

Appendix B

Emissions Calculations

Air Quality Calculations

Assumptions

Estimated Construction Schedule & Annual Durations

Part of Project	Work Months	Days	Years	Approximate Start Date	Approximate End Date	No of Days 2029	No of Days 2030
Staging Areas	3	100	1	3/11/2029	7/5/2029	100	0
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	14	366	1.166666667	4/1/2029	6/1/2030	235	131
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	14	366	1.166666667	4/1/2029	6/1/2030	235	131
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	11	288	1	5/1/2029	4/1/2030	210	78
Civil Crew (Road Maintenance, BMP's, Gates)	19	515	1.583333333	3/11/2029	11/1/2030	253	262
Structure Installation - Lattice - Guyed V Framing	11	287	1	6/1/2029	5/1/2030	183	104
Structure Installation - Lattice - Guyed V Setting	11	287	1	6/1/2029	5/1/2030	183	104
Structure Installation - Monopole and Lattice - 4-Legged	11	287	1	6/1/2029	5/1/2030	183	104
Structure Installation - Spotting	11	287	1	6/1/2029	5/1/2030	183	104
Conductor and Wires Installation	11	287	1	11/1/2029	10/1/2030	52	235
Civil Crew (Clean Up)	8	211	1	3/1/2030	11/1/2030	0	211
Notes: If the duration for a given phase is less than one year, it was assumed to occur over one year for the purpose of converting lifetime emissions to annual averages. Start and end date for each construction phase was taken from Table 3.9 of the Project Description to determine phase duration. Construction was assumed to occur Monday through Saturday.							

Estimated Construction Equipment Counts for All Crews & Usage Days by Phase

Equipment	HP	Specific Name	Phase	Total Equipment Count for All Crews	Total No. of Usage Days	No. of Usage Days - 2029	No. of Usage Days - 2030
Forklifts (medium)	96	R/T Forklift	Staging Areas	4	100	100	-
Generator Sets	45	Generator	Staging Areas	1	100	100	-
Off-Highway Trucks	350	Water Truck	Staging Areas	1	100	100	-
Graders	200	GRADER 150 AWD	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	366	235	131
Rubber Tired Dozers (medium)	200	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	366	235	131
Off-Highway Trucks	350	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	366	235	131
Rollers	150	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	366	235	131
Excavators (heavy)	450	EXCAVATOR>100,000 LBS	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	366	235	131
Rubber Tired Dozers (medium)	200	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	366	235	131
Off-Highway Trucks	350	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	366	235	131
Rollers	150	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	366	235	131
Bore/Drill Rigs	500	IMT Drill	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	288	210	78
Bore/Drill Rigs	400	LoDrill	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	288	210	78
Tractors/Loaders/Backhoes	150	Backhoe	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	6	288	210	78
Cranes (heavy)	425	CRANE 40T	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	6	288	210	78
Other Material Handling Equipment	400	Material Handler	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	288	210	78
Forklifts (Heavy)	100	SKID STEER & FORKS	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	288	210	78
Off-Highway Trucks	350	Water Truck	Civil Crew (Road Maintenance, BMP's, Gates)	3	515	253	262
Graders	200	GRADER 150 AWD	Civil Crew (Road Maintenance, BMP's, Gates)	1	515	253	262
Forklifts (Heavy)	100	SKID STEER & FORKS	Civil Crew (Road Maintenance, BMP's, Gates)	1	515	253	262
Off-Highway Trucks	335	Mechanic Truck	Civil Crew (Road Maintenance, BMP's, Gates)	1	515	253	262
Forklifts (Heavy)	100	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Framing	4	287	183	104
Cranes (heavy)	500	CRANE 275 TON	Structure Installation - Lattice - Guyed V Setting	4	287	183	104
Excavators (medium)	175	EXCAVATOR>60,000 LBS	Structure Installation - Lattice - Guyed V Setting	4	287	183	104
Forklifts (Heavy)	100	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Setting	4	287	183	104
Forklifts	100	FORKLIFT 12K	Structure Installation - Monopole and Lattice - 4-Legged	1	287	183	104
Cranes	500	CRANE 160 TON RT	Structure Installation - Monopole and Lattice - 4-Legged	1	287	183	104
Forklifts (Heavy)	100	FORKLIFT 12K	Structure Installation - Spotting	1	287	183	104
Cranes (medium)	270	CRANE 100 TON RT	Structure Installation - Spotting	1	287	183	104
Rubber Tired Dozers (heavy)	350	DOZER D8 TRIPLE BUNDEL SAG	Conductor and Wires Installation	4	287	52	235
Rubber Tired Dozers (medium)	200	DOZER D6 SINGLE TOW WINCH	Conductor and Wires Installation	2	287	52	235
Other Construction Equipment	500	HARDLINE PULLER	Conductor and Wires Installation	4	287	52	235
Other Construction Equipment (medium)	175	TRIPLE DRUM PULLER 3/8	Conductor and Wires Installation	6	287	52	235
Other Construction Equipment	300	TENSIONER 72" BNDL TRK MNTD	Conductor and Wires Installation	2	287	52	235
Forklifts (Heavy)	100	FORKLIFT 12K	Conductor and Wires Installation	4	287	52	235
Off-Highway Trucks	400	7 TON ARMY BUNK TRUCK	Conductor and Wires Installation	4	287	52	235
Off-Highway Trucks	300	BUCKET TRUCK 90'-100' AWD	Conductor and Wires Installation	2	287	52	235
Cranes (heavy)	425	CRANE 40T	Conductor and Wires Installation	11	287	52	235
Forklifts (Heavy)	100	SKID STEER & FORKS	Conductor and Wires Installation	2	287	52	235
Off-Highway Trucks	335	Mechanic Truck	Conductor and Wires Installation	2	287	52	235
Excavators (heavy)	450	EXCAVATOR>100,000 LBS	Civil Crew (Clean Up)	1	211	-	211

Estimated Construction Equipment Counts per Crew & Usage Days by Phase

Equipment	HP	Specific Name	Phase	No. of Equipment per Crew	Total No. of Usage Days	No. of Usage Days - 2029	No. of Usage Days - 2030
Forklifts (medium)	96	R/T Forklift	Staging Areas	4	100	100	-
Generator Sets	45	Generator	Staging Areas	1	100	100	-
Off-Highway Trucks	350	Water Truck	Staging Areas	1	100	100	-
Graders	200	GRADER 150 AWD	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	1	366	235	131
Rubber Tired Dozers (medium)	200	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	1	366	235	131
Off-Highway Trucks	350	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	1	366	235	131
Rollers	150	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	1	366	235	131
Excavators (heavy)	450	EXCAVATOR>100,000 LBS	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	366	235	131
Rubber Tired Dozers (medium)	200	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	366	235	131
Off-Highway Trucks	350	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	366	235	131
Rollers	150	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	366	235	131
Bore/Drill Rigs	500	IMT Drill	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	1	288	210	78
Bore/Drill Rigs	400	LoDril	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	1	288	210	78
Tractors/Loaders/Backhoes	150	Backhoe	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	2	288	210	78
Cranes (heavy)	425	CRANE 40T	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	2	288	210	78
Other Material Handling Equipment	400	Material Handler	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	1	288	210	78
Forklifts (Heavy)	100	SKID STEER & FORKS	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	1	288	210	78
Off-Highway Trucks	350	Water Truck	Civil Crew (Road Maintenance, BMP's, Gates)	3	515	253	262
Graders	200	GRADER 150 AWD	Civil Crew (Road Maintenance, BMP's, Gates)	1	515	253	262
Forklifts (Heavy)	100	SKID STEER & FORKS	Civil Crew (Road Maintenance, BMP's, Gates)	1	515	253	262
Off-Highway Trucks	335	Mechanic Truck	Civil Crew (Road Maintenance, BMP's, Gates)	1	515	253	262
Forklifts (Heavy)	100	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Framing	1	287	183	104
Cranes (heavy)	500	CRANE 275 TON	Structure Installation - Lattice - Guyed V Setting	1	287	183	104
Excavators (medium)	175	EXCAVATOR>60,000 LBS	Structure Installation - Lattice - Guyed V Setting	1	287	183	104
Forklifts (Heavy)	100	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Setting	1	287	183	104
Forklifts	100	FORKLIFT 12K	Structure Installation - Monopole and Lattice - 4-Legged	1	287	183	104
Cranes	500	CRANE 160 TON RT	Structure Installation - Monopole and Lattice - 4-Legged	1	287	183	104
Forklifts (Heavy)	100	FORKLIFT 12K	Structure Installation - Spotting	1	287	183	104
Cranes (medium)	270	CRANE 100 TON RT	Structure Installation - Spotting	1	287	183	104
Rubber Tired Dozers (heavy)	350	DOZER D8 TRIPLE BUNDEL SAG	Conductor and Wires Installation	2	287	52	235
Rubber Tired Dozers (medium)	200	DOZER D6 SINGLE TOW WINCH	Conductor and Wires Installation	1	287	52	235
Other Construction Equipment	500	HARDLINE PULLER	Conductor and Wires Installation	2	287	52	235
Other Construction Equipment (medium)	175	TRIPLE DRUM PULLER 3/8	Conductor and Wires Installation	3	287	52	235
Other Construction Equipment	300	TENSIONER 72" BNDL TRK MNTD	Conductor and Wires Installation	1	287	52	235
Forklifts (Heavy)	100	FORKLIFT 12K	Conductor and Wires Installation	2	287	52	235
Off-Highway Trucks	400	7 TON ARMY BUNK TRUCK	Conductor and Wires Installation	2	287	52	235
Off-Highway Trucks	300	BUCKET TRUCK 90'-100' AWD	Conductor and Wires Installation	1	287	52	235
Cranes (heavy)	425	CRANE 40T	Conductor and Wires Installation	6	287	52	235
Forklifts (Heavy)	100	SKID STEER & FORKS	Conductor and Wires Installation	1	287	52	235
Off-Highway Trucks	335	Mechanic Truck	Conductor and Wires Installation	1	287	52	235
Excavators (heavy)	450	EXCAVATOR>100,000 LBS	Civil Crew (Clean Up)	1	211	-	211

Onroad Equipment Usage for All Crews

Primary Equipment Description	Phase	Total Equipment Count for All Crews	Fuel Type
1-Ton Truck, 4x4	Staging Areas	4	Diesel
PICKUP 3/4 TON	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	3	Gas
PICKUP 3/4 TON	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	2	Gas
PICKUP 3/4 TON	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	12	Gas
Semi	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	2	Diesel
PICKUP 3/4 TON	Civil Crew (Road Maintenance, BMP's, Gates)	2	Diesel
PICKUP 3/4 TON	Structure Installation - Lattice - Guyed V Framing	4	Diesel
PICKUP 1 TON DIESEL	Structure Installation - Lattice - Guyed V Framing	4	Diesel
PICKUP 3/4 TON	Structure Installation - Lattice - Guyed V Setting	4	Gas
PICKUP WINCH TRUCK	Structure Installation - Lattice - Guyed V Setting	8	Diesel
PICKUP 3/4 TON	Structure Installation - Monopole and Lattice - 4-Legged	9	Gas
PICKUP 1 TON DIESEL	Structure Installation - Monopole and Lattice - 4-Legged	3	Diesel
Semi	Structure Installation - Spotting	3	Diesel
PICKUP 1 TON DIESEL	Structure Installation - Spotting	1	Diesel
PICKUP 3/4 TON	Structure Installation - Spotting	1	Diesel
SEMI - ON ROAD	Conductor and Wires Installation	6	Diesel
SEMI - ON ROAD	Conductor and Wires Installation	6	Diesel
SEMI - ON/OFF ROAD 6X6	Conductor and Wires Installation	4	Diesel
PICKUP 1 TON DIESEL	Conductor and Wires Installation	4	Diesel
PICKUP 3/4 TON DIESEL	Conductor and Wires Installation	32	Gas
PICKUP WINCH TRUCK	Conductor and Wires Installation	20	Diesel
PICKUP 3/4 TON	Civil Crew (Clean Up)	2	Gas

Phase	Primary Equipment Description	EMFAC Classification	Fuel Type	Trips per Day
Staging Areas	1-Ton Truck, 4x4	HHDT	Diesel	8
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	PICKUP 3/4 TON	LHDT2	Gas	6
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	PICKUP 3/4 TON	LHDT2	Gas	4
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	PICKUP 3/4 TON	LHDT2	Gas	24
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Semi	HHDT	Diesel	4
Civil Crew (Road Maintenance, BMP's, Gates)	PICKUP 3/4 TON	LHDT2	Diesel	4
Structure Installation - Lattice - Guyed V Framing	PICKUP 3/4 TON	LHDT2	Diesel	8
Structure Installation - Lattice - Guyed V Framing	PICKUP 1 TON DIESEL	LHDT2	Diesel	8
Structure Installation - Lattice - Guyed V Setting	PICKUP 3/4 TON	LHDT2	Gas	8
Structure Installation - Lattice - Guyed V Setting	PICKUP WINCH TRUCK	LHDT2	Diesel	16
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 3/4 TON	LHDT2	Gas	18
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 1 TON DIESEL	HHDT	Diesel	6
Structure Installation - Spotting	Semi	HHDT	Diesel	6
Structure Installation - Spotting	PICKUP 1 TON DIESEL	LHDT2	Diesel	2
Structure Installation - Spotting	PICKUP 3/4 TON	LHDT2	Diesel	2
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	Diesel	12
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	Diesel	12
Conductor and Wires Installation	SEMI - ON/OFF ROAD 6X6	HHDT	Diesel	8
Conductor and Wires Installation	PICKUP 1 TON DIESEL	LHDT2	Diesel	8
Conductor and Wires Installation	PICKUP 3/4 TON DIESEL	LHDT2	Gas	64
Conductor and Wires Installation	PICKUP WINCH TRUCK	LHDT2	Diesel	40
Civil Crew (Clean Up)	PICKUP 3/4 TON	LHDT2	Gas	4
Staging Areas	Worker	LHDT2	Gas	12
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Worker	LHDT2	Gas	16
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Worker	LHDT2	Gas	10
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Worker	LHDT2	Gas	42
Civil Crew (Road Maintenance, BMP's, Gates)	Worker	LHDT2	Gas	20
Structure Installation - Lattice - Guyed V Framing	Worker	LHDT2	Gas	24
Structure Installation - Lattice - Guyed V Setting	Worker	LHDT2	Gas	40
Structure Installation - Monopole and Lattice - 4-Legged	Worker	LHDT2	Gas	24
Structure Installation - Spotting	Worker	LHDT2	Gas	10
Conductor and Wires Installation	Worker	LHDT2	Gas	32
Civil Crew (Clean Up)	Worker	LHDT2	Gas	20
Staging Areas	Hauling	HHDT	Diesel	2
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Hauling	HHDT	Diesel	2
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Hauling	HHDT	Diesel	2
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Hauling	HHDT	Diesel	2
Civil Crew (Road Maintenance, BMP's, Gates)	Hauling	HHDT	Diesel	7
Structure Installation - Lattice - Guyed V Framing	Hauling	HHDT	Diesel	12
Structure Installation - Lattice - Guyed V Setting	Hauling	HHDT	Diesel	12
Structure Installation - Monopole and Lattice - 4-Legged	Hauling	HHDT	Diesel	12
Structure Installation - Spotting	Hauling	HHDT	Diesel	12
Conductor and Wires Installation	Hauling	HHDT	Diesel	2
Civil Crew (Clean Up)	Hauling	HHDT	Diesel	2

Notes: 1,250 hauling trips were estimated assuming total material export is 20,000 CY and hauling truck capacity is 16 CY.

Phase	Estimated Workforce/Crew	Total Equipment Count for All Crews	Hauling Trips per Day	Estimated Workforce All
Staging Areas	6	4	1.00	6
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	4	3	1.00	8
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	5	2	1.00	5
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	7	14	1.00	21
Civil Crew (Road Maintenance, BMP's, Gates)	10	2	3.67	10
Structure Installation - Lattice - Guyed V Framing	3	8	6.00	12
Structure Installation - Lattice - Guyed V Setting	5	12	6.00	20
Structure Installation - Monopole and Lattice - 4-Legged	4	12	6.00	12
Structure Installation - Spotting	5	5	6.00	5
Conductor and Wires Installation	6	72	1.00	16
Civil Crew (Clean Up)	10	2	1.00	10

Onroad Equipment Usage Per Crew

Phase	Primary Equipment Description	EMFAC Classification	Fuel Type	Trips per Day
Staging Areas	1-Ton Truck, 4x4	HHDT	Diesel	8
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	PICKUP 3/4 TON	LHDT2	Gas	3
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	PICKUP 3/4 TON	LHDT2	Gas	4
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	PICKUP 3/4 TON	LHDT2	Gas	8
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Semi	HHDT	Diesel	1
Civil Crew (Road Maintenance, BMP's, Gates)	PICKUP 3/4 TON	LHDT2	Diesel	4
Structure Installation - Lattice - Guyed V Framing	PICKUP 3/4 TON	LHDT2	Diesel	2
Structure Installation - Lattice - Guyed V Framing	PICKUP 1 TON DIESEL	LHDT2	Diesel	2
Structure Installation - Lattice - Guyed V Setting	PICKUP 3/4 TON	LHDT2	Gas	2
Structure Installation - Lattice - Guyed V Setting	PICKUP WINCH TRUCK	LHDT2	Diesel	4
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 3/4 TON	LHDT2	Gas	6
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 1 TON DIESEL	HHDT	Diesel	2
Structure Installation - Spotting	Semi	HHDT	Diesel	2
Structure Installation - Spotting	PICKUP 1 TON DIESEL	LHDT2	Diesel	2
Structure Installation - Spotting	PICKUP 3/4 TON	LHDT2	Diesel	2
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	Diesel	6
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	Diesel	6
Conductor and Wires Installation	SEMI - ON/OFF ROAD 6X6	HHDT	Diesel	4
Conductor and Wires Installation	PICKUP 1 TON DIESEL	LHDT2	Diesel	4
Conductor and Wires Installation	PICKUP 3/4 TON DIESEL	LHDT2	Gas	32
Conductor and Wires Installation	PICKUP WINCH TRUCK	LHDT2	Diesel	20
Civil Crew (Clean Up)	PICKUP 3/4 TON	LHDT2	Gas	4
Staging Areas	Worker	LHDT2	Gas	12
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Worker	LHDT2	Gas	8
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Worker	LHDT2	Gas	10
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Worker	LHDT2	Gas	14
Civil Crew (Road Maintenance, BMP's, Gates)	Worker	LHDT2	Gas	20
Structure Installation - Lattice - Guyed V Framing	Worker	LHDT2	Gas	6
Structure Installation - Lattice - Guyed V Setting	Worker	LHDT2	Gas	10
Structure Installation - Monopole and Lattice - 4-Legged	Worker	LHDT2	Gas	8
Structure Installation - Spotting	Worker	LHDT2	Gas	10
Conductor and Wires Installation	Worker	LHDT2	Gas	12
Civil Crew (Clean Up)	Worker	LHDT2	Gas	20
Staging Areas	Hauling	HHDT	Diesel	2
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Hauling	HHDT	Diesel	2
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Hauling	HHDT	Diesel	2
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Hauling	HHDT	Diesel	2
Civil Crew (Road Maintenance, BMP's, Gates)	Hauling	HHDT	Diesel	7
Structure Installation - Lattice - Guyed V Framing	Hauling	HHDT	Diesel	12
Structure Installation - Lattice - Guyed V Setting	Hauling	HHDT	Diesel	12
Structure Installation - Monopole and Lattice - 4-Legged	Hauling	HHDT	Diesel	12
Structure Installation - Spotting	Hauling	HHDT	Diesel	12
Conductor and Wires Installation	Hauling	HHDT	Diesel	2
Civil Crew (Clean Up)	Hauling	HHDT	Diesel	2

Notes: 1,250 hauling trips were estimated assuming total material export is 20,000 CY and hauling truck capacity is 16 CY.

Ironwood Transmission Construction
Air Quality Emissions
Onroad Equipment Usage Per Crew

Phase	Estimated Workforce/Crew	Onroad Equipment per Crew	Hauling Trips per Day	Estimated Workforce All
Staging Areas	6		4	1 6
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	4		2	1 8
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	5		2	1 5
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	7		5	1 21
Civil Crew (Road Maintenance, BMP's, Gates)	10		2	4 10
Structure Installation - Lattice - Guyed V Framing	3		2	6 12
Structure Installation - Lattice - Guyed V Setting	5		3	6 20
Structure Installation - Monopole and Lattice - 4-Legged	4		4	6 12
Structure Installation - Spotting	5		3	6 5
Conductor and Wires Installation	6		36	1 16
Civil Crew (Clean Up)	10		2	1 10

It was assumed that 5 trips/day during the Structure Installation subactivity will be required for structure-related transport.
Additionally, one additional truck trip per week is anticipated for liquid waste transport.

Primary Equipment Description	Phase	# of Equipment per Crew	Fuel Type
1-Ton Truck, 4x4	Staging Areas	4	Diesel
PICKUP 3/4 TON	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	Gas
PICKUP 3/4 TON	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	2	Gas
PICKUP 3/4 TON	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	4	Gas
Semi	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	1	Diesel
PICKUP 3/4 TON	Civil Crew (Road Maintenance, BMP's, Gates)	2	Diesel
PICKUP 3/4 TON	Structure Installation - Lattice - Guyed V Framing	1	Diesel
PICKUP 1 TON DIESEL	Structure Installation - Lattice - Guyed V Framing	1	Diesel
PICKUP 3/4 TON	Structure Installation - Lattice - Guyed V Setting	1	Gas
PICKUP WINCH TRUCK	Structure Installation - Lattice - Guyed V Setting	2	Diesel
PICKUP 3/4 TON	Structure Installation - Monopole and Lattice - 4-Legged	3	Gas
PICKUP 1 TON DIESEL	Structure Installation - Monopole and Lattice - 4-Legged	1	Diesel
Semi	Structure Installation - Spotting	1	Diesel
PICKUP 1 TON DIESEL	Structure Installation - Spotting	1	Diesel
PICKUP 3/4 TON	Structure Installation - Spotting	1	Diesel
SEMI - ON ROAD	Conductor and Wires Installation	3	Diesel
SEMI - ON ROAD	Conductor and Wires Installation	3	Diesel
SEMI - ON/OFF ROAD 6X6	Conductor and Wires Installation	2	Diesel
PICKUP 1 TON DIESEL	Conductor and Wires Installation	2	Diesel
PICKUP 3/4 TON DIESEL	Conductor and Wires Installation	16	Gas
PICKUP WINCH TRUCK	Conductor and Wires Installation	10	Diesel
PICKUP 3/4 TON	Civil Crew (Clean Up)	2	Gas

Offroad Equipment Types & Emission Factors

			g/bhp-hr							
CalEEMod Name	General Name	CalEEMod Name	HP	Load Factor	ROG	NOx	CO	SO2	PM10E	PM2.5E
Forklifts (medium)	R/T Forklift	Forklifts (medium)	96	0.2	0.21	1.96	3.57	0.005	0.07	0.065
Generator Sets	Generator	Generator Sets	45	0.74	0.275	3.14	3.66	0.007	0.045	0.041
Off-Highway Trucks	Water Truck	Off-Highway Trucks	350	0.38	0.172	0.823	1.16	0.005	0.029	0.027
Graders	GRADER 150 AWD	Graders	200	0.41	0.192	1.56	1.18	0.005	0.054	0.05
Rubber Tired Dozers (medium)	DOZER D6	Rubber Tired Dozers (medium)	200	0.4	0.441	4.44	3.49	0.005	0.201	0.185
Rollers	ROLLER	Rollers	150	0.38	0.107	0.749	2.93	0.005	0.033	0.03
Excavators (heavy)	EXCAVATOR>100,000 LBS	Excavators (heavy)	450	0.38	0.108	0.549	1.04	0.005	0.02	0.018
Bore/Drill Rigs	IMT Drill	Bore/Drill Rigs	500	0.5	0.097	0.703	0.983	0.005	0.026	0.024
Bore/Drill Rigs	LoDrill	Bore/Drill Rigs	400	0.5	0.097	0.703	0.983	0.005	0.026	0.024
Tractors/Loaders/Backhoes	Backhoe	Tractors/Loaders/Backhoes	150	0.37	0.145	0.847	3.12	0.005	0.042	0.039
Cranes (heavy)	CRANE 40T	Cranes (heavy)	425	0.29	0.182	1.48	1.61	0.005	0.062	0.057
Other Material Handling Equipment	Material Handler	Other Material Handling Equipment	400	0.4	0.131	0.727	1.16	0.005	0.025	0.023
Forklifts (Heavy)	SKID STEER & FORKS	Forklifts (Heavy)	100	0.2	0.165	1.03	3.18	0.005	0.048	0.044
Cranes (heavy)	CRANE 275 TON	Cranes (heavy)	500	0.29	0.182	1.48	1.61	0.005	0.062	0.057
Excavators (medium)	EXCAVATOR>60,000 LBS	Excavators (medium)	175	0.38	0.124	0.729	1.1	0.005	0.026	0.024
Forklifts (Heavy)	FORKLIFT 12K	Forklifts (Heavy)	100	0.2	0.165	1.03	3.18	0.005	0.048	0.044
Cranes (heavy)	CRANE 160 TON RT	Cranes (heavy)	500	0.29	0.182	1.48	1.61	0.005	0.062	0.057
Cranes (medium)	CRANE 100 TON RT	Cranes (medium)	270	0.29	0.225	2.04	1.41	0.005	0.086	0.079
Rubber Tired Dozers (heavy)	DOZER D8 TRIPLE BUNDEL SAG	Rubber Tired Dozers (heavy)	350	0.4	0.334	2.86	2.63	0.005	0.128	0.118
Rubber Tired Dozers (medium)	DOZER D6 SINGLE TOW WINCH	Rubber Tired Dozers (medium)	200	0.4	0.441	4.44	3.49	0.005	0.201	0.185
Other Construction Equipment	HARDLINE PULLER	Other Construction Equipment	500	0.42	0.145	1.1	1.25	0.005	0.043	0.039
Other Construction Equipment (medium)	TRIPLE DRUM PULLER 3/8	Other Construction Equipment (mediu	175	0.42	0.186	1.53	1.34	0.005	0.068	0.062
Other Construction Equipment	TENSIONER 72" BNDL TRK MNTD	Other Construction Equipment	300	0.42	0.145	1.1	1.25	0.005	0.043	0.039
Off-Highway Trucks	7 TON ARMY BUNK TRUCK	Off-Highway Trucks	400	0.38	0.172	0.823	1.16	0.005	0.029	0.027
Off-Highway Trucks	Mechanic Truck	Off-Highway Trucks	335	0.38	0.172	0.823	1.16	0.005	0.029	0.027
Off-Highway Trucks	BUCKET TRUCK 90'-100' AWD	Off-Highway Trucks	300	0.38	0.172	0.823	1.16	0.005	0.029	0.027

