

APPENDIX B

Air Quality and Greenhouse Gas Emissions Modeling

TECHNICAL MEMORANDUM

TO: Caitlin Gilleran, Panorama Environmental

FROM: Michael Ratte, RCH Group

DATE: January 9, 2017

SUBJECT: CPUC Pendleton TL 695 and TL 6971 Reconductor Project Air Quality Impacts

The proposed project would involve reconductoring approximately 10.1 miles of TL 695 and TL 6971 between the Talega, Basilone, and Japanese Mesa Substations by replacing existing wood pole structures with new steel pole structures, and installing a new segment underground power line. An air quality impact analysis was conducted to estimate the air quality impacts due to the construction and operation of the proposed project. This air quality impact assessment provides the basis for preparing the air quality analyses in the CEQA Initial Study/Mitigated Negative Declaration. **Attachment A** provides a detailed summary of the construction emissions inventory. **Attachment B** provides the construction equipment schedule and other calculation assumptions for the construction emissions inventory.

Construction would involve six (generally sequential) phases: 1) Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP Installation, 2) Pier Foundation and Micropile Construction, 3) Direct Bury Construction and Pole Installation, 4) Stringing Activities/Transfer Conductor/Sagging Activities, 5) Demobilization/Clean Up/Road Refreshing, and 6) Trenching for Installation of Underground Cables. Construction activities are expected to commence in January of 2018 and be completed by the end of August of 2018. The project construction site includes work areas, staging areas, access areas, access roads, and temporary easement.

Air Quality Overview

Primary air emissions from the proposed project include construction emissions associated with fugitive dust (from grading, loading/unloading, and vehicle movement on unpaved surfaces), combustion from heavy construction equipment (loaders, excavators), helicopter usage (fugitive dust and combustion emissions), and construction workers commuting to and from the project site. Operation and maintenance activities that would affect air quality would not increase as a result of the proposed project.

This air quality analysis is consistent with the San Diego County Department of Planning and Development Services *Guidelines for Determining Significance and Report Format and Content Requirement for Air Quality*¹ and supporting information from San Diego Air Pollution Control

¹ San Diego County, *Guidelines for Determining Significance and Report Format and Content Requirement for Air Quality*, March 19, 2007, <http://www.sandiegocounty.gov/content/dam/sdc/pds/ProjectPlanning/docs/AQ-Guidelines.pdf>

District (SDAPCD). The air quality analysis is also consistent with the methods described in the South Coast Air Quality Management District (SCAQMD) *CEQA Air Quality Handbook*².

The air quality analysis includes a review of criteria pollutant³ emissions such as carbon monoxide (CO)⁴, nitrogen oxides (NO_x), sulfur dioxide (SO₂), volatile organic compounds (VOC) as reactive organic gases (ROG)⁵, particulate matter less than or equal to 10 micrometers (coarse particulate or PM₁₀), particulate matter less than or equal to 2.5 micrometers (fine particulate or PM_{2.5}).⁶ The air quality analysis also addresses health impacts due to air toxics emissions such as diesel particulate matter (DPM). Impacts on climate change are addressed through a greenhouse gas (GHG) emissions inventory.

Regulatory models used to estimate air quality impacts include (but not limited to):

- California Air Resources Board's (CARB) EMFAC2014⁷ emissions inventory model. EMFAC2014 is the latest emission inventory model that calculates emission inventories and emission rates for motor vehicles operating on roads in California. This model reflects CARB's current understanding of how vehicles travel and how much they emit. EMFAC2014 can be used to show how California motor vehicle emissions have changed over time and are projected to change in the future.
- CARB OFFROAD⁸ emissions inventory model. OFFROAD is the latest emission inventory model that calculates emission inventories and emission rates for off-road equipment such as loaders, excavators, and off-road haul trucks operating in California. This model reflects CARB's current understanding of how equipment operates and how much they emit. OFFROAD can be used to show how California off-road equipment emissions have changed over time and are projected to change in the future.

² South Coast Air Quality Management District, *CEQA Air Quality Handbook*, <http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook>

³ Criteria air pollutants refer to those air pollutants for which the United States Environmental Protection Agency (USEPA) and California Air Resources Board (CARB) has established National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) under the Federal Clean Air Act (CAA).

⁴ CO is a non-reactive pollutant that is a product of incomplete combustion of organic material, and is mostly associated with motor vehicle traffic, and in wintertime, with wood-burning stoves and fireplaces.

⁵ VOC means any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions and thus, a precursor of ozone formation. ROG are any reactive compounds of carbon, excluding methane, CO, CO₂, carbonic acid, metallic carbides or carbonates, ammonium carbonate, and other exempt compounds. The terms VOC and ROG are often used interchangeably.

⁶ PM₁₀ and PM_{2.5} consists of airborne particles that measure 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. PM₁₀ and PM_{2.5} represent fractions of particulate matter that can be inhaled into the air passages and the lungs, causing adverse health effects.

⁷ California Air Resources Board, *EMFAC2014 User's Guide*, April 30, 2014, <http://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol1-users-guide-052015.pdf>

⁸ California Air Resources Board, *OFFROAD Instructions*, http://www.arb.ca.gov/msprog/ordiesel/info_1085/oei_write_up.pdf

- CalEEMod (California Emissions Estimator Model Version 2016.3.1)⁹ land use emissions model estimates construction emissions due to demolition and construction activities and operations.
- The Aviation Environmental Design Tool (AEDT) is developed and distributed by the Federal Aviation Administration (FAA).¹⁰ AEDT is a software system that dynamically models aircraft performance to compute emissions and fuel burn. AEDT's framework incorporates emissions and dispersion modeling functionality from the FAA's Emissions and Dispersion Modeling System (EDMS). EDMS is designed to assess the air quality impacts of emission sources including aircraft, helicopters, and supporting equipment. The FAA has identified AEDT/EDMS as the required model to perform air quality analyses for aviation sources. Helicopter fugitive dust emissions were based on emission factors developed by the Desert Research Institute.¹¹

The SDAPCD is the agency responsible for enforcing air quality regulations in the San Diego Air Basin (SDAB). The SDAB is designated as a state standard nonattainment area for PM10, PM2.5, 1-hour and 8-hour ozone, and a federal standard nonattainment area for 8-hour ozone. The SDAB is designated "attainment" or "unclassifiable" with respect to the other ambient air quality standards. The SCAQMD is the agency responsible for enforcing air quality regulations in the South Coast Air Basin (SCAB). The SCAB is in nonattainment status for the federal ozone, lead, and PM2.5; and in attainment for the federal CO, NO₂, SO₂, and PM10. Federal nonattainment areas are further designated as marginal, moderate, serious, severe, or extreme as a function of deviation from standards. The South Coast Basin is in nonattainment status for the State ozone, PM10, and PM2.5; and is in attainment status for CO, NO₂, SO₂, and lead.^{12 13}

Thresholds of Significance

The SDAPCD has not adopted any CEQA guidelines for projects in the SDAB. However, the SDAPCD has established screening-level criteria for non-major stationary sources under SDAPCD Rule 20.2. Secondly, the San Diego County Department of Planning and Development Services *Guidelines for Determining Significance and Report Format and Content Requirement for Air Quality* provides guidance for air quality CEQA analyses and applicable significance thresholds. For CEQA purposes, these screening-level criteria can be used as numeric methods to demonstrate if a project's total emissions would result in a significant air quality impact. Therefore, screening-level criteria under Rule 20.2 and San Diego County CEQA guidelines were used to determine the significance of emissions from the proposed project. Because a

⁹ California Air Pollution Control Officers Association, *CalEEMod User's Guide Version 2016.3.1*, September 2016, http://www.aqmd.gov/docs/default-source/caleemod/upgrades/2016.3/01_user-39-s-guide2016-3-1.pdf?sfvrsn=2

¹⁰ Federal Aviation Administration, *Aviation Environmental Design Tool*, <https://aedt.faa.gov/>

¹¹ Desert Research Institute, *Particulate Matter Emissions for Dust from Unique Military Activities*, December 31, 2009, <http://www.dtic.mil/dtic/tr/fulltext/u2/a478503.pdf>

¹² United States Environmental Protection Agency, *The Green Book Nonattainment Areas for Criteria Pollutants*, <https://www.epa.gov/green-book>

¹³ California Air Resources Board, *Area Designations Maps/State and National*, <http://www.arb.ca.gov/desig/adm/adm.htm>

screening-level criteria for daily ROG or PM2.5 emissions has not been established under Rule 20.2 and San Diego County CEQA guidelines, the SCAQMD significance thresholds for daily ROG and PM2.5 emissions were used. **Table 1** displays the significance thresholds used for the air quality analysis.

Table 1: Significance Thresholds for Daily Construction Emissions (pounds)

Condition	ROG	NO _x	CO	SO ₂	PM10	PM2.5
<i>SDAPCD Significance Threshold</i>	75	250	550	250	100	55
<i>SCAQMD Significance Threshold</i>	75	100	550	150	150	55

SOURCES: San Diego County, *Guidelines for Determining Significance and Report Format and Content Requirement for Air Quality*, March 19, 2007, <http://www.sandiegocounty.gov/content/dam/sdc/pds/ProjectPlanning/docs/AQ-Guidelines.pdf> and South Coast Air Quality Management District, *CEQA Air Quality Handbook*, <http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook>

Construction Air Quality Impacts

The proposed project would generate short-term emissions of air pollutants, including fugitive dust and combustion exhaust emissions from construction activities. Construction equipment would include compressors, cranes, drill rigs, graders, loaders, and off-highway trucks. SDG&E also anticipates that light-, medium- and heavy-duty helicopters would be used for the proposed project. The San Diego County *Guidelines for Determining Significance and Report Format and Content Requirement for Air Quality* recommend quantification of construction-related exhaust and fugitive dust emissions and comparison of those emissions to significance thresholds. The CalEEMod (California Emissions Estimator Model Version 2016.3.1) was used to quantify construction-related emissions for the proposed project.

Table 2 provides the estimated maximum daily construction exhaust and fugitive dust emissions that would be associated with the proposed project and compares those emissions to the SDAPCD and SCAQMD’s significance thresholds for construction emissions. **Table 3** provides the estimated average daily construction exhaust and fugitive dust emissions that would be associated with the proposed project. The average daily construction period emissions were based on the total construction emissions divided by the number of construction days (234 days). Of the proposed project length (approximately ten miles), approximately five percent is located within the SCAQMD and 95 percent is located within the SDAPCD. The air emissions were apportioned accordingly.

The following provides a summary of the construction emission results:

- Construction-related ROG, NO_x, SO₂, CO, PM10, and PM2.5 emissions would be below the significance thresholds within SDAPCD, and thus, a less than significant impact on air quality within the SDAPCD.
- Construction-related ROG, NO_x, SO₂, CO, PM10, and PM2.5 emissions would be below the significance thresholds within SCAQMD, and thus, a less than significant impact on air quality within the SCAQMD.

Table 2: Estimated Maximum Daily Construction Emissions (pounds)

Condition	ROG	NO _x	CO	SO ₂	PM10	PM2.5
Construction Equipment and Vehicles	11.4	130	60.9	0.24	7.46	4.96
Helicopter Activities	15.9	17.9	29.7	3.42	40.7	4.96
Total Proposed Project	27.3	148	90.5	3.66	48.2	9.92
Total Proposed Project within SDAPCD	25.9	141	86.0	3.47	45.8	9.43
<i>SDAPCD Significance Threshold</i>	75	250	550	250	100	55
Potentially Significant (Yes or No)?	No	No	No	No	No	No
Total Proposed Project within SCAQMD	1.36	7.41	4.53	0.18	2.41	0.50
<i>SCAQMD Significance Threshold</i>	75	100	550	150	150	55
Potentially Significant (Yes or No)?	No	No	No	No	No	No

SOURCES: CalEEMod Version 2016.3.1, Guidance on Determination of Helicopter Emissions, Edition 1, March 2009, Desert Research Institute, Particulate Matter Emissions for Dust from Unique Military Activities, December 31, 2009, and Federal Aviation Administration, Aviation Environmental Design Tool.

Table 3: Estimated Average Daily Construction Emissions (pounds)

Condition	ROG	NO _x	CO	SO ₂	PM10	PM2.5
Construction Equipment and Vehicles	5.39	62.6	30.2	0.11	3.45	2.36
Helicopter Activities	10.2	11.4	19.0	2.19	26.8	3.25
Total Proposed Project	15.6	74.1	49.2	2.31	30.2	5.61
Total Proposed Project within SDAPCD	14.8	70.4	46.8	2.19	28.7	5.33
<i>SDAPCD Significance Threshold</i>	75	250	550	250	100	55
Potentially Significant (Yes or No)?	No	No	No	No	No	No
Total Proposed Project within SCAQMD	0.78	3.68	2.46	0.12	1.51	0.28
<i>SCAQMD Significance Threshold</i>	75	100	550	150	150	55
Potentially Significant (Yes or No)?	No	No	No	No	No	No

SOURCES: CalEEMod Version 2016.3.1, Guidance on Determination of Helicopter Emissions, Edition 1, March 2009, Desert Research Institute, Particulate Matter Emissions for Dust from Unique Military Activities, December 31, 2009, and Federal Aviation Administration, Aviation Environmental Design Tool.

Construction of the proposed project would comply with SDAPCD's Rule 55, Fugitive Dust Control, which requires that construction activities implement specific measures to minimize fugitive dust emissions. The proposed project would also comply with SDAPCD's Rule 50 (Visible Emissions), Rule 51 (Nuisance), and Rule 52 (Particulate Matter).

It is also mandatory for all construction projects to comply with SCAQMD Rule 403 for fugitive dust. Specific Rule 403 control requirements include, but are not limited to, applying water in sufficient quantities to prevent the generation of visible dust plumes, applying soil binders to uncovered areas, reestablishing ground cover as quickly as possible, utilizing a wheel washing system to remove bulk material from tires and vehicle undercarriages before vehicles exit the project site, and maintaining effective cover over exposed areas.

In conclusion, construction-related ROG, CO, NO_x, SO₂, PM10, and PM2.5 emissions would be below the significance thresholds, and thus, a less than significant air quality impact within the SDAPCD and SCAQMD.

Operational Air Quality Impacts

Operation and maintenance activities that would affect air quality will not increase as a result of the proposed project. SDG&E would continue to regularly inspect, maintain, and repair the new and reconstructed power line and distribution line facilities following completion of proposed project construction. SDG&E will continue to employ standard Best Management Practices—such as minimizing vehicle trips and keeping vehicles and equipment well maintained—during operation of the proposed project.

Health Impacts

Diesel-powered equipment and vehicles such as haul trucks, back hoes, and cranes would be used during construction of the proposed project. Operation of diesel-powered equipment would generate diesel exhaust emissions. Diesel exhaust is a complex mixture of gases and fine particles and includes over 40 substances that are listed by the USEPA as hazardous air pollutants and by the CARB as toxic air contaminants.¹⁴ Additionally, helicopters would be operated throughout construction which, depending upon engine type, may be fueled by either aviation turbine fuel or aviation gasoline, which can also contain air toxics such as formaldehyde.

Some receptors are considered more sensitive to air pollutants than others, because of preexisting health problems, proximity to the emissions source, or duration of exposure to air pollutants. Land uses such as primary and secondary schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because the very young, the old, and the infirm are more susceptible to respiratory infections and other air quality-related health problems than the general public. Residential areas are also considered sensitive to poor air quality because people in residential areas are often at home for extended periods. Recreational land uses are moderately sensitive to air pollution because vigorous exercise associated with recreation places a high demand on respiratory system function. Children under 16 years are more susceptible to carcinogens compared to adults. As such, child care centers and schools are higher risk sensitive receptors.

