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February 4, 2013

Matt Huber, P.E.
Principle Engineer-Substations
8315 Century Park Ct. CP21G
San Diego, CA 92123-9517

Re: East County Substation Project Fire Protection Plan (8/24/2012)
East County Substation Project Construction Fire Prevention Plan (11/26/2012)

Dear Mr. Huber,

The San Diego County Fire Authority has reviewed both the East County Substation Project Fire Protection Plan dated August 24, 2012 and the East County Substation Project Construction Fire Prevention Plan dated November 26, 2012. Both of these documents are acceptable to the San Diego County Fire Authority and should be considered complete. These shall also be the working documents for the course of construction for the substation.

Please contact me directly if you have any questions. (858) 974-5925 or
ralph.steinhoff@sdcounty.ca.gov

Sincerely,

Ralph Steinhoff
Fire Services Coordinator
San Diego County Fire Authority



SAN DIEGO RURAL FIRE PROTECTION DISTRICT

November 7, 2012

Matt Huber, P.E.
Principle Engineer- Substations
8315 Century Park CT. CP21G
San Diego, CA 92123-9517

Re: East County Substation Fire Protection Plan (**August 24, 2012**)

Dear Mr. Huber,

The San Diego Rural Fire Protection District has reviewed the FPP for the ECO Substation dated August 24, 2012. This latest version is acceptable to the Fire District, and should be considered to be complete, and also be used as a working document for the life of the proposed substation. Please call me directly with any questions that you may have.

Sincerely,

David R. Nissen
Division Chief, San Diego Rural Fire protection District.



EAST COUNTY SUBSTATION PROJECT FIRE PROTECTION PLAN

August 24, 2012

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1. Executive Summary

This Fire Protection Plan (FPP) has been prepared by the San Diego Gas & Electric (SDG&E) East County (ECO) Substation Project. In compliance with Mitigation Measure FF-4: Customized Fire Protection Plan of the Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the ECO Substation Project. The plan addresses water supply, access (including access roads), structural ignitability and ignition resistant building features, fire protection systems and equipment, defensible space and vegetation management.

This project contains three components, which are located in the community of Jacumba, the community of Boulevard, and the areas between Jacumba and Boulevard. Refer to Appendix A for the Project Map. The components are:

- **ECO Substation:** A new 500/230/138kV electric substation to be constructed in a currently undeveloped area, elevation 3,169 feet above sea level, 0.5 miles south of Interstate 8 (I-8) and 4 miles east of the community of Jacumba; just north of the U.S. – Mexico border.
- **Boulevard Substation:** The existing Boulevard Substation, elevation 3,388 feet above sea level, off Old Highway 80, on Ozz Road, is about 12 miles from the ECO Substation site. Boulevard Substation will be rebuilt as a 138/68/12kV electric substation adjacent to the existing location on an approximately 8.5 acre site to the east.
- **Transmission Line:** The Project will construct one new 138 kV transmission line from the rebuilt Boulevard Substation in Boulevard to the new ECO Substation east of Jacumba, and (1) 500 kV transmission interconnect to the Southwest Powerlink (SWPL) at the ECO Substation. The total distance of the new 138 kV transmission line is approximately 14 miles with approximately 7.1 miles constructed overhead and 6.9 miles constructed underground.

The Project is in an extremely rural area. The ECO Substation property is currently vacant land. The transmission line ROW is currently vacant land. The overhead transmission line portion of the project is adjacent to the existing 500kV SWPL transmission line. There is an existing Boulevard Substation that will be rebuilt on an adjacent property to the east. There are various residential structures in the immediate vicinity of Boulevard Substation.

The ECO project will be constructed in areas of San Diego County which are determined to be moderate, high and very high Fire Hazard Severity Zones (FHSZ) per the FRAP maps. Refer to the map in Appendix D. There will be 0.5 miles in the Moderate FHSZ, 3.8 miles in the High FHSZ and 9.7 miles in the Very High FHSZ. The construction phase will involve multiple operations that can present a fire ignition risk. (The construction related ignition risks are addressed in the ECO Project Construction Fire Prevention/Protection Plan.) The existence of the overhead transmission lines post construction and the resulting maintenance activities will present some fire ignition risk for the life of the ECO project. The 7.1 mile overhead portion of the new 138kV line will be constructed through 0.3 miles in the Moderate FHSZ, 1.0 mile in the High FHSZ and 5.8 miles in the Very High FHSZ. The overhead portion of the line will be adjacent to the ROW for the existing Southwest Power Link (SWPL) 500kV transmission line

except for a 0.2 mile section that runs from the 500kV line to the new ECO substation. Substations present a risk of an onsite oil fire if a transformer failure occurs. The Boulevard Substation is located in Very High FHSZ. The ECO Substation is located on a boundary between High and Very High FHSZ

The ECO project will be in fire jurisdictional and land management responsibilities of the following departments or agencies: San Diego Rural Fire Protection District (RFPD), Bureau of Land management (BLM), and San Diego County Fire Authority (SDCFA). The fire protection for the BLM land is contracted to CALFIRE.

Responsible Fire District	Overhead [miles]	Underground [miles]	Total [miles]
RFPD	5.1	2.8	7.9
SDCFA	2.0	4.1	6.1
Total	7.1	6.9	14.0

The sites vary from flat to mild slopes. The vegetation on site at ECO Substation is considered semi-desert Chaparral. It appears to be a BEHAVE fuel model SH-2. It is observed to be about one foot high with some jackpots that are about five feet high. It has some spacing between vegetation, which results in broken continuity. The Boulevard Substation site, and the ROW in the area of Boulevard, in its current condition, has some shrubs around the property which are similar to BEHAVE SH-5 and FM-4 models but some of this will be removed during construction. Refer to site photos in Appendix C.

Vegetation along the 138 kV transmission line ROW is similar to that at the ECO Substation site, but changes and gets thicker as elevation increases (some heavy shrubs are found as elevation increases). There is some Red Shank and Chamise as it nears the Boulevard Substation. However, the new 138kV line will be constructed underground for approximately 4.1 miles between the Boulevard Substation and the existing 500kV transmission line ROW to the south. Vegetation around the Boulevard Substation is heavier than that at ECO Substation and includes Junipers, Red Shank, and Chamise. Overall, the vegetation in this project is relatively light with broken continuity. The estimated general flame lengths in a wind driven fall fire (worst case) are 17.5 feet in lighter fuels with the exception of some “jackpots” on the transmission ROW near and around Boulevard Substation. These would probably cause higher flame lengths in those locations. (Refer to the BEHAVE models in Section 3.c.)

2. Introduction

This Fire Protection Plan (FPP) has been prepared by the San Diego Gas & Electric (SDG&E) East County (ECO) Substation Project. In compliance with Mitigation Measure FF-4: Customized Fire Protection Plan of the Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the ECO Substation Project. The purpose of the FPP is to assess the potential wildland fire hazards and to identify fire protection measures that will be incorporated in the project design to reduce fire risks. The Technical Fire Report section of the plan provides detailed technical information regarding various proposed fire protection features.

The plan addresses water supply, access (including access roads), structural ignitability and ignition resistant building features, fire protection systems and equipment, defensible space and vegetation management.

a. Project Location:

This FPP is for the ECO Substation Project by SDG&E. This project contains three components, which are located in the community of Jacumba, the community of Boulevard, and the areas between Jacumba and Boulevard. Refer to Appendix A for the Project Map.

b. Environmental setting:

Location: The site of the ECO Substation is in the O'Neil Valley. The elevation is 3,169 feet above sea level. It is approximately four miles northeast of the community of Jacumba. It is approximately 2 miles southeast of the closest stick built structures. The State CALFIRE FRAP fire hazard classification maps classify this area as the boundary between the "High" and "Very High Fire Hazard Severity Zone". The 138 kV transmission line ROW is at elevations from 3,169' to 3,388' in areas of varying fuel load.

Topography: The average slope of the ECO Substation property is less than 15%. The ECO Substation pads will be substantially flat with a slight sloping. The ECO Substation is adjacent to a hill. There are no hills within the construction limits of the ECO Substation property. The slope on the 138 kV transmission line ROW varies from flat to 35% slopes. Boulevard Substation elevation is 3,388 feet above sea level and the slope is primarily flat.

Geology: The legal property access road to the ECO Substation will be a 30 foot wide paved road leading from Old Highway 80 into the ECO Substation. The transmission line ROW access roads are dirt. The Boulevard Substation will be flat and covered with dirt and gravel. Access is from a 25 foot wide paved driveway off of Old Highway 80.

Flammable Vegetation: The vegetation on site at ECO Substation is considered semi-desert Chaparral. It appears to be a BEHAVE fuel model SH-2. It is observed to be about

one foot high with some jackpots that are about five feet high. It has some spacing between vegetation, which results in broken continuity. The Boulevard Substation site, and the ROW in the area of Boulevard, in its current condition, has some shrubs around the property which are similar to BEHAVE SH-5 and FM-4 models but some of this will be removed during construction. Refer to site photos in Appendix C.

Vegetation along the 138 kV transmission line ROW is similar to that at the ECO Substation site, but changes and gets thicker as elevation increases (some heavy shrubs are found as elevation increases). There is some Red Shank and Chamise as it nears the Boulevard Substation. However, the new 138kV line will be constructed underground for approximately 4.1 miles between the Boulevard Substation and the existing 500kV transmission line ROW. Vegetation around the Boulevard Substation is heavier than that at ECO Substation and includes Junipers, Red Shank, and Chamise. Overall, the vegetation in this project is relatively light with broken continuity. The estimated general flame lengths in a wind driven fall fire (worst case) are 17.5 feet in lighter fuels with the exception of some “jackpots” on the transmission ROW near and around Boulevard Substation. These would probably cause higher flame lengths in those locations. (Refer to the BEHAVE models in Section 3.c and to photos in Appendix C.)

Climate: The temperatures in this area can reach an extreme maximum temperature between July and October. The maximum recorded temperature occurred in July, with a temperature of about 112 degrees Fahrenheit. The average maximum temperature in July-September was 92 degrees Fahrenheit in August. Winds can be estimated to be 50 mph at 20 feet for a fall fire, and 18 mph at 20 feet for a summer fire. Therefore, wind driven fires can occur in times when weather is hot and fuel moistures are low.