Daily Acres Graded by Equipment Type

Equipment	Acres Graded per 8 Hours
Crawler Tractors	0.5
Graders	0.5
Rubber Tired Dozers	0.5
Scrapers	1
Source: CalEEMod Appendix G, Table G-14	

Grading Emission Factor (lbs/acre/day)		
Pollutant	PM10	PM2.5
S	7.10	7.10
F	0.60	0.03
Wb	12	12
SF per acre	43,560	43,560
Ft per mile	5,280	5,280
Uncontrolled EF	1.06	0.11
Controlled EF	0.41	0.04
Notes: Grading calculations rely upon this equation (acres graded per day x EF) for Loaders & Scrapers; controlled EF assumes 61% reduction in PM from 2x per day watering.		
Source: CalEEMod Appendix C, Section 4.4.1 (pg C-11)		

Bulldozing Emission Factor (lbs/hr)		
Pollutant	PM10	PM2.5
C	1.00	5.70
s	6.90	6.90
M	7.90	7.90
F	0.75	0.11
Uncontrolled EF	0.75	0.41
Controlled EF	0.29	0.16
Notes: Bulldozer calculations rely upon this equation (hours per day x emission factor (EF)) for Dozers; controlled EF assumes 61% reduction in PM from 2x per day watering.		
Source: CalEEMod Appendix C, Section 4.4.2 (pg C-12)		

Helicopter Type and Usage

Type	Engine	HP	Fuel Consumption (gallons/hr)
UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	GECT7-2A	4380	133
Bell 407/MD530F (Light Duty)	Alison 250-C20B	420	28
Source: Fuel Consumption is obtained from the U.S. Department of Interior National Business Center (2006)			

Helicopter Emission Factors

Helicopter Emission Factor	lbs/hr						lbs/gallon
Type	HC	NOx	CO	SOx	PM10	CO2	
UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	0.13	10.49	2.02	0.65	0.72	18.355	
Bell 407/MD530F (Light Duty)	0.08	1.75	2.07	0.14	0.1	18.355	
Source: Emission factors for HC, NOx, CO, and SOx were obtained from the California Public Utilities Commission (2007); PM10 emission factors were obtained from the CPUC (2006); and CO2 emission factor for aviation gasoline was obtained from the U.S. Department of Energy (2008).							
Note: Emission factors for Sikorsky UH-60A Blackhawk/Boeing CH-47D Chinook were derived from the emission factors for H-53 Super Stallion (T64-GE-416 Turboshift 4,380 hp engine). Emission factors for take-off and climb-out modes were used. Emission factors for Bell 407/MD530F were derived from the emission factors for Bell 206 Jet Ranger (Alison 250-C20 Turboshift 420 hp engine). Emission factors for take-off mode were used.							

Helicopter Usage Schedule

Phase	Type	Hours per Day	Number of Helicopters	Total Days of Helicopter Usage	No of Days 2029	No of Days 2030
Staging Areas	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	100	-
Staging Areas	Bell 407/MD530F (Light Duty)	-	-	-	100	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	235	131
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Bell 407/MD530F (Light Duty)	-	-	-	235	131
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	235	131
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Bell 407/MD530F (Light Duty)	-	-	-	235	131
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	210	78
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Bell 407/MD530F (Light Duty)	-	-	-	210	78
Civil Crew (Road Maintenance, BMP's, Gates)	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	253	262
Civil Crew (Road Maintenance, BMP's, Gates)	Bell 407/MD530F (Light Duty)	-	-	-	253	262
Structure Installation - Lattice - Guyed V Framing	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	6	1	287	183	104
Structure Installation - Lattice - Guyed V Framing	Bell 407/MD530F (Light Duty)	-	-	-	183	104
Structure Installation - Lattice - Guyed V Setting	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	183	104
Structure Installation - Lattice - Guyed V Setting	Bell 407/MD530F (Light Duty)	-	-	-	183	104
Structure Installation - Monopole and Lattice - 4-Legged	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	183	104
Structure Installation - Monopole and Lattice - 4-Legged	Bell 407/MD530F (Light Duty)	-	-	-	183	104
Structure Installation - Spotting	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	183	104
Structure Installation - Spotting	Bell 407/MD530F (Light Duty)	-	-	-	183	104
Conductor and Wires Installation	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	52	235
Conductor and Wires Installation	Bell 407/MD530F (Light Duty)	5	2	235	52	235
Civil Crew (Clean Up)	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	211
Civil Crew (Clean Up)	Bell 407/MD530F (Light Duty)	-	-	-	-	211

Paved Roadway Dust Emission Factors

Paved	PM10 (lb/mile)	PM2.5 (lb/mile)
k	1	0.25
sL	0.1	0.1
W	2.4	2.4
p	2	2
N	365	365
Emission Factor Controlled	0.00030	0.00007
Emission Factor Uncontrolled	0.00066	0.00017
Notes: Used the Controlled emissions factor, which assumes watering twice a day, resulting in a 55% reduction in PM10.		
Source: CalEEMod Appendix C, Section 5.14 (page C-45)		

$$EF_{\text{unpaved}} = \left(\frac{k(s/12)^1(S/30)^{0.5}}{(M/0.5)^{0.2}} - C \right) \times \left(1 - \frac{P}{365} \right)$$

Unpaved Roadway Dust Emission Factors

Unpaved	LHDT2 Diesel 25mph		LDT2 Gas 25 mph		HHDT Diesel 15 mph	
	PM10 (lb/mile)	PM2.5 (lb/mile)	PM10 (lb/mile)	PM2.5 (lb/mile)	PM10 (lb/mile)	PM2.5 (lb/mile)
k	816.47	81.65	816.47	81.65	816.47	81.65
sL	8.50	8.50	8.50	8.50	8.50	8.50
M	0.50	0.50	0.50	0.50	0.50	0.50
p	2	2	2	2	2	2
S	40	40	40	40	40	40
C	0.14	0.05	0.09	0.03	0.09	0.03
Emission Factor Controlled (Calculated)	0.66	0.07	0.66	0.07	0.66	0.07
Emission Factor Uncontrolled (CARB Default)	2	0.2	2	0.2	2	0.2
Emission Factor Uncontrolled (Calculated)	1.46	0.15	1.46	0.15	1.46	0.15
Notes: Used the Controlled emissions factor, which assumes watering twice a day, resulting in a 55% reduction in PM10.						
Source: CalEEMod Appendix C, Section 5.14 (page C-45); https://www.caleemod.com/documents/user-guide/04_Appendix%20C.pdf						

Annual Emissions Estimates

Offroad Construction Equipment Combustion Emissions Calculations - Annual

CalEEMod Name	HP	Load Factor	Specific Name	Phase	Total Equipment Count for All Crews	Hours Per Day	Total No. of Usage Days	No. of Usage Days - 2029	No. of Usage Days - 2030
Forklifts (medium)	96	0.2	N/T Forklift	Staging Areas	4	8	100	100	0
Generator Sets	45	0.74	Generator	Staging Areas	1	8	100	100	0
Off-Highway Trucks	350	0.38	Water Truck	Staging Areas	1	8	100	100	0
Graders	200	0.41	GRADER 150 AWD	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	8	366	235	131
Rubber Tired Dozers (medium)	200	0.4	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	8	366	235	131
Off-Highway Trucks	350	0.38	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	8	366	235	131
Rollers	150	0.38	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	8	366	235	131
Excavators (heavy)	450	0.38	EXCAVATOR>100,000 LBS	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	8	366	235	131
Rubber Tired Dozers (medium)	200	0.4	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	8	366	235	131
Off-Highway Trucks	350	0.38	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	8	366	235	131
Rollers	150	0.38	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	8	366	235	131
Bore/Drill Rigs	500	0.5	IMT DRILL	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	8	288	210	78
Bore/Drill Rigs	400	0.5	LeDrill	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	8	288	210	78
Tractors/Loaders/Backhoes	150	0.37	Backhoe	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	6	8	288	210	78
Cranes (heavy)	425	0.29	CRANE 40T	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	6	8	288	210	78
Other Material Handling Equipment	400	0.4	Material Handler	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	8	288	210	78
Forklifts (Heavy)	100	0.2	SKID STEER & FORKS	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	8	288	210	78
Off-Highway Trucks	350	0.38	Water Truck	Civil Crew (Road Maintenance, BMP's, Gates)	3	8	515	253	262
Graders	200	0.41	GRADER 150 AWD	Civil Crew (Road Maintenance, BMP's, Gates)	1	8	515	253	262
Forklifts (Heavy)	100	0.2	SKID STEER & FORKS	Civil Crew (Road Maintenance, BMP's, Gates)	1	8	515	253	262
Off-Highway Trucks	335	0.38	Mechanic Truck	Civil Crew (Road Maintenance, BMP's, Gates)	1	8	515	253	262
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Framing	4	8	287	183	104
Cranes (heavy)	500	0.29	CRANE 275 TON	Structure Installation - Lattice - Guyed V Setting	4	8	287	183	104
Excavators (medium)	175	0.38	EXCAVATOR<60,000 LBS	Structure Installation - Lattice - Guyed V Setting	4	8	287	183	104
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Setting	4	8	287	183	104
Forklifts	100	0.2	FORKLIFT 12K	Structure Installation - Monopole and Lattice - 4-Legged	1	9	287	183	104
Cranes	500	0.29	CRANE 160 TON RT	Structure Installation - Monopole and Lattice - 4-Legged	1	10	287	183	104
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Structure Installation - Spotting	1	8	287	183	104
Cranes (medium)	270	0.29	CRANE 100 TON RT	Structure Installation - Spotting	1	8	287	183	104
Rubber Tired Dozers (heavy)	350	0.4	DOZER D8 TRIPLE BUNDLE SAG	Conductor and Wires Installation	4	8	287	52	235
Rubber Tired Dozers (medium)	200	0.4	DOZER D6 SINGLE TOW WINCH	Conductor and Wires Installation	2	8	287	52	235
Other Construction Equipment	500	0.42	HARDLINE PULLER	Conductor and Wires Installation	4	8	287	52	235
Other Construction Equipment (medium)	175	0.42	TRIPLE DRUM PULLER 3/8"	Conductor and Wires Installation	6	8	287	52	235
Other Construction Equipment	300	0.42	TENSIONER 72" BNDL TRK MNTD	Conductor and Wires Installation	2	8	287	52	235
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Conductor and Wires Installation	4	8	287	52	235
Off-Highway Trucks	400	0.38	7 TON ARMY BUNK TRUCK	Conductor and Wires Installation	4	8	287	52	235
Off-Highway Trucks	300	0.38	BUCKET TRUCK 90'-100' AWD	Conductor and Wires Installation	2	8	287	52	235
Cranes (heavy)	425	0.29	CRANE 40T	Conductor and Wires Installation	11	8	287	52	235
Forklifts (Heavy)	100	0.2	SKID STEER & FORKS	Conductor and Wires Installation	2	8	287	52	235
Off-Highway Trucks	335	0.38	Mechanic Truck	Conductor and Wires Installation	2	8	287	52	235
Excavators (heavy)	450	0.38	EXCAVATOR>100,000 LBS	Civil Crew (Clean Up)	1	8	211	0	211

2029 Emissions (TPY)						2030 Emissions (TPY)					
ROG	NOx	CO	SO2	PM10E	PM2.5E	ROG	NOx	CO	SO2	PM10E	PM2.5E
0.01	0.13	0.24	0.00	0.00	0.00	-	-	-	-	-	-
0.01	0.09	0.11	0.00	0.00	0.00	-	-	-	-	-	-
0.02	0.10	0.14	0.00	0.00	0.00	-	-	-	-	-	-
0.07	0.53	0.40	0.00	0.02	0.02	0.04	0.30	0.22	0.00	0.01	0.01
0.15	1.47	1.16	0.00	0.07	0.06	0.08	0.82	0.65	0.00	0.04	0.03
0.09	0.45	0.64	0.00	0.02	0.01	0.05	0.25	0.36	0.00	0.01	0.01
0.03	0.18	0.69	0.00	0.01	0.01	0.01	0.10	0.39	0.00	0.00	0.00
0.04	0.19	0.37	0.00	0.01	0.01	0.02	0.11	0.21	0.00	0.00	0.00
0.07	0.74	0.58	0.00	0.03	0.03	0.04	0.41	0.32	0.00	0.02	0.02
0.05	0.23	0.32	0.00	0.01	0.01	0.03	0.13	0.18	0.00	0.00	0.00
0.01	0.09	0.35	0.00	0.00	0.00	0.01	0.05	0.19	0.00	0.00	0.00
0.13	0.98	1.37	0.01	0.04	0.03	0.05	0.36	0.51	0.00	0.01	0.01
0.11	0.78	1.09	0.01	0.03	0.03	0.04	0.29	0.41	0.00	0.01	0.01
0.09	0.52	1.92	0.00	0.03	0.02	0.03	0.19	0.71	0.00	0.01	0.01
0.25	2.03	2.20	0.01	0.08	0.08	0.09	0.75	0.82	0.00	0.03	0.03
0.17	0.65	1.03	0.00	0.03	0.03	0.04	0.34	0.38	0.00	0.01	0.01
0.02	0.11	0.35	0.00	0.01	0.00	0.01	0.04	0.13	0.00	0.00	0.00
0.15	0.73	1.03	0.00	0.03	0.02	0.16	0.76	1.07	0.00	0.03	0.02
0.04	0.29	0.22	0.00	0.01	0.01	0.04	0.30	0.22	0.00	0.01	0.01
0.01	0.05	0.14	0.00	0.00	0.00	0.01	0.05	0.15	0.00	0.00	0.00
0.05	0.23	0.33	0.00	0.01	0.01	0.05	0.24	0.34	0.00	0.01	0.01
0.02	0.13	0.41	0.00	0.01	0.01	0.01	0.08	0.23	0.00	0.00	0.00
0.17	1.39	1.51	0.00	0.06	0.05	0.10	0.79	0.86	0.00	0.03	0.03
0.05	0.31	0.47	0.00	0.01	0.01	0.03	0.18	0.27	0.00	0.01	0.01
0.02	0.12	0.41	0.00	0.01	0.01	0.01	0.08	0.23	0.00	0.00	0.00
0.01	0.04	0.12	0.00	0.00	0.00	0.00	0.02	0.07	0.00	0.00	0.00
0.05	0.43	0.47	0.00	0.02	0.02	0.03	0.25	0.27	0.00	0.01	0.01
0.01	0.03	0.10	0.00	0.00	0.00	0.00	0.02	0.06	0.00	0.00	0.00
0.03	0.26	0.18	0.00	0.01	0.01	0.02	0.15	0.10	0.00	0.01	0.01
0.09	0.73	0.68	0.00	0.03	0.03	0.39	3.32	3.05	0.01	0.15	0.14
0.03	0.33	0.26	0.00	0.01	0.01	0.15	1.47	1.16	0.00	0.07	0.06
0.06	0.42	0.48	0.00	0.02	0.02	0.25	1.91	2.18	0.01	0.07	0.07
0.04	0.31	0.27	0.00	0.01	0.01	0.17	1.40	1.22	0.00	0.06	0.06
0.02	0.13	0.14	0.00	0.00	0.00	0.08	0.57	0.65	0.00	0.02	0.02
0.01	0.04	0.12	0.00	0.00	0.00	0.03	0.17	0.53	0.00	0.01	0.01
0.05	0.23	0.32	0.00	0.01	0.01	0.22	1.04	1.46	0.01	0.04	0.03
0.02	0.09	0.12	0.00	0.00	0.00	0.08	0.39	0.55	0.00	0.01	0.01
0.11	0.92	1.00	0.00	0.04	0.04	0.51	4.16	4.52	0.01	0.17	0.16
0.00	0.02	0.06	0.00	0.00	0.00	0.01	0.09	0.26	0.00	0.00	0.00
0.02	0.10	0.14	0.00	0.00	0.00	0.09	0.43	0.61	0.00	0.02	0.01
-	-	-	-	-	-	0.03	0.17	0.33	0.00	0.01	0.01

Offroad Construction Equipment Combustion Emissions - Annual

Construction Phase	2029 Emissions (TPY)						2030 Emissions (TPY)					
	ROG	NOx	CO	SO2	PM10E	PM2.5E	ROG	NOx	CO	SO2	PM10E	PM2.5E
Staging Areas	0.04	0.32	0.49	0.00	0.00	0.00	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	0.33	2.63	2.89	0.01	0.04	0.04	0.18	1.47	1.61	0.00	0.02	0.02
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	0.17	1.25	1.61	0.00	0.02	0.02	0.10	0.69	0.90	0.00	0.01	0.01
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	0.72	5.07	7.97	0.03	0.08	0.07	0.27	1.88	2.96	0.01	0.03	0.03
Civil Crew (Road Maintenance, BMP's, Gates)	0.24	1.30	1.72	0.01	0.02	0.02	0.25	1.34	1.78	0.01	0.02	0.02
Structure Installation - Lattice - Guyed V Framing	0.02	0.13	0.41	0.00	0.00	0.00	0.01	0.08	0.23	0.00	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	0.24	1.83	2.39	0.01	0.03	0.03	0.14	1.04	1.36	0.00	0.02	0.02
Structure Installation - Monopole and Lattice - 4-Legged	0.06	0.47	0.59	0.00	0.01	0.01	0.03	0.27	0.33	0.00	0.00	0.00
Structure Installation - Spotting	0.03	0.29	0.28	0.00	0.00	0.00	0.02	0.17	0.16	0.00	0.00	0.00
Conductor and Wires Installation	0.44	3.31	3.58	0.01	0.05	0.05	1.97	14.95	16.10	0.05	0.34	0.32
Civil Crew (Clean Up)	-	-	-	-	-	-	0.03	0.17	0.33	0.00	0.00	0.00

Grading & Material Movement Calculations - Annual

						2029 Emissions (TPV)		2030 Emissions (TPV)	
	Equipment	Lookup	No. of Equipment	Hours Per Day	Acres Graded	PM10	PM2.5	PM10	PM2.5
Staging Areas	Forklifts (medium)		4	-	-	-	-	-	-
Staging Areas	Generator Sets		1	-	-	-	-	-	-
Staging Areas	Off-Highway Trucks		1	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Graders	Graders	2	-	0.50	0.05	0.01	0.03	0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Rubber Tired Dozers (medium)	Rubber Tired Dozers (medium)	2	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Off-Highway Trucks		2	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Rollers		2	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Excavators (heavy)		1	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Rubber Tired Dozers (medium)	Rubber Tired Dozers (medium)	1	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Off-Highway Trucks		1	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Rollers		1	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Bore/Drill Rigs		3	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Bore/Drill Rigs		3	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Tractor/Loaders/Backhoes	Crawler Tractors	6	-	0.50	0.13	0.01	0.05	0.01
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Cranes (heavy)		6	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Other Material Handling Equipment		3	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Forklifts (heavy)		3	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Off-Highway Trucks		3	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Graders	Graders	1	-	0.50	0.03	0.00	0.03	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	Forklifts (heavy)		1	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Off-Highway Trucks		1	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	Forklifts (heavy)		4	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	Cranes (heavy)		4	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	Excavators (medium)		4	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	Forklifts (heavy)		4	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	Forklifts		1	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	Cranes		1	-	-	-	-	-	-
Structure Installation - Spotting	Forklifts (heavy)		1	-	-	-	-	-	-
Structure Installation - Spotting	Cranes (medium)		1	-	-	-	-	-	-
Conductor and Wires Installation	Rubber Tired Dozers (heavy)	Rubber Tired Dozers	4	8	0.50	0.27	0.14	1.20	0.62
Conductor and Wires Installation	Rubber Tired Dozers (medium)	Rubber Tired Dozers	2	8	0.50	0.13	0.07	0.60	0.31
Conductor and Wires Installation	Other Construction Equipment		4	-	-	-	-	-	-
Conductor and Wires Installation	Other Construction Equipment (medium)		6	-	-	-	-	-	-
Conductor and Wires Installation	Other Construction Equipment		2	-	-	-	-	-	-
Conductor and Wires Installation	Forklifts (heavy)		4	-	-	-	-	-	-
Conductor and Wires Installation	Off-Highway Trucks		4	-	-	-	-	-	-
Conductor and Wires Installation	Off-Highway Trucks		2	-	-	-	-	-	-
Conductor and Wires Installation	Cranes (heavy)		11	-	-	-	-	-	-
Conductor and Wires Installation	Forklifts (heavy)		2	-	-	-	-	-	-
Conductor and Wires Installation	Off-Highway Trucks		2	-	-	-	-	-	-
Civil Crew (Clean Up)	Excavators (heavy)		1	-	-	-	-	-	-

Grading & Material Movement - Annual

Construction Phase	2029 Emissions (TPV)		2030 Emissions (TPV)	
	PM10	PM2.5	PM10	PM2.5
Staging Areas	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	0.05	0.01	0.03	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	0.13	0.01	0.05	0.01
Civil Crew (Road Maintenance, BMP's, Gates)	0.03	0.00	0.03	0.00
Structure Installation - Lattice - Guyed V Framing	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	-	-	-	-
Structure Installation - Spotting	-	-	-	-
Conductor and Wires Installation	0.40	0.20	1.80	0.93
Civil Crew (Clean Up)	-	-	-	-

