SPD DATA REQUEST: SPD-SDGE-WMP2026-02
SDG&E RESPONSE

Date Received: 07-01-2025
Date Submitted: 07-24-2025

I. GENERAL OBJECTIONS

1. SDG&E objects generally to each request to the extent that it seeks information protected by the attorney-client privilege, the attorney work product doctrine, or any other applicable privilege or evidentiary doctrine. No information protected by such privileges will be knowingly disclosed.

2. SDG&E objects generally to each request that is overly broad and unduly burdensome. As part of this objection, SDG&E objects to discovery requests that seek "all documents" or "each and every document" and similarly worded requests on the grounds that such requests are unreasonably cumulative and duplicative, fail to identify with specificity the information or material sought, and create an unreasonable burden compared to the likelihood of such requests leading to the discovery of admissible evidence. Notwithstanding this objection, SDG&E will produce all relevant, non-privileged information not otherwise objected to that it is able to locate after reasonable inquiry.

3. SDG&E objects generally to each request to the extent that the request is vague, unintelligible, or fails to identify with sufficient particularity the information or documents requested and, thus, is not susceptible to response at this time.

4. SDG&E objects generally to each request that: (1) asks for a legal conclusion to be drawn or legal research to be conducted on the grounds that such requests are not designed to elicit facts and, thus, violate the principles underlying discovery; (2) requires SDG&E to do legal research or perform additional analyses to respond to the request; or (3) seeks access to counsel's legal research, analyses or theories.

5. SDG&E objects generally to each request to the extent it seeks information or documents that are not reasonably calculated to lead to the discovery of admissible evidence.

6. SDG&E objects generally to each request to the extent that it is unreasonably duplicative or cumulative of other requests.

7. SDG&E objects generally to each request to the extent that it would require SDG&E to search its files for matters of public record such as filings, testimony, transcripts, decisions, orders, reports or other information, whether available in the public domain or through FERC or CPUC sources.

8. SDG&E objects generally to each request to the extent that it seeks information or documents that are not in the possession, custody or control of SDG&E.

9. SDG&E objects generally to each request to the extent that the request would impose an undue burden on SDG&E by requiring it to perform studies, analyses or calculations or to create documents that do not currently exist.

10. SDG&E objects generally to each request that calls for information that contains trade

secrets, is privileged or otherwise entitled to confidential protection by reference to statutory protection. SDG&E objects to providing such information absent an appropriate protective order.

II. EXPRESS RESERVATIONS

1. No response, objection, limitation or lack thereof, set forth in these responses and objections shall be deemed an admission or representation by SDG&E as to the existence or nonexistence of the requested information or that any such information is relevant or admissible.

2. SDG&E reserves the right to modify or supplement its responses and objections to each request, and the provision of any information pursuant to any request is not a waiver of that right.

3. SDG&E reserves the right to rely, at any time, upon subsequently discovered information.

4. These responses are made solely for the purpose of this proceeding and for no other purpose.

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SDG&E RESPONSE

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III. RESPONSES

QUESTION 1

In response to Question 3 of SPD-SDG&E-WMP 2026-001 SDG&E submitted a slide deck called "SDGE WMP 2026-2028_Presentation." On slide 20, SDG&E presented its strategic undergrounding mitigation effectiveness calculation. The following are questions regarding the slide:

a. SDG&E estimates that undergrounding is 95% effective at mitigating the risk of drivers related ignitions on the underground system.

i. Would it be correct to interpret this as SDG&E estimates that an ignition associated with underground lines is 95% less risky than an overhead ignitions?

1. Provide any SDG&E studies to justify that an underground ignition is less risky than an overhead ignition.

2. SDG&E states that ignitions associated with the underground system are unlikely to cause wildfires due to underground assets' enclosed and protected nature. What proof exists that this is correct?

3. SDG&E is reporting non-reportable and reportable ignitions in the data set. What percentage of ignitions are reportable for each of the drivers?

