the van. The budget also includes line items for the web portal development and maintenance, and power and communication. Boulder A.I.R. will provide matching funds by making available at no cost to the project one ozone instrument, one nitrogen oxides monitor, and one gas chromatograph. Boulder A.I.R. will also cover the costs for the acquisition of the van for the mobile laboratory. <p>The total project budget is \$996,789. With matching funds of \$126,800, the resulting request is for \$869,989. The itemized budget details are provided in Exhibit J.</p> | | | | |
| Project Schedule/Work Plan | Activities | Staff Responsible | Completion Date | | |
| | Equipment Acquisition | Boulder A.I.R. | 3 months after project start | | |
| | Instrument and Shelter Installation | Boulder A.I.R. | 3-6 months after project start | | |
| | Air Monitoring at Fixed Site | Boulder A.I.R. | 6-18 months after project start | | |
| | Air Monitoring with Mobile Lab Van | Boulder A.I.R. | 6-18 months after project start | | |
| | Data Reporting, Public Outreach | Boulder A.I.R. | 6-18 months after project start | | |
| | Data Interpretation, Questionnaire, Final Report | Boulder A.I.R. | 18-24 months after project start | | |

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| Reporting | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30px; text-align: center; vertical-align: middle;">X</td> <td style="color: red; font-weight: bold;">The applicant has reviewed the reporting requirements below and if selected for SEP funding, agrees to adhere to these requirements.</td> </tr> </table> <p><u>Applicant's Biannual Status Reports</u> The applicant will submit a biannual project status report to the department's SEP Coordinator. Status reports will be submitted using the department's template and include the following information:</p> <ul style="list-style-type: none"> • A description of activities completed to date; • A budget summary table listing funds expended to date by budget category; and • A discussion of any anticipated changes to the project scope or timeline. <p><u>Applicant's Final SEP Completion Report</u> The applicant will submit the SEP Completion Report to the department's SEP Coordinator within 30 days of project completion. The applicant's Final SEP Completion Report will be submitted using the department's template, and will contain at a minimum:</p> <ul style="list-style-type: none"> • A detailed description of the project as implemented; • A summary table identifying project deliverables and tasks along with the associated completion date; • A description of any operating problems encountered and the solutions thereto; • A full expense accounting including itemized costs, documented by copies of purchase orders, contracts, receipts or canceled checks; • Demonstration that the SEP has been fully implemented in accordance with the SEP application; • A description of the environmental or public health protection and improvement resulting from implementation of the SEP along with quantification of the outcomes and benefits; • Examples of brochures, educational or outreach materials developed or produced as part of the SEP; and • Photographs documenting both project implementation and results. | X | The applicant has reviewed the reporting requirements below and if selected for SEP funding, agrees to adhere to these requirements. |
| X | The applicant has reviewed the reporting requirements below and if selected for SEP funding, agrees to adhere to these requirements. | | |
| Other Relevant Information | <p>This project was developed in response to the widely expressed desire within the Tier 1 communities to know what chemicals were being released by the Suncor refinery and what effect those chemicals were having on community wellbeing. This proposal evolved over ten months of communication and collaboration with local citizens and neighborhood groups. The monitoring work proposed here, in Component A, will be essential to much of the work to be accomplished under Component B. As stated previously, Component B will constitute the locally directed outreach and education portion of the project. Organizations and civic leaders who have gained early knowledge of this proposal and endorsed the project are shown in Exhibit L. Endorsements will grow exponentially as people and civic organizations learn of this proposal, for it represents good government at its best in our opinion. But remember no listing can properly represent un-named thousands of children and adults, many of them from minority and under-represented groups, who will ultimately benefit from the reforms this study will engender.</p> <p>This project will give the people the information they want and have a right to know about Suncor air pollution. It will undoubtedly lead to less pollution from reformed operations, and thus better health outcomes. Nevertheless, It will almost certainly take further action on the part of government to implement wider solutions.</p> | | |