Roadway Dust Annual Emission Estimates

Roadway Dust Annual Emission Estimates						Paved Trips Roadway Dust						Unpaved Trips Roadway Dust																								
						Paved Trips						Unpaved Trips																								
Work Days						Annual VMT (miles/year)						2029 Annual Emissions (tons/year)					2030 Annual Emissions (tons/year)					Annual VMT (miles/year)					2029 Annual Emissions (tons/year)					2030 Annual Emissions (tons/year)				
Phase	Primary Equipment Description	EMFAC Classification	2029	2030	Fuel Type	Identifier for EF	2029	2030		2029		2030		2029		2030		2029		2030		2029		2030		2029		2030								
										PM10	PM2.5	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5											
Staging Areas	1-Ton Truck, 4x4	HHDT	100	-	Diesel	HHDT Diesel	9,600	-	-	0.00	0.00	-	-	6,400	-	-	2.11	0.21	-	-	-	-	-	-	-	-	-	-								
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	PICKUP 3/4 TON	LHD2	235	131	Gas	LHD2 Gas	7,817	4,358	0.00	0.00	0.00	0.00	5,211	2,905	1.72	0.17	0.96	0.10	-	-	-	-	-	-	-	-	-	-								
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	PICKUP 3/4 TON	LHD2	235	131	Gas	LHD2 Gas	5,211	2,905	0.00	0.00	0.00	0.00	3,474	1,937	1.14	0.11	0.64	0.06	-	-	-	-	-	-	-	-	-	-								
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	PICKUP 3/4 TON	LHD2	210	78	Gas	LHD2 Gas	27,942	10,378	0.00	0.00	0.00	0.00	18,658	6,919	6.14	0.61	2.28	0.23	-	-	-	-	-	-	-	-	-	-								
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Semi	HHDT	210	78	Diesel	HHDT Diesel	10,080	5,611	0.00	0.00	0.00	0.00	6,720	2,496	2.21	0.22	0.82	0.08	-	-	-	-	-	-	-	-	-	-								
Civil Crew (Road Maintenance, BMP's, Gates)	PICKUP 3/4 TON	LHD2	253	262	Diesel	LHD2 Diesel	5,611	5,810	0.00	0.00	0.00	0.00	3,740	3,873	1.23	0.12	1.28	0.13	-	-	-	-	-	-	-	-	-	-								
Structure Installation - Lattice - Guyed V Framing	PICKUP 3/4 TON	LHD2	183	104	Diesel	LHD2 Diesel	17,568	9,984	0.00	0.00	0.00	0.00	11,712	6,656	3.86	0.39	2.19	0.22	-	-	-	-	-	-	-	-	-	-								
Structure Installation - Lattice - Guyed V Framing	PICKUP 1 TON DIES	LHD2	183	104	Diesel	LHD2 Diesel	8,116	4,613	0.00	0.00	0.00	0.00	5,411	3,075	1.78	0.18	1.01	0.10	-	-	-	-	-	-	-	-	-	-								
Structure Installation - Lattice - Guyed V Setting	PICKUP 3/4 TON	LHD2	183	104	Gas	LHD2 Gas	8,116	4,613	0.00	0.00	0.00	0.00	5,411	3,075	1.78	0.18	1.01	0.10	-	-	-	-	-	-	-	-	-	-								
Structure Installation - Lattice - Guyed V Setting	PICKUP WINCH TRL	LHD2	183	104	Diesel	LHD2 Diesel	35,136	19,968	0.01	0.00	0.00	0.00	23,424	13,312	7.72	0.77	4.38	0.44	-	-	-	-	-	-	-	-	-	-								
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 3/4 TON	LHD2	183	104	Gas	LHD2 Gas	18,262	10,378	0.00	0.00	0.00	0.00	12,175	6,919	4.01	0.40	2.28	0.23	-	-	-	-	-	-	-	-	-	-								
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 1 TON DIES	HHDT	183	104	Diesel	HHDT Diesel	13,176	7,488	0.00	0.00	0.00	0.00	8,784	4,992	2.89	0.29	1.64	0.16	-	-	-	-	-	-	-	-	-	-								
Structure Installation - Spotting	Semi	HHDT	183	104	Diesel	HHDT Diesel	13,176	7,488	0.00	0.00	0.00	0.00	8,784	4,992	2.89	0.29	1.64	0.16	-	-	-	-	-	-	-	-	-	-								
Structure Installation - Spotting	PICKUP 1 TON DIES	LHD2	183	104	Diesel	LHD2 Diesel	2,029	1,153	0.00	0.00	0.00	0.00	1,353	769	0.45	0.04	0.25	0.03	-	-	-	-	-	-	-	-	-	-								
Structure Installation - Spotting	PICKUP 3/4 TON	LHD2	183	104	Diesel	LHD2 Diesel	2,029	1,153	0.00	0.00	0.00	0.00	1,353	769	0.45	0.04	0.25	0.03	-	-	-	-	-	-	-	-	-	-								
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	52	235	Diesel	HHDT Diesel	7,488	33,840	0.00	0.00	0.01	0.00	4,992	22,560	1.64	0.16	7.43	0.74	-	-	-	-	-	-	-	-	-	-								
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	52	235	Diesel	HHDT Diesel	7,488	33,840	0.00	0.00	0.01	0.00	4,992	22,560	1.64	0.16	7.43	0.74	-	-	-	-	-	-	-	-	-	-								
Conductor and Wires Installation	SEMI - ON/OFF RD	HHDT	52	235	Diesel	HHDT Diesel	4,992	22,560	0.00	0.00	0.00	0.00	3,328	15,040	1.10	0.11	4.95	0.50	-	-	-	-	-	-	-	-	-	-								
Conductor and Wires Installation	PICKUP 1 TON DIES	LHD2	52	235	Diesel	LHD2 Diesel	2,306	10,423	0.00	0.00	0.00	0.00	1,538	6,948	0.51	0.05	2.29	0.23	-	-	-	-	-	-	-	-	-	-								
Conductor and Wires Installation	PICKUP 3/4 TON DI	LHD2	52	235	Gas	LHD2 Gas	18,450	83,382	0.00	0.00	0.01	0.00	12,300	55,588	4.05	0.41	18.31	1.83	-	-	-	-	-	-	-	-	-	-								
Conductor and Wires Installation	PICKUP WINCH TRL	LHD2	52	235	Diesel	LHD2 Diesel	11,532	52,114	0.00	0.00	0.01	0.00	7,688	34,742	2.53	0.25	11.44	1.14	-	-	-	-	-	-	-	-	-	-								
Civil Crew (Clean Up)	PICKUP 3/4 TON	LHD2	-	211	Gas	LHD2 Gas	-	4,679	-	-	0.00	0.00	-	3,119	-	-	1.03	0.10	-	-	-	-	-	-	-	-	-	-								
Staging Areas	Worker	LHD2	100	-	Gas	LHD2 Gas	6,653	-	0.00	0.00	-	-	4,435	-	1.46	0.15	-	-	-	-	-	-	-	-	-	-	-	-								
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Worker	LHD2	235	131	Gas	LHD2 Gas	20,845	11,620	0.00	0.00	0.00	0.00	13,897	7,747	4.58	0.46	2.55	0.26	-	-	-	-	-	-	-	-	-	-								
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Worker	LHD2	235	131	Gas	LHD2 Gas	13,028	7,263	0.00	0.00	0.00	0.00	8,686	4,842	2.86	0.29	1.59	0.16	-	-	-	-	-	-	-	-	-	-								
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Worker	LHD2	210	78	Gas	LHD2 Gas	48,808	18,162	0.01	0.00	0.00	0.00	32,599	12,107	10.74	1.07	3.99	0.40	-	-	-	-	-	-	-	-	-	-								
Civil Crew (Road Maintenance, BMP's, Gates)	Worker	LHD2	253	262	Gas	LHD2 Gas	28,053	29,051	0.00	0.00	0.00	0.00	18,702	19,367	6.16	0.62	6.38	0.64	-	-	-	-	-	-	-	-	-	-								
Structure Installation - Lattice - Guyed V Framing	Worker	LHD2	183	104	Gas	LHD2 Gas	24,349	13,838	0.00	0.00	0.00	0.00	16,233	9,225	5.35	0.53	3.04	0.30	-	-	-	-	-	-	-	-	-	-								
Structure Installation - Lattice - Guyed V Setting	Worker	LHD2	183	104	Gas	LHD2 Gas	40,582	23,063	0.01	0.00	0.00	0.00	27,055	15,375	8.91	0.89	5.06	0.51	-	-	-	-	-	-	-	-	-	-								
Structure Installation - Monopole and Lattice - 4-Legged	Worker	LHD2	183	104	Gas	LHD2 Gas	24,349	13,838	0.00	0.00	0.00	0.00	16,233	9,225	5.35	0.53	3.04	0.30	-	-	-	-	-	-	-	-	-	-								
Structure Installation - Spotting	Worker	LHD2	183	104	Gas	LHD2 Gas	10,146	5,766	0.00	0.00	0.00	0.00	6,764	3,844	2.23	0.22	1.27	0.13	-	-	-	-	-	-	-	-	-	-								
Conductor and Wires Installation	Worker	LHD2	52	235	Gas	LHD2 Gas	9,225	41,691	0.00	0.00	0.01	0.00	6,150	27,794	2.03	0.20	9.16	0.92	-	-	-	-	-	-	-	-	-	-								
Civil Crew (Clean Up)	Worker	LHD2	-	211	Gas	LHD2 Gas	-	23,396	-	-	0.00	0.00	-	15,597	-	-	5.14	0.51	-	-	-	-	-	-	-	-	-	-								
Staging Areas	Hauling	HHDT	100	-	Diesel	HHDT Diesel	2,400	-	0.00	0.00	-	-	1,600	-	0.53	0.05	-	-	-	-	-	-	-	-	-	-	-	-								
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Hauling	HHDT	235	131	Diesel	HHDT Diesel	5,640	3,144	0.00	0.00	0.00	0.00	3,760	2,096	1.24	0.12	0.69	0.07	-	-	-	-	-	-	-	-	-	-								
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Hauling	HHDT	235	131	Diesel	HHDT Diesel	5,640	3,144	0.00	0.00	0.00	0.00	3,760	2,096	1.24	0.12	0.69	0.07	-	-	-	-	-	-	-	-	-	-								
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Hauling	HHDT	210	78	Diesel	HHDT Diesel	5,040	1,872	0.00	0.00	0.00	0.00	3,360	1,248	1.11	0.11	0.41	0.04	-	-	-	-	-	-	-	-	-	-								
Civil Crew (Road Maintenance, BMP's, Gates)	Hauling	HHDT	253	262	Diesel	HHDT Diesel	22,284	23,076	0.00	0.00	0.00	0.00	14,856	15,384	4.89	0.49	5.07	0.51	-	-	-	-	-	-	-	-	-	-								
Structure Installation - Lattice - Guyed V Framing	Hauling	HHDT	183	104	Diesel	HHDT Diesel	26,352	14,976	0.00	0.00	0.00	0.00	17,568	9,984	5.79	0.58	3.29	0.33	-	-	-	-	-	-	-	-	-	-								
Structure Installation - Lattice - Guyed V Setting	Hauling	HHDT	183	104	Diesel	HHDT Diesel	26,352	14,976	0.00	0.00	0.00	0.00	17,568	9,984	5.79	0.58	3.29	0.33	-	-	-	-	-	-	-	-	-	-								
Structure Installation - Monopole and Lattice - 4-Legged	Hauling	HHDT	183	104	Diesel	HHDT Diesel	26,352	14,976	0.00	0.00	0.00	0.00	17,568	9,984	5.79	0.58	3.29	0.33	-	-	-	-	-	-	-	-	-	-								
Structure Installation - Spotting	Hauling	HHDT	183	104	Diesel	HHDT Diesel	26,352	14,976	0.00	0.00	0.00	0.00	17,568	9,984	5.79	0.58	3.29	0.33	-	-	-	-	-	-	-	-	-	-								
Conductor and Wires Installation	Hauling	HHDT	52	235	Diesel	HHDT Diesel	1,248	5,640	0.00	0.00	0.00	0.00	832	3,760	0.27	0.03	1.24	0.12	-	-	-	-	-	-	-	-	-	-								
Civil Crew (Clean Up)	Hauling	HHDT	-	211	Diesel	HHDT Diesel	-	5,064	-	-	0.00	0.00	-	3,376	-	-	1.11	0.11	-	-	-	-	-	-	-	-	-	-								

Note: Emissions assume a 55% reduction in PM10, as watering twice a day for industrial unpaved roads is 55%. Additional measures that will further reduce PM10 include limiting the max speed to 25 mph (44% reduction) and applying chemical dust suppressants annually to unpaved parking areas (84% reduction).

Total Paved Roadway Dust Emissions - Annual

	2029 Annual Emissions (tons/year)		2030 Annual Emissions (tons/year)	
	PM10	PM2.5	PM10	PM2.5
	PM10	PM2.5	PM10	PM2.5
Staging Areas	0.00	0.00	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	0.01	0.00	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	0.00	0.00	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	0.01	0.00	0.01	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	0.01	0.00	0.01	0.00
Structure Installation - Lattice - Guyed V Framing	0.01	0.00	0.01	0.00
Structure Installation - Lattice - Guyed V Setting	0.02	0.00	0.01	0.00
Structure Installation - Monopole and Lattice - 4-Legged	0.01	0.00	0.01	0.00
Structure Installation - Spotting	0.01	0.00	0.00	0.00
Conductor and Wires Installation	0.01	0.00	0.04	0.01
Civil Crew (Clean Up)	-	-	0.00	0.00

Total Unpaved Roadway Dust Emissions - Annual

	2029 Annual Emissions (tons/year)		2030 Annual Emissions (tons/year)	
	PM10	PM2.5	PM10	PM2.5
	PM10	PM2.5	PM10	PM2.5
Staging Areas	4.10	0.41	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	7.53	0.75	4.20	0.42
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	5.24	0.52	2.92	0.29
Civil Crew (Road Work, Foundations, Ducts) - Foundation C	20.19	2.02	7.50	0.75
Civil Crew (Road Maintenance, BMP's, Gates)	12.29	1.23	12.72	1.27
Structure Installation - Lattice - Guyed V Framing	16.77	1.68	9.53	0.95
Structure Installation - Lattice - Guyed V Setting	24.20	2.42	13.75	1.37
Structure Installation - Monopole and Lattice - 4-Legged	18.04	1.80	10.25	1.02
Structure Installation - Spotting	11.80	1.18	6.71	0.67
Conductor and Wires Installation	13.78	1.38	62.25	6.22
Civil Crew (Clean Up)	-	-	7.28	0.73

Mobile Combustion Annual Emissions - Paved Roadways

[illegible]

Ironwood Transmission Construction
Air Quality Emissions
Paved Mobile Emissions

[illegible]

Construction Phase	2029 Annual Emissions (TPY)												2030 Annual Emissions (TPY)											
	ROG Exhaust	NOX Exhaust	CO Exhaust	SO2 Exhaust	PM10 Exhaust	PM10_PMTW	PM10_PMBW	PM10 TOTAL	PM2.5 Exhaust	PM2.5_PMTW	PM2.5_PMBW	PM2.5 TOTAL	ROG Exhaust	NOX Exhaust	CO Exhaust	SO2 Exhaust	PM10 Exhaust	PM10_PMTW	PM10_PMBW	PM10 TOTAL	PM2.5 Exhaust	PM2.5_PMTW	PM2.5_PMBW	PM2.5 TOTAL
Staging Areas	0.00	0.01	0.01	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	0.00	0.01	0.03	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	0.00	0.01	0.02	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	0.00	0.01	0.02	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.01	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	0.00	0.02	0.08	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	0.00	0.01	0.03	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	0.00	0.03	0.03	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	0.00	0.03	0.03	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Lattice - Guyed V Framing	0.00	0.04	0.04	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	0.00	0.02	0.02	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	0.00	0.05	0.06	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	0.00	0.03	0.03	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Monopole and Lattice - 4-Legged	0.00	0.04	0.05	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	0.00	0.02	0.03	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Spotting	0.00	0.04	0.02	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	0.00	0.02	0.01	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Conductor and Wires Installation	0.00	0.03	0.03	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	0.00	0.15	0.16	0.00	0.00	-	0.01	0.01	0.00	-	0.00	0.00
Civil Crew (Clean Up)	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.01	0.03	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00

Helicopter Emissions - Annual

Helicopter Emissions		2029 Emissions (TPY)						2030 Emissions (TPY)					
Phase	Type	ROG	NOx	CO	SO2	PM10E	PM2.5E	ROG	NOx	CO	SO2	PM10E	PM2.5E
Staging Areas	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-
Staging Areas	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	0.07	5.76	1.11	0.36	0.40	-	0.04	3.27	0.63	0.20	0.22	-
Structure Installation - Lattice - Guyed V Framing	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Spotting	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Spotting	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-
Conductor and Wires Installation	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-
Conductor and Wires Installation	Bell 407/MD530F (Light Duty)	0.03	0.46	0.54	0.04	0.03	-	0.15	2.06	2.43	0.16	0.12	-
Civil Crew (Clean Up)	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Clean Up)	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-	-	-	-	-

Daily Emissions Estimates

Offroad Construction Equipment Combustion Emissions - Maximum Daily

CalEEMod Name	HP	Load Factor	Specific Name	Phase	No. of Equipment per Crew	Hours Per Day	Total No. of Usage Days	No. of Usage Days - 2029	No. of Usage Days - 2030
Forklifts (medium)	96	0.2	R/T Forklift	Staging Areas	4	8	100	100	0
Generator Sets	45	0.74	Generator	Staging Areas	1	8	100	100	0
Off-Highway Trucks	350	0.38	Water Truck	Staging Areas	1	8	100	100	0
Graders	200	0.41	GRADER 150 AWD	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	1	8	366	235	131
Rubber Tired Dozers (medium)	200	0.4	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	1	8	366	235	131
Off-Highway Trucks	350	0.38	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	1	8	366	235	131
Rollers	150	0.38	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	1	8	366	235	131
Excavators (heavy)	450	0.38	EXCAVATOR>100,000 LBS	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	8	366	235	131
Rubber Tired Dozers (medium)	200	0.4	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	8	366	235	131
Off-Highway Trucks	350	0.38	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	8	366	235	131
Rollers	150	0.38	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	8	366	235	131
Bore/Drill Rigs	500	0.5	IMT Drill	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	1	8	288	210	78
Bore/Drill Rigs	400	0.5	LoDrill	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	1	8	288	210	78
Tractors/Loaders/Backhoes	150	0.37	Backhoe	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	2	8	288	210	78
Cranes (heavy)	425	0.29	CRANE 40T	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	2	8	288	210	78
Other Material Handling Equipment	400	0.4	Material Handler	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	1	8	288	210	78
Forklifts (Heavy)	100	0.2	SKID STEER & FORKS	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	1	8	288	210	78
Off-Highway Trucks	350	0.38	Water Truck	Civil Crew (Road Maintenance, BMP's, Gates)	3	8	515	253	262
Graders	200	0.41	GRADER 150 AWD	Civil Crew (Road Maintenance, BMP's, Gates)	1	8	515	253	262
Forklifts (Heavy)	100	0.2	SKID STEER & FORKS	Civil Crew (Road Maintenance, BMP's, Gates)	1	8	515	253	262
Off-Highway Trucks	335	0.38	Mechanic Truck	Civil Crew (Road Maintenance, BMP's, Gates)	1	8	515	253	262
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Framing	1	8	287	183	104
Cranes (heavy)	500	0.29	CRANE 275 TON	Structure Installation - Lattice - Guyed V Setting	1	8	287	183	104
Excavators (medium)	175	0.38	EXCAVATOR>60,000 LBS	Structure Installation - Lattice - Guyed V Setting	1	8	287	183	104
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Setting	1	8	287	183	104
Forklifts	100	0.2	FORKLIFT 12K	Structure Installation - Monopole and Lattice - 4-Legged	1	9	287	183	104
Cranes	500	0.29	CRANE 160 TON RT	Structure Installation - Monopole and Lattice - 4-Legged	1	10	287	183	104
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Structure Installation - Spotting	1	8	287	183	104
Cranes (medium)	270	0.29	CRANE 100 TON RT	Structure Installation - Spotting	1	8	287	183	104
Rubber Tired Dozers (heavy)	350	0.4	DOZER D8 TRIPLE BUNDEL SAG	Conductor and Wires Installation	2	8	287	52	235
Rubber Tired Dozers (medium)	200	0.4	DOZER D6 SINGLE TOW WINCH	Conductor and Wires Installation	1	8	287	52	235
Other Construction Equipment	500	0.42	HARDLINE PULLER	Conductor and Wires Installation	2	8	287	52	235
Other Construction Equipment (medium)	175	0.42	TRIPLE DRUM PULLER 3/8	Conductor and Wires Installation	3	8	287	52	235
Other Construction Equipment	300	0.42	TENSIONER 72" BN DL TRK MN TD	Conductor and Wires Installation	1	8	287	52	235
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Conductor and Wires Installation	2	8	287	52	235
Off-Highway Trucks	400	0.38	7 TON ARMY BUNK TRUCK	Conductor and Wires Installation	2	8	287	52	235
Off-Highway Trucks	300	0.38	BUCKET TRUCK 90'-100' AWD	Conductor and Wires Installation	1	8	287	52	235
Cranes (heavy)	425	0.29	CRANE 40T	Conductor and Wires Installation	6	8	287	52	235
Forklifts (Heavy)	100	0.2	SKID STEER & FORKS	Conductor and Wires Installation	1	8	287	52	235
Off-Highway Trucks	335	0.38	Mechanic Truck	Conductor and Wires Installation	1	8	287	52	235
Excavators (heavy)	450	0.38	EXCAVATOR>100,000 LBS	Civil Crew (Clean Up)	1	8	211	0	211

lbs per day					
ROG	NOx	CO	SO2	PM10E	PM2.5E
0.28	2.65	4.84	0.01	0.09	0.09
0.16	1.84	2.15	0.00	0.03	0.02
0.40	1.93	2.72	0.01	0.07	0.06
0.28	2.26	1.71	0.01	0.08	0.07
0.62	6.26	4.92	0.01	0.28	0.26
0.40	1.93	2.72	0.01	0.07	0.06
0.11	0.75	2.95	0.01	0.03	0.03
0.33	1.66	3.14	0.02	0.06	0.05
0.62	6.26	4.92	0.01	0.28	0.26
0.40	1.93	2.72	0.01	0.07	0.06
0.11	0.75	2.95	0.01	0.03	0.03
0.43	3.10	4.33	0.02	0.11	0.11
0.34	2.48	3.47	0.02	0.09	0.08
0.28	1.66	6.11	0.01	0.08	0.08
0.79	6.43	7.00	0.02	0.27	0.25
0.37	2.05	3.27	0.01	0.07	0.06
0.06	0.36	1.12	0.00	0.02	0.02
1.21	5.79	8.16	0.04	0.20	0.19
0.28	2.26	1.71	0.01	0.08	0.07
0.06	0.36	1.12	0.00	0.02	0.02
0.39	1.85	2.60	0.01	0.07	0.06
0.06	0.36	1.12	0.00	0.02	0.02
0.47	3.78	4.12	0.01	0.16	0.15
0.15	0.86	1.29	0.01	0.03	0.03
0.06	0.36	1.12	0.00	0.02	0.02
0.07	0.41	1.26	0.00	0.02	0.02
0.58	4.73	5.15	0.02	0.20	0.18
0.06	0.36	1.12	0.00	0.02	0.02
0.31	2.82	1.95	0.01	0.12	0.11
1.65	14.12	12.99	0.02	0.63	0.58
0.62	6.26	4.92	0.01	0.28	0.26
1.07	8.15	9.26	0.04	0.32	0.29
0.72	5.95	5.21	0.02	0.26	0.24
0.32	2.44	2.78	0.01	0.10	0.09
0.12	0.73	2.24	0.00	0.03	0.03
0.92	4.41	6.22	0.03	0.16	0.14
0.35	1.65	2.33	0.01	0.06	0.05
2.18	17.69	19.25	0.06	0.74	0.68
0.06	0.36	1.12	0.00	0.02	0.02
0.39	1.85	2.60	0.01	0.07	0.06
0.33	1.66	3.14	0.02	0.06	0.05

Offroad Construction Equipment Combustion Emissions - Maximum Daily

Construction Phase	lbs per day					
	ROG	NOx	CO	SO2	PM10E	PM2.5E
Staging Areas	0.85	6.43	9.71	0.02	0.07	0.07
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	1.41	11.20	12.30	0.03	0.18	0.17
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1.46	10.60	13.73	0.04	0.17	0.16
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	2.27	16.09	25.30	0.09	0.25	0.23
Civil Crew (Road Maintenance, BMP's, Gates)	1.93	10.26	13.60	0.06	0.14	0.13
Structure Installation - Lattice - Guyed V Framing	0.06	0.36	1.12	0.00	0.01	0.01
Structure Installation - Lattice - Guyed V Setting	0.67	5.00	6.53	0.02	0.08	0.07
Structure Installation - Monopole and Lattice - 4-Legged	0.65	5.14	6.41	0.02	0.08	0.08
Structure Installation - Spotting	0.37	3.18	3.07	0.01	0.05	0.05
Conductor and Wires Installation	8.40	63.63	68.93	0.21	1.04	0.95
Civil Crew (Clean Up)	0.33	1.66	3.14	0.02	0.02	0.02

Grading & Material Movement

	Equipment	Lookup	No. of Equipment	Hours Per Day	Acres Graded	lbs per day	
						PM10	PM2.5
Staging Areas	Forklifts (medium)		4	-	-	-	-
Staging Areas	Generator Sets		1	-	-	-	-
Staging Areas	Off-Highway Trucks		1	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Graders	Graders	1	-	0.50	0.21	0.02
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Rubber Tired Dozers (medium)	Rubber Tired Dozers (med	1	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Off-Highway Trucks		1	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Rollers		1	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Excavators (heavy)		1	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Rubber Tired Dozers (medium)	Rubber Tired Dozers (med	1	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Off-Highway Trucks		1	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Rollers		1	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Bore/Drill Rigs		1	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Bore/Drill Rigs		1	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Tractors/Loaders/Backhoes	Crawler Tractors	2	-	0.50	0.41	0.04
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Cranes (heavy)		2	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Other Material Handling Equipment		1	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Forklifts (Heavy)		1	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Off-Highway Trucks		3	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Graders	Graders	1	-	0.50	0.21	0.02
Civil Crew (Road Maintenance, BMP's, Gates)	Forklifts (Heavy)		1	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Off-Highway Trucks		1	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	Forklifts (Heavy)		1	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	Cranes (heavy)		1	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	Excavators (medium)		1	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	Forklifts (Heavy)		1	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	Forklifts		1	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	Cranes		1	-	-	-	-
Structure Installation - Spotting	Forklifts (Heavy)		1	-	-	-	-
Structure Installation - Spotting	Cranes (medium)		1	-	-	-	-
Conductor and Wires Installation	Rubber Tired Dozers (heavy)	Rubber Tired Dozers	2	8	0.50	5.11	2.63
Conductor and Wires Installation	Rubber Tired Dozers (medium)	Rubber Tired Dozers	1	8	0.50	2.56	1.31
Conductor and Wires Installation	Other Construction Equipment		2	-	-	-	-
Conductor and Wires Installation	Other Construction Equipment (medium)		3	-	-	-	-
Conductor and Wires Installation	Other Construction Equipment		1	-	-	-	-
Conductor and Wires Installation	Forklifts (Heavy)		2	-	-	-	-
Conductor and Wires Installation	Off-Highway Trucks		2	-	-	-	-
Conductor and Wires Installation	Off-Highway Trucks		1	-	-	-	-
Conductor and Wires Installation	Cranes (heavy)		6	-	-	-	-
Conductor and Wires Installation	Forklifts (Heavy)		1	-	-	-	-
Conductor and Wires Installation	Off-Highway Trucks		1	-	-	-	-
Civil Crew (Clean Up)	Excavators (heavy)		1	-	-	-	-