The ECO project will be constructed in areas of San Diego County which are determined to be moderate, high and very high Fire Hazard Severity Zones (FHSZ) per the FRAP maps. Refer to the map in Appendix D. There will be 0.5 miles in the Moderate FHSZ, 3.8 miles in the High FHSZ and 9.7 miles in the Very High FHSZ. The construction phase will involve multiple operations that can present a fire ignition risk. (The construction related ignition risks are addressed in the ECO Project Construction Fire Prevention/Protection Plan.) The existence of the overhead transmission lines post construction and the resulting maintenance activities will present some fire ignition risk for the life of the ECO project. The 7.1 mile overhead portion of the new 138kV line will be constructed through 0.3 miles in the Moderate FHSZ, 1.0 mile in the High FHSZ and 5.8 miles in the Very High FHSZ. The overhead portion of the line will be adjacent to the ROW for the existing Southwest Power Link (SWPL) 500kV transmission line except for a 0.3 mile section that runs from the 500kV line to the new ECO substation. Substations present a risk of an onsite oil fire if a transformer failure occurs. The Boulevard Substation is located in Very High FHSZ. The ECO Substation is located on a boundary between High and Very High FHSZ

The ECO project will be in fire jurisdictional and land management responsibilities of the following departments or agencies: San Diego Rural Fire Protection District (RFPD), Bureau of Land management (BLM), and San Diego County Fire Authority (SDCFA). The fire protection for the BLM land is contracted to CALFIRE.

Responsible Fire District	Overhead [miles]	Underground [miles]	Total [miles]
RFPD	5.1	2.8	7.9
SDCFA	2.0	4.1	6.1
Total	7.1	6.9	14.0

The sites vary from flat to mild slopes. The vegetation around ECO Substation is mainly semi desert chaparral BEHAVE model SH-2 with lack of continuity. The vegetation becomes somewhat thicker as elevation increases toward the Boulevard Substation. Flame length estimates are about 17.5 feet in a wind driven fall fire, with some heavier shrubs on ROW near Boulevard and around Boulevard Substation which would probably yield higher flame lengths based on the models (Refer to the BEHAVE models in Section 3.c).

c. **Project Description:**

The purpose of the Project is to provide an interconnection hub for renewable generation projects and to improve the electric reliability of Eastern San Diego County. The components are as follows:

- i. **ECO Substation:** A new 500/230/138kV electric substation to be constructed in a currently undeveloped area, elevation 3,169 feet above sea level, 0.5 miles south of Interstate 8 (I-8) and 4 miles east of the community of Jacumba; just north of the U.S. – Mexico border. (Lat: 32.629305/Long: -116.110777) The substation will be located on private land just south of Old Highway 80, 0.5 miles west of the Imperial County line and 0.5 miles north of the U.S- Mexico Border. The substation fence will enclose approximately 58 acres. There will be a 20-foot buffer around the perimeter of the substation and a permanent access road off of Old Highway 80. During construction of the ECO Substation there will be approximately 83.56 acres of permanent disturbance and 18.35 acres of temporary disturbance. SDG&E procured approximately 404 acres for the ECO Substation development. Refer to Appendix B for a site plan.
- ii. **Boulevard Substation:** The existing Boulevard Substation, elevation 3,388 feet above sea level, off Old Highway 80, on Ozz Road, is about 12 miles from the ECO Substation site. (Lat: 32.662149/Long:-116.272477) Boulevard Substation will be rebuilt as a 138/68/12kV electric substation adjacent to the existing location on an approximately 8.5 acre site to the east. The substation fence will enclose approximately 2.1 acres. There will be a 10- foot buffer around the perimeter of the substation and there will be a new permanent access road off of OLD Highway 80. During construction of the Boulevard Substation there will be approximately 3.2 acres of permanent disturbance and no temporary disturbance. Refer to Appendix B for a site plan and Appendix C for photos of the existing Boulevard Substation. The existing substation will

be dismantled when the new one is built. Existing single-family residences on large lots surround the current substation. There are no other structures surrounding the other project components.

- iii. **Transmission Line:** The Project will construct one new 138 kV transmission line from the rebuilt Boulevard Substation in Boulevard to the new ECO Substation east of Jacumba, and (1) 500 kV transmission interconnect to the Southwest Powerlink (SWPL) at the ECO Substation. The total distance of the new 138 kV transmission line is approximately 13.9 miles with approximately 7.1 miles constructed overhead and 6.9 miles constructed underground. (See Appendix A.) Approximately 6.8 miles of the overhead portion of the line will run generally east-west and be constructed adjacent to the existing Southwest Powerlink (SWPL) 500kV line. The remaining 0.3 miles of overhead construction will be from the new ECO Substation to the existing SWPL ROW. There will be 2 sections of underground line. An approximately 4.1 mile section of the power line will be placed underground from the rebuilt Boulevard Substation and run generally south to the SWPL ROW where it will connect to the overhead portion of the line. The second section of approximately 2.8 miles underground line will begin just west of where the Carrizo Gorge Road crosses the SWPL ROW and will follow the ROW of Carrizo Gorge Road and Old Highway 80 to a point near ECO Substation just east of where Old Highway 80 crosses the SWPL ROW. During construction of the 138kV transmission line there will be approximately 6 acres of permanent disturbance and 47 acres of temporary disturbance. The permanent right of way (ROW) being purchased for the approximately 7 miles of overhead construction will be 100 feet wide (approximately 85 acres). The permanent right of way (ROW) being purchased for the approximately 4.1 miles of underground construction near Boulevard will be 60 feet wide (approximately 30 acres). The approximately 2.8 mile underground portion construction following Carrizo Gorge Road and Old Highway 80 will be built mostly in a franchise position in the existing road ROW. A permanent easement (approximately 10.44 acres) will be obtained from the BLM for the portions of the Old Highway 80 ROW and approximately 0.1 miles east of Old Highway 80 on BLM land.

d. **Existing Land Use:**

The Project is in an extremely rural area. The ECO Substation property is currently vacant land. The transmission line ROW is currently vacant land. The overhead transmission line portion of the project is adjacent to the existing 500kV SWPL transmission line. There is an existing Boulevard Substation that will be rebuilt on an adjacent property to the east. There are various residential structures in the immediate vicinity of Boulevard Substation.

e. **Fire History:**

The following is a summary of the fires that have occurred in the last one hundred years within a 15-mile radius from the center point of the two substations:

Years (*)	Number of Fires	Total Acres Burned	Average Acres Burned/Fire
2001 to 2011	22	3,206	146
1991 to 2000	12	7,531	628
1981 to 1990	12	11,770	981
1971 to 1980	12	7,455	621
1961 to 1970	3	183,015	61,005
1951 to 1960	3	575	192
1941 to 1950	8	97,837	12,230
1931 to 1940	5	5,989	1,198
1921 to 1930	5	4,277	855
1911 to 1920	10	2,346	235
100 year totals	92	324,002	3,522

(*) Appendix E contains a list of the individual fire data including the CALFire causes.

The above data identifies that on average there have been 0.9 fires per year with average of 3,522 acres burned per fire. As identified in Appendix E, a single fire, and the 1970 Laguna Fire that burned 174,161 has a significant impact on the average fire size.

As noted in the BLM review of this plan, often there are more than one fire burning in southern California simultaneously that can create a "competition for resources" impacting available firefighting support and extends response time. Also during the most adverse weather conditions where the effectiveness of firefighters capabilities are reduced, aircraft and ground actions cannot always meet or exceed the fire's rate of spread.

f. **Project Permitting:**

The proposed project requires a Permit to Construct (PTC) from the California Public Utilities Commission (CPUC) in accordance with the CPUC's General Order No. 131-D Section III.B (GO 131-D), which contains the permitting requirements for the construction of transmission and power line facilities. The proposed project will also require a ROW Grant from the BLM in accordance with the Federal Land Policy and Management Act of 1976.

g. **Project Design and Maintenance Requirements:**

The CPUC has regulatory authority over SDG&E facilities. The proposed project will be designed and operated to be in compliance with the CPUC regulations. Project design will also comply with applicable NFPA standards and the California Fire Code. In addition, the facilities will be maintained in compliance with Public Resource Codes (PRC).

3. Provisions for Fire Safety and Prevention

a. **Fire Fuels Assessment:**

The fuels are primarily a moderate to high load dry climate shrub (desert chaparral type) fuel with broken continuity. The primary carrier of fire would be grasses, forbs, and shrub litter. Much of the fuel bed has broken continuity. (However as noted in the BLM review, in the broken continuity of these fuels, the likely carriers are grasses and forbs. These light flashy fuels offer less resistance to fire control efforts, yet, if improperly attacked, are a leading cause of wildland firefighter death and burn injuries.) There is some heavier vegetation (shrubs) as elevations increase on the ROW and in the vicinity of Boulevard Substation. The vegetation fire threat at a substation after fuel modification is implemented, as described Section 2.e of this document, is not catastrophic. (Refer to Fire Behavior Model Section 3.c below for anticipated fire behavior.) The substations, after development, should not present a catastrophic wildland fire threat based on the types of fuels present, fuel modification, built in fire protection safeguards and the fire history.

Fire can occur in the ROW. As discussed in the final EIR/EIS (page D.15-57), although the fire ignition risk of the project cannot be fully mitigated the design criteria that will be used for the 138kV overhead transmission line would reduce fire safety risks. (These design criteria include use of steel structures, inherent larger spacing of the 138kV conductors, consideration of potentially unusual structural loading, and installation of an overhead shield wire.) Only 7.1 miles of the 14 mile line will be constructed overhead. 6.8 miles of this overhead section will be adjacent to the existing 500kV overhead transmission line. The approximately 4.1 miles of transmission line from the rebuilt Boulevard Substation to the existing overhead line will be constructed underground. SDG&E will comply with all applicable state requirements for fuel modification in the ROW.

b. **Wildfire Risk Assessment:**

- As noted in the final EIR/EIS for the Project, substations and overhead transmission lines present an ongoing source of potential wildfire ignitions for the life of the project. Although the impact cannot be fully mitigated, the project design criteria and mitigation measures outlined in the final EIR/EIS reduce the likelihood of ignition and reduce the fire safety risks.