Within the project area, the majority of the sensitive receptors are primarily residences, educational facilities, libraries, hospitals, places of worship, and passive recreation areas. Construction vehicles and trucks carrying construction equipment to and from work sites would travel along construction routes to and from staging yards in the vicinity of sensitive

¹⁴ In August of 1998, CARB identified particulate emissions from diesel-fueled engines as a toxic air contaminant. CARB developed the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*. The document represents a proposal to reduce diesel particulate emissions, with the goal to reduce emissions and the associated health risk by 75 percent in 2010 and by 85 percent in 2020. The program aims to require the use of state-of-the-art catalyzed diesel particulate filters and ultra-low sulfur diesel fuel on diesel-fueled engines.

Diesel particulate matter (DPM) is the most complex of diesel emissions. Diesel particulates, as defined by most emission standards, are sampled from diluted and cooled exhaust gases. This definition includes both solid and liquid material that condenses during the dilution process. The basic fractions of DPM are elemental carbon; heavy hydrocarbons derived from the fuel and lubricating oil and hydrated sulfuric acid derived from the fuel sulfur. DPM contains a large portion of the polycyclic aromatic hydrocarbons found in diesel exhaust. Diesel particulates include small nuclei particles of diameters below 0.04 micrometers (μm) and their agglomerates of diameters up to 1 μm .

receptors. Residences were identified within varying distances to the project area with some locations within 1,000 feet of the transmission line corridor. Segment E runs adjacent to and within 1,000 feet of the San Onofre Elementary School.

In accordance with California Code of Regulations (CCR) § 2485, trucks with a gross vehicle weight rating over 10,000 pounds must not idle longer than five consecutive minutes except under extenuating circumstances. As required by CCR § 2480, a vehicle stopping at or within 100 feet of a school must not idle for more than 30 seconds. Idling restriction regulations would limit impacts to sensitive receptors in the vicinity of the staging yards, construction routes, and work areas.

Construction-related emissions would be short term in duration. Secondly, due to the linear nature of the proposed project, emissions would generally only occur for a few days to a week at a given location. Therefore, it is not anticipated that exposure to construction-related DPM or other air toxics would result in an adverse health impacts and health impacts to sensitive receptors would be less than significant.

Greenhouse Gas Emissions

“Global warming” and “global climate change” are the terms used to describe the increase in the average temperature of the earth’s near-surface air and oceans since the mid-20th century and its projected continuation. Warming of the climate system is now considered to be unequivocal, with global surface temperature increasing approximately 1.33 degrees Fahrenheit (°F) over the last 100 years. Continued warming is projected to increase global average temperature between 2 and 11°F over the next 100 years.

Natural processes and human actions have been identified as the causes of this warming. The International Panel on Climate Change (IPCC) concludes that variations in natural phenomena such as solar radiation and volcanoes produced most of the warming from pre-industrial times to 1950 and had a small cooling effect afterward. After 1950, however, increasing GHG concentrations resulting from human activity such as fossil fuel burning and deforestation have been responsible for most of the observed temperature increase. These basic conclusions have been endorsed by more than 45 scientific societies and academies of science, including all of the national academies of science of the major industrialized countries. Since 2007, no scientific body of national or international standing has maintained a dissenting opinion.

Increases in GHG concentrations in the earth’s atmosphere are thought to be the main cause of human-induced climate change. GHG naturally trap heat by impeding the exit of solar radiation that has hit the earth and is reflected back into space. Some GHG occur naturally and are necessary for keeping the earth’s surface inhabitable. However, increases in the concentrations of these gases in the atmosphere during the last 100 years have decreased the amount of solar radiation that is reflected back into space, intensifying the natural greenhouse effect and resulting in the increase of global average temperature.

Gases that trap heat in the atmosphere are referred to as GHG because they capture heat radiated from the sun as it is reflected back into the atmosphere, much like a greenhouse does. The accumulation of GHG has been implicated as the driving force for global climate change.

The primary GHG are carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O), ozone, and water vapor.

While the presence of the primary GHG in the atmosphere are naturally occurring, CO₂, CH₄, and N₂O are also emitted from human activities, accelerating the rate at which these compounds occur within earth's atmosphere. Emissions of CO₂ are largely by-products of fossil fuel combustion, whereas methane results from off-gassing associated with agricultural practices and landfills. Other GHG include hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, and are generated in certain industrial processes. Greenhouse gases are typically reported in "carbon dioxide-equivalent" measures (CO₂e).¹⁵

There is international scientific consensus that human-caused increases in GHG have and will continue to contribute to global warming. Potential global warming impacts in California may include, but are not limited to, loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years. Secondary effects are likely to include a global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity.¹⁶

The GHG significance threshold is described in the San Diego County *2016 Climate Change Analysis Guidance*¹⁷ as a means for determining GHG emissions significance under CEQA. The San Diego County has recommended a GHG significance threshold of 900 metric tons of CO₂e per year as a conservative screening criterion for determining which projects require further analysis and identification of project design features or potential mitigation measures with regard to GHG emissions. The proposed project would have a cumulatively considerable contribution to climate change impacts if it would result in a net increase of construction and operational GHG emissions, either directly or indirectly, at a level exceeding 900 metric tons of CO₂e per year.

The SCAQMD adopted a screening threshold of 10,000 metric tons of CO₂e per year. SCAQMD concluded that projects with emissions less than the screening threshold would not result in a significant cumulative impact. Given that the San Diego County GHG significance threshold is more stringent than the SCAQMD threshold, the proposed project GHG emissions were compared to the San Diego County GHG significance threshold.

Estimated construction GHG emissions from the proposed project are presented in **Table 4**. Estimated construction GHG emissions from construction equipment and helicopter activities are 1,866 metric tons of CO₂e per year. It is a customary methodology that total construction emissions be amortized over a 30-year period or the project's expected lifetime if it is less than

¹⁵ Because of the differential heat absorption potential of various GHG, GHG emissions are frequently measured in "carbon dioxide-equivalents," which present a weighted average based on each gas's heat absorption (or "global warming") potential.

¹⁶ California Environmental Protection Agency, *2006 Final Climate Action Team Report to the Governor and Legislature*. March 2006. http://www.climatechange.ca.gov/climate_action_team/reports/2006report/2006-04-03_FINAL_CAT_REPORT.PDF.

¹⁷ San Diego County, *2016 Climate Change Analysis Guidance*, July 29, 2016, <http://www.sandiegocounty.gov/content/dam/sdc/pds/ProjectPlanning/docs/ClimateChangeAnalysisGuidance.pdf>

30 years. As indicated, 30-year amortized annual construction-related GHG emissions would be approximately 62 metric tons of CO₂e per year. Therefore, the proposed project GHG emissions are below the San Diego County GHG significance threshold of 900 metric tons of CO₂e per year and thus, a less than significant climate change impact.

Table 4: Estimated Greenhouse Gas Emissions

Source	Annual CO ₂ e Metric Tons
Construction Equipment and Vehicles	1,239
Helicopter Activities	627
Total Proposed Project (Construction)	1,866
Total Proposed Project (30-Year Amortized Construction)	62.2
San Diego County <i>Significance Threshold</i>	900
Potentially Significant (Yes or No)?	No

SOURCES: CalEEMod Version 2016.3.1, Guidance on Determination of Helicopter Emissions, Edition 1, March 2009, and Federal Aviation Administration, Aviation Environmental Design Tool.

Operation and maintenance of the proposed project will have less-than-significant GHG-related impacts. SDG&E will continue to employ standard Best Management Practices—such as minimizing vehicle trips and keeping vehicles and equipment well maintained—during operations.

Attachment A

Construction Emission Calculations

- Summary of Emissions
- Helicopter Fugitive Emissions
- Helicopter Combustion Emissions
- CALEEMOD Output files (Annual, Summer, Winter)

SDG&E Tie Line 695/6971 Reconductor Project - Air Emissions Inventory

Annual Estimated Emissions from the Proposed Project within the SDAPCD and SCAPCD

Emission Source	Emissions (tons/year)					
	VOC	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Proposed Project Emissions within the SDAPCD						
Construction Emissions (tons/year)	0.60	6.96	3.36	0.01	0.38	0.26
Construction Emissions (lbs/day)	5.12	59.5	28.7	0.11	3.28	2.24
Helicopter Emissions (tons/year)	1.13	1.27	2.11	0.24	2.98	0.36
Helicopter Emissions (lbs/day)	9.69	10.9	18.1	2.08	25.4	3.09
Total Emissions (lbs/day)	14.8	70.4	46.8	2.19	28.7	5.33
Significance Thresholds (lbs/day)	75	250	550	250	100	55
Exceeds Air Quality Significance Threshold Standards?	No	No	No	No	No	No
Proposed Project Emissions within the SCAQMD						
Construction Emissions (tons/year)	0.03	0.37	0.18	0.00	0.02	0.01
Construction Emissions (lbs/day)	0.27	3.13	1.51	0.01	0.17	0.12
Helicopter Emissions (tons/year)	0.06	0.06	0.11	0.01	0.16	0.02
Helicopter Emissions (lbs/day)	0.51	0.55	0.95	0.11	1.34	0.16
Total Emissions (lbs/day)	0.78	3.68	2.46	0.12	1.51	0.28
Significance Thresholds (lbs/day)	75	100	550	150	100	55
Exceeds Air Quality Significance Threshold Standards?	No	No	No	No	No	No

estimated that 95% of the construction effort would occur within SDAPCD, and 5% would occur within SCAQMD. The emissions were apportioned appropriately between the two air districts for evaluation of impact significance.

2. Per SDG&E's administrative safety controls, only one type of helicopter would be used for construction at a time during any given day.

However, it is reasonable that both types of helicopters might be used on-site. The light duty helicopter might ferry crews to remote locations, followed by the heavy duty helicopter installing/removing poles. Therefore, to provide maximum flexibility in the construction approach, a

Summer Peak Estimated Emissions from the Proposed Project within the SDAPCD and SCAPCD

Emission Source	Emissions (lbs/day)					
	VOC	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Proposed Project Emissions within the SDAPCD						
Construction Emissions (lbs/day)	10.7	123	57.9	0.22	7.08	4.71
Helicopter Emissions (lbs/day)	15.1	17.0	28.2	3.25	38.7	4.71
Total Emissions (lbs/day)	25.9	140	86.1	0.22	45.8	9.43
Significance Thresholds (lbs/day)	75	250	550	250	100	55
Exceeds Air Quality Significance Threshold Standards?	No	No	No	No	No	No
Proposed Project Emissions within the SCAQMD						
Construction Emissions (lbs/day)	0.57	6.49	3.05	0.01	0.37	0.25
Helicopter Emissions (lbs/day)	0.80	0.89	1.48	0.17	2.04	0.25
Total Emissions (lbs/day)	1.36	7.38	4.53	0.01	2.41	0.50
Significance Thresholds (lbs/day)	75	100	550	150	100	55
Exceeds Air Quality Significance Threshold Standards?	No	No	No	No	No	No

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Winter Peak Estimated Emissions from the Proposed Project within the SDAPCD and SCAPCD

Emission Source	Emissions (lbs/day)					
	VOC	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Proposed Project Emissions within the SDAPCD						
Construction Emissions (lbs/day)	10.8	124	57.8	0.22	7.08	4.71
Helicopter Emissions (lbs/day)	15.1	17.0	28.2	3.25	38.7	4.71
Total Emissions (lbs/day)	25.9	141	86.0	3.47	45.8	9.43
Significance Thresholds (lbs/day)	75	250	550	250	100	55
Exceeds Air Quality Significance Threshold Standards?	No	No	No	No	No	No
Proposed Project Emissions within the SCAQMD						
Construction Emissions (lbs/day)	0.57	6.52	3.04	0.01	0.37	0.25
Helicopter Emissions (lbs/day)	0.80	0.89	1.48	0.17	2.04	0.25
Total Emissions (lbs/day)	1.36	7.41	4.53	0.18	2.41	0.50
Significance Thresholds (lbs/day)	75	100	550	150	100	55
Exceeds Air Quality Significance Threshold Standards?	No	No	No	No	No	No

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However, it is reasonable that both types of helicopters might be used on-site. The light duty helicopter might ferry crews to remote locations, followed by the heavy duty helicopter installing/removing poles. Therefore, to provide maximum flexibility in the construction approach, a

Helicopter Fugitive Emissions

Total Project Emissions w/o APM

Activity	Qty.	Equip.	Mode	Days/ Week	LTO/ Day	Duration (weeks)	PM10 (tons)	Average	Maximum	PM2.5 (tons)	Average	Maximum
								PM10 (lbs/day)	PM10 (lbs/day)		PM2.5 (lbs/day)	PM2.5 (lbs/day)
Pole Installation	1	light duty - Hughes 500	LTO	7	6	22	1.53	13.1	19.9	0.15	1.31	1.99
Pole Installation	1	heavy duty - Bell 214B	LTO	7	6	22	1.53	13.1	19.9	0.15	1.31	1.99
Total							3.06	26.1	39.7	0.31	2.61	3.97

Total Project Emissions w/ APM AIR-1 and AIR-2

Activity	Qty.	Equip.	Mode	Days/ Week	LTO/ Day	Duration (weeks)	PM10 (tons)	Average	Maximum	PM2.5 (tons)	Average	Maximum
								PM10 (lbs/day)	PM10 (lbs/day)		PM2.5 (lbs/day)	PM2.5 (lbs/day)
Pole Installation	1	light duty - Hughes 500	LTO	7	6	22	0.69	5.88	8.94	0.07	0.59	0.89
Pole Installation	1	heavy duty - Bell 214B	LTO	7	6	22	0.69	5.88	8.94	0.07	0.59	0.89
Total							1.38	11.8	17.9	0.14	1.18	1.79

Notes:

Emission Factor Source: Dr. J. A. Gillies et. al. December 31, 2007. *Particulate Matter Emissions for Dust from Unique Military Activities* .

Measurements indicated approximately 0.5 kg of PM10 during takeoff and 1 kg during landing.

Measurements were conducted in dry, unpaved, desert in Arizona.

The model used in testing was a UH-1H Huey, more similar to the Bell 214B above.

It is assumed the light duty Hughes 500 would produce less fugitive dust emissions.

The 0.5 kg takeoff and 1 kg landing emission factor is conservatively assumed for both helicopters.

The landing and takeoff surface is assumed to be watered, reducing fugitive dust emissions 55%.

PM2.5/PM10 Factor: Western Governors' Association. September 7, 2006. *WRAP Fugitive Dust Handbook*.

The emission factor for PM2.5 for unpaved roads is 0.1 x PM10 emissions.

