SDG&E TL 6975 San Marcos to Escondido Project (A.17-11-010)
Energy Division Data Request #5 Dated October 30, 2018
SDG&E Response #5 Dated November 6, 2018

SDG&E Response to CPUC Data Request #5

SDG&E San Marcos to Escondido TL6975 69kV Project

Thank you for the opportunity to review and confirm the California Public Utility Commission's (CPUC) administrative working draft of the San Marcos to Escondido TL6975 69kV Project (Project) micropile foundation work description (Description). SDG&E concurs that the CPUC sample diagram (that was provided in Data Request #5) of a typical micropile foundation (below ground) is accurate, and we request that this diagram be included in the Project's Initial Study/Mitigated Negative Declaration (IS/MND).

SDG&E reviewed the Description in which the CPUC assumes 13 micropile foundation pole locations within Segments 2 and 3 of the proposed Project based on "site-specific substrate constraints, site-specific access constraints, and/or to minimize the amount of ground disturbance" (CPUC, 2018). Given that final engineering for the Project has not yet been completed, SDG&E cannot confirm the use of any micropile foundations for the Project; therefore, the Description should assume a construction methodology implementing industry standard concrete pier foundations at all foundation locations. Such an analysis in the Project's IS/MND would represent the worst-case scenario of expected environmental impacts. In accordance with the California Environmental Quality Act (CEQA) Guidelines, Section 15151, "The courts have looked not for perfection but for adequacy, completeness, and good faith effort at full disclosure" (CEQA Guidelines, 2018). SDG&E reaffirms its request that the environmental impact analysis contained in the Project's IS/MND be prepared to assume the use of concrete pier foundations, and to identify the potential use of micropile foundations as part of the Project Description (in accordance with providing full public disclosure).

CEQA Standards of Adequacy and Worst-Case Scenario Methodology

CEQA Guidelines, Section 15151 states that, "A CEQA document should be prepared with a sufficient degree of analysis to provide decision-makers with information that enables them to make a decision, which intelligently takes account of environmental consequences" (CEQA Guidelines, 2018). SDG&E believes that by providing information regarding micropile foundations as a possible Project variant and analyzing the Project's worst-case scenario environmental impacts (e.g., pier foundation construction) it is meeting the intent of Section 15151.

Furthermore, when information is unavailable or there is possible variation in project characteristics/ methods, CEQA best practices typically recommend employing a "worst case analysis" scenario in order to capture the largest expected potential change from existing baseline conditions. This practice of creating a worst-case scenario is not mandated by CEQA but is a common practice to address uncertainty, such as construction methodology deviations that are identified during final engineering.

SDG&E's Proponent's Environmental Assessment (PEA) assumed that all pole foundations would be constructed using the concrete pier method, and that final engineering would determine the installation method (micropile versus concrete pier foundation). This assumption was made to account for the Project's worst-case scenario for determining the potential environmental impacts, based on established CEQA thresholds of significance, since the installation of micropiles would have a smaller impact than pier foundations (see discussion below). It is SDG&E's understanding that this

same impact analysis methodology can be used for the Project's IS/MND. Therefore, the IS/MND should analyze the Project's largest potential impact from a construction perspective, which in this case would be to assume pier foundations for all Project locations requiring a foundation (Segments 1, 2 and 3). If final engineering does recommend the use of a micropile foundation for selected poles, the CEQA document would still be adequate (from an impact assessment perspective) as the change in construction methodology would result in a reduction of environmental impacts.

Comparison of Environmental Impacts: Pier Foundations vs. Micropile Foundations

As previously described, a micropile foundation consists of multiple small-diameter, drilled and grouted reinforced foundations, arranged in a circular pattern. For electric transmission and power line structure support, a series of approximately 4 to 16 (or more) individual micropiles are arranged in a circular pattern to take the place of a larger conventional reinforced concrete drilled pier foundation that would typically be approximately 4 to 10 feet in diameter and 10 to 40 feet deep. One micropile typically consists of a small hole (approximately 6 to 8 inches in diameter) excavated to a depth of approximately 10 to 40 feet depending on the properties of the soil or rock underlying the area.

As such, the amount of ground disturbance (i.e., excavation and spoils) would be considerably less for micropile foundations. Therefore, the reduction in excavation for micropiles would generally help reduce potential paleontological and cultural resource impacts when compared to the impacts associated with pier foundation construction because there is less risk of disturbing previously unidentified resources. The temporary work area required for micropile foundation construction is the same size as the pier foundation, which is an approximately 35 by 50-foot work area. Therefore, biological resources, geology, hydrology and water quality impacts would mainly be the same for either construction methodology.

Where micropile foundation and pier foundation construction differ the most is in the type of equipment and duration required for installation. Equipment used for the micropile installations is smaller and more portable than the equipment used for drilled pier excavation and construction (see Table 2.6, below). Pier foundation construction takes approximately 80 days longer, with longer run times for equipment, with larger crews than micropile foundation construction. In addition, pier foundations require large equipment including a drill rig, boom truck, excavator and loader, which are not required for micropile foundation construction. As such, impacts related to air quality, greenhouse gas and noise for micropile foundation construction would be less significant than those for the construction of pier foundations.

