ATTACHMENT “B”

SCE SCOPE CHANGES

Aliso Canyon Turbine Replacement Project

Petition for Modification, Attachment B:

Southern California Edison Project Components—Descriptions and Analysis of Scope Changes

September 2014

Tables

FIGURES

APPENDICES

1.0 Introduction

In November 2013, the CPUC certified the Final Environmental Impact Report (FEIR) for the Southern California Gas Company's (SCG) Aliso Canyon Turbine Replacement (ACTR) Project through its issuance of a Certificate of Public Convenience and Necessity (CPCN) for the ACTR Project. The ACTR Project is located at the Aliso Canyon Natural Gas Storage Field (Storage Field), on unincorporated land north of Porter Ranch, in western Los Angeles County, California. The Storage Field lies in the southeastern portion of the Santa Susanna Mountains. The Storage Field has an inventory of approximately 165 billion cubic feet, and is the largest underground natural gas storage field operated by SCG. As part of the ACTR Project, SCG will construct and operate a new compressor station at the Storage Field, including the following components:

- Three new electric-driven, variable-speed compressors and pipelines to connect the station to existing facilities;
- 12 kilovolt (kV) plant power line;
- Rough grading for the SCE Natural Substation and access road;
- Main office and crew-shift buildings;
- New guardhouse on a widened segment of the existing entry road to the Storage Field.

SCE will construct several project components in order to provide power for the new compressors at the Storage Field. SCE will:

- Construct the new SCE Natural Substation;
- Modify several existing substations;
- Improve the access road for the 66 kV subtransmission line and the Natural Substation;
- Install 66 kV subtransmission line tubular steel poles (TSPs);
- Utilize pulling/tensioning sites for the 66 kV subtransmission line TSPs and the telecom lines;
- Reconductor segments of existing 66 kV subtransmission lines;
- Deconstruct the subtransmission line towers;
- Replace wood poles for telecommunications lines; and
- Install new telecommunications lines.

The areas encompassed by these SCE project components comprise the Project area for the purposes of this document (see Figure 1.0-1). Subsequent to the development and certification of the FEIR, SCE has engaged in a continuing process to refine the design of the SCE components of the ACTR Project. The project components with proposed/necessary scope changes are as follows:

- **Install 66 kV subtransmission line TSPs.** There are four separate subtransmission line-related scope updates:
    - Install fewer tubular steel poles
    - Re-route the subtransmission line at the "Tap" location on the east side of Interstate 5 (I-5)
    - Re-route the subtransmission line west of the Sunshine Canyon landfill
- **Improve the access road for the 66 kV subtransmission line.** Rehabilitate existing/construct new subtransmission line access and spur roads and related features.

This document describes each of these scope updates; each scope update is described in a separate section. To maximize efficiency, this document includes references to the Final Environmental Impact Report (FEIR).

Each section includes a characterization and quantification of potential environmental impacts that may be associated with the revised project scope to supplement the FEIR for the ACTR Project. The impact assessments are based on recently-completed surveys conducted in the project areas, and on the studies conducted in preparation of the FEIR. Where a revised project component scope would have either no impacts to an environmental resource or where the impacts would be less than or equivalent to those impacts described in the FEIR, these are summarily noted in each section.

The scope updates addressed in this assessment include activities that were not described in the ACTR Project FEIR and/or modifications to activities that were described in the ACTR Project FEIR. To capture the range of work tasks and potential impacts resulting from these scope updates, SCE has developed the following sections of this document that (a) describe the new or modified activities, (b) contain construction equipment and workforce tables for each of the new or modified activities, (c) describe the changes in land disturbance that would occur, and (d) present an evaluation of potential environmental impacts that may result from these scope updates.

2.0 Subtransmission Scope Update

Subsequent to the development and certification of the FEIR, SCE has engaged in a continuing process to refine the design of the SCE components of the ACTR Project. This process has resulted in the identification of four separate subtransmission line-related scope updates:

- Install fewer tubular steel poles
- Re-route the subtransmission line at the "Tap" location on the east side of Interstate 5 (I-5)
- Re-route the subtransmission line west of the Sunshine Canyon landfill

These three scope updates are discussed below; Table 2.0-1 provides a comparison of the original scope as presented in the FEIR for the ACTR Project and the updated scope presented in this document.

The construction of these components would generally utilize the same methods and equipment as described in Section 2.3 (Construction) of the FEIR; therefore, the descriptions of construction methods are not repeated here.

The FEIR includes several references to the SCE 66 kV Subtransmission Line scope of work, including Section 2.1.3 (Reconductoring and Telecommunications Route Locations), Section 2.2.7 (66 kV Subtransmission Line Reconductoring), as well as maps, tables and figures. Table 2-2 (66 kV Reconductoring and Structure Replacement) discusses the route length, number of existing structures, and number of new structures.

Table 2.0-1 Subtransmission Components: Comparison of Original Scope and Updated Scope

	Original Scope in FEIR	Updated Scope
Install Fewer Tubular Steel Poles	Remove 64 structures and install 78 new structures. (FEIR Table 2-2)	Remove 57 structures and install 48 new TSPs[1]
Re-route the subtransmission line at the "Tap" location on the east side of Interstate 5 (I-5)[1,2]	Remove 5 LSTs Install 4 TSPs Acquire new ROW Acquire easement modifications	Remove 5 LSTs and one H frame Install 4 TSPs Acquire new ROW
Re-route the subtransmission line west of the Sunshine Canyon landfill[1,2]	Remove 3 LSTs Install 3 TSPs	Remove 3 LSTs Install 3 TSPs

Notes:
Only components subject to change are listed; components or descriptions not subject to change as a result of the scope update are not listed.
1 Six structures were removed as part of the SCE BFI project, and one additional structure was removed from the scope as a result of design changes.
2 These structure counts are also included in the total counts presented under "Install Fewer Tubular Steel Poles".

2.1 Install Fewer Tubular Steel Poles and Relocate Tubular Steel Poles 18, 34, 42, and 43

The original project scope as described in the FEIR for the ACTR Project indicated that 64 existing subtransmission structures (including LSTs and H-frames) along the existing Macneil-Newhall-San Fernando 66 kV Subtransmission Line and the existing Chatsworth-Macneil-Newhall-San Fernando 66 kV Subtransmission Line would be removed and replaced with 78 new structures.

Subsequent to finalization of the FEIR, SCE has continued to advance the engineering of the project; this is normal as stated in a note to Table 2-2 of the FEIR: "The exact number of TSPs to be installed would be determined during final engineering." SCE's 90 percent design now estimates a reduction in the number of new structures that would be installed: Rather than 78 new structures, SCE now anticipates only 48 new TSPs will need to be installed.

In addition, four TSPs have been relocated as follows:

- TSP 18. Move approximately 100' east-southeast to a location along the existing access road.
- TSP 34. Move approximately 5' to the north to avoid underground utilities.
- TSP 42. Move approximately 5' to avoid underground utilities.
- TSP 43. Move approximately 150' south-southwest to a location along the existing access road.

The reduction in the number of new structures and the relocation of the four TSPs is due to design optimization. Installing taller TSPs (but still within the height range identified in the FEIR) and designing with higher tensions in some locations allowed SCE to increase the span length between these TSPs, thus reducing the number of TSPs to be installed. The relocation of the four TSPs was necessary due to the results of geotechnical investigations conducted along the subtransmission line route and the presence of underground utilities. Table 2.1-1 below provides a comparison of the original scope and updated scope by Segment.

Table 2.1-1 Comparison of Original Scope and Updated Scope

66 kV Route Segment	Original Scope in FEIR		Updated Scope	
	Removals	Installations	Removals	Installations
Segment A/B	38 LSTs, TSPs, and wood poles	45 TSPs	39 LSTs, TSPs, and wood poles	31 TSPs
Segment C	22 LSTs, H-frame, and 3-pole structures	28 TSPs	18 LSTs, H-frame, and 3-pole structures	17 TSPs

2.1.1 Land Disturbance

The reduction in the number of TSPs to be installed per the updated scope, and the relocation of the four TSPs, will result in a reduction of the areas both temporarily and permanently disturbed as part of the project. For the sake of simplicity, surface disturbance-related impacts are addressed in Section 3.0 of this document (Subtransmission Access and Spur Road Civil

Engineering Scope Update). Therefore, this analysis focuses on assessing the potential additional impacts of the installation of fewer TSPs, but in some cases taller TSPs.

2.1.2 Construction Equipment and Workforce

The construction equipment that would be used to install the reduced number of TSPs would be identical to that presented in the FEIR for the ACTR Project; the construction schedule or workforce, or both, would be reduced.

2.1.3 Evaluation of Potential Environmental Impacts

The assessment of potential impacts associated with the installation of fewer TSPs have been characterized according to the following threshold levels:

1. Result in no impacts additional to those contained in the FEIR
2. Result in a less than significant impact additional to those contained in the FEIR
3. Result in a significant impact additional to those contained in the FEIR
4. Result in reduced (beneficial) impacts compared to those described in the ACTR Project FEIR.

These impacts are summarized by resource area below:

Aesthetics (4)	Land Use and Planning (NA)
Agriculture and Forestry Resources (NA)	Minerals (1)
Air Quality (4)	Noise (4)
Biological Resources (4)	Population and Housing (1)
Cultural Resources (1)	Public Services (1)
Geology and Soils (NA)	Recreation (1)
Greenhouse Gases (4)	Transportation and Traffic (4)
Hazards and Hazardous Materials (NA)	Utilities and Service Systems (1)
Hydrology and Water Quality (NA)	

Note: Impacts associated with the surface disturbance necessary to realign/reposition TSPs, those impacts associated with the access and spur roads needed to gain access to the TSP locations, and the impacts associated with development of crane pads and work areas, are assessed in Section 4.0 of this document.

The considerable reduction in the number of TSPs to be installed would result in fewer potential impacts for several resource areas compared to what was analyzed in the FEIR. The impact assessments contained in the ACTR Project FEIR for all of these resource areas was Less than Significant or Less than Significant with Mitigation.

The considerable reduction in the number of TSPs to be installed would result in a reduction in the area of surface disturbance; the FEIR addressed 31.4 acres of temporary disturbance and 4.6 acres of permanent disturbance associated with TSP installations. Revisions to the civil engineering scope associated with the project (as presented in Section 3.0 of this document) have reduced the temporary disturbance of the subtransmission line-related activities to 23.5

acres (the reduction in disturbance area comes from the reduced numbers of TSPs to be installed; the disturbance area associated with the removal of existing structures is unchanged). The area of permanent disturbance associated with the installation of TSPs has also been reduced. As presented in the FEIR, all applicable and relevant APMs and MMs would be implemented. The reduction in the temporary and permanent disturbances associated with the reduced number of TSPs to be installed would result in reduced (beneficial) impacts compared to those described in the ACTR Project FEIR.

The reduced activities under the updated scope would not result in reduced impacts sufficient to either remove impacts entirely (and thus shift from a Less than Significant Impact to No Impact), nor would the updated scope result in reduced impacts sufficient to trigger the removal of mitigation measures. Therefore, the updated scope would not result in a change to the significance assessments described in the ACTR Project FEIR.

2.2 Re-route the Subtransmission Line at the "Tap" Location on the East Side of Interstate 5

Figure 2-1 (Proposed Project Area), Figure 2-6 (Existing 66 kV Subtransmission Lines, 66 kV Reconductoring Segments, and Telecommunications Route #1), Appendix D (66 kV Subtransmission Line Reconductoring Routes, Existing Structures and Vegetation Communities) in the FEIR assumed SCE's subtransmission line modifications or upgrades would follow the same route as the existing subtransmission lines in the area. This assumption is correct with the exception of two minor deviations, the first of which is at the "Tap" location on the east side of Interstate 5.

The existing route at the "Tap" location presents several challenges. Currently there is either no access or restricted access to Towers M7-T2, M7-T3, and M7-T4, and accordingly, if SCE were to construct within the existing alignment, such construction could only be achieved either through helicopter and hand construction, or by re-establishing surface access to these tower locations (see Figures 2.2-1a and 2.2-1b). Further, the location presents potential safety challenges for SCE if it were to construct in the existing alignment because of the terrain and the current locations of the existing structures.

SCE proposes to reroute approximately 2,400 feet of Segments A, B, and C. SCE would realign the subtransmission line in this location approximately 300 feet to the east of the current alignment, and outside the area surveyed in the FEIR (see Figures 2.2-1a and 2.2-1b). This reroute would require the acquisition of new ROW (from the same private landowner who owns the land associated with the existing tower alignment), would provide for better access for construction as well as operations and maintenance, and would result in the disturbance of a smaller area, as the TSP installation locations along the rerouted alignment are closer to the existing access road, and thus the spur roads to these rerouted locations would be shorter than the spur roads necessary to access locations in the existing alignment.

SCE's proposed re-route would require removing 5 existing towers (M7-T1, -T2, -T3, -T5 and -T6) and one H-Frame structure and replacing those structures with 4 TSPs (TSPs 31, 32, 33 and 34) to be installed in the new alignment. A new 200-foot spur road will be required for access to TSP 32, which would provide for appropriate access for construction, operations and

maintenance; the potential impacts associated with the new spur road are captured in Section 3.0 of this document.

2.2.1 Land Disturbance

The re-routing of the subtransmission line at the "Tap" will result in a reduction of the areas both temporarily and permanently disturbed as part of the project. For the sake of simplicity, surface disturbance-related impacts are addressed in Section 3.0 of this document (Subtransmission Access and Spur Road Civil Engineering Scope Update). Therefore, this analysis focuses on assessing the potential additional impacts of the re-routing of the subtransmission line at the "Tap."

2.2.2 Construction Equipment and Workforce

The construction equipment and workforce that would be used to accomplish the "Tap" realignment would be identical to those presented in the FEIR for the ACTR Project. The schedule of use would be reduced due to the net reduction of one TSP installation as part of the realignment.

2.2.3 Evaluation of Potential Environmental Impacts

The assessment of potential impacts associated with the construction activities necessary to realign the subtransmission line in the vicinity of the "Tap" have been characterized according to the following threshold levels:

1. Result in no impacts additional to those contained in the FEIR
2. Result in a less than significant impact additional to those contained in the FEIR
3. Result in a significant impact additional to those contained in the FEIR
4. Result in reduced (beneficial) impacts compared to those described in the ACTR Project FEIR.

These impacts are summarized by resource area below:

Aesthetics (2)	Land Use and Planning (1)
Agriculture and Forestry Resources (1)	Minerals (1)
Air Quality (1)	Noise (1)
Biological Resources (1)	Population and Housing (1)
Cultural Resources (1)	Public Services (1)
Geology and Soils (1)	Recreation (1)
Greenhouse Gases (1)	Transportation and Traffic (1)
Hazards and Hazardous Materials (1)	Utilities and Service Systems (1)
Hydrology and Water Quality (1)	

Note: Impacts associated with the surface disturbance necessary to realign/reposition TSPs are discussed in Section 3.0 of this document.

These additional impacts are discussed below.

2.2.3.1 Aesthetics

The relocation of the subtransmission line at the "Tap" location would result in minor additional aesthetics-related impacts in the area. The "Tap" location is not adjacent to or visible from a designated scenic highway, and no additional light or glare would be associated with the relocated TSPs in this area. Sensitive receptors with views of this location are Michael D. Antonovich (MDA) Open Space trail users, who are considered to have high sensitivity levels and low levels of viewer exposure, and motorists on I-5, who are considered to have low sensitivity levels and high levels of viewer exposure.

The realignment of the subtransmission line at the "Tap" location would result in a net reduction of one subtransmission structure—four existing LSTs and one H frame structure would be replaced with four TSPs. Three of the TSPs would be located proximate to the LSTs that would be removed; one TSP would be located higher on the hillside than the LST it replaces. This TSP would be more visible to viewers both in the MDA Open Space and along I-5, as it would be silhouetted against the sky to a greater extent than the existing LST structure in the vicinity. The other TSPs to be installed in the "Tap" area would be installed proximate to the structures they replace, and thus would have the same potential impacts as described in the ACTR FEIR. On balance, the incremental change in tower height, type, and spacing would not substantially degrade from the existing character or quality of view, and would result in only a very minor change from the current visual conditions. Therefore, these changes would not result in additional impacts beyond what was analyzed in the FEIR.

2.3 Re-route the Subtransmission Line West of the Sunshine Canyon landfill

Due to difficult terrain and restricted access to existing pole locations along the existing tower line route in Segment C west of the Sunshine Canyon Landfill, SCE proposes to relocate a short portion of the subtransmission line in the vicinity of TSPs 39, 40, and 41. This minor re-route would deviate from the existing alignment for approximately 950 feet in length, and would require SCE to obtain a new ROW. TSPs 39, 40, and 41 would be installed offset approximately 35 - 85 feet north of the existing alignment in which Towers M14-T2, -T3 and -T4 are installed (see Figure 2.3-1). Realigning the subtransmission line in this area would provide for improved access for TSP construction and ongoing maintenance, and would result in a smaller disturbance area. The location of the new alignment would require a new easement from the County of Los Angeles, which is also the landowner associated with the easement in which the existing towers are located.

2.3.1 Land Disturbance

Relocating TSPs 39, 40, and 41 will result in a reduction of the areas both temporarily and permanently disturbed as part of the project. These TSPs will be relocated to areas closer to the existing access road, resulting in the following benefits:

- TSP 39. This TSP will be relocated to the end of an existing spur road, thus eliminating the need to extend the spur road to the previously-proposed installation site.

- TSP 40. This TSP will be relocated to the end of an existing spur road, thus eliminating the need to extend the spur road to the previously-proposed installation site.
- TSP 41. This TSP will be relocated adjacent to the existing access road in the area, eliminating the need for grading along the spur road and the need to develop a crane pad at the installation site.

For the sake of simplicity, surface disturbance-related impacts are addressed in Section 3.0 of this document (Subtransmission Access and Spur Road Civil Engineering Scope Update). Therefore, this analysis focuses on assessing the potential additional impacts of relocating TSPs 39, 40, and 41.

2.3.2 Construction Equipment and Workforce

The construction equipment and workforce that would be used to accomplish the relocation of TSPs 39, 40, and 41 would be identical to those presented in the FEIR for the ACTR Project.

2.3.3 Evaluation of Potential Environmental Impacts

The assessment of potential impacts associated with the construction activities necessary to reroute the subtransmission line west of the Sunshine Canyon landfill have been characterized according to the following threshold levels:

1. Result in no impacts additional to those contained in the FEIR
2. Result in a less than significant impact additional to those contained in the FEIR
3. Result in a significant impact additional to those contained in the FEIR
4. Result in reduced (beneficial) impacts compared to those described in the ACTR Project FEIR.

These impacts are summarized by resource area below:

Aesthetics (1)	Land Use and Planning (1)
Agriculture and Forestry Resources (1)	Minerals (1)
Air Quality (1)	Noise (1)
Biological Resources (2)	Population and Housing (1)
Cultural Resources (1)	Public Services (1)
Geology and Soils (1)	Recreation (1)
Greenhouse Gases (1)	Transportation and Traffic (1)
Hazards and Hazardous Materials (1)	Utilities and Service Systems (1)
Hydrology and Water Quality (1)	

Note: Impacts associated with the surface disturbance necessary to realign/reposition TSPs are discussed in Section 3.0 of this document.

2.3.3.1 Biology

As described above, the minor relocation of TSPs 39, 40, and 41 results in a reduction in the area of impact by moving the construction closer to the existing roads. It is anticipated that two oak trees will require canopy trimming that may exceed 25% of the existing canopy. These

impacts may be avoidable during construction, but are included here to understand potential impacts and are included in the totals described in Section 4.3.3.1. This scope change and the modified location of these TSPs does not significantly change the anticipated impacts to oak trees or other ecological resources and is consistent with the Less Than Significant finding of the FEIR.

3.0 Subtransmission Access and Spur Road Civil Engineering Scope Update

Several sections of the FEIR discuss the subtransmission line access road scope, including Section 2.2.10 (Access Roads), Section 2.3.10.1 (Siting for Final Engineering), Section 2.3.10.3 (Tubular Steel Pole Installation/Grading, Laydown Areas and Crane Pads), and Section 2.3.12 (Access Road Construction).

Specifically, Section 2.2.10 (Access Roads) states that access roads to existing subtransmission line structures 50, 51, and 52 and others would be widened as needed, and refers to Appendix D (66 kV Subtransmission Line Reconductoring Routes, Existing Structures and Vegetation Communities). In addition, Section 2.2.10 (Access Roads) also states that new 18-foot-wide access roads would be required along the subtransmission reconductoring routes, where new structures would be installed and no structure is currently present. In addition, this section discusses the construction of one crossing and/or culvert near a location where a drainage channel has formed across an existing access road near structures 27, 28, and 29 and refers to Figure 2-12 (Access Road Modification and Drainage Near Structures 27 and 28).

Section 2.3.10.1 (Siting for Final Engineering) states that determinations of road location curvature, cuts and fills, grades and drainage, and necessary erosion controls would be made in accordance with design standards and best management practices and/or landowner requirements.

Section 2.3.12 (Access Road Construction) states that stormwater/erosion control devices such as wet crossings, water bars, over-side drains, and pipe culverts would be installed to allow for construction traffic usage as well as prevent road damage due to uncontrolled water flow. Further, this section mentions that slides, washouts, and slope failures would be repaired and stabilized by installing retaining walls or other means necessary to prevent future failures. In addition, Section 2.13.12 states that construction roads across areas that are not required for maintenance access would be restored after construction is completed. Section 2.3.10.3 (Tubular Steel Pole Installation) states that cranes would be used for installation of TSPs, and that if the terrain is not suitable to support crane activities, a temporary 50- by 50-foot (0.06-acre) crane pad would be constructed.

SCE's updated access road scope (presented in Table 3.0-1) will be consistent with the portion of FEIR Section 2.2.10 (Access Roads) that states that existing access roads will be widened as needed, and new 18-foot-wide access roads would be required along the subtransmission reconductoring routes where new structures would be installed where no structure was previously present. SCE's updated scope deviates from FEIR Section 2.2.10 (Access Roads) in that instead of just one crossing and/or culvert as discussed in this section, SCE proposes to install a number of the features as presented in Appendix B.

Table 3.0-1 Subtransmission Access and Spur Road Civil Engineering: Crosswalk of Original Scope and Update Scope

Original Scope	Updated Scope
Access roads to existing 66 kV subtransmission line structures 50, 51, and 52 and others would be widened as needed. (2.2.10, Access Roads)	Due to tower removals, roads would be widened or upgraded at TSPs 21, 24, 39, 40, and 41. See the mapsets in the Habitat Assessment (Attachment C to the PFM) for a visual representation of where access roads would be widened.
New 18-foot-wide access roads would be required along the 66 kV reconductoring routes where new structures would be installed where no structure was previously present. (2.2.10, Access Roads)	See the mapsets in the Habitat Assessment (Attachment C to the PFM) for a visual representation of where previously proposed access roads would be widened.
Install one hardened crossing and/or culvert in access road near structures 27, 28, and 29.	See Appendix B to this document for details of the features to be installed as part of the updated scope.
Drainage structures such as wet crossings, water bars, over-side drains, and pipe culverts would be installed to allow for construction traffic usage as well as prevent road damage due to uncontrolled water flow. (2.3.12, Access Road Construction)	See Appendix B to this document for details of the stormwater/erosion control devices to be installed as part of the updated scope.
Slides, washouts, and slope failures would be repaired and stabilized by installing retaining walls or other means necessary to prevent future failures. (2.3.12, Access Road Construction)	See Appendix B to this document for details of the features to be installed as part of the updated scope.
Notes: The numbering of structures differs between the original scope and the updated scope because several TSPs have been removed from the updated scope.	

SCE's proposed access road scope of work is consistent with Section 2.3.12 (Access Road Construction) in that stormwater/erosion control devices will be installed to allow for construction traffic usage as well as prevent road damage due to uncontrolled water flow. SCE would install permanent road improvements along the existing access roads (including water bars, McCarthy or "Mac" drains, soil cement berms, overside drains, downdrains, culverts, etc.) as described in Appendix B to this document). [1]

In addition, as noted in Section 2.3.12 (Access Road Construction), SCE would repair or stabilize existing access roads by installing up to 40 retaining walls at up to 20 locations. Three different types of retaining walls may be installed: gabion walls, Hilfiker-type walls, or soldier pile walls. Gabion and Hilfiker-type walls are constructed largely from natural materials: gabion walls utilize boulders and cobbles contained in wire mesh cubes, and Hilfiker-type walls use wire mesh to stabilize native soils. A soldier pile wall is constructed of structural steel columns (e.g., I-beams) either driven into the ground or placed in pre-drilled holes. Steel sheeting is then placed between the structural steel columns in the spaces in the I-beams to retain the earth behind the wall. Any soldier pile wall installed by SCE as part of the ACTR Project would be stained or painted a dull color approximating the color of the soil found in the area immediately surrounding the soldier pile wall.

SCE's proposed access road scope of work is consistent with Section 2.3.10.3 (Tubular Steel Pole Installation) in that cranes would be used for installation of TSPs, and that if the terrain is not suitable to support crane activities, a temporary 50- by 50-foot (0.06-acre) (approximate size) crane pad would be constructed.

[1] SCE is installing BMPs (McCarthy drains/energy dissipaters) in areas where surrounding runoff is creating erosion along the roadway that presents potential safety hazards for both construction as well as long term O&M/access activities. While runoff is evident, these watershed areas are too small to allow for the establishment of defined bed or bank, characteristic of jurisdictional waters.

Most features shown in Appendix B are for minor storm water management to prevent erosion of the roads, with the exception of 5 culverts (1 proposed, and 4 existing) and one McCarthy drain, which convey jurisdictional waters.

An energy dissipater is a mesh wire basket filled with rocks, also known as a gabion basket, for the purpose of slowing the water flow to reduce its energy and erosion capacity. Other erosion control devices incorporate these energy dissipaters.

A 'drainage crossing' is also referred to as a 'storm water crossing' and is a hardened crossing in the dirt access road that allows minor storm water to cross the road without eroding it. Most of the storm water crossings for the project are concrete v-ditches (V-shaped cross section, with the flowline at the bottom of the V), but they may also comprise gabion baskets flush with the road, across the path of the storm water runoff, rather than a v-ditch.

3.1 Land Disturbance

Section 2.3.2.1 of the FEIR (Additional Environmental Analysis) notes:

> "During final engineering for the proposed project, areas in addition to the identified project areas may be determined to be required, especially for the 66 kV subtransmission line reconductoring and fiber optic telecommunications cable installation project components. If additional areas are required for the proposed project that may result in land disturbance other than that identified in Table 2-6 and other than that which would occur in the locations identified by text and on the figures documented by this EIR, additional environmental analysis may be required."

As shown in Table 2-6 in the FEIR, no permanent or temporary areas of habitat disturbance were assumed for the "66 kV Subtransmission Line Reconductoring Access" component of the project. The permanent and temporary habitat disturbance associated with the updated scope of this component affects approximately 32.9 acres. The temporary and permanent impact areas are presented in Table 3.1-1 below; disturbance areas are presented in figures in the Habitat Assessment document (Attachment C to the PFM).

Table 3.1-1 Subtransmission Access and Spur Road Habitat Disturbance, Updated Scope

ACTR Project, SCE Project Components, Additional Scope Features—Habitat Disturbance	Permanent Disturbance	Temporary Disturbance	Total Disturbance
Access Roads and Related Features, Remove existing subtransmission structures (57 removals), and Install TSPs (48 installations)	11.7	23.5	35.2
Notes: Disturbance associated with the establishment of stringing sites was assumed and assessed in the FEIR, and so is not captured here. As stated in Sections 2.1.1, 2.2.1, 2.3.1, and 2.4.1 of this document, all habitat disturbances associated with the subtransmission line components of the scope update (installation of TSPs, removal of existing structures, rehabilitating/constructing access roads and related features) are included in this table.			

As shown in Table 4.3.1, the updated civil engineering scope represents a considerable reduction in the temporary habitat disturbance area associated with the project: the FEIR assessed temporary impacts of 60.4 acres, and the revised civil engineering scope has reduced this to 23.5 acres, a reduction of 36.9 acres. The permanent habitat disturbance area has increased from 4.6 acres in the FEIR to 11.7 acres as a result of the addition of impacts associated with constructing/rehabilitating access roads (no acres of permanent or temporary habitat disturbances were included in the FEIR for access roads).

3.2 Construction Equipment and Workforce

The construction equipment and workforce data as presented in Table 3.7-5 of the PEA, and as analyzed in the FEIR, is presented in Table 3.2-1 below. The construction equipment and workforce associated with the updated scope is presented in Table 3.2-2 below.

Table 3.2-1 Construction Equipment and Workforce, Original Scope

WORK ACTIVITY				ACTIVITY PRODUCTION			
Primary Equipment Description	**Estimated Horse-Power**	**Probable Fuel Type**	**Primary Equipment Quantity**	**Estimated Workforce**	**Estimated Schedule (Days)**	**Duration of Use (Hours/Day)**	**Total to be Installed**
Roads and Landing Work				**5**	**35**		**10 Miles and 73 pads**
1-Ton Crew Cab, 4x4	300	Diesel	2		35	2	0.5 miles/day and 5 structure pads/day
Road Grader	350	Diesel	1		35	4	
Water Truck	350	Diesel	2		35	8	
Backhoe/Front Loader	350	Diesel	1		35	6	
Drum Type Compactor	250	Diesel	1		35	4	
Track Type Dozer	350	Diesel	1		35	6	
Excavator	300	Diesel	1		18	6	
Lowboy Truck/Trailer	500	Diesel	1		18	2	

Table 3.2-2 Construction Equipment and Workforce, Updated Scope

WORK ACTIVITY				ACTIVITY PRODUCTION			
Primary Equipment Description	**Estimated Horse-Power**	**Probable Fuel Type**	**Primary Equipment Quantity**	**Estimated Workforce**	**Estimated Schedule (Days)**	**Duration of Use (Hours/Day)**	**Total to be Installed**
Roads and Landing Work				**5**	**20**		**5 Miles and 48 Pads**
1-Ton Crew Cab, 4x4	300	Diesel	2		20	2	0.5 miles/day and 5 structure pads/day
Road Grader	350	Diesel	1		20	4	
Water Truck	350	Diesel	2		20	8	
Backhoe/Front Loader	350	Diesel	1		20	6	
Drum Type Compactor	250	Diesel	1		20	4	
Track Type Dozer	350	Diesel	1		20	6	
Excavator	300	Diesel	1		10	6	
Lowboy Truck/Trailer	500	Diesel	1		10	2	
Retaining Wall Structures				**12**	**150**		**40 Walls (~3,000 linear feet)**
1-Ton Truck, 4x4	300	Gas	2		150	8	2 linear feet/day
Boom Truck	350	Diesel	2		150	8	
Tracked Drill Rig	250	Diesel	2		150	8	
Rubber Tire Backhoe	125	Diesel	2		150	8	
Wheel Loader	250	Diesel	2		150	8	
Dump Truck	350	Diesel	4		150	8	
Water Truck	300	Diesel	2		150	10	
Concrete Redi-Mix Truck	350	Diesel	6		75	4	
1-Ton Truck, 4x4	300	Gas	2		150	8	
Boom Truck	350	Diesel	2		150	8	

3.3 Evaluation of Potential Environmental Impacts

The assessment of potential impacts associated with the construction activities necessary to construct/rehabilitate the subtransmission access roads and related features as described above have been characterized according to the following threshold levels:

1. Result in no impacts additional to those contained in the FEIR
2. Result in a less than significant impact additional to those contained in the FEIR
3. Result in a significant impact additional to those contained in the FEIR
4. Result in reduced (beneficial) impacts compared to those described in the ACTR Project FEIR.

These impacts are summarized by resource area below:

Aesthetics (2)	Land Use and Planning (1)
Agriculture and Forestry Resources (1)	Minerals (1)
Air Quality (2)	Noise (1)
Biological Resources (2)	Population and Housing (1)
Cultural Resources (2)	Public Services (1)
Geology and Soils (2)	Recreation (1)
Greenhouse Gases (2)	Transportation and Traffic (2)
Hazards and Hazardous Materials (2)	Utilities and Service Systems (1)
Hydrology and Water Quality (2)	

3.3.1 Aesthetics

Construction/rehabilitation of the subtransmission line access roads and related features (e.g., retaining walls) and the continued maintenance of those roads during operations would result in additional visual impacts not assessed in the FEIR. The existing visual setting in the vicinity of the access roads is as described for Telecommunications Route #1 in Section 4.1.1 of the FEIR.

During construction, impacts would result from the presence of heavy equipment, materials, and work crews along the access roads, as well as from the presence of freshly-graded access roads and work areas. Aesthetics-related impacts would be greatest during and immediately following construction/rehabilitation activities, as the roadbed would be newly graded and vegetation-free, and vegetation along the sides of the roads would have been trimmed/removed as necessary, and thus would not provide visual screening.

Construction activities would take place over an approximately 18-month period; however, the duration of construction at individual construction locations would be considerably shorter, lasting from days to perhaps two weeks at any site. To varying degrees, construction activity could be seen by local residents, motorists, and recreational users.

The rehabilitated and new access roads and related features would be visible from open space areas, from a small number of residences, and from local roadways, including an eligible scenic highway. At present, no retaining walls are planned to be installed within 100’ horizontally or

vertically of a ridgeline as identified in the City of Santa Clarita's ridgeline preservation zoning overlay classification (City of Santa Clarita Ordinance 17.38.070).

The retaining walls that may be installed at TSPs 39, 40, and 43 could be visible from locations within the Michael D. Antonovich Open Space Preserve. The retaining walls that may be installed at TSP 14, between TSPs 19 and 21, and at TSPs 24, 25, 26, 29, and 30 could be viewable from open space areas (specifically from the Santa Clarita Woodlands Park and Michael D. Antonovich Open Space Preserve), a small number or residences in a single residential area, and from Interstate 5 (I-5). The views of these retaining walls from existing trails in open space areas would be at a considerable distance (greater than one-half mile), and the views would also include I-5 and existing non-project related infrastructure along the I-5 corridor. The types and dimensions of the retaining walls that may be installed are presented in Appendix B to this document.

The aesthetic impacts associated with access roads and related features would be greatest immediately following construction. As time elapses after construction, the visibility of the retaining walls would be lessened as vegetation regrows throughout the project area blocking retaining wall faces and as the surfaces of the retaining walls weather. In addition, all retaining walls installed by SCE would be constructed from natural materials or local soils, or would be painted or stained to approximate the color of the soil in the immediate vicinity of the wall.