- The project should not result in inadequate emergency access due to proximity to the highway accessing the property.
- The estimated response driving time to the ECO Substation is about 7 minutes (4 road miles) from the RFPD Fire Station in Jacumba. (Depending on resource availability, the estimated arrival time of a second engine would be at least 18 minutes.) The estimated response driving time to the Boulevard Substation from the Boulevard Fire Station is about 2 minutes. The distance is about 1 mile. Response distances and times comply with the General Plan.

This project is in an isolated rural area. The proposed Sempra Generation transmission line terminates in the ECO substation. A power line from Tule Wind Farm Project terminates at Boulevard Substation.

The most likely threat of a significant on-site fire would be a transformer related oil fire. The potential sources of a fire at the substations including in a building, or along the transmission ROW, would be from one of the following:

- Electrical system malfunctions
- Transformers: Transformers generally contain the largest quantity of combustible material found in a substation.
- Transformer bushing failures.
- Transformer winding failures (this causes 60% of failures per FM Global)
- Cable tray, trough, or tunnel fires involving combustible cable.
- Fires involving capacitors.
- Spotting of airborne burning debris from an offsite, wind driven, vegetation fire onto a roof of a building or into an HVAC inlet, open smoke vent, through other building vents, or open door.
- Fire within an onsite building usually caused by electrical or heating system malfunction.
- Careless smoking.
- Lightning strikes.
- Vehicle fire on site.
- Arson/vandalism
- Welding or open flame during construction.
- Fire in exterior storage due to chemical reaction, carelessly discarded smoking material, arson, etc.
- There is a potential for a plane crash due to proximity of the airport. The development is east of the airfield in Jacumba off Old Highway 80.
- Offsite vegetation fire along right ROW.
- Downed power line on ROW igniting vegetation.

With the features proposed in this plan, any on site substation fire should not spread offsite and any offsite fire should not cause a fire on site in substations.

Vegetation Fire:

As the entire substation pads will be gravel surfaced and the CPUC mandated vegetation management along the transmission ROW, where allowed, the current vegetation fire hazard will be significantly reduced. As covered more specifically in Section 3.e, SDG&E will maintain the fire resistant elements of the project design including the fuel modification zones around the substations and the CPUC and PRC mandated vegetation management along the transmission line. Any vegetation fires at a substation should be easily controlled by the initial attack fire forces. Any vegetation fire should not originate in the fenced substation as the surface is gravel, so there is no vegetation fire to burn out of the substation. Any other type of fire in the substation will be contained either by the building, if it is in building, or by secondary containment around transformers. At ECO Substation, the transformers will be at least 100 feet from any vegetation or will have a 2-hour rated firewall installed between the transformer and the substation fence. Any fire starting outside the fence line would be probably due to shooters or off road vehicles and should not spread onto the substation pad. This type of vegetation fire risk exists now without any substation being present. Therefore, the substation should not increase any vegetation fire risk. The 100 foot of fuel modification required by this plan will be provided around buildings and equipment. In addition, at ECO Substation, a 20 foot gravel buffer, also serving as an emergency access road, will be provided around all sides of substation on the exterior of the fence.

At Boulevard Substation, transformers will be at least 50 feet from any vegetation or have a fire wall between the transformer and the vegetation. A 10-foot gravel buffer will be provided around the outside of the fence.

The vegetation on the ROW will be “cleared” out at tower/pole maintenance pads and new access roads, where not prohibited by environmental constraints. All applicable CPUC and PRC vegetation management requirements will be followed by SDG&E around the overhead power line.

A vegetation fire along the transmission line ROW would most likely be controlled by the initial attack fire forces utilizing engine companies or water tenders. The expected flame lengths would be approximately 17.5 feet or more in a worse case wind driven fall fire depending on location. (As noted by the BLM in their review of this plan, flame lengths greater than 8 feet require the fire engine based firefighters to be supported by firefighting aircraft in order to effectively knock down the fire. During extreme firefighting weather conditions competition for resources can severely affect availability and response times.) The fire would most likely start off the transmission line ROW and would be caused by shooters, off road vehicles or arsonists. This same potential exists now without any new transmission line ROW.

While the natural vegetation will be reduced, it will be important to control any vegetation, or required landscaping on the perimeter of the substations or substation access roads.

c. **Fire Behavior Models:**

Computerized Fire Behavior Models are not actually necessary for this project due to the fact that the moderate or high fire hazard determinations are not disputed and the requirement for 100 foot of Fuel Modification around any structures is not disputed.

BEHAVE fire spread models were generated at request of the Rural Fire Protection District and the San Diego County Fire Authority. The models required are for SH2, SH5, and Fuel Model 4. The Fire Agencies requested the models for fall Santa Ana wind driven fires. The following models are provided for summer and fall fires.

SH2 model: (moderate load dry climate shrub)

Summer Fire inputs:

1 hour fuel moisture: 2 %
10 hour fuel moisture: 2%
100 hour fuel moisture: 3%
Live woody Moisture: 75%
20 ft wind speed: 18 MPH
Air temperature: 102 degrees F

Outputs:

Rate of spread: 0.26 MPH
Flame length: 8.5 feet
Spotting distance in wind driven fire: 0.4 MPH

Fall Fire Inputs: (SH-2)

1 hour fuel moisture: 2%
10 hour fuel moisture: 2%
100 hour fuel moisture: 3%
Live woody moisture: 60%
20 ft wind speed: 50 MPH
Air temperature: 102 degrees F

Fall Fire outputs: (SH-2)

Rate of spread; 1.26 MPH
Flame length: 17.5 feet
Spotting distance in wind driven fire: 1.3 miles

SH 5 model: (high load dry climate shrub)

Summer fire inputs: (SH5)

1 hour and 10 hour fuel moisture: 2%
Live woody moisture: 75%
20 ft wind speed: 18 mph
Air temperature: 102 degrees F

Summer fire outputs (SH 5)

Rate of spread: 2.05 MPH
Flame Length: 24.5 feet
Spotting distance in wind driven fire: 0.8 miles

Fall Fire Inputs (SH5)

1 and 10 hour fuel moisture: 2%
Live woody moisture; 60%
20-foot wind speed: 50 mph
Air temp: 102 degrees F

Fall Fire outputs (SH5)

Rate of spread: 8.10 MPH
Flame length: 46.8 feet
Spotting distance in wind driven fire: 2.5 miles

Fuel Model 4 (chaparral)

Summer Fire inputs:

1 and 10 hour fuel moisture: 2%
100 hour fuel moisture: 3%
Live woody moisture: 75%
20 ft wind speed: 18 MPH
Air temperature: 102 degrees F

Summer Fire outputs (FM 4):

Rate of spread: 3.26 MPH
Flame length: 38.4 feet
Spotting distance in wind driven fire: 1.1 miles

Fall Fire inputs (FM-4):

1 and 10 hour fuel moisture: 2%
100 hour fuel moisture: 3%
Live woody moisture: 60%
20 ft wind speed: 50 MPH
Air temperature: 102 degrees F

Fall Fire Outputs (FM-4)

Rate of spread: 15.9 MPH
Flame length: 80.6 feet
Spotting distance in wind driven fire: 3.7 miles

Therefore, the worst-case fire behavior is in Fuel Model 4 fuels in a fall fire. Fall fires in SH-5 and FM-4 would result in an extended attack fire.

Portions of the transmission line ROW, in the current condition, would appear to be similar to the SH-2 BEHAVE model vegetation around ECO Substation. Vegetation does get thicker as elevation increases on the transmission line ROW. There are some shrubs in various locations along the ROW near Boulevard and around Boulevard Substation. (However the new 138kV transmission line will be constructed underground for an approximately 4.1 mile section between the Boulevard Substation and the existing 500kV transmission line ROW.) The shrubs could create “jackpots” with potentially high flame lengths during a vegetation fire. That vegetation is similar in places to BEHAVE fuel model SH-5 and Fuel Model 4, very high load dry climate shrub, and chaparral. A fire in summer 2011 in the area of ECO substation was reported to have flame lengths of about 10 feet. A summer fire on the mountain east of ECO substation reportedly had flame lengths of 4-6 feet.

The fire behavior within this project is not expected to be catastrophic. This is validated based on the fire history in the past 100 years. (Refer to Section 2.e) The average size fire was 3,522 acres which is an extended attack fire but is controllable once all responding resources arrive on scene. There is always a risk of a major wildland fire occurring under the right conditions in any wildland area whether or not there is development. Depending on location and available resources, even small fires have the potential to consume several homes to several hundred homes and pose a significant life safety threat, along with a potential regional draw down of available fire resources. The potential for such a fire being ignited by equipment in this project is a low probability due to the type of equipment proposed for this project and the design features being incorporated.

d. **Site Security and Access:**

The two SDG&E substation facilities included in this project will be surrounded with an eight foot high chain link fence topped with barbed wire. In addition, an intrusion alarm system will be installed that is monitored at SDG&E’s Operation Center. Access to the substation is limited to Qualified Electrical Workers (QEW) that have undergone specific

SDG&E training and are included on the access list contained at the Operation Center. Prior to anyone entering these substations, the authorized individual must contact the Operation Center by Company radio or cell phone to have the alarm turned off. Only authorized individuals will be issued the necessary key to unlock the gates at the substations. When authorized individuals are inside the substation the gates must remain locked. In addition, these stations will have a live video feed from the facilities that will allow SDG&E security personnel to remotely inspect the yard for fires, unusual activities or verify who has accessed the facility.

