Company: San Diego Gas & Electric Company (U 902-E)
Proceeding: 2019 Tree Trimming Balancing Account
Application: A.20-07-003
Exhibit: SDG&E-____

SAN DIEGO GAS & ELECTRIC COMPANY

REBUTTAL TESTIMONY OF

TYSON SWETEK

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

JANUARY 8, 2021

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REBUTTAL TESTIMONY OF TYSON SWETEK ON BEHALF OF SDG&E

I. SUMMARY

My name is Tyson Swetek. I am the Director of Electric Distribution Operations at San Diego Gas & Electric (SDG&E). My qualifications are attached to this testimony as Section IV.

My testimony addresses the *Report on the Results of Operations for San Diego Gas & Electric Company Recovery of the 2019 Undercollected Balance Recorded in the Tree Trimming Balancing Account* (Report) prepared by Mr. Ryan Andresen of the Public Advocates Office at the California Public Utilities Commission (Cal Advocates). In the Report, Cal Advocates recommends recovery of $6.3 million for San Diego Gas & Electric Company's (SDG&E's) undercollected operations and maintenance (O&M) costs recorded in SDG&E's Tree Trimming Balancing Account (TTBA). Cal Advocates' recommendation is $4.1 million lower than SDG&E's $10.4 million TTBA undercollection.

Cal Advocates alleges, amongst other things, that SDG&E's recovery should be reduced because SDG&E did not include adequate evidence or data demonstrating that its expanded 25-foot tree clearance from distribution facilities in the High Fire Threat District (HFTD) reduces wildfire risk. Contrary to Cal Advocates' claim, however, SDG&E has provided clear, empirical, quantitative analysis that demonstrates the wildfire risk reduction benefits of enhanced clearances. SDG&E should thus be authorized to recover related costs recorded in its TTBA and requested in its application, as they are critical to the safe and reliable operation of SDG&E's electric distribution system and the safety of SDG&E's customers. Put another way, a Commission decision that SDG&E's enhanced clearance costs are unreasonable and unrecoverable could send the signal that the Commission does not support vegetation management activities designed to mitigate and prevent the risk of wildfires.

II. SDG&E'S ENHANCED VEGETATION MANAGEMENT PROGRAM

SDG&E presented its Enhanced Vegetation Management (EVM) Program, including the goal of achieving increased 25-foot post-trim tree clearances for trees in certain locations, in its 2019 Wildfire Mitigation Plan (WMP) in Rulemaking (R.) 18-10-007.[1] SDG&E established this program with the goal to further reduce vegetation contacts by increasing post-trim clearances, with a specific focus on five of the highest risk tree species in the HFTD, wherever possible.[2] SDG&E's 2019 WMP received Commission approval in Decision (D.) 19-05-039.[3] In approving the 2019 WMP, the Commission found that "SDG&E may implement a 25-foot post-trim clearance where necessary and feasible if such a practice is supported by scientific evidence or other data showing that such clearance will reduce risk under wildfire conditions."[4]

SDG&E limited the scope of the EVM program, and specifically the 25-foot clearance, to instances where it would have the biggest impact on reducing risk.[5] These limitations reduced the scope of the enhanced clearance from the over 400,000 trees within SDG&E's entire tree inventory, to approximately 80,000 trees, or 20%.[6] SDG&E has continued to update the Commission and Wildfire Safety Division (WSD) – which now oversees WMP activities – on its EVM program, and data supporting the program, in various submissions, including its WMP

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1 *See* SDG&E Response to PUBADV-SDG&E-DR-003-RYD at q.1(f).

2 *Id.* at q.1.

3 The purpose of Wildfire Mitigation Plan submissions is not to address cost recovery and the reasonableness of such costs. That is the purpose of this Application.