SDG&E Tie Line 695 Helicopter Emissions

Emissions Factors

Helicopter Model	Engine	Assumed Engine	Operating Mode	Fuel Flow, kg/s	Time in Mode, min	Emission Incides, g/kg fuel						Emission, lbs/mode						Cruise Mode Emission Factor, lbs/hour						
						CO	VOC	NOx	SO2	PM	CO2	CO	VOC	NOx	SO2	PM	CO2	CO	VOC	NOx	SO2	PM	CO2	
Hughes 500E	Allison 250-C20B/R	250B17B	Taxi Out	0.008401	3.5	99.85	23.68	2.05	1.29	0.50	3155	0.39	0.09	0.01	0.01	0.00	12.3							
			Takeoff	0.032612	2.17	8.66	0.41	6.16	1.29	0.37	3155	0.08	0.00	0.06	0.01	0.00	29.5							
			Climbout	0.030261	4.33	8.66	0.41	5.56	1.29	0.37	3155	0.15	0.01	0.10	0.02	0.01	54.7	0.23	0.01	0.15	0.03	0.01	84.1	
			Approach	0.010847	6.5	48.59	6.16	2.05	1.29	1.05	3155	0.45	0.06	0.02	0.01	0.01	29.4							
			Taxi In	0.008401	3.5	99.86	23.68	2.05	1.29	0.50	3155	0.39	0.09	0.01	0.01	0.00	12.3							
			Total per LTO										1.46	0.25	0.19	0.06	0.02	138						

Helicopter Model	Engine	Assumed Engine	Operating Mode	Fuel Flow, kg/s	Time in Mode, min	Emission Incides, g/kg fuel						Emission, lbs/mode						Cruise Mode Emission Factor, lbs/hour					
						CO	VOC	NOx	SO2	PM	CO2	CO	VOC	NOx	PM	PM	PM	CO	VOC	NOx	PM	CO2	
Sikorsky S-76	Allison 250-C20B/R	250B17B	Taxi Out	0.017865	3.5	54.74	67.10	2.59	1.29	1.23	3155	0.91	1.11	0.04	0.02	0.02	52.2						
			Takeoff	0.086900	2.17	3.52	0.52	8.03	1.29	0.32	3155	0.18	0.03	0.40	0.06	0.02	157						
			Climbout	0.072664	4.33	4.04	0.52	7.63	1.29	0.31	3155	0.34	0.04	0.64	0.11	0.03	263	0.52	0.07	0.98	0.17	0.04	404
			Approach	0.062123	6.5	5.40	0.44	7.05	1.29	0.17	3155	0.58	0.05	0.75	0.14	0.02	337						
			Taxi In	0.017865	3.5	54.74	67.10	2.59	1.29	1.23	3155	0.91	1.11	0.04	0.02	0.02	52.2						
			Total per LTO										2.90	2.34	1.87	0.35	0.10	861					

Notes: Fuel flow rates and emission factors are from the Federal Aviation Administration's Emission and Dispersion Modeling System (EDMS). Time in mode is based on default times in EDMS.

Maximum Emissions (lbs/day) - Light-duty Helicopter Usage

Component	Number of LTOs	Hours of Cruising Time	Emissions (lbs/day)							Emissions (tons/year)						
			CO	VOC	NOx	SO2	PM ₁₀	PM _{2.5}	CO2	CO	VOC	NOx	SO2	PM ₁₀	PM _{2.5}	CO2
LTO - Light Helicopter (Hughes 500E)	6		8.77	1.52	1.13	0.34	0.14	0.14	829	0.66	0.11	0.09	0.03	0.01	0.01	62.2
Cruising Time (Installation/Demolition) - Light Helicopter		4	0.92	0.04	0.59	0.14	0.04	0.04	337	0.07	0.00	0.04	0.01	0.00	25.2	
Peak Estimated Helicopter Emissions			9.69	1.56	1.73	0.48	0.18	0.18	1,166	0.73	0.12	0.13	0.04	0.01	0.01	87.4

Notes: Assume a 9 hour work day = 4 hrs of cruising time. Each LTO cycle requires an estimated 20 minutes to complete with 6 LTOs per day (maximum).

Maximum Emissions (lbs/day) - Heavy-duty Helicopter Usage

Component	Number of LTOs	Number of LTOs or hours cruising ¹	Emissions (lbs/day)							Emissions (tons/year)						
			CO	VOC	NOx	SO2	PM ₁₀	PM _{2.5}	CO2	CO	VOC	NOx	SO2	PM ₁₀	PM _{2.5}	CO2
LTO - Heavy Helicopter (Sikorsky S-76)	6		17.4	14.0	11.2	2.12	0.61	0.61	5,169	1.31	1.05	0.84	0.16	0.05	0.05	388
Cruising Time (Installation/Demolition) - Heavy Helicopter		5	2.59	0.33	4.89	0.83	0.20	0.20	2,020	0.19	0.03	0.37	0.06	0.02	152	
Peak Estimated Helicopter Emissions			20.0	14.3	16.1	2.94	0.81	0.81	7,189	1.50	1.08	1.21	0.22	0.06	0.06	539

Notes: Assume a 9 hour work day = 5 hrs of cruising time. Each LTO cycle requires an estimated 20 minutes to complete with 6 LTOs per day (maximum).

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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	0.00	1000sqft	98.33	0.01	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	40
Climate Zone	13			Operational Year	2019
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MW hr)	720.49	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

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Project Characteristics - -

Land Use - Selected General Light Industry as the most appropriate default land use type. Assumed that "Lot acreage" was equivalent to the total area of site disturbance as described in Section 4.3 within the document.

Construction Phase - The construction phasing is per the construction schedule within the PEA.

Off-road Equipment - Off-highway trucks = water truck, spray truck. Crew trucks and pickup trucks are included within the worker VMT calculations.

Off-road Equipment - Off-highway trucks = water trucks (3), tractor trailer units (3), and bucket trucks (3).

Off-road Equipment - Off-highway trucks = water trucks (2), and cement trucks (10). Crew trucks are counted in the worker VMT calculations.

Off-road Equipment - Off-highway trucks = water trucks (2), tractor trailer units (2). Other construction equipment = mowers (2).

Off-road Equipment - Off-highway trucks = water trucks (3), boom trucks (3), bucket trucks (3), wire truck, pulling rig. Crew trucks and pickups are included within the worker VMT calculations.

Off-road Equipment - Off-highway trucks = water truck, bucket trucks (2), and wire dolly.

Trips and VMT - Trips and VMT-worker trips based on the max # of workers/phase. Assumed 10 haul trips/day for trenching, and 2 haul trips/day for staging yard construction. Vendor trips estimated to be 2 trips/day for each water truck/cement truck, 30 miles one-way.

Grading - Grading-site preparation activities would occur at approximately 10.25 acres total. Assumed half that amount for total acres disturbed from demobilization activities. Trenching operations will generate up to approximately 2,900 cubic yards total.

Vehicle Trips - No Operations

Energy Use -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	15
tblConstructionPhase	NumDays	1,550.00	50.00
tblConstructionPhase	NumDays	1,550.00	90.00
tblConstructionPhase	NumDays	1,550.00	60.00
tblConstructionPhase	NumDays	60.00	30.00
tblConstructionPhase	NumDays	60.00	40.00
tblConstructionPhase	NumDays	60.00	10.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00

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tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	5/31/2018	4/3/2018
tblConstructionPhase	PhaseEndDate	9/13/2018	7/17/2018
tblConstructionPhase	PhaseEndDate	11/22/2018	7/30/2018
tblConstructionPhase	PhaseEndDate	3/22/2018	8/31/2018
tblConstructionPhase	PhaseEndDate	4/3/2018	7/28/2018
tblConstructionPhase	PhaseStartDate	4/4/2018	2/5/2018
tblConstructionPhase	PhaseStartDate	6/1/2018	4/4/2018
tblConstructionPhase	PhaseStartDate	9/14/2018	5/22/2018
tblConstructionPhase	PhaseStartDate	2/4/2018	7/17/2018
tblConstructionPhase	PhaseStartDate	3/23/2018	7/18/2018
tblGrading	AcresOfGrading	22.50	10.25
tblGrading	AcresOfGrading	17.50	5.13
tblGrading	MaterialExported	0.00	2,900.00
tblLandUse	BuildingSpaceSquareFeet	0.00	0.01
tblLandUse	LandUseSquareFeet	0.00	0.01
tblLandUse	LotAcreage	0.00	98.33
tblOffRoadEquipment	HorsePower	402.00	231.00
tblOffRoadEquipment	LoadFactor	0.38	0.29
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	3.00
tblOffRoadEquipment	UsageHours	7.00	5.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	6.00

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tblOffRoadEquipment	UsageHours	8.00	7.00
tblProjectCharacteristics	OperationalYear	2018	2019
tblTripsAndVMT	HaulingTripLength	20.00	74.00
tblTripsAndVMT	HaulingTripLength	20.00	74.00
tblTripsAndVMT	HaulingTripLength	20.00	74.00
tblTripsAndVMT	HaulingTripLength	20.00	74.00
tblTripsAndVMT	HaulingTripLength	20.00	74.00
tblTripsAndVMT	HaulingTripLength	20.00	74.00
tblTripsAndVMT	HaulingTripNumber	0.00	363.00
tblTripsAndVMT	VendorTripLength	7.30	69.00
tblTripsAndVMT	VendorTripLength	7.30	69.00
tblTripsAndVMT	VendorTripLength	7.30	69.00
tblTripsAndVMT	VendorTripLength	7.30	69.00
tblTripsAndVMT	VendorTripLength	7.30	69.00
tblTripsAndVMT	VendorTripLength	7.30	69.00
tblTripsAndVMT	VendorTripLength	7.30	69.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	24.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	WorkerTripNumber	23.00	14.00
tblTripsAndVMT	WorkerTripNumber	10.00	14.00
tblTripsAndVMT	WorkerTripNumber	20.00	16.00
tblTripsAndVMT	WorkerTripNumber	0.00	12.00
tblTripsAndVMT	WorkerTripNumber	0.00	60.00
tblTripsAndVMT	WorkerTripNumber	0.00	24.00

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tblVehicleTrips	ST_TR	1.32	0.00
tblVehicleTrips	SU_TR	0.68	0.00
tblVehicleTrips	WD_TR	6.97	0.00

2.0 Emissions Summary

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2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.6308	7.3269	3.5325	0.0134	0.1505	0.2534	0.4040	0.0410	0.2353	0.2763	0.0000	1,239.0623	1,239.0623	0.2747	0.0000	1,245.9285
Maximum	0.6308	7.3269	3.5325	0.0134	0.1505	0.2534	0.4040	0.0410	0.2353	0.2763	0.0000	1,239.0623	1,239.0623	0.2747	0.0000	1,245.9285

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.6308	7.3269	3.5325	0.0134	0.1459	0.2534	0.3994	0.0405	0.2353	0.2758	0.0000	1,239.0613	1,239.0613	0.2747	0.0000	1,245.9275
Maximum	0.6308	7.3269	3.5325	0.0134	0.1459	0.2534	0.3994	0.0405	0.2353	0.2758	0.0000	1,239.0613	1,239.0613	0.2747	0.0000	1,245.9275

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	3.06	0.00	1.14	1.24	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00

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Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
3	7-1-2018	9-30-2018	0.2820	0.2820
		Highest	0.2820	0.2820

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.0000e-005	3.0000e-005	0.0000	0.0000	3.0000e-005
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	3.0000e-005	3.0000e-005	0.0000	0.0000	3.0000e-005

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2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.0000e-005	3.0000e-005	0.0000	0.0000	3.0000e-005
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	3.0000e-005	3.0000e-005	0.0000	0.0000	3.0000e-005

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

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Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP	Site Preparation	1/1/2018	2/3/2018	6	30	
2	Demobilization/Clean up/Road Refreshing	Site Preparation	7/17/2018	8/31/2018	6	40	
3	Trenching for Installation of Underground Cables	Site Preparation	7/18/2018	7/28/2018	6	10	
4	Pier Foundation and Mircopile Construction	Building Construction	2/5/2018	4/3/2018	6	50	
5	Direct Bury Construction and Pole Installation	Building Construction	4/4/2018	7/17/2018	6	90	
6	Stringing Activities/Transfer Conductor/ Sagging Activities	Building Construction	5/22/2018	7/30/2018	6	60	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP	Dumpers/Tenders	1	3.00	16	0.38
Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP	Graders	2	6.00	187	0.41
Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP	Off-Highway Trucks	4	3.00	402	0.38
Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP	Other Construction Equipment	2	7.00	172	0.42
Demobilization/Clean up/Road Refreshing	Graders	1	7.00	187	0.41
Demobilization/Clean up/Road Refreshing	Off-Highway Trucks	2	6.00	402	0.38
Demobilization/Clean up/Road Refreshing	Tractors/Loaders/Backhoes	1	6.00	97	0.37

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Trenching for Installation of Underground Cables	Bore/Drill Rigs	1	6.00	221	0.50
Trenching for Installation of Underground Cables	Off-Highway Trucks	4	3.00	402	0.38
Trenching for Installation of Underground Cables	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Pier Foundation and Mircopile Construction	Air Compressors	3	5.00	78	0.48
Pier Foundation and Mircopile Construction	Bore/Drill Rigs	3	7.00	221	0.50
Pier Foundation and Mircopile Construction	Cement and Mortar Mixers	1	4.00	9	0.56
Pier Foundation and Mircopile Construction	Dumpers/Tenders	1	4.00	16	0.38
Pier Foundation and Mircopile Construction	Excavators	1	4.00	158	0.38
Pier Foundation and Mircopile Construction	Forklifts	3	4.00	89	0.20
Pier Foundation and Mircopile Construction	Off-Highway Trucks	12	3.00	402	0.38
Direct Bury Construction and Pole Installation	Air Compressors	3	3.00	78	0.48
Direct Bury Construction and Pole Installation	Bore/Drill Rigs	3	7.00	221	0.50
Direct Bury Construction and Pole Installation	Cranes	3	5.00	231	0.29
Direct Bury Construction and Pole Installation	Off-Highway Trucks	9	4.00	402	0.38
Stringing Activities/Transfer Conductor/Sagging Activities	Off-Highway Trucks	11	4.00	231	0.29

Trips and VMT

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Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Staging Yard Setup, Road Refinishing, Vegetation Trimming, Demobilization/Clean up/Road Refreshing	9	14.00	2.00	0.00	10.80	69.00	74.00	LD_Mix	HDT_Mix	HHDT
Trenching for Installation of Interior Pier Foundation and Micropile Construction	4	14.00	2.00	0.00	10.80	69.00	74.00	LD_Mix	HDT_Mix	HHDT
Direct Bury Construction and Pole Stringing	8	16.00	2.00	363.00	10.80	69.00	74.00	LD_Mix	HDT_Mix	HHDT
Activities/Transfer Con	24	12.00	8.00	0.00	10.80	69.00	74.00	LD_Mix	HDT_Mix	HHDT
	18	60.00	24.00	0.00	10.80	69.00	74.00	LD_Mix	HDT_Mix	HHDT
	11	24.00	6.00	0.00	10.80	69.00	74.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.4400e-003	0.0000	5.4400e-003	5.9000e-004	0.0000	5.9000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0441	0.5093	0.2482	6.1000e-004		0.0205	0.0205		0.0189	0.0189	0.0000	55.9310	55.9310	0.0174	0.0000	56.3647
Total	0.0441	0.5093	0.2482	6.1000e-004	5.4400e-003	0.0205	0.0260	5.9000e-004	0.0189	0.0195	0.0000	55.9310	55.9310	0.0174	0.0000	56.3647

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3.2 Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0200e-003	0.0214	5.6000e-003	6.0000e-005	1.8800e-003	2.8000e-004	2.1500e-003	5.4000e-004	2.6000e-004	8.1000e-004	0.0000	6.2577	6.2577	3.3000e-004	0.0000	6.2659
Worker	9.0000e-004	7.1000e-004	6.8200e-003	2.0000e-005	1.6800e-003	1.0000e-005	1.7000e-003	4.5000e-004	1.0000e-005	4.6000e-004	0.0000	1.6207	1.6207	6.0000e-005	0.0000	1.6221
Total	1.9200e-003	0.0221	0.0124	8.0000e-005	3.5600e-003	2.9000e-004	3.8500e-003	9.9000e-004	2.7000e-004	1.2700e-003	0.0000	7.8784	7.8784	3.9000e-004	0.0000	7.8880

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.4500e-003	0.0000	2.4500e-003	2.6000e-004	0.0000	2.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0441	0.5093	0.2482	6.1000e-004		0.0205	0.0205		0.0189	0.0189	0.0000	55.9309	55.9309	0.0174	0.0000	56.3647
Total	0.0441	0.5093	0.2482	6.1000e-004	2.4500e-003	0.0205	0.0230	2.6000e-004	0.0189	0.0192	0.0000	55.9309	55.9309	0.0174	0.0000	56.3647