Grading & Material Movement - Maximum Daily

Construction Phase	lbs per day	
	PM10	PM2.5
Staging Areas	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	0.21	0.02
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	0.41	0.04
Civil Crew (Road Maintenance, BMP's, Gates)	0.21	0.02
Structure Installation - Lattice - Guyed V Framing	-	-
Structure Installation - Lattice - Guyed V Setting	-	-
Structure Installation - Monopole and Lattice - 4-Legged	-	-
Structure Installation - Spotting	-	-
Conductor and Wires Installation	7.67	3.94
Civil Crew (Clean Up)	-	-

Total Paved Roadway Dust Emissions - Maximum Daily

	lbs per day	
	PM10	PM2.5
Staging Areas	0.06	0.01
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	0.03	0.01
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	0.03	0.01
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	0.05	0.01
Civil Crew (Road Maintenance, BMP's, Gates)	0.07	0.02
Structure Installation - Lattice - Guyed V Framing	0.06	0.02
Structure Installation - Lattice - Guyed V Setting	0.08	0.02
Structure Installation - Monopole and Lattice - 4-Legged	0.07	0.02
Structure Installation - Spotting	0.07	0.02
Conductor and Wires Installation	0.18	0.04
Civil Crew (Clean Up)	0.05	0.01

Total Unpaved Roadway Dust Emissions - Maximum Daily

	lbs per day	
	PM10	PM2.5
Staging Areas	36.87	3.69
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	16.80	1.68
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	20.08	2.01
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	32.01	3.20
Civil Crew (Road Maintenance, BMP's, Gates)	43.70	4.37
Structure Installation - Lattice - Guyed V Framing	41.97	4.20
Structure Installation - Lattice - Guyed V Setting	51.09	5.11
Structure Installation - Monopole and Lattice - 4-Legged	48.54	4.85
Structure Installation - Spotting	48.54	4.85
Conductor and Wires Installation	117.20	11.72
Civil Crew (Clean Up)	31.04	3.10

Roadway Dust Maximum Daily Emission Estimates

Paved Trips Roadway Dust

Unpaved Trips Roadway Dust

Phase	Primary Equipment Description	EMFAC Classification	Fuel Type	Identifier for EF	Paved Trips					Unpaved Trips				
					Trips Per Day	Trip Length (miles)	Daily VMT (miles/day)	lbs per day		Trips Per Day	Trip Length (miles)	Daily VMT (miles/day)	lbs per day	
								PM10	PM2.5				PM10	PM2.5
Staging Areas	1-Ton Truck, 4x4	HHDT	Diesel	HHDT Diesel	8	12	96	0.03	0.01	8	8	64	42.16	4.21
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	PICKUP 3/4 TON	LHDT2	Gas	LHDT2 Gas	3	6	17	0.00	0.00	3	4	11	7.30	0.73
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	PICKUP 3/4 TON	LHDT2	Gas	LHDT2 Gas	4	6	22	0.01	0.00	4	4	15	9.74	0.97
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	PICKUP 3/4 TON	LHDT2	Gas	LHDT2 Gas	8	6	44	0.01	0.00	8	4	30	19.48	1.95
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Semi	HHDT	Diesel	HHDT Diesel	1	12	16	0.00	0.00	1	8	11	7.03	0.70
Civil Crew (Road Maintenance, BMP's, Gates)	PICKUP 3/4 TON	LHDT2	Diesel	LHDT2 Diesel	4	6	22	0.01	0.00	4	4	15	9.74	0.97
Structure Installation - Lattice - Guyed V Framing	PICKUP 3/4 TON	LHDT2	Diesel	LHDT2 Diesel	2	12	24	0.01	0.00	2	8	16	10.54	1.05
Structure Installation - Lattice - Guyed V Framing	PICKUP 1 TON DIESEL	LHDT2	Diesel	LHDT2 Diesel	2	6	11	0.00	0.00	2	4	7	4.87	0.49
Structure Installation - Lattice - Guyed V Setting	PICKUP 3/4 TON	LHDT2	Gas	LHDT2 Gas	2	6	11	0.00	0.00	2	4	7	4.87	0.49
Structure Installation - Lattice - Guyed V Setting	PICKUP WINCH TRUCK	LHDT2	Diesel	LHDT2 Diesel	4	12	48	0.01	0.00	4	8	32	21.08	2.11
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 3/4 TON	LHDT2	Gas	LHDT2 Gas	6	6	33	0.01	0.00	6	4	22	14.61	1.46
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 1 TON DIESEL	HHDT	Diesel	HHDT Diesel	2	12	24	0.01	0.00	2	8	16	10.54	1.05
Structure Installation - Spotting	Semi	HHDT	Diesel	HHDT Diesel	2	12	24	0.01	0.00	2	8	16	10.54	1.05
Structure Installation - Spotting	PICKUP 1 TON DIESEL	LHDT2	Diesel	LHDT2 Diesel	2	6	11	0.00	0.00	2	4	7	4.87	0.49
Structure Installation - Spotting	PICKUP 3/4 TON	LHDT2	Diesel	LHDT2 Diesel	2	6	11	0.00	0.00	2	4	7	4.87	0.49
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	Diesel	HHDT Diesel	6	12	72	0.02	0.01	6	8	48	31.62	3.16
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	Diesel	HHDT Diesel	6	12	72	0.02	0.01	6	8	48	31.62	3.16
Conductor and Wires Installation	SEMI - ON/OFF ROAD 6X6	HHDT	Diesel	HHDT Diesel	4	12	48	0.01	0.00	4	8	32	21.08	2.11
Conductor and Wires Installation	PICKUP 1 TON DIESEL	LHDT2	Diesel	LHDT2 Diesel	4	6	22	0.01	0.00	4	4	15	9.74	0.97
Conductor and Wires Installation	PICKUP 3/4 TON DIESEL	LHDT2	Gas	LHDT2 Gas	32	6	177	0.05	0.01	32	4	118	77.92	7.79
Conductor and Wires Installation	PICKUP WINCH TRUCK	LHDT2	Diesel	LHDT2 Diesel	20	6	111	0.03	0.01	20	4	74	48.69	4.87
Civil Crew (Clean Up)	PICKUP 3/4 TON	LHDT2	Gas	LHDT2 Gas	4	6	22	0.01	0.00	4	4	15	9.74	0.97
Staging Areas	Worker	LHDT2	Gas	LHDT2 Gas	12	6	67	0.02	0.00	12	4	44	29.22	2.92
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Worker	LHDT2	Gas	LHDT2 Gas	8	6	44	0.01	0.00	8	4	30	19.48	1.95
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Worker	LHDT2	Gas	LHDT2 Gas	10	6	55	0.02	0.00	10	4	37	24.35	2.43
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Worker	LHDT2	Gas	LHDT2 Gas	14	6	78	0.02	0.01	14	4	52	34.09	3.41
Civil Crew (Road Maintenance, BMP's, Gates)	Worker	LHDT2	Gas	LHDT2 Gas	20	6	111	0.03	0.01	20	4	74	48.70	4.87
Structure Installation - Lattice - Guyed V Framing	Worker	LHDT2	Gas	LHDT2 Gas	6	6	33	0.01	0.00	6	4	22	14.61	1.46
Structure Installation - Lattice - Guyed V Setting	Worker	LHDT2	Gas	LHDT2 Gas	10	6	55	0.02	0.00	10	4	37	24.35	2.43
Structure Installation - Monopole and Lattice - 4-Legged	Worker	LHDT2	Gas	LHDT2 Gas	8	6	44	0.01	0.00	8	4	30	19.48	1.95
Structure Installation - Spotting	Worker	LHDT2	Gas	LHDT2 Gas	10	6	55	0.02	0.00	10	4	37	24.35	2.43
Conductor and Wires Installation	Worker	LHDT2	Gas	LHDT2 Gas	12	6	67	0.02	0.00	12	4	44	29.22	2.92
Civil Crew (Clean Up)	Worker	LHDT2	Gas	LHDT2 Gas	20	6	111	0.03	0.01	20	4	74	48.70	4.87
Staging Areas	Hauling	HHDT	Diesel	HHDT Diesel	2	12	24	0.01	0.00	2	8	16	10.54	1.05
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Hauling	HHDT	Diesel	HHDT Diesel	2	12	24	0.01	0.00	2	8	16	10.54	1.05
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Hauling	HHDT	Diesel	HHDT Diesel	2	12	24	0.01	0.00	2	8	16	10.54	1.05
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Hauling	HHDT	Diesel	HHDT Diesel	7	12	88	0.03	0.01	7	8	59	38.68	3.87
Civil Crew (Road Maintenance, BMP's, Gates)	Hauling	HHDT	Diesel	HHDT Diesel	12	12	144	0.04	0.01	12	8	96	63.24	6.32
Structure Installation - Lattice - Guyed V Framing	Hauling	HHDT	Diesel	HHDT Diesel	12	12	144	0.04	0.01	12	8	96	63.24	6.32
Structure Installation - Lattice - Guyed V Setting	Hauling	HHDT	Diesel	HHDT Diesel	12	12	144	0.04	0.01	12	8	96	63.24	6.32
Structure Installation - Monopole and Lattice - 4-Legged	Hauling	HHDT	Diesel	HHDT Diesel	12	12	144	0.04	0.01	12	8	96	63.24	6.32
Structure Installation - Spotting	Hauling	HHDT	Diesel	HHDT Diesel	12	12	144	0.04	0.01	12	8	96	63.24	6.32
Conductor and Wires Installation	Hauling	HHDT	Diesel	HHDT Diesel	2	12	24	0.01	0.00	2	8	16	10.54	1.05
Civil Crew (Clean Up)	Hauling	HHDT	Diesel	HHDT Diesel	2	12	24	0.01	0.00	2	8	16	10.54	1.05

Note: Emissions assume a 55% reduction in PM10, as watering twice a day for industrial unpaved roads is 55%. Additional measures that will further reduce PM10 include limiting the max speed to 25 mph (44% reduction) and applying chemical dust suppressants annually to unpaved parking areas (84% reduction).

Mobile Combustion Maximum Daily Emissions - Paved Roadways

		EMFAC Emission Factors (g/mile)																	Daily Emissions (lb/day)											
Phase	Primary Equipment Description	EMFAC Classification	Fuel Type	Speed Bin (mph)	Trips Per Day	Trip Length (mi)	Daily VMT (miles/day)	ROG Exhaust	NOX Exhaust	CO Exhaust	SO2 Exhaust	PM10 Exhaust	PM10_P MTW	PM10_PMB W	PM2.5 Exhaust	PM2.5_P MTW	PM2.5_P MBW	ROG Exhaust	NOX Exhaust	CO Exhaust	SO2 Exhaust	PM10 Exhaust	PM10_P MTW	PM10_PMB W	PM10 TOTAL	PM2.5 Exhaust	PM2.5_P MTW	PM2.5_PMB W	PM2.5 TOTAL	
Staging Areas	1-Ton Truck, 4x4	HHDT	Diesel	Aggregate	8	12	96	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.01	0.12	0.02	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.01	0.01	
	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	LHD72	Gas	Aggregate	3	6	17	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.01	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	LHD72	Gas	Aggregate	4	6	22	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.01	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	PICKUP 3/4 TON	LHD72	Gas	Aggregate	8	6	44	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.01	0.16	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
	Semi	HHDT	Diesel	Aggregate	1	12	16	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Civil Crew (Road Maintenance, BMP's, Gates)	PICKUP 3/4 TON	LHD72	Diesel	Aggregate	4	6	22	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Structure Installation - Lattice - Guyed V Framing	Structure Installation - Lattice - Guyed V Framing	PICKUP 3/4 TON	LHD72	Diesel	Aggregate	2	12	24	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
	Structure Installation - Lattice - Guyed V Framing	PICKUP 1 TON DIESEL	LHD72	Diesel	Aggregate	2	6	11	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Structure Installation - Lattice - Guyed V Setting	PICKUP 3/4 TON	LHD72	Gas	Aggregate	2	6	11	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	Structure Installation - Lattice - Guyed V Setting	PICKUP WINCH TRUCK	LHD72	Diesel	Aggregate	4	12	48	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.01	0.06	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
	Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 3/4 TON	LHD72	Gas	Aggregate	6	6	33	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.01	0.12	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
	Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 1 TON DIESEL	HHDT	Diesel	Aggregate	2	12	24	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Structure Installation - Spotting	Structure Installation - Spotting	Semi	HHDT	Diesel	Aggregate	2	12	24	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
	Structure Installation - Spotting	PICKUP 1 TON DIESEL	LHD72	Diesel	Aggregate	2	6	11	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Structure Installation - Spotting	PICKUP 3/4 TON	LHD72	Diesel	Aggregate	2	6	11	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Conductor and Wires Installation	Conductor and Wires Installation	SEMI - ON ROAD	HHDT	Diesel	Aggregate	6	12	72	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.01	0.09	0.02	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.01	0.01
	Conductor and Wires Installation	SEMI - ON/OFF ROAD 6X6	HHDT	Diesel	Aggregate	4	12	48	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.01	0.06	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
	Conductor and Wires Installation	PICKUP 1 TON DIESEL	LHD72	Diesel	Aggregate	4	6	22	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Conductor and Wires Installation	Conductor and Wires Installation	PICKUP 3/4 TON DIESEL	LHD72	Gas	Aggregate	32	6	177	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.01	0.05	0.66	0.00	0.00	0.00	0.04	0.04	0.00	0.00	0.01	0.01
	Conductor and Wires Installation	PICKUP WINCH TRUCK	LHD72	Diesel	Aggregate	20	6	111	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.01	0.13	0.03	0.00	0.00	0.00	0.02	0.03	0.00	0.00	0.01	0.01
	Civil Crew (Clean Up)	PICKUP 3/4 TON	LHD72	Gas	Aggregate	4	6	22	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.01	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Staging Areas	Worker	LHD72	Gas	Aggregate	12	6	67	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.02	0.25	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.01	
	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Worker	LHD72	Gas	Aggregate	8	6	44	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.01	0.16	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Worker	LHD72	Gas	Aggregate	10	6	55	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.02	0.20	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Worker	LHD72	Gas	Aggregate	14	6	78	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.02	0.29	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.01	0.01
	Civil Crew (Road Maintenance, BMP's, Gates)	Worker	LHD72	Gas	Aggregate	20	6	111	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.03	0.41	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.01	0.01
	Structure Installation - Lattice - Guyed V Framing	Worker	LHD72	Gas	Aggregate	6	6	33	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.01	0.12	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	Structure Installation - Lattice - Guyed V Setting	Worker	LHD72	Gas	Aggregate	10	6	55	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.02	0.20	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
	Structure Installation - Monopole and Lattice - 4-Legged	Worker	LHD72	Gas	Aggregate	8	6	44	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.01	0.16	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
	Structure Installation - Spotting	Worker	LHD72	Gas	Aggregate	10	6	55	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.02	0.20	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Conductor and Wires Installation	Conductor and Wires Installation	Worker	LHD72	Gas	Aggregate	12	6	67	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.02	0.25	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.01
	Civil Crew (Clean Up)	Worker	LHD72	Gas	Aggregate	20	6	111	0.01	0.14	1.68	0.00	0.00	0.01	0.09	0.00	0.00	0.03	0.00	0.03	0.41	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.01	0.01
	Staging Areas	Hauling	HHDT	Diesel	Aggregate	2	12	24	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Hauling	HHDT	Diesel	Aggregate	2	12	24	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Hauling	Diesel	Aggregate	2	12	24	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Hauling	Diesel	Aggregate	2	12	24	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	Civil Crew (Road Maintenance, BMP's, Gates)	Hauling	HHDT	Diesel	Aggregate	7	12	88	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.01	0.11	0.02	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.01	0.01
	Structure Installation - Lattice - Guyed V Framing	Hauling	HHDT	Diesel	Aggregate	12	12	144	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.02	0.17	0.04	0.00	0.00	0.00	0.03	0.04	0.00	0.00	0.01	0.01
	Structure Installation - Lattice - Guyed V Setting	Hauling	HHDT	Diesel	Aggregate	12	12	144	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.02	0.17	0.04	0.00	0.00	0.00	0.03	0.04	0.00	0.00	0.01	0.01
Structure Installation - Monopole and Lattice - 4-Legged	Structure Installation - Monopole and Lattice - 4-Legged	Hauling	HHDT	Diesel	Aggregate	12	12	144	0.05	0.55	0.12	0.00	0.01	0.01	0.09	0.01	0.00	0.03	0.02	0.17</										

Mobile Combustion Maximum Daily Emissions - Unpaved Roadways

Work Days										EMFAC Emission Factors (g/mile)										Daily Emissions (lb/day)											
Phase	Primary Equipment Description	EMFAC Classification	2029	2030	Fuel Type	Speed Bin	Trips Per Day	Trip Length (miles)	Daily VMT (miles/day)	ROG Exhaust	NOX Exhaust	CO Exhaust	SO2 Exhaust	PM10 Exhaust	PM10_PMT W	PM10_PMBW	PM2.5 Exhaust	PM2.5_PMT TW	PM2.5_P MBW	ROG Exhaust	NOX Exhaust	CO Exhaust	SO2 Exhaust	PM10 Exhaust	PM10_P MTW	PM10_PMB W	PM10 TOTAL	PM2.5 Exhaust	PM2.5_P MTW	PM2.5_P BW	PM2.5 TOTAL
Staging Areas	1-Ton Truck, 4x4	HHDT	100	-	Diesel	15	8	8	64	0.03	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.00	0.22	0.05	0.00	0.00	-	0.02	0.02	0.00	-	0.01	0.01
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	PICKUP 3/4 TON	LHD72	235	131	Gas	25	3	4	11	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.00	0.03	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	PICKUP 3/4 TON	LHD72	235	131	Gas	25	4	4	15	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.00	0.04	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	PICKUP 3/4 TON	LHD72	210	78	Gas	25	8	4	30	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.01	0.08	0.00	0.00	-	0.01	0.01	0.00	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Semi	HHDT	210	78	Diesel	15	1	8	11	0.03	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.00	0.04	0.01	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	PICKUP 3/4 TON	LHD72	253	262	Diesel	25	4	4	15	0.13	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	0.00	0.02	0.01	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Lattice - Guyed V Framing	PICKUP 3/4 TON	LHD72	183	104	Diesel	25	2	8	16	0.13	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	0.00	0.02	0.01	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Lattice - Guyed V Framing	PICKUP 1 TON DIESEL	LHD72	183	104	Diesel	25	2	4	7	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.00	0.02	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	PICKUP 3/4 TON	LHD72	183	104	Gas	25	2	4	7	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.00	0.02	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	PICKUP WINCH TRUCK	LHD72	183	104	Diesel	25	4	8	32	0.13	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	0.01	0.04	0.02	0.00	0.00	-	0.01	0.01	0.00	-	0.00	0.00
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 3/4 TON	LHD72	183	104	Gas	25	6	4	22	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.01	0.06	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 1 TON DIESEL	HHDT	183	104	Diesel	15	2	8	16	0.13	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	0.00	0.02	0.01	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Spotting	Semi	HHDT	183	104	Diesel	15	2	8	16	0.13	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	0.00	0.02	0.01	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Spotting	PICKUP 1 TON DIESEL	LHD72	183	104	Diesel	25	2	4	7	0.13	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	0.00	0.01	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Spotting	PICKUP 3/4 TON	LHD72	183	104	Diesel	25	2	4	7	0.13	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	0.00	0.01	0.00	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	52	235	Diesel	15	6	8	48	0.03	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.00	0.17	0.03	0.00	0.00	-	0.01	0.02	0.00	-	0.01	0.01
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	52	235	Diesel	15	6	8	48	0.03	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.00	0.17	0.03	0.00	0.00	-	0.01	0.02	0.00	-	0.01	0.01
Conductor and Wires Installation	SEMI - ON/OFF ROAD 6X6	HHDT	52	235	Diesel	15	4	8	32	0.03	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.00	0.11	0.02	0.00	0.00	-	0.01	0.01	0.00	-	0.00	0.00
Conductor and Wires Installation	PICKUP 1 TON DIESEL	LHD72	52	235	Diesel	25	4	4	15	0.13	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	0.00	0.02	0.01	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Conductor and Wires Installation	PICKUP 3/4 TON DIESEL	LHD72	52	235	Gas	25	32	4	118	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.01	0.03	0.34	0.00	0.00	-	0.02	0.02	0.00	-	0.01	0.01
Conductor and Wires Installation	PICKUP WINCH TRUCK	LHD72	52	235	Diesel	25	20	4	74	0.13	0.60	0.30	0.00	0.02	-	0.09	0.02	-	0.03	0.02	0.10	0.05	0.00	0.00	-	0.01	0.02	0.00	-	0.01	0.01
Civil Crew (Clean Up)	PICKUP 3/4 TON	LHD72	-	211	Gas	25	4	4	15	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.00	0.04	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Staging Areas	Worker	LHD72	100	-	Gas	25	12	4	44	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.01	0.13	0.00	0.00	-	0.01	0.01	0.00	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Worker	LHD72	235	131	Gas	25	8	4	30	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.01	0.08	0.00	0.00	-	0.01	0.01	0.00	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Worker	LHD72	235	131	Gas	25	10	4	37	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.01	0.11	0.00	0.00	-	0.01	0.01	0.00	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Worker	LHD72	210	78	Gas	25	14	4	52	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.01	0.15	0.00	0.00	-	0.01	0.01	0.00	-	0.00	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	Worker	LHD72	253	262	Gas	25	20	4	74	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.02	0.21	0.00	0.00	-	0.01	0.01	0.00	-	0.01	0.01
Structure Installation - Lattice - Guyed V Framing	Worker	LHD72	183	104	Gas	25	6	4	22	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.01	0.06	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	Worker	LHD72	183	104	Gas	25	10	4	37	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.01	0.11	0.00	0.00	-	0.01	0.01	0.00	-	0.00	0.00
Structure Installation - Monopole and Lattice - 4-Legged	Worker	LHD72	183	104	Gas	25	8	4	30	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.01	0.08	0.00	0.00	-	0.01	0.01	0.00	-	0.00	0.00
Structure Installation - Spotting	Worker	LHD72	183	104	Gas	25	10	4	37	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.01	0.11	0.00	0.00	-	0.01	0.01	0.00	-	0.00	0.00
Conductor and Wires Installation	Worker	LHD72	52	235	Gas	25	12	4	44	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.01	0.13	0.00	0.00	-	0.01	0.01	0.00	-	0.00	0.00
Civil Crew (Clean Up)	Worker	LHD72	-	211	Gas	25	20	4	74	0.02	0.13	1.30	0.00	0.00	-	0.09	0.00	-	0.03	0.00	0.02	0.21	0.00	0.00	-	0.01	0.01	0.00	-	0.01	0.01
Staging Areas	Hauling	HHDT	100	-	Diesel	15	2	8	16	0.03	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.00	0.06	0.01	0.00	0.00	-	0.00	0.01	0.00	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Hauling	HHDT	235	131	Diesel	15	2	8	16	0.03	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.00	0.06	0.01	0.00	0.00	-	0.00	0.01	0.00	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Hauling	HHDT	235	131	Diesel	15	2	8	16	0.03	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.00	0.06	0.01	0.00	0.00	-	0.00	0.01	0.00	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Hauling	HHDT	210	78	Diesel	15	2	8	16	0.03	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.00	0.06	0.01	0.00	0.00	-	0.02	0.02	0.00	-	0.01	0.01
Civil Crew (Road Maintenance, BMP's, Gates)	Hauling	HHDT	253	262	Diesel	15	7	8	59	0.03	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.00	0.20	0.04	0.00	0.00	-	0.02	0.02	0.00	-	0.01	0.01
Structure Installation - Lattice - Guyed V Framing	Hauling	HHDT	183	104	Diesel	15	12	8	96	0.03	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.01	0.33	0.07	0.00	0.00	-	0.03	0.03	0.00	-	0.01	0.01
Structure Installation - Lattice - Guyed V Setting	Hauling	HHDT	183	104	Diesel	15	12	8	96	0.03	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.01	0.33	0.07	0.00	0.00	-	0.03	0.03	0.00	-	0.01	0.01
Structure Installation - Monopole and Lattice - 4-Legged	Hauling	HHDT	183	104	Diesel	15	12	8	96	0.03	1.57	0.33	0.01	0.00	-	0.14	0.00	-	0.05	0.01	0.33	0.07	0.00	0.00	-	0.03	0.03	0.00	-	0.01	0.01

Notes:
1. It was assumed that 40% of total trips would be on unpaved roads.
2. Hauling trips during the "Civil Crew (Road Work, Foundations, Ducts)" were based on 20,000 CY of material export and 16 CY per haul truck.
3. EMFAC 2021 emissions factors for 2029 were used for each year of construction (2029, 2030, and 2031). 25 mph speed was assumed for worker trips, while 15 mph speed assumed for hauling trips. Fuel type was provided to Rincon.
4. Emissions assume a 55% reduction in PM10, as watering twice a day for industrial unpaved roads is 55%. Additional measures that will further reduce PM10 include limiting the max speed to 25 mph (44% reduction) and applying chemical dust suppressants annually to unpaved parking areas (84% reduction).