4. SDG&E's four largest CPUC-reportable ignitions between 2015 and 2024 (ignitions on 4/12/2015, 7/6/2018, 5/22/2018, 7/1/2024) were each located in rural areas with a relative abundance of fuel sources. Many of the underground or padmounted reportable ignitions appear to be near more densely populated areas with limited fuel sources. How can SDG&E ensure that the reason for undergrounded ignitions appearing to be less risky is not that they are less risky but instead that undergrounded lines are in areas with less fuels as compared to the overhead lines which result in the more impactful overhead ignitions?

b. Correct the mitigation effectiveness calculation to fix the arithmetic error which conflates the drivers for outage ignitions. The chart computes the mitigation effectiveness of undergrounding by comparing the number of ignitions from drivers before versus after being mitigated. However, the chart adds the drivers of underground ignitions to the drivers overhead ignitions, as an "ignition being mitigated." These drivers of undergrounding ignitions will not be mitigated by undergrounding. In fact – the newly undergrounded lines will now be subject to these new set of underground ignition drivers – and so the number of undergrounding related ignitions to increase as lines are undergrounded.

c. Provide a workpaper which computes the strategic undergrounding mitigation effectiveness calculation, but only includes ignitions that occurred the HFTD.

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RESPONSE 1

a.i.1) SDG&E does not estimate that ignitions associated with underground lines are 95% less risky than those from overhead lines in its efficacy tables. SDG&E's Mitigation Effectiveness is a quantitative measure of the estimated reduction of ignitions from specific wildfire risk drivers. It is a static, system-wide measure that quantifies a mitigation's capability to prevent an ignition occurring from a given wildfire risk driver. Undergrounding does not mitigate the consequence of ignition, rather, it reduces the likelihood of the ignition itself. The consequence of an ignition is the product of conditions at the time of ignition, such as wind, weather, terrain, and topography. Thus, the consequence of the ignition is generally unrelated to the source of the ignition. Undergrounding may have corollary benefits in reducing the consequence of ignition as well, including but not limited to removing the incidence of electrical infrastructure coming into contact with an active fire and/or posing a threat to emergency responders, and improved post-fire restoration times, as underground lines often do not have to be rebuilt after a fire. These corollary benefits, however, are not measured in SDG&E's ignition reduction estimates.

a.i.2) In SDG&E's system, underground conductors are typically installed 24 to 48 inches below ground within protective conduits. This installation method physically isolates the conductors from combustible vegetation and other wildfire fuels, significantly reducing the potential for ignition. Additionally, underground systems are inherently shielded from environmental hazards such as wind-blown debris, falling branches, lightning, and other weather-related risks that affect overhead infrastructure. This physical isolation from fuel and protection from atmospheric hazards reduces ignition occurrence in the first place. In case of a fault within the underground system, any resulting arc or thermal event is generally contained within the conduit and undergrounding system structures, where the limited availability of oxygen significantly reduces the likelihood of sustained combustion. These design characteristics collectively contribute to the extremely low probability of ignition from faults occurring in properly installed underground systems. Please see the response to a.1.3 for additional data supporting this analysis.

a.i.3) SDG&E's reportable and non-reportable Ignitions ratio.

Distribution OH Risk Driver	Total Number of OH CPUC Reportable Ignitions [2019 - 2024]	Total Number of OH CPUC Reportable Ignitions and Evidence of Heat Events [2019 - 2024]	Ratio
Animal Contact	19	20	95.00%
Balloon Contact	9	27	33.33%
Vehicle Contact	10	20	50.00%
Vegetation Contact	11	72	15.28%

Distribution OH Risk Driver	Total Number of OH CPUC Reportable Ignitions [2019 - 2024]	Total Number of OH CPUC Reportable Ignitions and Evidence of Heat Events [2019 - 2024]	Ratio
Other Contact[1]	4	47	8.51%
Conductor	10	123	8.13%
Equipment – Non-Conductor[2]	49	412	11.89%
Other All[3]	9	151	5.96%
Undetermined[4]	1	10	10.00%
OH to UG Connection	0	20	0.00%
Total	**122**	**902**	**13.53%**

a.i.4) SDG&E does not base its Strategic Undergrounding decisions on the historical consequences of underground ignition events. Rather, the utility employs a data-driven approach that prioritizes areas for undergrounding based on the potential consequences of overhead ignitions, particularly in High Fire-Threat District (HFTD). This includes consideration of factors such as fuel density, topography, historical weather patterns, and proximity to communities.