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3.2 Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0200e-003	0.0214	5.6000e-003	6.0000e-005	1.8800e-003	2.8000e-004	2.1500e-003	5.4000e-004	2.6000e-004	8.1000e-004	0.0000	6.2577	6.2577	3.3000e-004	0.0000	6.2659
Worker	9.0000e-004	7.1000e-004	6.8200e-003	2.0000e-005	1.6800e-003	1.0000e-005	1.7000e-003	4.5000e-004	1.0000e-005	4.6000e-004	0.0000	1.6207	1.6207	6.0000e-005	0.0000	1.6221
Total	1.9200e-003	0.0221	0.0124	8.0000e-005	3.5600e-003	2.9000e-004	3.8500e-003	9.9000e-004	2.7000e-004	1.2700e-003	0.0000	7.8784	7.8784	3.9000e-004	0.0000	7.8880

3.3 Demobilization/Clean up/Road Refreshing - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.7200e-003	0.0000	2.7200e-003	2.9000e-004	0.0000	2.9000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0363	0.4139	0.1946	5.6000e-004		0.0160	0.0160		0.0147	0.0147	0.0000	51.0781	51.0781	0.0159	0.0000	51.4757
Total	0.0363	0.4139	0.1946	5.6000e-004	2.7200e-003	0.0160	0.0187	2.9000e-004	0.0147	0.0150	0.0000	51.0781	51.0781	0.0159	0.0000	51.4757

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3.3 Demobilization/Clean up/Road Refreshing - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.3600e-003	0.0285	7.4600e-003	9.0000e-005	2.5000e-003	3.7000e-004	2.8700e-003	7.2000e-004	3.5000e-004	1.0700e-003	0.0000	8.3436	8.3436	4.4000e-004	0.0000	8.3545
Worker	1.2000e-003	9.5000e-004	9.0900e-003	2.0000e-005	2.2500e-003	2.0000e-005	2.2600e-003	6.0000e-004	2.0000e-005	6.1000e-004	0.0000	2.1610	2.1610	7.0000e-005	0.0000	2.1628
Total	2.5600e-003	0.0295	0.0166	1.1000e-004	4.7500e-003	3.9000e-004	5.1300e-003	1.3200e-003	3.7000e-004	1.6800e-003	0.0000	10.5045	10.5045	5.1000e-004	0.0000	10.5173

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2200e-003	0.0000	1.2200e-003	1.3000e-004	0.0000	1.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0363	0.4139	0.1946	5.6000e-004		0.0160	0.0160		0.0147	0.0147	0.0000	51.0781	51.0781	0.0159	0.0000	51.4756
Total	0.0363	0.4139	0.1946	5.6000e-004	1.2200e-003	0.0160	0.0172	1.3000e-004	0.0147	0.0148	0.0000	51.0781	51.0781	0.0159	0.0000	51.4756

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3.3 Demobilization/Clean up/Road Refreshing - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.3600e-003	0.0285	7.4600e-003	9.0000e-005	2.5000e-003	3.7000e-004	2.8700e-003	7.2000e-004	3.5000e-004	1.0700e-003	0.0000	8.3436	8.3436	4.4000e-004	0.0000	8.3545
Worker	1.2000e-003	9.5000e-004	9.0900e-003	2.0000e-005	2.2500e-003	2.0000e-005	2.2600e-003	6.0000e-004	2.0000e-005	6.1000e-004	0.0000	2.1610	2.1610	7.0000e-005	0.0000	2.1628
Total	2.5600e-003	0.0295	0.0166	1.1000e-004	4.7500e-003	3.9000e-004	5.1300e-003	1.3200e-003	3.7000e-004	1.6800e-003	0.0000	10.5045	10.5045	5.1000e-004	0.0000	10.5173

3.4 Trenching for Installation of Underground Cables - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.0000e-004	0.0000	2.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0104	0.1127	0.0700	1.8000e-004		5.1700e-003	5.1700e-003		4.7600e-003	4.7600e-003	0.0000	15.9834	15.9834	4.9800e-003	0.0000	16.1078
Total	0.0104	0.1127	0.0700	1.8000e-004	2.0000e-004	5.1700e-003	5.3700e-003	3.0000e-005	4.7600e-003	4.7900e-003	0.0000	15.9834	15.9834	4.9800e-003	0.0000	16.1078

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3.4 Trenching for Installation of Underground Cables - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.1400e-003	0.1683	0.0373	4.9000e-004	0.0115	8.0000e-004	0.0123	3.1500e-003	7.6000e-004	3.9200e-003	0.0000	48.0980	48.0980	3.7200e-003	0.0000	48.1910
Vendor	3.4000e-004	7.1300e-003	1.8700e-003	2.0000e-005	6.3000e-004	9.0000e-005	7.2000e-004	1.8000e-004	9.0000e-005	2.7000e-004	0.0000	2.0859	2.0859	1.1000e-004	0.0000	2.0886
Worker	3.4000e-004	2.7000e-004	2.6000e-003	1.0000e-005	6.4000e-004	0.0000	6.5000e-004	1.7000e-004	0.0000	1.7000e-004	0.0000	0.6174	0.6174	2.0000e-005	0.0000	0.6180
Total	5.8200e-003	0.1757	0.0418	5.2000e-004	0.0128	8.9000e-004	0.0137	3.5000e-003	8.5000e-004	4.3600e-003	0.0000	50.8013	50.8013	3.8500e-003	0.0000	50.8976

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.0000e-005	0.0000	9.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0104	0.1127	0.0700	1.8000e-004		5.1700e-003	5.1700e-003		4.7600e-003	4.7600e-003	0.0000	15.9833	15.9833	4.9800e-003	0.0000	16.1077
Total	0.0104	0.1127	0.0700	1.8000e-004	9.0000e-005	5.1700e-003	5.2600e-003	1.0000e-005	4.7600e-003	4.7700e-003	0.0000	15.9833	15.9833	4.9800e-003	0.0000	16.1077

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3.4 Trenching for Installation of Underground Cables - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.1400e-003	0.1683	0.0373	4.9000e-004	0.0115	8.0000e-004	0.0123	3.1500e-003	7.6000e-004	3.9200e-003	0.0000	48.0980	48.0980	3.7200e-003	0.0000	48.1910
Vendor	3.4000e-004	7.1300e-003	1.8700e-003	2.0000e-005	6.3000e-004	9.0000e-005	7.2000e-004	1.8000e-004	9.0000e-005	2.7000e-004	0.0000	2.0859	2.0859	1.1000e-004	0.0000	2.0886
Worker	3.4000e-004	2.7000e-004	2.6000e-003	1.0000e-005	6.4000e-004	0.0000	6.5000e-004	1.7000e-004	0.0000	1.7000e-004	0.0000	0.6174	0.6174	2.0000e-005	0.0000	0.6180
Total	5.8200e-003	0.1757	0.0418	5.2000e-004	0.0128	8.9000e-004	0.0137	3.5000e-003	8.5000e-004	4.3600e-003	0.0000	50.8013	50.8013	3.8500e-003	0.0000	50.8976

3.5 Pier Foundation and Mircopile Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1374	1.4455	0.8192	2.4300e-003		0.0584	0.0584		0.0545	0.0545	0.0000	220.2650	220.2650	0.0649	0.0000	221.8865
Total	0.1374	1.4455	0.8192	2.4300e-003		0.0584	0.0584		0.0545	0.0545	0.0000	220.2650	220.2650	0.0649	0.0000	221.8865

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3.5 Pier Foundation and Mircopile Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.7800e-003	0.1426	0.0373	4.3000e-004	0.0125	1.8500e-003	0.0144	3.6100e-003	1.7700e-003	5.3700e-003	0.0000	41.7178	41.7178	2.1900e-003	0.0000	41.7724
Worker	1.2800e-003	1.0200e-003	9.7400e-003	3.0000e-005	2.4100e-003	2.0000e-005	2.4200e-003	6.4000e-004	2.0000e-005	6.6000e-004	0.0000	2.3153	2.3153	8.0000e-005	0.0000	2.3173
Total	8.0600e-003	0.1436	0.0471	4.6000e-004	0.0149	1.8700e-003	0.0168	4.2500e-003	1.7900e-003	6.0300e-003	0.0000	44.0331	44.0331	2.2700e-003	0.0000	44.0898

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1374	1.4455	0.8192	2.4300e-003		0.0584	0.0584		0.0545	0.0545	0.0000	220.2647	220.2647	0.0649	0.0000	221.8862
Total	0.1374	1.4455	0.8192	2.4300e-003		0.0584	0.0584		0.0545	0.0545	0.0000	220.2647	220.2647	0.0649	0.0000	221.8862

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3.5 Pier Foundation and Mircopile Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.7800e-003	0.1426	0.0373	4.3000e-004	0.0125	1.8500e-003	0.0144	3.6100e-003	1.7700e-003	5.3700e-003	0.0000	41.7178	41.7178	2.1900e-003	0.0000	41.7724
Worker	1.2800e-003	1.0200e-003	9.7400e-003	3.0000e-005	2.4100e-003	2.0000e-005	2.4200e-003	6.4000e-004	2.0000e-005	6.6000e-004	0.0000	2.3153	2.3153	8.0000e-005	0.0000	2.3173
Total	8.0600e-003	0.1436	0.0471	4.6000e-004	0.0149	1.8700e-003	0.0168	4.2500e-003	1.7900e-003	6.0300e-003	0.0000	44.0331	44.0331	2.2700e-003	0.0000	44.0898

3.6 Direct Bury Construction and Pole Installation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2605	2.8924	1.4359	4.4700e-003		0.1106	0.1106		0.1026	0.1026	0.0000	407.1307	407.1307	0.1230	0.0000	410.2061
Total	0.2605	2.8924	1.4359	4.4700e-003		0.1106	0.1106		0.1026	0.1026	0.0000	407.1307	407.1307	0.1230	0.0000	410.2061

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3.6 Direct Bury Construction and Pole Installation - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0366	0.7698	0.2015	2.3200e-003	0.0675	9.9700e-003	0.0775	0.0195	9.5400e-003	0.0290	0.0000	225.2761	225.2761	0.0118	0.0000	225.5712
Worker	0.0115	9.1400e-003	0.0876	2.3000e-004	0.0217	1.6000e-004	0.0218	5.7500e-003	1.5000e-004	5.9000e-003	0.0000	20.8379	20.8379	7.2000e-004	0.0000	20.8559
Total	0.0482	0.7789	0.2891	2.5500e-003	0.0892	0.0101	0.0993	0.0252	9.6900e-003	0.0349	0.0000	246.1140	246.1140	0.0125	0.0000	246.4271

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2605	2.8924	1.4359	4.4700e-003		0.1106	0.1106		0.1026	0.1026	0.0000	407.1302	407.1302	0.1230	0.0000	410.2056
Total	0.2605	2.8924	1.4359	4.4700e-003		0.1106	0.1106		0.1026	0.1026	0.0000	407.1302	407.1302	0.1230	0.0000	410.2056

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3.6 Direct Bury Construction and Pole Installation - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0366	0.7698	0.2015	2.3200e-003	0.0675	9.9700e-003	0.0775	0.0195	9.5400e-003	0.0290	0.0000	225.2761	225.2761	0.0118	0.0000	225.5712
Worker	0.0115	9.1400e-003	0.0876	2.3000e-004	0.0217	1.6000e-004	0.0218	5.7500e-003	1.5000e-004	5.9000e-003	0.0000	20.8379	20.8379	7.2000e-004	0.0000	20.8559
Total	0.0482	0.7789	0.2891	2.5500e-003	0.0892	0.0101	0.0993	0.0252	9.6900e-003	0.0349	0.0000	246.1140	246.1140	0.0125	0.0000	246.4271

3.7 Stringing Activities/Transfer Conductor/ Sagging Activities - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0664	0.6727	0.3009	9.4000e-004		0.0275	0.0275		0.0253	0.0253	0.0000	86.2401	86.2401	0.0269	0.0000	86.9113
Total	0.0664	0.6727	0.3009	9.4000e-004		0.0275	0.0275		0.0253	0.0253	0.0000	86.2401	86.2401	0.0269	0.0000	86.9113

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3.7 Stringing Activities/Transfer Conductor/ Sagging Activities - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.1100e-003	0.1283	0.0336	3.9000e-004	0.0113	1.6600e-003	0.0129	3.2400e-003	1.5900e-003	4.8300e-003	0.0000	37.5460	37.5460	1.9700e-003	0.0000	37.5952
Worker	3.0800e-003	2.4400e-003	0.0234	6.0000e-005	5.7700e-003	4.0000e-005	5.8200e-003	1.5300e-003	4.0000e-005	1.5700e-003	0.0000	5.5568	5.5568	1.9000e-004	0.0000	5.5616
Total	9.1900e-003	0.1307	0.0570	4.5000e-004	0.0170	1.7000e-003	0.0187	4.7700e-003	1.6300e-003	6.4000e-003	0.0000	43.1028	43.1028	2.1600e-003	0.0000	43.1568

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0664	0.6727	0.3009	9.4000e-004		0.0275	0.0275		0.0253	0.0253	0.0000	86.2400	86.2400	0.0269	0.0000	86.9111
Total	0.0664	0.6727	0.3009	9.4000e-004		0.0275	0.0275		0.0253	0.0253	0.0000	86.2400	86.2400	0.0269	0.0000	86.9111

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3.7 Stringing Activities/Transfer Conductor/ Sagging Activities - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.1100e-003	0.1283	0.0336	3.9000e-004	0.0113	1.6600e-003	0.0129	3.2400e-003	1.5900e-003	4.8300e-003	0.0000	37.5460	37.5460	1.9700e-003	0.0000	37.5952
Worker	3.0800e-003	2.4400e-003	0.0234	6.0000e-005	5.7700e-003	4.0000e-005	5.8200e-003	1.5300e-003	4.0000e-005	1.5700e-003	0.0000	5.5568	5.5568	1.9000e-004	0.0000	5.5616
Total	9.1900e-003	0.1307	0.0570	4.5000e-004	0.0170	1.7000e-003	0.0187	4.7700e-003	1.6300e-003	6.4000e-003	0.0000	43.1028	43.1028	2.1600e-003	0.0000	43.1568

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.581689	0.044135	0.186694	0.113515	0.018244	0.005600	0.015197	0.022573	0.001888	0.002088	0.006279	0.000742	0.001357

5.0 Energy Detail

Historical Energy Use: N

SDG&E Tie Line 695/6971 Reconstructor Project - San Diego Air Basin, Annual

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	3.0000e-005	3.0000e-005	0.0000	0.0000	3.0000e-005
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	3.0000e-005	3.0000e-005	0.0000	0.0000	3.0000e-005
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0000	1.0000e-005
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0000	1.0000e-005

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	0.1159	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0000	1.0000e-005
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0000	1.0000e-005

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5.2 Energy by Land Use - Natural Gas

Mitigated

	Natural Gas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	0.1159	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0000	1.0000e-005
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-005	1.0000e-005	0.0000	0.0000	1.0000e-005

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	0.0845	3.0000e-005	0.0000	0.0000	3.0000e-005
Total		3.0000e-005	0.0000	0.0000	3.0000e-005

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Annual

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	0.0845	3.0000e-005	0.0000	0.0000	3.0000e-005
Total		3.0000e-005	0.0000	0.0000	3.0000e-005

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

7.0 Water Detail

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Annual

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Annual

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

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8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
----------------	--------	-----------	-----------	-------------	-------------	-----------

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Annual

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
----------------	--------	-----------	------------	-------------	-------------	-----------

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
----------------	--------	----------------	-----------------	---------------	-----------

User Defined Equipment

Equipment Type	Number
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11.0 Vegetation

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Summer

SDG&E Tie Line 695/6971 Reconductor Project
San Diego Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	0.00	1000sqft	98.33	0.01	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	40
Climate Zone	13			Operational Year	2019
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Summer

Project Characteristics - -

Land Use - Selected General Light Industry as the most appropriate default land use type. Assumed that "Lot acreage" was equivalent to the total area of site disturbance as described in Section 4.3 within the document.

Construction Phase - The construction phasing is per the construction schedule within the PEA.

Off-road Equipment - Off-highway trucks = water truck, spray truck. Crew trucks and pickup trucks are included within the worker VMT calculations.