Helicopter Emissions - Maximum Daily

Phase	Type	ROG	NO _x	lbs per day				PM10	PM2.5
				CO	SO ₂				
Staging Areas	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-
Staging Areas	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	0.78	62.94	12.12	3.90	4.32	-	-	-
Structure Installation - Lattice - Guyed V Framing	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-
Structure Installation - Spotting	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-
Structure Installation - Spotting	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-
Conductor and Wires Installation	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-
Conductor and Wires Installation	Bell 407/MD530F (Light Duty)	1.30	17.50	20.70	1.40	1.00	-	-	-
Civil Crew (Clean Up)	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-	-	-
Civil Crew (Clean Up)	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-	-	-

Summary of Project Construction Total Annual Emissions

Construction Phase	Source	2029 Emissions (TPY)						2030 Emissions (TPY)					
		ROG	NOx	CO	SO2	PM10	PM2.5	ROG	NOx	CO	SO2	PM10	PM2.5
Staging Areas	Off-Road Equipment	0.04	0.32	0.49	0.00	0.00	0.00	-	-	-	-	-	-
Staging Areas	Dust from Material Movement	-	-	-	-	-	-	-	-	-	-	-	-
Staging Areas	On-Road Trip Exhaust (Paved)	0.00	0.01	0.01	0.00	0.00	0.00	-	-	-	-	-	-
Staging Areas	On-Road Trip Exhaust (Unpaved)	0.00	0.01	0.01	0.00	0.00	0.00	-	-	-	-	-	-
Staging Areas	On-Road Roadway Dust (Paved)	-	-	-	-	0.00	0.00	-	-	-	-	-	-
Staging Areas	On-Road Roadway Dust (Unpaved)	-	-	-	-	4.10	0.41	-	-	-	-	-	-
Staging Areas	Helicopter Use	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Off-Road Equipment	0.33	2.63	2.89	0.01	0.04	0.04	0.18	1.47	1.61	0.00	0.02	0.02
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Dust from Material Movement	-	-	-	-	0.05	0.01	-	-	-	-	0.03	0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Trip Exhaust (Paved)	0.00	0.01	0.05	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Trip Exhaust (Unpaved)	0.00	0.01	0.03	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Roadway Dust (Paved)	-	-	-	-	0.01	0.00	-	-	-	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Roadway Dust (Unpaved)	-	-	-	-	7.53	0.75	-	-	-	-	4.20	0.42
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Helicopter Use	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Off-Road Equipment	0.17	1.25	1.61	0.00	0.02	0.02	0.10	0.69	0.90	0.00	0.01	0.01
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Dust from Material Movement	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Trip Exhaust (Paved)	0.00	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Trip Exhaust (Unpaved)	0.00	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Roadway Dust (Paved)	-	-	-	-	0.00	0.00	-	-	-	-	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Roadway Dust (Unpaved)	-	-	-	-	5.24	0.52	-	-	-	-	2.92	0.29
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Helicopter Use	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Off-Road Equipment	0.72	5.07	7.97	0.03	0.08	0.07	0.27	1.88	2.96	0.01	0.03	0.03
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Dust from Material Movement	-	-	-	-	0.13	0.01	-	-	-	-	0.05	0.01
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Trip Exhaust (Paved)	0.00	0.02	0.14	0.00	0.01	0.00	0.00	0.01	0.05	0.00	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Trip Exhaust (Unpaved)	0.00	0.02	0.08	0.00	0.00	0.00	0.00	0.01	0.03	0.00	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Roadway Dust (Paved)	-	-	-	-	0.01	0.00	-	-	-	-	0.01	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Roadway Dust (Unpaved)	-	-	-	-	20.19	2.02	-	-	-	-	7.50	0.75
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Helicopter Use	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Off-Road Equipment	0.24	1.30	1.72	0.01	0.02	0.02	0.25	1.34	1.78	0.01	0.02	0.02
Civil Crew (Road Maintenance, BMP's, Gates)	Dust from Material Movement	-	-	-	-	0.03	0.00	-	-	-	-	0.03	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Trip Exhaust (Paved)	0.00	0.02	0.06	0.00	0.01	0.00	0.00	0.02	0.06	0.00	0.01	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Trip Exhaust (Unpaved)	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Roadway Dust (Paved)	-	-	-	-	0.01	0.00	-	-	-	-	0.01	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Roadway Dust (Unpaved)	-	-	-	-	12.29	1.23	-	-	-	-	12.72	1.27
Civil Crew (Road Maintenance, BMP's, Gates)	Helicopter Use	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	Off-Road Equipment	0.02	0.13	0.41	0.00	0.00	0.00	0.01	0.08	0.23	0.00	0.00	0.00
Structure Installation - Lattice - Guyed V Framing	Dust from Material Movement	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	On-Road Trip Exhaust (Paved)	0.00	0.03	0.07	0.00	0.01	0.00	0.00	0.02	0.04	0.00	0.01	0.00
Structure Installation - Lattice - Guyed V Framing	On-Road Trip Exhaust (Unpaved)	0.00	0.04	0.04	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00
Structure Installation - Lattice - Guyed V Framing	On-Road Roadway Dust (Paved)	-	-	-	-	0.01	0.00	-	-	-	-	0.01	0.00
Structure Installation - Lattice - Guyed V Framing	On-Road Roadway Dust (Unpaved)	-	-	-	-	16.77	1.68	-	-	-	-	9.53	0.95
Structure Installation - Lattice - Guyed V Framing	Helicopter Use	0.07	5.76	1.11	0.36	0.40	-	0.04	3.27	0.63	0.20	0.22	-
Structure Installation - Lattice - Guyed V Setting	Off-Road Equipment	0.24	1.83	2.39	0.01	0.03	0.03	0.14	1.04	1.36	0.00	0.02	0.02
Structure Installation - Lattice - Guyed V Setting	Dust from Material Movement	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	On-Road Trip Exhaust (Paved)	0.00	0.04	0.10	0.00	0.01	0.01	0.00	0.03	0.06	0.00	0.01	0.00
Structure Installation - Lattice - Guyed V Setting	On-Road Trip Exhaust (Unpaved)	0.00	0.05	0.06	0.00	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	On-Road Roadway Dust (Paved)	-	-	-	-	0.02	0.00	-	-	-	-	0.01	0.00
Structure Installation - Lattice - Guyed V Setting	On-Road Roadway Dust (Unpaved)	-	-	-	-	24.20	2.42	-	-	-	-	13.75	1.37
Structure Installation - Lattice - Guyed V Setting	Helicopter Use	-	-	-	-	-	-	-	-	-	-	-	-

Construction Phase	Source	2029 Emissions (TPY)						2030 Emissions (TPY)					
		ROG	NOx	CO	SO2	PM10	PM2.5	ROG	NOx	CO	SO2	PM10	PM2.5
Structure Installation - Monopole and Lattice - 4-Legged	Off-Road Equipment	0.06	0.47	0.59	0.00	0.01	0.01	0.03	0.27	0.33	0.00	0.00	0.00
Structure Installation - Monopole and Lattice - 4-Legged	Dust from Material Movement	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Trip Exhaust (Paved)	0.00	0.03	0.08	0.00	0.01	0.00	0.00	0.02	0.05	0.00	0.01	0.00
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Trip Exhaust (Unpaved)	0.00	0.04	0.05	0.00	0.00	0.00	0.00	0.02	0.03	0.00	0.00	0.00
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Roadway Dust (Paved)	-	-	-	-	0.01	0.00	-	-	-	-	0.01	0.00
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Roadway Dust (Unpaved)	-	-	-	-	18.04	1.80	-	-	-	-	10.25	1.02
Structure Installation - Monopole and Lattice - 4-Legged	Helicopter Use	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Spotting	Off-Road Equipment	0.03	0.29	0.28	0.00	0.00	0.00	0.02	0.17	0.16	0.00	0.00	0.00
Structure Installation - Spotting	Dust from Material Movement	-	-	-	-	-	-	-	-	-	-	-	-
Structure Installation - Spotting	On-Road Trip Exhaust (Paved)	0.00	0.03	0.02	0.00	0.01	0.00	0.00	0.02	0.01	0.00	0.00	0.00
Structure Installation - Spotting	On-Road Trip Exhaust (Unpaved)	0.00	0.04	0.02	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.00
Structure Installation - Spotting	On-Road Roadway Dust (Paved)	-	-	-	-	0.01	0.00	-	-	-	-	0.00	0.00
Structure Installation - Spotting	On-Road Roadway Dust (Unpaved)	-	-	-	-	11.80	1.18	-	-	-	-	6.71	0.67
Structure Installation - Spotting	Helicopter Use	-	-	-	-	-	-	-	-	-	-	-	-
Conductor and Wires Installation	Off-Road Equipment	0.44	3.31	3.58	0.01	0.05	0.05	1.97	14.95	16.20	0.05	0.24	0.22
Conductor and Wires Installation	Dust from Material Movement	-	-	-	-	0.40	0.20	-	-	-	-	1.80	0.93
Conductor and Wires Installation	On-Road Trip Exhaust (Paved)	0.00	0.03	0.06	0.00	0.01	0.00	0.01	0.11	0.25	0.00	0.03	0.01
Conductor and Wires Installation	On-Road Trip Exhaust (Unpaved)	0.00	0.03	0.03	0.00	0.00	0.00	0.01	0.15	0.16	0.00	0.01	0.00
Conductor and Wires Installation	On-Road Roadway Dust (Paved)	-	-	-	-	0.01	0.00	-	-	-	-	0.04	0.01
Conductor and Wires Installation	On-Road Roadway Dust (Unpaved)	-	-	-	-	13.78	1.38	-	-	-	-	62.25	6.22
Conductor and Wires Installation	Helicopter Use	0.03	0.46	0.54	0.04	0.03	-	0.15	2.06	2.43	0.16	0.12	-
Civil Crew (Clean Up)	Off-Road Equipment	-	-	-	-	-	-	0.03	0.17	0.33	0.00	0.00	0.00
Civil Crew (Clean Up)	Dust from Material Movement	-	-	-	-	-	-	-	-	-	-	-	-
Civil Crew (Clean Up)	On-Road Trip Exhaust (Paved)	-	-	-	-	-	-	0.00	0.01	0.05	0.00	0.00	0.00
Civil Crew (Clean Up)	On-Road Trip Exhaust (Unpaved)	-	-	-	-	-	-	0.00	0.01	0.03	0.00	0.00	0.00
Civil Crew (Clean Up)	On-Road Roadway Dust (Paved)	-	-	-	-	-	-	-	-	-	-	0.00	0.00
Civil Crew (Clean Up)	On-Road Roadway Dust (Unpaved)	-	-	-	-	-	-	-	-	-	-	7.28	0.73
Civil Crew (Clean Up)	Helicopter Use	-	-	-	-	-	-	-	-	-	-	-	-

Construction Phase	Source	ROG	NOx	2029 Emissions (TPY)				2030 Emissions (TPY)					
				CO	SO2	PM10	PM2.5	ROG	NOx	CO	SO2	PM10	PM2.5
Overall Project Emissions (California & Arizona)													
Construction Phase	Source	ROG	NOx	2029 Emissions (TPY)				2030 Emissions (TPY)					
				CO	SO2	PM10	PM2.5	ROG	NOx	CO	SO2	PM10	PM2.5
Staging Areas	Total	0.04	0.34	0.51	0.00	4.11	0.41	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Total	0.33	2.65	2.97	0.01	7.63	0.80	0	1	2	0	4	0
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Total	0.17	1.26	1.67	0.00	5.27	0.55	0	1	1	0	3	0
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Total	0.72	5.11	8.19	0.03	20.43	2.11	0	2	3	0	8	1
Civil Crew (Road Maintenance, BMP's, Gates)	Total	0.25	1.35	1.81	0.01	12.35	1.25	0	1	2	0	13	1
Structure Installation - Lattice - Guyed V Framing	Total	0.10	5.96	1.63	0.36	17.19	1.69	0	3	1	0	10	1
Structure Installation - Lattice - Guyed V Setting	Total	0.25	1.93	2.55	0.01	24.26	2.46	0	1	1	0	14	1
Structure Installation - Monopole and Lattice - 4-Legged	Total	0.06	0.54	0.72	0.00	18.07	1.82	0	0	0	0	10	1
Structure Installation - Spotting	Total	0.04	0.36	0.32	0.00	11.82	1.19	0	0	0	0	7	1
Conductor and Wires Installation	Total	0.47	3.82	4.21	0.05	14.27	1.64	2	17	19	0	65	7
Civil Crew (Clean Up)	Total	-	-	-	-	-	-	0	0	0	0	7	1

Project Emissions in Arizona		2029 Emissions (TPY)						2030 Emissions (TPY)					
Construction Phase	Source	ROG	NOx	CO	SO2	PM10	PM2.5	ROG	NOx	CO	SO2	PM10	PM2.5
Staging Areas	Total	0	0	0	0	0	0	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Total	0	0	0	0	1	0	0	0	0	0	0	0
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Total	0	0	0	0	0	0	0	0	0	0	0	0
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Total	0	0	1	0	1	0	0	0	0	0	1	0
Civil Crew (Road Maintenance, BMP's, Gates)	Total	0	0	0	0	1	0	0	0	0	0	1	0
Structure Installation - Lattice - Guyed V Framing	Total	0	0	0	0	1	0	0	0	0	0	1	0
Structure Installation - Lattice - Guyed V Setting	Total	0	0	0	0	2	0	0	0	0	0	1	0
Structure Installation - Monopole and Lattice - 4-Legged	Total	0	0	0	0	1	0	0	0	0	0	1	0
Structure Installation - Spotting	Total	0	0	0	0	1	0	0	0	0	0	0	0
Conductor and Wires Installation	Total	0	0	0	0	1	0	0	1	1	0	5	1
Civil Crew (Clean Up)	Total	-	-	-	-	-	-	0	0	0	0	1	0
Total		0	2	2	0	10	1	0	2	2	0	10	1
<i>De Minimis Conformity Thresholds</i>		<i>50</i>	<i>50</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>50</i>	<i>50</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>
Exceed?		No	No	No	No	No	No	No	No	No	No	No	No

Method Used to Estimate State Specific Construction Emissions

The project proposes to develop a 80-85 mile transmission line from California to Arizona. The Arizona portion of Route 1 was measured using Google Earth; assuming the entire length of the project is 87 miles, this would result in 81 miles (93 percent) of construction occurring in California and 6 miles (7 percent) of transmission line construction occurring in Arizona.

Sources: <https://www.epa.gov/general-conformity/de-minimis-tables>; Thresholds used for ozone and PM10 under the Arizona portion reflect that Yuma County, Arizona is currently in nonattainment for ozone and PM10.

Percent of total project Miles		
California miles	93%	81
Arizona miles	7%	6
Overall Project miles	100%	87

Summary of Project Construction Maximum Daily Emissions

Construction Phase	Source	lbs per day					
		ROG	NOx	CO	SO2	PM10	PM2.5
Staging Areas	Off-Road Equipment	0.85	6.43	9.71	0.02	0.07	0.07
Staging Areas	Dust from Material Movement	-	-	-	-	-	-
Staging Areas	On-Road Trip Exhaust (Paved)	0.01	0.17	0.28	0.00	0.05	0.02
Staging Areas	On-Road Trip Exhaust (Unpaved)	0.01	0.29	0.18	0.00	0.02	0.01
Staging Areas	On-Road Roadway Dust (Paved)	-	-	-	-	0.06	0.01
Staging Areas	On-Road Roadway Dust (Unpaved)	-	-	-	-	36.87	3.69
Staging Areas	Helicopter Use	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Off-Road Equipment	1.41	11.20	12.30	0.03	0.18	0.17
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Dust from Material Movement	-	-	-	-	0.21	0.02
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Trip Exhaust (Paved)	0.00	0.05	0.23	0.00	0.02	0.01
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Trip Exhaust (Unpaved)	0.00	0.07	0.13	0.00	0.01	0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Roadway Dust (Paved)	-	-	-	-	0.03	0.01
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Roadway Dust (Unpaved)	-	-	-	-	16.80	1.68
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Helicopter Use	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Off-Road Equipment	1.46	10.60	13.73	0.04	0.17	0.16
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Dust from Material Movement	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Trip Exhaust (Paved)	0.00	0.05	0.29	0.00	0.02	0.01
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Trip Exhaust (Unpaved)	0.00	0.07	0.16	0.00	0.01	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Roadway Dust (Paved)	-	-	-	-	0.03	0.01
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Roadway Dust (Unpaved)	-	-	-	-	20.08	2.01
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Helicopter Use	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Off-Road Equipment	2.27	16.09	25.30	0.09	0.25	0.23
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Dust from Material Movement	-	-	-	-	0.41	0.04
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Trip Exhaust (Paved)	0.01	0.09	0.46	0.00	0.04	0.01
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Trip Exhaust (Unpaved)	0.01	0.12	0.25	0.00	0.01	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Roadway Dust (Paved)	-	-	-	-	0.05	0.01
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Roadway Dust (Unpaved)	-	-	-	-	32.01	3.20
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Helicopter Use	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Off-Road Equipment	1.93	10.26	13.60	0.06	0.14	0.13
Civil Crew (Road Maintenance, BMP's, Gates)	Dust from Material Movement	-	-	-	-	0.21	0.02
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Trip Exhaust (Paved)	0.02	0.17	0.44	0.00	0.05	0.02
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Trip Exhaust (Unpaved)	0.01	0.24	0.26	0.00	0.02	0.01
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Roadway Dust (Paved)	-	-	-	-	0.07	0.02
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Roadway Dust (Unpaved)	-	-	-	-	43.70	4.37
Civil Crew (Road Maintenance, BMP's, Gates)	Helicopter Use	-	-	-	-	-	-

Construction Phase	Source	ROG	NO _x	lbs per day			
				CO	SO ₂	PM ₁₀	PM _{2.5}
Structure Installation - Lattice - Guyed V Framing	Off-Road Equipment	0.06	0.36	1.12	0.00	0.01	0.01
Structure Installation - Lattice - Guyed V Framing	Dust from Material Movement	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	On-Road Trip Exhaust (Paved)	0.02	0.22	0.21	0.00	0.05	0.02
Structure Installation - Lattice - Guyed V Framing	On-Road Trip Exhaust (Unpaved)	0.01	0.36	0.16	0.00	0.02	0.01
Structure Installation - Lattice - Guyed V Framing	On-Road Roadway Dust (Paved)	-	-	-	-	0.06	0.02
Structure Installation - Lattice - Guyed V Framing	On-Road Roadway Dust (Unpaved)	-	-	-	-	41.97	4.20
Structure Installation - Lattice - Guyed V Framing	Helicopter Use	0.78	62.94	12.12	3.90	4.32	-
Structure Installation - Lattice - Guyed V Setting	Off-Road Equipment	0.67	5.00	6.53	0.02	0.08	0.07
Structure Installation - Lattice - Guyed V Setting	Dust from Material Movement	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	On-Road Trip Exhaust (Paved)	0.02	0.25	0.29	0.00	0.06	0.02
Structure Installation - Lattice - Guyed V Setting	On-Road Trip Exhaust (Unpaved)	0.02	0.39	0.22	0.00	0.02	0.01
Structure Installation - Lattice - Guyed V Setting	On-Road Roadway Dust (Paved)	-	-	-	-	0.08	0.02
Structure Installation - Lattice - Guyed V Setting	On-Road Roadway Dust (Unpaved)	-	-	-	-	51.09	5.11
Structure Installation - Lattice - Guyed V Setting	Helicopter Use	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	Off-Road Equipment	0.65	5.14	6.41	0.02	0.08	0.08
Structure Installation - Monopole and Lattice - 4-Legged	Dust from Material Movement	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Trip Exhaust (Paved)	0.02	0.23	0.33	0.00	0.06	0.02
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Trip Exhaust (Unpaved)	0.01	0.37	0.23	0.00	0.02	0.01
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Roadway Dust (Paved)	-	-	-	-	0.07	0.02
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Roadway Dust (Unpaved)	-	-	-	-	48.54	4.85
Structure Installation - Monopole and Lattice - 4-Legged	Helicopter Use	-	-	-	-	-	-
Structure Installation - Spotting	Off-Road Equipment	0.37	3.18	3.07	0.01	0.05	0.05
Structure Installation - Spotting	Dust from Material Movement	-	-	-	-	-	-
Structure Installation - Spotting	On-Road Trip Exhaust (Paved)	0.02	0.25	0.25	0.00	0.06	0.02
Structure Installation - Spotting	On-Road Trip Exhaust (Unpaved)	0.02	0.38	0.20	0.00	0.02	0.01
Structure Installation - Spotting	On-Road Roadway Dust (Paved)	-	-	-	-	0.07	0.02
Structure Installation - Spotting	On-Road Roadway Dust (Unpaved)	-	-	-	-	48.54	4.85
Structure Installation - Spotting	Helicopter Use	-	-	-	-	-	-

Construction Phase	Source	ROG	NO _x	lbs per day			
				CO	SO ₂	PM ₁₀	PM _{2.5}
Conductor and Wires Installation	Off-Road Equipment	8.40	63.63	68.93	0.21	1.04	0.95
Conductor and Wires Installation	Dust from Material Movement	-	-	-	-	7.67	3.94
Conductor and Wires Installation	On-Road Trip Exhaust (Paved)	0.04	0.50	0.99	0.00	0.14	0.05
Conductor and Wires Installation	On-Road Trip Exhaust (Unpaved)	0.04	0.66	0.63	0.00	0.05	0.02
Conductor and Wires Installation	On-Road Roadway Dust (Paved)	-	-	-	-	0.18	0.04
Conductor and Wires Installation	On-Road Roadway Dust (Unpaved)	-	-	-	-	117.20	11.72
Conductor and Wires Installation	Helicopter Use	1.30	17.50	20.70	1.40	1.00	-
Civil Crew (Clean Up)	Off-Road Equipment	0.33	1.66	3.14	0.02	0.02	0.02
Civil Crew (Clean Up)	Dust from Material Movement	-	-	-	-	-	-
Civil Crew (Clean Up)	On-Road Trip Exhaust (Paved)	0.01	0.07	0.50	0.00	0.04	0.01
Civil Crew (Clean Up)	On-Road Trip Exhaust (Unpaved)	0.01	0.08	0.27	0.00	0.01	0.00
Civil Crew (Clean Up)	On-Road Roadway Dust (Paved)	-	-	-	-	0.05	0.01
Civil Crew (Clean Up)	On-Road Roadway Dust (Unpaved)	-	-	-	-	31.04	3.10
Civil Crew (Clean Up)	Helicopter Use	-	-	-	-	-	-

Maximum Daily Emissions		ROG	NO _x	lbs per day			
Construction Phase	Source			CO	SO ₂	PM ₁₀	PM _{2.5}
Staging Areas	Total	0.87	6.89	10.17	0.02	37.05	3.79
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Total	1.42	11.32	12.66	0.03	17.23	1.88
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Total	1.47	10.73	14.18	0.04	20.32	2.19
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Total	2.29	16.29	26.02	0.09	32.77	3.51
Civil Crew (Road Maintenance, BMP's, Gates)	Total	1.96	10.67	14.30	0.06	44.19	4.57
Structure Installation - Lattice - Guyed V Framing	Total	0.87	63.88	13.61	3.90	46.43	4.24
Structure Installation - Lattice - Guyed V Setting	Total	0.71	5.64	7.04	0.02	51.34	5.23
Structure Installation - Monopole and Lattice - 4-Legged	Total	0.68	5.74	6.97	0.02	48.78	4.98
Structure Installation - Spotting	Total	0.41	3.81	3.52	0.01	48.75	4.95
Conductor and Wires Installation	Total	9.78	82.29	91.25	1.62	127.27	16.73
Civil Crew (Clean Up)	Total	0.34	1.81	3.90	0.02	31.16	3.15
Maximum Daily Overlapping Phases		3	71	36	4	88	9
Total Project Maximum Daily		10	82	91	4	127	17
ICAPCD Thresholds		75	100	550	NA	150	NA
Exceed?		No	No	No	NA	No	NA

Notes:

Arizona Department of Environmental Quality does not have a daily emissions threshold.