4 D.19-05-039, Ordering Paragraph 5 at 29-30.

5 SDG&E Response to PUBADV-SDG&E-DR-003-RYD at q.1(i).

6 *Id.*

quarterly updates, one of which included the submission of a comprehensive study to demonstrate the efficacy of post-trim clearances based on SDG&E's historical data.[7]

In the Report, Cal Advocates claims that SDG&E did not provide adequate evidence or data to demonstrate that expanding to a 25-foot clearance for distribution facilities reduces wildfire risk. On page 8 lines 14 through 22 of the Report, Cal Advocates quickly dismisses the evidence and data SDG&E has provided—both to Cal Advocates' data requests as well as to the Commission and WSD in its WMP quarterly reports—to demonstrate that increasing clearances reduces vegetation contacts. But the extensive data provided fully justifies the enhanced clearances.

As noted, SDG&E made the decision to increase post-trim clearances within the HFTD with the goal of reducing vegetation contacts that both can and have historically led to ignitions and catastrophic wildfires in San Diego County and the state of California. This decision was based on historical success SDG&E has experienced when increasing post-trim clearances, and an outstanding performance record on its transmission vegetation contacts (less than one contact per year on average in the last five years) where 20-30 feet of clearance is maintained. SDG&E initially proposed an expansion of minimal clearance requirements to 10-12 feet in R.08-11-005, which examined revisions and clarifications to the Commission's regulations relating to the safety of electric utility and communications infrastructure provider facilities (specifically General Order 95, Rule 35).[8] Following the devastating California fires in 2017 and 2018, SDG&E began to consider ways to further improve its existing vegetation management program

[7] *See* San Diego Gas & Electric Company Quarterly Report on 2020 Wildfire Mitigation Plan for Q3 2020 (September 9, 2020) (SDG&E's 2020 WMP Q3 Report), Section III.L at 125-129, attached as Appendix B.

[8] *See* SDG&E Response to PUBADV-SDG&E-DR-003-RYD at q.1(f).

by increasing its post-trim clearances.[9] SDG&E finalized the scope of the 25-foot program in March 2019 and began performing the work in April 2019.[10]

In the Report, Cal Advocates inaccurately claims SDG&E did not provide data to support increasing clearances reduces wildfire risk. In response, SDG&E pointed to the times in history where increasing vegetation clearances beyond regulatory minimum requirements led to dramatic reductions in vegetation contacts and therefore wildfire risk, highlighting data to support the logic behind the decision to seek greater clearances. The chart on page 10 of the Report, Cal Advocates demonstrates the value of increased post-trim clearances and the logic behind SDG&E's premise that greater clearances will lead to less vegetation contacts. The chart specifically demonstrates how increasing the post-trim clearance from six inches to 10 feet reduced tree-related outages from an average of approximately 400 per year (1995-1998), to approximately 80 per year (1999-2010).[11] Additional refinements to the program, including slightly increased clearances for fast-growing species such as eucalyptus and palm, resulted in an additional reduction in average contacts from 80 per year (1999-2010) to about 40 per year (2011-2019). In its 2017 revision to General Order 95, Rule 35, which increased post-trim clearance recommendations for trees adjacent to distribution lines from 6 feet to 12 feet, the Commission appears to agree with SDG&E that increasing post-trim clearances in the HFTD is a best practice worth following.[12] SDG&E has maintained a 10-12 foot standard clearance throughout its system since 1999.

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[9] *Id*.

[10] *Id*. at q.1(g).

[11] *Id*. at q.1(i).

[12] *See* General Order 95, Rule 35, and Appendix E.

While the historical data demonstrates that SDG&E's expectation that increasing clearances would have some measurable impact on reducing vegetation contacts was reasonable, the data obtained since implementing the EVM program provides further support for the programs' efficacy. At the time the Commission approved the Wildfire Safety Division's Resolution WSD-005, [13] SDG&E had not yet provided sufficient evidence that increasing clearances from their current standard of 10-12 feet to the new enhanced clearances of 20-30 feet actually reduced vegetation contacts. As the Commission noted, this made it "difficult to determine the effectiveness of this measure." However, the purpose of Wildfire Mitigation Plan submissions is not to provide cost recovery and the reasonableness of such costs. That is the purpose of this Application. Further, SDG&E remedied this issue in SDG&E's 2020 WMP Third Report.[14] Not only does this report clearly identify the impacts, it calculates the average reduction in vegetation contacts per year by the end of the program utilizing the measured difference in vegetation contact rates at the different post-trim clearance levels.[15]

While WSD recently found that an SDG&E Remedial Compliance Plan regarding its 2020 WMP did not sufficiently address the data requirements,[16] WSD has not yet responded to SDG&E's 2020 WMP Q3 Report (which SDG&E submitted subsequent to the Remedial Compliance Plan), and the division instructed SDG&E to further address this issue in its 2021 WMP Update. In any event, neither the Commission nor the WSD has ever found that

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[13] Resolution WSD-005 (June 11, 2020) at 38.