During operations, the visual impact of the new/rehabilitated access roads and related features would diminish as vegetation regrows along the edges of access roads, as vegetation colonizes the faces of the retaining walls, and as the road surfaces weather; these would serve to either screen the access roads (as they are screened in the current environment) or to visually break up the outlines of the features.

Therefore, because the visual change from current conditions would be minor (access roads are currently found along the subtransmission line route, and thus are part of the existing visual condition; because retaining walls would be constructed from natural materials or local soils, or colored); because the duration and frequency of the views of access roads and retaining walls from the eligible scenic highway would be short and low, respectively, due to the small size of these structures, the movement of the viewers, and the existing topography and vegetation; because the viewing distances in some cases are large; and due to topographic screening in the area, the aesthetic impacts associated with the retaining walls would be less than significant during construction and operation. The retaining walls would not substantially damage any scenic resources and would not substantially degrade the existing visual character or quality of the site and its surroundings, and thus would be consistent with the findings presented in the FEIR.

3.3.2 Air Quality

The civil engineering-related scope update would generate additional emissions during construction activities; emissions generated during operations activities would be equivalent to those emissions currently generated during operation of the subtransmission lines and telecommunications lines in the project area, and thus are not discussed further in this section. Calculations of emissions generated during construction of the updated civil engineering scope (rehabilitation/construction of access roads and related features) are presented in Appendix A.

None of the work associated with the updated civil engineering scope would occur in Ventura County.

Construction emissions from the updated scope would be temporary and would represent a small fraction of the regional emission inventory included in the South Coast Air Quality Management District (SCAQMD) 2007 Air Quality Management Plan (AQMP). Thus, the temporary emissions generated during construction of the updated scope would not contribute substantially to the region's emission budget. In addition, the construction equipment for the proposed project would be operated in compliance with applicable local, state, and federal regulations mandating reductions in emissions as outlined in the plans and related SIP. Therefore, project emissions would be consistent with the 2007 SCAQMD AQMP, and impacts would be less than significant.

Construction activities associated with the updated scope would generate emissions of pollutants for which the project region is designated as "nonattainment." The emissions produced would include the ozone precursors NO_x, and ROG. As shown in Appendix A, these additional emissions are minor, and thus the individual impact from the scope update would be less than significant.

Construction of the updated civil engineering scope would occur within 100 feet of residences; these residences are the same for which impacts were analyzed in the FEIR. However, given that construction activities at these locations would be transient and would impact specific locations for only limited durations (e.g., no more than one week to accomplish the civil engineering-related work at any given site), long-term impacts would not occur, and impacts would be less than significant.

Construction of the updated civil engineering scope would occur within 100 feet of residences; these residences are the same for which impacts were analyzed in the FEIR. Exhaust from construction equipment and vehicles may temporarily create odors from the combustion of fuel. However, the level of emissions would likely not cause a perceptible odor to a substantial number of people, as the majority of the updated civil engineering scope would be conducted away from residences. Odors generated by diesel exhaust would be reduced by the use of either low-sulfur or ultra-low sulfur fuel, as required under California law. Accordingly, any perceptible odors would be temporary during construction activities, and impacts would be less than significant. Because the same receptors as identified in the FEIR would potentially be affected, the revised scope project is consistent with the issues analyzed and the conclusions presented in the FEIR.

3.3.3 Biological Resources

These discussions are excerpted from the May 2014 Habitat Assessment (ARCADIS, 2014) performed for the SCE components of the ACTR Project; this Habitat Assessment was based on April 29, 2014 plans, and is provided as Attachment C to the PFM. The full content of the Habitat Assessment is not repeated herein, and more detailed analysis of all ecological issues is provided in the Habitat Assessment. Please refer to figures in the Habitat Assessment for visual representations of the locations of vegetation types and sensitive biological resources referenced in this section.

3.3.3.1 Special Status Species and Habitat

No state or federally listed threatened or endangered species were observed in the project area during the ARCADIS 2014 surveys. A total of 10 sensitive wildlife species were observed or have been reported in the Project area: eight avian species and two reptiles. The eight avian species are: Cooper's hawk, Swainson's hawk, golden eagle, turkey vulture, oak titmouse, olive-sided flycatcher, Hutton's vireo, and western meadowlark. Of these, none are listed as state or federally threatened or endangered species. The two reptile species are the coast horned lizard (*Phrynosoma blainvillii*) and the silvery legless lizard (*Anniella pulchra pulchra*). Of the 10 sensitive species, five are considered California species of concern (CSC): Cooper's hawk, nesting oak titmouse, olive-sided flycatcher, the coast horned lizard, and the silvery legless lizard. An additional five avian species are categorized as sensitive bird species in Los Angeles County (Western Tanager 2009): Swainson's hawk, golden eagle, turkey vulture, Hutton's vireo, and western meadowlark.

A total of six sensitive plant taxa were observed or have been reported in the Project area. Of these, none are listed as state or federally threatened or endangered species. These six plant taxa all have rare plant ranks provided by California Native Plant Society (CNPS). Two taxa have a rare plant rank of 1B.2, plants that are fairly rare, threatened, or endangered in California and elsewhere: slender mariposa lily and Santa Susanna tarplant. Three taxa have a rare plant rank of 4.2, plants that are uncommon and fairly endangered in California that are on a watch list: Plummer's mariposa lily, Palmer's grappling hook, and Southern California black walnut. One taxon has a rare plant rank of 4.3, a plant of limited distribution in California that is on a watch list: club-haired mariposa lily.

Expected direct impacts associated with the project involve the loss of scattered individual native plants, including slender mariposa lily, club-haired mariposa lily, and Southern California black walnut from permanent disturbance areas. In addition, direct impacts include the loss of open foraging ground for wildlife and loss of fossorial wildlife species present during clearing.

ARCADIS mapped and characterized individual oak trees throughout the project area to establish a baseline from which to quantify project impacts. More than 600 oak trees with a diameter at breast height of 8 inches (20 cm) or greater were mapped in the general project area including work areas and surrounding buffer areas for construction and associated access roads. Of the mapped oak trees, approximately 85 trees may require trimming of greater than 25% of the canopy or complete removal. Of these, 33 trees occur within permanent impact areas and 52 occur within temporary impact areas. Additional trees may require limited pruning, limbing, or foliage trimming to allow vehicle access, but with less than 25% trimming of an individual oak tree canopy during one growing season. SCE has identified numerous opportunities to reduce the impacts to individual oak trees, particularly along access roads and in temporary disturbance areas. However, the feasibility of the specific avoidance measures are dependent on subtle field conditions such as the actual location of an individual tree relative to a particular activity and the topography at that location to determine if measures such as protective plates can be employed to protect root zones. Similarly, the impact assessment includes oak canopies that encroach in the specified 14-foot vertical clearance zone needed by construction equipment. In some cases, the equipment may be able to drive around the overhanging canopy or at least minimize the area to be pruned, reducing the impact to less that 25% of the canopy. The feasibility of this and other protection measures will be determined

during construction based on the specific location, equipment, and activity that will occur, to ensure that all work is conducted safely and that impacts are avoided and minimized to the maximum extent feasible. For purposes of environmental review, SCE is using the conservative estimate of 85 impacted trees, though it is anticipated that the actual number of impacted oak trees will be lower.

As stated in the FEIR: "To avoid impacts, MM BR-15 would require that oak trees with a trunk of 8 inches in diameter at 4.5 feet be replaced in kind at a 5:1 ratio and that a qualified arborist evaluate all oak trees affected by the proposed project." With implementation of MM BR-15, the project would not conflict with a local policy or ordinance protecting oak trees, and there would be no additional impact as a result of the scope update. The relevant and applicable local policies and ordinances associated with oak trees are presented in Section 4.4.2.4 of the FEIR, and the mitigation follows MM BR-15 for regulatory compliance.[2]

California walnut woodland and southern mixed evergreen forests occur commonly throughout the region. These vegetation communities and the site specific observations are detailed in the Habitat Assessment for the ACTR SCE Project Components (Attachment C to the PFM). Within the project area, there are approximately 10.3 acres of walnut woodland and 17.4 acres of southern mixed evergreen forest. The impacts to these vegetation types from the SCE project components are small relative to the acreage within the project area and very small relative to the cover of these vegetation types in the surrounding area. Moreover, the impacts occur in areas of temporary disturbance only. The impact to CA walnut woodland (0.3 acre) represents approximately 2.9% of the walnut woodland in the project area. The impact to southern mixed evergreen forest (0.1 acre) represents approximately 0.5% of mixed evergreen forest in the project area. The project activities are anticipated to affect a small area of each vegetation type relative to the amount of comparable habitat in the project area and in the surrounding area. Because the impacts occur in the temporary disturbance areas, it is anticipated that the actual impacts will generally be limited to individual trees and portions of the mapped areas where temporary project activities occur. Given this, the impact would be less than significant.

Anticipated impacts to all habitat types based on current disturbance envelopes are contained in the Habitat Assessment. As presented in Table 4.3-1, a reduction of 45.3 acres of temporary habitat disturbance area has been realized as a result of the scope update: temporary habitat disturbance areas have been reduced from 68.8 acres in the original scope to 23.5 acres in the updated scope. The area of permanent habitat disturbance has increased, however, by 4.8 acres: this is attributable to the fact that the FEIR did not include any acreage associated with the rehabilitation of existing access roads or the construction of new access or spur roads, or the rehabilitation/construction of related features such as catch basins, retaining walls, and the like.

Although impacts will include relatively small areas of the sensitive habitats described in the biological studies as a result of construction activities, plant and wildlife species diversity and richness are not expected to be reduced as a result of the project. Implementation of the impact

[2] SCE and SCG are in the process of seeking changes to the requirements of MM-BR-15 and APM-BR-4 through the Petition For Modification (PFM) process. If approved, the updated requirements in the PFM will supersede those currently in the FEIR.

avoidance, minimization, and mitigation measures is expected to result in avoidance of long-term significant impacts to biotic resources and ecological functions.

Collectively, the additional impacts to sensitive species or habitats described in the biological studies associated with the updated access road civil engineering scope, with implementation of relevant APMs and MMs included in the FEIR, would not result in a change to the significance assessments described in the ACTR Project FEIR.

3.3.3.2 Riparian Habitat and other Sensitive Natural Communities

No riparian woodland occurs directly in Project disturbance areas, although this vegetation occurs immediately adjacent to disturbance areas in one or more locations; this vegetation represents a sensitive habitat type. No riparian scrub or coast live oak riparian forest occurs directly in Project disturbance areas, and thus there would be no direct impacts to these communities. Indirect impacts such as noise, lighting, and increased human activity would be minimized and would be of short term duration.

The site does not support perennial water features, however, some of the ephemeral drainages are likely to be considered as jurisdictional Waters of the United States pursuant to the definitions of the federal Clean Water Act. As such, any dredge or fill activities below the Ordinary High Water Mark (OHWM) would be regulated by the Army Corps of Engineers (Corps) under Section 404 of the Clean Water Act, and by the California Regional Water Quality Control Board (RWQCB) under Section 401 of the Clean Water Act (Water Quality Certification). The OHWM is defined in the Corps 1987 Wetlands Delineation Manual as: “That line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural lines impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.”

As described in the findings summarized in the U.S. Army Corps of Engineers and U.S. Environmental Protection Agency joint guidance document for Clean Water Act jurisdictional determinations (Clean Water Act Jurisdiction, June 5, 2007, U.S. EPA and the Corps), the drainages on the Site can be described as “Non-navigable tributaries that are not relatively permanent” and as such, would be subject to federal jurisdiction based on a fact-specific analysis by the Corps to determine whether they have a significant biological, chemical or physical nexus with a traditional navigable water. Further consideration of the regulatory standing of these drainages is being addressed by SCE with the Corps through Section 404 permitting pursuant to the Clean Water Act. During the federal review, consultation will occur with the US Fish and Wildlife Service and the National Marine Fisheries Service to ensure full compliance with the Endangered Species Act (ESA).

In general, the drainages support a defined bed and bank and meet the CDFW definition of a jurisdictional Water of the State. Section 1602 of the California Fish and Game Code (Lake and Streambed Alteration Program) charges CDFW with executing Streambed Alteration Agreements. Pursuant to the program, “an entity may not substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake…” The CDFW specifies that Fish and Game Code Section 1602 applies to all perennial, intermittent,

and ephemeral rivers, streams, and lakes in the state. The regulatory definition of a stream is a body of water that flows at least periodically or intermittently through a bed or channel that has banks and supports fish or other aquatic life. This includes watercourses with a surface or sub-surface flow that supports or has supported riparian vegetation. The area of the under state jurisdiction is defined as the area from top-of-bank to top-of-bank or the outer limit of riparian vegetation, whichever is greater.

The project work in jurisdictional waters is limited to short duration activities, primarily replacing or improving existing road crossings, and includes measures to protect water quality during construction (BMPs). The project is not expected to result in increased sediment loading or other water quality degradation during construction or operation.

The following points of concentration (POCs) are included in the application packages for state and federal jurisdictional permitting:

Drainage 1—POC 9: Improvements to an existing surface wet crossing/McCarthy drain at (earthen) access road crossing.

- Note: POC 8 is a corrugated metal pipe (CMP) cross culvert, under the access road that will be replaced. The new outlet from this replacement culvert will result in minor impacts to the jurisdictional area of Drainage 1, and will also require permit authorization.

Drainage 2—POC 11: Replacement of existing CMP crossing.

Drainage 3—POC 12.1 & 12.2: Road access, potential culvert extension(s).

Drainage 4—POC 13 & 14: Crossing reconstruction and road improvements.

Drainage 5—POC 17: Replacement of existing culvert to improve access and safety.

Further details can be found in the Hydrology and Hydraulics Study conducted for the project (see Attachment D to the PFM).

Project-related disturbances to Waters of the US, Waters of the State, and the associated riparian resources require assessment and potentially permit approval by all three of the agencies noted above. It also should be noted that the presence of designated critical habitat for the coastal California gnatcatcher overlaying the drainages, may require additional consideration under Section 7 of the federal ESA if impacts are permitted for jurisdictional waters regulated by the Corps, a federal agency. The issuance of a federal permit also requires consideration of Section 106 of the National Historic Preservation Act (NHPA). Both the ESA and NHPA consultations would be led by the Corps.

The disturbance area within features anticipated to be considered Waters of the State and/or Waters of the U.S. are provided below:

0.4 acres (0.2 ha) - Waters of the State – Permanent Impacts

0.5 acres (0.2 ha) – Waters of the State – Temporary Impacts

0.0 acres – Waters of the US – Permanent Impacts

0.1 acres (0.04 ha) – Waters of the US – Temporary Impacts

The FEIR reported that construction of the project could result in impacts on five potentially federally protected waters and noted that a formal wetland delineation had not yet been conducted. The FEIR provided an estimate of impacts to potentially jurisdictional waters for one project element (reengineering of the access road between subtransmission line structures 27 and 28). The FEIR estimated 0.06 acres of temporary impacts and 0.008 acres of permanent impacts to potentially jurisdictional federal waters. SCE anticipates applying for and receiving a Section 404 Nationwide Permit 12 from the U.S. Army Corps of Engineers, a Section 401 Water Quality Certification from the Los Angeles Regional Water Quality Control Board, and a Section 1602 Streambed Alteration Agreement from the California Department of Fish and Wildlife prior to conducting work in these areas. The FEIR estimated impacts to approximately 1.8 acres of southern mixed riparian forest, potentially constituting jurisdictional waters of the state. The FEIR noted that areas of ground disturbance along the 66 kV subtransmission line and telecommunications route #2 had not yet been determined. These areas of ground disturbance have now been identified, and no impacts to southern mixed riparian forest will occur.

Prior to and during construction in riparian areas or wetlands, SCE will implement all applicable APMs and MMs contained in the FEIR. By implementing the relevant APMs and MMs, and by complying with the terms and conditions of state and federal permits and/or authorizations for work in riparian areas or wetlands, impacts would be less than significant. These impacts to riparian areas or wetlands associated with the updated access road civil engineering scope, alone or in combination with the other scope updates described in this document, would not result in a change to the relevant significance assessment described in the ACTR Project FEIR.

3.3.4 Cultural Resources

The additional grading and earthwork associated with the construction and use of subtransmission access and spur roads and related features in the updated civil engineering scope have the potential for additional impacts to archaeological and paleontological resources. Surveys for archaeological and paleontological resources have been conducted in the revised scope work areas and the detailed findings are provided under separate cover (PaleoSolutions, 2014). No new sensitive archaeological or paleontological resources have been identified within the limits of disturbance. All applicable APMs and MMs contained in the FEIR would be implemented. As presented in the FEIR and based on surveys conducted in the revised scope areas, implementation of these APMs and MMs would result in less than significant impacts to cultural resources.

3.3.5 Geology and Soils

Section 4.6.2.1 (Storage Field, 66 kilovolt Subtransmission Line Segments A, B, and C), and Telecommunications Route #1) describes the existing environment in the vicinity of the existing and new subtransmission access roads and related features.

Pursuant to APM GE-1, SCE is conducting a geotechnical investigation along the access road alignment; this will generate information on the potential for rupture of a known earthquake fault, would identify potential threats due to seismic ground shaking and measures to reduce these threats; would identify potential threats due to liquefaction; would identify potential threats due to landslides; and would identify unstable geologic or soil units (primarily those susceptible to liquefaction and landslides, as expansive and collapsible soils are not anticipated along the access roads, nor is subsidence). This investigation would enable site-specific design criteria to reduce any potential impacts during construction and operation.

Rehabilitation of existing access roads, developing new roads, and installing related features (e.g., retaining walls) will require an increase in surface disturbances; accordingly, the potential for soil erosion as a result of the updated scope is greater than as assessed in the FEIR. However, SCE will implement APM GE-2, APM AQ-3, and MM BR-5; and will implement erosion control measures included in the Project construction SWPPP; and will obtain, and comply with the conditions of, all necessary and applicable grading permits. With the implementation of the measures identified above, geology and soils impacts associated with the construction and use of the access roads and related structures would be less than significant.

3.3.6 Greenhouse Gas Emissions

The rehabilitation of existing access roads/construction of new access roads and related features, and the updated civil engineering scope would result in an increase in greenhouse gas (GHG) emissions. As seen in Appendix A, these emissions are below the SCAQMD interim GHG significance threshold of 10,000 metric tons of CO_2 equivalent ($MTCO_2e$) per year, and thus would result in less than significant impacts. Because these GHG emissions would fall well below the interim numerical thresholds of significance, the Project would not conflict with any applicable plan, policy, or regulation, and thus would not result in an impact beyond what was analyzed in the FEIR.

3.3.7 Hazards and Hazardous Materials

The rehabilitation of existing access roads/construction of new access roads and related features, and the updated civil engineering scope, represent additional use of construction equipment and other vehicles beyond the number of vehicles and pieces of construction equipment used in the analysis in the FEIR. However, these additional uses are not considerably different from those uses assessed in the FEIR, and the types of potential impacts are identical to those identified in the FEIR. During the rehabilitation of existing access roads/construction of new access roads and related features, and during the execution of the updated civil engineering scope, SCE would implement the relevant APMs and MMs contained in the FEIR, would implement the best management practices listed in SCE's construction SWPPP and SCE's SPCC plan(s), and would comply with its standard operating procedures. Therefore, the additional activities included in the updated scope would present only less than significant impacts for any of the hazards and hazardous materials criteria.

3.3.8 Hydrology and Water Quality

The rehabilitation of existing access roads/construction of new access roads and related features, and the updated civil engineering scope represent additional use of construction equipment and other vehicles beyond that assessed in the FEIR that could potentially result in runoff or other issues affecting water quality. However, the additional use is not considerably different from that assessed in the FEIR.

SCE would utilize the findings of the Hydrology and Hydraulics Study conducted for the project in the design and implementation of stormwater/erosion control devices that will ameliorate impacts to hydrology and water quality (see Attachment D to the PFM). The stormwater/erosion control devices included in Appendix B to this document are designed to provide safe access along existing access roads, including across existing jurisdictional drainage features. The jurisdictional drainage crossings (culverts), as well as other proposed erosion control measures (e.g., cross culverts, water bars, Mac drains, gabion mattresses, energy dissipaters) are intended to convey and maintain existing flows and drainage patters, and to protect existing access roads without creating diversions, impoundments, and to ensure that surface water flows do not result in erosion or impacts to water quality.

SCE would implement the relevant APMs and MMs contained in the FEIR, implement the best management practices listed in SCE's construction Stormwater Pollution Prevention Plan and SCE's Spill Prevention Control, and Countermeasure plan(s), apply for coverage of construction activities under the General Construction Activity National Pollutant Discharge Elimination System Storm Water Permit, and would implement its standard operating procedures and BMPs. Therefore, the additional activities included in the updated scope would result in less than significant impacts with mitigation.

3.3.9 Transportation and Traffic

The rehabilitation of existing access roads/construction of new access roads and related features, and the updated civil engineering scope represent additional use of construction equipment and other vehicles beyond that assessed in the FEIR; this updated scope activity will require additional workforce (and personal vehicle trips) and would require the on- and off-site movement of up to 40 dump trucks per day.[3] In addition, the updated scope would require the transportation of additional off-road construction vehicles to the access road construction locations; most of this additional equipment would be transported over public roads once as it is moved to the access road system, with transport from the project site at the end of the work period. As a result, this additional off-road construction equipment would have an insignificant additional effect on the circulation system, and is not discussed further.

The personal vehicle trips associated with the additional workforce for the revised scope activities and the movement of a maximum of 40 dump trucks per day would have a nominal additional impact to the circulation system in the project area.[4] There are numerous points of ingress to, and egress from, the access road network, and thus the additional vehicle traffic

[3] Note that the emissions from these additional vehicle movements are captured in Appendix A to this document.
[4] Exported soil hauled by these dump trucks would be disposed of at a permitted offsite disposal site.

would be dispersed across the project area. In addition, much of the vehicle traffic would occur during non-peak hours. Therefore, the additional vehicle traffic would not result in a significant impact at any of the study area intersections. No additional vehicle traffic during the operations phase would be required as a result of the access road scope update activities.

SCE would implement APM TT-1, preparation of a Traffic Control Plan, and APM TT-3, preparation of a commuter plan, during construction. These measures would ensure that the additional vehicle traffic does not result in the project conflicting with applicable congestion management programs. The FEIR adequately addresses potential increased hazards due to design features, as well as issues related to emergency access and conflicts with public transit, bicycle, and pedestrian facilities.

In summary, the additional activities included in the updated scope would result in less than significant impacts.

4.0 Summary of Potential Environmental Impacts

The potential environmental impacts that could result from each of the updated scope items associated with the SCE components of the Aliso Canyon Turbine Replacement Project are presented in Sections 2 and 3 above. The potential environmental impacts that could result from all of the updated scope items, combined and in conjunction with the original scope assessed in the FEIR, are assessed in this section.

As presented in the preceding sections, the updated scope activities would result in no or very limited additional impacts to the following resource areas:

- Agriculture and Forestry Resources
- Land Use and Planning
- Minerals
- Noise
- Population and Housing
- Public Services
- Recreation
- Utilities and Service Systems

Therefore, these resource areas are not further discussed in this section.

The updated scope activities would result in new or modified impacts to the following resource areas:

- Aesthetics
- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Greenhouse Gases
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Transportation and Traffic

These new impacts are discussed in the following sections.

4.1 Aesthetics

As presented in Sections 2.2.3.1, 2.4.3.1, and 4.3 above, the updated scope activities would result in additional, individually minimal impacts to visual resources in the project area.

Impact AE-1: Substantial adverse effect on a scenic vista.
FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

The potential effects on scenic vistas from the updated civil engineering scope (as presented in Section 3.3) and the realignment of the subtransmission line at the "Tap" are described in Sections 2.2.3.1, and 3.3.1. As described in these Sections, the updated scope activities would individually have negligible additional effects on the scenic vistas in the project area.

The FEIR notes that development in these areas already exists, that work on the subtransmission line would not occur at any single location for extended periods of time, and that all construction activity would be temporary, and therefore the short-term impacts would not be significant. These same attributes apply to the rehabilitation/construction of access roads and related features. The access road-related work and subtransmission structure-related construction would occur in series across the project area, and consequently, the effects on a scenic vista addressed in Sections 2.2.3.1 and 3.3.1 would not be additive or cumulative. Therefore, there would be no combined construction-related impacts under this criterion, and the updated scope activities would not change the less than significant assessment described in the FEIR.

The re-aligned TSPs and rehabilitated/constructed access roads and related features would be visible in the environment in the long-term. At present, electrical infrastructure and access roads are visible in the area and in the scenic vistas found in the vicinity of the "Tap". The FEIR notes that the installation of TSPs in the area of the "Tap" would "not substantially degrade from the existing character or quality of views" in the area due to the past and current presence of similar infrastructure (LSTs) in the area. Similarly, the civil engineering updated scope would not introduce new features into the area, and thus would not substantially degrade the existing character or quality of views. Therefore, during operations, these two scope updates combined would not introduce new features, and would not degrade the scenic vistas in the area, and thus the updated scope activities would not change the less than significant assessment described in the FEIR.

Impact AE-2: Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State Scenic Highway.

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

As presented in the discussions for Impact AE-1 and Impact AE-3, the updated civil engineering scope (as presented in Section 3.3) and the realignment of the subtransmission line at the "Tap" location would not degrade the existing visual character or quality of the area, and would not have a substantial effect on a scenic vista. As presented in Section 3.3.1, retaining walls along the section of I-5 identified as an "Eligible State Scenic Highway—Not Officially Designated" between Pico Canyon Road in the north and the I-5/SR-14 interchange in the south may be visible from this section of I-5. As stated in Table 4.1-1 of the FEIR, the sensitivity of viewers on I-5 is low. Additionally, the duration and frequency of the views of retaining walls would be short and low, respectively, due to the small size of these structures, the movement of the viewers, and the existing topography and vegetation. All retaining walls installed by SCE would be constructed from natural materials or local soils, or would be painted or stained to approximate the color of the soil in the immediate vicinity of the wall, and thus would blend with the surroundings rather than strongly contrast.

As a result of these factors, the visual change from current conditions would be minor, and thus the scope change activities would not substantially damage any scenic resources. Therefore, the combined impacts under this criterion would be less than significant, and would not change the less than significant assessment contained in the FEIR.

Impact AE-3: Substantially degrade the existing visual character or quality of the site and its surroundings.

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

The additional impacts realized from the updated civil engineering scope and the realignment of the subtransmission line at the "Tap" location would occur in the same geographic area, and work at different sites in this geographic area would be visible concurrently to some viewers. In this area, the existing visual resource would be modified by: the rehabilitation/construction of access roads and related features, and work areas, adjacent to structure sites; the removal of existing LSTs; and the installation of TSPs. The greatest combined visual impact would be realized during construction and the period immediately after; as vegetation regrows along the access roads and related features and bordering the permanently-disturbed areas adjacent to each of the TSPs, it would screen some of these features from viewers, reducing the apparent change to the visual resource of the area.

As stated for Impact AE-1 above, the access road-related work and subtransmission structure-related construction would occur in series in any specific location, but work at several locations may be visible in a single geographic area; thus the effects on the visual character and quality of the site may be additive or cumulative. Also as stated for Impact AE-1, during operations, these two scope updates combined would not introduce any new features to the area, and thus would not substantially degrade the existing visual character of the area. Therefore, the combined impacts under this criterion would be less than significant, and would not change the less than significant assessment contained in the FEIR.

Impact AE-4: Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

The realignment of the subtransmission line at the 'Tap' location and rehabilitation/construction of access roads and related features would not introduce any new source of substantial light or glare beyond that assessed in the FEIR; retaining walls are constructed of natural materials and local soils; metal components of retaining walls would be dulled, and painted or stained, and thus would not be reflective. The realigned TSPs installed in this area, like all other TSPs, would have a de-glared hot dipped galvanized finish, and all conductors would be non-specular, and would not be a source of glare. Therefore, the combined impacts under this criterion would be less than significant, and would not change the less than significant assessment described in the FEIR.

4.2 Air Quality

The scope change discussed in Section 3.0 above present new emissions of air pollutants: the emissions associated with the updated civil engineering scope (rehabilitating/constructing access roads and related features) discussed in Section 3.3.2 are presented in Appendix B. These emissions are assessed below using the criteria from the FEIR.

Note that the emissions presented in the following discussions were calculated for a greater number of scope change activities than are presented in this document; the scheduling and intensity of the scope change activities described in this document have not been modified from the time the air emissions were calculated. Therefore, these emissions are conservative, and overestimate the actual additional emissions associated with the scope change activities presented in this document. However, the overestimation of emissions would not change any of the AQ CEQA criteria determinations as presented in the FEIR and as discussed below.

Emissions associated with the operation of the updated scope would be the same as those assessed in the FEIR, and therefore operational emissions are not discussed further.

Impact AQ-1: Conflict with/obstruct implementation of SCAQMD or VCAPCD air quality plan.

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

As stated in Section 4.3.4.2 of the FEIR, construction emissions from the original scope would be temporary and would represent a small fraction of the regional emission inventory included in the South Coast Air Quality Management District (SCAQMD) 2007 Air Quality Management Plan (AQMP), and thus the temporary emissions generated during construction of the original scope would not contribute substantially to the region's emission budget. Further, the FEIR notes that the construction equipment for the proposed project would be operated in compliance with applicable local, state, and federal regulations mandating reductions in emissions as outlined in the plan and related SIP. The FEIR concludes that

> "Project emissions would be consistent with the SCAQMD's 2007 AQMP and would not conflict with or obstruct implementation of the plan. Therefore, impacts under this criterion that would be associated with project components constructed in Los Angeles County would be less than significant without mitigation under this criterion."

Similarly, and as presented in Section 3.3.2 above, the construction emissions from the updated scope would be temporary, would represent a small fraction of the regional emission inventory included in the SCAQMD 2007 AQMP, and thus would not contribute substantially to the region's emission budget. As presented in the FEIR, the construction equipment would be operated in compliance with applicable local, state, and federal regulations mandating reductions in emissions as outlined in the plan and related SIP.

Therefore, because less than significant impacts were assessed for the construction emissions associated with the original scope; because the combined emissions would represent a small fraction of the regional emission inventory included in the SCAQMD 2007 AQMP; because the temporary emissions generated during construction of the original scope and the updated scope would not contribute substantially to the region's emission budget; and because the construction equipment used for both the original scope and updated scope would be operated in compliance with applicable local, state, and federal regulations mandating reductions in emissions as outlined in the plan and related SIP, the combined emissions would be consistent with the SCAQMD 2007 AQMP and would not conflict with or obstruct implementation of the plan, and thus less than significant combined impacts would occur under this criterion.

Impact AQ-2: Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

As stated in Section 4.3.4.2 of the FEIR, SCAQMD has developed an LST methodology that may be applied in the analysis of localized impacts associated with the proposed project in the South Coast Air Basin. The LST methodology was used to assess the significance of impacts caused by emissions of NO_x, CO, PM_{10}, and $PM_{2.5}$ during project construction. SCAQMD guidance includes LST levels that would indicate whether daily emissions for proposed construction activities could result in significant localized air quality impacts. If project daily emissions are less than the corresponding Localized Significant Threshold (LST) level, then those emissions would not violate any air quality standard or contribute substantially to an existing or projected air quality violation.

The LST analyses presented in the FEIR indicate that the impacts of emissions of NO_x, CO, PM_{10}, and $PM_{2.5}$ during construction would be less than applicable LST levels. Thus, emissions generated during construction activities are not expected to violate or contribute substantially to an existing or projected air quality violation.

Table 4.2-1 below presents the results of LST analyses conducted for the updated scope construction activities. As show in the table, emissions of NO_x, CO, PM_{10}, and $PM_{2.5}$ during construction would be less than applicable LST levels. Thus, neither the original scope nor the updated scope emissions generated during construction activities are expected to violate or

contribute substantially to an existing or projected air quality violation, and a less than significant impact would be expected under this criterion.

Table 4.2-1 LST Analysis Results

	Maximum Daily Onsite Emissions (pounds/day)				LST Level for Construction (pounds/day)			
Construction Activity	**CO**	**NO_x**	**$PM1_0$**	**$PM_{2.5}$**	**CO**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**
66 kV Subtransmission Line	30	87	3.48	2.96	590	114	4	3
Telecommunications	19	60	2.32	2.10	590	114	4	3

Impact AQ-3: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment.

FEIR Assessment: LESS THAN SIGNIFICANT WITH MITIGATION
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT WITH MITIGATION

As stated in Section 4.3.4.2 of the FEIR, construction activities associated with the original scope would generate emissions of pollutants for which the proposed project region is designated as "nonattainment." The emissions produced would include the ozone precursors NOx, and ROG. As shown in Table 4.3-5 of the FEIR, daily construction emissions of NOx and ROG would exceed the applicable SCAQMD thresholds. To mitigate this significant impact, MM AQ-1, MM AQ-2, and MM AQ-3 would be implemented. The FEIR concludes that "[w]ith the implementation of MMs AQ-1, AQ-2, and AQ-3, the short-term impacts associated with project construction would be less than significant under this criterion."

Construction activities associated with the updated scope activities would also generate emissions of the same pollutants for which the project region is designated as "nonattainment." These emissions would occur during Scenarios 4, 5 and 6 as described in the FEIR. Table 4.2-2 presents the additional emissions associated with the updated scope activities.

Table 4.2-2 Peak Daily Construction Emissions

	Peak Daily Construction Emissions (pounds/day)					
Scenario	CO (lb/day)	NO_x (lb/day)	ROG (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	SO_x (lb/day)
4	68	215	22	8	7	0.27
5	122	358	44	17	13	0.52
6	75	220	25	9	8	0.27

Since the original scope exceeded the applicable SCAQMD thresholds, the combined emissions from the original scope and the updated scope would also exceed the applicable SCAQMD thresholds. To mitigate this significant impact, MM AQ-1, MM AQ-2, and MM AQ-3 would be implemented. Implementation of these mitigation measures would be sufficient to reduce the significant impact characterized in the FEIR to a level of "Less than Significant with Mitigation."

Similarly, implementation of these mitigation measures to the combined emissions would reduce this significant impact to a level of Less than Significant with Mitigation.

Impact AQ-4: Exposure of sensitive receptors to substantial pollutant concentrations.
FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

As presented in Section 4.3.4.2 of the FEIR, impacts under this criterion would be less than significant because construction activities would either be conducted at a significant distance from sensitive receptors, or because construction activities would be transient and would impact specific locations for only limited durations.