As of today, SDG&E operates nearly 3,000 miles of underground infrastructure within HFTD, including approximately 1,790 miles located in rural areas—regions typically associated with higher wildfire risk due to abundant fuel sources. Furthermore, SDG&E has experienced over 700 underground outages in HFTD during the same period, with only one resulting in an ignition. These statistics demonstrate that the low ignition rate associated with underground systems is not merely a function of location or fuel proximity, but rather a reflection of the inherent safety and protection provided by underground infrastructure.

Therefore, the observed lower risk of underground ignitions is not due to selective placement in low fuel areas, but is instead a result of the physical characteristics and operational performance of underground systems, even in high-risk rural environments.

b) SDG&E has refined its methodology for calculating the Mitigation Effectiveness (ME) of its Strategic Undergrounding (SUG) program. This revision introduces a clearer and more straightforward approach to estimating the reduction in ignition risk achieved by converting overhead (OH) electric infrastructure to underground (UG) systems.

[1] Other contacts include external contacts caused by SDG&E or non-SDG&E personnel, customers, and foreign objects (excluding animals, balloons, vegetation, and vehicles) in overhead electrical equipment

[2] Equipment – Non-Conductor includes electrical equipment like lightning arrestors, fuses, and transformers.

[3] Other All includes contamination, dig-ins, vandalism, and non-utility fires.

[4] Undetermined includes outages/ignitions with no information in Primary or Secondary Cause.

To calculate the Mitigation Effectiveness for SUG and CCC, SDG&E utilizes the Evidence of Heat events dataset. This data is collected through its Ignition Management Program (IMP), and it is used to estimate Mitigation Effectiveness of SUG and CCC. The IMP gathers input from internal stakeholders to systematically track both actual and potential events. It also identifies the specific causes of equipment failures or incidents. When a definitive cause is established, the corresponding mode of failure is documented and communicated to the appropriate mitigation owner for corrective action. In addition to supporting internal risk management, the IMP helps fulfill regulatory reporting obligations associated with Energy Safety and CPUC ignition reporting requirements. This dataset is continuously updated as new ignition-related events occur in SDG&E's service territory and is thoroughly reviewed and evaluated by a cross-functional team of subject matter experts.

The dataset includes not only ignitions that meet the CPUC's reporting criteria (D.14-02-015) but also all recorded Evidence of Heat events, regardless of whether they qualify as CPUC-reportable ignitions. Each of these data points, whether classified as reportable or not, is systematically communicated to SDG&E's Engineering, Risk Analytics, and District teams. This ensures that both immediate and long-term corrective actions can be identified and implemented.