[14] SDG&E's 2020 WMP Q3 Report, Section III.L at 125-129, and Appendix B.

[15] While Cal Advocates also received SDG&E's 2020 WMP Q3 Report, SDG&E also provided (contrary to Cal Advocates' allegations in its Report) similarly extensive data analysis supporting the EVM program and the conclusion that "as post-trim clearance distance increases, vegetation contact decreases." *See* SDG&E Response to PUBADV-SDG&E-DR-003-RYD at q.1(k).

[16] *See* Wildfire Safety Division Evaluation of San Diego Gas & Electric Company's Remedial Compliance Plan (December 30, 2020).

SDG&E's enhanced vegetation clearance activities were unreasonable or that they should be stopped or adjusted – nor should they. The data demonstrates that enhanced vegetation clearances reduce the likelihood of vegetation powerline contact, which has all too frequently been the source of catastrophic wildfires in California in the past few years. Mr. Andresen dismisses the extensive analysis provided in SDG&E's 2020 WMP Q3 Report and SDG&E data request responses that clearly, empirically, and quantitatively demonstrates the benefits of increasing clearances from SDG&E's required standard of 10-12 feet to 20-25 feet in the HFTD, for the subset of species that have historically caused the greatest amount of vegetation contacts on SDG&E's electric system in one sentence.[17]

Cal Advocates then provides Table 2-5 as alleged evidence that SDG&E's enhanced clearance program has failed to reduce vegetation contacts. But there are a number of flaws with Mr. Andresen's analysis that have led Cal Advocates to draw the wrong conclusions:

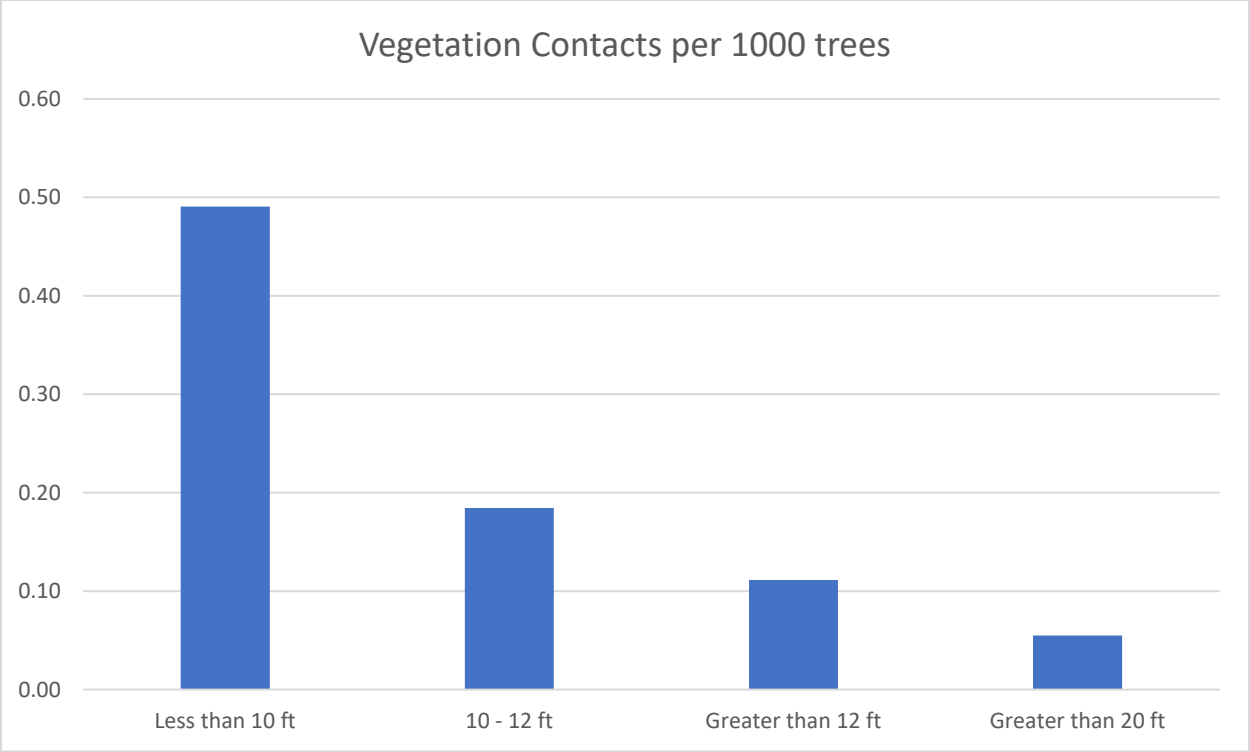
1. In Table 2-5, Cal Advocates questions the reasonableness of the EVM program by demonstrating that trees which were historically trimmed to 20-30 foot clearance do not correlate with overall reductions in vegetation contacts. While the table goes back to 2010, SDG&E's enhanced clearance program began in 2019. The trees trimmed before 2019 were already being maintained to this clearance level. In general, these trees were not being trimmed from a lower clearance level to a higher clearance level, they were already located 20-30 feet from the distribution line and were receiving routine maintenance trims. Because the EVM program began in 2019, the benefits of the program would not have been expected to be realized until 2020 and would not be fully realized until all 80,000 trees identified were completed.