For these safety reasons, SDG&E will not provide Knox locks on the substation security gates or on the control or maintenance shelters. If a gate is installed on the private access road to the substations, SDG&E will install a Knox lock on that gate to provide firefighters access to the areas outside the security fence and to the water tanks.

e. **Fuel Modification Plan:**

All vegetation will be removed from the substation pads and be replaced with a gravel surface that will extend beyond the perimeter security fence. The control and maintenance shelters at the substations will be surrounded by gravel and will have fuel modification beyond the pads where necessary to provide the required 100 feet of fuel modification. All vegetation will be removed a minimum of 50 foot from transformers and oil filled equipment and replaced with weed free gravel. Fuel modification will be maintained in a 100 foot zone from that equipment and from the control/maintenance shelters. In this fuel modification area, beyond the graveled 50 feet, all dead vegetation will be removed and tree limbs will be removed from the bottom third of the tree height or 6 feet above the ground whichever is less. During the final design of the substations a revised landscape plan will be prepared that would attempt to avoid the planting of the highly flammable plants discussed in Section 3.f below in the fuel modification zone. However, the revised landscaping plans and revegetation plans will be reviewed by the CPUC and resource agencies and they will have the final decision on the planting material.

An emergency generator(s) is planned at ECO Substation. The fuel type for the generators has not been finalized but the diesel or LPG tank would be located at least 30 feet from any vegetation. No emergency generator or fuel tanks are planned at Boulevard Substation.

The substation access roads will be maintained as fire access roads. There shall not be closed vegetation canopies over fire access roads. Any CPUC required trees shall be planted 10 feet from edge of road to center of tree trunk. They will be maintained in compliance with this plan by SDG&E. Erosion control and soil stability must be provided.

The landscaping and re-vegetation associated with this project will use drought tolerant, ignition resistive, native plants that will result in a natural appearance without the need for long-term irrigation. For the substation areas, short-term irrigation is planned to support the establishment of the native plants and to protect them from natural drought conditions until they become established. In other areas hydro seeding supported by natural rainfall is planned. Ongoing maintenance of the defensible space areas defined in this plan is anticipated so that onsite vegetation, including all slopes will be maintained in a fire safe condition. This includes weeding, pruning, and limbing. Vegetation management in the defensible space areas will be done at least annually before the start of the high-risk fire period and more often as needed to maintain fire safety. SDG&E will utilize its existing staff and procedures to manage the maintenance of the substation graveled areas and defensible space. Mature trees should be limbed up 1/3 height or 6 feet from adjacent ground, whichever is less. They should not have any flammable, non-fire resistive, vegetation under them and maintain adequate separation above any groundcover. There will not be any tree limbs or canopies within 10 feet of a building.

Defensible space areas and vegetation management requirements will be documented on landscape plans. The SDG&E Fire Coordinators will follow existing SDG&E procedures to coordinate with the substation landscape maintenance personnel to maintain the defensible space around the substations. SDG&E will be responsible for maintaining defensible space on SDG&E owned property. The responsible Fire District shall enforce all vegetation management requirements, and structural protection requirements on all private property, and assure vegetation management requirements are met.

Vegetation in the transmission ROW will be removed at pole maintenance pads and new access roads. Vegetation will be trimmed where required to maintain CPUC mandated clearances from the power lines.

The PRC, Sections 4292 and 4293, require a 10 foot vegetation free zone from around the base of poles (or towers) that contain certain types of equipment and 10 feet between vegetation and wires. However, it is anticipated that the 138 kV transmission line will not have any of the equipment that would require vegetation removal at the base of the poles. The vegetation clearance to the wires will be maintained.

These PRC requirements are explained in detail in the California State Fire Marshal Power Line Fire Prevention Field Guide, dated October, 2008, (<http://cdfdata.fire.ca.gov/pub/fireplan/fpupload/fppguidepdf126.pdf>) and co-authored by Sempra Energy, SDGE, and other power companies. The requirements in this guide, along with any additional requirements of the CPUC, PRC, or fire agencies, will be complied with, as and where applicable to this line, through SDG&E's existing vegetation management program. Applicable sections of CPUC GO-95 will also be complied with.

Fuel modification cannot be done on private property without property owner approval or in any areas where it is prohibited by the CPUC or resource agencies due to sensitive habitat or vegetation, archeological sites, etc.

SDG&E will follow the requirements of the Natural Communities Conservation Plan (NCCP) (an agreement between SDG&E, the US Fish & Wildlife Service, and the California Department of Fish & Game) for doing vegetation management during the operation of this project.

f. Proposed Prohibited Plants for Revegetation:

Certain vegetation is considered to be undesirable due to characteristics that make them highly flammable. These characteristics can be physical or chemical. Physical properties that contribute to high flammability include large amounts of dead material retained within the vegetation, rough or peeling bark, and the production of large amounts of litter. Chemical properties include presence of oils, resins, wax, and pitch. The following list of plants should not be used for revegetation in the fuel modification zones around the substations, where feasible: acacia, eucalyptus, palm, juniper, pepper, olive, bottlebrush, cypress, conifer, cedar or pampas grass. No chaparral, sage, including purple sage, chamise, salvia spp, coastal sage scrub, sagebrush, California buckwheat, red shank, or manzanita. However, areas of temporary disturbance are required to be restored in accordance to Mitigation Measure BIO-1d contained in the final EIR/EIS. This mitigation measure in part requires revegetation using species native to the surrounding areas. The BLM and CPUC will have final approval of the plantings used for habitat restoration.

g. Existing Emergency Services:

Emergency response for ECO Substation will be provided by the RFPD from its Station 43 in Jacumba, and emergency response for Boulevard Substation will be provided by the Boulevard Fire Station. Both fire station crews and apparatus will respond to fires at either substation or on the ROW. Please refer to the table below for equipment and staffing at these two facilities. The estimated response driving time to the ECO Substation site is approximately 7 minutes from Station 43. The distance from this facility is approximately 4 miles. (Depending on resource availability, the estimated arrival time of a second engine would be at least 18 minutes.) The estimated response driving time to the Boulevard Substation from the Boulevard Fire Station is approximately 2 minutes and the distance is approximately 1 mile. In addition, response is also available via an Automatic Aid Agreement, from the fire stations listed below. Fire Stations are located as follows:

Station/ Fire Department	Apparatus	staffing
RFPD Station 43, Jacumba	One 1000 GPM type 2 engine, one 2200 gallon tender	2 stipend firefighters
Boulevard Station	Type 1, 2, 3 and water tender	2 or 3 stipend firefighters
CALFIRE; White Star/Campo*	In season: 1 type 3 (White Star) 2 Type 3, and dozer at Campo.	3 firefighters at each station. Could be reduced to 2. One BC.
Campo Fire Department	One Type 3 engine or tender	Two stipend firefighters
Campo Indian Reservation FD	One Type 3 engine & one aerial ladder truck; cross staffed	Varies daily
Lake Morena Fire Station (RFPD)	One Type 2 engine, water tender, medium rescue truck	Two career and one stipend firefighter
BLM	None	1 BLM Battalion Chief/Agency Representative
USFS; Cottonwood and Glenciff Fire Stations	Two engines	4-5 firefighters per company; seasonal only
<u>USFS Cameron Fire Station</u>	Type 3 engine. Type 1 helicopter planned for 2014 .	4-5 firefighters per company; seasonal only

- State of California reports they will only staff 5 engine companies in the San Diego Unit during winter 2011-2012, plus some Amador plan engines.
- This table was updated per information from the RFPD in October 2011. it is subject to change.
- The USFS Fire stations have seasonal staffing with daily hours that vary from 0930-1800 in Summer/Fall and reduced staffing from 0800-1630 in Winter/Spring.

In addition, numerous other resources are available upon request through the County Mutual Aid system and from CALFIRE statewide. However, these resources would only be able to respond if available and would have an extended time of arrival.

The RFPD has requested that portions of the Cal Fire Wildland Fire standards be noted in this plan. The following standard Rates of Production apply to a seasoned three person engine company.

- For hoselays less than 600 feet, a well trained engine crew, with pre-connects (150 foot of pre-connect line to the apparatus) can lay 50 feet of hose per minute.
- Account for 5 minutes per 100 feet of an “extended hoselay” (hoselays greater than 600 feet); this accounts for broken hose, fatigue, topography, fuel type, etc.
- Assign a minimum of 3 engines with 8 to 10 personnel to an extended hoselay. Water Shuttle Turn-Around Times, to supply hose lay:
- Studies have determined fire engine travel times to be 2 minutes per mile on a good road, 4 minutes per mile on a poorly maintained road and 15 minutes to refill the 500 gallon tank.

h. SDG&E Emergency Response:

SDG&E’s Operation Center is manned 24 hours a day/ 7 days a week. Maintenance personnel are also on duty 24/7 to respond to electric and gas facility issues. SDG&E Fire Coordinators are on call 24/7 to respond to fire issues related to SDG&E facilities. In addition, SDG&E opens its Emergency Operations Center for major emergencies to facilitate coordination of emergency response with outside agencies. 911 will be called without delay by SDG&E once a fire is discovered. The call would be made by the dispatcher at SDG&E’s Operation Center. These dispatchers are in radio contact with field personnel. In addition, field personnel are equipped with cell phones and the substations will equipped with telephones if there are problems with the radio communications.

SDG&E has a robust Fire Safety & Prevention Program for all of its operations and maintenance work. It provides a comprehensive set of directions for SDG&E employees and contractors to implement when performing work in the wildland areas of the service territory with regard to fire safety and fire prevention.

i. Emergency Drill Participation:

SDG&E’s Emergency Operations Center has developed relationships with the County and emergency first responders including fire districts and law enforcement throughout the service territory. SDG&E conducts internal emergency drills and training as well as coordinates joint training drills with outside agencies.

For fire preparedness, SDG&E has a written “SDG&E Substation, Pre-Emergency Response Plan” and a DVD that are issued to most fire departments that would respond to SDG&E substation facilities to support their training efforts. In addition, SDG&E conducts electric safety training with many fire departments and law enforcement agencies in the service territory. SDG&E has a goal to repeat the training every three

years for those groups interested in the training and will do it more frequently upon request.

j. **Emergency Evacuation Plan:**

SDG&E prepares a Hazardous Material Business Plan for every substation. This plan is filed with the County and includes a section on emergency evacuation that would provide employees the necessary emergency evacuation information.

4. **Technical Fire Report:**

a. **Water Supply:**

The onsite fire water system at the ECO Substation will be a private stored water tank provided by SDG&E. The purpose is to provide a water supply to fire engines for vegetation fires or to produce firefighting foam for an oil fire. In addition, the tank will provide water for the irrigation of landscaping material around the substation.