Sources: <https://www.epa.gov/general-conformity/de-minimis-tables>; Thresholds used for ozone and PM₁₀ under the Arizona portion reflect that Yuma County, Arizona is currently in nonattainment for ozone and PM₁₀.

Energy Calculations

Ironwood Transmission Line Project

****The Proposed Project plans to develop an 87 mile transmission line from California to Arizona. 81 miles (93 percent) of construction occurring in California and 6 miles (7 percent) of transmission line construction occurring in Arizona.**

Overall Project Energy Use During Construction

Electricity

	Water Consumption	8,888.95 kWh
Total kWh		8,889 kWh

Gasoline

On Road	27,243 Gallons
Off Road	n/a Gallons

Diesel

On Road	80,675 Gallons
Off Road	1,347,347 Gallons

Jet A

Helicopter	311,024 Gallons
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Total Gasoline	27,243 Gallons
Total Diesel	1,428,021 Gallons
Jet A	311,024 Gallons

Ironwood Transmission Line Project

California Project Energy Use During Construction

Electricity

	Water Consumption	8,266.72 kWh
Total kWh		8,267 kWh

Gasoline

On Road	25,336 Gallons
Off Road	n/a Gallons

Diesel

On Road	75,027 Gallons
Off Road	1,253,032 Gallons

Jet A

Helicopter	289,252 Gallons
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Total Gasoline	25,336 Gallons
Total Diesel	1,328,060 Gallons
Jet A	289,252 Gallons

Ironwood Transmission Line Project

Arizona Project Energy Use During Construction

Electricity

	Water Cons	622.23 kWh
Total kWh		622 kWh

Gasoline

On Road	1,907 Gallons
Off Road	n/a Gallons

Diesel

On Road	5,647 Gallons
Off Road	94,314 Gallons

Jet A

Helicopter	21,772 Gallons
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Total Gasoline	1,907 Gallons
Total Diesel	99,961 Gallons
Jet A	21,772 Gallons

Ironwood Transmission Line Project

Compression-Ignition Engine Brake-Specific Fuel Consumption (BSFC) [1]:	0.05
Gallons/HP	

Estimated Off-Road Construction Equipment Diesel Fuel Consumption

General Name	HP	Specific Name	Phase	No. of Equipment	Hours per Day	Load Factor	Total No. of Usage Days	Fuel Used (gallons)
Forklifts	96	R/T Forklift	Staging Areas	4	8	0.2	101	3,103
Generator Sets	45	Generator	Staging Areas	1	8	0.74	101	1,345
Off-Highway Trucks	350	Water Truck	Staging Areas	1	8	0.38	101	5,373
Graders	200	GRADER 150 AWD	Civil Crew (Road Work, Foundations, Ducts) - Flat Land	2	8	0.41	366	24,010
Rubber Tired Dozers	200	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Flat Land	2	8	0.4	366	23,424
Off-Highway Trucks	350	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Flat Land	2	8	0.38	366	38,942
Rollers	150	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Flat Land	2	8	0.38	366	16,690
Excavators	450	EXCAVATOR>100,000 LBS	Civil Crew (Road Work, Foundations, Ducts) - Regular	1	8	0.38	366	25,034
Rubber Tired Dozers	200	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Regular	1	8	0.4	366	11,712
Off-Highway Trucks	350	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Regular	1	8	0.38	366	19,471
Rollers	150	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Regular	1	8	0.38	366	8,345
Bore/Drill Rigs	500	IMT Drill	Civil Crew (Road Work, Foundations, Ducts) - Foundat	3	8	0.5	287	86,100
Bore/Drill Rigs	400	LoDrill	Civil Crew (Road Work, Foundations, Ducts) - Foundat	3	8	0.5	287	68,880
Tractors/Loaders/Backhoes	150	Backhoe	Civil Crew (Road Work, Foundations, Ducts) - Foundat	6	8	0.37	287	38,228
Cranes	425	CRANE 40T	Crew (Road Work, Foundations, Ducts) - Foundation C	6	8	0.29	287	84,895
Other Material Handling Equipment	400	Material Handler	Crew (Road Work, Foundations, Ducts) - Foundation C	3	8	0.4	287	55,104
Forklifts	100	SKID STEER & FORKS	Crew (Road Work, Foundations, Ducts) - Foundation C	3	8	0.2	287	6,888
Off-Highway Trucks	350	Water Truck	Civil Crew (Road Maintenance, BMP's, Gates)	3	8	0.38	514	82,034
Graders	200	GRADER 150 AWD	Civil Crew (Road Maintenance, BMP's, Gates)	1	8	0.41	514	16,859
Forklifts	100	SKID STEER & FORKS	Civil Crew (Road Maintenance, BMP's, Gates)	1	8	0.2	514	4,112
Off-Highway Trucks	335	Mechanic Truck	Civil Crew (Road Maintenance, BMP's, Gates)	1	8	0.38	514	26,173
Forklifts	100	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Framing	4	8	0.2	288	9,216
Cranes	500	CRANE 275 TON	Structure Installation - Lattice - Guyed V Setting	4	8	0.29	288	66,816
Excavators	175	EXCAVATOR>60,000 LBS	Structure Installation - Lattice - Guyed V Setting	4	8	0.38	288	30,643
Forklifts	100	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Setting	4	8	0.2	288	9,216
Forklifts	100	FORKLIFT 12K	Structure Installation - Spotting	1	8	0.2	288	2,304
Cranes	270	CRANE 100 TON RT	Structure Installation - Spotting	1	8	0.29	288	9,020
Rubber Tired Dozers	350	DOZER D8 TRIPLE BUNDEL SAG	Conductor and Wires Installation	4	8	0.4	290	64,960
Rubber Tired Dozers	200	DOZER D6 SINGLE TOW WINCH	Conductor and Wires Installation	2	8	0.4	290	18,560
Other Construction Equipment	500	HARDLINE PULLER	Conductor and Wires Installation	4	8	0.42	290	97,440
Other Construction Equipment	175	TRIPLE DRUM PULLER 3/8	Conductor and Wires Installation	6	8	0.42	290	51,156
Other Construction Equipment	300	TENSIONER 72" BNDL TRK MNTD	Conductor and Wires Installation	2	8	0.42	290	29,232
Forklifts	100	FORKLIFT 12K	Conductor and Wires Installation	4	8	0.2	290	9,280
Off-Highway Trucks	400	7 TON ARMY BUNK TRUCK	Conductor and Wires Installation	4	8	0.38	290	70,528
Off-Highway Trucks	300	BUCKET TRUCK 90'-100' AWD	Conductor and Wires Installation	2	8	0.38	290	26,448
Cranes	425	CRANE 40T	Conductor and Wires Installation	11	8	0.29	290	157,267
Forklifts	100	SKID STEER & FORKS	Conductor and Wires Installation	2	8	0.2	290	4,640
Off-Highway Trucks	335	Mechanic Truck	Conductor and Wires Installation	2	8	0.38	290	29,534
Excavators	450	EXCAVATOR>100,000 LBS	Civil Crew (Clean Up)	1	8	0.38	210	14,364

[1] SCAQMD 1993 CEQA Air Quality Handbook Table 9A-3E

Total Fuel Used	1,347,347
Gallons	

TABLE A9 - 3 - E

FUEL USAGE ESTIMATES PER HORSEPOWER-HOUR
(Estimated Horsepower x Estimated Hours of Usage = Brake Horsepower-Hour)
(For Example, 500 Brake Horsepower x 8 Hours Used = 4,000 Brake Horsepower-Hours)

Fuel Type	Fuel Usage/Horsepower-hour
Diesel	0.05 Gallons
Gasoline	0.12 Gallons
Fuel Oil	0.05 Gallons
Methanol	0.12 Gallons
LPG, Propane, Butane	0.07 Gallons
Natural Gas	7.5 Cubic Feet

Estimated Off-Road Helicopter Diesel Fuel Consumption

Helicopter Type and Usage						
Phase	Type	Hours per Day	Total Days	# of Helicopters	Fuel Consumption (gallons/hr)	Fuel Consumption Total
Structure Installation	UH-60A Blackhawk/CH-47	6	288	1	133	229,824
Structure Installation		-	-			
Conductor and Wires Installation		-	-			
Conductor and Wires Installation	Bell 407/MD530F (Light Du	5	290	2	28	81,200
				Total Fuel Used		311,024
Gallons						

Source: Fuel Consumption is obtained from the U.S. Department of Interior National Business Center (2006)

Ironwood Transmission Line Project

Water Usage for Control of Fugitive Dust during Construction

Phase	Days	# of Equipment	Average Daily Acreage Disturbed	Total Gallons	Electricity (kWhr)
Stagline Area	101	1	0.5	152,510.0	351.38
Civil Crew (Road Work, Foundations, Ducts)	366	2	1	1,105,320.0	2,546.66
Civil Crew (Road Maintenance, BMP's, Gates)	287	6	3	2,600,220.0	5,990.91
			Total	3,858,050.0	8,888.95

Gallons per year of water usage for dust control is calculated based on a minimum control efficiency of 66% (three times daily) with an application rate of 3,020 gal/acre/day (Air & Waste Management Association Air Pollution Engineering Manual (1992 Edition))

kwh/gallon

CalEEMod Default: Each gallon of delivered potable water in Colorado River Region is associated with

0.002304

Table G-32. Water Energy Intensity Factors by Hydrologic Region and Process (kWh per million gallon)

Hydrologic Region	Supply	Treat	Distribute	Wastewater
South Coast	3044	725	1537	1501
San Francisco Bay	1182	754	2998	1542
Central Coast	1577	754	1537	1542
Tulare Lake	1506	748	166	1519
North Coast	620	754	1537	1542
San Joaquin River	827	748	166	1519
Colorado River	2304	748	166	1519
Sacramento River	698	748	166	1519
South Lahontan	1953	748	1537	1519
North Lahontan	541	748	166	1519

Source: Szinai, G.; Abraham, S.; Cooley, H.; Gleick, P. 2021. The Future of California's Water-Energy-Climate Nexus. Prepared by the Pacific Institute. Produced by Next 10. Available: https://www.next10.org/sites/default/files/2021-09/Next10-Water-Energy-Report_v2.pdf.

Accessed: March 2022

Ironwood Transmission Line Project

Estimated On-Road Construction Equipment Diesel Fuel Consumption

			Work Days				Daily VMT (miles/day)	Miles per Gallon	Fuel Used (gallons)	Light Duty MPG	HHDT MPG
Phase	Primary Equipment Description	EMFAC Classification	2029	2030	2031	Fuel Type	Total	Total	Total		
Staging Areas	1-Ton Truck, 4x4	HHDT	101	0	0	Diesel	160	22.8	3,648	22.8	7.8
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	PICKUP 3/4 TON	LHDT2	131	235	0	Gas	55	7.8	432		
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	PICKUP 3/4 TON	LHDT2	131	235	0	Gas	37	7.8	288		
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	PICKUP 3/4 TON	LHDT2	104	183	0	Gas	222	7.8	1,730		
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Semi	HHDT	104	183	0	Diesel	80	22.8	1,824		
Civil Crew (Road Maintenance, BMP's, Gates)	PICKUP 3/4 TON	LHDT2	149	313	52	Diesel	37	22.8	843		
Structure Installation - Lattice - Guyed V Framing	PICKUP 3/4 TON	LHDT2	79	209	0	Diesel	160	22.8	3,648		
Structure Installation - Lattice - Guyed V Framing	PICKUP 1 TON DIESEL	LHDT2	79	209	0	Diesel	74	22.8	1,685		
Structure Installation - Lattice - Guyed V Setting	PICKUP 3/4 TON	LHDT2	79	209	0	Gas	74	7.8	577		
Structure Installation - Lattice - Guyed V Setting	PICKUP WINCH TRUCK	LHDT2	79	209	0	Diesel	320	22.8	7,296		
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 3/4 TON	LHDT2	79	209	0	Gas	166	7.8	1,297		
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 1 TON DIESEL	HHDT	79	209	0	Diesel	120	22.8	2,736		
Structure Installation - Spotting	Semi	HHDT	79	209	0	Diesel	120	22.8	2,736		
Structure Installation - Spotting	PICKUP 1 TON DIESEL	LHDT2	79	209	0	Diesel	18	22.8	421		
Structure Installation - Spotting	PICKUP 3/4 TON	LHDT2	79	209	0	Diesel	18	22.8	421		
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	0	262	28	Diesel	240	22.8	5,472		
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	0	262	28	Diesel	240	22.8	5,472		
Conductor and Wires Installation	SEMI - ON/OFF ROAD 6X6	HHDT	0	262	28	Diesel	160	22.8	3,648		
Conductor and Wires Installation	PICKUP 1 TON DIESEL	LHDT2	0	262	28	Diesel	74	22.8	1,685		
Conductor and Wires Installation	PICKUP 3/4 TON DIESEL	LHDT2	0	262	28	Gas	591	7.8	4,613		
Conductor and Wires Installation	PICKUP WINCH TRUCK	LHDT2	0	262	28	Diesel	370	22.8	8,427		
Civil Crew (Clean Up)	PICKUP 3/4 TON	LHDT2	0	158	52	Gas	37	7.8	288		
Staging Areas	Worker	LHDT2	101	0	0	Gas	111	7.8	865		
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Worker	LHDT2	131	235	0	Gas	148	7.8	1,153		
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Worker	LHDT2	131	235	0	Gas	92	7.8	721		
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Worker	LHDT2	104	183	0	Gas	388	7.8	3,027		
Civil Crew (Road Maintenance, BMP's, Gates)	Worker	LHDT2	149	313	52	Gas	185	7.8	1,441		
Structure Installation - Lattice - Guyed V Framing	Worker	LHDT2	79	209	0	Gas	222	7.8	1,730		
Structure Installation - Lattice - Guyed V Setting	Worker	LHDT2	79	209	0	Gas	370	7.8	2,883		
Structure Installation - Monopole and Lattice - 4-Legged	Worker	LHDT2	79	209	0	Gas	222	7.8	1,730		
Structure Installation - Spotting	Worker	LHDT2	79	209	0	Gas	92	7.8	721		
Conductor and Wires Installation	Worker	LHDT2	0	262	28	Gas	296	7.8	2,306		
Civil Crew (Clean Up)	Worker	LHDT2	0	158	52	Gas	185	7.8	1,441		
Staging Areas	Hauling	HHDT	101	0	0	Diesel	40	22.8	912		
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Hauling	HHDT	131	235	0	Diesel	40	22.8	912		
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Hauling	HHDT	131	235	0	Diesel	40	22.8	912		
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Hauling	HHDT	104	183	0	Diesel	40	22.8	912		
Civil Crew (Road Maintenance, BMP's, Gates)	Hauling	HHDT	149	313	52	Diesel	147	22.8	3,352		
Structure Installation - Lattice - Guyed V Framing	Hauling	HHDT	79	209	0	Diesel	240	22.8	5,472		
Structure Installation - Lattice - Guyed V Setting	Hauling	HHDT	79	209	0	Diesel	240	22.8	5,472		
Structure Installation - Monopole and Lattice - 4-Legged	Hauling	HHDT	79	209	0	Diesel	240	22.8	5,472		
Structure Installation - Spotting	Hauling	HHDT	79	209	0	Diesel	240	22.8	5,472		
Conductor and Wires Installation	Hauling	HHDT	0	262	28	Diesel	40	22.8	912		
Civil Crew (Clean Up)	Hauling	HHDT	0	158	52	Diesel	40	22.8	912		

Total Gasoline Consumption (gallons)	27,243
Total Diesel Consumption (gallons)	80,675

Greenhouse Gas Calculations

Estimated Construction Schedule & Annual Durations

Part of Project	Work Months	Days	Years	Approximate Start Date	Approximate End Date	No of Days 2029	No of Days 2030
Staging Areas	3	100	1	3/11/2029	7/5/2029	100	0
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	14	366	1.166666667	4/1/2029	6/1/2030	235	131
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	14	366	1.166666667	4/1/2029	6/1/2030	235	131
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	11	288	1	5/1/2029	4/1/2030	210	78
Civil Crew (Road Maintenance, BMP's, Gates)	19	515	1.583333333	3/11/2029	11/1/2030	253	262
Structure Installation - Lattice - Guyed V Framing	11	287	1	6/1/2029	5/1/2030	183	104
Structure Installation - Lattice - Guyed V Setting	11	287	1	6/1/2029	5/1/2030	183	104
Structure Installation - Monopole and Lattice - 4-Legged	11	287	1	6/1/2029	5/1/2030	183	104
Structure Installation - Spotting	11	287	1	6/1/2029	5/1/2030	183	104
Conductor and Wires Installation	11	287	1	11/1/2029	10/1/2030	52	235
Civil Crew (Clean Up)	8	211	1	3/1/2030	11/1/2030	0	211
Notes: If the duration for a given phase is less than one year, it was assumed to occur over one year for the purpose of converting lifetime emissions to annual averages. Start and end date for each construction phase was taken from Table 3.9 of the Project Description to determine phase duration. Construction was assumed to occur Monday through Saturday.							

Estimated Construction Equipment Counts for All Crews & Usage Days by Phase

Equipment	HP	Specific Name	Phase	Total Equipment Count for All Crews	Total No. of Usage Days	No. of Usage Days - 2029	No. of Usage Days - 2030
Forklifts (medium)	96	R/T Forklift	Staging Areas	4	100	100	-
Generator Sets	45	Generator	Staging Areas	1	100	100	-
Off-Highway Trucks	350	Water Truck	Staging Areas	1	100	100	-
Graders	200	GRADER 150 AWD	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	366	235	131
Rubber Tired Dozers (medium)	200	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	366	235	131
Off-Highway Trucks	350	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	366	235	131
Rollers	150	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	366	235	131
Excavators (heavy)	450	EXCAVATOR>100,000 LBS	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	366	235	131
Rubber Tired Dozers (medium)	200	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	366	235	131
Off-Highway Trucks	350	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	366	235	131
Rollers	150	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	366	235	131
Bore/Drill Rigs	500	IMT Drill	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	288	210	78
Bore/Drill Rigs	400	LoDrill	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	288	210	78
Tractors/Loaders/Backhoes	150	Backhoe	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	6	288	210	78
Cranes (heavy)	425	CRANE 40T	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	6	288	210	78
Other Material Handling Equipment	400	Material Handler	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	288	210	78
Forklifts (Heavy)	100	SKID STEER & FORKS	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	288	210	78
Off-Highway Trucks	350	Water Truck	Civil Crew (Road Maintenance, BMP's, Gates)	3	515	253	262
Graders	200	GRADER 150 AWD	Civil Crew (Road Maintenance, BMP's, Gates)	1	515	253	262
Forklifts (Heavy)	100	SKID STEER & FORKS	Civil Crew (Road Maintenance, BMP's, Gates)	1	515	253	262
Off-Highway Trucks	335	Mechanic Truck	Civil Crew (Road Maintenance, BMP's, Gates)	1	515	253	262
Forklifts (Heavy)	100	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Framing	4	287	183	104
Cranes (heavy)	500	CRANE 275 TON	Structure Installation - Lattice - Guyed V Setting	4	287	183	104
Excavators (medium)	175	EXCAVATOR>60,000 LBS	Structure Installation - Lattice - Guyed V Setting	4	287	183	104
Forklifts (Heavy)	100	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Setting	4	287	183	104
Forklifts	100	FORKLIFT 12K	Structure Installation - Monopole and Lattice - 4-Legged	1	287	183	104
Cranes	500	CRANE 160 TON RT	Structure Installation - Monopole and Lattice - 4-Legged	1	287	183	104
Forklifts (Heavy)	100	FORKLIFT 12K	Structure Installation - Spotting	1	287	183	104
Cranes (medium)	270	CRANE 100 TON RT	Structure Installation - Spotting	1	287	183	104
Rubber Tired Dozers (heavy)	350	DOZER D8 TRIPLE BUNDEL SAG	Conductor and Wires Installation	4	287	52	235
Rubber Tired Dozers (medium)	200	DOZER D6 SINGLE TOW WINCH	Conductor and Wires Installation	2	287	52	235
Other Construction Equipment	500	HARDLINE PULLER	Conductor and Wires Installation	4	287	52	235
Other Construction Equipment (medium)	175	TRIPLE DRUM PULLER 3/8	Conductor and Wires Installation	6	287	52	235
Other Construction Equipment	300	TENSIONER 72" BNDL TRK MNTD	Conductor and Wires Installation	2	287	52	235
Forklifts (Heavy)	100	FORKLIFT 12K	Conductor and Wires Installation	4	287	52	235
Off-Highway Trucks	400	7 TON ARMY BUNK TRUCK	Conductor and Wires Installation	4	287	52	235
Off-Highway Trucks	300	BUCKET TRUCK 90'-100' AWD	Conductor and Wires Installation	2	287	52	235
Cranes (heavy)	425	CRANE 40T	Conductor and Wires Installation	11	287	52	235
Forklifts (Heavy)	100	SKID STEER & FORKS	Conductor and Wires Installation	2	287	52	235
Off-Highway Trucks	335	Mechanic Truck	Conductor and Wires Installation	2	287	52	235
Excavators (heavy)	450	EXCAVATOR>100,000 LBS	Civil Crew (Clean Up)	1	211	-	211

Offroad Equipment Types & Emission Factors

CalEEMod Name	General Name	CalEEMod Name	HP	Load Factor	g/bhp-hr		
					CO2	CH4	N2O
Forklifts (medium)	R/T Forklift	Forklifts (medium)	96	0.2	527	0.021	0.004
Generator Sets	Generator	Generator Sets	45	0.74	568	0.023	0.005
Off-Highway Trucks	Water Truck	Off-Highway Trucks	350	0.38	530	0.021	0.004
Graders	GRADER 150 AWD	Graders	200	0.41	528	0.021	0.004
Rubber Tired Dozers (medium)	DOZER D6	Rubber Tired Dozers (medium)	200	0.4	528	0.021	0.004
Rollers	ROLLER	Rollers	150	0.38	527	0.021	0.004
Excavators (heavy)	EXCAVATOR>100,000 LBS	Excavators (heavy)	450	0.38	527	0.021	0.004
Bore/Drill Rigs	IMT Drill	Bore/Drill Rigs	500	0.5	522	0.021	0.004
Bore/Drill Rigs	LoDrill	Bore/Drill Rigs	400	0.5	522	0.021	0.004
Tractors/Loaders/Backhoes	Backhoe	Tractors/Loaders/Backhoes	150	0.37	526	0.021	0.004
Cranes (heavy)	CRANE 40T	Cranes (heavy)	425	0.29	528	0.021	0.004
Other Material Handling Equipment	Material Handler	Other Material Handling Equipment	400	0.4	528	0.021	0.004
Forklifts (Heavy)	SKID STEER & FORKS	Forklifts (Heavy)	100	0.2	528	0.021	0.004
Cranes (heavy)	CRANE 275 TON	Cranes (heavy)	500	0.29	528	0.021	0.004
Excavators (medium)	EXCAVATOR>60,000 LBS	Excavators (medium)	175	0.38	528	0.021	0.004
Forklifts (Heavy)	FORKLIFT 12K	Forklifts (Heavy)	100	0.2	528	0.021	0.004
Cranes (heavy)	CRANE 160 TON RT	Cranes (heavy)	500	0.29	528	0.021	0.004
Cranes (medium)	CRANE 100 TON RT	Cranes (medium)	270	0.29	528	0.021	0.004
Rubber Tired Dozers (heavy)	DOZER D8 TRIPLE BUNDEL SAG	Rubber Tired Dozers (heavy)	350	0.4	532	0.022	0.004
Rubber Tired Dozers (medium)	DOZER D6 SINGLE TOW WINCH	Rubber Tired Dozers (medium)	200	0.4	528	0.021	0.004
Other Construction Equipment	HARDLINE PULLER	Other Construction Equipment	500	0.42	530	0.021	0.004
Other Construction Equipment (medium)	TRIPLE DRUM PULLER 3/8	Other Construction Equipment (medium)	175	0.42	529	0.021	0.004
Other Construction Equipment	TENSIONER 72" BNDL TRK MNTD	Other Construction Equipment	300	0.42	530	0.021	0.004
Off-Highway Trucks	7 TON ARMY BUNK TRUCK	Off-Highway Trucks	400	0.38	530	0.021	0.004
Off-Highway Trucks	Mechanic Truck	Off-Highway Trucks	335	0.38	530	0.021	0.004
Off-Highway Trucks	BUCKET TRUCK 90'-100' AWD	Off-Highway Trucks	300	0.38	530	0.021	0.004