Appendix

Exhibit A – List of Citations

1. <https://www.bouldair.com/boulder.htm>.
2. <https://www.bouldair.com/NoCoFrontRange.htm>.
3. <https://www.bouldair.com/longmont.htm>.
4. <https://www.bouldair.com/broomfield.htm>.
5. Finley, B., *Suncor refinery accident released 75,600 pounds of sulfur dioxide, 150 times daily limit*. Denver Post, 2016. <https://www.denverpost.com/2016/10/28/suncor-sulfur-dioxide-release/>.
6. Finley, B., *Climate change clobbers Colorado and the West, unfurling fire, drought, insects and heat*. Denver Post, 2018. <https://www.denverpost.com/2018/12/01/climate-change-impact-colorado/>.
7. Finley, B., *Suncor refinery north of Denver faces state review of outdated permits, plans \$300 million push to be “better not bigger”*. Denver Post, 2020. <https://www.denverpost.com/2020/11/29/suncor-oil-refinery-permit-renewals-closure-pollution/>.
8. Williams, S.B. and e. al., *Proximity to oil refineries and risk of cancer: A population-based analysis*. JNCI Cancer Spectrum, 2020. <https://doi.org/10.1093/jncics/pkaa088>.
9. Denver Department of Environmental Health, *How Neighborhood planning Affects Health in Globeville and Elyris Swansea*, . 2014. https://www.denvergov.org/content/dam/denvergov/Portals/746/documents/HIA/HIA%20Composite%20Report_9-18-14.pdf.
10. Datz, T., *Air pollution below EPA standards linked with higher death rates*. Harvard School of Public Health, 2015. <https://www.hsph.harvard.edu/news/press-releases/air-pollution-below-epa-standards-linked-with-higher-death-rates/>.
11. Finley, B., *Suncor oil refinery spews 8.5 tons a year of cyanide gas over low-income north Denver neighborhoods, state records show*. Denver Post, 2018. <https://www.denverpost.com/2018/04/19/suncor-energy-cyanide-gas-poor-denver-neighborhoods/>.
12. National Research Council, *Acute Exposure Guideline Levels for Selected Airborne Chemicals*, page 220, <https://www.epa.gov/sites/production/files/2014-09/documents/tsd6.pdf> p. 220.
13. AIR, B. <https://bouldair.com/>.
14. <https://www.denverpost.com/2020/12/12/suncor-pollution-refinery-commerce-city-fines/>.
15. <https://vimeo.com/showcase/7077649>.
16. G., P., F. F., H. R., O. J., and L. S., *Process-Based and Regional Source Impact Analysis for FRAPPÉ and DISCOVER-AQ 2014*. Final Report 2017.
17. Woodruff, C., *Diana DeGette takes aim at loophole allowing Suncor cyanide emissions*. Westword, 2019. <https://www.westword.com/news/diana-degette-takes-aim-at-loophole-allowing-suncor-cyanide-emissions-11275304>.
18. Code, I.C.M., *Cyanide Facts*. <https://www.cyanidecode.org/cyanide-facts/environmental-health-effects>.
19. World Health Organization, *Exposure to Benzene, A Major Public Health Concern*, page 2, <https://apps.who.int/iris/bitstream/handle/10665/329481/WHO-CED-PHE-EPE-19.4.2-eng.pdf?ua=1>
20. Tami McMullen, Times-Call, August 18, 2020, *It’s Important to Know What Benzene Measurements Mean*, <https://www.timescall.com/2020/08/18/tami-mcmullen-its-important-to-know-what-benzene-measurements-mean/>
21. Wu, X. et.al., Harvard University, November 4, 2020, *Fine particulate matter and COVID-19 mortality in the United States*, <https://projects.iq.harvard.edu/covid-pm/home>
22. Nichols, J., Wildearth Gaurdians, September 26, 2019, *Notice of Intent to File Suit Over Clean Air Act Violations at Suncor’s Commerce City Oil Refinery North of Denver*, page 3, https://pdf.wildearthguardians.org/support_docs/2019-9-26%20Suncor%20Notice%20Letter%20with%20Exhibits-lo.pdf
23. Finley, B., Denver Post, May 26, 2019, *Suncor’s hydrogen-cyanide emissions exceeded permit last year; Colorado now weighing refinery’s request to increase limit*. <https://www.denverpost.com/2019/05/26/suncor-refinery-emissions-colorado/>
24. Tessum, C.W., et.al., *Inequity in consumption of goods and services adds to racial–ethnic disparities in air pollution exposure*, Proceedings of the National Academy of Science, November 2, 2018, <https://www.pnas.org/content/116/13/6001>
25. https://earthjustice.org/sites/default/files/files/Comments%28final%29_08-23-2018.pdf
26. <https://www.eia.gov/tools/faqs/faq.php?id=29&t=6>
27. https://en.wikipedia.org/wiki/Chevron_Richmond_Refinery
28. <https://wildearthguardians.org/press-releases/guardians-puts-denver-oil-refinery-on-notice-of-clean-air-violations>