As presented in Section 3.3.2 above, construction of the updated civil engineering scope would occur within 100 feet of residences; these are the same residences and potentially sensitive receptors identified in the FEIR. However, given that construction activities at these locations would be transient and would impact specific locations for only limited durations (e.g., no more than one week to accomplish the civil engineering-related work at any given site), long-term impacts would not occur, and impacts would be less than significant.

At any given location, the updated civil engineering scope activities would not occur at the same time as those activities assessed in the FEIR; therefore, there would be no combined increase in pollutant concentrations. The updated civil engineering scope activities and some activities assessed in the FEIR could occur in series at any given location (e.g., construction of a new access road under the updated scope followed by installation of a TSP under the original scope). However, these combined activities conducted in series would have a limited duration of only a few weeks at any given location. Therefore, less than significant impacts would be anticipated under this criterion for the combined scope of activities.

Impact AQ-5: Creation of objectionable odors affecting a substantial number of people.
FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

As presented in Section 4.3.4.2 of the FEIR, exhaust from construction equipment and vehicles may temporarily create odors from the combustion of fuel. However, the level of emissions would likely not cause a perceptible odor to a substantial number of people, and thus less than significant impacts would be realized under this criterion. This is similarly stated in Section 3.3.2 for the updated civil engineering scope activities.

At any given location, the updated civil engineering scope activities would not occur at the same time as those activities assessed in the FEIR; therefore, there would be no combined increase in emissions or objectionable odors. The updated civil engineering scope activities and some activities assessed in the FEIR could occur in series at any given location (e.g., construction of a new access road under the updated scope followed by installation of a TSP under the original scope). However, these combined activities conducted in series would have a limited duration of only a few weeks at any given location. Therefore, less than significant impacts would be anticipated under this criterion for the combined scope of activities.

4.3 Biological Resources

FEIR Assessment: LESS THAN SIGNIFICANT or LESS THAN SIGNIFICANT with MITIGATION
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT with MITIGATION

The potential impacts to biological resources associated with the updated civil engineering scope activities are presented in Section 3.3.3 for the individual revised scope project components; total disturbance areas assessed in the FEIR for the original scope and the current disturbance areas reflecting the updated scope are presented in Table 4.3-1.

The project includes robust measures to avoid and minimize impacts to ecological resources including detailed baseline surveys, preconstruction reconnaissance surveys, specialized construction monitoring, seasonal special protection measures (e.g., nesting bird protection measures), and delineation of all work areas.

As presented in Table 4.3-1, the refinement of the civil engineering scope (including the areas necessary for installation of the TSPs, removal of existing structures, and stringing conductor; and the rehabilitation/construction of access roads and related features) has resulted in a considerable decrease in the temporary habitat disturbance area associated with the project: this area has been reduced from 68.8 acres in the original scope to 23.5 acres in the updated scope). The area of permanent habitat disturbance has increased, however, from 6.9 acres in the original scope to 11.7 acres in the updated scope; this is attributable to the fact that the FEIR did not include any acreage associated with the rehabilitation of existing access roads or the construction of new access or spur roads, or the rehabilitation/construction of related features such as catch basin, retaining walls, and the like.

Less than significant impacts (with mitigation for Impacts BR-1, BR-2, BR-3, and BR-5) were determined for the following criteria in the FEIR:

- **Impact BR-1: Substantial adverse direct or indirect effect on special status species.**
- **Impact BR-2: Substantial adverse effect on riparian habitat or other sensitive natural community.**
- **Impact BR-3: Substantial adverse effect on federally protected wetlands.**
- **Impact BR-4: Substantial interference with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impedance of the use of native wildlife nursery sites.**
- **Impact BR-5: Conflict with local policy and ordinance protecting oak trees.**

As detailed in the recently completed Habitat Assessment report (Attachment C to the PFM) and as described herein for each of the revised project scope, the increased impacts for each of the criteria above will individually have less than significant impacts with mitigation. During construction and operation of the project, SCE would implement all applicable and relevant APMs and MMs as presented in the FEIR that supported a finding of Less Than Significant or Less Than Significant with Mitigation for the project's biological resources impacts. Taken collectively, and with the implementation of all applicable and relevant APMs and MMs, the

revised scope as part of the project as a whole would result in less than significant impacts with mitigation for the biological resources criteria as described in the FEIR. Specific analyses for each criteria are provided above in the specific project component analyses.

Table 4.3-1 Permanent and Temporary Habitat Disturbance Areas, Original Scope and Updated Scope

SCE Natural Substation Project—Land Disturbance	Permanent Disturbance (acres)	Temporary Disturbance (acres)	TOTAL Area Disturbed (acres)
Original Scope as Presented in FEIR			
Equipment/Structure Installations within Existing Substations[1]	2.3	0	2.3
66 kV Subtransmission Line Structure Removal[2]	0	29	29
66 kV Subtransmission Line TSPs[3]	4.6	31.4	36
66 kV Subtransmission Line Staging Areas	0	Not Provided	Not Provided
Wire-pulling, Tensioning, and Splicing Sites for 66 kV Subtransmission Line Reconductoring[4]	0	8.4	8.4
66 kV Subtransmission Line Reconductoring Access Roads	Not Provided	Not Provided	Not Provided
Original Scope Total	**6.9**	**68.8**	**75.7**
Updated Scope			
Equipment/Structure Installations within Existing Substations[1]	2.3	0	2.3
66 kV Subtransmission Line Reconductoring Access Roads and Related Features, to include:[6] 66 kV Subtransmission Line Structure Removal 66 kV Subtransmission Line TSPs Wire-pulling, Tensioning, and Splicing Sites for 66 kV Subtransmission Line Reconductoring	9.4	23.5	32.9
66 kV Subtransmission Line Staging Areas	0	Not Provided	Not Provided
Updated Scope Total	**11.7**	**23.5**	**35.2**
Area difference between Original Scope and Updated Scope	**4.8**	**-45.3**	**-40.5**

Notes:
1. These substation areas are already disturbed.
2. Predicated on 64 removal sites with dimensions of 200’ x 100’ each.
3. Predicated on 78 installation sites with dimensions of 200’ x 100’ each.
4. Predicated on 7 stringing sites or 500’ x 100’ each.
5. Source: Southern California Edison Scope Update Report: Aliso Canyon Turbine Replacement Project, February 4, 2014
6. Source: SCE GIS dataset dated July 23, 2014
Access roads and related features may overlap structure removal and TSP installation locations.

4.4 Cultural Resources

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

The individual potential impacts to cultural resources that could result from the updated scope activities are presented above in Sections 2.4.3.2 and 4.3.4. Given the nature of cultural resources, the potential for impact as a result of multiple activities is generally not cumulative or additive.

Less than significant impacts were determined for the following criteria in the FEIR:

- **Impact CR-1: Substantial adverse change in the significance of an historical resource.**
- **Impact CR-2: Substantial adverse change in the significance of an archaeological resource.**
- **Impact CR-3: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.**
- **Impact CR-4: Disturb any human remains, including those interred outside of formal cemeteries.**

During construction and operation of the project, SCE would implement all applicable and relevant APMs and MMs as presented in the FEIR; this will help ensure that all activities of the project, including the updated scope activities, will individually have less than significant impacts for each of the above criterion, and that the project as a whole would have less than significant impacts for each of the cultural resources criterion. Detailed discussions are provided in the sections above for each project component.

4.5 Geology and Soils

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

As presented above, the only scope update activity that may have an additional impact to the geology and soils criteria is the additional rehabilitation/construction of access roads and related features (e.g., retaining walls).

Geological hazards are generally site-specific and depend on localized geologic and soil conditions. The geographic scope of potential geological and soils impacts is limited to the immediate vicinity around each construction and infrastructure site. As a result, such impacts are not typically additive or cumulative in nature.

SCE will, as discussed in the earlier sections, implement APM GE-2, APM AQ-3, and MM BR-5; will implement erosion control measures included in the Project construction SWPPP; and will obtain, and comply with the conditions of, all necessary and applicable grading permits. These measures will be applied to both the original scope in the FEIR and the updated scope activities.

With the implementation of the APMs and MMs identified above, and the implementation of erosion control measures, the impact of the original scope of the project, combined with the impact of the updated scope activities, would be less than significant for the following criterion:

- **Impact GE-1: Expose people or structures to risk of loss, injury, or death involving rupture of a known earthquake fault.**
- **Impact GE-2: Expose people or structures to the risk of loss, injury, or death involving strong seismic ground shaking.**
- **Impact GE-3: Expose people or structures to the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction.**
- **Impact GE-4: Expose people or structures to the risk of loss, injury, or death involving landslides.**
- **Impact GE-5: Result in substantial soil erosion or the loss of topsoil.**
- **Impact GE-6: Located on a geologic unit or soil that is or would become unstable and result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.**
- **Impact GE-7: Located on expansive soil.**

Detailed analysis is provided in the prior sections for each revised scope component.

4.6 Greenhouse Gases

The analysis in this section follows that presented for air emissions above: the emissions associated with the updated civil engineering scope, in combination with the emissions calculated for the original scope, are assessed below using the criterion from the FEIR.

Emissions associated with the operation of the updated scope would be the same as those assessed in the FEIR, and therefore operational emissions are not discussed further.

Impact GHG-1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

As stated in Section 4.7.4.2 of the FEIR, the net GHG emission change associated with the original scope would be less than the SCAQMD interim GHG significance threshold of 10,000 metric tons of CO_2e ($MTCO_2e$) per year, and therefore the proposed project would result in a less than significant impact under this criterion.

As shown in Appendix A, the updated scope would result in temporary emissions of greenhouse gases (GHGs) of 1,523 $MTCO_2e$ (51 $MTCO_2e$/year). Combined, the GHG emissions of the original scope and the updated scope would be less than 10,000 $MTCO_2e$ per year, and therefore would result in a less than significant impact under this criterion.

Impact GHG-2: Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

FEIR Assessment: NO IMPACT
FEIR plus Updated Scope Assessment: NO IMPACT

As stated in Section 4.7.4.2 of the FEIR, the original scope would be consistent with state and local plans and policies adopted for the purpose of reducing GHGs, and therefore no impact would result under this criterion.

The rehabilitation of existing access roads/construction of new access roads and related features would result in the emission of greenhouse gases (GHGs) of 1,523 $MTCO_2e$ (51 $MTCO_2e$/year). These emissions are below the SCAQMD interim GHG significance threshold of 10,000 $MTCO_2e$ per year, and thus would not conflict with any applicable plan, policy, or regulation, and no impacts would occur under this criterion.

Combined, the GHG emissions of the original scope and the updated scope would be less than 10,000 $MTCO_2e$ per year, and thus would not conflict with any applicable plan, policy, or regulation, and no impacts would occur under this criterion.

4.7 Hazards and Hazardous Materials

As presented in Section 3.3.7, the updated scope activities would result in individually less than significant hazards and hazardous materials-related impacts. The cumulative impact of the updated scope and the original scope contained in the FEIR is presented below.

Impact HZ-1: Significant hazard from routine transport, use, or disposal of hazardous materials.

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

Many of the updated scope activities presented above will involve the additional use of vehicles and construction equipment beyond that described and assessed in the FEIR. However, the additional uses are not considerably different from those assessed in the FEIR.

As stated in Section 4.8.4.7 of the FEIR, the impacts during construction and operations would be less than significant because “hazardous materials and wastes would be handled, stored, recycled, and disposed of according to applicable manufacturer specifications as well as local, state, and federal regulations, and in accordance with the best management practices listed in the applicant and SCE’s construction SWPPPs, SPCC plans, and hazardous materials management programs, as well as the applicant’s SWPPP for operations and SCE’s standard operating procedures.” The FEIR further states that the less than significant assessment is based on “implementation of applicable APMs and compliance with federal, state, and local regulations for the management of hazardous materials and the disposal of hazardous waste.”

During execution of the updated scope activities, SCE would implement the relevant APMs contained in the FEIR, would implement the best management practices listed in SCE’s construction SWPPP and SCE’s SPCC plan(s), and would comply with its standard operating procedures. Because implementation of these measures during execution of the original scope was assessed to result in less than significant impacts in the FEIR, implementation of these measures during execution of the updated scope would accordingly result in less than significant impacts under this criterion. Therefore, the combined impacts under this criterion would be less than significant, and would not change the less than significant assessment contained in the FEIR.

Impact HZ-2: Significant hazard from accident conditions involving the release of hazardous materials.

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

The scope update activities would not substantially increase the safety hazards described in the FEIR. Therefore, the combined impacts under this criterion would be less than significant, and would not change the less than significant assessment contained in the FEIR.

Impact HZ-3: Emit hazardous emissions or involve handling hazardous materials, substances or waste within one-quarter mile of an existing or proposed school.

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

The FEIR addresses all of the geographical areas in which the original scope and updated scope activities would occur. Therefore, the updated scope activities would have no additional impact under this criterion, and the less than significant assessment contained in the FEIR would not be altered.

Impact HZ-4: Be located on a site that is included on a list of hazardous materials sites.

FEIR Assessment: LESS THAN SIGNIFICANT with MITIGATION
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT with MITIGATION

No component of the Project contained in the updated scope would be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. The FEIR assessed this criterion as less than significant with the implementation of MM HZ-1; during construction and operations of the updated scope activities, MM HZ-1 would also be implemented. Therefore, the impacts of the updated scope activities would be less than significant with mitigation, and thus the combined impacts under this criterion would be less than significant with mitigation, and the updated scope activities would not change the less than significant assessment contained in the FEIR.

Impact HZ-5: Safety hazards for people residing or working in the project component areas that are within the area of an airport land use plan or within 2 miles of an airport.

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

None of the scope update activities would increase the safety hazards described in the FEIR. Therefore, the combined impacts under this criterion would be less than significant, and would not change the less than significant assessment described in the FEIR.

Impact HZ-6: Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

The assessment of impacts under this criterion in the FEIR includes the types and intensities of activities described in this scope update document. The scope changes assessed herein would not individually or cumulatively result in a substantial change in the impact level compared to that assessed in the FEIR. Therefore, there would be no change to the impact assessment of less than significant described in the FEIR.

Impact HZ-7: Expose people or structures to a significant risk involving wildland fires.

FEIR Assessment: LESS THAN SIGNIFICANT with MITIGATION
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT with MITIGATION

The assessment of impacts under this criterion in the FEIR includes the types and intensities of activities described in this scope update document. The scope changes assessed herein would not individually or cumulatively result in a substantial change in the impact level compared to that assessed in the FEIR. Therefore, there would be no change to the impact assessment of less than significant described in the FEIR.

4.8 Hydrology and Water Quality

Impact HY-1: Violate water quality standards or waste discharge requirements.

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

As stated in Section 4.9.4.2 of the FEIR:

> "Implementation of construction permits and the project APMs listed above, as well as construction SWPPPs, SPCC plans, and BMPs would reduce potentially significant impacts associated with construction-related erosion, sedimentation, and introduction of hazardous materials or toxic substances. Therefore, impacts under this criterion would be less than significant."

As discussed above in this document, these measures would also be implemented during the updated scope activities. Therefore, the combined impacts under this criterion would be less than significant, and would not change the less than significant assessment contained in the FEIR.

Impact HY-2: Substantial depletion of groundwater supplies or substantial interference with groundwater recharge.

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

The assessment of impacts under this criterion in the FEIR includes the types and intensities of activities described in this scope update document. The scope changes assessed herein would not individually or cumulatively result in a substantial change in the impact level compared to that assessed in the FEIR. Therefore, there would be no change to the impact assessment level of less than significant described in the FEIR.

Impact HY-3: Substantial alteration of the existing drainage pattern of the site or area.

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

Of the updated scope activities described in this document, the only activity that would alter the existing drainage pattern of an area is the rehabilitation/construction of access roads and related features. As presented above in Section 3.3.8, the scope changes assessed herein would not individually or cumulatively result in a substantial change in the impact level compared to that assessed in the FEIR. These impacts would be less than significant with implementation of the relevant APMS and MMs contained in the FEIR and implementation of SCE's standard operating procedures and BMPs.

As presented in Section 4.9.4.2 of the FEIR, "Implementation of the BMPs under the SWPPP, along with MM BR-5, APM AQ-3, and APM GE-2 would reduce any potential impacts associated with substantial erosion or siltation to less than significant." Similarly, the implementation of these measures during execution of the updated scope would also result in less than significant impacts under this criterion. Therefore, the combined impacts under this criterion would be less than significant, and would not change the less than significant assessment contained in the FEIR.

Impact HY-4: Substantial alteration of the existing drainage pattern or rate or amount of surface runoff in a manner which would result in flooding.

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

The assessment of impacts under this criterion in the FEIR includes the types and intensities of activities described in this scope update document. The scope changes assessed herein would not individually or cumulatively result in a substantial change in the impact level compared to that assessed in the FEIR. Therefore, there would be no change to the impact assessment of less than significant described in the FEIR.

Impact HY-5: Create or contribute to runoff water exceeding the capacity of existing or planned storm water drainage systems, or provide substantial additional sources of polluted runoff.

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

The assessment of impacts under this criterion in the FEIR includes the types and intensities of activities described in this scope update document. The scope changes assessed herein would not individually or cumulatively result in a substantial change in the impact level compared to that assessed in the FEIR. Therefore, there would be no change to the impact assessment of less than significant described in the FEIR.

Impact HY-6: Other substantial degradation of water quality.

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

The scope update activities would not present a potential source of degradation of water quality beyond those discussed above. As stated in the FEIR, “Implementation of the SWPPP and the SPCC plans would reduce the potential for impacts on water quality associated with both project construction and operations to a less-than-significant level.” This would hold similarly true for the scope update activities, during which the SWPPP and SPCC plans would also be implemented. Therefore, the combined impacts under this criterion would be less than significant, and would not change the less than significant assessment contained in the FEIR.

Impact HY-7: Project structures would impede or redirect flood flows within a 100-year flood hazard area.

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

The scope update activities would not result in the installation of any additional structures that could impede or redirect flood flows beyond those structures accounted for and assessed in the FEIR. Therefore, the combined impacts under this criterion would be less than significant, and would not change the less than significant assessment contained in the FEIR.

Impact HY-8: Risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow.

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

None of the infrastructure proposed in the updated scope activities is located in an area susceptible to seiche or tsunami. As presented in the FEIR, SCE would complete geotechnical studies and would employ measures recommended in the geotechnical studies during construction to address potential impacts related to geological instability (APM GE-1) and would implement erosion and sediment control measures per APM GE-2. Additionally, the applicant would implement the project-specific SWPPP, which would further reduce the potential for mudflows in these areas by reducing impacts to natural runoff patterns. As presented in the

previous sections, these measures would also be implemented for the updated scope activities; in addition, the updated scope activities propose the installation of fewer subtransmission structures in areas where mudflows could occur, thus lessening the number of structures that could be affected. With the implementation of the above measures, the combined impacts under this criterion would be less than significant, and would not change the less than significant assessment contained in the FEIR.

Impact HY-9: Risk of loss, injury or death involving flooding.

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

The assessment of impacts under this criterion in the FEIR includes the types of activities described in this scope update document. The scope changes assessed herein would not individually or cumulatively result in a substantial change in the impact level compared to that assessed in the FEIR. Therefore, there would be no change to the impact assessment of less than significant described in the FEIR.

4.9 Transportation and Traffic

As presented in Section 3.3.9, the updated scope activities would result in individually less than significant impacts to traffic and transportation in the project area. The cumulative impact of the updated scope and the original scope contained in the FEIR is presented below.

Impact TT-1: Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and nonmotorized travel and relevant components of the circulation system including, but not limited to, intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

As presented in the sections above, the updated scope activities would, individually, result in less than significant impacts under this criterion. The updated scope activities and those activities assessed in the FEIR would occur over a wide geographic area and would not likely occur contemporaneously in the same geographic area due to construction scheduling demands and constraints. As a result, the potential impacts associated with the updated scope and the original scope in the FEIR would be unlikely to overlap in either time or space, and thus the impacts would not be additive. Therefore, there would be no change to the impact assessment of less than significant contained in the FEIR.

Impact TT-2: Conflict with an applicable congestion management program including, but not limited to, LOS standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

As presented in the sections above, the updated scope activities would, individually, result in less than significant impacts under this criterion. The updated scope activities and those activities assessed in the FEIR would occur over a wide geographic area and would not likely occur contemporaneously in the same geographic area due to construction scheduling demands and constraints. As a result, the potential impacts associated with the updated scope and the original scope in the FEIR would be unlikely to overlap in either time or space, and thus the impacts would not be additive. Therefore, there would be no change to the impact assessment of less than significant contained in the FEIR.

Impact TT-3: Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

The assessment of impacts under this criterion in the FEIR includes the types of activities described in this scope update document. The scope changes assessed herein would not individually or cumulatively result in a substantial change in the impact level compared to that assessed in the FEIR. Therefore, there would be no change to the impact assessment of less than significant described in the FEIR.

Impact TT-4: Result in inadequate emergency access.

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

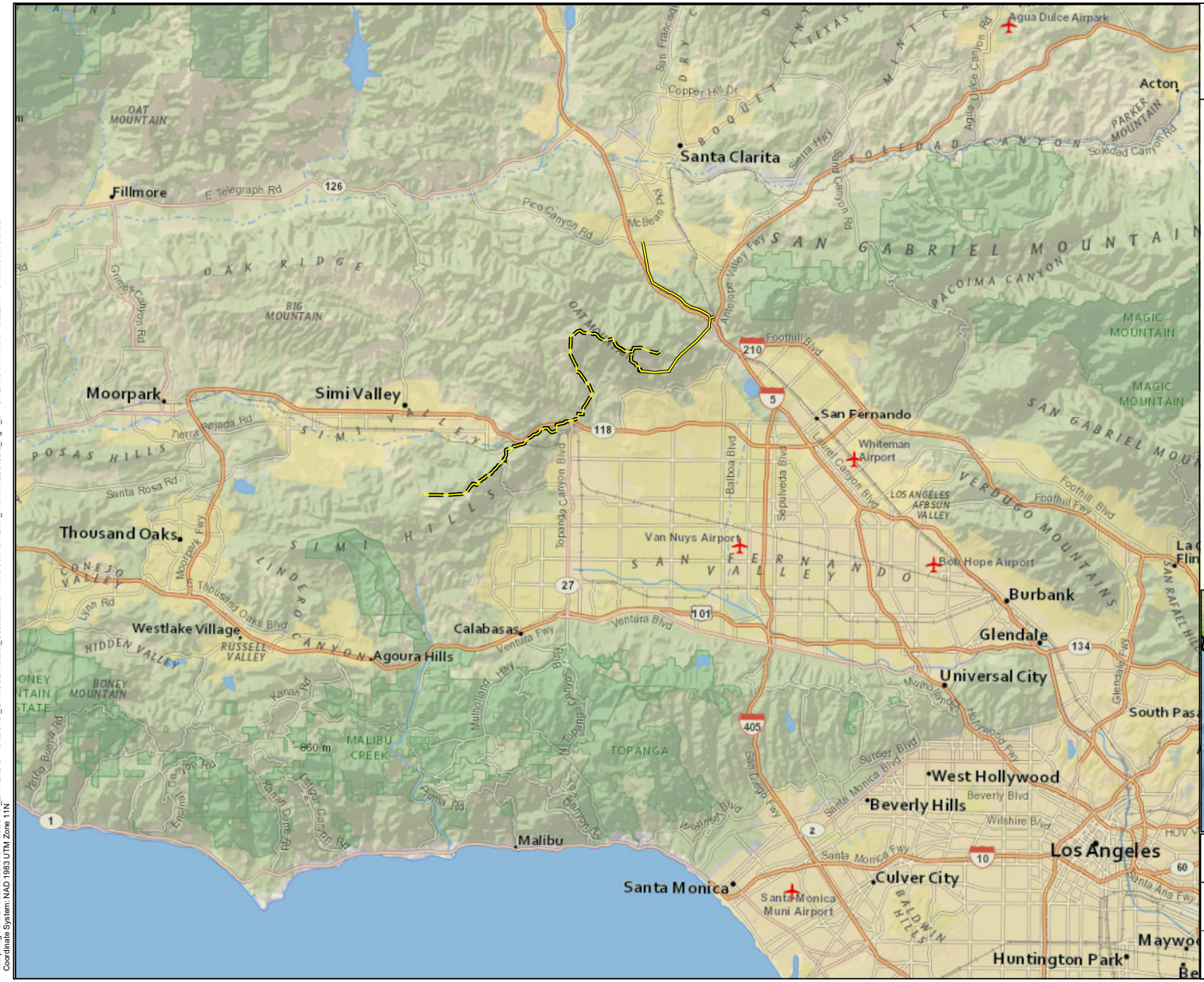
The updated scope activities would be conducted largely on non-public SCE access roads or on substation properties; work that would be executed along public roadways or elsewhere that could impact emergency access was previously described and assessed in the FEIR. The scope update work not assessed in the FEIR would take place largely on non-public roads and on SCE owned substation properties; the access roads may be used by emergency responders. SCE would coordinate with local authorities regarding appropriate procedures to ensure that any access road blockages are temporary and intermittent and that the roads remain available for use in case of emergency; therefore, those activities would have no impact on emergency access. Therefore, the combined impacts under this criterion would be less than significant, and would not change the less than significant assessment contained in the FEIR.

Impact TT-5: Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

FEIR Assessment: LESS THAN SIGNIFICANT
FEIR plus Updated Scope Assessment: LESS THAN SIGNIFICANT

The updated scope activities would be conducted largely on non-public SCE access roads or on substation properties; work that would be executed along public roadways or elsewhere that could impact emergency access was previously described and assessed in the FEIR. The assessment of impacts under this criterion in the FEIR includes the types of activities described in this scope update document. Therefore, there would be no change to the impact assessment of less than significant contained in the FEIR.

Figures



SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

LEGEND
- Newhall-Natural Line
- Natural-Chatsworth Line

0 1 2 3 4 5 10
Miles

MAP SOURCE: ESRI ONLINE NATIONAL GEOGRAPHIC 2014

SCE Natural Substation
Los Angeles County, CA

SITE VICINITY

ARCADIS

FIGURE
1.0-1

\\corpgis\Data\ArcGisData\GISPROJECTS_ENV:Z:\GISPROJECTS_ENV\SCE-Natural_Substation\DATA\GIS\MXD\TEMP_WORKFILES\SCE_Fig 1_0-1 SITE VICINITY.mxd 5/9/2014 DFischer/KPeterson
Coordinate System: NAD 1983 UTM Zone 11N

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

Feature Legend

- Proposed Structures
- Remove Structures
- Existing Route/Original Proposed Alignment
- Updated Scope Proposed Realignment

NOTES:
Aerial photograph: USDA NAIP, dated 8 May 2010
ESRI Online Services: National Geographic

0 50 100 150 200 400 Feet

SCE Natural Substation
Los Angeles County, CA

TAP LOCATION REALIGNMENT
PART 1 OF 2

ARCADIS

FIGURE
2.2-1a

G:\GIS\GIS_Projects\SCE_Natural\Conrad_Work_Request\Figure 2.2-1a Tap Location Realignment 1 of 2.mxd 8/15/2014 PCartier
Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet

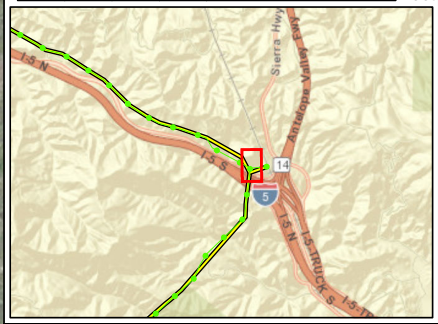
SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

Feature Legend

- Proposed Structures
- Remove Structures
- Existing Route/Original Proposed Alignment
- Updated Scope Proposed Realignment

NOTES:
Aerial photograph: USDA NAIP, dated 8 May 2010
ESRI Online Services: National Geographic

0 50 100 150 200 400 Feet



SCE Natural Substation
Los Angeles County, CA

TAP LOCATION REALIGNMENT
PART 2 OF 2

ARCADIS

FIGURE
2.2-1b

G:\GIS\GIS_Projects\SCE_Natural\Conrad_Work_Request\Figure 2.2-1b Tap Location Realignment 2 of 2.mxd 8/15/2014 PCartier
Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet

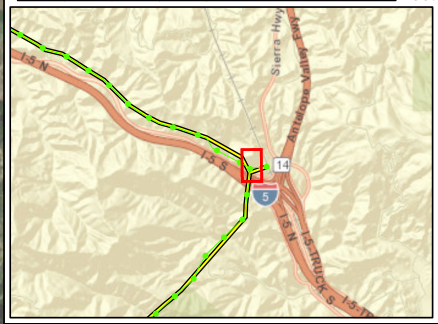
SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

Feature Legend

- Proposed Structures
- Remove Structures
- Existing Route/Original Proposed Alignment
- Updated Scope Proposed Realignment

NOTES:
Aerial photograph: USDA NAIP, dated 8 May 2010
ESRI Online Services: National Geographic

0 50 100 150 200 400 Feet



SCE Natural Substation
Los Angeles County, CA

WEST OF SUNSHINE CANYON REALIGNMENT

ARCADIS

FIGURE
2.3-1

G:\GIS\GIS_Projects\SCE_Natural\Conrad_Work_Request\Figure 2.3-1 West of Sunshine Canyon Realignment.mxd 8/15/2014 PCartier
Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet

Appendix A—Air Quality and Greenhouse Gas Calculation Sheets

Worksheet Index		
Table No.	**Title**	**Comments**
1	Summary of Changes	
2	Peak Daily Emissions	
3	Localized Significance Threshold Analysis	
4	GHG Emissions Summary	
5	Subtransmission Line Remove Existing Towers and Foundations	
5a	Subtransmission Line Remove Existing Towers and Foundations - LST Analysis	
6	Subtransmission Line TSP Footing Installation	
6a	Subtransmission Line TSP Footing Installation - LST Analysis	
7	Subtransmission Line TSP Haul, Assembly, and Erection	
7a	Subtransmission Line TSP Haul, Assembly, and Erection - LST Analysis	
8	Subtransmission Conduit Installation	
8a	Subtransmission Conduit Installation - LST Analysis	
9	Subtransmission Duct Bank Installation	
9a	Subtransmission Duct Bank Installation - LST Analysis	
10	Subtransmission Vault Installation	
10a	Subtransmission Vault Installation - LST Analysis	
11	Subtransmission UG Cable Installation	
11a	Subtransmission UG Cable Installation - LST Analysis	
12	Subtransmission Line Conductor Installation	
13	Telecommunications Line Aboveground Work	
14	Telecommunications Line Underground Work	
15	Telecommunications Line Wood Pole Removal	
16	Telecommunications Line LWC Pole Haul	
17	Telecommunications Line Pole Assembly	
18	Telecommunications Line Install LWS Pole	
19	Access and Spur Road Road and Landing Work	
20	Access and Spur Road Retaining Wall Installation	
21	Offroad Emission Factors	
22	Offroad Emission Factors	
23	Onroad Emission Factors	
24	Motor Vehicle Entrained Road Dust Emission Factors	
25	Fugitive Dust Emission Factors	
26	Peak Daily Subtransmission Line Construction Emissions	
27	Peak Daily Telecommunications Line Construction Emissions	

Table 1
Summary of Changes

Section 3.4: Reconfigure Subtransmisison Line at the San Fernando Substation

		Daily Emissions (lb/day)						GHG Emissions (MT)		
Scope	**Activity**	**ROG**	**CO**	**NO_x**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**Equipment CO2e**	**Motor Vehicle CO2e**	**Total CO2e**
	Subtransmission Line Remove Existing Towers and Foundations	15	55	132	0.15	6	5	7	0.24	7
	Subtransmission Line TSP Footing Installation	19	69	184	0.22	7	7	56	3.54	59
	Subtransmission Line TSP Haul, Assembly, and Erection	15	46	141	0.16	6	5	18	0.48	18
Replaced	Subtransmission Line Conductor Installation	17	48	162	0.19	6	5	7	0.33	7
Scope1	Subtotal	*66*	*217*	*620*	*0.73*	*25*	*22*	*87*	*4.59*	*92*
	Subtransmission Line Remove Existing Towers and Foundations	15	55	132	0.15	6	5	6	0.24	6
	Subtransmission Line TSP Footing Installation	19	69	184	0.22	7	7	35	2.22	37
	Subtransmission Line TSP Haul, Assembly, and Erection	15	46	141	0.16	6	5	11	0.32	11
	Subtransmission Conduit Installation	5	16	44	0.05	2	2	4	0.32	4
	Subtransmission Duct Bank Installation	8	26	71	0.09	3	3	7	0.47	7
	Subtransmission Vault Installation	16	48	153	0.18	6	5	22	0.71	23
	Subtransmission UG Cable Installation	7	24	64	0.08	3	2	3	0.16	3
Updated	Subtransmission Line Conductor Installation	17	48	162	0.19	6	5	7	0.33	7
Scope	Subtotal	*102*	*330*	*952*	*1.13*	*39*	*34*	*94*	*4.76*	*99*
	INCREMENTAL CHANGE	**36**	**113**	**332**	**0.40**	**14**	**12**	**7**	**0.18**	**7**

1 Replaced Scope refers to activities that were included in the previous evaluation and will be replaced by the updated scope.