Onroad Equipment Usage for All Crews

Primary Equipment Description	Phase	Total Equipment Count for All Crews	Fuel Type
1-Ton Truck, 4x4	Staging Areas	4	Diesel
PICKUP 3/4 TON	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	3	Gas
PICKUP 3/4 TON	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	2	Gas
PICKUP 3/4 TON	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	12	Gas
Semi	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	2	Diesel
PICKUP 3/4 TON	Civil Crew (Road Maintenance, BMP's, Gates)	2	Diesel
PICKUP 3/4 TON	Structure Installation - Lattice - Guyed V Framing	4	Diesel
PICKUP 1 TON DIESEL	Structure Installation - Lattice - Guyed V Framing	4	Diesel
PICKUP 3/4 TON	Structure Installation - Lattice - Guyed V Setting	4	Gas
PICKUP WINCH TRUCK	Structure Installation - Lattice - Guyed V Setting	8	Diesel
PICKUP 3/4 TON	Structure Installation - Monopole and Lattice - 4-Legged	9	Gas
PICKUP 1 TON DIESEL	Structure Installation - Monopole and Lattice - 4-Legged	3	Diesel
Semi	Structure Installation - Spotting	3	Diesel
PICKUP 1 TON DIESEL	Structure Installation - Spotting	1	Diesel
PICKUP 3/4 TON	Structure Installation - Spotting	1	Diesel
SEMI - ON ROAD	Conductor and Wires Installation	6	Diesel
SEMI - ON ROAD	Conductor and Wires Installation	6	Diesel
SEMI - ON/OFF ROAD 6X6	Conductor and Wires Installation	4	Diesel
PICKUP 1 TON DIESEL	Conductor and Wires Installation	4	Diesel
PICKUP 3/4 TON DIESEL	Conductor and Wires Installation	32	Gas
PICKUP WINCH TRUCK	Conductor and Wires Installation	20	Diesel
PICKUP 3/4 TON	Civil Crew (Clean Up)	2	Gas

Phase	Primary Equipment Description	EMFAC Classification	Fuel Type	Trips per Day
Staging Areas	1-Ton Truck, 4x4	HHDT	Diesel	8
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	PICKUP 3/4 TON	LHDT2	Gas	6
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	PICKUP 3/4 TON	LHDT2	Gas	4
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	PICKUP 3/4 TON	LHDT2	Gas	24
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Semi	HHDT	Diesel	4
Civil Crew (Road Maintenance, BMP's, Gates)	PICKUP 3/4 TON	LHDT2	Diesel	4
Structure Installation - Lattice - Guyed V Framing	PICKUP 3/4 TON	LHDT2	Diesel	8
Structure Installation - Lattice - Guyed V Framing	PICKUP 1 TON DIESEL	LHDT2	Diesel	8
Structure Installation - Lattice - Guyed V Setting	PICKUP 3/4 TON	LHDT2	Gas	8
Structure Installation - Lattice - Guyed V Setting	PICKUP WINCH TRUCK	LHDT2	Diesel	16
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 3/4 TON	LHDT2	Gas	18
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 1 TON DIESEL	HHDT	Diesel	6
Structure Installation - Spotting	Semi	HHDT	Diesel	6
Structure Installation - Spotting	PICKUP 1 TON DIESEL	LHDT2	Diesel	2
Structure Installation - Spotting	PICKUP 3/4 TON	LHDT2	Diesel	2
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	Diesel	12
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	Diesel	12
Conductor and Wires Installation	SEMI - ON/OFF ROAD 6X6	HHDT	Diesel	8
Conductor and Wires Installation	PICKUP 1 TON DIESEL	LHDT2	Diesel	8
Conductor and Wires Installation	PICKUP 3/4 TON DIESEL	LHDT2	Gas	64
Conductor and Wires Installation	PICKUP WINCH TRUCK	LHDT2	Diesel	40
Civil Crew (Clean Up)	PICKUP 3/4 TON	LHDT2	Gas	4
Staging Areas	Worker	LHDT2	Gas	12
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Worker	LHDT2	Gas	16
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Worker	LHDT2	Gas	10
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Worker	LHDT2	Gas	42
Civil Crew (Road Maintenance, BMP's, Gates)	Worker	LHDT2	Gas	20
Structure Installation - Lattice - Guyed V Framing	Worker	LHDT2	Gas	24
Structure Installation - Lattice - Guyed V Setting	Worker	LHDT2	Gas	40
Structure Installation - Monopole and Lattice - 4-Legged	Worker	LHDT2	Gas	24
Structure Installation - Spotting	Worker	LHDT2	Gas	10
Conductor and Wires Installation	Worker	LHDT2	Gas	32
Civil Crew (Clean Up)	Worker	LHDT2	Gas	20
Staging Areas	Hauling	HHDT	Diesel	2
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Hauling	HHDT	Diesel	2
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Hauling	HHDT	Diesel	2
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Hauling	HHDT	Diesel	2
Civil Crew (Road Maintenance, BMP's, Gates)	Hauling	HHDT	Diesel	7
Structure Installation - Lattice - Guyed V Framing	Hauling	HHDT	Diesel	12
Structure Installation - Lattice - Guyed V Setting	Hauling	HHDT	Diesel	12
Structure Installation - Monopole and Lattice - 4-Legged	Hauling	HHDT	Diesel	12
Structure Installation - Spotting	Hauling	HHDT	Diesel	12
Conductor and Wires Installation	Hauling	HHDT	Diesel	2
Civil Crew (Clean Up)	Hauling	HHDT	Diesel	2

Notes: 1,250 hauling trips were estimated assuming total material export is 20,000 CY and hauling truck capacity is 16 CY.

Phase	Estimated Workforce/Crew	Total Equipment Count for All Crews	Hauling Trips per Day	Estimated Workforce All
Staging Areas	6	4	1.00	6
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	4	3	1.00	8
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	5	2	1.00	5
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	7	14	1.00	21
Civil Crew (Road Maintenance, BMP's, Gates)	10	2	3.67	10
Structure Installation - Lattice - Guyed V Framing	3	8	6.00	12
Structure Installation - Lattice - Guyed V Setting	5	12	6.00	20
Structure Installation - Monopole and Lattice - 4-Legged	4	12	6.00	12
Structure Installation - Spotting	5	5	6.00	5
Conductor and Wires Installation	6	72	1.00	16
Civil Crew (Clean Up)	10	2	1.00	10

Helicopter Type and Usage

Type	Engine	HP	Fuel Consumption (gallons/hr)
UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	GECT7-2A	4380	133
Bell 407/MD530F (Light Duty)	Alison 250-C20B	420	28
Source: Fuel Consumption is obtained from the U.S. Department of Interior National Business Center (2006)			

Helicopter Emission Factors

Helicopter Emission Factor	lbs/hr						lbs/gallon
Type	HC	NOx	CO	SOx	PM10	CO2	
UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	0.13	10.49	2.02	0.65	0.72	18.355	
Bell 407/MD530F (Light Duty)	0.08	1.75	2.07	0.14	0.1	18.355	
Source: Emission factors for HC, NOx, CO, and SOx were obtained from the California Public Utilities Commission (2007); PM10 emission factors were obtained from the CPUC (2006); and CO2 emission factor for aviation gasoline was obtained from the U.S. Department of Energy (2008).							
Note: Emission factors for Sikorsky UH-60A Blackhawk/Boeing CH-47D Chinook were derived from the emission factors for H-53 Super Stallion (T64-GE-416 Turboshift 4,380 hp engine). Emission factors for take-off and climb-out modes were used. Emission factors for Bell 407/MD530F were derived from the emission factors for Bell 206 Jet Ranger (Alison 250-C20 Turboshift 420 hp engine). Emission factors for take-off mode were used.							

Helicopter Usage Schedule

Phase	Type	Hours per Day	Number of Helicopters	Total Days of Helicopter Usage	No of Days 2029	No of Days 2030
Staging Areas	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	100	-
Staging Areas	Bell 407/MD530F (Light Duty)	-	-	-	100	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	235	131
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Bell 407/MD530F (Light Duty)	-	-	-	235	131
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	235	131
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Bell 407/MD530F (Light Duty)	-	-	-	235	131
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	210	78
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Bell 407/MD530F (Light Duty)	-	-	-	210	78
Civil Crew (Road Maintenance, BMP's, Gates)	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	253	262
Civil Crew (Road Maintenance, BMP's, Gates)	Bell 407/MD530F (Light Duty)	-	-	-	253	262
Structure Installation - Lattice - Guyed V Framing	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	6	1	287	183	104
Structure Installation - Lattice - Guyed V Framing	Bell 407/MD530F (Light Duty)	-	-	-	183	104
Structure Installation - Lattice - Guyed V Setting	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	183	104
Structure Installation - Lattice - Guyed V Setting	Bell 407/MD530F (Light Duty)	-	-	-	183	104
Structure Installation - Monopole and Lattice - 4-Legged	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	183	104
Structure Installation - Monopole and Lattice - 4-Legged	Bell 407/MD530F (Light Duty)	-	-	-	183	104
Structure Installation - Spotting	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	183	104
Structure Installation - Spotting	Bell 407/MD530F (Light Duty)	-	-	-	183	104
Conductor and Wires Installation	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	52	235
Conductor and Wires Installation	Bell 407/MD530F (Light Duty)	5	2	235	52	235
Civil Crew (Clean Up)	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	211
Civil Crew (Clean Up)	Bell 407/MD530F (Light Duty)	-	-	-	-	211

Offroad Construction Equipment Combustion Emissions Calculations - Annual

CalEEMod Name	HP	Load Factor	Specific Name	Phase	Total Equipment Count for All Crews	Hours Per Day	Total No. of Usage Days	No. of Usage Days - 2029	No. of Usage Days - 2030	2029 MT/Year			2030 MT/Year		
										CO2	CH4	N2O	CO2	CH4	N2O
Forklifts (medium)	96	0.2	R/T Forklift	Staging Areas	4	8	100	100	0	32	0.00	0.00	-	-	-
Generator Sets	45	0.74	Generator	Staging Areas	1	8	100	100	0	15	0.00	0.00	-	-	-
Off-Highway Trucks	350	0.38	Water Truck	Staging Areas	1	8	100	100	0	57	0.00	0.00	-	-	-
Graders	200	0.41	GRADER 150 AWD	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	8	366	235	131	163	0.01	0.00	91	0.00	0.00
Rubber Tired Dozers (medium)	200	0.4	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	8	366	235	131	159	0.01	0.00	89	0.00	0.00
Off-Highway Trucks	350	0.38	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	8	366	235	131	266	0.01	0.00	148	0.01	0.00
Rollers	150	0.38	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	2	8	366	235	131	113	0.00	0.00	63	0.00	0.00
Excavators (heavy)	450	0.38	EXCAVATOR>100,000 LBS	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	8	366	235	131	170	0.01	0.00	95	0.00	0.00
Rubber Tired Dozers (medium)	200	0.4	DOZER D6	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	8	366	235	131	80	0.00	0.00	44	0.00	0.00
Off-Highway Trucks	350	0.38	Water Truck	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	8	366	235	131	133	0.01	0.00	74	0.00	0.00
Rollers	150	0.38	ROLLER	Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	1	8	366	235	131	57	0.00	0.00	32	0.00	0.00
Bore/Drill Rigs	500	0.5	IMT Drill	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	8	288	210	78	659	0.03	0.01	245	0.01	0.00
Bore/Drill Rigs	400	0.5	LoDrill	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	8	288	210	78	527	0.02	0.00	196	0.01	0.00
Tractors/Loaders/Backhoes	150	0.37	Backhoe	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	6	8	288	210	78	295	0.01	0.00	110	0.00	0.00
Cranes (heavy)	425	0.29	CRANE 40T	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	6	8	288	210	78	657	0.03	0.00	244	0.01	0.00
Other Material Handling Equipment	400	0.4	Material Handler	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	8	288	210	78	427	0.02	0.00	158	0.01	0.00
Forklifts (Heavy)	100	0.2	SKID STEER & FORKS	Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	3	8	288	210	78	53	0.00	0.00	20	0.00	0.00
Off-Highway Trucks	350	0.38	Water Truck	Civil Crew (Road Maintenance, BMP's, Gates)	3	8	515	253	262	429	0.02	0.00	444	0.02	0.00
Graders	200	0.41	GRADER 150 AWD	Civil Crew (Road Maintenance, BMP's, Gates)	1	8	515	253	262	88	0.00	0.00	91	0.00	0.00
Forklifts (Heavy)	100	0.2	SKID STEER & FORKS	Civil Crew (Road Maintenance, BMP's, Gates)	1	8	515	253	262	21	0.00	0.00	22	0.00	0.00
Off-Highway Trucks	335	0.38	Mechanic Truck	Civil Crew (Road Maintenance, BMP's, Gates)	1	8	515	253	262	137	0.01	0.00	142	0.01	0.00
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Framing	4	8	287	183	104	62	0.00	0.00	35	0.00	0.00
Cranes (heavy)	500	0.29	CRANE 275 TON	Structure Installation - Lattice - Guyed V Setting	4	8	287	183	104	449	0.02	0.00	255	0.01	0.00
Excavators (medium)	175	0.38	EXCAVATOR>60,000 LBS	Structure Installation - Lattice - Guyed V Setting	4	8	287	183	104	206	0.01	0.00	117	0.00	0.00
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Structure Installation - Lattice - Guyed V Setting	4	8	287	183	104	62	0.00	0.00	35	0.00	0.00
Forklifts	100	0.2	FORKLIFT 12K	Structure Installation - Monopole and Lattice - 4-Legged	1	9	287	183	104	17	0.00	0.00	10	0.00	0.00
Cranes	500	0.29	CRANE 160 TON RT	Structure Installation - Monopole and Lattice - 4-Legged	1	10	287	183	104	140	0.01	0.00	80	0.00	0.00
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Structure Installation - Spotting	1	8	287	183	104	15	0.00	0.00	9	0.00	0.00
Cranes (medium)	270	0.29	CRANE 100 TON RT	Structure Installation - Spotting	1	8	287	183	104	61	0.00	0.00	34	0.00	0.00
Rubber Tired Dozers (heavy)	350	0.4	DOZER D8 TRIPLE BUNDEL SAG	Conductor and Wires Installation	4	8	287	52	235	124	0.01	0.00	561	0.02	0.00
Rubber Tired Dozers (medium)	200	0.4	DOZER D6 SINGLE TOW WINCH	Conductor and Wires Installation	2	8	287	52	235	35	0.00	0.00	159	0.01	0.00
Other Construction Equipment	500	0.42	HARDLINE PULLER	Conductor and Wires Installation	4	8	287	52	235	186	0.01	0.00	839	0.03	0.01
Other Construction Equipment (medium)	175	0.42	TRIPLE DRUM PULLER 3/8	Conductor and Wires Installation	6	8	287	52	235	97	0.00	0.00	440	0.02	0.00
Other Construction Equipment	300	0.42	TENSIONER 72" BNDL TRK MNTD	Conductor and Wires Installation	2	8	287	52	235	56	0.00	0.00	252	0.01	0.00
Forklifts (Heavy)	100	0.2	FORKLIFT 12K	Conductor and Wires Installation	4	8	287	52	235	18	0.00	0.00	80	0.00	0.00
Off-Highway Trucks	400	0.38	7 TON ARMY BUNK TRUCK	Conductor and Wires Installation	4	8	287	52	235	134	0.01	0.00	607	0.02	0.00
Off-Highway Trucks	300	0.38	BUCKET TRUCK 90'-100' AWD	Conductor and Wires Installation	2	8	287	52	235	50	0.00	0.00	228	0.01	0.00
Cranes (heavy)	425	0.29	CRANE 40T	Conductor and Wires Installation	11	8	287	52	235	298	0.01	0.00	1,349	0.05	0.01
Forklifts (Heavy)	100	0.2	SKID STEER & FORKS	Conductor and Wires Installation	2	8	287	52	235	9	0.00	0.00	40	0.00	0.00
Off-Highway Trucks	335	0.38	Mechanic Truck	Conductor and Wires Installation	2	8	287	52	235	56	0.00	0.00	254	0.01	0.00
Excavators (heavy)	450	0.38	EXCAVATOR>100,000 LBS	Civil Crew (Clean Up)	1	8	211	0	211	-	-	-	152	0.01	0.00

Offroad Construction Equipment Combustion Emissions - Annual

Construction Phase	2029 MT/Year			2030 MT/Year		
	CO2	CH4	N2O	CO2	CH4	N2O
Staging Areas	104	0.00	0.00	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	701	0.03	0.01	391	0.02	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	439	0.02	0.00	245	0.01	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	2,619	0.10	0.02	973	0.04	0.01
Civil Crew (Road Maintenance, BMP's, Gates)	675	0.03	0.01	699	0.03	0.01
Structure Installation - Lattice - Guyed V Framing	62	0.00	0.00	35	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	717	0.03	0.01	408	0.02	0.00
Structure Installation - Monopole and Lattice - 4-Legged	158	0.01	0.00	90	0.00	0.00
Structure Installation - Spotting	76	0.00	0.00	43	0.00	0.00
Conductor and Wires Installation	1,064	0.04	0.01	4,807	0.19	0.04
Civil Crew (Clean Up)	-	-	-	152	0.01	0.00

Mobile Combustion Annual Emissions - Paved Roadways

Phase	Primary Equipment Description	EMFAC Classification	Work Days										EMFAC Emission Factors (g/mile)			2029 MT/Year			2030 MT/Year		
			2029	2030	Fuel Type	Speed Bin (mph)	Trips Per Day	Trip Length (miles)	Daily VMT (miles/day)	2029 Annual VMT (miles/year)	2030 Annual VMT (miles/year)	CO2	NH4	N2O	CO2	NH4	N2O	CO2	NH4	N2O	
Staging Areas	1-Ton Truck, 4x4	HHDT	100	-	Diesel	Aggregate	8	12	96	9,600	-		537.30	0.00	0.38	5.17	0.00	0.00	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	PICKUP 3/4 TON	LHD72	235	131	Gas	Aggregate	6	6	33	7,817	4,358		611.32	0.00	0.01	4.79	0.00	0.00	2.67	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	PICKUP 3/4 TON	LHD72	235	131	Gas	Aggregate	4	6	22	5,211	2,905		611.32	0.00	0.01	3.19	0.00	0.00	1.78	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	PICKUP 3/4 TON	LHD72	210	78	Gas	Aggregate	24	6	133	27,942	10,378		611.32	0.00	0.01	17.12	0.00	0.00	6.36	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Semi	HHDT	210	78	Diesel	Aggregate	4	12	48	10,080	3,744		537.30	0.00	0.38	5.43	0.00	0.00	2.02	0.00	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	PICKUP 3/4 TON	LHD72	253	262	Diesel	Aggregate	4	6	22	5,611	5,810		537.30	0.00	0.38	3.02	0.00	0.00	3.13	0.00	0.00
Structure Installation - Lattice - Guyed V Framing	PICKUP 3/4 TON	LHD72	183	104	Diesel	Aggregate	8	12	96	17,568	9,984		537.30	0.00	0.38	9.46	0.00	0.01	5.38	0.00	0.00
Structure Installation - Lattice - Guyed V Framing	PICKUP 1 TON DIESEL	LHD72	183	104	Diesel	Aggregate	8	6	44	8,116	4,613		611.32	0.00	0.01	4.97	0.00	0.00	2.83	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	PICKUP 3/4 TON	LHD72	183	104	Gas	Aggregate	8	6	44	8,116	4,613		611.32	0.00	0.01	4.97	0.00	0.00	2.83	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	PICKUP WINCH TRUCK	LHD72	183	104	Diesel	Aggregate	16	12	192	35,136	19,968		537.30	0.00	0.38	18.92	0.00	0.01	10.75	0.00	0.01
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 3/4 TON	LHD72	183	104	Gas	Aggregate	18	6	100	18,262	10,378		611.32	0.00	0.01	11.19	0.00	0.00	6.36	0.00	0.00
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 1 TON DIESEL	HHDT	183	104	Diesel	Aggregate	6	12	72	13,176	7,488		537.30	0.00	0.38	7.09	0.00	0.00	4.03	0.00	0.00
Structure Installation - Spotting	Semi	HHDT	183	104	Diesel	Aggregate	6	12	72	13,176	7,488		537.30	0.00	0.38	7.09	0.00	0.00	4.03	0.00	0.00
Structure Installation - Spotting	PICKUP 1 TON DIESEL	LHD72	183	104	Diesel	Aggregate	2	6	11	2,029	1,153		537.30	0.00	0.38	1.09	0.00	0.00	0.62	0.00	0.00
Structure Installation - Spotting	PICKUP 3/4 TON	LHD72	183	104	Diesel	Aggregate	2	6	11	2,029	1,153		537.30	0.00	0.38	1.09	0.00	0.00	0.62	0.00	0.00
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	52	235	Diesel	Aggregate	12	12	144	7,488	33,840		537.30	0.00	0.38	4.03	0.00	0.00	18.22	0.00	0.01
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	52	235	Diesel	Aggregate	12	12	144	7,488	33,840		537.30	0.00	0.38	4.03	0.00	0.00	18.22	0.00	0.01
Conductor and Wires Installation	SEMI - ON/OFF ROAD 6X6	HHDT	52	235	Diesel	Aggregate	8	12	96	4,992	22,560		537.30	0.00	0.38	2.69	0.00	0.00	12.15	0.00	0.01
Conductor and Wires Installation	PICKUP 1 TON DIESEL	LHD72	52	235	Diesel	Aggregate	8	6	44	2,306	10,423		537.30	0.00	0.38	1.24	0.00	0.00	5.61	0.00	0.00
Conductor and Wires Installation	PICKUP 3/4 TON DIESEL	LHD72	52	235	Gas	Aggregate	64	6	355	18,450	83,382		611.32	0.00	0.01	11.30	0.00	0.00	51.08	0.00	0.00
Conductor and Wires Installation	PICKUP WINCH TRUCK	LHD72	52	235	Diesel	Aggregate	40	6	222	11,532	52,114		537.30	0.00	0.38	6.21	0.00	0.00	28.06	0.00	0.02
Civil Crew (Clean Up)	PICKUP 3/4 TON	LHD72	-	211	Gas	Aggregate	4	6	22	-	4,679		611.32	0.00	0.01	-	-	-	2.87	0.00	0.00
Staging Areas	Worker	LHD72	100	-	Gas	Aggregate	12	6	67	6,653	-		611.32	0.00	0.01	4.08	0.00	0.00	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Worker	LHD72	235	131	Gas	Aggregate	16	6	89	20,845	11,620		611.32	0.00	0.01	12.77	0.00	0.00	7.12	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Worker	LHD72	235	131	Gas	Aggregate	10	6	55	13,028	7,263		611.32	0.00	0.01	7.98	0.00	0.00	4.45	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Worker	LHD72	210	78	Gas	Aggregate	42	6	233	48,898	18,162		611.32	0.00	0.01	29.96	0.00	0.00	11.13	0.00	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	Worker	LHD72	253	262	Gas	Aggregate	20	6	111	28,053	29,051		611.32	0.00	0.01	17.19	0.00	0.00	17.80	0.00	0.00
Structure Installation - Lattice - Guyed V Framing	Worker	LHD72	183	104	Gas	Aggregate	24	6	133	24,349	13,838		611.32	0.00	0.01	14.92	0.00	0.00	8.48	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	Worker	LHD72	183	104	Gas	Aggregate	40	6	222	40,582	23,063		611.32	0.00	0.01	24.86	0.00	0.00	14.13	0.00	0.00
Structure Installation - Monopole and Lattice - 4-Legged	Worker	LHD72	183	104	Gas	Aggregate	24	6	133	24,349	13,838		611.32	0.00	0.01	14.92	0.00	0.00	8.48	0.00	0.00
Structure Installation - Spotting	Worker	LHD72	183	104	Gas	Aggregate	10	6	55	10,146	5,766		611.32	0.00	0.01	6.22	0.00	0.00	3.53	0.00	0.00
Conductor and Wires Installation	Worker	LHD72	52	235	Gas	Aggregate	32	6	177	9,225	41,691		611.32	0.00	0.01	5.65	0.00	0.00	25.54	0.00	0.00
Civil Crew (Clean Up)	Worker	LHD72	-	211	Gas	Aggregate	20	6	111	-	23,396		611.32	0.00	0.01	-	-	-	14.33	0.00	0.00
Staging Areas	Hauling	HHDT	100	-	Diesel	Aggregate	2	12	24	2,400	-		537.30	0.00	0.38	1.29	0.00	0.00	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Hauling	HHDT	235	131	Diesel	Aggregate	2	12	24	5,640	3,144		537.30	0.00	0.38	3.04	0.00	0.00	1.69	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Hauling	HHDT	235	131	Diesel	Aggregate	2	12	24	5,640	3,144		537.30	0.00	0.38	3.04	0.00	0.00	1.69	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Hauling	HHDT	210	78	Diesel	Aggregate	2	12	24	5,040	1,872		537.30	0.00	0.38	2.71	0.00	0.00	1.01	0.00	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	Hauling	HHDT	253	262	Diesel	Aggregate	7	12	88	22,284	23,076		537.30	0.00	0.38	12.00	0.00	0.01	12.42	0.00	0.01
Structure Installation - Lattice - Guyed V Framing	Hauling	HHDT	183	104	Diesel	Aggregate	12	12	144	26,352	14,976		537.30	0.00	0.38	14.19	0.00	0.01	8.06	0.00	0.01
Structure Installation - Lattice - Guyed V Setting	Hauling	HHDT	183	104	Diesel	Aggregate	12	12	144	26,352	14,976		537.30	0.00	0.38	14.19	0.00	0.01	8.06	0.00	0.01
Structure Installation - Monopole and Lattice - 4-Legged	Hauling	HHDT	183	104	Diesel	Aggregate	12	12	144	26,352	14,976		537.30	0.00	0.38	14.19	0.00	0.01	8.06	0.00	0.01
Structure Installation - Spotting	Hauling	HHDT	183	104	Diesel	Aggregate	12	12	144	26,352	14,976		537.30	0.00	0.38	14.19	0.00	0.01	8.06	0.00	0.01
Conductor and Wires Installation	Hauling	HHDT	52	235	Diesel	Aggregate	2	12	24	1,248	5,640		537.30	0.00	0.38	0.67	0.00	0.00	3.04	0.00	0.00
Civil Crew (Clean Up)	Hauling	HHDT	-	211	Diesel	Aggregate	2	12	24	-	5,064		537.30	0.00	0.38	-	-	-	2.73	0.00	0.00
Notes: 1. Assumed CalEEMod default values for Imperial County for trip length. It was assumed that 60% of total trips would be on paved roads. 2. Hauling trips during the "Civil Crew (Road Work, Foundations, Ducts)" were based on 20,000 CY of material export and 16 CY per haul truck. 3. EMFAC 2021 emissions factors for 2029 were used for each year of construction (2029, 2030, and 2031). Aggregate speed assumed. Fuel type was provided to Rincon. 4. Emissions assume a 55% reduction in PM10, as watering twice a day for industrial unpaved roads is 55%. Additional measures that will further reduce PM10 include limiting the max speed to 25 mph (44% reduction) and applying chemical dust suppressants annually to unpaved parking areas (84% reduction).												2029 Annual VMT (miles/year)	2030 Annual VMT (miles/year)								
												609,914	624,401								