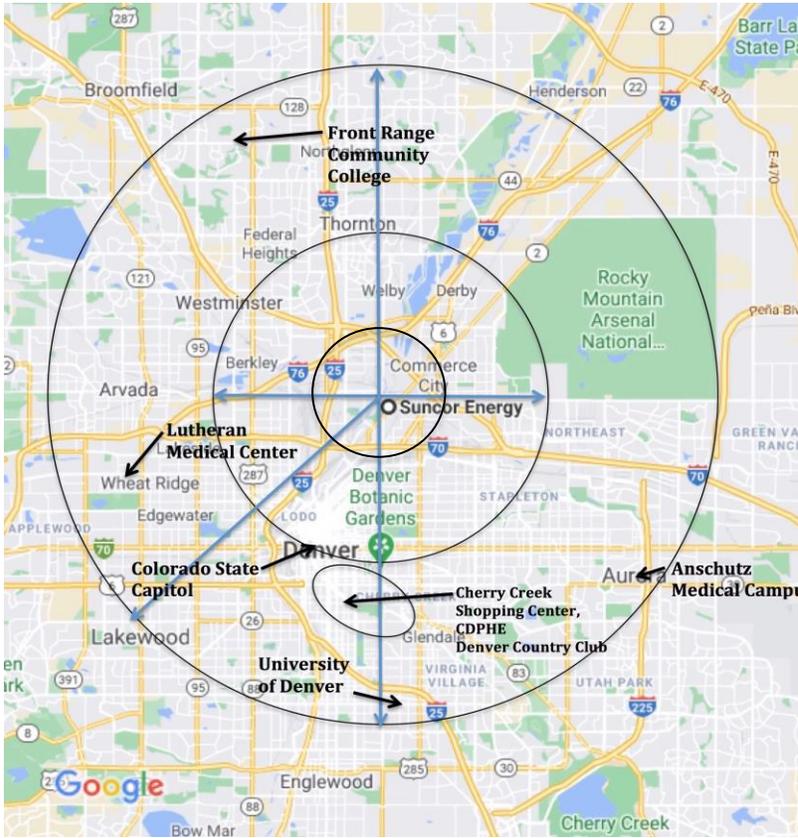


Exhibit B – Denver Area Map

Denver Metro Area communities surrounding the Suncor Refinery. The circles indicate a 5- and 10-mile radius from the plant. Within a 5-mile radius are the State Capitol, Downtown Denver, and many of the city’s major hospitals are covered. At 10 miles, most of the metro area from the Univ. of Denver to the south, Green Valley Ranch to the east, Arvada and Lakewood to the west, and Thornton and Northglenn to the north are captured.

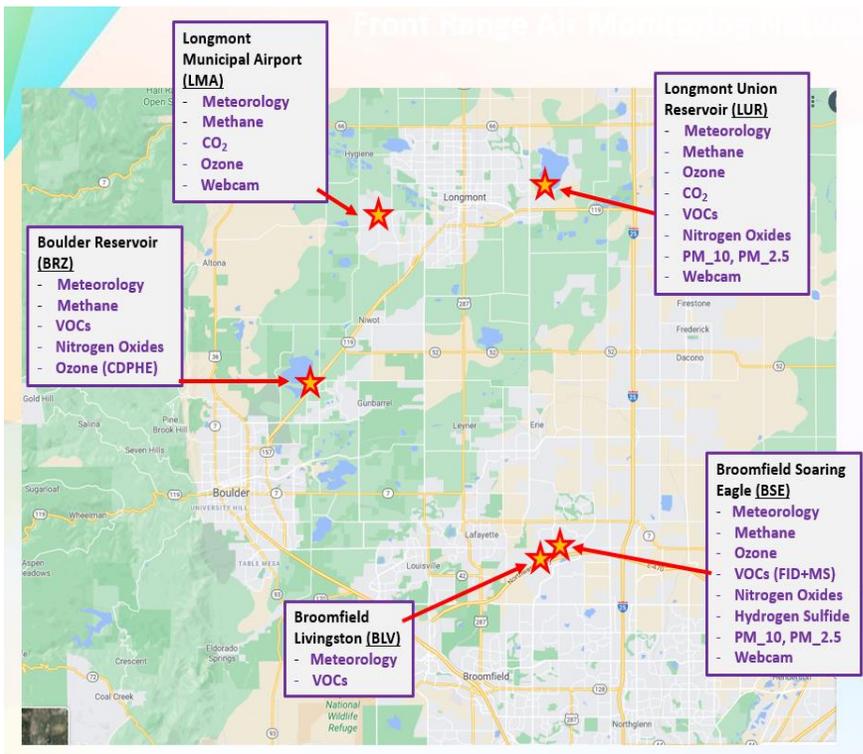


Exhibit C – Boulder A.I.R. Monitoring Network

Current Boulder A.I.R. monitoring network with five stations located in Boulder [1], Longmont [3], and Broomfield [4]. Stars indicate the site locations. Monitored variables and pollutants are listed in the boxes.