Section 4.2: Replace Fewer Poles for Telecommunications Routes 2 and 3

		Daily Emissions (lb/day)						GHG Emissions (MT)		
Scope	**Activity**	**ROG**	**CO**	**NO_x**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**Equipment CO2e**	**Motor Vehicle CO2e**	**Total CO2e**
	Subtransmission Line Remove Existing Towers and Foundations	15	55	132	0.15	6	5	3	0.12	1
	Subtransmission Line TSP Footing Installation	19	69	184	0.22	7	7	7	0.33	2
Updated	Subtransmission Line TSP Haul, Assembly, and Erection	15	46	141	0.16	6	5	8	0.65	2
Scope	Subtransmission Conduit Installation	5	16	44	0.05	2	2	11	0.49	9
	INCREMENTAL CHANGE	**55**	**185**	**502**	**0.59**	**21**	**19**	**28**	**1.59**	**29**

Section 4.3: Connect Telecommunications Route 1 into Sunshine Substation

		Daily Emissions (lb/day)						GHG Emissions (MT)		
Scope	**Activity**	**ROG**	**CO**	**NO_x**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**Equipment CO2e**	**Motor Vehicle CO2e**	**Total CO2e**
Updated	Telecommunications Line Aboveground Work	3	8	26	0.03	1	1	2	0.16	3
Scope	Telecommunications Line Belowground Work	3	8	26	0.03	1	1	2	0.16	3
	INCREMENTAL CHANGE	**6**	**16**	**52**	**0.06**	**2**	**2**	**5**	**0.32**	**5**

Section 5.0: Subtransmission Access and Spur Road Civil Engineering

		Daily Emissions (lb/day)						GHG Emissions (MT)		
Scope	**Activity**	**ROG**	**CO**	**NO_x**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**Equipment CO2e**	**Motor Vehicle CO2e**	**Total CO2e**
Replaced	Access and Spur Road Road and Landing Work	12	44	116	0.12	12	5	98	2	100
Scope	Subtotal	*12*	*44*	*116*	*0.12*	*12*	*5*	*98*	*2*	*100*
	Access and Spur Road Road and Landing Work	12	44	116	0.12	12	5	65	1	72
Updated	Access and Spur Road Retaining Wall Installation	22	68	215	0.27	8	7	1468	47	1515
Scope	Subtotal	*34*	*112*	*331*	*0.39*	*21*	*12*	*1533*	*47*	*1580*
	INCREMENTAL CHANGE	**22**	**68**	**215**	**0.27**	**8**	**7**	**1435**	**45**	**1480**

Table 2
Peak Daily Construction Emissions

Scenario[1]	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
4	22	68	215	0.27	8	7
5	36	113	332	0.40	14	12
6	25	75	220	0.27	9	8

[1] Emissions were calculated for seven scenarios in the FEIR. Each scenario includes a combination of construction activities that could occur at the same time.

Scenario 4 Daily Emissions

Scope	Activity	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
	Access and Spur Road Road and Landing Work	12.13	44.40	115.59	0.12	12.37	4.56
	Subtransmission Line Remove Existing Towers and Foundations	15.23	54.51	132.19	0.15	6.06	5.46
	Subtransmission Line TSP Footing Installation	19.15	68.98	184.37	0.22	7.48	6.53
Replaced	*Subtotal*	*46.51*	*167.89*	*432.14*	*0.50*	*25.91*	*16.55*
	Access and Spur Road Road and Landing Work	12.13	44.40	115.59	0.12	12.37	4.56
	Access and Spur Road Retaining Wall Installation	21.85	68.04	215.45	0.27	8.20	7.30
	Subtransmission Line Remove Existing Towers and Foundations	15.23	54.51	132.19	0.15	6.06	5.46
	Subtransmission Line TSP Footing Installation	19.15	68.98	184.37	0.22	7.48	6.53
Updated	*Subtotal*	*68.37*	*235.93*	*647.59*	*0.77*	*34.11*	*23.85*
	INCREMENTAL CHANGE	**21.85**	**68.04**	**215.45**	**0.27**	**8.20**	**7.30**

Scenario 5 Daily Emissions

Scope	Activity	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
	Subtransmission Line TSP Footing Installation	19.15	68.98	184.37	0.22	7.48	6.53
	Subtransmission Line TSP Haul, Assembly, and Erection	15.21	45.72	140.99	0.16	5.76	5.14
Replaced	*Subtotal*	*34.37*	*114.70*	*325.35*	*0.38*	*13.24*	*11.67*
	Subtransmission Line TSP Footing Installation	19.15	68.98	184.37	0.22	7.48	6.53
	Subtransmission Line TSP Haul, Assembly, and Erection	15.21	45.72	140.99	0.16	5.76	5.14
	Subtransmission Conduit Installation	4.98	16.03	44.34	0.05	1.99	1.67
	Subtransmission Duct Bank Installation	7.86	25.55	71.19	0.09	3.00	2.64
	Subtransmission Vault Installation	16.05	48.19	152.86	0.18	5.94	5.35
	Subtransmission UG Cable Installation	6.95	23.54	63.94	0.08	2.69	2.31
Updated	*Subtotal*	*70.20*	*228.01*	*657.70*	*0.78*	*26.86*	*23.64*
	INCREMENTAL CHANGE	**35.84**	**113.31**	**332.34**	**0.40**	**13.62**	**11.97**

Scenario 6 Daily Emissions

Scope	Activity	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
	Subtransmission Line Conductor Installation	16.70	47.64	162.48	0.19	6.08	5.27
Original	*Subtotal*	*16.70*	*47.64*	*162.48*	*0.19*	*6.08*	*5.27*
	Subtransmission Line Conductor Installation	16.70	47.64	162.48	0.19	6.08	5.27
	Telecommunications Line Aboveground Work	2.77	8.20	25.99	0.03	1.02	0.85
	Telecommunications Line Belowground Work	2.77	8.20	25.99	0.03	1.02	0.85
	Telecommunication Wood Pole Removal	6.54	18.68	59.52	0.07	2.32	2.01
	Telecommunication LWC Pole Haul	3.76	10.81	35.70	0.04	1.36	1.17
	Telecommunication Pole Assembly	3.54	11.34	27.86	0.04	1.27	1.01
	Telecommunication Install LWS Pole	5.27	18.10	44.77	0.05	2.17	1.88
Updated	*Subtotal*	*41.35*	*122.97*	*382.31*	*0.46*	*15.24*	*13.05*
	INCREMENTAL CHANGE	**24.65**	**75.33**	**219.83**	**0.27**	**9.16**	**7.78**

Table 3
Localized Significance Threshold Analysis

Construction Activity	Maximum Daily Onsite Emissions (pounds/day)				LST Level for Construction (pounds/day)			
	CO	NOx	PM10	PM2.5	CO	NOx	PM10	PM2.5
66-kV Subtransmission Line	30	87	3.48	2.96	590	114	4	3
Telecommunications	19	60	2.32	2.01	590	114	4	3

LST Analysis for the 66kV
(1 acre site: Nearest Receptor at 25 meters)[1]

	CO	NOx	PM10	PM2.5
Peak Daily Construction Emissions	30.33	86.75	3.48	2.96
NOx and CO LST	***590***	***114***	**--**	**--**
PM10 and PM2.5 Construction LST	**--**	**--**	***4***	***3***
Significant (Yes/No)?	**NO**	**NO**	**NO**	**NO**

1. Receptor distance is within 25 meters of 12 poles to be replaced within the alignment.

LST Analysis for the Telecommunication Line
(1 acre site; Nearest Receptor at 25 meters)

	CO	NOx	PM10	PM2.5
Peak Daily Construction Emissions	18.68	59.52	2.32	2.01
NOx and CO LST	***590***	***114***	**--**	**--**
PM10 and PM2.5 Construction LST	**--**	**--**	***4***	***3***
Significant (Yes/No)?	**NO**	**NO**	**NO**	**NO**

SCAQMD Localized Significance Threshold (LST) Values

	Allowable emissions (lb/day) as a function of receptor distance from Site Boundary														
Pollutant	**1 Acre**					**2 Acre**					**5 Acre**				
Receptor Distance (meters)	**25**	**50**	**100**	**200**	**500**	**25**	**50**	**100**	**200**	**500**	**25**	**50**	**100**	**200**	**500**
CO	590	879	1294	2500	8174	877	1256	1787	3108	8933	1644	2095	2922	4608	11049
NOx	114	115	133	173	273	163	159	172	204	291	246	236	251	275	345
PM_{10} Construction	4	12	25	51	131	6	19	32	59	139	12	38	52	79	161
PM_{10} Operation	1	3	6	13	32	2	5	8	15	34	3	10	13	19	39
$PM_{2.5}$ Construction	3	4	7	18	74	4	5	9	20	80	6	8	13	26	95
$PM_{2.5}$ Operation	1	1	2	5	18	1	2	2	5	20	2	2	3	7	23

Table 4
Construction Greenhouse Gas Emissions

Emissions Summary			
Construction Activity	**CO_2e (MT)[a]**		
	Replaced	**Updated**	**Total**
66 kV Subtransmission Line	92	99	
Telecommunications	0	34	
Access and Spur Road	100	1,581	
INCREMENTAL CHANGE	**191**	**1,714**	**1,523**

	CO_2e (MT)[a]		
Source	**Replaced**	**Updated**	**Total**
Equipment Exhaust	185	1,659	
Motor Vehicle Exhaust	7	55	
INCREMENTAL CHANGE	***191***	**1,714**	**1,523**

Construction Equipment Exhaust - 66kV Subtransmission											
					Replaced Scope			**Updated Scope -**			
Equipment	**Horse-Power**	**Hours/ Day Used**	**Number**	**Days Used**	**CO_2 (MT)[a]**	**CH4 (MT)[a]**	**CO_2e (MT)[a]**	**Days Used**	**CO_2 (MT)[a]**	**CH4 (MT)[a]**	**CO_2e (MT)[a]**
Subtransmission Line Remove Existing Towers and Foundations											
1-Ton Crew Cab, 4x4	300	5	2	2	1.5	0.000	1.51	2	1.5	0.000	1.51
10,000 lb/ Rough Terrain Forklift	200	4	1	2	0.2	0.000	0.20	2	0.2	0.000	0.20
30-Ton Crane	300	6	2	2	1.2	0.000	1.22	2	1.2	0.000	1.22
Compressor Trailer	120	8	2	2	1.2	0.000	1.18	2	1.2	0.000	1.18
Flat Bed Truck/Trailer	350	8	1	2	1.2	0.000	1.21	2	1.2	0.000	1.21
10-cu yd. Dump Truck	350	4	1	2	0.6	0.000	0.61	1	0.3	0.000	0.30
Backhoe/Front Loader	350	4	1	2	0.6	0.000	0.62	1	0.3	0.000	0.31
Subtransmission Line TSP Footing Installation											
1-Ton Crew Cab Flat Bed, 4x4	300	2	4	8	4.8	0.000	4.84	5	3.0	0.000	3.03
30-Ton Crane Truck	300	5	2	8	4.1	0.000	4.08	5	2.5	0.000	2.55
Backhoe	200	8	2	8	5.9	0.001	5.90	5	3.7	0.001	3.69
Auger Truck	500	6	2	8	11.9	0.001	11.88	5	7.4	0.001	7.43
4000 Gallon Water Truck	350	4	2	8	4.8	0.000	4.84	5	3.0	0.000	3.03
10-cu. yd. Dump Truck	350	5	2	8	6.0	0.001	6.05	5	3.8	0.001	3.79
10-cu. yd. Concrete Mixer Truck	425	5	6	8	18.1	0.002	18.16	5	11.3	0.002	11.37
Subtransmission Conduit Installation											
3/4-Ton Pick-up Truck, 4x4	300	5	2					2	1.5	0.000	1.51
1-Ton Crew Cab Flat Bed, 4x4	300	5	2					2	1.5	0.000	1.51
Compressor Trailer	120	5	1					2	0.4	0.000	0.37
80-Ton Rough Terrain Crane	350	6	1					2	0.6	0.000	0.61
Subtransmission Duct Bank Installation											
1-Ton Crew Cab Flat Bed, 4x4	300	4	2					2	1.2	0.000	1.21
Pipe Truck/Trailer	275	6	1					2	0.9	0.000	0.91
Dump Truck	350	6	2					2	1.8	0.000	1.82
Backhoe/Front Loader	125	4	1					2	0.2	0.000	0.19
Compressor Trailer	60	4	1					2	0.1	0.000	0.10
Water Truck	350	4	2					2	0.8	0.000	0.77
Concrete Mixer Truck	350	2	3					2	0.9	0.000	0.91
Lowboy Truck/Trailer	500	4	1					2	0.9	0.000	0.92
Subtransmission Vault Installation											
1-Ton Crew Cab, 4x4	300	8	4					3	7.3	0.001	7.27
Excavator	250	6	2					3	2.6	0.000	2.60
Dump Truck	350	8	2					3	3.6	0.000	3.63
Backhoe/Front Loader	125	4	1					3	0.3	0.000	0.28
Water Truck	350	8	1					3	1.2	0.000	1.16
30-Ton Crane Truck	500	6	1					3	2.2	0.000	2.23
Concrete Mixer Truck	350	2	3					3	1.4	0.000	1.36
Lowboy Truck/Trailer	450	4	1					3	0.6	0.000	0.58
Flat Bed Truck/Trailer	400	4	3					3	2.7	0.000	2.72
Subtransmission UG Cable Installation											
1-Ton Crew Cab Flat Bed, 4x4	300	4	2					1	0.6	0.000	0.61
Wire Truck/Trailer	350	6	2					1	0.9	0.000	0.91
Bucket Truck	250	6	1					1	0.5	0.000	0.45
Boom Truck	350	6	1					1	0.5	0.000	0.45
Puller	350	6	1					1	0.3	0.000	0.29
Static Truck/Tensioner	350	6	1					1	0.3	0.000	0.29
Subtransmission Line Conductor Installation											
3/4-Ton Pick-up	300	8	2	1	1.2	0.000	1.21	1	1.2	0.000	1.21
1-Ton Crew Cab Flat Bed, 4x4	300	8	4	1	2.4	0.000	2.42	1	2.4	0.000	2.42
Wire Truck/Trailer	350	2	2	1	0.3	0.000	0.30	1	0.3	0.000	0.30
Dump Truck	350	2	1	1	0.2	0.000	0.15	1	0.2	0.000	0.15
Bucket Truck	350	8	2	1	1.2	0.000	1.21	1	1.2	0.000	1.21
22-Ton Manitex	350	8	2	1	0.8	0.000	0.77	1	0.8	0.000	0.77
Splicing Rig	350	2	1	1	0.2	0.000	0.17	1	0.2	0.000	0.17
Splicing Lab	300	2	1	1	0.1	0.000	0.10	1	0.1	0.000	0.10
3 Drum Straw line Puller	300	6	1	1	0.3	0.000	0.29	1	0.3	0.000	0.29
Static Truck/Tensioner	350	6	1	1	0.3	0.000	0.29	1	0.3	0.000	0.29
Subtransmission Assembly											
3/4-Ton Pick-up Truck, 4x4	300	5	5	3	5.7	0.001	5.68	2	3.8	0.001	3.79
1-Ton Crew Cab Flat Bed, 4x4	300	5	4	3	4.5	0.000	4.54	2	3.0	0.000	3.03
Compressor Trailer	120	5	2	3	1.1	0.000	1.10	2	0.7	0.000	0.74
80-Ton Rough Terrain Crane	350	6	3	3	2.7	0.000	2.75	2	1.8	0.000	1.84
40' Flat Bed Truck/Trailer	350	8	2	3	3.6	0.000	3.63	1	1.2	0.000	1.22
TOTAL							**86.9**				**94.0**

[a] Emissions [metric tons, MT] = Emission factor [lb/hr] x Operating time [hr/day] x Number x Days used [days] x 453.6 [g/lb] / 1,000,000 [g/MT]
Emission factors are in Table 22

Motor Vehicle Exhaust - 66kV Subtransmission										
			Replaced Scope				Updated Scope			
Vehicle Type	Miles/ Day per Vehicle	Number	Days Used	CO_2 (MT)[a]	CH4 (MT)[a]	CO_2e (MT)[a]	Days Used	CO_2 (MT)[a]	CH4 (MT)[a]	CO_2e (MT)[a]
Subtransmission Line Remove Existing										
Worker Commuting	40	6	2	0.24	0.00	0.24	2	0.24	0.00	0.24
Subtransmission Line TSP Footing										
Water Truck	20	2	8	0.61	0.00	0.61	5	0.38	0.00	0.38
Crew Truck	20	2	8	0.40	0.00	0.40	5	0.25	0.00	0.25
Concrete Truck	20	1	8	0.31	0.00	0.31	5	0.19	0.00	0.19
Worker Commuting	40	14	8	2.23	0.00	2.23	5	1.39	0.00	1.39
Subtransmission Conduit Installation										
Worker Commuting	40	8					2	0.32	0.00	0.32
Subtransmission Duct Bank Installation										
Crew Truck	0.35	6					2	0.01	0.00	0.01
Worker Commuting	40	6					2	0.24	0.00	0.24
Water Truck	20	2					2	0.15	0.00	0.15
Concrete Truck	20	1					2	0.08	0.00	0.08
Subtransmission Vault Installation										
Crew Truck	0.35	6					3	0.01	0.00	0.01
Worker Commuting	40	6					3	0.36	0.00	0.36
Water Truck	20	2					3	0.23	0.00	0.23
Concrete Truck	20	1					3	0.11	0.00	0.11
Subtransmission UG Cable Installation										
Crew Truck	0.35	8					1	0.00	0.00	0.00
Worker Commuting	40	8					1	0.16	0.00	0.16
Subtransmission Line Conductor Installation										
Crew Truck	0.35	16	1	0.01	0.00	0.01	1	0.01	0.00	0.01
Worker Commuting	40	16	1	0.32	0.00	0.32	1	0.32	0.00	0.32
Subtransmission Line TSP Haul, Assembly, and Erection										
Worker Commuting	40	8	3	0.48	0.00	0.48	2	0.32	0.00	0.32
TOTAL						**4.6**				**4.8**

[a] Emissions [metric tons, MT] = Emission factor [lb/mi] x Distance per vehicle [mi/day] x Number vehicles x Days used *453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 23

Construction Equipment Exhaust - Telecommunications											
				Replaced Scope				Updated Scope -			
Equipment	Horse-Power	Hours/ Day Used	Number	Days Used	CO_2 (MT)[a]	CH4 (MT)[a]	CO_2e (MT)[a]	Days Used	CO_2 (MT)[a]	CH4 (MT)[a]	CO_2e (MT)[a]
Telecommunications Line Aboveground Work											
Reel Truck	300	8	1					2	1.2	0.0	1.21
Bucket Truck	350	8	1					2	1.2	0.0	1.21
Telecommunications Line Belowground Work											
Reel Truck	300	8	1					2	1.2	0.0	1.21
Bucket Truck	350	8	1					2	1.2	0.0	1.21
Telecommunication Wood Pole Removal											
1-Ton Crew Cab Flat Bed, 4x4	300	8	2					1	1.2	0.0	1.21
Bucket Truck	250	6	1					1	0.5	0.0	0.45
Compressor Trailer	60	4	1					1	0.1	0.0	0.05
Boom Truck	350	6	1					1	0.5	0.0	0.45
Flat Bed Truck/Trailer	400	8	1					1	0.6	0.0	0.61
Telecommunication LWC Pole Haul											
3/4-Ton Pick-up Truck, 4x4	275	8	1					4	2.4	0.0	2.42
Boom Truck	350	6	1					4	1.8	0.0	1.82
Flat Bed Truck/Trailer	400	8	1					4	2.4	0.0	2.42
Telecommunication Pole Assembly											
3/4-Ton Pick-up Truck, 4x4	275	4	2					4	2.4	0.0	2.42
1-Ton Crew Cab Flat Bed, 4x4	300	4	2					4	2.4	0.0	2.42
Compressor Trailer	60	6	1					4	0.3	0.0	0.31
Boom Truck	350	8	1					4	2.4	0.0	2.42
Telecommunication Install LWS Pole											
1-Ton Crew Cab Flat Bed, 4x4	300	8	1					4	2.4	0.0	2.42
Bucket Truck	250	6	1					4	1.8	0.0	1.82
Boom Truck	350	6	1					4	1.8	0.0	1.82
Auger Truck	210	6	1					4	1.4	0.0	1.37
Backhoe/Front loader	125	8	1					4	0.8	0.0	0.75
Flat Bed Truck/Trailer	400	8	1					4	2.4	0.0	2.42
TOTAL							**0.00**				**32.45**

[a] Emissions [metric tons, MT] = Emission factor [lb/hr] x Operating time [hr/day] x Number x Days used [days] x 453.6 [g/lb] / 1,000,000 [g/MT]

Emission factors are in Table 22

Motor Vehicle Exhaust - Telecommunications										
			Replaced Scope				Updated Scope -			
Vehicle Type	Miles/ Day per Vehicle	Number	Days Used	CO_2 (MT)[a]	CH4 (MT)[a]	CO_2e (MT)[a]	Days Used	CO_2 (MT)[a]	CH4 (MT)[a]	CO_2e (MT)[a]
Telecommunications Line Aboveground Work										
Worker Commuting	40	4					2	0.16	0.00	0.16
Telecommunications Line Belowground Work										
Worker Commuting	40	4					2	0.16	0.00	0.16
Telecommunication Wood Pole Removal										
Crew Truck	0.35	6					1	0.00	0.00	0.00
Worker Commuting	40	6					1	0.12	0.00	0.12
Telecommunication LWC Pole Haul										
Crew Truck	0.35	4					4	0.01	0.00	0.01
Worker Commuting	40	4					4	0.32	0.00	0.32
Telecommunication Pole Assembly										
Crew Truck	0.35	8					4	0.01	0.00	0.01
Worker Commuting	40	8					4	0.64	0.00	0.64
Telecommunication Install LWS Pole										
Crew Truck	0.35	6					4	0.01	0.00	0.01
Worker Commuting	40	6					4	0.48	0.00	0.48
TOTAL						**0.0**				**1.9**

[a] Emissions [metric tons, MT] = Emission factor [lb/mi] x Distance per vehicle [mi/day] x Number vehicles x Days used *453.6 [g/lb] / 1,000,000 [g/MT]
Emission factors are in Table 23

Construction Equipment Exhaust - Access and Spur Road											
					Replaced Scope			Updated Scope -			
Equipment	Horse-Power	Hours/ Day Used	Number	Days Used	CO_2 (MT)[a]	CH4 (MT)[a]	CO_2e (MT)[a]	Days Used	CO_2 (MT)[a]	CH4 (MT)[a]	CO_2e (MT)[a]
Access and Spur Road Road and Landing Work											
1-Ton Crew Cab, 4x4	500	2	2	35	17.3	0.001	17.32	20	9.9	0.001	9.91
Road Grader	500	4	1	35	8.4	0.001	8.45	20	4.8	0.001	4.84
Water Truck	350	8	2	35	27.1	0.003	27.11	20	15.5	0.003	15.52
Backhoe/Front Loader	500	6	1	35	32.8	0.002	32.90	20	18.8	0.002	18.82
Drum Type Compactor	0	4	1	35	0.3	0.000	0.27	20	0.2	0.000	0.16
Track Type Dozer	350	6	1	3	1.5	0.000	1.50	20	10.0	0.000	9.99
Excavator	500	6	1	18	5.9	0.001	5.87	10	3.3	0.001	3.27
Lowboy Truck/Trailer	500	2	1	18	4.2	0.000	4.16	10	2.3	0.000	2.31
Access and Spur Road Retaining Wall Installation											
1-Ton Crew Cab, 4x4	300	8	2					150	181.3	0.000	181.31
Boom Truck	350	8	2					150	181.3	0.000	181.31
Drill Rig	250	8	2					150	204.8	0.000	204.78
Backhoe/Front Loader	350	6	1					150	70.1	0.000	70.11
Wheel Loader	250	8	2					150	187.0	0.000	186.96
Dump Truck	350	8	4					150	362.6	0.000	362.62
Water Truck	350	10	2					150	144.9	0.000	144.95
Concrete Mixer Truck	350	4	6					75	136.0	0.000	135.98
TOTAL							**97.6**				**1,532.8**

Motor Vehicle Exhaust - Access and Spur Road										
				Replaced Scope			Updated Scope			
Vehicle Type	Miles/ Day per Vehicle	Number	Days Used	CO_2 (MT)[a]	CH4 (MT)[a]	CO_2e (MT)[a]	Days Used	CO_2 (MT)[a]	CH4 (MT)[a]	CO_2e (MT)[a]
Access and Spur Road Road and Landing Work										
Worker Commuting	40	3	35	2.09	0.00	2.09	20	1.19	0.00	1.19
Access and Spur Road Retaining Wall Installation										
Worker Commuting	40	12					150	35.78	0.00	35.84
Water Truck	20	1					150	5.73	0.00	5.73
Concrete Truck	20	1					150	5.73	0.00	5.73
TOTAL						**2.1**				**48.5**

Table 5
Subtransmission Line Remove Existing Towers and Foundations

Emissions Summary

Source	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Equipment Exhaust	15.01	52.53	131.96	0.15	5.92	5.44
Vehicle Exhaust	0.22	1.98	0.22	0.00	0.02	0.01
Vehicle Fugitive	--	--	--	--	0.12	0.00
Earthwork Fugitive	--	--	--	--	0.00	0.00
Total	**15.23**	**54.51**	**132.19**	**0.15**	**6.06**	**5.46**

Construction Equipment Exhaust Emissions

Equipment	Horse-Power	Hours/ Day Used	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
1-Ton Crew Cab, 4x4	300	5	2	1.64	4.30	16.15	0.02	0.57	0.53
1-Ton Crew Cab, 4x4	300	8	1	1.64	4.30	16.15	0.02	0.57	0.53
10,000 lb/ Rough Terrain Forklift	200	4	1	0.66	2.92	5.15	0.01	0.30	0.28
30-Ton Crane	300	6	2	1.49	4.16	14.85	0.02	0.56	0.52
Compressor Trailer	120	8	2	2.77	12.20	20.47	0.02	1.23	1.14
Compressor Trailer	120	6	1	2.77	12.20	20.47	0.02	1.23	1.14
Flat Bed Truck/Trailer	350	8	1	1.99	6.03	18.55	0.02	0.70	0.64
10-cu yd. Dump Truck	350	4	1	1.00	3.02	9.28	0.01	0.35	0.32
Backhoe/Front Loader	350	4	1	1.05	3.40	10.90	0.02	0.39	0.36
Total Equipment Exhaust				**15.01**	**52.53**	**131.96**	**0.15**	**5.92**	**5.44**

[a] Emissions [lb/day] = Emission factor [lb/hr] x Operating time [hr/day] x Number

Emission factors are in Table 22

Motor Vehicle Exhaust Emissions

Vehicle Type	Miles/ Day per Vehicle	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Worker Commuting	40	6	0.22	1.98	0.22	0.00	0.02	0.01
Total Vehicle Exhaust			**0.22**	**1.98**	**0.22**	**0.00**	**0.02**	**0.01**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 23

Motor Vehicle Entrained Particulate Matter Emissions

Vehicle Type	Road Type	Miles/ Day per Vehicle	Number	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Worker Commuting	Paved	40	6	0.12	0.00
Worker Commuting	Unpaved	0	6	0.00	0.00
Total Vehicle Fugitive				**0.12**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 24

Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
None			0.00	0.00
Total Earthwork Fugitive			**0.00**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Emission factors are in Table 25

Table 5a
Subtransmission Line Remove Existing Towers and Foundations - LST Analysis

Emissions Summary

Source	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Equipment Exhaust	7.14	23.97	65.18	0.08	2.75	2.53
Vehicle Exhaust	0.22	1.98	0.22	0.00	0.02	0.01
Vehicle Fugitive	--	--	--	--	0.12	0.00
Earthwork Fugitive	--	--	--	--	0.00	0.00
Total	**7.36**	**25.95**	**65.40**	**0.08**	**2.89**	**2.54**

Construction Equipment Exhaust Emissions

Equipment	Horse-Power	Hours/ Day Used	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
1-Ton Crew Cab, 4x4	300	8	1	1.31	3.44	12.92	0.01	0.46	0.42
10,000 lb/ Rough Terrain Forklift	200	4	1	0.66	2.92	5.15	0.01	0.30	0.28
30-Ton Crane	300	6	1	0.75	2.08	7.42	0.01	0.28	0.26
Compressor Trailer	120	8	1	1.39	6.10	10.24	0.01	0.62	0.57
Flat Bed Truck/Trailer	350	4	1	1.00	3.02	9.28	0.01	0.35	0.32
10-cu yd. Dump Truck	350	4	1	1.00	3.02	9.28	0.01	0.35	0.32
Backhoe/Front Loader	350	4	1	1.05	3.40	10.90	0.02	0.39	0.36
Total Equipment Exhaust				**7.14**	**23.97**	**65.18**	**0.08**	**2.75**	**2.53**

[a] Emissions [lb/day] = Emission factor [lb/hr] x Operating time [hr/day] x Number

Emission factors are in Table 22

Motor Vehicle Exhaust Emissions

Vehicle Type	Miles/ Day per Vehicle	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Worker Commuting	40	6	0.22	1.98	0.22	0.00	0.02	0.01
Total Vehicle Exhaust			**0.22**	**1.98**	**0.22**	**0.00**	**0.02**	**0.01**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 23

Motor Vehicle Entrained Particulate Matter Emissions

Vehicle Type	Road Type	Miles/ Day per Vehicle	Number	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Worker Commuting	Paved	40	6	0.12	0.00
Worker Commuting	Unpaved	0	6	0.00	0.00
Total Vehicle Fugitive				**0.12**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 24

Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
None			0.00	0.00
Total Earthwork Fugitive			**0.00**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Emission factors are in Table 25

Table 6
Subtransmission Line TSP Footing Installation

Emissions Summary

Source	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Equipment Exhaust	18.35	62.89	180.74	0.21	6.93	6.38
Vehicle Exhaust	0.80	6.08	3.63	0.01	0.19	0.15
Vehicle Fugitive	--	--	--	--	0.34	0.00
Earthwork Fugitive	--	--	--	--	0.02	0.00
Total	**19.15**	**68.98**	**184.37**	**0.22**	**7.48**	**6.53**

Construction Equipment Exhaust Emissions

Equipment	Horse-Power	Hours/ Day Used	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
1-Ton Crew Cab Flat Bed, 4x4	300	2	4	1.99	6.03	18.55	0.02	0.70	0.64
30-Ton Crane Truck	300	5	2	1.82	6.62	17.72	0.02	0.68	0.63
Backhoe	200	8	2	1.95	9.41	15.43	0.02	0.90	0.83
Auger Truck	500	6	2	2.99	9.05	27.83	0.03	1.05	0.96
4000 Gallon Water Truck	350	4	2	1.99	6.03	18.55	0.02	0.70	0.64
10-cu. yd. Dump Truck	350	5	2	2.49	7.54	23.19	0.03	0.87	0.80
10-cu. yd. Concrete Mixer Truck	425	5	6	5.12	18.20	59.46	0.07	2.03	1.87
Total Equipment Exhaust				**18.35**	**62.89**	**180.74**	**0.21**	**6.93**	**6.38**

[a] Emissions [lb/day] = Emission factor [lb/hr] x Operating time [hr/day] x Number

Emission factors are in Table 22

Motor Vehicle Exhaust Emissions

Vehicle Type	Miles/ Day per Vehicle	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Water Truck	20	2	0.12	0.48	1.53	0.00	0.07	0.06
Crew Truck	20	2	0.10	0.74	0.82	0.00	0.03	0.03
Concrete Truck	20	1	0.06	0.24	0.76	0.00	0.04	0.03
Worker Commuting	40	14	0.51	4.63	0.51	0.01	0.05	0.03
Total Vehicle Exhaust			**0.80**	**6.08**	**3.63**	**0.01**	**0.19**	**0.15**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 23

Motor Vehicle Entrained Particulate Matter Emissions

Vehicle Type	Road Type	Miles/ Day per Vehicle	Number	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Water Truck	Paved	20	2	0.02	0.00
Water Truck	Unpaved	0	2	0.00	0.00
Crew Truck	Paved	20	2	0.02	0.00
Crew Truck	Unpaved	0	2	0.00	0.00
Concrete Truck	Paved	20	1	0.01	0.00
Concrete Truck	Unpaved	0	1	0.00	0.00
Worker Commuting	Paved	40	14	0.29	0.00
Worker Commuting	Unpaved	0	14	0.00	0.00
Total Vehicle Fugitive				**0.34**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 24

Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Soil Dropping[b]	CY/Day	22	0.02	0.00
Total Earthwork Fugitive			**0.02**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Emission factors are in Table 25

Table 6a
Subtransmission Line TSP Footing Installation

Emissions Summary

Source	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Equipment Exhaust	6.97	23.87	65.91	0.08	2.61	2.40
Vehicle Exhaust	0.69	5.47	2.46	0.01	0.14	0.11
Vehicle Fugitive	--	--	--	--	0.32	0.00
Earthwork Fugitive	--	--	--	--	0.02	0.00
Total	**7.66**	**29.35**	**68.36**	**0.08**	**3.09**	**2.52**

Construction Equipment Exhaust Emissions

Equipment	Horse-Power	Hours/ Day Used	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
1-Ton Crew Cab Flat Bed, 4x4	300	2	1	0.50	1.51	4.64	0.01	0.17	0.16
30-Ton Crane Truck	300	5	1	0.91	3.31	8.86	0.01	0.34	0.32
Backhoe	200	8	1	0.97	4.70	7.72	0.01	0.45	0.41
Auger Truck	500	6	1	1.50	4.52	13.91	0.02	0.52	0.48
4000 Gallon Water Truck	350	4	1	1.00	3.02	9.28	0.01	0.35	0.32
10-cu. yd. Dump Truck	350	5	1	1.25	3.77	11.59	0.01	0.44	0.40
10-cu. yd. Concrete Mixer Truck	425	5	1	0.85	3.03	9.91	0.01	0.34	0.31
Total Equipment Exhaust				**6.97**	**23.87**	**65.91**	**0.08**	**2.61**	**2.40**

[a] Emissions [lb/day] = Emission factor [lb/hr] x Operating time [hr/day] x Number

Emission factors are in Table 22

Motor Vehicle Exhaust Emissions

Vehicle Type	Miles/ Day per Vehicle	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Water Truck	20	1	0.06	0.24	0.76	0.00	0.04	0.03
Crew Truck	20	1	0.05	0.37	0.41	0.00	0.02	0.01
Concrete Truck	20	1	0.06	0.24	0.76	0.00	0.04	0.03
Worker Commuting	40	14	0.51	4.63	0.51	0.01	0.05	0.03
Total Vehicle Exhaust			**0.69**	**5.47**	**2.46**	**0.01**	**0.14**	**0.11**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 23

Motor Vehicle Entrained Particulate Matter Emissions

Vehicle Type	Road Type	Miles/ Day per Vehicle	Number	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Water Truck	Paved	20	1	0.01	0.00
Water Truck	Unpaved	0	1	0.00	0.00
Crew Truck	Paved	20	1	0.01	0.00
Crew Truck	Unpaved	0	1	0.00	0.00
Concrete Truck	Paved	20	1	0.01	0.00
Concrete Truck	Unpaved	0	1	0.00	0.00
Worker Commuting	Paved	40	14	0.29	0.00
Worker Commuting	Unpaved	0	14	0.00	0.00
Total Vehicle Fugitive				**0.32**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 24

Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Soil Dropping[b]	CY/Day	22	0.02	0.00
Total Earthwork Fugitive			**0.02**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Emission factors are in Table 25