The fire consultant estimated the required fire water flow at either substation in the event of a vegetation fire at 360 GPM for 60 minutes (21,600 gallons). The estimated needed fire water flow for an oil fire in a secondary containment dike at a transformer is 250 GPM for 15 minutes (3750 gallons) after initial use of a fire truck 500 gpm deck gun or portable monitor for an estimated 15 minutes (7,500 gallons). It is recommended that twice this amount of water be available for a potential oil fire (15,000 gallons). The capacity of the ECO Substation water tank is proposed to be 120,000 gallons which will exceed 15,000 gallons for water supply requirement for fire engines making foam or the 21,600 gallons requirement for fighting a vegetation fire. In addition, SDG&E is proposing a 15,000 gallon water tank for fire suppression support at the rebuilt Boulevard Substation. SDG&E will coordinate with the fire agencies to assure compatible connections to the water tanks.

b. **Firefighting foam:**

Firefighting foam application for an oil fire: Typically 3% AFFF concentrate is used and the application rate is 0.16 GPM/sq ft for 15 minutes from a handline and/ or a fire truck deck gun or monitor. The conceptual flow rate for a handline is 250 GPM. That amounts to 3750 gallons of water plus 112.5 gallons of 3% foam concentrate. A minimum of 15,000 gallons of water would be available for fire engine and foam making use at each substation.

SDG&E will transport a foam support trailer, described in Section 4.j, that can be connected to the responding fire departments equipment to apply dry chemical or foam on an oil fire. SDG&E will transport the trailer to the substation if there is an oil fire.

c. **Typical Firefighting Water Requirements:**

- It is estimated the needed fire water flow at either substation in the event of a vegetation fire is 360 GPM for 60 minutes (21,600 gallons).
- For habitable structures in wildland fire areas in San Diego County, that are not covered by municipal fire hydrants, a 10,000-gallon water tank is required if the building is over 1500 square feet. Fire flow from the tank to a fire engine connected to it is required to be 250 GPM for 40 minutes.

d. **Fire Suppression/Detection Systems**

As discussed more fully in the security section of this report, the substations are secured facilities where access is strictly limited to only qualified electrical workers (QEW) that have undergone specific SDG&E procedural training. The substations are unmanned facilities. There are no office facilities at the substations. The stations are remotely monitored and operated from the SDG&E Operating Center located in the City of San Diego. Personnel will travel to the substations to perform periodic inspections, perform manual switching operations and conduct equipment maintenance. No personnel will be stationed at the substations.

The inherent design of a substation continuously monitors the power equipment contained in the substation and will automatically de-energize equipment that has failed. In addition, major equipment such as transformers and breakers are continuously monitored to alarm for issues that potentially could result in equipment failures. Automatic switching events and alarms are instantaneously reported to the SDG&E Operating Center that is manned 24/7. In addition, for these substations, live video feeds of the yards are monitored at the Operating Center. A fire involving equipment in the substation should be detected quickly by the SDG&E operators and appropriate emergency notifications would be made.

SDG&E has evaluated the use of automatic deluge systems in the past for large transformer installations, it has been determined that for unmanned facilities they are not practical. System components can degrade over time and must be tested and maintained regularly. The potential for system malfunction is high due to the complexity and also due to the need for a fire pump and water system. Therefore, deluge systems are not being considered by SDG&E for this project.

e. **Secondary Containment**

There will be a separate concrete oil containment pit under each transformer unit. To size the containment pits, SDG&E will follow the 2005 Spill Prevention Control and Countermeasure (SPCC) Federal Guidelines to size the pit to contain 110% of the total volume of oil in the transformer. A petro-pipe system is used in the containment wall to drain rain water out of the containment as long as no oil is present. The physical size of

the containment cannot be finalized until the transformers to be used are identified and the exact base dimensions and oil volume is finalized. The following table lists the transformers and approximate oil quantities for each substation.

Substation	Transf. Description	Number of Transf.	Approx. Gallons Oil/Transf.	Total Gallons of Oil
ECO	500/230kV, single phase	4	28,111	112,444
	230/138kV, three phase	1	21,331	21,331
Total				133,775
Boulevard	138/69kV, three phase	1	17,000	17,000
	138/12kV, three phase	1	7,000	7,000
Total				24,000

During the routine substation inspections, the transformers and containment pits are visually checked to determine if there are any oil leaks. In addition, an alarm will be transmitted to the SDG&E Operation Center if there is a significant drop of oil levels in any of the power transformers that might be the result of an oil leak.

f. **Transformer Fire Walls:**

Transformers will be separated from each other and from buildings by 50 feet or they will have a 2-hour rated firewall between them. An “Intelli” or equivalent fire wall may be used.

g. **Building Construction**

ECO Substation will have two, single story, control shelters (each approximately 3,800 square feet) and one, single story, maintenance shelter that is approximately 800 square feet. The shelters at ECO are several hundred feet apart. The smaller Boulevard Substation will have one single story control shelter that is approximately 1,600 square feet. The control shelters are divided into 3 separate rooms that are only accessible from the outside. The larger room contains the relay and control equipment. The two smaller rooms contain the storage batteries required to power the relay and control equipment. The maintenance shelter will have no interior partitions. To provide an acceptable environment for the relay and control electronics, the relay and control equipment room will have two or more thermostatically controlled self-contained HVAC units that are hung on the exterior of the building. The battery rooms and the maintenance shelter will have exhaust fans to keep concentration of hydrogen gas below flammability limits.

The substation control and maintenance shelters will use concrete masonry units (CMU) block construction for the interior and exterior walls, the floor is an on grade concrete slab, the roof will have a metal deck covered with composite panels (no attic and no soffit vents) meeting NFPA256/UL790 Class A rating. The shelters will not have exterior glazing or skylights. The shelters will meet State Building Code Wildland Urban Interface (WUI) requirements for ignition resistant or non-combustible construction. There will be a limited amount of combustible materials contained in the shelters and all the electrical equipment contained in the shelter has overload protection. Therefore, it is very unlikely to have a fire start in the control or maintenance shelter and reach a point where it will cause structural failure or allow the fire to go beyond the shelter. Due to the electrical equipment contained in the control shelters, a water sprinkler system would not be acceptable.

h. Emergency Shutdown Provisions

Emergency Shut Down Provisions: SDG&E Inspectors, Troublemens and Fire Coordinators in the field coordinate with the SDG&E Operation Center and/or the Emergency Operations Center (if it has been activated for a major emergency) to identify field issues and to make recommendations when it is necessary to de-energize facilities for safety reasons.

i. Access Roads

Access Roads (widths and surfacing): Main access to both substations is via Old Highway 80, which can be accessed from Interstate 8, and from Jacumba and Boulevard. Access roads to the substations will be designed to meet a American Association of State & Highway Transportation Officials (AASHTO) H-20 vehicle loading criterion which is the same criteria used to design public roads in California. Therefore these roads should be suitable for any fire department vehicles that are licensed in California.

The ECO Substation access road from the County road to the substation fence will be a minimum of 30 feet wide. The Boulevard Substation access road from the County road to the substation fence will be a minimum of 25 feet wide. All roadways will have asphalt concrete paving. The minimum turning radius will be 75 feet. The maximum allowed road grade is 12%. A 20 foot wide gravel access area will be provided around the outside of the entire ECO Substation security fence as part of the defensible space and for fire truck emergency access. Since Boulevard is a much smaller installation, a 10 foot wide gravel access area will be provided around the outside of the substation fence as part of the defensible space and to provide firefighters foot access. Designated drive aisles inside the substations will be have a minimum 20 foot wide asphalt concrete paved width. The drive aisles will provide access to the control and maintenance shelters and power transformers. Vertical clearance over the substation access roads will be at least 16 feet with no vegetative canopies over them. Any power lines crossing a substation access road will meet the CPUC GO-95 vertical clearance requirements which is 17 feet or greater depending on operating voltage.

The transmission line ROW access roads are dirt surfaced and have an average width of 14 feet. These roads are not designed to be fire access roads.

j. **Portable Fire Extinguishers**

Since all SDG&E substations are unmanned facilities with highly restrictive access, SDG&E has a standard practice on relying on fire extinguishers carried on all Company vehicles if extinguishers are needed while personnel are at a substation.

SDG&E will have equipment available for the responsible fire agencies to provide them Class B foam capabilities and/or Dry Chemical in large enough quantities to extinguish potential transformer fires. This will be on a portable trailer w/foam, dry chemical, monitor, handline capability, hose, and associated equipment that can be connected to the responding fire departments equipment. This trailer would be transported to the substation by SDG&E in the case of an oil fire. This equipment is intended to serve multiple SDG&E substations.

k. **Site Security and Access**

For the personal safety of the fire fighters or other emergency responders, no one is allowed access in an SDG&E substation until after a qualified SDG&E employee has arrived at the substation and determined that the areas where the responders need to traverse are safe. This may require de-energizing parts of or the entire substation. If the fire department arrives before the qualified SDG&E employee, they are expected to wait outside the security gate and attempt to prevent the fire from spreading outside the substation facility until they have been contacted by the qualified SDG&E employee and it is mutually agreed that it is safe to enter the substation facility. An Emergency Response Procedures sign will be affixed to the substation access gates reminding emergency responders not to enter the substation until a qualified SDG&E employee assures them it is safe to enter

l. **Diesel Fuel and LPG for emergency generator at ECO substation:**

Diesel fuel and/or LPG tanks serving the emergency generator to be located outside. Tanks and piping to be protected by approved crash posts. LPG or diesel tanks shall be located a safe distance away from buildings and transformers and be properly anchored and be protected against earthquake damage. Diesel tanks shall be UL listed for combustible liquids and be double walled or have spill control.

m. **Lightning Protection:**

All applicable equipment in substations and all power line towers in substations and on ROW will have lightning protection as specified by SDG&E standards and applicable industry standards.

n. **Tower Markings and Lights:**

Power line towers shall have markings and lighting as required by the FAA.