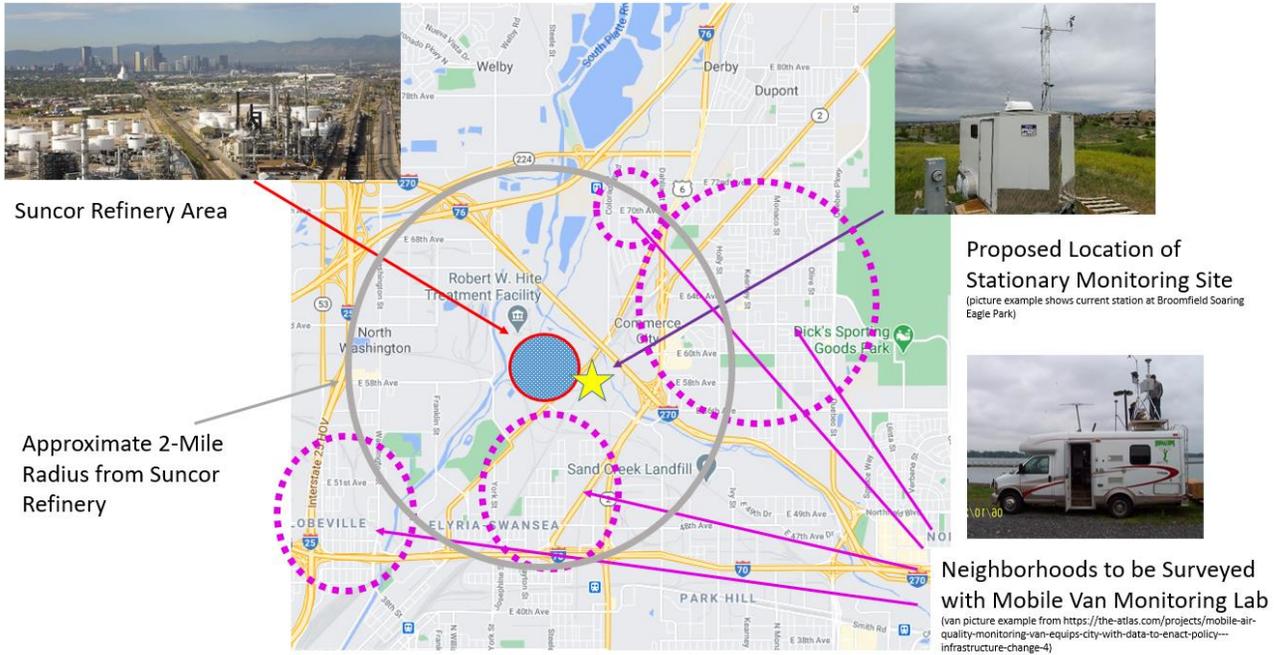


Exhibit D – Proposed Locations of the Two Project Air Monitoring Stations

Proposed concept for the air data collection in this project, with one fixed air monitoring site close to the refinery, and communities to be surveyed with the mobile monitoring van indicated by the dotted circle.



Real Time Monitoring and Real Time Reporting of Air Quality and Oil and Gas Emissions

Exhibit F – Real Time Air Quality Monitoring

Concept of real-time monitoring and real-time reporting. Monitoring data are processed within minutes of their recording and uploaded to a public website for informing citizens, health care professional, plant operators and any other interested parties about current air quality conditions. Example website portal is for the Boulder Reservoir.

| Air Quality Index (AQI) Values | Levels of Health Concern | Colors |
|---------------------------------------|---------------------------------------|--|
| <i>When the AQI is in this range:</i> | <i>...air quality conditions are:</i> | <i>...as symbolized by this color:</i> |
| 0 to 50 | Good | Green |
| 51 to 100 | Moderate | Yellow |
| 101 to 150 | Unhealthy for Sensitive Groups | Orange |
| 151 to 200 | Unhealthy | Red |
| 201 to 300 | Very Unhealthy | Purple |
| 301 to 500 | Hazardous | Maroon |

Exhibit H – Air Quality Index Classification

Monitoring results of the criteria pollutants ozone, carbon monoxide, sulfur dioxide, and particulate matter are used to calculate the Air Quality Index (AQI) as a simplified metrics to portray current air pollution conditions.