[17] Report at 8 (emphasis added).

2. The data set for Table 2-5 includes all vegetation contacts. Enhanced post-trim clearance is a mitigation designed to reduce vegetation contacts from trees blowing into the lines, growing into lines, or trees shedding branches that then fall/glide into the distribution lines. Trimming a tree to nearly any clearance will not prevent vegetation contact from a tree being uprooted in a storm and falling into a line. SDG&E's analysis in its 2020 WMP Q3 Report appropriately truncates the dataset to remove vegetation contacts caused by uprooted trees. SDG&E has a hazard tree program specifically designed to mitigate that type of vegetation contact.

3. Cal Advocates analysis provides no normalization or context with its data. 10,000 trees trimmed in 2019 may seem like a lot, but SDG&E completed 203,000 trims in 2019. When SDG&E moved from 8,000 trees in 2018 to 10,000 trees in 2019 at the enhanced clearance levels, that 30% increase represents less than 1% of all trims in SDG&E service territory. And again, while 50 contacts occurred in 2019, *zero of them occurred at the 20-30 foot clearance level,* again highlighting how the analysis in Table 2-5 is misleading without appropriate context. SDG&E's analysis in its 2020 WMP Q3 Report, however, is fair because the data is presented in context. SDG&E could have selected data from its analysis to support a conclusion that from 2010 through 2019, SDG&E has averaged just 0.5 vegetation contacts per year on trees trimmed to enhanced levels, While it might be true, such an analysis would be similarly misleading because it failed to take into account the volume of trees in the inventory. A fair analysis should consider the contacts that occur, normalized by the opportunity for the contacts to occur, which is exactly what SDG&E does in its 2020 WMP Q3 Report.

Below is the summary table provided in SDG&E's 2020 WMP Q3 Report that demonstrates through measured average contact rates the reduction in contacts as post-trim clearances are achieved.



By expanding clearances from SDG&E's standard of 10-12 feet to the enhanced clearance levels for identified species, annual contacts rates move from 0.18 per thousand trees to 0.05 per thousand trees, a significant reduction. SDG&E encourages the Commission to review SDG&E's data and analysis on post-trim vegetation clearance provided in its 2020 WMP Q3 Report in assessing the merits of the EVM program and whether it meets SDG&E's WMP requirements.

III. CONCLUSION

SDG&E has provided the Commission with clear, empirical, quantitative analysis that demonstrates the wildfire risk reduction benefits of enhanced clearances, as required by D.19-05-039. SDG&E should be authorized to recover expenses incurred by this program, as wildfire risk reduction benefits are critical to the safe and reliable operation of the SDG&E's electric distribution system and the safety of SDG&E's customers in the communities served.