Off-road Equipment - Off-highway trucks = water trucks (3), tractor trailer units (3), and bucket trucks (3).

Off-road Equipment - Off-highway trucks = water trucks (2), and cement trucks (10). Crew trucks are counted in the worker VMT calculations.

Off-road Equipment - Off-highway trucks = water trucks (2), tractor trailer units (2). Other construction equipment = mowers (2).

Off-road Equipment - Off-highway trucks = water trucks (3), boom trucks (3), bucket trucks (3), wire truck, pulling rig. Crew trucks and pickups are included within the worker VMT calculations.

Off-road Equipment - Off-highway trucks = water truck, bucket trucks (2), and wire dolly.

Trips and VMT - Trips and VMT-worker trips based on the max # of workers/phase. Assumed 10 haul trips/day for trenching, and 2 haul trips/day for staging yard construction. Vendor trips estimated to be 2 trips/day for each water truck/cement truck, 30 miles one-way.

Grading - Grading-site preparation activities would occur at approximately 10.25 acres total. Assumed half that amount for total acres disturbed from demobilization activities. Trenching operations will generate up to approximately 2,900 cubic yards total.

Vehicle Trips - No Operations

Energy Use -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	15
tblConstructionPhase	NumDays	1,550.00	50.00
tblConstructionPhase	NumDays	1,550.00	90.00
tblConstructionPhase	NumDays	1,550.00	60.00
tblConstructionPhase	NumDays	60.00	30.00
tblConstructionPhase	NumDays	60.00	40.00
tblConstructionPhase	NumDays	60.00	10.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Summer

tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	5/31/2018	4/3/2018
tblConstructionPhase	PhaseEndDate	9/13/2018	7/17/2018
tblConstructionPhase	PhaseEndDate	11/22/2018	7/30/2018
tblConstructionPhase	PhaseEndDate	3/22/2018	8/31/2018
tblConstructionPhase	PhaseEndDate	4/3/2018	7/28/2018
tblConstructionPhase	PhaseStartDate	4/4/2018	2/5/2018
tblConstructionPhase	PhaseStartDate	6/1/2018	4/4/2018
tblConstructionPhase	PhaseStartDate	9/14/2018	5/22/2018
tblConstructionPhase	PhaseStartDate	2/4/2018	7/17/2018
tblConstructionPhase	PhaseStartDate	3/23/2018	7/18/2018
tblGrading	AcresOfGrading	22.50	10.25
tblGrading	AcresOfGrading	17.50	5.13
tblGrading	MaterialExported	0.00	2,900.00
tblLandUse	BuildingSpaceSquareFeet	0.00	0.01
tblLandUse	LandUseSquareFeet	0.00	0.01
tblLandUse	LotAcreage	0.00	98.33
tblOffRoadEquipment	HorsePower	402.00	231.00
tblOffRoadEquipment	LoadFactor	0.38	0.29
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	3.00
tblOffRoadEquipment	UsageHours	7.00	5.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	6.00

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Summer

tblOffRoadEquipment	UsageHours	8.00	7.00
tblProjectCharacteristics	OperationalYear	2018	2019
tblTripsAndVMT	HaulingTripLength	20.00	74.00
tblTripsAndVMT	HaulingTripLength	20.00	74.00
tblTripsAndVMT	HaulingTripLength	20.00	74.00
tblTripsAndVMT	HaulingTripLength	20.00	74.00
tblTripsAndVMT	HaulingTripLength	20.00	74.00
tblTripsAndVMT	HaulingTripLength	20.00	74.00
tblTripsAndVMT	HaulingTripNumber	0.00	363.00
tblTripsAndVMT	VendorTripLength	7.30	69.00
tblTripsAndVMT	VendorTripLength	7.30	69.00
tblTripsAndVMT	VendorTripLength	7.30	69.00
tblTripsAndVMT	VendorTripLength	7.30	69.00
tblTripsAndVMT	VendorTripLength	7.30	69.00
tblTripsAndVMT	VendorTripLength	7.30	69.00
tblTripsAndVMT	VendorTripLength	7.30	69.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	24.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	WorkerTripNumber	23.00	14.00
tblTripsAndVMT	WorkerTripNumber	10.00	14.00
tblTripsAndVMT	WorkerTripNumber	20.00	16.00
tblTripsAndVMT	WorkerTripNumber	0.00	12.00
tblTripsAndVMT	WorkerTripNumber	0.00	60.00
tblTripsAndVMT	WorkerTripNumber	0.00	24.00

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tblVehicleTrips	ST_TR	1.32	0.00
tblVehicleTrips	SU_TR	0.68	0.00
tblVehicleTrips	WD_TR	6.97	0.00

2.0 Emissions Summary

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Summer

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	11.3154	129.7562	60.9700	0.2367	3.6029	4.4752	7.4567	0.9643	4.1461	4.9610	0.0000	24,204.0802	24,204.0802	5.2904	0.0000	24,336.3388
Maximum	11.3154	129.7562	60.9700	0.2367	3.6029	4.4752	7.4567	0.9643	4.1461	4.9610	0.0000	24,204.0802	24,204.0802	5.2904	0.0000	24,336.3388

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	11.3154	129.7562	60.9700	0.2367	3.5057	4.4752	7.3819	0.9528	4.1461	4.9529	0.0000	24,204.0802	24,204.0802	5.2904	0.0000	24,336.3388
Maximum	11.3154	129.7562	60.9700	0.2367	3.5057	4.4752	7.3819	0.9528	4.1461	4.9529	0.0000	24,204.0802	24,204.0802	5.2904	0.0000	24,336.3388

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	2.70	0.00	1.00	1.19	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00

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2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP	Site Preparation	1/1/2018	2/3/2018	6	30	
2	Demobilization/Clean up/Road Refreshing	Site Preparation	7/17/2018	8/31/2018	6	40	
3	Trenching for Installation of Underground Cables	Site Preparation	7/18/2018	7/28/2018	6	10	
4	Pier Foundation and Mircopile Construction	Building Construction	2/5/2018	4/3/2018	6	50	
5	Direct Bury Construction and Pole Installation	Building Construction	4/4/2018	7/17/2018	6	90	
6	Stringing Activities/Transfer Conductor/ Sagging Activities	Building Construction	5/22/2018	7/30/2018	6	60	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP	Dumpers/Tenders	1	3.00	16	0.38
Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP	Graders	2	6.00	187	0.41

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Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP	Off-Highway Trucks	4	3.00	402	0.38
Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP	Other Construction Equipment	2	7.00	172	0.42
Demobilization/Clean up/Road Refreshing	Graders	1	7.00	187	0.41
Demobilization/Clean up/Road Refreshing	Off-Highway Trucks	2	6.00	402	0.38
Demobilization/Clean up/Road Refreshing	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Trenching for Installation of Underground Cables	Bore/Drill Rigs	1	6.00	221	0.50
Trenching for Installation of Underground Cables	Off-Highway Trucks	4	3.00	402	0.38
Trenching for Installation of Underground Cables	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Pier Foundation and Mircopile Construction	Air Compressors	3	5.00	78	0.48
Pier Foundation and Mircopile Construction	Bore/Drill Rigs	3	7.00	221	0.50
Pier Foundation and Mircopile Construction	Cement and Mortar Mixers	1	4.00	9	0.56
Pier Foundation and Mircopile Construction	Dumpers/Tenders	1	4.00	16	0.38
Pier Foundation and Mircopile Construction	Excavators	1	4.00	158	0.38
Pier Foundation and Mircopile Construction	Forklifts	3	4.00	89	0.20
Pier Foundation and Mircopile Construction	Off-Highway Trucks	12	3.00	402	0.38
Direct Bury Construction and Pole Installation	Air Compressors	3	3.00	78	0.48
Direct Bury Construction and Pole Installation	Bore/Drill Rigs	3	7.00	221	0.50
Direct Bury Construction and Pole Installation	Cranes	3	5.00	231	0.29
Direct Bury Construction and Pole Installation	Off-Highway Trucks	9	4.00	402	0.38
Stringing Activities/Transfer Conductor/Sagging Activities	Off-Highway Trucks	11	4.00	231	0.29

Trips and VMT

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Summer

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Staging Yard Setup, Road Refinishing, Vegetation	9	14.00	2.00	0.00	10.80	69.00	74.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Clean up/Road Refreshing	4	14.00	2.00	0.00	10.80	69.00	74.00	LD_Mix	HDT_Mix	HHDT
Trenching for Installation of Interior Pier Foundation and Micropile Construction	8	16.00	2.00	363.00	10.80	69.00	74.00	LD_Mix	HDT_Mix	HHDT
Direct Bury Construction and Pole Stringing	24	12.00	8.00	0.00	10.80	69.00	74.00	LD_Mix	HDT_Mix	HHDT
Activities/Transfer Con	18	60.00	24.00	0.00	10.80	69.00	74.00	LD_Mix	HDT_Mix	HHDT
	11	24.00	6.00	0.00	10.80	69.00	74.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.3623	0.0000	0.3623	0.0391	0.0000	0.0391			0.0000			0.0000
Off-Road	2.9402	33.9558	16.5450	0.0409		1.3680	1.3680		1.2591	1.2591		4,110.2258	4,110.2258	1.2749		4,142.0985
Total	2.9402	33.9558	16.5450	0.0409	0.3623	1.3680	1.7303	0.0391	1.2591	1.2982		4,110.2258	4,110.2258	1.2749		4,142.0985

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Summer

3.2 Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0676	1.3788	0.3718	4.3100e-003	0.1275	0.0185	0.1460	0.0367	0.0177	0.0543		460.4892	460.4892	0.0240		461.0891
Worker	0.0596	0.0429	0.4793	1.2600e-003	0.1150	8.3000e-004	0.1158	0.0305	7.6000e-004	0.0313		125.6114	125.6114	4.3000e-003		125.7189
Total	0.1272	1.4217	0.8510	5.5700e-003	0.2425	0.0193	0.2618	0.0672	0.0184	0.0856		586.1006	586.1006	0.0283		586.8080

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1631	0.0000	0.1631	0.0176	0.0000	0.0176			0.0000			0.0000
Off-Road	2.9402	33.9558	16.5450	0.0409		1.3680	1.3680		1.2591	1.2591	0.0000	4,110.2258	4,110.2258	1.2749		4,142.0985
Total	2.9402	33.9558	16.5450	0.0409	0.1631	1.3680	1.5310	0.0176	1.2591	1.2767	0.0000	4,110.2258	4,110.2258	1.2749		4,142.0985

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Summer

3.2 Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0676	1.3788	0.3718	4.3100e-003	0.1275	0.0185	0.1460	0.0367	0.0177	0.0543		460.4892	460.4892	0.0240		461.0891
Worker	0.0596	0.0429	0.4793	1.2600e-003	0.1150	8.3000e-004	0.1158	0.0305	7.6000e-004	0.0313		125.6114	125.6114	4.3000e-003		125.7189
Total	0.1272	1.4217	0.8510	5.5700e-003	0.2425	0.0193	0.2618	0.0672	0.0184	0.0856		586.1006	586.1006	0.0283		586.8080

3.3 Demobilization/Clean up/Road Refreshing - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1360	0.0000	0.1360	0.0147	0.0000	0.0147			0.0000			0.0000
Off-Road	1.8143	20.6964	9.7304	0.0280		0.7983	0.7983		0.7344	0.7344		2,815.1995	2,815.1995	0.8764		2,837.1098
Total	1.8143	20.6964	9.7304	0.0280	0.1360	0.7983	0.9343	0.0147	0.7344	0.7491		2,815.1995	2,815.1995	0.8764		2,837.1098

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Summer

3.3 Demobilization/Clean up/Road Refreshing - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0676	1.3788	0.3718	4.3100e-003	0.1275	0.0185	0.1460	0.0367	0.0177	0.0543		460.4892	460.4892	0.0240		461.0891
Worker	0.0596	0.0429	0.4793	1.2600e-003	0.1150	8.3000e-004	0.1158	0.0305	7.6000e-004	0.0313		125.6114	125.6114	4.3000e-003		125.7189
Total	0.1272	1.4217	0.8510	5.5700e-003	0.2425	0.0193	0.2618	0.0672	0.0184	0.0856		586.1006	586.1006	0.0283		586.8080

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0612	0.0000	0.0612	6.6100e-003	0.0000	6.6100e-003			0.0000			0.0000
Off-Road	1.8143	20.6964	9.7304	0.0280		0.7983	0.7983		0.7344	0.7344	0.0000	2,815.1995	2,815.1995	0.8764		2,837.1098
Total	1.8143	20.6964	9.7304	0.0280	0.0612	0.7983	0.8595	6.6100e-003	0.7344	0.7410	0.0000	2,815.1995	2,815.1995	0.8764		2,837.1098

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Summer

3.3 Demobilization/Clean up/Road Refreshing - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0676	1.3788	0.3718	4.3100e-003	0.1275	0.0185	0.1460	0.0367	0.0177	0.0543		460.4892	460.4892	0.0240		461.0891
Worker	0.0596	0.0429	0.4793	1.2600e-003	0.1150	8.3000e-004	0.1158	0.0305	7.6000e-004	0.0313		125.6114	125.6114	4.3000e-003		125.7189
Total	0.1272	1.4217	0.8510	5.5700e-003	0.2425	0.0193	0.2618	0.0672	0.0184	0.0856		586.1006	586.1006	0.0283		586.8080

3.4 Trenching for Installation of Underground Cables - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0408	0.0000	0.0408	6.1700e-003	0.0000	6.1700e-003			0.0000			0.0000
Off-Road	2.0844	22.5376	14.0051	0.0350		1.0338	1.0338		0.9511	0.9511		3,523.7261	3,523.7261	1.0970		3,551.1507
Total	2.0844	22.5376	14.0051	0.0350	0.0408	1.0338	1.0745	6.1700e-003	0.9511	0.9572		3,523.7261	3,523.7261	1.0970		3,551.1507

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Summer

3.4 Trenching for Installation of Underground Cables - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.0238	32.6062	7.4105	0.0977	2.3449	0.1595	2.5044	0.6425	0.1526	0.7950		10,625.9208	10,625.9208	0.8160		10,646.3195
Vendor	0.0676	1.3788	0.3718	4.3100e-003	0.1275	0.0185	0.1460	0.0367	0.0177	0.0543		460.4892	460.4892	0.0240		461.0891
Worker	0.0681	0.0491	0.5477	1.4400e-003	0.1314	9.5000e-004	0.1324	0.0349	8.7000e-004	0.0357		143.5559	143.5559	4.9100e-003		143.6787
Total	1.1595	34.0341	8.3300	0.1034	2.6039	0.1789	2.7827	0.7140	0.1711	0.8851		11,229.9659	11,229.9659	0.8449		11,251.0873

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0183	0.0000	0.0183	2.7800e-003	0.0000	2.7800e-003			0.0000			0.0000
Off-Road	2.0844	22.5376	14.0051	0.0350		1.0338	1.0338		0.9511	0.9511	0.0000	3,523.7261	3,523.7261	1.0970		3,551.1507
Total	2.0844	22.5376	14.0051	0.0350	0.0183	1.0338	1.0521	2.7800e-003	0.9511	0.9538	0.0000	3,523.7261	3,523.7261	1.0970		3,551.1507

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3.4 Trenching for Installation of Underground Cables - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.0238	32.6062	7.4105	0.0977	2.3449	0.1595	2.5044	0.6425	0.1526	0.7950		10,625.9208	10,625.9208	0.8160		10,646.3195
Vendor	0.0676	1.3788	0.3718	4.3100e-003	0.1275	0.0185	0.1460	0.0367	0.0177	0.0543		460.4892	460.4892	0.0240		461.0891
Worker	0.0681	0.0491	0.5477	1.4400e-003	0.1314	9.5000e-004	0.1324	0.0349	8.7000e-004	0.0357		143.5559	143.5559	4.9100e-003		143.6787
Total	1.1595	34.0341	8.3300	0.1034	2.6039	0.1789	2.7827	0.7140	0.1711	0.8851		11,229.9659	11,229.9659	0.8449		11,251.0873