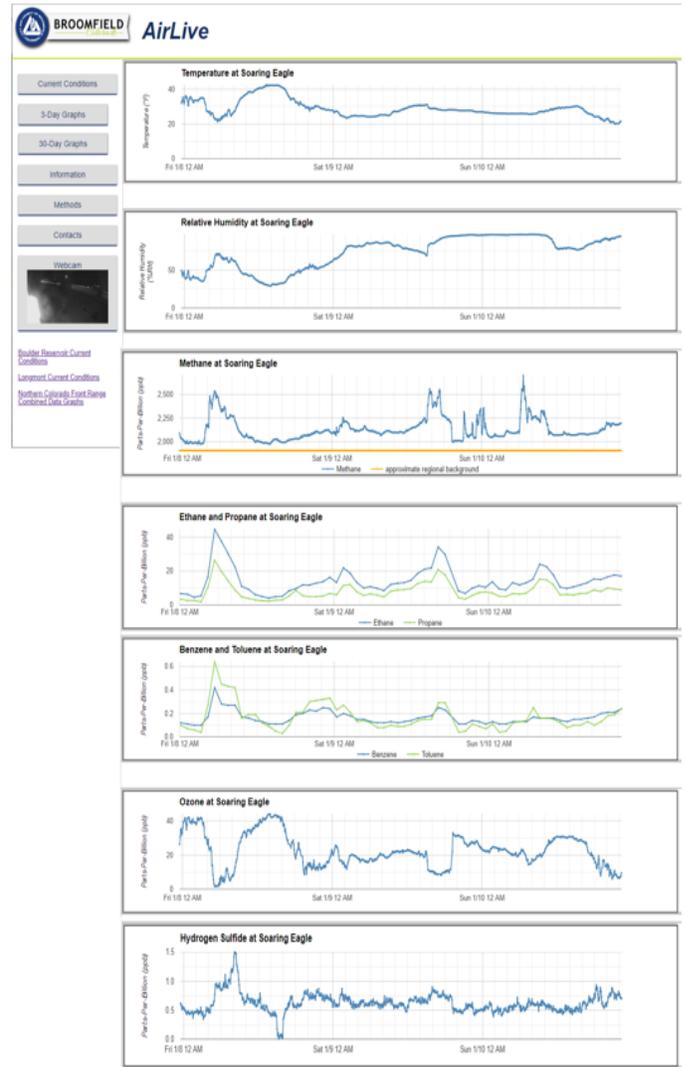
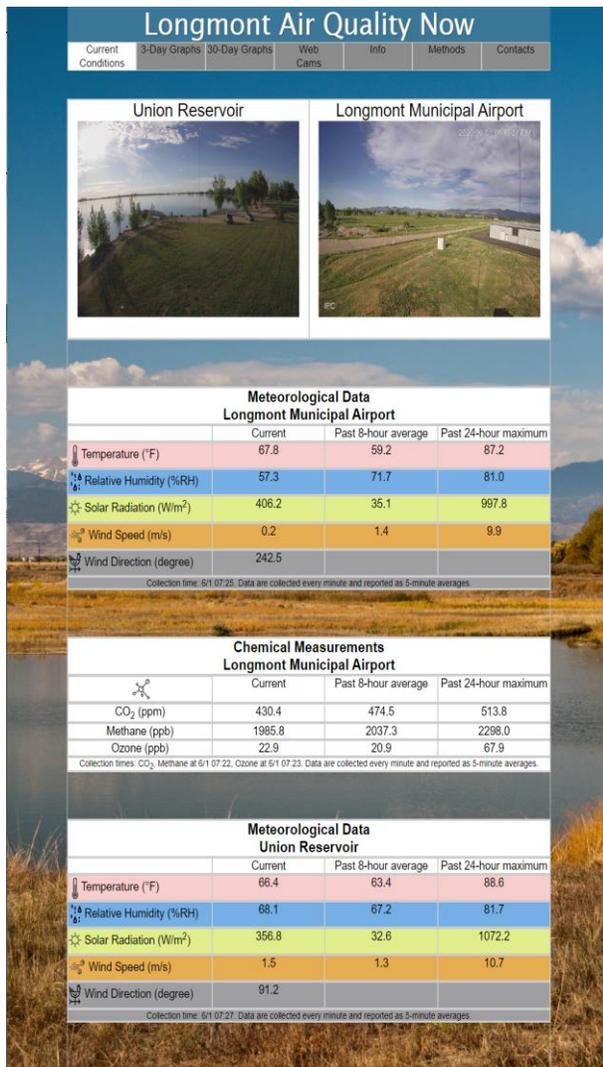
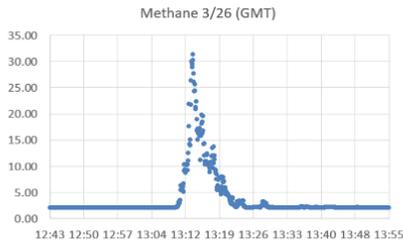


Exhibit G – Web Portal

Example of real-time data reporting web portal, with the left side showing the tabulated data results for the monitoring at the Longmont Municipal Airport and Longmont Union Reservoir [3], and the right panel showing an example of the 3-day data graphs for the Broomfield Soaring Eagle Park monitoring [4].