Table 7
Subtransmission Line TSP Haul, Assembly, and Erection

Emissions Summary

Source	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Equipment Exhaust	14.92	43.08	140.69	0.16	5.57	5.12
Vehicle Exhaust	0.29	2.64	0.29	0.00	0.03	0.02
Vehicle Fugitive	--	--	--	--	0.16	0.00
Earthwork Fugitive	--	--	--	--	0.00	0.00
Total	**15.21**	**45.72**	**140.99**	**0.16**	**5.76**	**5.14**

Construction Equipment Exhaust Emissions

Equipment	Horse-Power	Hours/ Day Used	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
3/4-Ton Pick-up Truck, 4x4	300	5	5	4.10	10.75	40.37	0.05	1.44	1.32
1-Ton Crew Cab Flat Bed, 4x4	300	5	4	3.28	8.60	32.30	0.04	1.15	1.06
Compressor Trailer	120	5	2	1.32	5.42	8.65	0.01	0.74	0.68
80-Ton Rough Terrain Crane	350	6	3	2.24	6.23	22.27	0.02	0.85	0.78
40' Flat Bed Truck/Trailer	350	8	2	3.99	12.07	37.10	0.04	1.39	1.28
Total Equipment Exhaust				**14.92**	**43.08**	**140.69**	**0.16**	**5.57**	**5.12**

[a] Emissions [lb/day] = Emission factor [lb/hr] x Operating time [hr/day] x Number

Emission factors are in Table 22

Motor Vehicle Exhaust Emissions

Vehicle Type	Miles/ Day per Vehicle	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Worker Commuting	40	8	0.29	2.64	0.29	0.00	0.03	0.02
Total Vehicle Exhaust			**0.29**	**2.64**	**0.29**	**0.00**	**0.03**	**0.02**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 23

Motor Vehicle Entrained Particulate Matter Emissions

Vehicle Type	Road Type	Miles/ Day per Vehicle	Number	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Worker Commuting	Paved	40	8	0.16	0.00
Worker Commuting	Unpaved	0	8	0.00	0.00
Total Vehicle Fugitive				**0.16**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 24

Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
None			0.00	0.00
Total Earthwork Fugitive			**0.00**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Emission factors are in Table 25

Table 7a
Subtransmission Line TSP Haul, Assembly, and Erection - LST Analysis

Emissions Summary

Source	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Equipment Exhaust	5.04	15.12	46.45	0.05	1.92	1.77
Vehicle Exhaust	0.29	2.64	0.29	0.00	0.03	0.02
Vehicle Fugitive	--	--	--	--	0.16	0.00
Earthwork Fugitive	--	--	--	--	0.00	0.00
Total	**5.33**	**17.77**	**46.74**	**0.06**	**2.12**	**1.79**

Construction Equipment Exhaust Emissions

Equipment	Horse-Power	Hours/ Day Used	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
3/4-Ton Pick-up Truck, 4x4	300	5	1	0.82	2.15	8.07	0.01	0.29	0.26
1-Ton Crew Cab Flat Bed, 4x4	300	5	1	0.82	2.15	8.07	0.01	0.29	0.26
Compressor Trailer	120	5	1	0.66	2.71	4.32	0.00	0.37	0.34
80-Ton Rough Terrain Crane	350	6	1	0.75	2.08	7.42	0.01	0.28	0.26
40' Flat Bed Truck/Trailer	350	8	1	1.99	6.03	18.55	0.02	0.70	0.64
Total Equipment Exhaust				**5.04**	**15.12**	**46.45**	**0.05**	**1.92**	**1.77**

[a] Emissions [lb/day] = Emission factor [lb/hr] x Operating time [hr/day] x Number

Emission factors are in Table 22

Motor Vehicle Exhaust Emissions

Vehicle Type	Miles/ Day per Vehicle	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Worker Commuting	40	8	0.29	2.64	0.29	0.00	0.03	0.02
Total Vehicle Exhaust			**0.29**	**2.64**	**0.29**	**0.00**	**0.03**	**0.02**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 23

Motor Vehicle Entrained Particulate Matter Emissions

Vehicle Type	Road Type	Miles/ Day per Vehicle	Number	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Worker Commuting	Paved	40	8	0.16	0.00
Worker Commuting	Unpaved	0	8	0.00	0.00
Total Vehicle Fugitive				**0.16**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 24

Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
None			0.00	0.00
Total Earthwork Fugitive			**0.00**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Emission factors are in Table 25

Table 8
Subtransmission Conduit Installation

Emissions Summary

Source	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Equipment Exhaust	4.68	13.39	44.05	0.05	1.80	1.66
Vehicle Exhaust	0.29	2.64	0.29	0.00	0.03	0.02
Vehicle Fugitive	--	--	--	--	0.16	0.00
Earthwork Fugitive	--	--	--	--	0.00	0.00
Total	**4.98**	**16.03**	**44.34**	**0.05**	**1.99**	**1.67**

Construction Equipment Exhaust Emissions

Equipment	Horse-Power	Hours/ Day Used	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
3/4-Ton Pick-up Truck, 4x4	300	5	2	1.64	4.30	16.15	0.02	0.57	0.53
1-Ton Crew Cab Flat Bed, 4x4	300	5	2	1.64	4.30	16.15	0.02	0.57	0.53
Compressor Trailer	120	5	1	0.66	2.71	4.32	0.00	0.37	0.34
80-Ton Rough Terrain Crane	350	6	1	0.75	2.08	7.42	0.01	0.28	0.26
Total Equipment Exhaust				**4.68**	**13.39**	**44.05**	**0.05**	**1.80**	**1.66**

[a] Emissions [lb/day] = Emission factor [lb/hr] x Operating time [hr/day] x Number

Motor Vehicle Exhaust Emissions

Vehicle Type	Miles/ Day per Vehicle	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]	
Worker Commuting	40	8	0.29	2.64	0.29	0.00	0.03	0.02	
Total Vehicle Exhaust			**0.29**	**2.64**	**0.29**	**0.00**	**0.03**	**0.02**	

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 23

Motor Vehicle Entrained Particulate Matter Emissions

Vehicle Type	Road Type	Miles/ Day per Vehicle	Number	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Worker Commuting	Paved	40	8	0.16	0.00
Worker Commuting	Unpaved	0	8	0.00	0.00
Total Vehicle Fugitive				**0.16**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 24

Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
None			0.00	0.00
Total Earthwork Fugitive			**0.00**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Emission factors are in Table 25

Table 8a
Subtransmission Conduit Installation

Emissions Summary

Source	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Equipment Exhaust	3.05	9.09	27.90	0.03	1.23	1.13
Vehicle Exhaust	0.29	2.64	0.29	0.00	0.03	0.02
Vehicle Fugitive	--	--	--	--	0.16	0.00
Earthwork Fugitive	--	--	--	--	0.00	0.00
Total	**3.34**	**11.73**	**28.19**	**0.03**	**1.42**	**1.15**

Construction Equipment Exhaust Emissions

Equipment	Horse-Power	Hours/ Day Used	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
3/4-Ton Pick-up Truck, 4x4	300	5	1	0.82	2.15	8.07	0.01	0.29	0.26
1-Ton Crew Cab Flat Bed, 4x4	300	5	1	0.82	2.15	8.07	0.01	0.29	0.26
Compressor Trailer	120	5	1	0.66	2.71	4.32	0.00	0.37	0.34
80-Ton Rough Terrain Crane	350	6	1	0.75	2.08	7.42	0.01	0.28	0.26
Total Equipment Exhaust				**3.05**	**9.09**	**27.90**	**0.03**	**1.23**	**1.13**

[a] Emissions [lb/day] = Emission factor [lb/hr] x Operating time [hr/day] x Number

Motor Vehicle Exhaust Emissions

Vehicle Type	Miles/ Day per Vehicle	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]	
Worker Commuting	40	8	0.29	2.64	0.29	0.00	0.03	0.02	
Total Vehicle Exhaust			**0.29**	**2.64**	**0.29**	**0.00**	**0.03**	**0.02**	

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 23

Motor Vehicle Entrained Particulate Matter Emissions

Vehicle Type	Road Type	Miles/ Day per Vehicle	Number	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Worker Commuting	Paved	40	8	0.16	0.00
Worker Commuting	Unpaved	0	8	0.00	0.00
Total Vehicle Fugitive				**0.16**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 24

Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
None			0.00	0.00
Total Earthwork Fugitive			**0.00**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Emission factors are in Table 25

Table 9
Subtransmission Duct Bank Installation

Emissions Summary

Source	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Equipment Exhaust	7.64	23.53	70.93	0.08	2.86	2.63
Vehicle Exhaust	0.22	2.02	0.26	0.00	0.02	0.01
Vehicle Fugitive	--	--	--	--	0.12	0.00
Earthwork Fugitive	--	--	--	--	0.00	0.00
Total	**7.86**	**25.55**	**71.19**	**0.09**	**3.00**	**2.64**

Construction Equipment Exhaust Emissions

Equipment	Horse-Power	Hours/ Day Used	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
1-Ton Crew Cab Flat Bed, 4x4	300	4	2	1.31	3.44	12.92	0.01	0.46	0.42
Pipe Truck/Trailer	275	6	1	0.98	2.58	9.69	0.01	0.34	0.32
Dump Truck	350	6	2	1.97	5.16	19.38	0.02	0.69	0.63
Backhoe/Front Loader	125	4	1	0.36	1.45	2.27	0.00	0.21	0.19
Compressor Trailer	60	4	1	0.41	1.17	1.11	0.00	0.11	0.10
Water Truck	350	4	2	0.93	4.72	7.94	0.01	0.43	0.40
Concrete Mixer Truck	350	2	3	0.98	2.58	9.69	0.01	0.34	0.32
Lowboy Truck/Trailer	500	4	1	0.68	2.43	7.93	0.01	0.27	0.25
Total Equipment Exhaust				**7.64**	**23.53**	**70.93**	**0.08**	**2.86**	**2.63**

[a] Emissions [lb/day] = Emission factor [lb/hr] x Operating time [hr/day] x Number

#REF!

Motor Vehicle Exhaust Emissions

Vehicle Type	Miles/ Day per Vehicle	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]	
Crew Truck	0.35	6	0.01	0.04	0.04	0.00	0.00	0.00	
Worker Commuting	40	6	0.22	1.98	0.22	0.00	0.02	0.01	
Water Truck	20	2	0.12	0.48	1.53	0.00	0.07	0.06	
Concrete Truck	20	1	0.06	0.24	0.76	0.00	0.04	0.03	
Total Vehicle Exhaust			**0.22**	**2.02**	**0.26**	**0.00**	**0.02**	**0.01**	

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 23

Motor Vehicle Entrained Particulate Matter Emissions

Vehicle Type	Road Type	Miles/ Day per Vehicle	Number	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Crew Truck	Paved	0.35	6	0.00	0.00
Crew Truck	Unpaved	0	6	0.00	0.00
Worker Commuting	Paved	40	6	0.12	0.00
Worker Commuting	Unpaved	0	6	0.00	0.00
Water Truck	Paved	20	2	0.02	0.00
Water Truck	Unpaved	0	2	0.00	0.00
Concrete Truck	Paved	20	1	0.01	0.00
Concrete Truck	Unpaved	0	1	0.00	0.00
Total Vehicle Fugitive				**0.12**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 24

Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
None			0.00	0.00
Total Earthwork Fugitive			**0.00**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Emission factors are in Table 25

Table 9a
Subtransmission Duct Bank Installation

Emissions Summary

Source	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Equipment Exhaust	4.88	15.15	44.35	0.05	1.83	1.69
Vehicle Exhaust	0.22	2.02	0.26	0.00	0.02	0.01
Vehicle Fugitive	--	--	--	--	0.12	0.00
Earthwork Fugitive	--	--	--	--	0.00	0.00
Total	**5.10**	**17.17**	**44.61**	**0.06**	**1.98**	**1.70**

Construction Equipment Exhaust Emissions

Equipment	Horse-Power	Hours/ Day Used	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
1-Ton Crew Cab Flat Bed, 4x4	300	4	1	0.66	1.72	6.46	0.01	0.23	0.21
Pipe Truck/Trailer	275	6	1	0.98	2.58	9.69	0.01	0.34	0.32
Dump Truck	350	6	1	0.98	2.58	9.69	0.01	0.34	0.32
Backhoe/Front Loader	125	4	1	0.36	1.45	2.27	0.00	0.21	0.19
Compressor Trailer	60	4	1	0.41	1.17	1.11	0.00	0.11	0.10
Water Truck	350	4	1	0.47	2.36	3.97	0.00	0.22	0.20
Concrete Mixer Truck	350	2	1	0.33	0.86	3.23	0.00	0.11	0.11
Lowboy Truck/Trailer	500	4	1	0.68	2.43	7.93	0.01	0.27	0.25
Total Equipment Exhaust				**4.88**	**15.15**	**44.35**	**0.05**	**1.83**	**1.69**

[a] Emissions [lb/day] = Emission factor [lb/hr] x Operating time [hr/day] x Number

#REF!

Motor Vehicle Exhaust Emissions

Vehicle Type	Miles/ Day per Vehicle	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]	
Crew Truck	0.35	6	0.01	0.04	0.04	0.00	0.00	0.00	
Worker Commuting	40	6	0.22	1.98	0.22	0.00	0.02	0.01	
Water Truck	20	2	0.12	0.48	1.53	0.00	0.07	0.06	
Concrete Truck	20	1	0.06	0.24	0.76	0.00	0.04	0.03	
Total Vehicle Exhaust			**0.22**	**2.02**	**0.26**	**0.00**	**0.02**	**0.01**	

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 23

Motor Vehicle Entrained Particulate Matter Emissions

Vehicle Type	Road Type	Miles/ Day per Vehicle	Number	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Crew Truck	Paved	0.35	6	0.00	0.00
Crew Truck	Unpaved	0	6	0.00	0.00
Worker Commuting	Paved	40	6	0.12	0.00
Worker Commuting	Unpaved	0	6	0.00	0.00
Water Truck	Paved	20	2	0.02	0.00
Water Truck	Unpaved	0	2	0.00	0.00
Concrete Truck	Paved	20	1	0.01	0.00
Concrete Truck	Unpaved	0	1	0.00	0.00
Total Vehicle Fugitive				**0.12**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 24

Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
None			0.00	0.00
Total Earthwork Fugitive			**0.00**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Emission factors are in Table 25

Table 10
Subtransmission Vault Installation

Emissions Summary

Source	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Equipment Exhaust	15.82	46.16	152.60	0.18	5.79	5.33
Vehicle Exhaust	0.22	2.02	0.26	0.00	0.02	0.01
Vehicle Fugitive	--	--	--	--	0.12	0.00
Earthwork Fugitive	--	--	--	--	0.00	0.00
Total	**16.05**	**48.19**	**152.86**	**0.18**	**5.94**	**5.35**

Construction Equipment Exhaust Emissions

Equipment	Horse-Power	Hours/ Day Used	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
1-Ton Crew Cab, 4x4	300	8	4	5.25	13.76	51.68	0.06	1.84	1.69
Excavator	250	6	2	1.74	4.72	17.92	0.02	0.62	0.57
Dump Truck	350	8	2	2.62	6.88	25.84	0.03	0.92	0.85
Backhoe/Front Loader	125	4	1	0.36	1.45	2.27	0.00	0.21	0.19
Water Truck	350	8	1	0.93	4.72	7.94	0.01	0.43	0.40
30-Ton Crane Truck	500	6	1	1.50	4.52	13.91	0.02	0.52	0.48
Concrete Mixer Truck	350	2	3	0.98	2.58	9.69	0.01	0.34	0.32
Lowboy Truck/Trailer	450	4	1	0.47	2.36	3.97	0.00	0.22	0.20
Flat Bed Truck/Trailer	400	4	3	1.97	5.16	19.38	0.02	0.69	0.63
Total Equipment Exhaust				**15.82**	**46.16**	**152.60**	**0.18**	**5.79**	**5.33**

[a] Emissions [lb/day] = Emission factor [lb/hr] x Operating time [hr/day] x Number

#REF!

Motor Vehicle Exhaust Emissions

Vehicle Type	Miles/ Day per Vehicle	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]	
Crew Truck	0.35	6	0.01	0.04	0.04	0.00	0.00	0.00	
Worker Commuting	40	6	0.22	1.98	0.22	0.00	0.02	0.01	
Water Truck	20	2	0.12	0.48	1.53	0.00	0.07	0.06	
Concrete Truck	20	1	0.06	0.24	0.76	0.00	0.04	0.03	
Total Vehicle Exhaust			**0.22**	**2.02**	**0.26**	**0.00**	**0.02**	**0.01**	

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 23

Motor Vehicle Entrained Particulate Matter Emissions

Vehicle Type	Road Type	Miles/ Day per Vehicle	Number	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Crew Truck	Paved	0.35	6	0.00	0.00
Crew Truck	Unpaved	0	6	0.00	0.00
Worker Commuting	Paved	40	6	0.12	0.00
Worker Commuting	Unpaved	0	6	0.00	0.00
Water Truck	Paved	20	2	0.02	0.00
Water Truck	Unpaved	0	2	0.00	0.00
Concrete Truck	Paved	20	1	0.01	0.00
Concrete Truck	Unpaved	0	1	0.00	0.00
Total Vehicle Fugitive				**0.12**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 24

Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
None			0.00	0.00
Total Earthwork Fugitive			**0.00**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Emission factors are in Table 25

Table 10a
Subtransmission Vault Installation

Emissions Summary

Source	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Equipment Exhaust	7.74	24.88	72.58	0.08	2.96	2.72
Vehicle Exhaust	0.22	2.02	0.26	0.00	0.02	0.01
Vehicle Fugitive	--	--	--	--	0.12	0.00
Earthwork Fugitive	--	--	--	--	0.00	0.00
Total	**7.96**	**26.90**	**72.85**	**0.09**	**3.10**	**2.73**

Construction Equipment Exhaust Emissions

Equipment	Horse-Power	Hours/ Day Used	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
1-Ton Crew Cab, 4x4	300	8	1	1.31	3.44	12.92	0.01	0.46	0.42
Excavator	250	6	1	0.87	2.36	8.96	0.01	0.31	0.29
Dump Truck	350	8	1	1.31	3.44	12.92	0.01	0.46	0.42
Backhoe/Front Loader	125	4	1	0.36	1.45	2.27	0.00	0.21	0.19
Water Truck	350	8	1	0.93	4.72	7.94	0.01	0.43	0.40
30-Ton Crane Truck	500	6	1	1.50	4.52	13.91	0.02	0.52	0.48
Concrete Mixer Truck	350	2	1	0.33	0.86	3.23	0.00	0.11	0.11
Lowboy Truck/Trailer	450	4	1	0.47	2.36	3.97	0.00	0.22	0.20
Flat Bed Truck/Trailer	400	4	1	0.66	1.72	6.46	0.01	0.23	0.21
Total Equipment Exhaust				**7.74**	**24.88**	**72.58**	**0.08**	**2.96**	**2.72**

[a] Emissions [lb/day] = Emission factor [lb/hr] x Operating time [hr/day] x Number

#REF!

Motor Vehicle Exhaust Emissions

Vehicle Type	Miles/ Day per Vehicle	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]	
Crew Truck	0.35	6	0.01	0.04	0.04	0.00	0.00	0.00	
Worker Commuting	40	6	0.22	1.98	0.22	0.00	0.02	0.01	
Water Truck	20	2	0.12	0.48	1.53	0.00	0.07	0.06	
Concrete Truck	20	1	0.06	0.24	0.76	0.00	0.04	0.03	
Total Vehicle Exhaust			**0.22**	**2.02**	**0.26**	**0.00**	**0.02**	**0.01**	

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 23

Motor Vehicle Entrained Particulate Matter Emissions

Vehicle Type	Road Type	Miles/ Day per Vehicle	Number	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Crew Truck	Paved	0.35	6	0.00	0.00
Crew Truck	Unpaved	0	6	0.00	0.00
Worker Commuting	Paved	40	6	0.12	0.00
Worker Commuting	Unpaved	0	6	0.00	0.00
Water Truck	Paved	20	2	0.02	0.00
Water Truck	Unpaved	0	2	0.00	0.00
Concrete Truck	Paved	20	1	0.01	0.00
Concrete Truck	Unpaved	0	1	0.00	0.00
Total Vehicle Fugitive				**0.12**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 24

Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
None			0.00	0.00
Total Earthwork Fugitive			**0.00**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Emission factors are in Table 25

Table 11
Subtransmission UG Cable Installation

Emissions Summary

Source	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Equipment Exhaust	6.65	20.84	63.59	0.07	2.49	2.29
Vehicle Exhaust	0.30	2.70	0.35	0.00	0.03	0.02
Vehicle Fugitive	--	--	--	--	0.17	0.00
Earthwork Fugitive	--	--	--	--	0.00	0.00
Total	**6.95**	**23.54**	**63.94**	**0.08**	**2.69**	**2.31**

Construction Equipment Exhaust Emissions

Equipment	Horse-Power	Hours/ Day Used	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
1-Ton Crew Cab Flat Bed, 4x4	300	4	2	1.31	3.44	12.92	0.01	0.46	0.42
Wire Truck/Trailer	350	6	2	1.97	5.16	19.38	0.02	0.69	0.63
Bucket Truck	250	6	1	0.98	2.58	9.69	0.01	0.34	0.32
Boom Truck	350	6	1	0.98	2.58	9.69	0.01	0.34	0.32
Puller	350	6	1	0.70	3.54	5.96	0.01	0.33	0.30
Static Truck/Tensioner	350	6	1	0.70	3.54	5.96	0.01	0.33	0.30
Total Equipment Exhaust				**6.65**	**20.84**	**63.59**	**0.07**	**2.49**	**2.29**

[a] Emissions [lb/day] = Emission factor [lb/hr] x Operating time [hr/day] x Number

#REF!

Motor Vehicle Exhaust Emissions

Vehicle Type	Miles/ Day per Vehicle	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]	
Crew Truck	0.35	8	0.01	0.05	0.06	0.00	0.00	0.00	
Worker Commuting	40	8	0.29	2.64	0.29	0.00	0.03	0.02	
Total Vehicle Exhaust			**0.30**	**2.70**	**0.35**	**0.00**	**0.03**	**0.02**	

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 23

Motor Vehicle Entrained Particulate Matter Emissions

Vehicle Type	Road Type	Miles/ Day per Vehicle	Number	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Crew Truck	Paved	0.35	8	0.00	0.00
Crew Truck	Unpaved	0	8	0.00	0.00
Worker Commuting	Paved	40	8	0.16	0.00
Worker Commuting	Unpaved	0	8	0.00	0.00
Total Vehicle Fugitive				**0.17**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 24

Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
None			0.00	0.00
Total Earthwork Fugitive			**0.00**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Emission factors are in Table 25

Table 11a
Subtransmission UG Cable Installation

Emissions Summary

Source	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Equipment Exhaust	5.01	16.54	47.44	0.06	1.92	1.76
Vehicle Exhaust	0.30	2.70	0.35	0.00	0.03	0.02
Vehicle Fugitive	--	--	--	--	0.17	0.00
Earthwork Fugitive	--	--	--	--	0.00	0.00
Total	**5.31**	**19.24**	**47.79**	**0.06**	**2.11**	**1.78**

Construction Equipment Exhaust Emissions

Equipment	Horse-Power	Hours/ Day Used	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
1-Ton Crew Cab Flat Bed, 4x4	300	4	1	0.66	1.72	6.46	0.01	0.23	0.21
Wire Truck/Trailer	350	6	1	0.98	2.58	9.69	0.01	0.34	0.32
Bucket Truck	250	6	1	0.98	2.58	9.69	0.01	0.34	0.32
Boom Truck	350	6	1	0.98	2.58	9.69	0.01	0.34	0.32
Puller	350	6	1	0.70	3.54	5.96	0.01	0.33	0.30
Static Truck/Tensioner	350	6	1	0.70	3.54	5.96	0.01	0.33	0.30
Total Equipment Exhaust				**5.01**	**16.54**	**47.44**	**0.06**	**1.92**	**1.76**

[a] Emissions [lb/day] = Emission factor [lb/hr] x Operating time [hr/day] x Number

#REF!

Motor Vehicle Exhaust Emissions

Vehicle Type	Miles/ Day per Vehicle	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]	
Crew Truck	0.35	8	0.01	0.05	0.06	0.00	0.00	0.00	
Worker Commuting	40	8	0.29	2.64	0.29	0.00	0.03	0.02	
Total Vehicle Exhaust			**0.30**	**2.70**	**0.35**	**0.00**	**0.03**	**0.02**	

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 23

Motor Vehicle Entrained Particulate Matter Emissions

Vehicle Type	Road Type	Miles/ Day per Vehicle	Number	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Crew Truck	Paved	0.35	8	0.00	0.00
Crew Truck	Unpaved	0	8	0.00	0.00
Worker Commuting	Paved	40	8	0.16	0.00
Worker Commuting	Unpaved	0	8	0.00	0.00
Total Vehicle Fugitive				**0.17**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 24

Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
None			0.00	0.00
Total Earthwork Fugitive			**0.00**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Emission factors are in Table 25

Table 12
Subtransmission Line Conductor Installation

Emissions Summary

Source	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Equipment Exhaust	16.10	42.25	161.78	0.18	5.69	5.23
Vehicle Exhaust	0.60	5.39	0.70	0.01	0.06	0.04
Vehicle Fugitive	--	--	--	--	0.33	0.00
Earthwork Fugitive	--	--	--	--	0.00	0.00
Total	**16.70**	**47.64**	**162.48**	**0.19**	**6.08**	**5.27**

Construction Equipment Exhaust Emissions

Equipment	Horse-Power	Hours/ Day Used	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
3/4-Ton Pick-up	300	8	2	2.62	6.88	25.84	0.03	0.92	0.85
1-Ton Crew Cab Flat Bed, 4x4	300	8	4	5.25	13.76	51.68	0.06	1.84	1.69
Wire Truck/Trailer	350	2	2	0.66	1.72	6.46	0.01	0.23	0.21
Dump Truck	350	2	1	0.33	0.86	3.23	0.00	0.11	0.11
Bucket Truck	350	8	2	2.62	6.88	25.84	0.03	0.92	0.85
22-Ton Manitex	350	8	2	2.24	5.88	24.03	0.02	0.81	0.75
Splicing Rig	350	2	1	0.28	0.74	3.00	0.00	0.10	0.09
Splicing Lab	300	2	1	0.28	0.74	3.00	0.00	0.10	0.09
3 Drum Straw line Puller	300	6	1	0.84	2.21	9.01	0.01	0.31	0.28
Static Truck/Tensioner	350	6	1	0.98	2.58	9.69	0.01	0.34	0.32
Total Equipment Exhaust				**16.10**	**42.25**	**161.78**	**0.18**	**5.69**	**5.23**

[a] Emissions [lb/day] = Emission factor [lb/hr] x Operating time [hr/day] x Number

Emission factors are in Table 22

Motor Vehicle Exhaust Emissions

Vehicle Type	Miles/ Day per Vehicle	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Crew Truck	0.35	16	0.01	0.10	0.12	0.00	0.00	0.00
Worker Commuting	40	16	0.58	5.29	0.59	0.01	0.06	0.04
Total Vehicle Exhaust			**0.60**	**5.39**	**0.70**	**0.01**	**0.06**	**0.04**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 23

Motor Vehicle Entrained Particulate Matter Emissions

Vehicle Type	Road Type	Miles/ Day per Vehicle	Number	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Crew Truck	Paved	0.35	16	0.00	0.00
Crew Truck	Unpaved	0	16	0.00	0.00
Worker Commuting	Paved	40	16	0.33	0.00
Worker Commuting	Unpaved	0	16	0.00	0.00
Total Vehicle Fugitive				**0.33**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 24

Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
None			0.00	0.00
Total Earthwork Fugitive			**0.00**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Emission factors are in Table 25

Table 15
Telecommunication Wood Pole Removal

Emissions Summary

Source	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Equipment Exhaust	6.32	16.66	59.25	0.07	2.17	2.00
Vehicle Exhaust	0.22	2.02	0.26	0.00	0.02	0.01
Vehicle Fugitive	--	--	--	--	0.12	0.00
Earthwork Fugitive	--	--	--	--	0.00	0.00
Total	**6.54**	**18.68**	**59.52**	**0.07**	**2.32**	**2.01**

Construction Equipment Exhaust Emissions

Equipment	Horse-Power	Hours/ Day Used	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
1-Ton Crew Cab Flat Bed, 4x4	300	8	2	2.62	6.88	25.84	0.03	0.92	0.85
Bucket Truck	250	6	1	0.98	2.58	9.69	0.01	0.34	0.32
Compressor Trailer	60	4	1	0.41	1.17	1.11	0.00	0.11	0.10
Boom Truck	350	6	1	0.98	2.58	9.69	0.01	0.34	0.32
Flat Bed Truck/Trailer	400	8	1	1.31	3.44	12.92	0.01	0.46	0.42
Total Equipment Exhaust				**6.32**	**16.66**	**59.25**	**0.07**	**2.17**	**2.00**

[a] Emissions [lb/day] = Emission factor [lb/hr] x Operating time [hr/day] x Number

#REF!

Motor Vehicle Exhaust Emissions

Vehicle Type	Miles/ Day per Vehicle	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]	
Crew Truck	0.35	6	0.01	0.04	0.04	0.00	0.00	0.00	
Worker Commuting	40	6	0.22	1.98	0.22	0.00	0.02	0.01	
Total Vehicle Exhaust			**0.22**	**2.02**	**0.26**	**0.00**	**0.02**	**0.01**	

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 23

Motor Vehicle Entrained Particulate Matter Emissions

Vehicle Type	Road Type	Miles/ Day per Vehicle	Number	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Crew Truck	Paved	0.35	6	0.00	0.00
Crew Truck	Unpaved	0	6	0.00	0.00
Worker Commuting	Paved	40	6	0.12	0.00
Worker Commuting	Unpaved	0	6	0.00	0.00
Total Vehicle Fugitive				**0.12**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 24

Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
None			0.00	0.00
Total Earthwork Fugitive			**0.00**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Emission factors are in Table 25

Table 16
Telecommunication LWC Pole Haul

Emissions Summary

Source	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Equipment Exhaust	3.61	9.46	35.53	0.04	1.26	1.16
Vehicle Exhaust	0.15	1.35	0.18	0.00	0.01	0.01
Vehicle Fugitive	--	--	--	--	0.08	0.00
Earthwork Fugitive	--	--	--	--	0.00	0.00
Total	**3.76**	**10.81**	**35.70**	**0.04**	**1.36**	**1.17**

Construction Equipment Exhaust Emissions

Equipment	Horse-Power	Hours/ Day Used	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
3/4-Ton Pick-up Truck, 4x4	275	8	1	1.31	3.44	12.92	0.01	0.46	0.42
Boom Truck	350	6	1	0.98	2.58	9.69	0.01	0.34	0.32
Flat Bed Truck/Trailer	400	8	1	1.31	3.44	12.92	0.01	0.46	0.42
Total Equipment Exhaust				**3.61**	**9.46**	**35.53**	**0.04**	**1.26**	**1.16**

[a] Emissions [lb/day] = Emission factor [lb/hr] x Operating time [hr/day] x Number

#REF!

Motor Vehicle Exhaust Emissions

Vehicle Type	Miles/ Day per Vehicle	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]	
Crew Truck	0.35	4	0.00	0.03	0.03	0.00	0.00	0.00	
Worker Commuting	40	4	0.15	1.32	0.15	0.00	0.01	0.01	
Total Vehicle Exhaust			**0.15**	**1.35**	**0.18**	**0.00**	**0.01**	**0.01**	

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 23

Motor Vehicle Entrained Particulate Matter Emissions

Vehicle Type	Road Type	Miles/ Day per Vehicle	Number	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Crew Truck	Paved	0.35	4	0.00	0.00
Crew Truck	Unpaved	0	4	0.00	0.00
Worker Commuting	Paved	40	4	0.08	0.00
Worker Commuting	Unpaved	0	4	0.00	0.00
Total Vehicle Fugitive				**0.08**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 24

Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
None			0.00	0.00
Total Earthwork Fugitive			**0.00**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Emission factors are in Table 25

Table 17
Telecommunication Pole Assembly

Emissions Summary

Source	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Equipment Exhaust	3.24	8.64	27.51	0.03	1.08	0.99
Vehicle Exhaust	0.30	2.70	0.35	0.00	0.03	0.02
Vehicle Fugitive	--	--	--	--	0.17	0.00
Earthwork Fugitive	--	--	--	--	0.00	0.00
Total	**3.54**	**11.34**	**27.86**	**0.04**	**1.27**	**1.01**

Construction Equipment Exhaust Emissions

Equipment	Horse-Power	Hours/ Day Used	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
3/4-Ton Pick-up Truck, 4x4	275	4	2	1.31	3.44	12.92	0.01	0.46	0.42
1-Ton Crew Cab Flat Bed, 4x4	300	4	2	1.31	3.44	12.92	0.01	0.46	0.42
Compressor Trailer	60	6	1	0.62	1.76	1.67	0.00	0.16	0.15
Boom Truck	350	8	1	1.31	3.44	12.92	0.01	0.46	0.42
Total Equipment Exhaust				**3.24**	**8.64**	**27.51**	**0.03**	**1.08**	**0.99**

[a] Emissions [lb/day] = Emission factor [lb/hr] x Operating time [hr/day] x Number

#REF!