o. **Emergency Response by SDG&E and Notification of 911:**

911 will be called without delay as soon as a fire is discovered or reported to SDG&E. The call would be made by the dispatcher at SDG&E's Operation Center. SDG&E has Response Teams on call 24/7 to respond to emergencies at the Substations or on the ROW. These teams serve as "Technical Specialists" within the on-scene Incident Command System and will report to the Incident Commander. They will provide all requested technical information, MSDS sheets, maps, and other information as requested and will coordinate with SDG&E operating personnel to assure that the appropriate equipment is de-energized as required to address the incident. The SDG&E teams will also arrange for SDG&E to deliver the foam support trailer to the fire scene if required. Under normal conditions, response time is estimated to be 1-2 hours depending on time of day and location of the trailer.

p. **24 hour Contact Numbers Posted**

24 hour emergency contact number will be posted on the fence at the main gate of each substation. The phone number will be answered at the Security Office at the SDG&E Operation Center.

q. **Summary of Fire Safety Design Considerations:**

Substation Access Roads: At ECO Substation the access road from Old Highway 80 to the substation will be 30 feet wide with asphalt concrete paving. The minimum turning radius will be 75 feet and the maximum allow grade is 12%. Provisions will be made to allow turning a fire truck around outside of the substation fence. At Boulevard Substation, the access road from Old Highway80 to the substation will be 25 feet wide with asphalt concrete paving. The minimum turning radius will be 75 feet and the maximum allow grade is 12%. The Boulevard access road is less than 150 feet in length. Access aisles inside the security fences will be a minimum of 20 feet wide with asphalt concrete paving. Access roads to the substations will be designed to meet the American Association of State & Highway Transportation Officials (AASHTO) H-20 vehicle loading criterion which is the same criteria used to design public roads in California. Therefore these roads should be suitable for any fire department vehicles that are licensed for use in California.

Equipment Shelters: ECO Substation will have two control shelters and one maintenance shelter. Boulevard Substation will have one control shelter. The walls of the shelters will be constructed of concrete masonry units (CMU). The roof will be a modified-bitumen roofing system meeting NFPA256/UL790 Class A constructed on an 18 gage galvanized roofing deck (with no attic or soffit vents). The floor will be an on-grade, reinforced concrete slab. The doors will have 18 gage steel faces with no glazing and be equipped with self-closing devices and panic bars. The shelters will not have any windows or sky lights. All cable troughs and ducts that enter the control shelters will be sealed with fire retardant foam. Structures will comply with State Building Code WUI construction requirements.

Power Transformers: At ECO Substation, each transformer will have an individual, concrete, oil containment pit. There will be a minimum of 50-foot clearance between the adjacent transformer, or any building, and the edge of the oil containment structure or a 2 hour rated fire wall will be placed between the adjacent units. There will be a minimum of 100-foot clearance from the edge of the oil containment pit and any vegetation or a fire wall will be installed between the containment pit and the vegetation. At the smaller Boulevard Substation, each transformer will have an individual, concrete, oil containment pit. There will be a minimum of 50 ft clearance from the edge of the oil containment pit and any vegetation or a 2 hour rated fire wall will be installed between the containment pit and the vegetation.

Defensible Space of Substations: Both substations will have a crushed rock surface that will be maintained free of vegetation. The security fences will be constructed of galvanized steel chain link fabric. These substations, which are located in wildland fire areas, will be inspected at least annually to assure the defensible space around oil filled equipment and the control and maintenance shelters is maintained. A minimum of 50 feet from this equipment will be maintained vegetation free and a minimum of a 100-foot fuel modification zone will be maintained from the equipment and buildings. For both of these substations, SDG&E will own the property in the 100-foot fuel modification zones.

Water Detention Basins: Based on the final grading design, the water detention basins required near the substations for this project will either be concrete lined or designed to facilitate vegetation management where required to maintain the defensible space as discussed above.

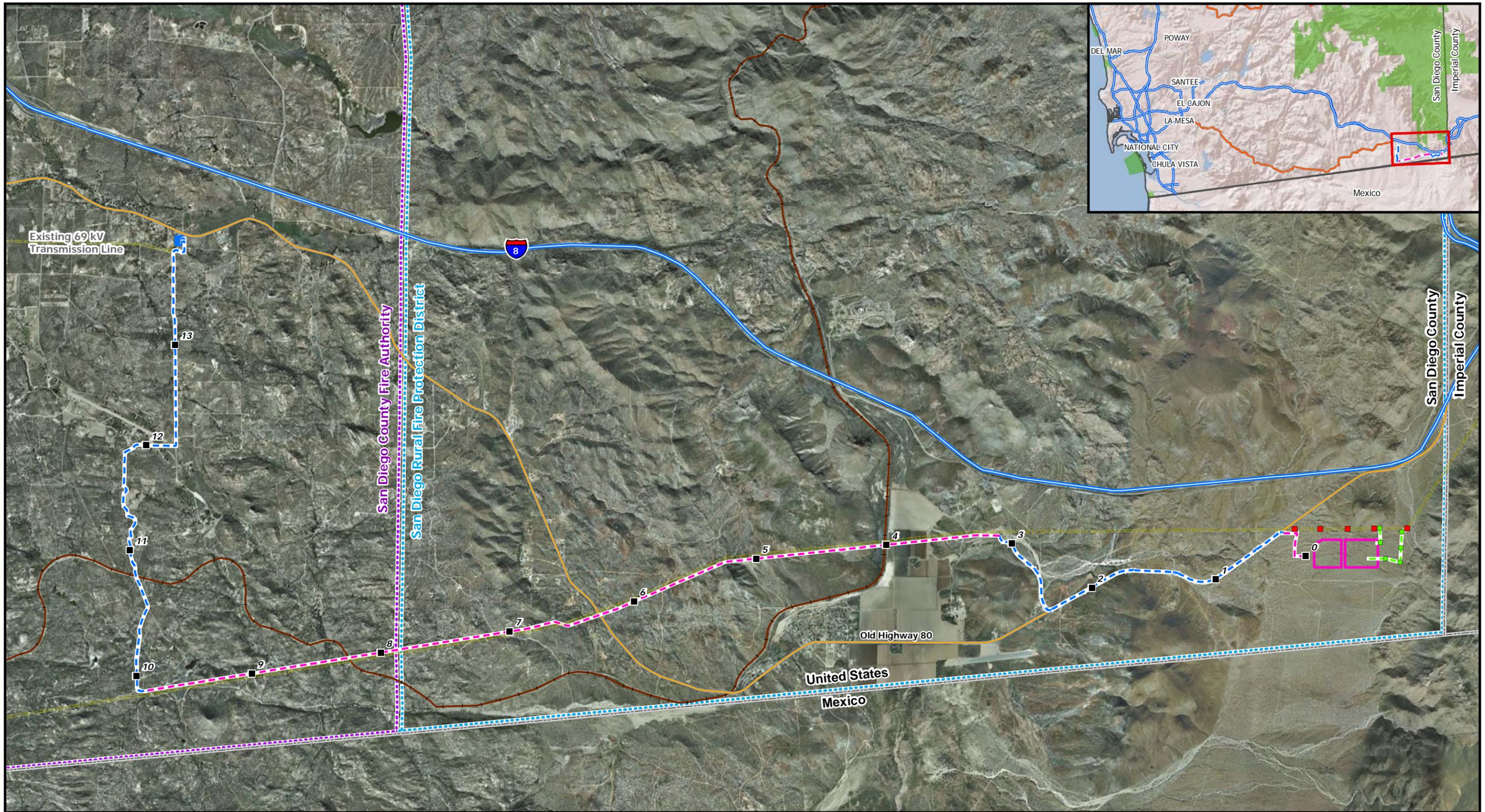
Water Supply: SDG&E will be installing a 120,000-gallon water tank at ECO Substation and a 15,000-gallon water tank at Boulevard Substation. SDG&E will coordinate with the fire departments to assure access and compatible fittings if water is needed to fight nearby fires.

Transmission Line: The 138 kV transmission line between Boulevard and ECO will meet SDG&E's wildland transmission design standards. Approximately 6.9 miles of the transmission line will be placed underground. The rest of the line will be constructed on

steel poles designed to an extreme wind design that exceeds current CPUC standards. This line will meet or exceed the CPUC required spacing between the conductors and between conductors and ground. In addition, SDG&E will follow CPUC and State Fire Marshal vegetation management clearance requirements. This line will also have an overhead static wire to improve lightning performance. Although SDG&E utilizes avian protection devices on lower voltage lines, the inherent spacing and clearances of a 138 kV line eliminates the need for avian protection devices. In the final design, SDG&E will incorporate any Federal Aviation Administration required tower or conductor marking or lighting devices.

SDG&E will provide a foam trailer, with dry chemical capability, for response to substations by SDG&E personnel. This unit will augment Fire Agency initial response. Portable fire extinguishers will be carried on SDG&E vehicles.