Exhibit I – Data Analysis Examples

LUR Methane Spike 3/26/2020
(5 second data)

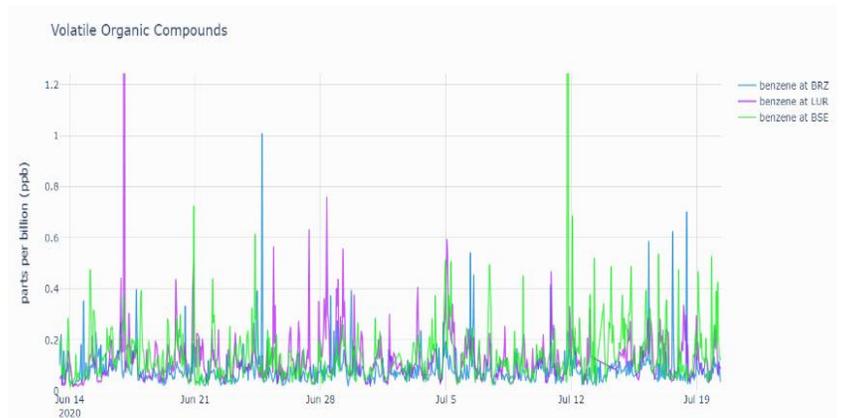


Duration: 13:10 to 13:24 (~ 14 minutes)

3/26/2020: Methane at Longmont Union reservoir was over 15x background levels. Analysis of wind speed and direction indicates the likely source was from the north to north-west upwind direction.

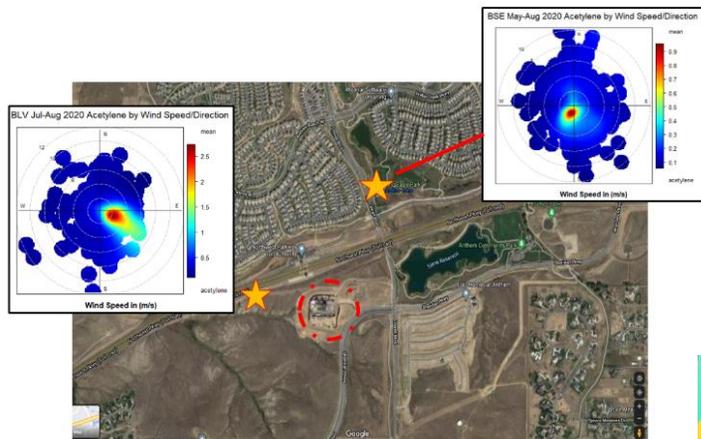


Comparison of benzene pollution spikes at 3 Northern Front Range monitoring sites Boulder Reservoir (BRZ), Longmont Municipal Airport (LMA), and Longmont Union Reservoir (LUR); June 2020. [2]



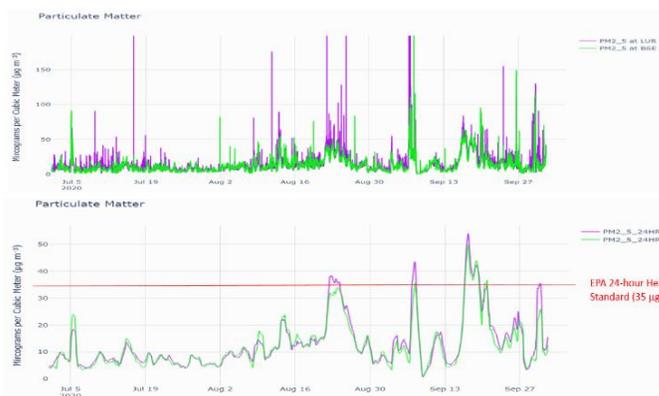
Statistical analysis comparing ozone data during winter months at the Boulder Reservoir (BRZ), Longmont Municipal Airport (LMA), and Longmont Union Reservoir (LUR).

Exhibit I – Data Analysis Examples Continued

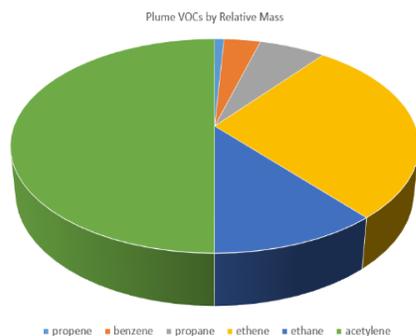
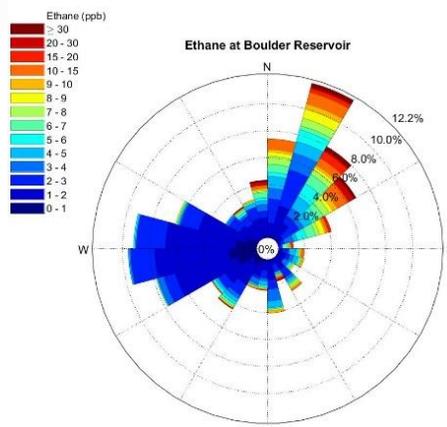


Identification of acetylene sources at the Livingston well pad in Broomfield by heat map analyses using data from the Broomfield Soaring Eagle and Broomfield Livingston monitoring sites.