3.5 Pier Foundation and Mircopile Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	5.4951	57.8187	32.7679	0.0972		2.3349	2.3349		2.1795	2.1795		9,712.0237	9,712.0237	2.8598		9,783.5197
Total	5.4951	57.8187	32.7679	0.0972		2.3349	2.3349		2.1795	2.1795		9,712.0237	9,712.0237	2.8598		9,783.5197

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3.5 Pier Foundation and Mircopile Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2704	5.5152	1.4871	0.0172	0.5101	0.0738	0.5839	0.1467	0.0706	0.2173		1,841.9568	1,841.9568	0.0960		1,844.3564
Worker	0.0511	0.0368	0.4108	1.0800e-003	0.0986	7.1000e-004	0.0993	0.0262	6.5000e-004	0.0268		107.6670	107.6670	3.6800e-003		107.7591
Total	0.3214	5.5520	1.8978	0.0183	0.6087	0.0745	0.6832	0.1728	0.0713	0.2441		1,949.6237	1,949.6237	0.0997		1,952.1155

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	5.4951	57.8187	32.7679	0.0972		2.3349	2.3349		2.1795	2.1795	0.0000	9,712.0237	9,712.0237	2.8598		9,783.5197
Total	5.4951	57.8187	32.7679	0.0972		2.3349	2.3349		2.1795	2.1795	0.0000	9,712.0237	9,712.0237	2.8598		9,783.5197

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Summer

3.5 Pier Foundation and Mircopile Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2704	5.5152	1.4871	0.0172	0.5101	0.0738	0.5839	0.1467	0.0706	0.2173		1,841.9568	1,841.9568	0.0960		1,844.3564
Worker	0.0511	0.0368	0.4108	1.0800e-003	0.0986	7.1000e-004	0.0993	0.0262	6.5000e-004	0.0268		107.6670	107.6670	3.6800e-003		107.7591
Total	0.3214	5.5520	1.8978	0.0183	0.6087	0.0745	0.6832	0.1728	0.0713	0.2441		1,949.6237	1,949.6237	0.0997		1,952.1155

3.6 Direct Bury Construction and Pole Installation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	5.7887	64.2750	31.9079	0.0994		2.4580	2.4580		2.2794	2.2794		9,972.9941	9,972.9941	3.0134		10,048.3294
Total	5.7887	64.2750	31.9079	0.0994		2.4580	2.4580		2.2794	2.2794		9,972.9941	9,972.9941	3.0134		10,048.3294

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Summer

3.6 Direct Bury Construction and Pole Installation - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.8111	16.5456	4.4612	0.0517	1.5304	0.2214	1.7518	0.4400	0.2118	0.6518		5,525.870 2	5,525.870 2	0.2880		5,533.069 3
Worker	0.2554	0.1839	2.0540	5.4100e-003	0.4929	3.5500e-003	0.4964	0.1307	3.2700e-003	0.1340		538.3347	538.3347	0.0184		538.7953
Total	1.0665	16.7296	6.5151	0.0571	2.0233	0.2249	2.2482	0.5707	0.2151	0.7858		6,064.205 0	6,064.205 0	0.3064		6,071.864 5

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	5.7887	64.2750	31.9079	0.0994		2.4580	2.4580		2.2794	2.2794	0.0000	9,972.994 0	9,972.994 0	3.0134		10,048.32 94
Total	5.7887	64.2750	31.9079	0.0994		2.4580	2.4580		2.2794	2.2794	0.0000	9,972.994 0	9,972.994 0	3.0134		10,048.32 94

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Summer

3.6 Direct Bury Construction and Pole Installation - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.8111	16.5456	4.4612	0.0517	1.5304	0.2214	1.7518	0.4400	0.2118	0.6518		5,525.870 2	5,525.870 2	0.2880		5,533.069 3
Worker	0.2554	0.1839	2.0540	5.4100e-003	0.4929	3.5500e-003	0.4964	0.1307	3.2700e-003	0.1340		538.3347	538.3347	0.0184		538.7953
Total	1.0665	16.7296	6.5151	0.0571	2.0233	0.2249	2.2482	0.5707	0.2151	0.7858		6,064.205 0	6,064.205 0	0.3064		6,071.864 5

3.7 Stringing Activities/Transfer Conductor/ Sagging Activities - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2139	22.4236	10.0287	0.0315		0.9180	0.9180		0.8445	0.8445		3,168.779 6	3,168.779 6	0.9865		3,193.441 7
Total	2.2139	22.4236	10.0287	0.0315		0.9180	0.9180		0.8445	0.8445		3,168.779 6	3,168.779 6	0.9865		3,193.441 7

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Summer

3.7 Stringing Activities/Transfer Conductor/ Sagging Activities - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000
Vendor	0.2028	4.1364	1.1153	0.0129	0.3826	0.0554	0.4379	0.1100	0.0530	0.1630		1,381.4676	1,381.4676	0.0720			1,383.2673
Worker	0.1022	0.0736	0.8216	2.1600e-003	0.1972	1.4200e-003	0.1986	0.0523	1.3100e-003	0.0536		215.3339	215.3339	7.3700e-003			215.5181
Total	0.3049	4.2100	1.9369	0.0151	0.5797	0.0568	0.6365	0.1623	0.0543	0.2166		1,596.8015	1,596.8015	0.0794			1,598.7854

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Off-Road	2.2139	22.4236	10.0287	0.0315		0.9180	0.9180		0.8445	0.8445	0.0000	3,168.7796	3,168.7796	0.9865			3,193.4417
Total	2.2139	22.4236	10.0287	0.0315		0.9180	0.9180		0.8445	0.8445	0.0000	3,168.7796	3,168.7796	0.9865			3,193.4417

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Summer

3.7 Stringing Activities/Transfer Conductor/ Sagging Activities - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2028	4.1364	1.1153	0.0129	0.3826	0.0554	0.4379	0.1100	0.0530	0.1630		1,381.4676	1,381.4676	0.0720		1,383.2673
Worker	0.1022	0.0736	0.8216	2.1600e-003	0.1972	1.4200e-003	0.1986	0.0523	1.3100e-003	0.0536		215.3339	215.3339	7.3700e-003		215.5181
Total	0.3049	4.2100	1.9369	0.0151	0.5797	0.0568	0.6365	0.1623	0.0543	0.2166		1,596.8015	1,596.8015	0.0794		1,598.7854

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.581689	0.044135	0.186694	0.113515	0.018244	0.005600	0.015197	0.022573	0.001888	0.002088	0.006279	0.000742	0.001357

5.0 Energy Detail

Historical Energy Use: N

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Summer

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	0.000317534	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Summer

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	3.17534e-007	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Summer

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

7.0 Water Detail

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Summer

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
----------------	--------	-----------	-----------	-------------	-------------	-----------

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
----------------	--------	-----------	------------	-------------	-------------	-----------

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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User Defined Equipment

Equipment Type	Number
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11.0 Vegetation

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Winter

SDG&E Tie Line 695/6971 Reconductor Project
San Diego Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	0.00	1000sqft	98.33	0.01	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	40
Climate Zone	13			Operational Year	2019
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Winter

Project Characteristics - -

Land Use - Selected General Light Industry as the most appropriate default land use type. Assumed that "Lot acreage" was equivalent to the total area of site disturbance as described in Section 4.3 within the document.

Construction Phase - The construction phasing is per the construction schedule within the PEA.

Off-road Equipment - Off-highway trucks = water truck, spray truck. Crew trucks and pickup trucks are included within the worker VMT calculations.

Off-road Equipment - Off-highway trucks = water trucks (3), tractor trailer units (3), and bucket trucks (3).

Off-road Equipment - Off-highway trucks = water trucks (2), and cement trucks (10). Crew trucks are counted in the worker VMT calculations.

Off-road Equipment - Off-highway trucks = water trucks (2), tractor trailer units (2). Other construction equipment = mowers (2).

Off-road Equipment - Off-highway trucks = water trucks (3), boom trucks (3), bucket trucks (3), wire truck, pulling rig. Crew trucks and pickups are included within the worker VMT calculations.

Off-road Equipment - Off-highway trucks = water truck, bucket trucks (2), and wire dolly.

Trips and VMT - Trips and VMT-worker trips based on the max # of workers/phase. Assumed 10 haul trips/day for trenching, and 2 haul trips/day for staging yard construction. Vendor trips estimated to be 2 trips/day for each water truck/cement truck, 30 miles one-way.

Grading - Grading-site preparation activities would occur at approximately 10.25 acres total. Assumed half that amount for total acres disturbed from demobilization activities. Trenching operations will generate up to approximately 2,900 cubic yards total.

Vehicle Trips - No Operations

Energy Use -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	15
tblConstructionPhase	NumDays	1,550.00	50.00
tblConstructionPhase	NumDays	1,550.00	90.00
tblConstructionPhase	NumDays	1,550.00	60.00
tblConstructionPhase	NumDays	60.00	30.00
tblConstructionPhase	NumDays	60.00	40.00
tblConstructionPhase	NumDays	60.00	10.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00

SDG&E Tie Line 695/6971 Reconstructor Project - San Diego Air Basin, Winter

tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	5/31/2018	4/3/2018
tblConstructionPhase	PhaseEndDate	9/13/2018	7/17/2018
tblConstructionPhase	PhaseEndDate	11/22/2018	7/30/2018
tblConstructionPhase	PhaseEndDate	3/22/2018	8/31/2018
tblConstructionPhase	PhaseEndDate	4/3/2018	7/28/2018
tblConstructionPhase	PhaseStartDate	4/4/2018	2/5/2018
tblConstructionPhase	PhaseStartDate	6/1/2018	4/4/2018
tblConstructionPhase	PhaseStartDate	9/14/2018	5/22/2018
tblConstructionPhase	PhaseStartDate	2/4/2018	7/17/2018
tblConstructionPhase	PhaseStartDate	3/23/2018	7/18/2018
tblGrading	AcresOfGrading	22.50	10.25
tblGrading	AcresOfGrading	17.50	5.13
tblGrading	MaterialExported	0.00	2,900.00
tblLandUse	BuildingSpaceSquareFeet	0.00	0.01
tblLandUse	LandUseSquareFeet	0.00	0.01
tblLandUse	LotAcreage	0.00	98.33
tblOffRoadEquipment	HorsePower	402.00	231.00
tblOffRoadEquipment	LoadFactor	0.38	0.29
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	3.00
tblOffRoadEquipment	UsageHours	7.00	5.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	6.00

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Winter

tblOffRoadEquipment	UsageHours	8.00	7.00
tblProjectCharacteristics	OperationalYear	2018	2019
tblTripsAndVMT	HaulingTripLength	20.00	74.00
tblTripsAndVMT	HaulingTripLength	20.00	74.00
tblTripsAndVMT	HaulingTripLength	20.00	74.00
tblTripsAndVMT	HaulingTripLength	20.00	74.00
tblTripsAndVMT	HaulingTripLength	20.00	74.00
tblTripsAndVMT	HaulingTripLength	20.00	74.00
tblTripsAndVMT	HaulingTripNumber	0.00	363.00
tblTripsAndVMT	VendorTripLength	7.30	69.00
tblTripsAndVMT	VendorTripLength	7.30	69.00
tblTripsAndVMT	VendorTripLength	7.30	69.00
tblTripsAndVMT	VendorTripLength	7.30	69.00
tblTripsAndVMT	VendorTripLength	7.30	69.00
tblTripsAndVMT	VendorTripLength	7.30	69.00
tblTripsAndVMT	VendorTripLength	7.30	69.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	24.00
tblTripsAndVMT	VendorTripNumber	0.00	6.00
tblTripsAndVMT	WorkerTripNumber	23.00	14.00
tblTripsAndVMT	WorkerTripNumber	10.00	14.00
tblTripsAndVMT	WorkerTripNumber	20.00	16.00
tblTripsAndVMT	WorkerTripNumber	0.00	12.00
tblTripsAndVMT	WorkerTripNumber	0.00	60.00
tblTripsAndVMT	WorkerTripNumber	0.00	24.00

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Winter

tblVehicleTrips	ST_TR	1.32	0.00
tblVehicleTrips	SU_TR	0.68	0.00
tblVehicleTrips	WD_TR	6.97	0.00

2.0 Emissions Summary

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Winter

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	11.3843	130.4279	60.8646	0.2359	3.6029	4.4758	7.4573	0.9643	4.1466	4.9615	0.0000	24,126.3067	24,126.3067	5.2929	0.0000	24,258.6290
Maximum	11.3843	130.4279	60.8646	0.2359	3.6029	4.4758	7.4573	0.9643	4.1466	4.9615	0.0000	24,126.3067	24,126.3067	5.2929	0.0000	24,258.6290

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	11.3843	130.4279	60.8646	0.2359	3.5057	4.4758	7.3825	0.9528	4.1466	4.9534	0.0000	24,126.3067	24,126.3067	5.2929	0.0000	24,258.6290
Maximum	11.3843	130.4279	60.8646	0.2359	3.5057	4.4758	7.3825	0.9528	4.1466	4.9534	0.0000	24,126.3067	24,126.3067	5.2929	0.0000	24,258.6290

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	2.70	0.00	1.00	1.19	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00

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2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP	Site Preparation	1/1/2018	2/3/2018	6	30	
2	Demobilization/Clean up/Road Refreshing	Site Preparation	7/17/2018	8/31/2018	6	40	
3	Trenching for Installation of Underground Cables	Site Preparation	7/18/2018	7/28/2018	6	10	
4	Pier Foundation and Mircopile Construction	Building Construction	2/5/2018	4/3/2018	6	50	
5	Direct Bury Construction and Pole Installation	Building Construction	4/4/2018	7/17/2018	6	90	
6	Stringing Activities/Transfer Conductor/ Sagging Activities	Building Construction	5/22/2018	7/30/2018	6	60	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP	Dumpers/Tenders	1	3.00	16	0.38
Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP	Graders	2	6.00	187	0.41

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Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP	Off-Highway Trucks	4	3.00	402	0.38
Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP	Other Construction Equipment	2	7.00	172	0.42
Demobilization/Clean up/Road Refreshing	Graders	1	7.00	187	0.41
Demobilization/Clean up/Road Refreshing	Off-Highway Trucks	2	6.00	402	0.38
Demobilization/Clean up/Road Refreshing	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Trenching for Installation of Underground Cables	Bore/Drill Rigs	1	6.00	221	0.50
Trenching for Installation of Underground Cables	Off-Highway Trucks	4	3.00	402	0.38
Trenching for Installation of Underground Cables	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Pier Foundation and Mircopile Construction	Air Compressors	3	5.00	78	0.48
Pier Foundation and Mircopile Construction	Bore/Drill Rigs	3	7.00	221	0.50
Pier Foundation and Mircopile Construction	Cement and Mortar Mixers	1	4.00	9	0.56
Pier Foundation and Mircopile Construction	Dumpers/Tenders	1	4.00	16	0.38
Pier Foundation and Mircopile Construction	Excavators	1	4.00	158	0.38
Pier Foundation and Mircopile Construction	Forklifts	3	4.00	89	0.20
Pier Foundation and Mircopile Construction	Off-Highway Trucks	12	3.00	402	0.38
Direct Bury Construction and Pole Installation	Air Compressors	3	3.00	78	0.48
Direct Bury Construction and Pole Installation	Bore/Drill Rigs	3	7.00	221	0.50
Direct Bury Construction and Pole Installation	Cranes	3	5.00	231	0.29
Direct Bury Construction and Pole Installation	Off-Highway Trucks	9	4.00	402	0.38
Stringing Activities/Transfer Conductor/Sagging Activities	Off-Highway Trucks	11	4.00	231	0.29