This concludes my rebuttal testimony.

IV. QUALIFICATIONS

My name is Tyson Swetek. My business address is 8316 Century Park Court, San Diego, California, 92123. I am employed by SDG&E as the Director of Electric Distribution Operations. I have been employed by SDG&E since 2004 and have over 15 years of experience in the utility industry. While with SDG&E, I have held various positions of increasing responsibility in the functional areas of Wildfire Mitigation, Transmission Engineering, Substation Construction and Maintenance, Distribution Construction and Maintenance, and Distribution Operations.

My current responsibilities include Electric Distribution Operations and the Enterprise Geographic Information Systems (GIS) services workgroup. Before starting my current position, I was the Wildfire Mitigation Program Manager where, among other things, I oversaw the development and implementation of SDG&E's WMP. Prior to that, I was the Manager of Transmission Engineering, leading the group responsible for the design and project management of SDG&E's capital transmission projects. I have also worked as the Operations and Engineering Manager at SDG&E's Substation Construction and Maintenance group where I was responsible for capital construction and substation inspection and maintenance. Prior to that, I was the Operations and Engineering manager at one of SDG&E's district field offices in charge of engineering, operations, and maintenance tasks.

I earned a Bachelor of Science degree in Electrical Engineering from California Polytechnic State University and a Master of Business Administration degree from San Diego State University. I am a registered Professional Engineer (PE) in California.

I have not testified previously to this Commission.

APPENDIX A

General Order 95

Appendix E

Clearance of Poles, Towers and Structures from Railroad Tracks

The following are guidelines to Rule 35 .

The radial clearances shown below are recommended minimum clearances that should be established, at time of trimming, between the vegetation and the energized conductors and associated live parts where practicable. Reasonable vegetation management practices may make it advantageous for the purposes of public safety or service reliability to obtain greater clearances than those listed below to ensure compliance until the next scheduled maintenance. Each utility may determine and apply additional appropriate clearances beyond clearances listed below, which take into consideration various factors, including: line operating voltage, length of span, line sag, planned maintenance cycles, location of vegetation within the span, species type, experience with particular species, vegetation growth rate and characteristics, vegetation management standards and best practices, local climate, elevation, fire risk, and vegetation trimming requirements that are applicable to State Responsibility Area lands pursuant to Public Resource Code Sections 4102 and 4293.

Voltage of Lines	Case 13 of Table 1	Case 14 of Table 1
Radial clearances for any conductor of a line operating at 2,400 or more volts, but less than 72,000 volt	4 feet	12 feet
Radial clearances for any conductor of a line operating at 72,000 or more volts, but less than 110,000 volts	6 feet	20 feet
Radial clearances for any conductor of a line operating at 110,000 or more volts but less than 300,000 volts	10 feet	30 feet
Radial clearance for any conductor of a line operating at 300,000 or more volts	15 feet	30 feet

Appendix B

L. Update on Condition SDGE-13: Lack of Risk Reduction or Other Supporting Data for Increased Time-or-Trim Clearances

As described in its 2020 WMP Remedial Compliance Plan, SDG&E's plan to measure the performance of enhanced clearances involved trimming trees to the enhanced clearance level, and then measuring the reliability performance of the electric system near those trees before and after the trimming. And while that will measure the effectiveness of this program on a going forward basis, SDG&E does have trees in the system that are trimmed to 20 – 30' clearance and was able to develop a study to measure the impacts of post trim clearance on vegetation contacts and ultimately ignitions.

To begin the study, SDG&E queried the vegetation database for outages caused by individual trees that had a post trim clearance associated with the tree at the time of the outage. At the outset, SDG&E's original goal was to utilize 20 years of data (2000 through 2019), but the data set was incomplete for years 2000 and 2001. While SDG&E has recorded vegetation contacts since 1995, SDG&E started recording outages for specific trees in its vegetation management database starting in the year 2000. There were some process issues in recording the data in the early years, however as this table demonstrates. Accordingly, SDG&E truncated the data set to 2002 – 2019.