Summer 2020 occurrences of Front Range ozone exceedances of the 70 ppb National Air Quality Standard.



Comparison of Particulate Matter (PM_{2.5}) at Longmont Union Reservoir and Broomfield Soaring Eagle from wildfire events in July 2020. 24-hour averaged data shows the air pollution was widespread and exceeded the air quality standards.



Composition of acetylene-rich pollution plumes from the Livingston well pad.

Dependence of ethane at the Boulder Reservoir on wind direction.

Exhibit J - Boulder A.I.R. Budget Details

| Part A: Fixed Monitoring Station | | | | | | | | | | | |
|--|--|-------|-----------------------|---------|--------------------|-----------------|----------------------|----------------|-------------------------------|-----------------|-----------------------------------|
| Item | Variable | Rate | Measurement Frequency | | Total | Cost | Est. % data coverage | Total Cost | Boulder A.I.R. Matching Funds | Funding Request | Notes |
| | | \$ | per hour | per day | # samples per year | \$ | | | | | |
| 1 | Ozone, TEI_49 | 0.40 | 6 | 144 | 52596 | 21,038 | 95 | 19,986 | 15,000 | 4,986 | Use refurbished monitor |
| 2a | NO, Teledyne_T200UP | 0.50 | 6 | 144 | 52596 | 26,298 | 95 | 24,983 | | 24,983 | |
| 2b | NO ₂ , Teledyne_T200UP | 0.50 | 6 | 144 | 52596 | 26,298 | 95 | 24,983 | | 24,983 | |
| 3 | Methane, PICARRO G2401 | 0.50 | 12 | 288 | 105192 | 52,596 | 95 | 49,966 | | 49,966 | |
| 4 | Volatile Organic Compounds (including ethane, ethene, acetylene, propane, propene, i-butane, n-butane, i-pentane, n-pentane, isoprene, n-hexane, benzene, toluene, o-xylene, ethylbenzene, o-xylene, m-xylene, p-xylene, hydrogen cyanide, and identification of other, unforeseen VOCs); custom-gas chromatograph; WMO-grade by two channel gas chromatography - flame ionization detection and mass spectrometry detection | 30.00 | 1 | 24 | 8766 | 262,980 | 95 | 249,831 | | 249,831 | |
| 5 | PM2.5, GRIMM EDM180 | 4.00 | 1 | 24 | 8766 | 35,064 | 95 | 33,311 | | 33,311 | |
| 6 | CO ₂ , PICARRO G2301 | 0.50 | 12 | 288 | 105192 | 52,596 | 95 | 49,966 | | 49,966 | |
| 7 | Hydrogen Sulfide (H ₂ S) and sulfur dioxide (SO ₂), Teledyne T101 | 0.75 | 6 | 144 | 52596 | 39,447 | 95 | 37,475 | | 37,475 | |
| 8 | Carbon Monoxide, PICARRO G2401 | 0.50 | 12 | 288 | 105192 | 52,596 | 95 | 49,966 | | 49,966 | |
| 9 | Radioactivity, RTS-CCAM-TF | | | | | 30,000 | 95 | 28,500 | | 28,500 | |
| 10 | Meteorological variables (wind speed, wind direction, temperature, radiation) | 0.07 | 12 | 288 | 105192 | 7,363 | 95 | 6,995 | | 6,995 | |
| 11 | Website design, maintenance, data management | | | | | 50,000 | 100 | 50,000 | | 50,000 | |
| 11 | Instrument shelter | | | | | 20,000 | | 20,000 | | 20,000 | |
| 12 | Power, Communication | | | | | 6,000 | 100 | 6,000 | | 6,000 | |
| Total fixed station continuous monitoring cost: | | | | | | Subtotal | | 651,963 | | 636,963 | |
| Part B: Mobile Platform | | | | | | | | | | | |
| 2a | NO, TEI_42_TL; refurbished monitor | 0.50 | 6 | 144 | 52596 | 26,298 | 80 | 21,038 | 15,000 | 6,038 | Use refurbished monitor |
| 3a | NO ₂ , TEI_42_TL; refurbished monitor | 0.50 | 6 | 144 | 52596 | 26,298 | 80 | 21,038 | 15,000 | 6,038 | Use refurbished monitor |
| 4a | Volatile Organic Compounds (including ethane, ethene, acetylene, propane, propene, i-butane, n-butane, i-pentane, n-pentane, isoprene, n-hexane, benzene, toluene, o-xylene, ethylbenzene, o-xylene, m-xylene, p-xylene); custom-gas chromatograph; WMO-grade by gas chromatography - flame ionization detection | 24.00 | 1 | 24 | 8766 | 210,384 | 80 | 168,307 | 6,800 | 161,507 | Use refurbished gas chromatograph |
| 5a | PM2.5, GRIMM EDM180 | 4.00 | 1 | 24 | 8766 | 35,064 | 80 | 28,051 | | 28,051 | |
| 8 | Meteorological variables (wind speed, wind direction, temperature, radiation) | 0.07 | 12 | 288 | 105192 | 7,363 | 80 | 5,891 | | 5,891 | |
| 10 | Website design, maintenance, data management | | | | | 20,000 | | 20,000 | | 20,000 | |
| 11 | Monitoring Van | | | | | 75,000 | | 75,000 | 75,000 | 0 | |
| 12 | Power, Communication | | | | | 6,000 | | 5,500 | | 5,500 | |
| Total mobile van continuous monitoring cost: | | | | | | Subtotal | | 344,826 | 126,800 | 233,026 | |
| Total stationary and mobile van continuous monitoring cost: | | | | | | | | 996,789 | | 869,989 | |