% of roads paved 60%

Construction Phase	2029 MT/Year			2030 MT/Year		
	CO2	NH4	N2O	CO2	NH4	N2O
Staging Areas	10.54	0.00	0.00	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	20.60	0.00	0.00	11.48	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	14.21	0.00	0.00	7.92	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	55.21	0.00	0.01	20.51	0.00	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	32.20	0.00	0.01	33.35	0.00	0.01
Structure Installation - Lattice - Guyed V Framing	43.54	0.00	0.02	24.74	0.00	0.01
Structure Installation - Lattice - Guyed V Setting	62.94	0.00	0.02	35.77	0.00	0.01
Structure Installation - Monopole and Lattice - 4-Legged	47.39	0.00	0.02	26.93	0.00	0.01
Structure Installation - Spotting	29.68	0.00	0.02	16.87	0.00	0.01
Conductor and Wires Installation	35.83	0.00	0.01	161.92	0.00	0.06
Civil Crew (Clean Up)	-	-	-	19.93	0.00	0.00

Mobile Combustion Annual Emissions - Unpaved Roadways

Phase	Primary Equipment Description	EMFAC Classification	Work Days						Emission Factors (g/mile)			2029 MT/Year			2030 MT/Year		
			2029	2030	Fuel Type	Speed Bin (mph)	Trips Per Day	Trip Length (miles)	Daily VMT (miles/day)	2029 Annual VMT (miles/year)	2030 Annual VMT (miles/year)	CO2	NH4	N2O	CO2	NH4	N2O
Staging Areas	1-Ton Truck, 4x4	HHDT	100	-	Diesel	15	8	8	64	6,400	-	1,892.88	0.00	0.40	12.14	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	PICKUP 3/4 TON	LHDT2	235	131	Gas	25	6	4	22	5,211	2,905	858.53	0.01	0.01	4.48	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	PICKUP 3/4 TON	LHDT2	235	131	Gas	25	4	4	15	3,474	1,937	858.53	0.01	0.01	2.99	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	PICKUP 3/4 TON	LHDT2	210	78	Gas	25	24	4	89	18,628	6,919	858.53	0.01	0.01	16.03	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Semi	HHDT	210	78	Diesel	15	4	8	32	6,720	2,496	1,892.88	0.00	0.40	12.75	0.00	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	PICKUP 3/4 TON	LHDT2	253	262	Diesel	25	4	4	15	3,740	3,873	735.52	0.01	0.38	2.76	0.00	0.00
Structure Installation - Lattice - Guyed V Framing	PICKUP 3/4 TON	LHDT2	183	104	Diesel	25	8	8	64	11,712	6,656	735.52	0.01	0.38	8.63	0.00	0.00
Structure Installation - Lattice - Guyed V Framing	PICKUP 1 TON DIESEL	LHDT2	183	104	Diesel	25	8	4	30	5,411	3,075	858.53	0.01	0.01	4.66	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	PICKUP 3/4 TON	LHDT2	183	104	Gas	25	8	4	30	5,411	3,075	858.53	0.01	0.01	4.66	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	PICKUP WINCH TRUCK	LHDT2	183	104	Diesel	25	16	8	128	23,424	13,312	735.52	0.01	0.38	17.27	0.00	0.01
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 3/4 TON	LHDT2	183	104	Gas	25	18	4	67	12,175	6,919	858.53	0.01	0.01	10.47	0.00	0.00
Structure Installation - Monopole and Lattice - 4-Legged	PICKUP 1 TON DIESEL	HHDT	183	104	Diesel	15	6	8	48	8,784	4,992	735.52	0.01	0.38	6.47	0.00	0.00
Structure Installation - Spotting	Semi	HHDT	183	104	Diesel	15	6	8	48	8,784	4,992	735.52	0.01	0.38	6.47	0.00	0.00
Structure Installation - Spotting	PICKUP 1 TON DIESEL	LHDT2	183	104	Diesel	25	2	4	7	1,353	769	735.52	0.01	0.38	1.00	0.00	0.00
Structure Installation - Spotting	PICKUP 3/4 TON	LHDT2	183	104	Diesel	25	2	4	7	1,353	769	735.52	0.01	0.38	1.00	0.00	0.00
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	52	235	Diesel	15	12	8	96	4,992	22,560	1,892.88	0.00	0.40	9.47	0.00	0.00
Conductor and Wires Installation	SEMI - ON ROAD	HHDT	52	235	Diesel	15	12	8	96	4,992	22,560	1,892.88	0.00	0.40	9.47	0.00	0.00
Conductor and Wires Installation	SEMI - ON/OFF ROAD 6X6	HHDT	52	235	Diesel	15	8	8	64	3,328	15,040	1,892.88	0.00	0.40	6.31	0.00	0.00
Conductor and Wires Installation	PICKUP 1 TON DIESEL	LHDT2	52	235	Diesel	25	8	4	30	1,538	6,948	735.52	0.01	0.38	1.13	0.00	0.00
Conductor and Wires Installation	PICKUP 3/4 TON DIESEL	LHDT2	52	235	Gas	25	64	4	237	12,300	55,588	858.53	0.01	0.01	10.58	0.00	0.00
Conductor and Wires Installation	PICKUP WINCH TRUCK	LHDT2	52	235	Diesel	25	40	4	148	7,688	34,742	735.52	0.01	0.38	5.67	0.00	0.00
Civil Crew (Clean Up)	PICKUP 3/4 TON	LHDT2	-	211	Gas	25	4	4	15	-	-	858.53	0.01	0.01	-	-	-
Staging Areas	Worker	LHDT2	100	-	Gas	25	12	4	44	4,435	-	858.53	0.01	0.01	3.82	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Worker	LHDT2	235	131	Gas	25	16	4	59	13,897	7,747	858.53	0.01	0.01	11.96	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Worker	LHDT2	235	131	Gas	25	10	4	37	8,686	4,842	858.53	0.01	0.01	7.47	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Worker	LHDT2	210	78	Gas	25	42	4	155	32,599	12,108	858.53	0.01	0.01	28.05	0.00	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	Worker	LHDT2	253	262	Gas	25	20	4	74	18,702	19,367	858.53	0.01	0.01	16.09	0.00	0.00
Structure Installation - Lattice - Guyed V Framing	Worker	LHDT2	183	104	Gas	25	24	4	89	16,233	9,225	858.53	0.01	0.01	13.97	0.00	0.00
Structure Installation - Lattice - Guyed V Setting	Worker	LHDT2	183	104	Gas	25	40	4	148	27,055	15,375	858.53	0.01	0.01	23.28	0.00	0.00
Structure Installation - Monopole and Lattice - 4-Legged	Worker	LHDT2	183	104	Gas	25	24	4	89	16,233	9,225	858.53	0.01	0.01	13.97	0.00	0.00
Structure Installation - Spotting	Worker	LHDT2	183	104	Gas	25	10	4	37	6,764	3,844	858.53	0.01	0.01	5.82	0.00	0.00
Conductor and Wires Installation	Worker	LHDT2	52	235	Gas	25	32	4	118	6,150	27,794	858.53	0.01	0.01	5.29	0.00	0.00
Civil Crew (Clean Up)	Worker	LHDT2	-	211	Gas	25	20	4	74	-	15,597	858.53	0.01	0.01	-	-	-
Staging Areas	Hauling	HHDT	100	-	Diesel	15	2	8	16	1,600	-	1,892.88	0.00	0.40	3.03	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Hauling	HHDT	235	131	Diesel	15	2	8	16	3,760	2,096	1,892.88	0.00	0.40	7.13	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Hauling	HHDT	235	131	Diesel	15	2	8	16	3,760	2,096	1,892.88	0.00	0.40	7.13	0.00	0.00
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Hauling	HHDT	210	78	Diesel	15	2	8	16	3,360	1,248	1,892.88	0.00	0.40	6.37	0.00	0.00
Civil Crew (Road Maintenance, BMP's, Gates)	Hauling	HHDT	253	262	Diesel	15	7	8	59	14,856	15,384	1,892.88	0.00	0.40	28.18	0.00	0.01
Structure Installation - Lattice - Guyed V Framing	Hauling	HHDT	183	104	Diesel	15	12	8	96	17,568	9,984	1,892.88	0.00	0.40	33.32	0.00	0.01
Structure Installation - Lattice - Guyed V Setting	Hauling	HHDT	183	104	Diesel	15	12	8	96	17,568	9,984	1,892.88	0.00	0.40	33.32	0.00	0.01
Structure Installation - Monopole and Lattice - 4-Legged	Hauling	HHDT	183	104	Diesel	15	12	8	96	17,568	9,984	1,892.88	0.00	0.40	33.32	0.00	0.01
Structure Installation - Spotting	Hauling	HHDT	183	104	Diesel	15	12	8	96	17,568	9,984	1,892.88	0.00	0.40	33.32	0.00	0.01
Conductor and Wires Installation	Hauling	HHDT	52	235	Diesel	15	2	8	16	832	3,760	1,892.88	0.00	0.40	1.58	0.00	0.00
Civil Crew (Clean Up)	Hauling	HHDT	-	211	Diesel	15	2	8	16	-	3,376	1,892.88	0.00	0.40	-	-	-

Notes:
1. It was assumed that 40% of total trips would be on unpaved roads.
2. Hauling trips during the "Civil Crew (Road Work, Foundations, Ducts)" were based on 20,000 CY of material export and 16 CY per haul truck.
3. EMFAC 2021 emissions factors for 2029 were used for each year of construction (2029, 2030, and 2031). 25 mph speed was assumed for worker trips, while 15 mph speed assumed for hauling trips. Fuel type was provided to Rincon.
4. Emissions assume a 55% reduction in PM10, as watering twice a day for industrial unpaved roads is 55%. Additional measures that will further reduce PM10 include limiting the max speed to 25 mph (44% reduction) and applying chemical dust suppressants annually to unpaved parking areas (84% reduction).

% of roadways unpaved	40%	2029 MT/Year						2030 MT/Year		
		CO2	NH4	N2O	CO2	NH4	N2O	CO2	NH4	N2O
		Construction Phase								
		18.99	0.00	0.00	-	-	-	-	-	-
		23.57	0.00	0.00	13.14	0.00	0.00			
		17.59	0.00	0.00	9.81	0.00	0.00			
		63.19	0.00	0.00	23.47	0.00	0.00			
		47.03	0.00	0.01	48.70	0.00	0.01			
		60.58	0.00	0.01	34.43	0.00	0.01			
		78.52	0.00	0.02	44.62	0.00	0.01			
		64.24	0.00	0.01	36.51	0.00	0.01			
		47.61	0.00	0.01	27.06	0.00	0.01			
		49.50	0.00	0.01	223.71	0.00	0.04			
		-	-	-	22.51	0.00	0.00			

Helicopter Emissions - Annual

Helicopter Emissions		2029 MT/Year			2030 MT/Year		
Phase	Type	CO2	CH4	N2O	CO2	CH4	N2O
Staging Areas	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-
Staging Areas	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	1,340.23	-	-	761.66	-	-
Structure Installation - Lattice - Guyed V Framing	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-
Structure Installation - Spotting	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-
Structure Installation - Spotting	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-
Conductor and Wires Installation	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-
Conductor and Wires Installation	Bell 407/MD530F (Light Duty)	121.48	-	-	603.88	-	-
Civil Crew (Clean Up)	UH-60A Blackhawk/CH-47D Chinook (Heavy Duty)	-	-	-	-	-	-
Civil Crew (Clean Up)	Bell 407/MD530F (Light Duty)	-	-	-	-	-	-

Summary of Project Construction Total Annual Emissions

Construction Phase	Source	2029 MT/Year				2030 MT/Year			
		CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e
Staging Areas	Off-Road Equipment	104.12	0.00	0.00	104.47	-	-	-	-
Staging Areas	Dust from Material Movement	-	-	-	-	-	-	-	-
Staging Areas	On-Road Trip Exhaust (Paved)	10.54	0.00	0.00	11.91	-	-	-	-
Staging Areas	On-Road Trip Exhaust (Unpaved)	18.99	0.00	0.00	19.96	-	-	-	-
Staging Areas	On-Road Roadway Dust (Paved)	-	-	-	-	-	-	-	-
Staging Areas	On-Road Roadway Dust (Unpaved)	-	-	-	-	-	-	-	-
Staging Areas	Helicopter Use	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Off-Road Equipment	701.08	0.03	0.01	703.36	390.81	0.02	0.00	392.08
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Dust from Material Movement	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Trip Exhaust (Paved)	20.60	0.00	0.00	21.35	11.48	0.00	0.00	11.90
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Trip Exhaust (Unpaved)	23.57	0.00	0.00	24.09	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Roadway Dust (Paved)	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	On-Road Roadway Dust (Unpaved)	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Helicopter Use	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Off-Road Equipment	438.75	0.02	0.00	440.17	244.58	0.01	0.00	245.37
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Dust from Material Movement	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Trip Exhaust (Paved)	14.21	0.00	0.00	14.92	7.92	0.00	0.00	8.32
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Trip Exhaust (Unpaved)	17.59	0.00	0.00	18.09	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Roadway Dust (Paved)	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	On-Road Roadway Dust (Unpaved)	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Helicopter Use	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Off-Road Equipment	2,618.63	0.10	0.02	2,627.20	972.64	0.04	0.01	975.82
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Dust from Material Movement	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Trip Exhaust (Paved)	55.21	0.00	0.01	57.22	20.51	0.00	0.00	21.25
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Trip Exhaust (Unpaved)	63.19	0.00	0.00	64.58	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Roadway Dust (Paved)	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	On-Road Roadway Dust (Unpaved)	-	-	-	-	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Helicopter Use	-	-	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Off-Road Equipment	675.00	0.03	0.01	677.18	699.01	0.03	0.01	701.27
Civil Crew (Road Maintenance, BMP's, Gates)	Dust from Material Movement	-	-	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Trip Exhaust (Paved)	32.20	0.00	0.01	35.45	33.35	0.00	0.01	36.72
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Trip Exhaust (Unpaved)	47.03	0.00	0.01	49.29	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Roadway Dust (Paved)	-	-	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	On-Road Roadway Dust (Unpaved)	-	-	-	-	-	-	-	-
Civil Crew (Road Maintenance, BMP's, Gates)	Helicopter Use	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	Off-Road Equipment	61.97	0.00	0.00	62.17	35.22	0.00	0.00	35.33
Structure Installation - Lattice - Guyed V Framing	Dust from Material Movement	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	On-Road Trip Exhaust (Paved)	43.54	0.00	0.02	48.61	24.74	0.00	0.01	27.62
Structure Installation - Lattice - Guyed V Framing	On-Road Trip Exhaust (Unpaved)	60.58	0.00	0.01	64.07	34.43	0.00	0.01	36.41
Structure Installation - Lattice - Guyed V Framing	On-Road Roadway Dust (Paved)	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	On-Road Roadway Dust (Unpaved)	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Framing	Helicopter Use	1,340.23	-	-	1,340.23	761.66	-	-	761.66
Structure Installation - Lattice - Guyed V Setting	Off-Road Equipment	717.30	0.03	0.01	719.63	407.64	0.02	0.00	408.97
Structure Installation - Lattice - Guyed V Setting	Dust from Material Movement	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	On-Road Trip Exhaust (Paved)	62.94	0.00	0.02	70.05	35.77	0.00	0.01	39.81

Construction Phase	Source	2029 MT/Year				2030 MT/Year			
		CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e
Structure Installation - Lattice - Guyed V Setting	On-Road Trip Exhaust (Unpaved)	78.52	0.00	0.02	83.37	44.62	0.00	0.01	47.38
Structure Installation - Lattice - Guyed V Setting	On-Road Roadway Dust (Paved)	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	On-Road Roadway Dust (Unpaved)	-	-	-	-	-	-	-	-
Structure Installation - Lattice - Guyed V Setting	Helicopter Use	-	-	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	Off-Road Equipment	157.83	0.01	0.00	158.34	89.70	0.00	0.00	89.99
Structure Installation - Monopole and Lattice - 4-Legged	Dust from Material Movement	-	-	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Trip Exhaust (Paved)	47.39	0.00	0.02	52.00	26.93	0.00	0.01	29.55
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Trip Exhaust (Unpaved)	64.24	0.00	0.01	67.43	36.51	0.00	0.01	38.32
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Roadway Dust (Paved)	-	-	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	On-Road Roadway Dust (Unpaved)	-	-	-	-	-	-	-	-
Structure Installation - Monopole and Lattice - 4-Legged	Helicopter Use	-	-	-	-	-	-	-	-
Structure Installation - Spotting	Off-Road Equipment	76.15	0.00	0.00	76.39	43.27	0.00	0.00	43.41
Structure Installation - Spotting	Dust from Material Movement	-	-	-	-	-	-	-	-
Structure Installation - Spotting	On-Road Trip Exhaust (Paved)	29.68	0.00	0.02	34.63	16.87	0.00	0.01	19.68
Structure Installation - Spotting	On-Road Trip Exhaust (Unpaved)	47.61	0.00	0.01	51.02	27.06	0.00	0.01	29.00
Structure Installation - Spotting	On-Road Roadway Dust (Paved)	-	-	-	-	-	-	-	-
Structure Installation - Spotting	On-Road Roadway Dust (Unpaved)	-	-	-	-	-	-	-	-
Structure Installation - Spotting	Helicopter Use	-	-	-	-	-	-	-	-
Conductor and Wires Installation	Off-Road Equipment	1,063.73	0.04	0.01	1,067.18	4,807.23	0.19	0.04	4,822.85
Conductor and Wires Installation	Dust from Material Movement	-	-	-	-	-	-	-	-
Conductor and Wires Installation	On-Road Trip Exhaust (Paved)	35.83	0.00	0.01	39.88	161.92	0.00	0.06	180.24
Conductor and Wires Installation	On-Road Trip Exhaust (Unpaved)	49.50	0.00	0.01	52.30	223.71	0.00	0.04	236.34
Conductor and Wires Installation	On-Road Roadway Dust (Paved)	-	-	-	-	-	-	-	-
Conductor and Wires Installation	On-Road Roadway Dust (Unpaved)	-	-	-	-	-	-	-	-
Conductor and Wires Installation	Helicopter Use	121.48	-	-	121.48	603.88	-	-	603.88
Civil Crew (Clean Up)	Off-Road Equipment	-	-	-	-	152.44	0.01	0.00	152.93
Civil Crew (Clean Up)	Dust from Material Movement	-	-	-	-	-	-	-	-
Civil Crew (Clean Up)	On-Road Trip Exhaust (Paved)	-	-	-	-	19.93	0.00	0.00	20.61
Civil Crew (Clean Up)	On-Road Trip Exhaust (Unpaved)	-	-	-	-	22.51	0.00	0.00	22.98
Civil Crew (Clean Up)	On-Road Roadway Dust (Paved)	-	-	-	-	-	-	-	-
Civil Crew (Clean Up)	On-Road Roadway Dust (Unpaved)	-	-	-	-	-	-	-	-
Civil Crew (Clean Up)	Helicopter Use	-	-	-	-	-	-	-	-

Construction Phase	Source	CO2	2029 MT/Year			CO2e	2030 MT/Year						
			CH4	N2O	CO2e		CO2	CH4	N2O	CO2e			
Overall Project Emissions (California & Arizona)						2029 MT/Year				2030 MT/Year			
Construction Phase	Source	CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e				
Staging Areas	Total	134	0.0042	0.0087	136	-	-	-	-				
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Total	745	0.0281	0.0095	749	402	0.0156	0.0044	404				
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Total	471	0.0176	0.0073	473	253	0.0098	0.0032	254				
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Total	2,737	0.1055	0.0313	2,749	993	0.0390	0.0099	997				
Civil Crew (Road Maintenance, BMP's, Gates)	Total	754	0.0271	0.0236	762	732	0.0279	0.0166	738				
Structure Installation - Lattice - Guyed V Framing	Total	1,506	0.0029	0.0292	1,515	856	0.0017	0.0166	861				
Structure Installation - Lattice - Guyed V Setting	Total	859	0.0293	0.0455	873	488	0.0166	0.0259	496				
Structure Installation - Monopole and Lattice - 4-Legged	Total	269	0.0068	0.0273	278	153	0.0039	0.0155	158				
Structure Installation - Spotting	Total	153	0.0033	0.0286	162	87	0.0019	0.0162	92				
Conductor and Wires Installation	Total	1,271	0.0428	0.0310	1,281	5,797	0.1935	0.1400	5,843				
Civil Crew (Clean Up)	Total	-	-	-	-	195	0.0063	0.0050	197				
Total		8,978.03				10,040							

Project Emissions in Arizona		2029 MT/Year				2030 MT/Year			
Construction Phase	Source	CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e
Staging Areas	Total	9	0	0	10	-	-	-	-
Civil Crew (Road Work, Foundations, Ducts) - Flat Land Crew	Total	52	0	0	52	28	0	0	28
Civil Crew (Road Work, Foundations, Ducts) - Regular Crew	Total	33	0	0	33	18	0	0	18
Civil Crew (Road Work, Foundations, Ducts) - Foundation Crew	Total	192	0	0	192	70	0	0	70
Civil Crew (Road Maintenance, BMP's, Gates)	Total	53	0	0	53	51	0	0	52
Structure Installation - Lattice - Guyed V Framing	Total	105	0	0	106	60	0	0	60
Structure Installation - Lattice - Guyed V Setting	Total	60	0	0	61	34	0	0	35
Structure Installation - Monopole and Lattice - 4-Legged	Total	19	0	0	19	11	0	0	11
Structure Installation - Spotting	Total	11	0	0	11	6	0	0	6
Conductor and Wires Installation	Total	89	0	0	90	406	0	0	409
Civil Crew (Clean Up)	Total	-	-	-	-	14	0	0	14
Total		623	0.0187	0.0169	628.4620	697	0.0221	0.0177	702.7785
De Minimis Conformity Thresholds Exceed?									
Method Used to Estimate State Specific Construction Emissions									
The project proposes to develop a 80-85 mile transmission line from California to Arizona. The Arizona portion of Route 1 was measured using Google Earth; assuming the entire length of the project is 87 miles, this would result in 81 miles (93 percent) of construction occurring in California and 6 miles (7 percent) of transmission line construction occurring in Arizona.									
Sources: https://www.epa.gov/general-conformity/de-minimis-tables; Thresholds used for ozone and PM10 under the Arizona portion reflect that Yuma County, Arizona is currently in nonattainment for ozone and PM10.									

	Percent of total project
California miles	93%
Arizona miles	7%
Overall Project miles	100%