SDGE-13 Table 21
Vegetation Contacts

	Contacts with post trim clearance	All Outages	% Trees with a trim
2000	4	42	9.5%
2001	21	64	32.8%
2002	46	102	45.1%
2003	58	113	51.3%
2004	37	72	51.4%
2005	32	70	45.7%
2006	62	79	78.5%
2007	43	71	60.6%
2008	52	107	48.6%
2009	40	78	51.3%
2010	55	130	42.3%
2011	18	29	62.1%
2012	25	39	64.1%
2013	21	29	72.4%
2014	36	48	75.0%
2015	21	28	75.0%
2016	39	65	60.0%
2017	38	70	54.3%
2018	30	36	83.3%
2019	21	31	67.7%
Total	699	1303	53.6%

The study concept involved measuring the amount of historical contacts from trees that had been in SDG&E's tree inventory and trimmed to a certain measured line clearance by SDG&E certified arborists. As this study is focused on the impact that trimming trees to a certain clearance has on vegetation contacts, contacts from trees that were not in inventory (had never been trimmed) or contacts from fall in trees were excluded from this data set. Below is a table containing the vegetation contact data.

SDGE-13 Table 22
Outages by Post Trim Clearance

Outages by Post Trim Clearance											
Year	2.1 to 4.0 ft	4.1 to 5.9 ft	6.0 to 7.9 ft	8.0 to 9.9 ft	10.0 to 11.9 ft	12.0 to 14.9 ft	15.0 to 19.9 ft	20.0 to 30.0 ft	30.1 to 40.0 ft	40.1 to 50.0 ft	50.1 - 60.0 ft
2002	2	8	1	19	15						
2003	0	6	4	20	26						
2004	0	1	3	6	26						
2005	0	1	3	4	24						
2006	0	0	3	4	54	0	0	0			
2007	1	0	3	1	37	1	0	0			
2008	1	1	2	3	41	2	0	1			
2009	0	3	1	0	32	2	1	1			
2010	0	1	2	2	45	0	3	2			
2011	0	0	0	0	17	0	1	0			
2012	0	0	0	0	22	3	0	0			
2013	1	0	0	0	15	2	0	1			
2014	0	2	0	2	26	3	1	1			
2015	2	1	0	0	18	0	0	0	0	0	0
2016	0	0	0	1	32	3	3	1	0	0	0
2017	0	1	1	1	33	2	1	0	0	0	0
2018	0	0	1	0	26	1	2	0	0	0	0
2019	0	0	2	0	17	2	0	0	0	0	0
Average contacts per year	0.4	1.4	1.4	3.5	28.1	1.5	0.9	0.5	0.0	0.0	0.0

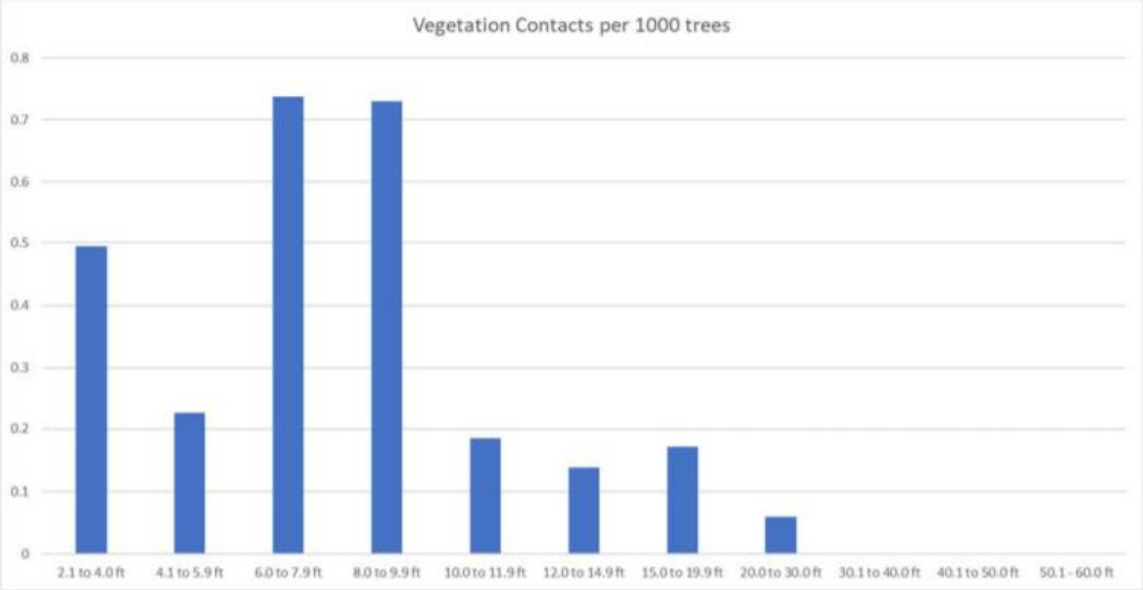
The next part of the study involved understanding the total tree exposure at these same post trim clearance levels so that a vegetation contact rate could be calculated. Ideally, SDG&E would have the entire tree inventory at the end of each year as a snapshot, by post trim clearance, but SDG&E did not record the data in that way. The best available data is the number of trees trimmed in a particular year to a post trim clearance level, which is the best proxy for inventory in this way because even though SDG&E does not trim every tree in the inventory every year, the number of trims are proportional to the inventory levels. Below is a chart showing the number of trims to post trim clearance levels by year.