Motor Vehicle Exhaust Emissions

Vehicle Type	Miles/ Day per Vehicle	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]	
Crew Truck	0.35	8	0.01	0.05	0.06	0.00	0.00	0.00	
Worker Commuting	40	8	0.29	2.64	0.29	0.00	0.03	0.02	
Total Vehicle Exhaust			**0.30**	**2.70**	**0.35**	**0.00**	**0.03**	**0.02**	

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 23

Motor Vehicle Entrained Particulate Matter Emissions

Vehicle Type	Road Type	Miles/ Day per Vehicle	Number	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Crew Truck	Paved	0.35	8	0.00	0.00
Crew Truck	Unpaved	0	8	0.00	0.00
Worker Commuting	Paved	40	8	0.16	0.00
Worker Commuting	Unpaved	0	8	0.00	0.00
Total Vehicle Fugitive				**0.17**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 24

Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
None			0.00	0.00
Total Earthwork Fugitive			**0.00**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Emission factors are in Table 25

Table 18
Telecommunication Install LWS Pole

Emissions Summary

Source	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Equipment Exhaust	5.05	16.08	44.51	0.05	2.02	1.86
Vehicle Exhaust	0.22	2.02	0.26	0.00	0.02	0.01
Vehicle Fugitive	--	--	--	--	0.12	0.00
Earthwork Fugitive	--	--	--	--	0.00	0.00
Total	**5.27**	**18.10**	**44.77**	**0.05**	**2.17**	**1.88**

Construction Equipment Exhaust Emissions

Equipment	Horse-Power	Hours/ Day Used	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
1-Ton Crew Cab Flat Bed, 4x4	300	8	1	1.31	3.44	12.92	0.01	0.46	0.42
Bucket Truck	250	6	1	0.98	2.58	9.69	0.01	0.34	0.32
Boom Truck	350	6	1	0.98	2.58	9.69	0.01	0.34	0.32
Auger Truck	210	6	1	1.04	4.58	7.68	0.01	0.46	0.43
Backhoe/Front loader	125	8	1	0.73	2.90	4.53	0.00	0.41	0.38
Flat Bed Truck/Trailer	400	8	1	1.31	3.44	12.92	0.01	0.46	0.42
Total Equipment Exhaust				**5.05**	**16.08**	**44.51**	**0.05**	**2.02**	**1.86**

[a] Emissions [lb/day] = Emission factor [lb/hr] x Operating time [hr/day] x Number

#REF!

Motor Vehicle Exhaust Emissions

Vehicle Type	Miles/ Day per Vehicle	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]	
Crew Truck	0.35	6	0.01	0.04	0.04	0.00	0.00	0.00	
Worker Commuting	40	6	0.22	1.98	0.22	0.00	0.02	0.01	
Total Vehicle Exhaust			**0.22**	**2.02**	**0.26**	**0.00**	**0.02**	**0.01**	

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 23

Motor Vehicle Entrained Particulate Matter Emissions

Vehicle Type	Road Type	Miles/ Day per Vehicle	Number	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Crew Truck	Paved	0.35	6	0.00	0.00
Crew Truck	Unpaved	0	6	0.00	0.00
Worker Commuting	Paved	40	6	0.12	0.00
Worker Commuting	Unpaved	0	6	0.00	0.00
Total Vehicle Fugitive				**0.12**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 24

Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
None			0.00	0.00
Total Earthwork Fugitive			**0.00**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Emission factors are in Table 25

Table 13
Telecommunications Line Aboveground Work

Emissions Summary

Source	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Equipment Exhaust	2.62	6.88	25.84	0.03	0.92	0.85
Vehicle Exhaust	0.15	1.32	0.15	0.00	0.01	0.01
Vehicle Fugitive	--	--	--	--	0.08	0.00
Earthwork Fugitive	--	--	--	--	0.00	0.00
Total	**2.77**	**8.20**	**25.99**	**0.03**	**1.02**	**0.85**

Construction Equipment Exhaust Emissions

Equipment	Horse-Power	Hours/ Day Used	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Reel Truck	300	8	1	1.31	3.44	12.92	0.01	0.46	0.42
Bucket Truck	350	8	1	1.31	3.44	12.92	0.01	0.46	0.42
Total Equipment Exhaust				**2.62**	**6.88**	**25.84**	**0.03**	**0.92**	**0.85**

[a] Emissions [lb/day] = Emission factor [lb/hr] x Operating time [hr/day] x Number

#REF!

Motor Vehicle Exhaust Emissions

Vehicle Type	Miles/ Day per Vehicle	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]	
Worker Commuting	40	4	0.15	1.32	0.15	0.00	0.01	0.01	
Total Vehicle Exhaust			**0.15**	**1.32**	**0.15**	**0.00**	**0.01**	**0.01**	

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 23

Motor Vehicle Entrained Particulate Matter Emissions

Vehicle Type	Road Type	Miles/ Day per Vehicle	Number	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Worker Commuting	Paved	40	4	0.08	0.00
Worker Commuting	Unpaved	0	4	0.00	0.00
Total Vehicle Fugitive				**0.08**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 24

Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
None			0.00	0.00
Total Earthwork Fugitive			**0.00**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Emission factors are in Table 25

Table 14
Telecommunications Line Belowground Work

Emissions Summary

Source	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Equipment Exhaust	2.62	6.88	25.84	0.03	0.92	0.85
Vehicle Exhaust	0.15	1.32	0.15	0.00	0.01	0.01
Vehicle Fugitive	--	--	--	--	0.08	0.00
Earthwork Fugitive	--	--	--	--	0.00	0.00
Total	**2.77**	**8.20**	**25.99**	**0.03**	**1.02**	**0.85**

Construction Equipment Exhaust Emissions

Equipment	Horse-Power	Hours/ Day Used	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Reel Truck	300	8	1	1.31	3.44	12.92	0.01	0.46	0.42
Bucket Truck	350	8	1	1.31	3.44	12.92	0.01	0.46	0.42
Total Equipment Exhaust				**2.62**	**6.88**	**25.84**	**0.03**	**0.92**	**0.85**

[a] Emissions [lb/day] = Emission factor [lb/hr] x Operating time [hr/day] x Number

#REF!

Motor Vehicle Exhaust Emissions

Vehicle Type	Miles/ Day per Vehicle	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]	
Worker Commuting	40	4	0.15	1.32	0.15	0.00	0.01	0.01	
Total Vehicle Exhaust			**0.15**	**1.32**	**0.15**	**0.00**	**0.01**	**0.01**	

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 23

Motor Vehicle Entrained Particulate Matter Emissions

Vehicle Type	Road Type	Miles/ Day per Vehicle	Number	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Worker Commuting	Paved	40	4	0.08	0.00
Worker Commuting	Unpaved	0	4	0.00	0.00
Total Vehicle Fugitive				**0.08**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 24

Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
None			0.00	0.00
Total Earthwork Fugitive			**0.00**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

Emission factors are in Table 25

Table 19
Access and Spur Road Road and Landing Work

Emissions Summary

Source	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Equipment Exhaust	12.02	43.41	115.48	0.12	4.42	4.06
Vehicle Exhaust	0.11	0.99	0.11	0.00	0.01	0.01
Vehicle Fugitive	--	--	--	--	0.06	0.00
Earthwork Fugitive	--	--	--	--	7.88	0.49
Total	**12.13**	**44.40**	**115.59**	**0.12**	**12.37**	**4.56**

Construction Equipment Exhaust Emissions

Equipment	Horse-Power	Hours/ Day Used	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
1-Ton Crew Cab, 4x4	500	2	2	0.66	1.72	6.46	0.01	0.23	0.21
Road Grader	500	4	1	0.86	3.01	8.48	0.01	0.32	0.30
Water Truck	350	8	2	3.99	12.07	37.10	0.04	1.39	1.28
Backhoe/Front Loader	500	6	1	2.08	9.81	20.41	0.02	0.82	0.76
Drum Type Compactor		4	1	0.90	2.49	10.19	0.01	0.34	0.31
Track Type Dozer	350	6	1	2.17	10.45	19.24	0.02	0.82	0.76
Excavator	500	6	1	0.87	2.36	8.96	0.01	0.31	0.29
Lowboy Truck/Trailer	500	2	1	0.50	1.51	4.64	0.01	0.17	0.16
Total Equipment Exhaust				**12.02**	**43.41**	**115.48**	**0.12**	**4.42**	**4.06**

[a] Emissions [lb/day] = Emission factor [lb/hr] x Operating time [hr/day] x Number

Emission factors are in Table 22

Motor Vehicle Exhaust Emissions

Vehicle Type	Miles/ Day per Vehicle	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Worker Commuting	40	3	0.11	0.99	0.11	0.00	0.01	0.01
Total Vehicle Exhaust			**0.11**	**0.99**	**0.11**	**0.00**	**0.01**	**0.01**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 23

Motor Vehicle Entrained Particulate Matter Emissions

Vehicle Type	Road Type	Miles/ Day per Vehicle	Number	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Worker Commuting	Paved	40	3	0.06	0.00
Worker Commuting	Unpaved	0	3	0.00	0.00
Total Vehicle Fugitive				**0.06**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 24

Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Bulldozing	Hours/Day	6	0.94	0.13
Excavating and Grading[b]	VMT/Day	10	6.94	0.36
Total Earthwork Fugitive			**7.88**	**0.49**

[a] Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

[b.] Assumes 1 mile of grader and excavator travel per hour.

Emission factors are in Table 25

Table 20
Access and Spur Road Retaining Wall Installation

Emissions Summary

Source	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Equipment Exhaust	21.41	64.07	215.01	0.27	7.91	7.27
Vehicle Exhaust	0.44	3.97	0.44	0.01	0.04	0.03
Vehicle Fugitive	--	--	--	--	0.25	0.00
Earthwork Fugitive	--	--	--	--	0.00	0.00
Total	**21.85**	**68.04**	**215.45**	**0.27**	**8.20**	**7.30**

Construction Equipment Exhaust Emissions

Equipment	Horse-Power	Hours/ Day Used	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
1-Ton Crew Cab, 4x4	300	8	2	2.62	6.88	25.84	0.03	0.92	0.85
Boom Truck	350	8	2	2.62	6.88	25.84	0.03	0.92	0.85
Drill Rig	250	8	2	1.53	5.54	18.95	0.03	0.61	0.57
Backhoe/Front Loader	350	6	1	0.85	2.42	9.30	0.01	0.31	0.29
Wheel Loader	250	8	2	2.27	6.46	24.79	0.03	0.84	0.77
Dump Truck	350	8	4	5.25	13.76	51.68	0.06	1.84	1.69
Water Truck	350	10	2	2.34	11.80	19.85	0.02	1.09	1.00
Concrete Mixer Truck	350	4	6	3.93	10.32	38.76	0.04	1.38	1.27
Total Equipment Exhaust				**21.41**	**64.07**	**215.01**	**0.27**	**7.91**	**7.27**

[a] Emissions [lb/day] = Emission factor [lb/hr] x Operating time [hr/day] x Number

#REF!

Motor Vehicle Exhaust Emissions

Vehicle Type	Miles/ Day per Vehicle	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]	
Worker Commuting	40	12	0.44	3.97	0.44	0.01	0.04	0.03	
Water Truck	20	1	0.06	0.24	0.76	0.00	0.04	0.03	
Concrete Truck	20	1	0.06	0.24	0.76	0.00	0.04	0.03	
Total Vehicle Exhaust			**0.44**	**3.97**	**0.44**	**0.01**	**0.04**	**0.03**	

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 23

Motor Vehicle Entrained Particulate Matter Emissions

Vehicle Type	Road Type	Miles/ Day per Vehicle	Number	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Worker Commuting	Paved	40	12	0.25	0.00
Worker Commuting	Unpaved	0	12	0.00	0.00
Water Truck	Paved	20	1	0.01	0.00
Water Truck	Unpaved	0	1	0.00	0.00
Concrete Truck	Paved	20	1	0.01	0.00
Concrete Truck	Unpaved	0	1	0.00	0.00
Total Vehicle Fugitive				**0.25**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 24

Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Bulldozing	Hours/Day		0.00	0.00
Excavating and Grading[b]	VMT/Day		0.00	0.00
Total Earthwork Fugitive			**0.00**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

[b.] Assumes 1 mile of grader and excavator travel per hour.

Emission factors are in Table 25

Table 20a
Spur Retaining Wall

Emissions Summary

Source	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Equipment Exhaust	8.51	26.36	86.31	0.11	3.19	2.94
Vehicle Exhaust	0.44	3.97	0.44	0.01	0.04	0.03
Vehicle Fugitive	--	--	--	--	0.25	0.00
Earthwork Fugitive	--	--	--	--	0.00	0.00
Total	**8.95**	**30.33**	**86.75**	**0.11**	**3.48**	**2.96**

Construction Equipment Exhaust Emissions

Equipment	Horse-Power	Hours/ Day Used	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
1-Ton Crew Cab, 4x4	300	8	1	1.31	3.44	12.92	0.01	0.46	0.42
Boom Truck	350	8	1	1.31	3.44	12.92	0.01	0.46	0.42
Drill Rig	250	8	1	0.77	2.77	9.48	0.02	0.31	0.28
Backhoe/Front Loader	350	6	1	0.85	2.42	9.30	0.01	0.31	0.29
Wheel Loader	250	8	1	1.13	3.23	12.39	0.02	0.42	0.39
Dump Truck	350	8	1	1.31	3.44	12.92	0.01	0.46	0.42
Water Truck	350	10	1	1.17	5.90	9.93	0.01	0.54	0.50
Concrete Mixer Truck	350	4	1	0.66	1.72	6.46	0.01	0.23	0.21
Total Equipment Exhaust				**8.51**	**26.36**	**86.31**	**0.11**	**3.19**	**2.94**

[a] Emissions [lb/day] = Emission factor [lb/hr] x Operating time [hr/day] x Number

#REF!

Motor Vehicle Exhaust Emissions

Vehicle Type	Miles/ Day per Vehicle	Number	ROG (lb/day)[a]	CO (lb/day)[a]	NO_x (lb/day)[a]	SO_x (lb/day)[a]	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]	
Worker Commuting	40	12	0.44	3.97	0.44	0.01	0.04	0.03	
Water Truck	20	1	0.06	0.24	0.76	0.00	0.04	0.03	
Concrete Truck	20	1	0.06	0.24	0.76	0.00	0.04	0.03	
Total Vehicle Exhaust			**0.44**	**3.97**	**0.44**	**0.01**	**0.04**	**0.03**	

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 23

Motor Vehicle Entrained Particulate Matter Emissions

Vehicle Type	Road Type	Miles/ Day per Vehicle	Number	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Worker Commuting	Paved	40	12	0.25	0.00
Worker Commuting	Unpaved	0	12	0.00	0.00
Water Truck	Paved	20	1	0.01	0.00
Water Truck	Unpaved	0	1	0.00	0.00
Concrete Truck	Paved	20	1	0.01	0.00
Concrete Truck	Unpaved	0	1	0.00	0.00
Total Vehicle Fugitive				**0.25**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/mi] x Distance per vehicle [lb/day] x Number

Emission factors are in Table 24

Fugitive Particulate Matter Emissions

Activity	Activity Units	Activity Level	PM_{10} (lb/day)[a]	$PM_{2.5}$ (lb/day)[a]
Bulldozing	Hours/Day		0.00	0.00
Excavating and Grading[b]	VMT/Day		0.00	0.00
Total Earthwork Fugitive			**0.00**	**0.00**

[a] Emissions [lb/day] = Emission factor [lb/activity unit] x Activity unit [units/day]

[b.] Assumes 1 mile of grader and excavator travel per hour.

Emission factors are in Table 25

Table 21
Offroad Emission Factors

SCAB Fleet Average Emission Factors (Diesel)

OffRoad 2010

Air Basin	SC

Equipment	MaxHP	(lb/hr) ROG	(lb/hr) CO	(lb/hr) NOX	(lb/hr) SOX	(lb/hr) PM	(lb/hr) PM2.5	(lb/hr) CO2	(lb/hr) CH4
Aerial Lifts	15	0.0104	0.0529	0.0662	0.0001	0.0037	0.0034	8.7	0.0009
	25	0.0210	0.0577	0.1013	0.0001	0.0065	0.0060	11.0	0.0019
	50	0.0756	0.1937	0.1984	0.0003	0.0189	0.0174	19.6	0.0068
	120	0.0702	0.2501	0.4502	0.0004	0.0361	0.0332	38.1	0.0063
	500	0.1506	0.5801	1.9198	0.0021	0.0598	0.0550	213	0.0136
	750	0.2803	1.0486	3.5605	0.0039	0.1096	0.1008	385	0.0253
Aerial Lifts Composite		0.0670	0.2093	0.3600	0.0004	0.0248	0.0228	34.7	0.0060
Air Compressors	15	0.0144	0.0513	0.0838	0.0001	0.0061	0.0056	7.2	0.0013
	25	0.0325	0.0847	0.1397	0.0002	0.0098	0.0091	14.4	0.0029
	50	0.1163	0.2813	0.2386	0.0003	0.0265	0.0243	22.3	0.0105
	120	0.1014	0.3351	0.5977	0.0006	0.0545	0.0501	47.0	0.0091
	175	0.1274	0.5113	1.0082	0.0010	0.0568	0.0523	88.5	0.0115
	250	0.1225	0.3413	1.3983	0.0015	0.0462	0.0425	131	0.0111
	500	0.1943	0.6778	2.2062	0.0023	0.0752	0.0692	232	0.0175
	750	0.3054	1.0476	3.5002	0.0036	0.1179	0.1085	358	0.0276
	1000	0.5203	1.8591	6.0195	0.0049	0.1809	0.1664	486	0.0469
Air Compressors Composite		0.1120	0.3613	0.7320	0.0007	0.0526	0.0484	63.6	0.0101
Bore/Drill Rigs	15	0.0120	0.0632	0.0754	0.0002	0.0031	0.0028	10.3	0.0011
	25	0.0196	0.0660	0.1257	0.0002	0.0065	0.0059	16.0	0.0018
	50	0.0545	0.2505	0.2820	0.0004	0.0194	0.0178	31.0	0.0049
	120	0.0722	0.4812	0.6155	0.0009	0.0456	0.0419	77.1	0.0065
	175	0.0930	0.7543	0.9148	0.0016	0.0481	0.0443	141	0.0084
	250	0.0957	0.3460	1.1847	0.0021	0.0384	0.0353	188	0.0086
	500	0.1488	0.5566	1.7054	0.0031	0.0614	0.0565	311	0.0134
	750	0.2996	1.0997	3.4821	0.0062	0.1231	0.1132	615	0.0270
	1000	0.5360	1.7074	8.3092	0.0093	0.2078	0.1912	928	0.0484
Bore/Drill Rigs Composite		0.1052	0.5146	1.1331	0.0017	0.0498	0.0458	165	0.0095
Cement and Mortar Mixers	15	0.0079	0.0388	0.0505	0.0001	0.0029	0.0027	6.3	0.0007
	25	0.0346	0.0942	0.1633	0.0002	0.0107	0.0099	17.6	0.0031
Cement and Mortar Mixers Composite		0.0101	0.0434	0.0599	0.0001	0.0035	0.0033	7.2	0.0009
Concrete/Industrial Saws	25	0.0200	0.0678	0.1279	0.0002	0.0063	0.0058	16.5	0.0018
	50	0.1231	0.3210	0.3070	0.0004	0.0301	0.0277	30.2	0.0111
	120	0.1342	0.4976	0.8601	0.0009	0.0719	0.0662	74.1	0.0121
	175	0.1927	0.8786	1.6459	0.0018	0.0864	0.0794	160	0.0174
Concrete/Industrial Saws Composite		0.1270	0.4273	0.6566	0.0007	0.0552	0.0508	58.5	0.0115
Cranes	50	0.1284	0.3166	0.2547	0.0003	0.0289	0.0266	23.2	0.0116
	120	0.1117	0.3723	0.6542	0.0006	0.0602	0.0554	50.1	0.0101
	175	0.1211	0.4880	0.9302	0.0009	0.0538	0.0495	80.3	0.0109
	250	0.1243	0.3464	1.2372	0.0013	0.0470	0.0432	112	0.0112
	500	0.1821	0.6625	1.7722	0.0018	0.0685	0.0630	180	0.0164
	750	0.3082	1.1113	3.0564	0.0030	0.1166	0.1072	303	0.0278
	9999	1.0894	4.1317	12.1879	0.0098	0.3792	0.3489	971	0.0983
Cranes Composite		0.1594	0.5431	1.4515	0.0014	0.0642	0.0591	129	0.0144
Crawler Tractors	50	0.1446	0.3520	0.2780	0.0003	0.0320	0.0295	24.9	0.0131
	120	0.1551	0.5018	0.9038	0.0008	0.0819	0.0753	65.8	0.0140
	175	0.1941	0.7597	1.4788	0.0014	0.0856	0.0787	121	0.0175
	250	0.2051	0.5743	1.9440	0.0019	0.0784	0.0722	166	0.0185
	500	0.2913	1.1931	2.7255	0.0025	0.1101	0.1013	259	0.0263
	750	0.5240	2.1290	4.9881	0.0047	0.1989	0.1829	465	0.0473
	1000	0.7980	3.3726	8.5998	0.0066	0.2810	0.2585	658	0.0720
Crawler Tractors Composite		0.1861	0.6409	1.3854	0.0013	0.0854	0.0786	114	0.0168
Crushing/Proc. Equipment	50	0.2271	0.5592	0.4700	0.0006	0.0520	0.0478	44.0	0.0205
	120	0.1760	0.5956	1.0382	0.0010	0.0960	0.0883	83.1	0.0159
	175	0.2367	0.9736	1.8607	0.0019	0.1068	0.0982	167	0.0214
	250	0.2243	0.6225	2.5465	0.0028	0.0841	0.0773	245	0.0202
	500	0.3091	1.0542	3.4510	0.0037	0.1187	0.1092	374	0.0279

Table 21
Offroad Emission Factors

SCAB Fleet Average Emission Factors (Diesel)

OffRoad 2010

Air Basin	SC

Equipment	MaxHP	(lb/hr) ROG	(lb/hr) CO	(lb/hr) NOX	(lb/hr) SOX	(lb/hr) PM	(lb/hr) PM2.5	(lb/hr) CO2	(lb/hr) CH4
	750	0.4956	1.6226	5.6506	0.0059	0.1900	0.1748	589	0.0447
	9999	1.3820	4.8014	16.0752	0.0131	0.4812	0.4427	1,308	0.1247
Crushing/Proc. Equipment Composite		0.2152	0.7260	1.4394	0.0015	0.0935	0.0861	132	0.0194
Dumpers/Tenders	25	0.0108	0.0336	0.0645	0.0001	0.0036	0.0034	7.6	0.0010
Dumpers/Tenders Composite		0.0108	0.0336	0.0645	0.0001	0.0036	0.0034	7.6	0.0010
Excavators	25	0.0199	0.0677	0.1261	0.0002	0.0057	0.0052	16.4	0.0018
	50	0.1131	0.3145	0.2638	0.0003	0.0276	0.0254	25.0	0.0102
	120	0.1398	0.5318	0.8402	0.0009	0.0781	0.0718	73.6	0.0126
	175	0.1465	0.6701	1.1143	0.0013	0.0663	0.0610	112	0.0132
	250	0.1451	0.3934	1.4935	0.0018	0.0519	0.0478	159	0.0131
	500	0.1984	0.6161	1.9285	0.0023	0.0711	0.0654	234	0.0179
	750	0.3313	1.0196	3.3023	0.0039	0.1198	0.1102	387	0.0299
Excavators Composite		0.1483	0.5581	1.1502	0.0013	0.0638	0.0587	120	0.0134
Forklifts	50	0.0666	0.1824	0.1530	0.0002	0.0163	0.0150	14.7	0.0060
	120	0.0601	0.2243	0.3497	0.0004	0.0342	0.0315	31.2	0.0054
	175	0.0738	0.3306	0.5540	0.0006	0.0337	0.0310	56.1	0.0067
	250	0.0652	0.1707	0.7163	0.0009	0.0227	0.0209	77.1	0.0059
	500	0.0868	0.2343	0.8909	0.0011	0.0307	0.0282	111	0.0078
Forklifts Composite		0.0686	0.2319	0.5161	0.0006	0.0281	0.0258	54.4	0.0062
Generator Sets	15	0.0172	0.0726	0.1154	0.0002	0.0069	0.0063	10.2	0.0016
	25	0.0300	0.1033	0.1705	0.0002	0.0107	0.0098	17.6	0.0027
	50	0.1117	0.2904	0.3070	0.0004	0.0284	0.0261	30.6	0.0101
	120	0.1395	0.5054	0.9075	0.0009	0.0714	0.0657	77.9	0.0126
	175	0.1672	0.7471	1.4780	0.0016	0.0721	0.0663	142	0.0151
	250	0.1618	0.5018	2.0720	0.0024	0.0618	0.0569	213	0.0146
	500	0.2305	0.8858	2.9974	0.0033	0.0917	0.0844	337	0.0208
	750	0.3838	1.4300	4.9646	0.0055	0.1502	0.1381	544	0.0346
	9999	1.0080	3.6008	12.1384	0.0105	0.3600	0.3312	1,049	0.0909
Generator Sets Composite		0.0961	0.3293	0.6440	0.0007	0.0396	0.0365	61.0	0.0087
Graders	50	0.1400	0.3584	0.2961	0.0004	0.0323	0.0297	27.5	0.0126
	120	0.1553	0.5459	0.9268	0.0009	0.0849	0.0781	75.0	0.0140
	175	0.1743	0.7409	1.3532	0.0014	0.0783	0.0720	124	0.0157
	250	0.1761	0.4934	1.7904	0.0019	0.0662	0.0609	172	0.0159
	500	0.2149	0.7523	2.1198	0.0023	0.0807	0.0742	229	0.0194
	750	0.4580	1.5877	4.6098	0.0049	0.1729	0.1591	486	0.0413
Graders Composite		0.1723	0.6314	1.4338	0.0015	0.0753	0.0693	133	0.0155
Off-Highway Tractors	120	0.2457	0.7439	1.4200	0.0011	0.1255	0.1155	93.7	0.0222
	175	0.2326	0.8561	1.7665	0.0015	0.1014	0.0933	130	0.0210
	250	0.1881	0.5347	1.7050	0.0015	0.0735	0.0677	130	0.0170
	750	0.7400	3.5496	6.8440	0.0057	0.2854	0.2625	568	0.0668
	1000	1.1197	5.5155	11.4633	0.0082	0.4009	0.3688	814	0.1010
Off-Highway Tractors Composite		0.2368	0.8385	1.9897	0.0017	0.0974	0.0896	151	0.0214
Off-Highway Trucks	175	0.1732	0.7625	1.2796	0.0014	0.0771	0.0710	125	0.0156
	250	0.1639	0.4301	1.6150	0.0019	0.0574	0.0528	167	0.0148
	500	0.2492	0.7542	2.3188	0.0027	0.0872	0.0802	272	0.0225
	750	0.4069	1.2210	3.8814	0.0044	0.1436	0.1321	442	0.0367
	1000	0.6440	2.0615	7.3260	0.0063	0.2219	0.2041	625	0.0581
Off-Highway Trucks Composite		0.2480	0.7429	2.3885	0.0027	0.0875	0.0805	260	0.0224
Other Construction Equipme	15	0.0118	0.0617	0.0737	0.0002	0.0030	0.0028	10.1	0.0011
	25	0.0162	0.0545	0.1039	0.0002	0.0053	0.0049	13.2	0.0015
	50	0.1033	0.2930	0.2787	0.0004	0.0263	0.0242	28.0	0.0093
	120	0.1320	0.5419	0.8649	0.0009	0.0740	0.0681	80.9	0.0119
	175	0.1168	0.5901	0.9927	0.0012	0.0543	0.0499	107	0.0105
	500	0.1705	0.6068	1.9821	0.0025	0.0678	0.0624	254	0.0154
Other Construction Equipment Composite		0.1056	0.4108	1.0117	0.0013	0.0442	0.0406	123	0.0095
Other General Industrial Equ	15	0.0066	0.0391	0.0466	0.0001	0.0017	0.0016	6.4	0.0006

Table 21
Offroad Emission Factors

SCAB Fleet Average Emission Factors (Diesel)

OffRoad 2010

Air Basin	SC

Equipment	MaxHP	ROG (lb/hr)	CO (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	PM (lb/hr)	PM2.5 (lb/hr)	CO2 (lb/hr)	CH4 (lb/hr)
	25	0.0186	0.0632	0.1177	0.0002	0.0054	0.0049	15.3	0.0017
	50	0.1281	0.3073	0.2413	0.0003	0.0285	0.0263	21.7	0.0116
	120	0.1459	0.4647	0.8218	0.0007	0.0795	0.0731	62.0	0.0132
	175	0.1516	0.5816	1.1364	0.0011	0.0676	0.0622	95.9	0.0137
	250	0.1400	0.3676	1.5016	0.0015	0.0509	0.0469	136	0.0126
	500	0.2500	0.8031	2.6018	0.0026	0.0919	0.0845	265	0.0226
	750	0.4153	1.3236	4.4083	0.0044	0.1538	0.1415	437	0.0375
	1000	0.6374	2.2063	7.1530	0.0056	0.2212	0.2035	560	0.0575
Other General Industrial Equipmen Compos		0.1847	0.5948	1.6649	0.0016	0.0740	0.0681	152	0.0167
Other Material Handling Equ	50	0.1773	0.4246	0.3355	0.0004	0.0395	0.0363	30.3	0.0160
	120	0.1417	0.4524	0.8014	0.0007	0.0772	0.0710	60.7	0.0128
	175	0.1914	0.7367	1.4429	0.0014	0.0856	0.0787	122	0.0173
	250	0.1481	0.3917	1.6024	0.0016	0.0542	0.0499	145	0.0134
	500	0.1782	0.5784	1.8750	0.0019	0.0660	0.0607	192	0.0161
	9999	0.8390	2.9174	9.4509	0.0073	0.2912	0.2679	741	0.0757
Other Material Handling Equipment Compo		0.1773	0.5556	1.6150	0.0015	0.0715	0.0658	141	0.0160
Pavers	25	0.0278	0.0845	0.1603	0.0002	0.0092	0.0085	18.7	0.0025
	50	0.1624	0.3860	0.3110	0.0004	0.0356	0.0328	28.0	0.0147
	120	0.1638	0.5223	0.9693	0.0008	0.0853	0.0785	69.2	0.0148
	175	0.2049	0.7959	1.6028	0.0014	0.0903	0.0831	128	0.0185
	250	0.2426	0.7011	2.3337	0.0022	0.0953	0.0877	194	0.0219
	500	0.2622	1.1661	2.5319	0.0023	0.1023	0.0941	233	0.0237
Pavers Composite		0.1774	0.5644	0.9868	0.0009	0.0709	0.0652	77.9	0.0160
Paving Equipment	25	0.0155	0.0521	0.0993	0.0002	0.0051	0.0047	12.6	0.0014
	50	0.1384	0.3277	0.2654	0.0003	0.0303	0.0279	23.9	0.0125
	120	0.1282	0.4084	0.7600	0.0006	0.0668	0.0615	54.5	0.0116
	175	0.1599	0.6208	1.2577	0.0011	0.0704	0.0648	101	0.0144
	250	0.1506	0.4363	1.4619	0.0014	0.0592	0.0545	122	0.0136
Paving Equipment Composite		0.1336	0.4478	0.8963	0.0008	0.0629	0.0579	68.9	0.0121
Plate Compactors	15	0.0050	0.0263	0.0317	0.0001	0.0015	0.0014	4.3	0.0005
Plate Compactors Composite		0.0050	0.0263	0.0317	0.0001	0.0015	0.0014	4.3	0.0005
Pressure Washers	15	0.0083	0.0348	0.0553	0.0001	0.0033	0.0030	4.9	0.0007
	25	0.0122	0.0419	0.0691	0.0001	0.0043	0.0040	7.1	0.0011
	50	0.0413	0.1143	0.1388	0.0002	0.0115	0.0106	14.3	0.0037
	120	0.0388	0.1487	0.2674	0.0003	0.0193	0.0177	24.1	0.0035
Pressure Washers Composite		0.0199	0.0666	0.0989	0.0001	0.0070	0.0065	9.4	0.0018
Pumps	15	0.0148	0.0528	0.0862	0.0001	0.0062	0.0057	7.4	0.0013
	25	0.0439	0.1142	0.1884	0.0002	0.0133	0.0122	19.5	0.0040
	50	0.1339	0.3428	0.3479	0.0004	0.0333	0.0306	34.3	0.0121
	120	0.1441	0.5136	0.9216	0.0009	0.0744	0.0685	77.9	0.0130
	175	0.1709	0.7489	1.4815	0.0016	0.0742	0.0683	140	0.0154
	250	0.1593	0.4846	1.9941	0.0023	0.0609	0.0560	201	0.0144
	500	0.2450	0.9411	3.1080	0.0034	0.0973	0.0895	345	0.0221
	750	0.4167	1.5559	5.2721	0.0057	0.1631	0.1500	571	0.0376
	9999	1.3269	4.8008	15.8590	0.0136	0.4723	0.4345	1,355	0.1197
Pumps Composite		0.0936	0.3096	0.5545	0.0006	0.0393	0.0362	49.6	0.0084
Rollers	15	0.0074	0.0386	0.0461	0.0001	0.0019	0.0017	6.3	0.0007
	25	0.0164	0.0551	0.1049	0.0002	0.0054	0.0050	13.3	0.0015
	50	0.1270	0.3169	0.2753	0.0003	0.0292	0.0269	26.0	0.0115
	120	0.1201	0.4177	0.7383	0.0007	0.0641	0.0590	59.0	0.0108
	175	0.1478	0.6270	1.2022	0.0012	0.0659	0.0606	108	0.0133
	250	0.1542	0.4540	1.6232	0.0017	0.0603	0.0555	153	0.0139
	500	0.1987	0.7785	2.0882	0.0022	0.0783	0.0721	219	0.0179
Rollers Composite		0.1176	0.4212	0.7749	0.0008	0.0547	0.0503	67.1	0.0106
Rough Terrain Forklifts	50	0.1590	0.4186	0.3558	0.0004	0.0377	0.0347	33.9	0.0143
	120	0.1213	0.4447	0.7326	0.0007	0.0676	0.0621	62.4	0.0109

Table 21
Offroad Emission Factors

SCAB Fleet Average Emission Factors (Diesel)