Trips and VMT

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Winter

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Staging Yard Setup, Road Refinishing, Vegetation Trimming, Demobilization/Clean up/Road Refreshing	9	14.00	2.00	0.00	10.80	69.00	74.00	LD_Mix	HDT_Mix	HHDT
Trenching for Installation of Interior Pier Foundation and Micropile Construction	4	14.00	2.00	0.00	10.80	69.00	74.00	LD_Mix	HDT_Mix	HHDT
Direct Bury Construction and Pole Stringing	8	16.00	2.00	363.00	10.80	69.00	74.00	LD_Mix	HDT_Mix	HHDT
Activities/Transfer Con	24	12.00	8.00	0.00	10.80	69.00	74.00	LD_Mix	HDT_Mix	HHDT
	18	60.00	24.00	0.00	10.80	69.00	74.00	LD_Mix	HDT_Mix	HHDT
	11	24.00	6.00	0.00	10.80	69.00	74.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.3623	0.0000	0.3623	0.0391	0.0000	0.0391			0.0000			0.0000
Off-Road	2.9402	33.9558	16.5450	0.0409		1.3680	1.3680		1.2591	1.2591		4,110.2258	4,110.2258	1.2749		4,142.0985
Total	2.9402	33.9558	16.5450	0.0409	0.3623	1.3680	1.7303	0.0391	1.2591	1.2982		4,110.2258	4,110.2258	1.2749		4,142.0985

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Winter

3.2 Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0685	1.4185	0.3760	4.3000e-003	0.1275	0.0185	0.1460	0.0367	0.0177	0.0544		458.9908	458.9908	0.0243		459.5970
Worker	0.0673	0.0482	0.4546	1.1800e-003	0.1150	8.3000e-004	0.1158	0.0305	7.6000e-004	0.0313		117.9258	117.9258	4.0900e-003		118.0280
Total	0.1358	1.4667	0.8306	5.4800e-003	0.2425	0.0193	0.2618	0.0672	0.0184	0.0856		576.9166	576.9166	0.0283		577.6250

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1631	0.0000	0.1631	0.0176	0.0000	0.0176			0.0000			0.0000
Off-Road	2.9402	33.9558	16.5450	0.0409		1.3680	1.3680		1.2591	1.2591	0.0000	4,110.2258	4,110.2258	1.2749		4,142.0985
Total	2.9402	33.9558	16.5450	0.0409	0.1631	1.3680	1.5310	0.0176	1.2591	1.2767	0.0000	4,110.2258	4,110.2258	1.2749		4,142.0985

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Winter

3.2 Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000
Vendor	0.0685	1.4185	0.3760	4.3000e-003	0.1275	0.0185	0.1460	0.0367	0.0177	0.0544		458.9908	458.9908	0.0243			459.5970
Worker	0.0673	0.0482	0.4546	1.1800e-003	0.1150	8.3000e-004	0.1158	0.0305	7.6000e-004	0.0313		117.9258	117.9258	4.0900e-003			118.0280
Total	0.1358	1.4667	0.8306	5.4800e-003	0.2425	0.0193	0.2618	0.0672	0.0184	0.0856		576.9166	576.9166	0.0283			577.6250

3.3 Demobilization/Clean up/Road Refreshing - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Fugitive Dust					0.1360	0.0000	0.1360	0.0147	0.0000	0.0147			0.0000				0.0000
Off-Road	1.8143	20.6964	9.7304	0.0280		0.7983	0.7983		0.7344	0.7344		2,815.1995	2,815.1995	0.8764			2,837.1098
Total	1.8143	20.6964	9.7304	0.0280	0.1360	0.7983	0.9343	0.0147	0.7344	0.7491		2,815.1995	2,815.1995	0.8764			2,837.1098

SDG&E Tie Line 695/6971 Reconstructor Project - San Diego Air Basin, Winter

3.3 Demobilization/Clean up/Road Refreshing - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0685	1.4185	0.3760	4.3000e-003	0.1275	0.0185	0.1460	0.0367	0.0177	0.0544		458.9908	458.9908	0.0243		459.5970
Worker	0.0673	0.0482	0.4546	1.1800e-003	0.1150	8.3000e-004	0.1158	0.0305	7.6000e-004	0.0313		117.9258	117.9258	4.0900e-003		118.0280
Total	0.1358	1.4667	0.8306	5.4800e-003	0.2425	0.0193	0.2618	0.0672	0.0184	0.0856		576.9166	576.9166	0.0283		577.6250

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0612	0.0000	0.0612	6.6100e-003	0.0000	6.6100e-003			0.0000			0.0000
Off-Road	1.8143	20.6964	9.7304	0.0280		0.7983	0.7983		0.7344	0.7344	0.0000	2,815.1995	2,815.1995	0.8764		2,837.1098
Total	1.8143	20.6964	9.7304	0.0280	0.0612	0.7983	0.8595	6.6100e-003	0.7344	0.7410	0.0000	2,815.1995	2,815.1995	0.8764		2,837.1098

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Winter

3.3 Demobilization/Clean up/Road Refreshing - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0685	1.4185	0.3760	4.3000e-003	0.1275	0.0185	0.1460	0.0367	0.0177	0.0544		458.9908	458.9908	0.0243		459.5970
Worker	0.0673	0.0482	0.4546	1.1800e-003	0.1150	8.3000e-004	0.1158	0.0305	7.6000e-004	0.0313		117.9258	117.9258	4.0900e-003		118.0280
Total	0.1358	1.4667	0.8306	5.4800e-003	0.2425	0.0193	0.2618	0.0672	0.0184	0.0856		576.9166	576.9166	0.0283		577.6250

3.4 Trenching for Installation of Underground Cables - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0408	0.0000	0.0408	6.1700e-003	0.0000	6.1700e-003			0.0000			0.0000
Off-Road	2.0844	22.5376	14.0051	0.0350		1.0338	1.0338		0.9511	0.9511		3,523.7261	3,523.7261	1.0970		3,551.1507
Total	2.0844	22.5376	14.0051	0.0350	0.0408	1.0338	1.0745	6.1700e-003	0.9511	0.9572		3,523.7261	3,523.7261	1.0970		3,551.1507

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3.4 Trenching for Installation of Underground Cables - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.0329	33.4747	7.5465	0.0972	2.3449	0.1605	2.5054	0.6425	0.1536	0.7960		10,573.2285	10,573.2285	0.8261		10,593.8798
Vendor	0.0685	1.4185	0.3760	4.3000e-003	0.1275	0.0185	0.1460	0.0367	0.0177	0.0544		458.9908	458.9908	0.0243		459.5970
Worker	0.0769	0.0551	0.5196	1.3500e-003	0.1314	9.5000e-004	0.1324	0.0349	8.7000e-004	0.0357		134.7724	134.7724	4.6700e-003		134.8891
Total	1.1784	34.9483	8.4420	0.1028	2.6039	0.1800	2.7838	0.7140	0.1721	0.8861		11,166.9917	11,166.9917	0.8550		11,188.3660

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0183	0.0000	0.0183	2.7800e-003	0.0000	2.7800e-003			0.0000			0.0000
Off-Road	2.0844	22.5376	14.0051	0.0350		1.0338	1.0338		0.9511	0.9511	0.0000	3,523.7261	3,523.7261	1.0970		3,551.1507
Total	2.0844	22.5376	14.0051	0.0350	0.0183	1.0338	1.0521	2.7800e-003	0.9511	0.9538	0.0000	3,523.7261	3,523.7261	1.0970		3,551.1507

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3.4 Trenching for Installation of Underground Cables - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.0329	33.4747	7.5465	0.0972	2.3449	0.1605	2.5054	0.6425	0.1536	0.7960		10,573.2285	10,573.2285	0.8261		10,593.8798
Vendor	0.0685	1.4185	0.3760	4.3000e-003	0.1275	0.0185	0.1460	0.0367	0.0177	0.0544		458.9908	458.9908	0.0243		459.5970
Worker	0.0769	0.0551	0.5196	1.3500e-003	0.1314	9.5000e-004	0.1324	0.0349	8.7000e-004	0.0357		134.7724	134.7724	4.6700e-003		134.8891
Total	1.1784	34.9483	8.4420	0.1028	2.6039	0.1800	2.7838	0.7140	0.1721	0.8861		11,166.9917	11,166.9917	0.8550		11,188.3660

3.5 Pier Foundation and Mircopile Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	5.4951	57.8187	32.7679	0.0972		2.3349	2.3349		2.1795	2.1795		9,712.0237	9,712.0237	2.8598		9,783.5197
Total	5.4951	57.8187	32.7679	0.0972		2.3349	2.3349		2.1795	2.1795		9,712.0237	9,712.0237	2.8598		9,783.5197

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3.5 Pier Foundation and Mircopile Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2741	5.6739	1.5038	0.0172	0.5101	0.0739	0.5841	0.1467	0.0707	0.2174		1,835.963 2	1,835.963 2	0.0970		1,838.388 0
Worker	0.0577	0.0413	0.3897	1.0200e-003	0.0986	7.1000e-004	0.0993	0.0262	6.5000e-004	0.0268		101.0793	101.0793	3.5000e-003		101.1669
Total	0.3318	5.7152	1.8935	0.0182	0.6087	0.0746	0.6834	0.1728	0.0714	0.2442		1,937.042 5	1,937.042 5	0.1005		1,939.554 9

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	5.4951	57.8187	32.7679	0.0972		2.3349	2.3349		2.1795	2.1795	0.0000	9,712.023 7	9,712.023 7	2.8598		9,783.519 7
Total	5.4951	57.8187	32.7679	0.0972		2.3349	2.3349		2.1795	2.1795	0.0000	9,712.023 7	9,712.023 7	2.8598		9,783.519 7

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Winter

3.5 Pier Foundation and Mircopile Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2741	5.6739	1.5038	0.0172	0.5101	0.0739	0.5841	0.1467	0.0707	0.2174		1,835.963 2	1,835.963 2	0.0970		1,838.388 0
Worker	0.0577	0.0413	0.3897	1.0200e-003	0.0986	7.1000e-004	0.0993	0.0262	6.5000e-004	0.0268		101.0793	101.0793	3.5000e-003		101.1669
Total	0.3318	5.7152	1.8935	0.0182	0.6087	0.0746	0.6834	0.1728	0.0714	0.2442		1,937.042 5	1,937.042 5	0.1005		1,939.554 9

3.6 Direct Bury Construction and Pole Installation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	5.7887	64.2750	31.9079	0.0994		2.4580	2.4580		2.2794	2.2794		9,972.994 1	9,972.994 1	3.0134		10,048.32 94
Total	5.7887	64.2750	31.9079	0.0994		2.4580	2.4580		2.2794	2.2794		9,972.994 1	9,972.994 1	3.0134		10,048.32 94

SDG&E Tie Line 695/6971 Reconstructor Project - San Diego Air Basin, Winter

3.6 Direct Bury Construction and Pole Installation - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.8222	17.0217	4.5115	0.0516	1.5304	0.2218	1.7522	0.4400	0.2122	0.6522		5,507.8896	5,507.8896	0.2910		5,515.1641
Worker	0.2885	0.2066	1.9484	5.0800e-003	0.4929	3.5500e-003	0.4964	0.1307	3.2700e-003	0.1340		505.3964	505.3964	0.0175		505.8342
Total	1.1107	17.2282	6.4599	0.0566	2.0233	0.2254	2.2486	0.5707	0.2155	0.7862		6,013.2860	6,013.2860	0.3085		6,020.9984

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	5.7887	64.2750	31.9079	0.0994		2.4580	2.4580		2.2794	2.2794	0.0000	9,972.9940	9,972.9940	3.0134		10,048.3294
Total	5.7887	64.2750	31.9079	0.0994		2.4580	2.4580		2.2794	2.2794	0.0000	9,972.9940	9,972.9940	3.0134		10,048.3294

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Winter

3.6 Direct Bury Construction and Pole Installation - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.8222	17.0217	4.5115	0.0516	1.5304	0.2218	1.7522	0.4400	0.2122	0.6522		5,507.8896	5,507.8896	0.2910		5,515.1641
Worker	0.2885	0.2066	1.9484	5.0800e-003	0.4929	3.5500e-003	0.4964	0.1307	3.2700e-003	0.1340		505.3964	505.3964	0.0175		505.8342
Total	1.1107	17.2282	6.4599	0.0566	2.0233	0.2254	2.2486	0.5707	0.2155	0.7862		6,013.2860	6,013.2860	0.3085		6,020.9984

3.7 Stringing Activities/Transfer Conductor/ Sagging Activities - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2139	22.4236	10.0287	0.0315		0.9180	0.9180		0.8445	0.8445		3,168.7796	3,168.7796	0.9865		3,193.4417
Total	2.2139	22.4236	10.0287	0.0315		0.9180	0.9180		0.8445	0.8445		3,168.7796	3,168.7796	0.9865		3,193.4417

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Winter

3.7 Stringing Activities/Transfer Conductor/ Sagging Activities - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2055	4.2554	1.1279	0.0129	0.3826	0.0555	0.4380	0.1100	0.0531	0.1631		1,376.9724	1,376.9724	0.0728		1,378.7910
Worker	0.1154	0.0826	0.7793	2.0300e-003	0.1972	1.4200e-003	0.1986	0.0523	1.3100e-003	0.0536		202.1586	202.1586	7.0100e-003		202.3337
Total	0.3209	4.3380	1.9072	0.0149	0.5797	0.0569	0.6366	0.1623	0.0544	0.2167		1,579.1310	1,579.1310	0.0798		1,581.1247

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2139	22.4236	10.0287	0.0315		0.9180	0.9180		0.8445	0.8445	0.0000	3,168.7796	3,168.7796	0.9865		3,193.4417
Total	2.2139	22.4236	10.0287	0.0315		0.9180	0.9180		0.8445	0.8445	0.0000	3,168.7796	3,168.7796	0.9865		3,193.4417

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Winter

3.7 Stringing Activities/Transfer Conductor/ Sagging Activities - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2055	4.2554	1.1279	0.0129	0.3826	0.0555	0.4380	0.1100	0.0531	0.1631		1,376.972 4	1,376.972 4	0.0728		1,378.791 0
Worker	0.1154	0.0826	0.7793	2.0300e-003	0.1972	1.4200e-003	0.1986	0.0523	1.3100e-003	0.0536		202.1586	202.1586	7.0100e-003		202.3337
Total	0.3209	4.3380	1.9072	0.0149	0.5797	0.0569	0.6366	0.1623	0.0544	0.2167		1,579.131 0	1,579.131 0	0.0798		1,581.124 7

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.581689	0.044135	0.186694	0.113515	0.018244	0.005600	0.015197	0.022573	0.001888	0.002088	0.006279	0.000742	0.001357

5.0 Energy Detail

Historical Energy Use: N

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Winter

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	0.000317534	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Winter

5.2 Energy by Land Use - Natural Gas

Mitigated

	Natural Gas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	3.17534e-007	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Winter

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

7.0 Water Detail

SDG&E Tie Line 695/6971 Reconductor Project - San Diego Air Basin, Winter

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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User Defined Equipment

Equipment Type	Number
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11.0 Vegetation

Attachment B

Air Emission Calculation Assumptions

- Estimated Project Construction Schedule
- Estimated Project Construction Equipment Usage
- Construction Trips and Trip Lengths
- Estimated Helicopter Operations

Construction Equipment

The proposed project would involve reconductoring approximately 10.1 miles of TL 695 and TL 6971 between the Talega, Basilone, and Japanese Mesa Substations by replacing existing wood pole structures with new steel pole structures, and installing a new segment underground power line. Construction would involve six (generally sequential) phases: 1) Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP Installation, 2) Pier Foundation and Micropile Construction, 3) Direct Bury Construction and Pole Installation, 4) Stringing Activities/Transfer Conductor/Sagging Activities, 5) Demobilization/Clean Up/Road Refreshing, and 6) Trenching for Installation of Underground Cables. Construction activities are expected to commence in January of 2018 and be completed by the end of August of 2018. **Table 1** provides the estimated construction schedule for each phase. The project construction site including work areas, staging areas, access areas, access roads, and temporary easement during construction is 116 acres. Trenching operations would generate up to approximately 2,900 cubic yards of materials for transport.