SDGE-13 Table 23
Trees Trimmed to Clearance Levels

	Trees Trimmed to Clearance Levels										
Year	2.1 to 4.0 ft	4.1 to 5.9 ft	6.0 to 7.9 ft	8.0 to 9.9 ft	10.0 to 11.9 ft	12.0 to 14.9 ft	15.0 to 19.9 ft	20.0 to 30.0 ft	30.1 to 40.0 ft	40.1 to 50.0	50.1 - 60.0
2002	910	4898	7787	27024	146090						
2003	768	5643	5254	16409	124730						
2004	359	9170	2787	3012	208161						
2005	329	5288	1922	2010	129322						
2006	430	5197	2052	2338	134801	6651	2222	2242			
2007	398	4708	1258	1627	121886	5545	1916	3203			
2008	403	5452	938	870	119608	2653	2952	6236			
2009	411	6630	872	820	140447	4902	3743	8183			
2010	173	6141	675	708	136307	5325	2747	8181			
2011	149	5779	714	664	144950	13106	2838	7489			
2012	175	5716	531	581	154370	9629	3177	6671			
2013	183	5568	414	398	148557	7716	3385	6099			
2014	1005	7368	1144	3697	203175	14008	6690	8025	2575	201	135
2015	1843	6285	1336	5031	193353	12925	7095	10457	2235	152	42
2016	1327	7313	1542	5080	191139	18308	9008	13770	3621	316	89
2017	1264	6135	1496	3459	145121	14955	7401	9856	2058	238	144
2018	1809	7148	1839	5488	164436	15922	7238	13359	2251	615	174
2019	2229	6484	2701	7067	136322	20096	9808	15154	2664	486	155
Average	787	6162	1959	4794	152376	10839	5016	8495	2567	335	123

SDG&E then divided average vegetation contacts per year at a clearance level by the trees trimmed at clearance level to determine the contact rate. As these numbers are small, SDG&E normalized the data by reporting the contact rate per 1,000 trees. Below is the resulting chart.