OffRoad 2010

Air Basin	SC

Equipment	MaxHP	ROG (lb/hr)	CO (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	PM (lb/hr)	PM2.5 (lb/hr)	CO2 (lb/hr)	CH4 (lb/hr)
	175	0.1640	0.7302	1.2875	0.0014	0.0749	0.0689	125	0.0148
	250	0.1523	0.4270	1.6632	0.0019	0.0567	0.0521	171	0.0137
	500	0.2097	0.6871	2.1987	0.0025	0.0788	0.0725	257	0.0189
Rough Terrain Forklifts Composite		0.1272	0.4766	0.7988	0.0008	0.0678	0.0624	70.3	0.0115
Rubber Tired Dozers	175	0.2398	0.8686	1.7881	0.0015	0.1036	0.0953	129	0.0216
	250	0.2776	0.7758	2.4482	0.0021	0.1071	0.0986	183	0.0250
	500	0.3621	1.7411	3.2071	0.0026	0.1370	0.1260	265	0.0327
	750	0.5457	2.6075	4.9024	0.0040	0.2071	0.1906	399	0.0492
	1000	0.8464	4.1786	8.4813	0.0060	0.3018	0.2776	592	0.0764
Rubber Tired Dozers Composite		0.3379	1.4127	2.9891	0.0025	0.1288	0.1185	239	0.0305
Rubber Tired Loaders	25	0.0206	0.0697	0.1314	0.0002	0.0064	0.0059	16.9	0.0019
	50	0.1560	0.4005	0.3333	0.0004	0.0361	0.0332	31.1	0.0141
	120	0.1206	0.4268	0.7227	0.0007	0.0660	0.0608	58.9	0.0109
	175	0.1476	0.6326	1.1513	0.0012	0.0664	0.0611	106	0.0133
	250	0.1493	0.4210	1.5357	0.0017	0.0563	0.0518	149	0.0135
	500	0.2172	0.7648	2.1684	0.0023	0.0819	0.0754	237	0.0196
	750	0.4484	1.5625	4.5660	0.0049	0.1700	0.1564	486	0.0405
	1000	0.6154	2.2308	7.1368	0.0060	0.2156	0.1983	594	0.0555
Rubber Tired Loaders Composite		0.1440	0.5078	1.1537	0.0012	0.0651	0.0599	109	0.0130
Scrapers	120	0.2236	0.7169	1.3034	0.0011	0.1177	0.1083	93.9	0.0202
	175	0.2391	0.9290	1.8284	0.0017	0.1053	0.0969	148	0.0216
	250	0.2618	0.7368	2.4818	0.0024	0.1006	0.0926	209	0.0236
	500	0.3650	1.5182	3.4250	0.0032	0.1386	0.1275	321	0.0329
	750	0.6328	2.6115	6.0373	0.0056	0.2413	0.2220	555	0.0571
Scrapers Composite		0.3202	1.2424	2.9078	0.0027	0.1256	0.1155	262	0.0289
Signal Boards	15	0.0072	0.0377	0.0450	0.0001	0.0017	0.0016	6.2	0.0006
	50	0.1492	0.3827	0.3689	0.0005	0.0364	0.0335	36.2	0.0135
	120	0.1495	0.5380	0.9446	0.0009	0.0792	0.0728	80.2	0.0135
	175	0.1907	0.8437	1.6203	0.0017	0.0846	0.0778	155	0.0172
	250	0.2049	0.6138	2.5094	0.0029	0.0789	0.0726	255	0.0185
Signal Boards Composite		0.0224	0.0953	0.1615	0.0002	0.0091	0.0084	16.7	0.0020
Skid Steer Loaders	25	0.0249	0.0700	0.1252	0.0002	0.0079	0.0073	13.8	0.0022
	50	0.0785	0.2507	0.2463	0.0003	0.0217	0.0199	25.5	0.0071
	120	0.0607	0.2822	0.4131	0.0005	0.0355	0.0327	42.8	0.0055
Skid Steer Loaders Composite		0.0692	0.2489	0.2919	0.0004	0.0252	0.0232	30.3	0.0062
Surfacing Equipment	50	0.0589	0.1520	0.1451	0.0002	0.0142	0.0131	14.1	0.0053
	120	0.1192	0.4334	0.7683	0.0007	0.0624	0.0574	63.8	0.0108
	175	0.1071	0.4787	0.9169	0.0010	0.0472	0.0435	85.8	0.0097
	250	0.1254	0.3883	1.3783	0.0015	0.0494	0.0455	135	0.0113
	500	0.1854	0.7785	2.0517	0.0022	0.0741	0.0682	221	0.0167
	750	0.2960	1.2171	3.2929	0.0035	0.1173	0.1079	347	0.0267
Surfacing Equipment Composite		0.1550	0.6164	1.5685	0.0017	0.0606	0.0557	166	0.0140
Sweepers/Scrubbers	15	0.0124	0.0729	0.0870	0.0002	0.0033	0.0030	11.9	0.0011
	25	0.0239	0.0808	0.1524	0.0002	0.0075	0.0069	19.6	0.0022
	50	0.1508	0.3893	0.3297	0.0004	0.0355	0.0327	31.6	0.0136
	120	0.1490	0.5329	0.8645	0.0009	0.0843	0.0776	75.0	0.0134
	175	0.1856	0.8049	1.4276	0.0016	0.0854	0.0786	139	0.0167
	250	0.1344	0.3643	1.5598	0.0018	0.0489	0.0450	162	0.0121
Sweepers/Scrubbers Composite		0.1548	0.5380	0.8473	0.0009	0.0686	0.0631	78.5	0.0140
Tractors/Loaders/Backhoes	25	0.0214	0.0681	0.1317	0.0002	0.0072	0.0066	15.9	0.0019
	50	0.1257	0.3548	0.3114	0.0004	0.0312	0.0287	30.3	0.0113
	120	0.0910	0.3623	0.5664	0.0006	0.0515	0.0474	51.7	0.0082
	175	0.1216	0.5881	0.9646	0.0011	0.0562	0.0517	101	0.0110
	250	0.1418	0.4037	1.5493	0.0019	0.0523	0.0482	172	0.0128
	500	0.2630	0.8495	2.7242	0.0039	0.0980	0.0901	345	0.0237
	750	0.3986	1.2725	4.2276	0.0058	0.1496	0.1376	517	0.0360

Table 21
Offroad Emission Factors

SCAB Fleet Average Emission Factors (Diesel)

OffRoad 2010

Air Basin	SC

		(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
Equipment	**MaxHP**	**ROG**	**CO**	**NOX**	**SOX**	**PM**	**PM2.5**	**CO2**	**CH4**
Tractors/Loaders/Backhoes Composite		0.1021	0.3930	0.6747	0.0008	0.0521	0.0479	66.8	0.0092
Trenchers	15	0.0099	0.0517	0.0617	0.0001	0.0023	0.0021	8.5	0.0009
	25	0.0400	0.1355	0.2555	0.0004	0.0125	0.0115	32.9	0.0036
	50	0.1837	0.4365	0.3620	0.0004	0.0405	0.0373	32.9	0.0166
	120	0.1509	0.4840	0.9082	0.0008	0.0776	0.0714	64.9	0.0136
	175	0.2254	0.8843	1.7973	0.0016	0.0990	0.0911	144	0.0203
	250	0.2770	0.8161	2.6802	0.0025	0.1103	0.1015	223	0.0250
	500	0.3468	1.6352	3.4013	0.0031	0.1373	0.1264	311	0.0313
	750	0.6586	3.0677	6.5218	0.0059	0.2602	0.2394	587	0.0594
Trenchers Composite		0.1675	0.4907	0.7598	0.0007	0.0637	0.0586	58.7	0.0151
Welders	15	0.0124	0.0441	0.0720	0.0001	0.0052	0.0048	6.2	0.0011
	25	0.0254	0.0661	0.1091	0.0001	0.0077	0.0071	11.3	0.0023
	50	0.1231	0.3025	0.2724	0.0003	0.0287	0.0264	26.0	0.0111
	120	0.0807	0.2738	0.4899	0.0005	0.0428	0.0394	39.5	0.0073
	175	0.1333	0.5515	1.0896	0.0011	0.0590	0.0542	98.2	0.0120
	250	0.1052	0.3022	1.2367	0.0013	0.0400	0.0368	119	0.0095
	500	0.1327	0.4823	1.5648	0.0016	0.0520	0.0479	168	0.0120
Welders Composite		0.0805	0.2246	0.2920	0.0003	0.0270	0.0248	25.6	0.0073

Table 22
Off-road Exhaust Emission Factors - Year 2010

Equipment Type	Fuel	Horse-power	SCAQMD Off-Road Model Category		ROG (lb/hr)[a]	CO (lb/hr)[a]	NO_X (lb/hr)[a]	SO_X (lb/hr)[a]	PM_{10} (lb/hr)[a]	$PM_{2.5}$ (lb/hr)[b]	CO_2 (lb/hr)[a]	CH_4 (lb/hr)[a]
10,000 lb Rough Terrain Fork Lif	Diesel	250	Forklifts	10,000 lb Rough Terrain Fork Lift 0250	0.069	0.232	0.516	0.001	0.028	0.026	54.396	0.006
10,000 lb/ Rough Terrain Forklift	Diesel	200	Forklifts	10,000 lb/ Rough Terrain Forklift 0200	0.069	0.232	0.516	0.001	0.028	0.026	54.396	0.006
10-cu yd. Dump Truck	Diesel	350	Off-Highway Trucks	10-cu yd. Dump Truck 0350	0.164	0.430	1.615	0.002	0.057	0.053	166.545	0.015
10-cu. yd. Concrete Mixer Truck	Diesel	425	Off-Highway Trucks	10-cu. yd. Concrete Mixer Truck 0425	0.164	0.430	1.615	0.002	0.057	0.053	166.545	0.015
10-cu. yd. Dump Truck	Diesel	350	Off-Highway Trucks	10-cu. yd. Dump Truck 0350	0.164	0.430	1.615	0.002	0.057	0.053	166.545	0.015
10-Ton Hydraulic Crane	Diesel		Cranes	10-Ton Hydraulic Crane 0000	0.127	0.427	0.657	0.001	0.055	0.051	58.464	0.011
15 Ton Crane	Diesel	125	Cranes	15 Ton Crane 0125	0.112	0.372	0.654	0.001	0.060	0.055	50.148	0.010
15 Ton Crane	Diesel		Cranes	15 Ton Crane 0000	0.127	0.427	0.657	0.001	0.055	0.051	58.464	0.011
17 Ton Crane	Diesel	125	Cranes	17 Ton Crane 0125	0.112	0.372	0.654	0.001	0.060	0.055	50.148	0.010
17 Ton Crane	Diesel		Cranes	17 Ton Crane 0000	0.127	0.427	0.657	0.001	0.055	0.051	58.464	0.011
1-Ton Crew Cab Flat Bed, 4x4	Diesel	500	Off-Highway Trucks	1-Ton Crew Cab Flat Bed, 4x4 0500	0.249	0.754	2.319	0.003	0.087	0.080	272.334	0.022
1-Ton Crew Cab Flat Bed, 4x4	Diesel	300	Off-Highway Trucks	1-Ton Crew Cab Flat Bed, 4x4 0300	0.164	0.430	1.615	0.002	0.057	0.053	166.545	0.015
1-Ton Crew Cab, 4x4	Diesel	250	Off-Highway Trucks	1-Ton Crew Cab, 4x4 0250	0.164	0.430	1.615	0.002	0.057	0.053	166.545	0.015
1-Ton Crew Cab, 4x4	Diesel	500	Off-Highway Trucks	1-Ton Crew Cab, 4x4 0500	0.249	0.754	2.319	0.003	0.087	0.080	272.334	0.022
1-Ton Crew Cab, 4x4	Diesel	300	Off-Highway Trucks	1-Ton Crew Cab, 4x4 0300	0.164	0.430	1.615	0.002	0.057	0.053	166.545	0.015
200 Ton Crawler Crane	Diesel		Cranes	200 Ton Crawler Crane 0000	0.127	0.427	0.657	0.001	0.055	0.051	58.464	0.011
22-Ton Manitex	Diesel	350	Other Construction Equipment	22-Ton Manitex 0350	0.117	0.590	0.993	0.001	0.054	0.050	106.516	0.011
3 Drum Straw line Puller	Diesel	300	Other Construction Equipment	3 Drum Straw line Puller 0300	0.117	0.590	0.993	0.001	0.054	0.050	106.516	0.011
3/4-Ton Pickup	Diesel		Off-Highway Trucks	3/4-Ton Pickup 0000	0.237	0.839	1.990	0.002	0.097	0.090	151.449	0.021
3/4-Ton Pick-up	Diesel	300	Off-Highway Trucks	3/4-Ton Pick-up 0300	0.164	0.430	1.615	0.002	0.057	0.053	166.545	0.015
3/4-Ton Pick-up Truck, 4x4	Diesel	275	Off-Highway Trucks	3/4-Ton Pick-up Truck, 4x4 0275	0.164	0.430	1.615	0.002	0.057	0.053	166.545	0.015
3/4-Ton Pick-up Truck, 4x4	Diesel	300	Off-Highway Trucks	3/4-Ton Pick-up Truck, 4x4 0300	0.164	0.430	1.615	0.002	0.057	0.053	166.545	0.015
30 Ton Crane	Diesel	125	Cranes	30 Ton Crane 0125	0.112	0.372	0.654	0.001	0.060	0.055	50.148	0.010
30 Ton Crane	Diesel		Cranes	30 Ton Crane 0000	0.127	0.427	0.657	0.001	0.055	0.051	58.464	0.011
30 Ton Hydraulic Crane	Diesel		Cranes	30 Ton Hydraulic Crane 0000	0.127	0.427	0.657	0.001	0.055	0.051	58.464	0.011
30-Ton Crane	Diesel	300	Cranes	30-Ton Crane 0300	0.124	0.346	1.237	0.001	0.047	0.043	112.159	0.011
30-Ton Crane Truck	Diesel	250	Off-Highway Trucks	30-Ton Crane Truck 0250	0.164	0.430	1.615	0.002	0.057	0.053	166.545	0.015
30-Ton Crane Truck	Diesel	500	Off-Highway Trucks	30-Ton Crane Truck 0500	0.249	0.754	2.319	0.003	0.087	0.080	272.334	0.022
30-Ton Crane Truck	Diesel	300	Cranes	30-Ton Crane Truck 0300	0.124	0.346	1.237	0.001	0.047	0.043	112.159	0.011
31 Ton Crane	Diesel	300	Cranes	31 Ton Crane 0300	0.124	0.346	1.237	0.001	0.047	0.043	112.159	0.011
40' Flat Bed Truck/Trailer	Diesel	350	Off-Highway Trucks	40' Flat Bed Truck/Trailer 0350	0.164	0.430	1.615	0.002	0.057	0.053	166.545	0.015
4000 Gallon Water Truck	Diesel	350	Off-Highway Trucks	4000 Gallon Water Truck 0350	0.164	0.430	1.615	0.002	0.057	0.053	166.545	0.015
50 Ton Hydraulic Crane	Diesel		Cranes	50 Ton Hydraulic Crane 0000	0.127	0.427	0.657	0.001	0.055	0.051	58.464	0.011
80ft. Hydraulic Man-lift Bucket T	Diesel	350	Off-Highway Trucks	80ft. Hydraulic Man-lift Bucket Truck 0350	0.164	0.430	1.615	0.002	0.057	0.053	166.545	0.015
80ft. Hydraulic Man-lift Bucket T	Diesel	500	Cranes	80ft. Hydraulic Man-lift Bucket Truck 0500	0.182	0.662	1.772	0.002	0.068	0.063	180.101	0.016
80-Ton Rough Terrain Crane	Diesel	350	Cranes	80-Ton Rough Terrain Crane 0350	0.124	0.346	1.237	0.001	0.047	0.043	112.159	0.011
980 Loader	Diesel		Tractors/Loaders/Backhoes	980 Loader 0000	0.155	0.538	0.847	0.001	0.069	0.063	78.543	0.014
Air Compressors	Diesel		Air Compressors	Air Compressors 0000	0.067	0.209	0.360	0.000	0.025	0.023	34.722	0.006
Asphalt Curb Machine	Diesel	35	Paving Equipment	Asphalt Curb Machine 0035	0.016	0.052	0.099	0.000	0.005	0.005	12.628	0.001
Asphalt Curb Machine	Diesel		Paving Equipment	Asphalt Curb Machine 0000	0.177	0.564	0.987	0.001	0.071	0.065	77.935	0.016
Asphalt Paver	Diesel	152	Pavers	Asphalt Paver 0152	0.164	0.522	0.969	0.001	0.085	0.079	69.196	0.015
Asphalt Paver	Diesel		Pavers	Asphalt Paver 0000	0.177	0.556	1.615	0.002	0.072	0.066	141.194	0.016
Auger Truck	Diesel	210	Off-Highway Trucks	Auger Truck 0210	0.173	0.763	1.280	0.001	0.077	0.071	125.088	0.016
Auger Truck	Diesel	500	Off-Highway Trucks	Auger Truck 0500	0.249	0.754	2.319	0.003	0.087	0.080	272.334	0.022
Backhoe	Diesel	79	Tractors/Loaders/Backhoes	Backhoe 0079	0.126	0.355	0.311	0.000	0.031	0.029	30.347	0.011
Backhoe	Diesel	350	Tractors/Loaders/Backhoes	Backhoe 0350	0.142	0.404	1.549	0.002	0.052	0.048	171.737	0.013
Backhoe	Diesel	200	Tractors/Loaders/Backhoes	Backhoe 0200	0.122	0.588	0.965	0.001	0.056	0.052	101.387	0.011
Backhoe	Diesel		Tractors/Loaders/Backhoes	Backhoe 0000	0.155	0.538	0.847	0.001	0.069	0.063	78.543	0.014
Backhoe/Front Loader	Diesel	350	Tractors/Loaders/Backhoes	Backhoe/Front Loader 0350	0.142	0.404	1.549	0.002	0.052	0.048	171.737	0.013
Backhoe/Front Loader	Diesel	500	Tractors/Loaders/Backhoes	Backhoe/Front Loader 0500	0.263	0.849	2.724	0.004	0.098	0.090	344.853	0.024
Backhoe/Front Loader	Diesel	125	Tractors/Loaders/Backhoes	Backhoe/Front Loader 0125	0.091	0.362	0.566	0.001	0.052	0.047	51.728	0.008
Backhoe/Loader	Diesel		Tractors/Loaders/Backhoes	Backhoe/Loader 0000	0.155	0.538	0.847	0.001	0.069	0.063	78.543	0.014
Backhoe/Loader	Diesel	500	Tractors/Loaders/Backhoes	Backhoe/Loader 0500	0.263	0.849	2.724	0.004	0.098	0.090	344.853	0.024
Batch Plant	Diesel		Other Construction Equipment	Batch Plant 0000	0.248	0.743	2.388	0.003	0.088	0.081	260.104	0.022
Boom Truck	Diesel	350	Off-Highway Trucks	Boom Truck 0350	0.164	0.430	1.615	0.002	0.057	0.053	166.545	0.015
Boom Truck	Diesel		Off-Highway Trucks	Boom Truck 0000	0.237	0.839	1.990	0.002	0.097	0.090	151.449	0.021
Bucket Truck	Diesel		Off-Highway Trucks	Bucket Truck 0000	0.237	0.839	1.990	0.002	0.097	0.090	151.449	0.021
Bucket Truck	Diesel	250	Off-Highway Trucks	Bucket Truck 0250	0.164	0.430	1.615	0.002	0.057	0.053	166.545	0.015
Bucket Truck	Diesel	350	Off-Highway Trucks	Bucket Truck 0350	0.164	0.430	1.615	0.002	0.057	0.053	166.545	0.015
Compressor	Diesel		Other Construction Equipment	Compressor 0000	0.248	0.743	2.388	0.003	0.088	0.081	260.104	0.022
Compressor Trailer	Diesel	120	Other Construction Equipment	Compressor Trailer 0120	0.132	0.542	0.865	0.001	0.074	0.068	80.859	0.012
Compressor Trailer	Diesel	120	Other Construction Equipment	Compressor Trailer 0120	0.132	0.542	0.865	0.001	0.074	0.068	80.859	0.012
Compressor Trailer	Diesel	60	Other Construction Equipment	Compressor Trailer 0060	0.103	0.293	0.279	0.000	0.026	0.024	27.990	0.009
Concrete Mixer Truck	Diesel	350	Off-Highway Trucks	Concrete Mixer Truck 0350	0.164	0.430	1.615	0.002	0.057	0.053	166.545	0.015
Concrete Truck	Diesel		Off-Highway Trucks	Concrete Truck 0000	0.237	0.839	1.990	0.002	0.097	0.090	151.449	0.021
Conductor Pulling Machine	Diesel	120	Other Construction Equipment	Conductor Pulling Machine 0120	0.132	0.542	0.865	0.001	0.074	0.068	80.859	0.012
Conductor Pulling Machine	Diesel		Other Construction Equipment	Conductor Pulling Machine 0000	0.248	0.743	2.388	0.003	0.088	0.081	260.104	0.022
Conductor Tensioner	Diesel	120	Other Construction Equipment	Conductor Tensioner 0120	0.132	0.542	0.865	0.001	0.074	0.068	80.859	0.012
Conductor Tensioner	Diesel		Other Construction Equipment	Conductor Tensioner 0000	0.248	0.743	2.388	0.003	0.088	0.081	260.104	0.022
Construction Fork	Diesel		Forklifts	Construction Fork 0000	0.148	0.558	1.150	0.001	0.064	0.059	119.581	0.013
Crane	Diesel	125	Cranes	Crane 0125	0.112	0.372	0.654	0.001	0.060	0.055	50.148	0.010
Crane	Diesel		Cranes	Crane 0000	0.127	0.427	0.657	0.001	0.055	0.051	58.464	0.011
D6 Dozer	Diesel		Crawler Tractors	D6 Dozer 0000	0.159	0.543	1.451	0.001	0.064	0.059	128.655	0.014
Ditch Witch	Diesel		Off-Highway Trucks	Ditch Witch 0000	0.237	0.839	1.990	0.002	0.097	0.090	151.449	0.021
Dozer	Diesel	350	Rubber Tired Dozers	Dozer 0350	0.278	0.776	2.448	0.002	0.107	0.099	183.487	0.025
Dozer	Diesel		Rubber Tired Dozers	Dozer 0000	0.127	0.477	0.799	0.001	0.068	0.062	70.281	0.011
Dozer, D6	Diesel	165	Crawler Tractors	Dozer, D6 0165	0.155	0.502	0.904	0.001	0.082	0.075	65.811	0.014
Dozer, D6	Diesel		Crawler Tractors	Dozer, D6 0000	0.159	0.543	1.451	0.001	0.064	0.059	128.655	0.014
Dozer, D8	Diesel	305	Crawler Tractors	Dozer, D8 0305	0.205	0.574	1.944	0.002	0.078	0.072	166.132	0.019
Dozer, D8	Diesel		Crawler Tractors	Dozer, D8 0000	0.159	0.543	1.451	0.001	0.064	0.059	128.655	0.014
Drill Rig	Diesel	250	Bore/Drill Rigs	Drill Rig 0250	0.096	0.346	1.185	0.002	0.038	0.035	188.102	0.009
Drill Rig	Diesel		Bore/Drill Rigs	Drill Rig 0000	0.112	0.361	0.732	0.001	0.053	0.048	63.607	0.010
Drilling Rig	Diesel	190	Bore/Drill Rigs	Drilling Rig 0190	0.093	0.754	0.915	0.002	0.048	0.044	141.076	0.008
Drilling Rig	Diesel		Bore/Drill Rigs	Drilling Rig 0000	0.112	0.361	0.732	0.001	0.053	0.048	63.607	0.010
Drilling Rig	Diesel		Bore/Drill Rigs	Drilling Rig 0000	0.112	0.361	0.732	0.001	0.053	0.048	63.607	0.010
Drum Type Compactor	Diesel		Plate Compactors	Drum Type Compactor 0000	0.005	0.026	0.032	0.000	0.002	0.001	4.314	0.000
Dump Truck	Diesel		Off-Highway Trucks	Dump Truck 0000	0.237	0.839	1.990	0.002	0.097	0.090	151.449	0.021
Dump Truck	Diesel	350	Off-Highway Trucks	Dump Truck 0350	0.164	0.430	1.615	0.002	0.057	0.053	166.545	0.015
Excavator	Diesel	152	Excavators	Excavator 0152	0.140	0.532	0.840	0.001	0.078	0.072	73.623	0.013
Excavator	Diesel	250	Excavators	Excavator 0250	0.145	0.393	1.494	0.002	0.052	0.048	158.683	0.013
Excavator	Diesel	500	Excavators	Excavator 0500	0.148	0.558	1.150	0.001	0.064	0.059	119.581	0.013
Excavator	Diesel		Excavators	Excavator 0000	0.011	0.034	0.064	0.000	0.004	0.003	7.624	0.001
Excavators	Diesel		Excavators	Excavators 0000	0.011	0.034	0.064	0.000	0.004	0.003	7.624	0.001
Extendable Flat Bed Pole Truck	Diesel	500	Off-Highway Trucks	Extendable Flat Bed Pole Truck 0500	0.249	0.754	2.319	0.003	0.087	0.080	272.334	0.022
Extendable Flat Bed Pole Truck	Diesel	350	Off-Highway Trucks	Extendable Flat Bed Pole Truck 0350	0.164	0.430	1.615	0.002	0.057	0.053	166.545	0.015
Flat Bed Truck/Trailer	Diesel	350	Off-Highway Trucks	Flat Bed Truck/Trailer 0350	0.164	0.430	1.615	0.002	0.057	0.053	166.545	0.015
Flat Bed Truck/Trailer	Diesel	400	Off-Highway Trucks	Flat Bed Truck/Trailer 0400	0.164	0.430	1.615	0.002	0.057	0.053	166.545	0.015

Table 22
Off-road Exhaust Emission Factors - Year 2010

Equipment Type	Fuel	Horse-power	SCAQMD Off-Road Model Category		ROG (lb/hr)[a]	CO (lb/hr)[a]	NO_X (lb/hr)[a]	SO_X (lb/hr)[a]	PM_{10} (lb/hr)[a]	$PM_{2.5}$ (lb/hr)[b]	CO_2 (lb/hr)[a]	CH_4 (lb/hr)[a]
Forklift	Diesel	83	Forklifts	Forklift 0083	0.067	0.182	0.153	0.000	0.016	0.015	14.672	0.006
Forklift	Diesel		Forklifts	Forklift 0000	0.148	0.558	1.150	0.001	0.064	0.059	119.581	0.013
Forklift	Diesel		Forklifts	Forklift 0000	0.148	0.558	1.150	0.001	0.064	0.059	119.581	0.013
Forklift	Diesel		Forklifts	Forklift 0000	0.148	0.558	1.150	0.001	0.064	0.059	119.581	0.013
Foundation Auger	Diesel	79	Bore/Drill Rigs	Foundation Auger 0079	0.054	0.250	0.282	0.000	0.019	0.018	31.037	0.005
Foundation Auger	Diesel		Bore/Drill Rigs	Foundation Auger 0000	0.112	0.361	0.732	0.001	0.053	0.048	63.607	0.010
Front End Loader	Diesel		Tractors/Loaders/Backhoes	Front End Loader 0000	0.155	0.538	0.847	0.001	0.069	0.063	78.543	0.014
Generators	Diesel		Generator Sets	Generators 0000	0.069	0.232	0.516	0.001	0.028	0.026	54.396	0.006
Grader	Diesel	110	Graders	Grader 0110	0.172	0.631	1.434	0.001	0.075	0.069	132.743	0.016
Grader	Diesel	350	Graders	Grader 0350	0.172	0.631	1.434	0.001	0.075	0.069	132.743	0.016
Grader	Diesel		Graders	Grader 0000	0.172	0.631	1.434	0.001	0.075	0.069	132.743	0.016
Grader	Diesel		Graders	Grader 0000	0.172	0.631	1.434	0.001	0.075	0.069	132.743	0.016
Hauler	Diesel		Off-Highway Trucks	Hauler 0000	0.237	0.839	1.990	0.002	0.097	0.090	151.449	0.021
Loader	Diesel	147	Tractors/Loaders/Backhoes	Loader 0147	0.091	0.362	0.566	0.001	0.052	0.047	51.728	0.008
Loader	Diesel		Tractors/Loaders/Backhoes	Loader 0000	0.155	0.538	0.847	0.001	0.069	0.063	78.543	0.014
Lowboy Truck/Trailer	Diesel	450	Other Construction Equipment	Lowboy Truck/Trailer 0450	0.117	0.590	0.993	0.001	0.054	0.050	106.516	0.011
Lowboy Truck/Trailer	Diesel	500	Other Construction Equipment	Lowboy Truck/Trailer 0500	0.171	0.607	1.982	0.002	0.068	0.062	254.238	0.015
Manlift	Diesel	43	Aerial Lifts	Manlift 0043	0.021	0.058	0.101	0.000	0.007	0.006	10.960	0.002
Manlift	Diesel	500	Aerial Lifts	Manlift 0500	0.151	0.580	1.920	0.002	0.060	0.055	212.856	0.014
Off-Highway Truck	Diesel		Off-Highway Trucks	Off-Highway Truck 0000	0.237	0.839	1.990	0.002	0.097	0.090	151.449	0.021
Off-Highway Truck	Diesel	500	Off-Highway Trucks	Off-Highway Truck 0500	0.249	0.754	2.319	0.003	0.087	0.080	272.334	0.022
Off-Highway Trucks	Diesel		Other Construction Equipment	Off-Highway Trucks 0000	0.248	0.743	2.388	0.003	0.088	0.081	260.104	0.022
Other Construction Equipment	Diesel		Other Construction Equipment	Other Construction Equipment 0000	0.248	0.743	2.388	0.003	0.088	0.081	260.104	0.022
Paver/Sealer	Diesel		Pavers	Paver/Sealer 0000	0.177	0.556	1.615	0.002	0.072	0.066	141.194	0.016
Paving Roller	Diesel	46	Rollers	Paving Roller 0046	0.016	0.055	0.105	0.000	0.005	0.005	13.343	0.001
Paving Roller	Diesel		Rollers	Paving Roller 0000	0.094	0.310	0.554	0.001	0.039	0.036	49.607	0.008
Pipe Truck/Trailer	Diesel	275	Off-Highway Trucks	Pipe Truck/Trailer 0275	0.164	0.430	1.615	0.002	0.057	0.053	166.545	0.015
Puller	Diesel	350	Other Construction Equipment	Puller 0350	0.117	0.590	0.993	0.001	0.054	0.050	106.516	0.011
Reach Manlift	Diesel	87	Aerial Lifts	Reach Manlift 0087	0.076	0.194	0.198	0.000	0.019	0.017	19.613	0.007
Reach Manlift	Diesel	500	Aerial Lifts	Reach Manlift 0500	0.151	0.580	1.920	0.002	0.060	0.055	212.856	0.014
Reel Truck	Diesel	300	Off-Highway Trucks	Reel Truck 0300	0.164	0.430	1.615	0.002	0.057	0.053	166.545	0.015
Road Grader	Diesel	500	Graders	Road Grader 0500	0.172	0.631	1.434	0.001	0.075	0.069	132.743	0.016
Scissor Lift	Diesel	87	Aerial Lifts	Scissor Lift 0087	0.076	0.194	0.198	0.000	0.019	0.017	19.613	0.007
Scissor Lift	Diesel	500	Aerial Lifts	Scissor Lift 0500	0.151	0.580	1.920	0.002	0.060	0.055	212.856	0.014
Scraper	Diesel	267	Scrapers	Scraper 0267	0.262	0.737	2.482	0.002	0.101	0.093	209.470	0.024
Scraper	Diesel		Scrapers	Scraper 0000	0.144	0.508	1.154	0.001	0.065	0.060	108.613	0.013
Sheep's Foot Vibrator Compactor (10 yards)	Diesel		Plate Compactors	ep's Foot Vibrator Compactor (10 yards)	0.005	0.026	0.032	0.000	0.002	0.001	4.314	0.000
Skid Steer Loader	Diesel	75	Skid Steer Loaders	Skid Steer Loader 0075	0.078	0.251	0.246	0.000	0.022	0.020	25.519	0.007
Skid Steer Loader	Diesel		Skid Steer Loaders	Skid Steer Loader 0000	0.022	0.095	0.161	0.000	0.009	0.008	16.698	0.002
Skip Loader	Diesel	75	Skid Steer Loaders	Skip Loader 0075	0.078	0.251	0.246	0.000	0.022	0.020	25.519	0.007
Skip Loader	Diesel		Skid Steer Loaders	Skip Loader 0000	0.022	0.095	0.161	0.000	0.009	0.008	16.698	0.002
Splicing Lab	Diesel	300	Other Construction Equipment	Splicing Lab 0300	0.117	0.590	0.993	0.001	0.054	0.050	106.516	0.011
Splicing Rig	Diesel	350	Bore/Drill Rigs	Splicing Rig 0350	0.096	0.346	1.185	0.002	0.038	0.035	188.102	0.009
Static Truck/Tensioner	Diesel	350	Other Construction Equipment	Static Truck/Tensioner 0350	0.117	0.590	0.993	0.001	0.054	0.050	106.516	0.011
Tamper	Diesel	174	Rollers	Tamper 0174	0.120	0.418	0.738	0.001	0.064	0.059	58.989	0.011
Tamper	Diesel		Rollers	Tamper 0000	0.094	0.310	0.554	0.001	0.039	0.036	49.607	0.008
Track Type Dozer	Diesel	350	Rubber Tired Dozers	Track Type Dozer 0350	0.278	0.776	2.448	0.002	0.107	0.099	183.487	0.025
Tractor	Diesel	45	Tractors/Loaders/Backhoes	Tractor 0045	0.021	0.068	0.132	0.000	0.007	0.007	15.863	0.002
Tractor	Diesel		Tractors/Loaders/Backhoes	Tractor 0000	0.155	0.538	0.847	0.001	0.069	0.063	78.543	0.014
Truck Mounted Crane	Diesel	235	Cranes	Truck Mounted Crane 0235	0.121	0.488	0.930	0.001	0.054	0.050	80.345	0.011
Truck Mounted Crane	Diesel		Cranes	Truck Mounted Crane 0000	0.127	0.427	0.657	0.001	0.055	0.051	58.464	0.011
Truck with Trailer	Diesel		Off-Highway Trucks	Truck with Trailer 0000	0.237	0.839	1.990	0.002	0.097	0.090	151.449	0.021
Truck, Semi, Tractor	Diesel	500	Off-Highway Trucks	Truck, Semi, Tractor 0500	0.249	0.754	2.319	0.003	0.087	0.080	272.334	0.022
Vibrating Roller	Diesel		Rollers	Vibrating Roller 0000	0.094	0.310	0.554	0.001	0.039	0.036	49.607	0.008
Water Truck	Diesel	350	Other Construction Equipment	Water Truck 0350	0.117	0.590	0.993	0.001	0.054	0.050	106.516	0.011
Water Truck	Diesel		Off-Highway Trucks	Water Truck 0000	0.237	0.839	1.990	0.002	0.097	0.090	151.449	0.021
Welders	Diesel		Welders	Welders 0000	0.167	0.491	0.760	0.001	0.064	0.059	58.719	0.015
Wheel Loader	Diesel	250	Tractors/Loaders/Backhoes	Wheel Loader 0250	0.142	0.404	1.549	0.002	0.052	0.048	171.737	0.013
Wire Truck/Trailer	Diesel	350	Off-Highway Trucks	Wire Truck/Trailer 0350	0.164	0.430	1.615	0.002	0.057	0.053	166.545	0.015