Table 1: Estimated Project Construction Schedule

Phase	Description	Phase Type	Start	End	Days per Week	Working Days
1	Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP Installation	Site Preparation	1/1/2018	2/3/2018	6	30
2	Pier Foundation and Micropile Construction	Building Construction	2/5/2018	4/3/2018	6	50
3	Direct Bury Construction and Pole Installation	Building Construction	4/4/2018	7/17/2018	6	90
4	Stringing Activities/Transfer Conductor/Sagging Activities	Building Construction	5/22/2018	7/30/2018	6	60
5	Demobilization/Clean Up/Road Refreshing	Site Preparation	7/17/2018	8/31/2018	6	40
6	Trenching for Installation of Underground Cables	Grading	7/18/2018	7/28/2018	6	10

SOURCE: CalEEMod Version 2016.3.1.

The estimated construction equipment associated with the proposed project along with the number of pieces of equipment, daily hours of operation, horsepower (hp), and load factor (i.e., percent of full throttle) are shown in **Table 2**.

Table 2: Estimated Project Construction Equipment Usage

Phase	Equipment Type	Amount	Daily Hours	HP	Load Factor
Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP Installation	Dumpers/Tenders	1	3	16	0.38
Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP Installation	Graders	2	6	187	0.41
Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP Installation	Off-Highway Trucks	4	3	402	0.38
Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP Installation	Other Construction Equipment	2	7	172	0.42
Pier Foundation and Micropile Construction	Air Compressors	3	5	78	0.48
Pier Foundation and Micropile Construction	Bore/Drill Rigs	3	7	221	0.50
Pier Foundation and Micropile Construction	Cement and Mortar Mixers	1	4	9	0.56
Pier Foundation and Micropile Construction	Forklifts	3	4	89	0.20
Pier Foundation and Micropile Construction	Dumpers/Tenders	1	4	16	0.38
Pier Foundation and Micropile Construction	Excavators	1	4	158	0.38
Pier Foundation and Micropile Construction	Off-Highway Trucks	12	3	402	0.38
Direct Bury Construction and Pole Installation	Air Compressors	3	3	78	0.48
Direct Bury Construction and Pole Installation	Bore/Drill Rigs	3	7	221	0.50
Direct Bury Construction and Pole Installation	Cranes	3	5	231	0.29
Direct Bury Construction and Pole Installation	Off-Highway Trucks	9	4	402	0.38
Stringing Activities/Transfer Conductor/Sagging Activities	Off-Highway Trucks	11	4	231	0.29
Demobilization/Clean Up/Road Refreshing	Graders	1	7	187	0.41
Demobilization/Clean Up/Road Refreshing	Off-Highway Trucks	2	6	402	0.38
Demobilization/Clean Up/Road Refreshing	Tractors/Loaders/Backhoes	1	6	97	0.37
Trenching for Installation of Underground Cables	Bore/Drill Rigs	1	6	221	0.50
Trenching for Installation of Underground Cables	Off-Highway Trucks	4	3	402	0.38
Trenching for Installation of Underground Cables	Tractors/Loaders/Backhoes	3	7	97	0.37

SOURCE: CalEEMod Version 2016.3.1.

A total of approximately 363 haul truck trips were estimated during trenching for installation of underground cables. An average daily construction crew of 60 employees would be present during pole installation and lesser number of construction crew during other phases. **Table 3** provides a list of the expected trips and trip lengths by construction phase of haul trucks, vendors, and construction workers. Solid waste from the proposed project will be transported to the Otay Landfill, which is located in southern San Diego County, approximately 74 miles to the south of the proposed project. It is anticipated that this waste will include construction, demolition, and non-hazardous waste, including vegetation, excavated material, treated wood products, and potentially ground water. Retired materials to be recycled, including copper,

steel, and/or aluminum conductor, will be transported by SOS Metals to their facility in southern San Diego County, approximately 69 miles to the south of the proposed project.

Table 3: Construction Trips and Trip Lengths

Phase	Equipment Count	Worker Trips	Vendor Trips	Haul Truck Trips	Worker Trip Length (mile)	Vendor Trip Length (mile)	Haul Trip Length (mile)
Staging Yard Setup, Road Refinishing, Vegetation Trimming, BMP Installation	9	14	2	0	10.8	69	74
Pier Foundation and Micropile Construction	24	12	8	0	10.8	69	74
Direct Bury Construction and Pole Installation	18	60	24	0	10.8	69	74
Stringing Activities/Transfer Conductor/Sagging Activities	11	24	6	0	10.8	69	74
Demobilization/Clean Up/Road Refreshing	4	14	2	0	10.8	69	74
Trenching for Installation of Underground Cables	8	16	2	363	10.8	69	74

SOURCE: CalEEMod Version 2016.3.1.

Helicopter Activities

Helicopters would be used for:

- Removal of existing power lines and pole structures
- Foundation installation for new pole structures
- Erection of new pole structures
- Stringing of new conductors and fiber optic cable
- Transporting equipment and personnel

Staging yards and helicopter landing areas would be used for refueling, and helicopter maintenance and repair would occur at local airports. All required spill prevention measures would be in place at the time and location of fueling. Staging yards and stringing sites would also be used for short-term helicopter operations, such as picking up conductor. SDG&E anticipates that light-, medium- and heavy-duty helicopters would be used for the proposed project.

In general, it is expected that only one type of helicopter would be used for construction at a time during any given day. However, it is possible that different types of helicopters may operate on a single day. For example, a light duty helicopter (Hughes 500E or similar) might ferry crews to remote locations, followed by a heavy duty helicopter (Sikorsky S-76 or similar) installing/removing poles.

Regarding duration of use, light-duty helicopter operations would occur intermittently during the 60-day conductor stringing phase, which is scheduled to begin in May 2018. Heavy- and medium-duty helicopter operations would occur intermittently during the pier foundation and direct bury construction phases, which would last for 90 days and start in February 2018. The

times of day and days of week for helicopter use would be controlled by the construction contractor and would be subject to change.

The maximum duration, the maximum number, and the types of helicopters to be used would be determined by the construction contractor. SDG&E assumed that the peak day for light-duty helicopter use for conductor stringing operations during construction would be approximately four hours of cruising time plus six landings and takeoff (LTO) cycles and the peak day for heavy-duty helicopter use for pole construction activities will include five hours of cruising time plus six LTO cycles. It is estimated that conductor stringing may require approximately four days of light-duty helicopter use, while pole construction may require approximately ten days of heavy-duty helicopter use. However, the number of days may be increased or decreased based on factors, such as inclement weather, training exercises at MCB Camp Pendleton, contractor methods, and other considerations.

Helicopter fugitive dust emissions were based on the emission factors developed by the Desert Research Institute; which found measurements indicating approximately 0.5 kilograms of PM10 emissions during takeoff and 1 kilogram of PM10 emissions during landing.¹ Approximately 10 percent of the PM10 emissions were considered PM2.5.² The helicopter combustion emission calculations were based on the Federal Aviation Administration (FAA)'s *Aviation Emissions and Air Quality Handbook*³ and the FAA's *Aviation Environmental Design Tool*.⁴ AEDT is a software system that dynamically models aircraft performance to compute emissions and fuel burn. AEDT's framework incorporates emissions and dispersion modeling functionality from the FAA's Emissions and Dispersion Modeling System (EDMS). EDMS is designed to assess the air quality impacts of emission sources including aircraft, helicopters, and supporting equipment. The FAA has identified AEDT/EDMS as the required model to perform air quality analyses for aviation sources.

¹ Desert Research Institute, *Particulate Matter Emissions for Dust from Unique Military Activities*, December 31, 2009, <http://www.dtic.mil/dtic/tr/fulltext/u2/a478503.pdf>

² Western Governors' Association, *WRAP Fugitive Dust Handbook*, September 7, 2006, http://www.wrapair.org/forums/dejf/fdh/content/FDHandbook_Rev_06.pdf

³ Federal Aviation Administration, *Aviation Emissions and Air Quality Handbook, Version 3, Update 1*, January, 2015, https://www.faa.gov/regulations_policies/policy_guidance/envir_policy/airquality_handbook/

⁴ Federal Aviation Administration, *Aviation Environmental Design Tool*, <https://aedt.faa.gov/>

Table 4 displays the helicopter emission factors as a function of fuel usage which were used for the air quality analysis.

Table 4: Helicopter Emission Factors during LTO (grams/kg of fuel)

Helicopter Type	Operating Mode	Fuel Flow (kg/s)	Time in Mode	CO	VOC	NO _x	SO ₂	PM	CO ₂
Hughes 500E	Taxi Out	0.0084	3.5	99.9	23.7	2.05	1.29	0.50	3155
	Takeoff	0.0326	2.17	8.66	0.41	6.16	1.29	0.37	3155
	Climbout	0.0303	4.33	8.66	0.41	5.56	1.29	0.37	3155
	Approach	0.0108	6.5	48.6	6.16	2.05	1.29	1.05	3155
	Taxi In	0.0084	3.5	99.9	23.7	2.05	1.29	0.50	3155
Sikorsky S-76	Taxi Out	0.0179	3.5	54.7	67.1	2.59	1.29	1.23	3155
	Takeoff	0.0869	2.17	3.52	0.52	8.03	1.29	0.32	3155
	Climbout	0.0727	4.33	4.04	0.52	7.63	1.29	0.31	3155
	Approach	0.0621	6.5	5.40	0.44	7.05	1.29	0.17	3155
	Taxi In	0.0179	3.5	54.7	67.1	2.59	1.29	1.23	3155

SOURCE: Federal Aviation Administration, *Aviation Environmental Design Tool*

When computing helicopter emissions, it is customary to simulate helicopter activity patterns within the LTO cycle. An LTO cycle consists of the following operational modes:

- *Taxi/idle* includes the time a helicopter takes to warm/cool engines while positioned on the ground.
- *Approach* begins when a helicopter descends below the atmospheric mixing height⁵ and ends when a helicopter touches down.
- *Takeoff* begins when full power is applied to a helicopter and ends when an aircraft reaches approximately 500 to 1,000 feet.
- *Climb out* begins when a helicopter powers back from the takeoff mode and ascends above the atmospheric mixing height.

Table 5 displays the helicopter emission factors as a function of time in mode which were used for the air quality analysis. Default aircraft time-in-mode values were used for each helicopter (e.g., a total of 20 minutes within ground idle mode, takeoff, and approach).

⁵ The height of the completely mixed portion of atmosphere that begins at the earth's surface and extends to a few thousand feet overhead where the atmosphere becomes fairly stable. For the San Diego region, this height is typically approximately 2,460 feet and varies with season and diurnally.

Table 5: Helicopter Emission Factors during LTO (pounds/mode)

Helicopter Type	Operating Mode	Time in Mode	CO	VOC	NO _x	SO ₂	PM	CO ₂
Hughes 500E	Taxi Out	3.5	0.39	0.09	0.01	0.01	0.00	12.3
	Takeoff	2.17	0.08	0.00	0.06	0.01	0.00	29.5
	Climbout	4.33	0.15	0.01	0.10	0.02	0.01	54.7
	Approach	6.5	0.45	0.06	0.02	0.01	0.01	29.4
	Taxi In	3.5	0.39	0.09	0.01	0.01	0.00	12.3
Sikorsky S-76	Taxi Out	3.5	0.91	1.11	0.04	0.02	0.02	52.2
	Takeoff	2.17	0.18	0.03	0.40	0.06	0.02	157
	Climbout	4.33	0.34	0.04	0.64	0.11	0.03	263
	Approach	6.5	0.58	0.05	0.75	0.14	0.02	337
	Taxi In	3.5	0.91	1.11	0.04	0.02	0.02	52.2

SOURCE: Federal Aviation Administration, *Aviation Environmental Design Tool*

Following this methodology, helicopter engine emissions are computed for one complete LTO cycle of each aircraft type. Within the LTO cycle, emissions are mainly a function of the number of operations (i.e., arrivals and departures); the helicopter fleet characteristics (i.e., aircraft type, number of engines, and take-off weight); the helicopter operating features (i.e., fuel flow rates and emission factors); and the time the helicopter spends in each of the operating modes (i.e., takeoff, climb out, approach, and idle), also known as the time in mode (TIM).

For this approach, **Equation 1** (*Emission Calculation for Each Helicopter Type for One LTO*) is used to compute NO_x, CO, and VOC emissions for each helicopter and is repeated for each LTO time in mode. If a helicopter has multiple engines, then the equation is multiplied by the number of engines used on that specific helicopter type.

$$E = (TIM) \times (FF) \times (EF) \times (NE)$$

Where:

E = total emissions of pollutant, expressed in pounds, produced by one LTO cycle

TIM = time in mode for operating mode, expressed in minutes

FF = fuel flow for operating mode, expressed in pounds per minute, for each engine used

EF = emission factor for pollutant, expressed in pounds of pollutant per one thousand pounds of fuel, in operating mode

NE = number of engines used

Equation 1. Emission Calculation for Each Helicopter Type for One LTO

Total aircraft emissions are then estimated by applying **Equation 2** (*Emission Calculation for All Helicopter*), which multiplies the helicopter emissions per LTO for a given helicopter.

$$E = \Sigma (E) \times (LTO)$$

Where:

E = total emissions of pollutant, expressed in pounds, produced by all helicopter operating

LTO = total number of LTO cycles during the inventory period

Equation 2. Emission Calculation for All Helicopters

Since SO₂ emissions are a primarily a function of the quantity of sulfur in the fuel, **Equation 3** (*Helicopter SO₂ Emission Calculation*) can be used to compute SO₂ emissions from helicopter engines.

$$E = (TIM) \times (Er) \times (NE)$$

Where:

E = total emissions of SO₂, expressed in grams, produced for one LTO cycle

NE = number of engines used

Er = 1 x (FF)

Where:

Er = emission rate of total SO₂, expressed as grams of SO₂ per second per operating mode

Er = the reported fuel flow by mode, expressed in kilograms per second per operating mode for each engine used

Equation 3. Helicopter SO₂ Emission Calculation

Helicopter engine emissions were also computed for operations within the cruise mode; traveling to and from destination, along transmission line, etc. Within the cruise mode, emissions are mainly a function of the number of hours of operation; the helicopter fleet characteristics (i.e., aircraft type, number of engines, and take-off weight); and the helicopter operating features (i.e., emission factors).

SDG&E assumed that the light-duty helicopter (Hughes 500E or similar) use for conductor stringing operations during construction would be approximately four hours of cruising time and the heavy-duty helicopter (Sikorsky S-76 or similar) use for pole construction activities would include five hours of cruising time. **Table 6** displays the helicopter emission factors during the cruise mode which were used for the air quality analysis. Helicopter combustion cruise emissions were based on emission factors within the *Guidance on Determination of Helicopter Emissions*.⁶

⁶ Guidance on the Determination of Helicopter Emissions, March 2009, <https://www.bazl.admin.ch/bazl/en/home/specialists/regulations-and-guidelines/environment/pollutant-emissions/triebwerkemissionen/guidance-on-the-determination-of-helicopter-emissions.html>

Table 6: Helicopter Emission Factors during Cruise (pounds/hour)

Helicopter Type	CO	VOC	NO _x	SO ₂	PM	CO ₂
Hughes 500E	0.23	0.01	0.15	0.03	0.01	84.1
Sikorsky S-76	0.52	0.07	0.98	0.17	0.04	404

SOURCE: Guidance on the Determination of Helicopter Emissions, March 2009,

<https://www.bazl.admin.ch/bazl/en/home/specialists/regulations-and-guidelines/environment/pollutant-emissions/triebwirkemissionen/guidance-on-the-determination-of-helicopter-emissions.html>