Appendices



Appendix A: Project Map

East County Substation Project

- | | | |
|-----------------------------------|--|--|
| ■ Proposed 138 kV Line Milepost | - - - Proposed 138 kV Overhead Line | San Diego County Fire Authority |
| ■ Existing SWPL Structure | - - - Proposed 138 kV Underground Line | San Diego Rural Fire Protection District |
| ■ Proposed SWPL Loop-In Structure | - - - Proposed SWPL Loop-In | Interstate |
| ■ Boulevard Substation Rebuild | - - - Existing Transmission Line | Major Road |
| ■ Substation Yard | | Railroad |



SDGE
Sempra Energy utility



INSIGNIA
ENVIRONMENTAL

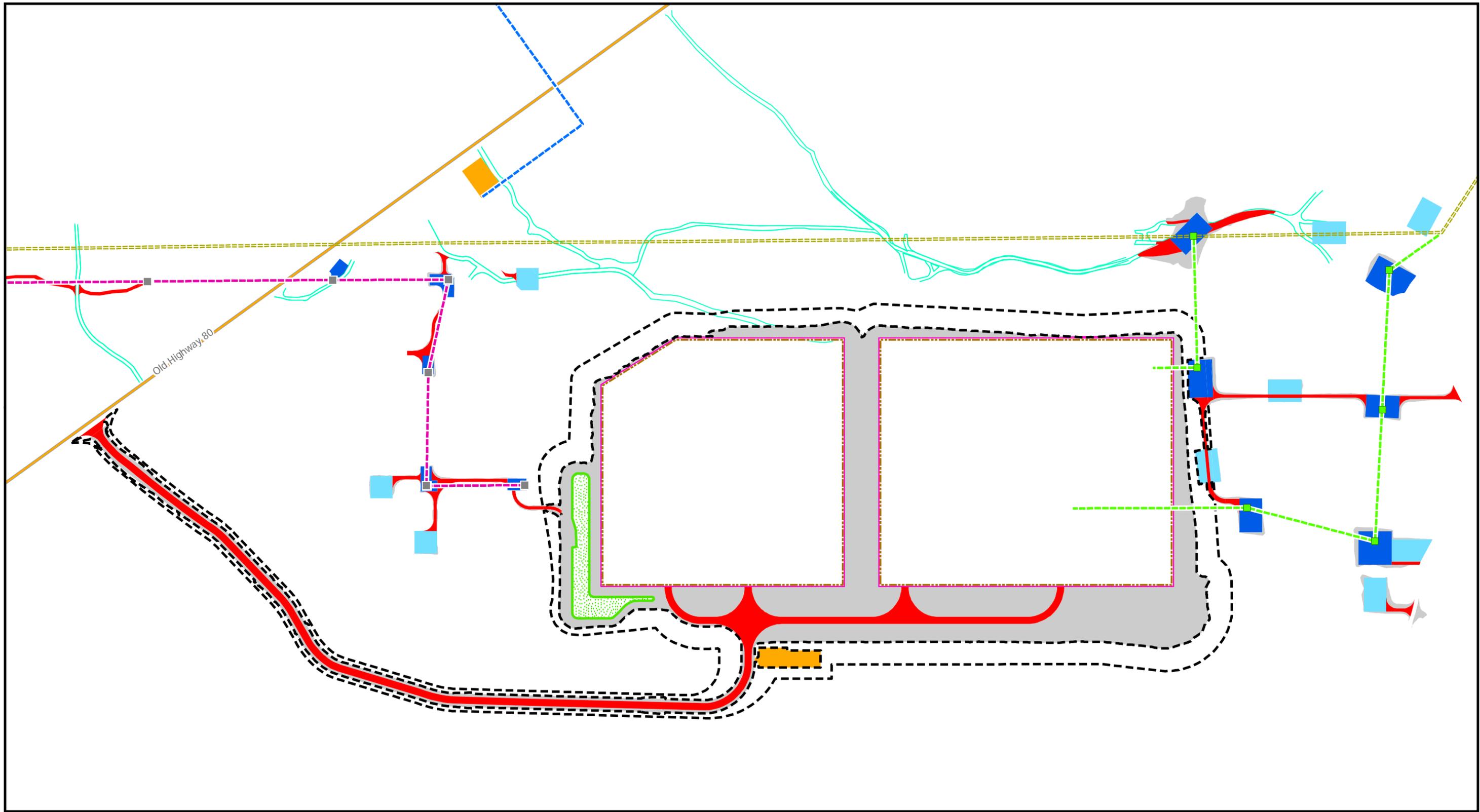


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0 0.5 1 2 3 4 Miles



Appendix B-1: ECO Site Plan

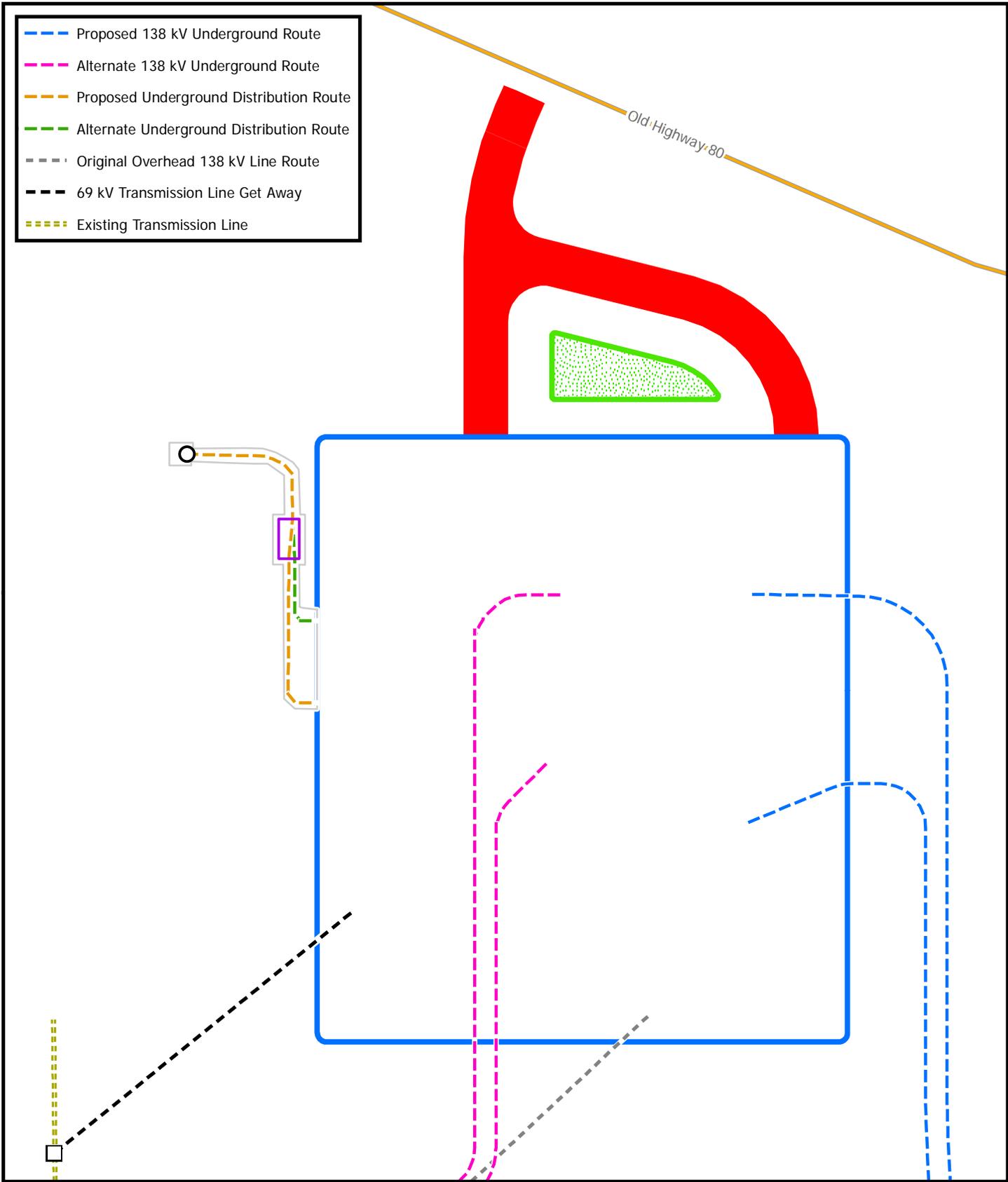
East County Substation Project

- | | | | |
|---|-----------------------------|-----------------|---------------------------------|
| Proposed SWPL Loop-In | Proposed ECO Substation | Pull Site | Proposed SWPL Loop-In Structure |
| Proposed 138 kV Line | Fence Line | Retention Basin | Proposed 138 kV Tower |
| Proposed 12 kV Temporary Distribution Tap | Temporary Construction Area | Staging Yard | Major Road |
| 445 Circuit Collocated with 138 kV Line | Access Road | Grading | Existing Access Road |
| Existing Transmission Line | Pole Work Area | | |



1:5,000





Appendix B-2: Boulevard Substation
Rebuild Site Plan

East County Substation Project

- Permanent ROW
- Boulevard Substation Rebuild
- Vault
- Boulevard Retention Pond
- New Riser Pole
- Boulevard Access Road
- 69 kV Transmission Line Get Away Pole
- Major Road