Exhibit K – Cultivando Tax Exempt Letter



ATLANTA GA 39901-0001

In reply refer to: 0752861009
Mar. 06, 2019 LTR 4168C 0
84-1499624 000000 00
00029981
BDDC: TE

CULTIVANDO
% CRISTIE JOPLIN MARTIN
PO BOX 29247
THORNTON CO 80229-0247

032658

Employer ID number: 84-1499624
Form 990 required: YES

Dear Taxpayer:

We're responding to your request dated Feb. 25, 2019, about your tax-exempt status.

We issued you a determination letter in AUGUST 1999, recognizing you as tax-exempt under Internal Revenue Code (IRC) Section 501(c)(3).

We also show you're not a private foundation as defined under IRC Section 509(a) because you're described in IRC Sections 509(a)(1) and 170(b)(1)(A)(vi).

Donors can deduct contributions they make to you as provided in IRC Section 170. You're also qualified to receive tax deductible bequests, legacies, devises, transfers, or gifts under IRC Sections 2055, 2106, and 2522.

In the heading of this letter, we indicated whether you must file an annual information return. If you're required to file a return, you must file one of the following by the 15th day of the 5th month after the end of your annual accounting period:

- Form 990, Return of Organization Exempt From Income Tax
- Form 990EZ, Short Form Return of Organization Exempt From Income Tax
- Form 990-N, Electronic Notice (e-Postcard) for Tax-Exempt Organizations Not Required to File Form 990 or Form 990-EZ
- Form 990-PF, Return of Private Foundation or Section 4947(a)(1) Trust Treated as Private Foundation

According to IRC Section 6033(j), if you don't file a required annual information return or notice for 3 consecutive years, we'll revoke your tax-exempt status on the due date of the 3rd required return or notice.

You can get IRS forms or publications you need from our website at www.irs.gov/forms-pubs or by calling 800-TAX-FORM (800-829-3676).

If you have questions, call 877-829-5500 between 8 a.m. and 5 p.m.,

0752861009
Mar. 06, 2019 LTR 4168C 0
84-1499624 000000 00
00029982

CULTIVANDO
% CRISTIE JOPLIN MARTIN
PO BOX 29247
THORNTON CO 80229-0247

local time, Monday through Friday (Alaska and Hawaii follow Pacific time).

Thank you for your cooperation.

Sincerely yours,

Teri M. Johnson
Operations Manager, AM Ops. 3

Exhibit L – Letter of Support

Parties and Individuals who have contributed to the conception of this project, and have agreed to have their names listed as an expression of their endorsement of the study:

- Richard Lamm, former Governor, Colorado
- Father Jorge de Los Santos
Nuestra Señora Madre de la Iglesia/Our Lady Mother of the Church
- Eva Henry, Adams County Commissioner
- Colorado Businesses for a Livable Climate
- Call to Action Colorado
- Catholic Network
- Venner Consulting
- Energy and Environmental Initiative of the Colorado Democratic Party
- I-70/Vasquez Blvd Superfund, Environmental Protection Agency Community Advisory Group
- Transformative Leadership for Change
- Colorado Jewish Climate Action
- Public Employees for Environmental Responsibility
- GES Coalition Organizing for Health and Housing Justice
- Clean Energy Action
- 350Colorado
- The Climate Mobilization, Colorado
- Colorado Latino Forum
- Fort Collins Sustainability Group
- Colorado Citizens for a Livable Climate
- What the Frack?! Arapahoe
- Be the Change, Colorado