CPUC Micropile Foundation Description [SDG&E Revisions in Track Changes]

The following are SDG&E's proposed revisions to the CPUC's description of micropile installation for inclusion in the IS/MND Project Description.

Micropile Foundations

A micropile foundation consists of several small-diameter, drilled, and grouted reinforced foundations. For electric power line structure support such as that proposed for this Project, a series

of up to 16 individual micropiles would be drilled in a circular array of a diameter similar to an equivalent pier foundation, as opposed to a larger conventional reinforced concrete pier foundation, as described above. One micropile is typically a small hole up to 8 inches in diameter at the ground line, excavated to a depth of up to 40 feet, depending on the properties of the soil or rock underlying the surface.

The piles would be constructed using high-strength steel casing, high-strength all-thread rebar, and grout. The high-strength all-thread rebar would be inserted into the hole and centered, with the surrounding annulus would be filled with a non-shrink grout. The rebar would protrude above grade to be connected to a transition steel plate that would support the structure above grade. Loads from the above structure would be transferred to the rebar, then transferred from the rebar to the grout to the surrounding soil. The steel casings would project a minimum of 1-foot above ground and the piles would connect to transition steel plates by either a steel cap or cast-in-place concrete cap connection. A diagram of a typical micropile foundation is provided in Figure 2-__.

The micropiles are typically installed from a platform situated approximately 6 feet above the ground surface. The platforms and all equipment can be placed by a truck-mounted crane. The platform would be supported on four to six telescoping legs that would be adjusted to support the platform on slopes. The drilling process would take place from the platform, and drills would be powered by generators or compressors that would either rest on the platform or be supported nearby on the ground. Following the installation of the micropile foundation, a line or boom truck would be used to remove the platform.

Equipment used for the micropile installations would be smaller and more portable than the large drill rigs used for drilled pier excavation and construction. Micropile foundations are more suitable for areas that are inaccessible because of terrain and areas where access may be prohibited because of environmental, resource agency, or CPUC concerns. Micropile foundations are also suitable for rock areas where excavation of the rock for conventional drilled piers would be difficult, entailing the use of blasting or rock breakers with augers or core barrels.

TABLE 2-2
PROJECT POLE STRUCTURE SUMMARY

Pole Type	Approximate Quantity	Maximum Height Above Ground (feet)	Base Diameter at Grade (feet)	Tip Diameter (inches)
Segment 1 Rebuild				
Pier Foundation	11	100	8	29
Micropile Foundation[b]	0	0	0	0
Segment 2 New Build				
Pier Foundation	11	110	8	29
Micropile Foundation[b]	0	N/A	N/A	N/A
Segment 3 Reconductor/Re-Energize				
Pier Foundation	4	85	8	29
Micropile Foundation[b]	0	N/A	N/A	N/A

TABLE 2-4
POWER LINE CONSTRUCTION SCHEDULE

Project Activity	Duration (days)[a]	Anticipated Start and End Date
Micropile foundation construction, approx. 0 poles	45[c]	N/A
Pier foundation construction, approx. 26 poles	125	Segment 1: Feb 2020 – May 2020 Segment 2: May 2020 – Aug 2020 Segment 3: May 2020

TABLE 2-6
ESTIMATED CONSTRUCTION EQUIPMENT AND PERSONNEL

Activity	People	# of Days[a]	Equipment	Quantity	Horsepower Rating	Hours of Use per Day	Additive Hours of Use per Day	Segment Number
Pier Foundation Construction (approx. 26 poles)	3 crews of 4 – 5 (12 – 15 total)	125	air compressor	3	78	4	1 2	All segments
			boom truck	3	250	3	9	All segments
			drilling rig	3	82	7	2 1	All segments
			excavator	3	162	4	1 2	All segments
			forklift	3	83	3	9	All segments
			generator	3	84	3	9	All segments
			loader	3	37	3	9	All segments
			pickup truck	3	250	4	1 2	All segments
			water truck	3	250	3	9	All segments
Micropile Foundation[b,c] Construction (approx. 0 poles)	2 crews of 4 - 5 (8 – 10 total)	45 [c]	air compressor	2	78	3	6	
			backhoe	1	97	3	3	
			crane	2	226	3	6	
			crew truck	2	250	4	8	
			flatbed truck	2	250	4	8	
			forklift	2	83	3	6	
			fuel truck	1	250	3	3	
			generator	2	84	4	8	
			grout plant	1	84	2-3	3	
			pickup truck	1	250	4	4	
			tractor/ trailer unit	1	250	3	3	
			water truck	2	250	3	6	

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NOTES:

[a] This reflects the additive, typical total of days of a given construction activity per each foundation location. See Section 2.5.1 for the Project's construction sequencing plan.

[b] As described in detail in Table 2-6, micropile foundations require smaller equipment and the duration of construction is considerably shorter than required for pier foundation poles. As common practice in addressing uncertainty, due to potential Project variation a "worst-expected-case analysis" is used to capture the largest potential change from baseline conditions.

[c] While the duration listed for micropile foundation construction is 45 days per foundation location, SDG&E is not currently proposing to utilize micropile foundation construction methods, and the durations included are for informational purposes only.

References:

Data Request #5 for the SDG&E San Marcos to Escondido TL6975 69 kV Project Initial Study, California Public Utilities Commission, October 30, 2018.

CEQA Guidelines, California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000–15387, January 1, 2018.