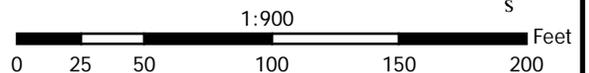




Photo 1: ROW West of Jacumba

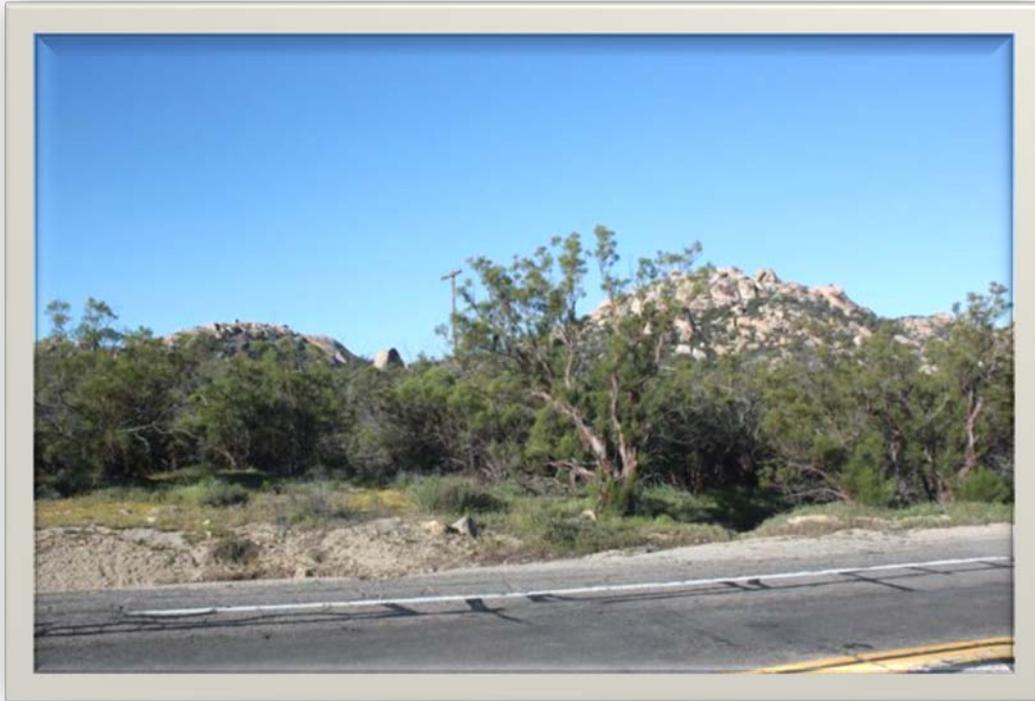


Photo 2: ROW Bankhead Springs Area



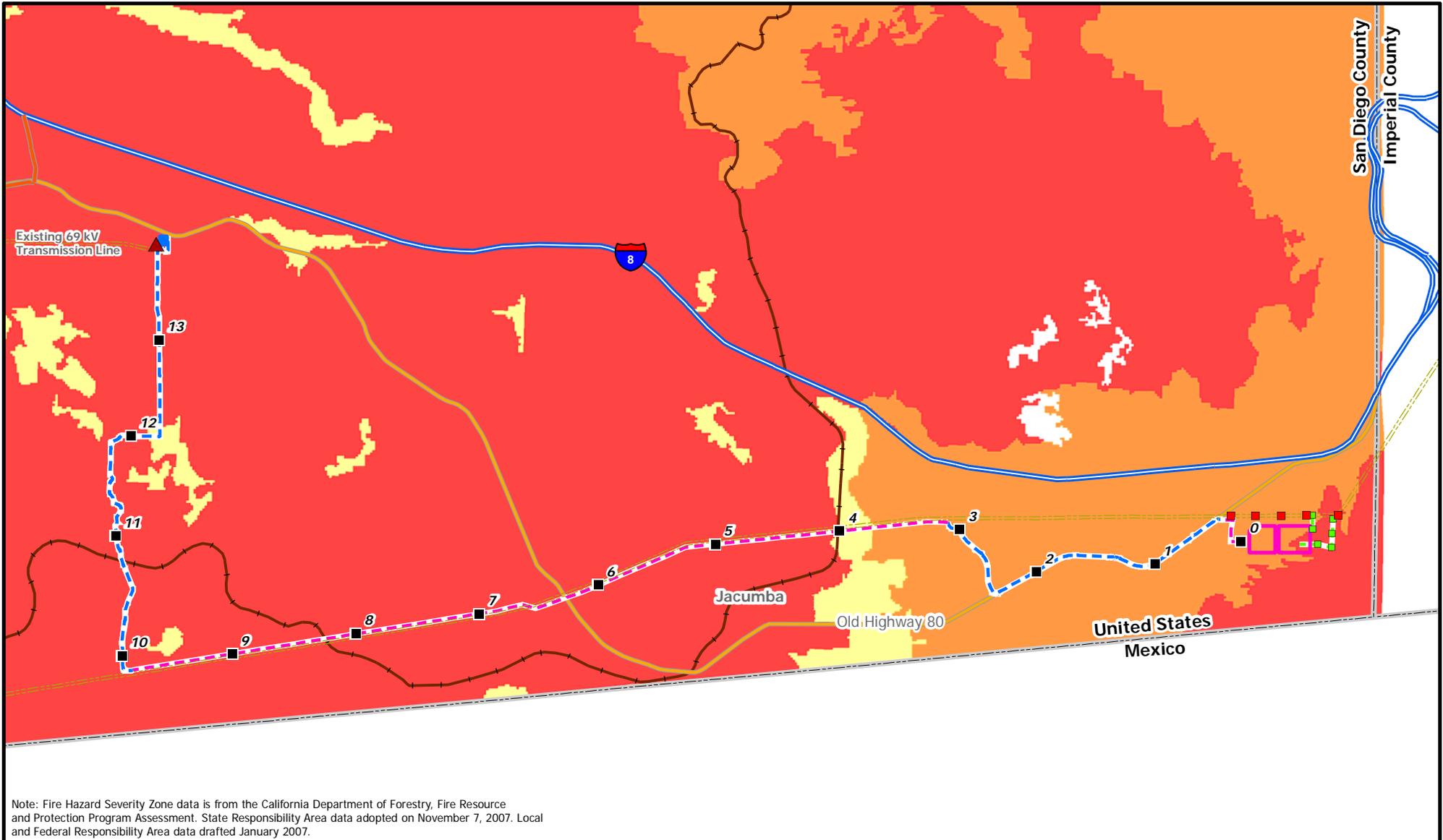
Photo 3: Existing Boulevard Substation



Photo 4: Boulevard rebuild site in foreground



Photo 5: ECO Substation Site



Appendix D: Fire Hazard Severity Zone Map

East County Substation Project

▲ Existing Boulevard Substation	- - - Proposed 138 kV Overhead Line	= Interstate	Fire Hazard Severity Zone	
■ Proposed 138 kV Line Milepost	- - - Proposed 138 kV Underground Line	— Highway	■ Very High	
■ Existing SWPL Structure	- - - Proposed SWPL Loop-In	— Major Road	■ High	
■ Proposed SWPL Loop-In Structure	- - - Existing Transmission Line	— Railroad	■ Moderate	
■ Boulevard Substation Rebuild				
■ Substation Yard				

1:70,000

Appendix E - Fire History

YEAR	FIRE NAME	ACRES BURNED	CALFIRE REPORTED CAUSED
2011	Buffalo (**)	25	Illegal Burning
2011	Jacumba	40	Illegal Alien Campfire
2010	BORDER 10	144	Unkown/Unidentified
2008	MOUNTAIN	53	Lightning
2008	CARRIZO	47	Vehicle
2008	BORDER 15	20	Illegal Alien Campfire
2008	CARRIZO	12	Unkown/Unidentified
2007	INKOPAH	699	Campfire
2006	COTTONWOOD	25	Debris
2006	GUNN 2	7	Misc.
2005	CHURCH	51	Unkown/Unidentified
2005	RAILROAD	40	Railroad
2005	RIBBONWOOD	36	Playing with Fire
2005	MILLER (**)	20	Power Line
2005	SAND	11	Lightning
2004	BORDER #10	89	Illegal Alien Campfire
2004	HI PASS	23	Lightning
2004	BORDER #7	21	Illegal Alien Campfire
2003	JEWELL	42	Campfire
2003	RANGE	29	Unkown/Unidentified
2002	TROY	1,558	Campfire
2002	MANZANITA#2	215	Unkown/Unidentified
2000	BORDER #6	75	Unkown/Unidentified
1999	LAGUNA 100	4,411	Arson
1999	COTTONWOOD	602	Campfire
1999	RAILROAD	149	Campfire
1996	SPENCER	492	Unkown/Unidentified
1996	HWY 94	202	Unkown/Unidentified
1996	WHITE	62	Unkown/Unidentified
1995	MCCAIN	302	Debris
1995	CHURCH	163	Unkown/Unidentified
1995	RIBBONWOOD	78	Unkown/Unidentified
1993	JEWEL	30	Unkown/Unidentified
1992	MANZANITA	964	Misc.
1989	THING #2	4,760	Smoking
1989	IN-KO-PAH	53	Misc.
1987	CARRIZO	290	Misc.
1986	CAMERON	131	Misc.
1983	CARRIZO	695	Equipment Use
1983	CARRIZO	665	Misc.
1983	MCCAIN	193	Lightning
1983	FLINN	114	Misc.
1982	TULE	4,645	Misc.
1981	LIVE OAK	107	Debris
1981	TOWER	99	Unkown/Unidentified

Appendix E - Fire History

YEAR	FIRE NAME	ACRES BURNED	CALFIRE REPORTED CAUSED
1981	MANZANITA #2	18	Misc.
1980	CANEBRAKE	189	Lightning
1980	IN-KO-PAH	25	Misc.
1978	HWY 25	1,966	Unkown/Unidentified
1976	HAMBAY #3	680	Unkown/Unidentified
1974	OUTSIDE ORIGIN #2	2,039	Unkown/Unidentified
1974	RIBBONWOOD	510	Unkown/Unidentified
1973	N/A	21	Misc.
1972	N/A	676	Unkown/Unidentified
1972	CUYAPAIPE	651	Misc.
1972	N/A	451	Misc.
1972	CUYAPAIPE	225	Unkown/Unidentified
1971	N/A	22	Misc.
1970	LAGUNA	174,161	Power Line
1970	KITCHEN	40	Misc.
1968	DONOVAN	8,814	Unkown/Unidentified
1958	N/A	175	Misc.
1953	HIPASS	331	Misc.
1953	N/A	69	Misc.
1950	BOULDER CREEK	2,995	Unkown/Unidentified
1950	PUEBLO SIDING	315	Misc.
1947	N/A	17,156	Unkown/Unidentified
1944	N/A	64,419	Misc.
1944	N/A	9,790	Misc.
1944	N/A	2,683	Misc.
1944	N/A	383	Unkown/Unidentified
1941	N/A	94	Misc.
1940	N/A	3,135	Misc.
1940	N/A	1,731	Misc.
1940	N/A	854	Lightning
1939	N/A	79	Misc.
1936	N/A	190	Misc.
1930	N/A	454	Unkown/Unidentified
1928	N/A	110	Misc.
1926	N/A	98	Misc.
1924	N/A	1,788	Misc.
1921	N/A	1,828	Misc.
1920	N/A	304	Misc.
1919	N/A	489	Misc.
1919	N/A	270	Unkown/Unidentified
1919	N/A	196	Unkown/Unidentified
1919	N/A	80	Misc.
1917	N/A	122	Unkown/Unidentified
1911	N/A	577	Misc.
1911	N/A	146	Misc.

Appendix E - Fire History

YEAR	FIRE NAME	ACRES BURNED	CALFIRE REPORTED CAUSED
1911	N/A	111	Misc.
1911	N/A	52	Misc.

Fire Statistics for 100 year period

324,002 total acres burned

3,522 acres/fire

0.9 fires/year

** Fire burned in Southwest Powerlink ROW. Flame lengths were approximately 10 feet. Aircraft made retardant drop on ROW. Retardant caused insulator flashover and line tripped out. Line re-energized after insulators were cleaned.

*** Incident caused by lines accidentally slapping together during together during repair. No damage to structures or other property.