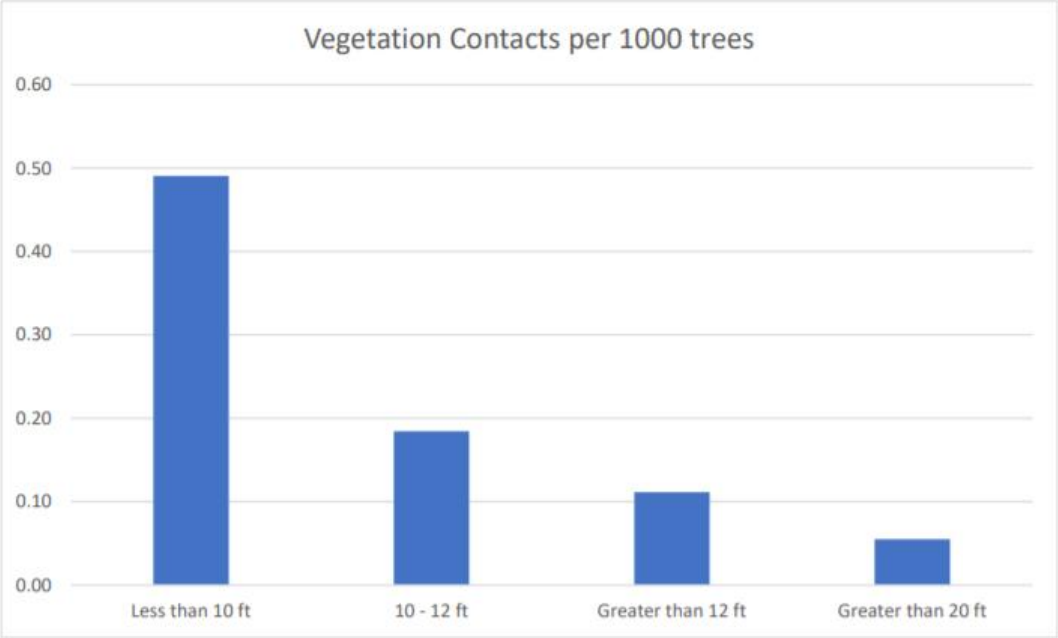
SDGE-13 Figure 16
Vegetation Contacts per 1,000 Trees



As shown by the chart, there is a relationship between post trim clearance and contact rates. As post trim clearance increases, the contact rates go down. To further illustrate this conclusion, SDG&E grouped the data into four categories. These groupings follow the same methodology described above. Set forth below are the results of the grouped data. SDG&E

maintained the 10 – 12' trim level as an individual category because the majority of trees in SDG&E's inventory are trimmed to this level.

SDGE-13 Figure 17
Vegetation Contacts per 1,000 Trees – By Group



This data demonstrates that increased post trim clearances decreases vegetation contacts are valid. It also demonstrates that stakeholder concerns regarding diminishing returns are valid too. Going from less than 10' to 10' - 12' represents a .31 vegetation contact per 1000 trees reduction, while going from 12' to greater than 20' represents a .13 vegetation contact reduction per 1000 tree reduction. In fact, SDG&E would estimate that going from less than 10' to 10 -12' has an even greater impact than this data demonstrates, as SDG&E has already completed most of the trims to get its inventory to this level prior to 2002. The trees that remain at less than 10' remain so because SDG&E's arborist inspections determined that these specific trees were safe at these levels.

Nevertheless, even with diminishing returns, trimming to 20' represents a 58% reduction in contact rate. For practical purposes, SDG&E's program has targeted 80,000 trees within the HFTD for this greater level of clearance. 80,000 * .13 / 1000 = 10.4 vegetation contacts reduced annually. Given that SDG&E currently averages 40 vegetation contacts per year, this would represent a 25% reduction in both vegetation contacts and ignition risk. While this risk

reduction is less than what SDG&E had originally estimated, based on SDG&E's current average cost per trim, this program remains risk spend efficient.

In addition to the information presented on the study, SDG&E would like to clarify the scope of the enhanced vegetation management program. The enhanced vegetation management program is targeting greater clearances on specific high-risk species (described in SDG&E-14 below), that are located in the HFTD. When SDG&E discusses achieving enhanced clearances up to 25' where feasible, it is talking about the high-risk tree species that have tree canopies located above the adjacent power lines, a radial clearance from 0-180 degrees versus 0 – 360 degrees. SDG&E is not trying to achieve a 25' radial clearance from all vegetation including native plants, grasses, shrubs, or trees that are located below the power lines. SDG&E maintains compliant clearances on trees that grow under power lines to ensure a grow in does not occur, but there is no need to increase clearances on these trees, because they are not at risk of shedding branches in wind events that could blow into the power lines. SDG&E agrees that native plants and vegetation can actually help slow the spread of fires and has no intention of clear cutting native vegetation below its power lines, its only objective is to trim back or remove trees with canopies located above the power lines that have the potential shed branches that could contact the power lines and result in a potential ignition.