[a] SCAQMD CEQA Air Quality Guidance Handbook - Offroad Model Mobile Source Emission Factors; where bhp not available, SCAQMD composite emission factors were used

[b] Diesel PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction of PM10 in Diesel Engine **0.920**

From Appendix A, Final–Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006, http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Table 23

Onroad Emission Factor Summary

Vechile Type	SCAQMD EF Classification	ROG	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
		2010							
Water Truck	HHDT	0.00304	0.01195	0.03822	0.00004	0.00183	0.00160	4.21121	0.00014
Dump Truck	HHDT	0.00304	0.01195	0.03822	0.00004	0.00183	0.00160	4.21121	0.00014
Carry-all Truck	HHDT	0.00304	0.01195	0.03822	0.00004	0.00183	0.00160	4.21121	0.00014
Stake Truck	HHDT	0.00304	0.01195	0.03822	0.00004	0.00183	0.00160	4.21121	0.00014
Low Bed Truck	HHDT	0.00304	0.01195	0.03822	0.00004	0.00183	0.00160	4.21121	0.00014
Flatbed Truck	HHDT	0.00304	0.01195	0.03822	0.00004	0.00183	0.00160	4.21121	0.00014
Line Truck	HHDT	0.00304	0.01195	0.03822	0.00004	0.00183	0.00160	4.21121	0.00014
Concrete Truck	HHDT	0.00304	0.01195	0.03822	0.00004	0.00183	0.00160	4.21121	0.00014
Heavy Duty Truck	HHDT	0.00304	0.01195	0.03822	0.00004	0.00183	0.00160	4.21121	0.00014
6 Ton Truck	HHDT	0.00304	0.01195	0.03822	0.00004	0.00183	0.00160	4.21121	0.00014
Dump Truck (10 yards)	HHDT	0.00304	0.01195	0.03822	0.00004	0.00183	0.00160	4.21121	0.00014
Dump Truck (20 yards)	HHDT	0.00304	0.01195	0.03822	0.00004	0.00183	0.00160	4.21121	0.00014
Water Truck (2000 gallons)	HHDT	0.00304	0.01195	0.03822	0.00004	0.00183	0.00160	4.21121	0.00014
Worker Shuttle	MHDT	0.00259	0.01844	0.02062	0.00003	0.00075	0.00064	2.73222	0.00013
Pickup Truck	MHDT	0.00259	0.01844	0.02062	0.00003	0.00075	0.00064	2.73222	0.00013
Crew Truck	MHDT	0.00259	0.01844	0.02062	0.00003	0.00075	0.00064	2.73222	0.00013
Maintenance Truck	MHDT	0.00259	0.01844	0.02062	0.00003	0.00075	0.00064	2.73222	0.00013
Tool Truck	MHDT	0.00259	0.01844	0.02062	0.00003	0.00075	0.00064	2.73222	0.00013
Light Truck	MHDT	0.00259	0.01844	0.02062	0.00003	0.00075	0.00064	2.73222	0.00013
Bucket Truck	MHDT	0.00259	0.01844	0.02062	0.00003	0.00075	0.00064	2.73222	0.00013
Framing Truck	MHDT	0.00259	0.01844	0.02062	0.00003	0.00075	0.00064	2.73222	0.00013
3/4-Ton Pickup	MHDT	0.00259	0.01844	0.02062	0.00003	0.00075	0.00064	2.73222	0.00013
Worker Commuting	Passenger	0.00091	0.00826	0.00092	0.00001	0.00009	0.00005	1.09568	0.00008

[a] SCAQMD CEQA Air Quality Guidance Handbook - Onroad - EMFAC 2007 Emission Factors

PM10 and PM2.5 includes exhaust + tire and brake wear emissions

Table 24
Motor Vehicle Entrained Road Dust Emission Factors

Vehicle Type	Surface		Silt Loading (sL, g/m2) or Silt Content (s, %)[a]	Average Weight (W) (tons)[b]	PM10 Emission Factor (lb/VMT)[c]	PM2.5 Emission Factor (lb/VMT)[c]
Water Truck	Paved	Water TruckPaved	0.035	2.7	5.15E-04	0.00E+00
Water Truck	Unpaved	Water TruckUnpaved	7.5	17	2.14E+00	2.14E-01
Tool Truck	Paved	Tool TruckPaved	0.035	2.7	5.15E-04	0.00E+00
Tool Truck	Unpaved	Tool TruckUnpaved	7.5	17	2.14E+00	2.14E-01
Pickup Truck	Paved	Pickup TruckPaved	0.035	2.7	5.15E-04	0.00E+00
Pickup Truck	Unpaved	Pickup TruckUnpaved	7.5	17	2.14E+00	2.14E-01
Dump Truck	Paved	Dump TruckPaved	0.035	2.7	5.15E-04	0.00E+00
Dump Truck	Unpaved	Dump TruckUnpaved	7.5	17	2.14E+00	2.14E-01
Dump Truck (10 yards)	Paved	ump Truck (10 yards)Pave	0.035	2.7	5.15E-04	0.00E+00
Dump Truck (10 yards)	Unpaved	mp Truck (10 yards)Unpav	7.5	17	2.14E+00	2.14E-01
Dump Truck (20 yards)	Paved	ump Truck (20 yards)Pave	0.035	2.7	5.15E-04	0.00E+00
Dump Truck (20 yards)	Unpaved	mp Truck (20 yards)Unpav	7.5	17	2.14E+00	2.14E-01
6 Ton Truck	Paved	6 Ton TruckPaved	0.035	2.7	5.15E-04	0.00E+00
6 Ton Truck	Unpaved	6 Ton TruckUnpaved	7.5	17	2.14E+00	2.14E-01
Carry-all Truck	Paved	Carry-all TruckPaved	0.035	2.7	5.15E-04	0.00E+00
Carry-all Truck	Unpaved	Carry-all TruckUnpaved	7.5	17	2.14E+00	2.14E-01
Stake Truck	Paved	Stake TruckPaved	0.035	2.7	5.15E-04	0.00E+00
Stake Truck	Unpaved	Stake TruckUnpaved	7.5	17	2.14E+00	2.14E-01
Crew Truck	Paved	Crew TruckPaved	0.035	2.7	5.15E-04	0.00E+00
Crew Truck	Unpaved	Crew TruckUnpaved	7.5	17	2.14E+00	2.14E-01
Low Bed Truck	Paved	Low Bed TruckPaved	0.035	2.7	5.15E-04	0.00E+00
Low Bed Truck	Unpaved	Low Bed TruckUnpaved	7.5	17	2.14E+00	2.14E-01
Maintenance Truck	Paved	Maintenance TruckPaved	0.035	2.7	5.15E-04	0.00E+00
Maintenance Truck	Unpaved	Maintenance TruckUnpave	7.5	17	2.14E+00	2.14E-01
Tractor	Paved	TractorPaved	0.035	2.7	5.15E-04	0.00E+00
Tractor	Unpaved	TractorUnpaved	7.5	17	2.14E+00	2.14E-01
Flatbed Truck	Paved	Flatbed TruckPaved	0.035	2.7	5.15E-04	0.00E+00
Flatbed Truck	Unpaved	Flatbed TruckUnpaved	7.5	17	2.14E+00	2.14E-01
Light Truck	Paved	Light TruckPaved	0.035	2.7	5.15E-04	0.00E+00
Light Truck	Unpaved	Light TruckUnpaved	7.5	17	2.14E+00	2.14E-01
Line Truck	Paved	Line TruckPaved	0.035	2.7	5.15E-04	0.00E+00
Line Truck	Unpaved	Line TruckUnpaved	7.5	17	2.14E+00	2.14E-01
Bucket Truck	Paved	Bucket TruckPaved	0.035	2.7	5.15E-04	0.00E+00
Bucket Truck	Unpaved	Bucket TruckUnpaved	7.5	17	2.14E+00	2.14E-01
Concrete Truck	Paved	Concrete TruckPaved	0.035	2.7	5.15E-04	0.00E+00
Concrete Truck	Unpaved	Concrete TruckUnpaved	7.5	17	2.14E+00	2.14E-01
Heavy Duty Truck	Paved	Heavy Duty TruckPaved	0.035	2.7	5.15E-04	0.00E+00
Heavy Duty Truck	Unpaved	Heavy Duty TruckUnpaved	7.5	17	2.14E+00	2.14E-01
Worker Commuting	Paved	Worker CommutingPaved	0.035	2.7	5.15E-04	0.00E+00
Worker Commuting	Unpaved	Worker CommutingUnpave	7.5	2.7	9.37E-01	9.37E-02
Worker Shuttle	Paved	Worker ShuttlePaved	0.035	2.7	5.15E-04	0.00E+00
Worker Shuttle	Unpaved	Worker ShuttleUnpaved	7.5	2.7	9.37E-01	9.37E-02
Framing Truck	Paved	Framing TruckPaved	0.035	2.7	5.15E-04	0.00E+00
Framing Truck	Unpaved	Framing TruckUnpaved	7.5	2.7	9.37E-01	9.37E-02

[a] Paved road silt loading from ARB Emission Inventory Methodology 7.9, Entrained Paved Road Dust (1997) for collector roads, http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9.pdf

Unpaved road silt content from SCAQMD CEQA Handbook, (1993) Table A9-9-E-1 for overburden

[b] Average paved on-road vehicle weight in Ventura County from ARB Emission Inventory Methodology 7.9, Entrained Paved Road Dust (1997)

Table 24
Motor Vehicle Entrained Road Dust Emission Factors

Vehicle Type	Surface		Silt Loading (sL, g/m2) or Silt Content (s, %)[a]	Average Weight (W) (tons)[b]	PM10 Emission Factor (lb/VMT)[c]	PM2.5 Emission Factor (lb/VMT)[c]

Unpaved worker commuting weight on access road assumed to be same as paved road weight

Unpaved weight for other trucks is based on upper limit of 33,000 lbs (16.5 tons) for heavy-duty trucks (SCAQMD CEQA Handbook, (1993) Table A9-9-

[c] Equations:

EF(paved) = k_p $(sL/2)^{0.65}$ $(W/3)^{1.5}$ - C Ref: AP-42, Section 13.2.1, "Paved Rods," November 2006

EF (unpaved) = k_u $(s/12)^a$ $(W/3)^b$ Ref: AP-42, Section 13.2.2, "Unpaved Rods," November 2006

Constants:

k_p =	0.016	(Particle size multiplier for PM10)
	0.0024	(Particle size multiplier for PM2.5)
C =	0.00047	(Exhaust, brake wear and tire wear adjustment, PM10)
	0.00036	(Exhaust, brake wear and tire wear adjustment, PM2.5)
k_u =	1.5	(Particle size multiplier for PM)
	0.15	(Particle size multiplier for PM2.5)
a =	0.9	for PM10
	0.9	for PM2.5
b =	0.45	for PM10
	0.45	for PM2.5

Table 25
Fugitive Dust Emission Factors

Soil Dropping During Excavation

Emission Factor [lb/cu. yd] = 0.0011 x (mean wind speed [mi/hr] / 5)$^{1.3}$ / (moisture [%] / 2)$^{1.4}$ x (number drops per ton) x (density [ton/cu. yd])
Reference: AP-42, Equation (1), Section 13.2.4, November 2006

Parameter	Value	Basis
Mean Wind Speed	12	SCAQMD CEQA Air Quality Handbook (1993), Table 9-9-G, default
Moisture	15	SCAQMD CEQA Air Quality Handbook (1993), Table 9-9-G-1, moist soil
Number Drops	4	Assumption
Soil Density	1.215	Table 2.46, Handbook of Solid Waste Management

PM10 Emission Factor (Uncontrolled)	9.94E-04	lb/cu. yd
Reduction from Watering Twice/Day[b]	0%	
Controlled PM10 Emission Factor	9.94E-04	lb/cu. yd
Controlled PM2.5 Emission Factor[a]	2.07E-04	lb/cu. yd

[a] PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction of PM10 in Construction Dust = 0.208 from Appendix A, Final–Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006

[b] Watering is assumed to be used to maintain moist conditions, so no further reduction from watering is included.

Emissions [pounds per day] = Controlled emission factor [pounds per cubic yard] x Volume soil handled [cubic yards per day]

Storage Pile Wind Erosion

Emission Factor [lb/day-acre] = 0.85 x (silt content [%] / 1.5) x (365 / 235) x (percentage of time unobstructed wind exceeds 12 mph / 15)
Reference: SCAQMD CEQA Air Quality Handbook (1993), Table 9-9-E

Parameter	Value	Basis
Silt Content	7.5	SCAQMD CEQA Handbook, (1993) Table A9-9-E-1 for overburden
Pct. time wind > 12 mph	100	Worst-case assumption

PM10 Emission Factor (Uncontrolled)	44.0	lb/day-acre
Reduction from Watering Twice/Day	50%	
Controlled PM10 Emission Factor	22.0	lb/day-acre
Controlled PM2.5 Emission Factor[a]	4.6	lb/day-acre

[a] PM2.5 emission factor [lb/hr] = PM10 emission factor [lb/hr] x PM2.5 fraction of PM10

PM2.5 Fraction of PM10 in Construction Dust = 0.208 from Appendix A, Final–Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, SCAQMD, October 2006

Emissions [pounds per day] = Controlled emission factor [pounds per acre-day] x Storage pile surface area [acres]

Bulldozing

Emission Factor [lb/hr] = [1.0 x (silt content [%])$^{1.5}$ / (moisture)$^{1.4}$]*Scaling Factor
Reference: AP-42, Table 11.9-1, July 1998

Parameter	Value	Basis
Silt Content	7.5	SCAQMD CEQA Handbook, (1993) Table A9-9-E-1 for overburden
Moisture	15	SCAQMD CEQA Air Quality Handbook (1993), Table 9-9-G-1, moist soil
PM_{10} Scaling Factor	0.75	EPA AP-42 Chapter 11, Table 11.9-1, Bulldozing, Overburden
$PM_{2.5}$ Scaling Factor	0.105	EPA AP-42 Chapter 11, Table 11.9-1, Bulldozing, Overburden

PM10 Emission Factor (Uncontrolled)	0.348	lb/hr
PM2.5 Emission Factor (Uncontrolled)	0.049	
Reduction from Watering Twice/Day[a]	55%	
Controlled PM10 Emission Factor[b]	0.156	lb/hr
Controlled PM2.5 Emission Factor[b]	0.022	lb/hr

Emissions [pounds per day] = Controlled emission factor [pounds per hour] x Bulldozing or grading time [hours/day]

Notes:
a. Watering is assumed to be applied at various intervals to disturbed areas within the construction sites, at a minimum of 2-1 hour intervals.
b. Control efficiency of site watering during construction obtained from 2006 WRAP Fugitive Dust Handbook. (WRAP 2006)

Grading and Scraping[d]
Emission Factor [lb/VMT] = [0.051 (S)^2.0*Scaling Factor
Reference: AP-42, Table 11.9-1, July 1998

Table 25
Fugitive Dust Emission Factors

Parameter	Value	Basis
Mean Vehicle Speed (S)[a] - Miles Per Hour (MPH)	7.1	EPA AP-42 Chapter 11, Table 11.9-3, Grading
PM_{10} Scaling Factor	0.6	EPA AP-42 Chapter 11, Table 11.9-1, Grading
$PM_{2.5}$ Scaling Factor	0.031	EPA AP-42 Chapter 11, Table 11.9-1, Grading

PM10 Emission Factor (Uncontrolled)	1.54 lb/VMT
PM2.5 Emission Factor (Uncontrolled)	0.08 lb/VMT
Reduction from Watering Twice/Day[b]	55%
Controlled PM10 Emission Factor[c]	0.69 lb/VMT
Controlled PM2.5 Emission Factor[c]	0.04 lb/VMT

Notes:

a. Speed limit assumed for all graded areas.

b. Watering is assumed to be applied at various intervals to disturbed areas within the construction sites, at a minimum of 2-1 hour intervals.

c. Control efficiency of site watering during construction obtained from 2006 WRAP Fugitive Dust Handbook. (WRAP 2006)

d. Emissions from excavating and scraper unloading are accounted for under "Soil Dropping" emissions per activity.

Table 26

Peak Daily 66kV Substransmission Construction Emissions						
Scenario[1]	**ROG (lb/day)**	**CO (lb/day)**	**NO_x (lb/day)**	**SO_x (lb/day)**	**PM_{10} (lb/day)**	**$PM_{2.5}$ (lb/day)**
1	7.36	25.95	65.40	0.08	2.89	2.54
2	7.66	29.35	68.36	0.08	3.09	2.52
3	5.33	17.77	46.74	0.06	2.12	1.79
4	3.34	11.73	28.19	0.03	1.42	1.15
5	5.10	17.17	44.61	0.06	1.98	1.70
6	7.96	26.90	72.85	0.09	3.10	2.73
7	5.31	19.24	47.79	0.06	2.11	1.78
8	8.95	30.33	86.75	0.11	3.48	2.96
Peak Daily	**8.95**	**30.33**	**86.75**	**0.11**	**3.48**	**2.96**

[1] Emissions were calculated for nine scenarios based on estimated schedule and activity that could occur concurrently, as listed below.

Scenario 1 Daily Emissions

Activity	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Subtransmission Line Remove Existing Towers and Foundations	7.36	25.95	65.40	0.08	2.89	2.54
Total	**7.36**	**25.95**	**65.40**	**0.08**	**2.89**	**2.54**

Scenario 2 Daily Emissions

Activity	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Subtransmission Line TSP Footing Installation	7.66	29.35	68.36	0.08	3.09	2.52
Total	**7.66**	**29.35**	**68.36**	**0.08**	**3.09**	**2.52**

Scenario 3 Daily Emissions

Activity	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Subtransmission Line TSP Haul, Assembly, and Erection	5.33	17.77	46.74	0.06	2.12	1.79
Total	**5.33**	**17.77**	**46.74**	**0.06**	**2.12**	**1.79**

Scenario 4 Daily Emissions

Activity	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Subtransmission Conduit Installation	3.34	11.73	28.19	0.03	1.42	1.15
Total	**3.34**	**11.73**	**28.19**	**0.03**	**1.42**	**1.15**

Scenario 5 Daily Emissions

Activity	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Subtransmission Duct Bank Installation	5.10	17.17	44.61	0.06	1.98	1.70
Total	**5.10**	**17.17**	**44.61**	**0.06**	**1.98**	**1.70**

Scenario 6 Daily Emissions

Activity	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Subtransmission Vault Installation	7.96	26.90	72.85	0.09	3.10	2.73
Total	**7.96**	**26.90**	**72.85**	**0.09**	**3.10**	**2.73**

Scenario 7 Daily Emissions

Activity	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Subtransmission UG Cable Installation	5.31	19.24	47.79	0.06	2.11	1.78
Total	**5.31**	**19.24**	**47.79**	**0.06**	**2.11**	**1.78**

Scenario 8 Daily Emissions

Activity	ROG (lb/day)	CO (lb/day)	NO_x (lb/day)	SO_x (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)
Spur Retaining Wall	8.95	30.33	86.75	0.11	3.48	2.96
Total	**8.95**	**30.33**	**86.75**	**0.11**	**3.48**	**2.96**

Table 27

Peak Daily Telecommunication Construction Emissions						
Scenario[1]	**ROG (lb/day)**	**CO (lb/day)**	**NO_x (lb/day)**	**SO_x (lb/day)**	**PM_{10} (lb/day)**	**$PM_{2.5}$ (lb/day)**
1	2.77	8.20	25.99	0.03	1.02	0.85
2	2.77	8.20	25.99	0.03	1.02	0.85
3	6.54	18.68	59.52	0.07	2.32	2.01
4	3.76	10.81	35.70	0.04	1.36	1.17
5	3.54	11.34	27.86	0.04	1.27	1.01
6	5.27	18.10	44.77	0.05	2.17	1.88
Peak Daily	**6.54**	**18.68**	**59.52**	**0.07**	**2.32**	**2.01**

[1] Emissions were calculated for six scenarios based on estimated schedule and activity that could occur concurrently, as listed below.

Scenario 1 Daily Emissions

Activity	**ROG (lb/day)**	**CO (lb/day)**	**NO_x (lb/day)**	**SO_x (lb/day)**	**PM_{10} (lb/day)**	**$PM_{2.5}$ (lb/day)**
Telecommunications Line Aboveground Work	2.77	8.20	25.99	0.03	1.02	0.85
Total	**2.77**	**8.20**	**25.99**	**0.03**	**1.02**	**0.85**

Scenario 2 Daily Emissions

Activity	**ROG (lb/day)**	**CO (lb/day)**	**NO_x (lb/day)**	**SO_x (lb/day)**	**PM_{10} (lb/day)**	**$PM_{2.5}$ (lb/day)**
Telecommunications Line Belowground Work	2.77	8.20	25.99	0.03	1.02	0.85
Total	**2.77**	**8.20**	**25.99**	**0.03**	**1.02**	**0.85**

Scenario 3 Daily Emissions

Activity	**ROG (lb/day)**	**CO (lb/day)**	**NO_x (lb/day)**	**SO_x (lb/day)**	**PM_{10} (lb/day)**	**$PM_{2.5}$ (lb/day)**
Telecommunication Wood Pole Removal	6.54	18.68	59.52	0.07	2.32	2.01
Total	**6.54**	**18.68**	**59.52**	**0.07**	**2.32**	**2.01**

Scenario 4 Daily Emissions

Activity	**ROG (lb/day)**	**CO (lb/day)**	**NO_x (lb/day)**	**SO_x (lb/day)**	**PM_{10} (lb/day)**	**$PM_{2.5}$ (lb/day)**
Telecommunication LWC Pole Haul	3.76	10.81	35.70	0.04	1.36	1.17
Total	**3.76**	**10.81**	**35.70**	**0.04**	**1.36**	**1.17**

Scenario 5 Daily Emissions

Activity	**ROG (lb/day)**	**CO (lb/day)**	**NO_x (lb/day)**	**SO_x (lb/day)**	**PM_{10} (lb/day)**	**$PM_{2.5}$ (lb/day)**
Telecommunication Pole Assembly	3.54	11.34	27.86	0.04	1.27	1.01
Total	**3.54**	**11.34**	**27.86**	**0.04**	**1.27**	**1.01**

Scenario 6 Daily Emissions

Activity	**ROG (lb/day)**	**CO (lb/day)**	**NO_x (lb/day)**	**SO_x (lb/day)**	**PM_{10} (lb/day)**	**$PM_{2.5}$ (lb/day)**
Telecommunication Install LWS Pole	5.27	18.10	44.77	0.05	2.17	1.88
Total	**5.27**	**18.10**	**44.77**	**0.05**	**2.17**	**1.88**

Appendix B—Stormwater/Erosion Control Devices and Retaining Walls

NATURAL SUBSTATION PROJECT, ACCESS ROAD RELATED FEATURES								
Location	**Type of Stormwater/Erosion Control Device**				**Type of Wall**			
	Name of Device	**Description**	**Qty**	**Approx. Dimension**	**Description**	**Approx. Max. Height**	**Approx. Min. Height**	**Approx. Length (ft)**
TSP 2	Downdrain	Concrete V-ditch. 3' wide and 18" deep	1	Length: 15'				
Near TSP 7 (At access Road entrance)	Energy Dissipator	Comprised of (14) - 6x12 gabion mattress and (30) - 3x3 gabions baskets	1	Length: 45' Width: 18'				
	Water bar	6' wide compacted earth on Dip side. Berm side of the water bar is made up of compacted soil cement	2	Length: 37'				
	Overside drain	Discharge end of the overside drain is a concrete V-ditch matching the existing ditch	1	Length: 15'				
TSP 7	Water bar	6' wide compacted earth on Dip side. Berm side of the water bar is made up of compacted soil cement	1	Length: 17'				
	Downdrain	Concrete V-ditch. 3' wide and 18" deep	1	Length: 220'				
	Drainage Crossing	Concrete crossing. 10' wide 3" deep	1	Length: 14'				

NATURAL SUBSTATION PROJECT, ACCESS ROAD RELATED FEATURES								
Location	**Type of Stormwater/Erosion Control Device**				**Type of Wall**			
	Name of Device	**Description**	**Qty**	**Approx. Dimension**	**Description**	**Approx. Max. Height**	**Approx. Min. Height**	**Approx. Length (ft)**
TSP 12	MacCarthy Drain	Provided with 6x12 dissipaters	1	Length: 50'				
Between TSP 12 and TSP 13	Armored Crossing	Equipped with energy dissipaters. The crossing and dissipater is comprised of (4) - 6x12 gabion mattress and (12) - 3x3 gabion baskets.	1	Length: 30' Width: 12'				
Between TSP 12 and TSP 13	Armored Crossing	Equipped with energy dissipaters. The crossing and dissipater is comprised of (10) - 6x12 gabion mattress and (58) - 3x3 gabion baskets.	1	Length: 66' Width: 12'				
Between TSP 12 and TSP 13	MacCarthy Drain	Provided with 6x12 dissipaters	1	Length: 60'				
TSP 14	Water bar	6' wide compacted earth on Dip side. Berm side of the water bar is made up of compacted soil cement	2	Length: 30'	Gabion Wall	7'	3'	90'
TSP 14	Armored Crossing	Concrete crossing. 10' wide 3" deep	1	Length: 30'				

NATURAL SUBSTATION PROJECT, ACCESS ROAD RELATED FEATURES								
Location	**Type of Stormwater/Erosion Control Device**				**Type of Wall**			
	Name of Device	**Description**	**Qty**	**Approx. Dimension**	**Description**	**Approx. Max. Height**	**Approx. Min. Height**	**Approx. Length (ft)**
TSP 14	MacCarthy Drain	Provided with 6x12 dissipaters	3	Length: 100'				
South of TSP 14	Water bar	6' wide compacted earth on Dip side. Berm side of the water bar is made up of compacted soil cement	4	Length: 30'				
South of TSP 14	Armored Crossing	Concrete crossing. 10' wide 3" deep	2	Length: 30'				
South of TSP 14	MacCarthy Drain	Provided with 6x12 dissipaters	2	Length: 60'				
TSP 15	Overside drain	Provided with 6x12 dissipaters	2	Length: 15'				
Between TSP 16 and TSP 17	Culvert repair	Headwalls and 6x12 dissipaters	1	Length: 30'				
Between TSP 16 and TSP 17	Water bar	6' wide compacted earth on Dip side. Berm side of the water bar is made up of compacted soil cement	4	Length: 30'				
Between TSP 16 and TSP 17	Armored Crossing	Concrete crossing. 10' wide 3" deep	2	Length: 30'				

NATURAL SUBSTATION PROJECT, ACCESS ROAD RELATED FEATURES								
Location	**Type of Stormwater/Erosion Control Device**				**Type of Wall**			
	Name of Device	**Description**	**Qty**	**Approx. Dimension**	**Description**	**Approx. Max. Height**	**Approx. Min. Height**	**Approx. Length (ft)**
Between TSP 16 and TSP 17	MacCarthy Drain	Provided with 6x12 dissipaters	2	Length: 60'				
TSP 19	Culvert	Replace the 48-inch CMP culvert in-place (Drainage 2).	1					
Between TSP 19 and TSP 21					Hilfiker Wall	10'	4'	75'
Between TSP 24 and TSP 25	Overside drain	Provided with 6x12 dissipaters	2	Length: 15'				
	Culvert	Comprised of (2) - 54" CSP culverts	1	Length: 60'				
	Water bar	6' wide compacted earth on Dip side. Berm side of the water bar is made up of compacted soil cement	3	Length: 51'				
	MacCarthy Drain	Provided with 6x12 dissipaters	2	Length: 100'				
Access to TSP 24	Culvert	Culver extension; see the attached table for the details.	1					

NATURAL SUBSTATION PROJECT, ACCESS ROAD RELATED FEATURES								
Location	**Type of Stormwater/Erosion Control Device**				**Type of Wall**			
	Name of Device	**Description**	**Qty**	**Approx. Dimension**	**Description**	**Approx. Max. Height**	**Approx. Min. Height**	**Approx. Length (ft)**
TSP 24					Soldier Pile Wall	11'	4'	65'
TSP 25					Hilfiker Wall	7'	4'	65'
TSP 26	Water bar	6' wide compacted earth on Dip side. Berm side of the water bar is made up of compacted soil cement	1	Length: 17'	Gabion Wall	7'	3'	45'
	MacCarthy Drain	Provided with 6x12 dissipaters	1	Length: 15'				
TSP 27	Overside drain	Provided with 6x12 dissipaters	1	Length: 7'				
TSP 28	MacCarthy Drain	Provided with 6x12 dissipaters	3	Length: 150'	Gabion Wall	4'	2'	40'
	Water bar	6' wide compacted earth on Dip side. Berm side of the water bar is made up of compacted soil cement	2	Length: 34'				
TSP 29	Overside drain	Provided with 6x12 dissipaters	1	Length: 7'	Gabion Wall	4'	2'	80'
	Catch basin	3x3 catch basin. Equipped with 6x12 dissipaters	1					

NATURAL SUBSTATION PROJECT, ACCESS ROAD RELATED FEATURES								
Location	**Type of Stormwater/Erosion Control Device**				**Type of Wall**			
	Name of Device	**Description**	**Qty**	**Approx. Dimension**	**Description**	**Approx. Max. Height**	**Approx. Min. Height**	**Approx. Length (ft)**
TSP 30	Water bar	6' wide compacted earth on Dip side. Berm side of the water bar is made up of compacted soil cement	1	Length: 17'	Hilfiker Wall	12'	3'	105'
	Catch basin	3x3 catch basin. Equipped with 6x12 dissipaters	1					
	Overside drain	Provided with 6x12 dissipaters	1	Length: 7'				
Near TSP30	Culvert	Replace and re-align existing culvert. Comprised of (1) - 36" CSP culvert and energy dissipaters at both ends of the culvert. Dissipaters comprised of (4)- 6x12 gabion mattress and (40) - 3x3 gabion baskets	1	Length: 30'				
	Water bar	6' wide compacted earth on Dip side. Berm side of the water bar is made up of compacted soil cement.	2	Length: 34'				
	Overside drain	Provided with 6x12 dissipaters	1	Length: 7'				

NATURAL SUBSTATION PROJECT, ACCESS ROAD RELATED FEATURES								
Location	**Type of Stormwater/Erosion Control Device**				**Type of Wall**			
	Name of Device	**Description**	**Qty**	**Approx. Dimension**	**Description**	**Approx. Max. Height**	**Approx. Min. Height**	**Approx. Length (ft)**
	MacCarthy Drain	Provided with 6x12 dissipaters	1	Length: 50'				
North of TSP 31	MacCarthy Drain	Provided with 6x12 dissipaters	1	Length: 80'				
Between TSP 31 and TSP 32	Water bar	6' wide compacted earth on Dip side. Berm side of the water bar is made up of compacted soil cement	5	Length: 20'				
Between TSP 31 and TSP 32	Armored Crossing	Concrete crossing. 10' wide 3" deep	1	Length: 20'				
Between TSP 31 and TSP 32	MacCarthy Drain	Provided with 6x12 dissipaters	1	Length: 50'				
TSP 32	MacCarthy Drain	Provided with 6x12 dissipaters	1	Length: 50'				
Road to TSP 35	Water bar	6' wide compacted earth on Dip side. Berm side of the water bar is made up of compacted soil cement	5	Length: 20'				
Road to TSP 35	Armored Crossing	Concrete crossing. 10' wide 3" deep	1	Length: 20'				

NATURAL SUBSTATION PROJECT, ACCESS ROAD RELATED FEATURES								
Location	**Type of Stormwater/Erosion Control Device**				**Type of Wall**			
	Name of Device	**Description**	**Qty**	**Approx. Dimension**	**Description**	**Approx. Max. Height**	**Approx. Min. Height**	**Approx. Length (ft)**
Road to TSP 35	MacCarthy Drain	Provided with 6x12 dissipaters	1	Length: 50'				
TSP 37	MacCarthy Drain	Provided with 6x12 dissipaters	1	Length: 50'				
TSP 38	MacCarthy Drain	Provided with 6x12 dissipaters	1	Length: 50'				
TSP 40	MacCarthy Drain	Provided with 6x12 dissipaters	1	Length: 50'				
Between TSP 39 to TSP 41	Water bar	6' wide compacted earth on Dip side. Berm side of the water bar is made up of compacted soil cement.	2	Length: 34'				
	Overside drain	Provided with 6x12 dissipaters	1	Length: 7'				
	MacCarthy Drain	Provided with 6x12 dissipaters	1	Length: 50'				
TSP 39	MacCarthy Drain	Provided with 6x12 dissipaters	1	Length: 50'	Hilfiker Wall	16'	3'	140'
TSP 40	Overside drain	Provided with 6x12 dissipaters	1	Length: 7'	Hilfiker Wall	16'	3'	180'
TSP 41	Overside drain	Provided with 6x12 dissipaters	1	Length: 7'				

NATURAL SUBSTATION PROJECT, ACCESS ROAD RELATED FEATURES								
Location	**Type of Stormwater/Erosion Control Device**				**Type of Wall**			
	Name of Device	**Description**	**Qty**	**Approx. Dimension**	**Description**	**Approx. Max. Height**	**Approx. Min. Height**	**Approx. Length (ft)**
TSP 43	MacCarthy Drain	Provided with 6x12 dissipaters	1	Length: 50'	Soldier Pile Wall	8'	3'	56'
					Soldier Pile Wall	10'	3'	56'
TSP 44	MacCarthy Drain	Provided with 6x12 dissipaters	1	Length: 50'				
TSP 45	MacCarthy Drain	Provided with 6x12 dissipaters	1	Length: 50'				
	Water bar	6' wide compacted earth on Dip side. Berm side of the water bar is made up of compacted soil cement.	1	Length: 17'				
TSP 49	Water bar	6' wide compacted earth on Dip side. Berm side of the water bar is made up of compacted soil cement.	2	Length: 34'				
	MacCarthy Drain	Provided with 6x12 dissipaters	2	Length: 100'				

Note: All data provided on this table is based on planning level assumptions and may change based on any of the following: the completion of final engineering; any updates and/or changes in project scope; any updates and/or changes to the project description; any changes to existing field conditions and/or the identification of yet unknown field conditions; as well as any constraints caused by environmental and/or permitting requirements.

Note: The armored crossings provide a reinforced permeable surface that allows water flow while providing a strong driving surface. The gabions are constructed of rectangular wire mesh boxes filled with cobble and boulders, and installed across the drainage area. Gabion mattresses are construction like gabion baskets, but the depth of the box is small compared to the width and length of the box. The top of the gabion mattress serves as the driving surface.