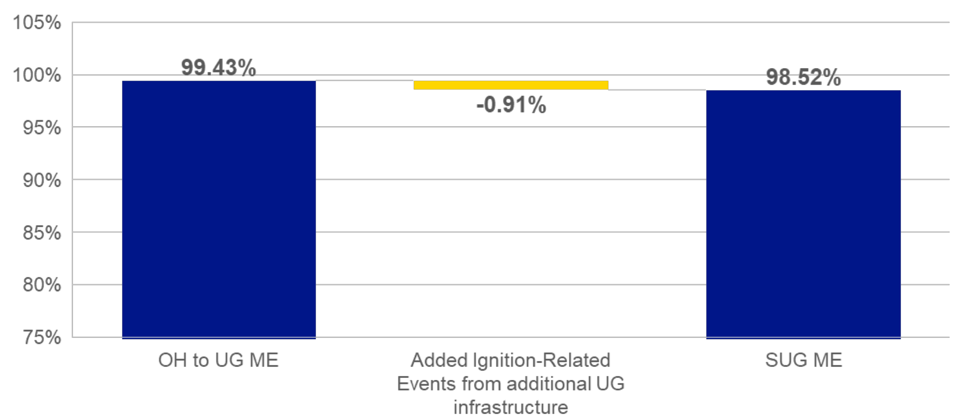
The initial step in the new mitigation effectiveness calculation involves estimating the total number of ignition-related events (i.e., Evidence of Heat events and CPUC reportable ignitions) that are avoided by removing overhead infrastructure. This "OH to UG ME" value represents the theoretical maximum benefit of undergrounding, assuming complete elimination of overhead-related ignition-related events recorded between 2019 and 2024. Based on SDG&E's subject matter expert (SME) assumptions on ignition-related event reduction, the "OH to UG ME" is calculated at 99.43%, indicating that nearly all ignition drivers associated with overhead assets are mitigated through strategic undergrounding. See the table below with detailed calculations.

However, this ME value represents the unadjusted ignition reduction percentage from nearly eliminating overhead ignition drivers. While undergrounding removes overhead assets, it also introduces new underground infrastructure that is subject to a separate, much lower likelihood and consequence of ignition-related events.

SDG&E estimates the residual ignition risk associated with underground infrastructure at approximately 0.91%. This estimate is derived by comparing the relative frequency of ignition-related events per mile of overhead (OH) and underground (UG) infrastructure. Additionally, the calculation accounts for the increased cable length typically required when converting overhead assets to underground, estimated at approximately 20% more mileage.

After incorporating the estimated residual risk, the adjusted Mitigation Effectiveness of SDG&E's Strategic Undergrounding program is calculated at 98.52% (99.43% - 0.91%) as shown in Figure 1. This value is based on ignition-related events recorded between 2019 and 2024, reflecting a comprehensive assessment of both the benefits of removing overhead infrastructure and the minimal ignition-related risk introduced by underground systems.

Figure 1: SUG Mitigation Effectiveness Based on All Ignition-Related Events



Note that in the interest of maintaining a conservative modeling approach, SDG&E has elected to assume and model mitigation effectiveness for SUG of 98% in its WiNGS-Planning risk analysis, instead of the calculated value of 98.52%.

The table below presents the Mitigation Effectiveness (ME) calculation for relocating assets from overhead to underground infrastructure, based on all recorded ignition-related events.

OH Distribution Ignition-Related Drivers		**Total Number of CPUC Reportable Ignitions and Evidence of Heat Events [2019 - 2024]**	**2024/2025 SME Ignition-Related Reduction (%)**	**Estimated Number of Ignition-Related Events Reduced**	**Comments**
Equipment	Conductor Failure	123	100%	123	With the removal of overhead (OH) assets, it is assumed that there will be zero ignition incidents.
Equipment	OH Equipment (Non-Conductor)	412	100%	412	With the removal of overhead (OH) assets, it is assumed that there will be zero ignition incidents.
External	Vehicle Contact (Pole)	20	100%	20	With the removal of overhead (OH) assets, it is assumed that there will be zero ignition incidents.

OH Distribution Ignition-Related Drivers		Total Number of CPUC Reportable Ignitions and Evidence of Heat Events [2019 - 2024]	2024/2025 SME Ignition-Related Reduction (%)	Estimated Number of Ignition-Related Events Reduced	Comments
Equipment	OH Equipment Failure Unknown	10	100%	10	Ignitions with no information in Primary or Secondary Cause (unknown). With the removal of overhead (OH) assets, it is assumed that there will be zero ignition incidents
Equipment	OH to UG Connection	20	100%	20	With the removal of overhead (OH) assets, it is assumed that there will be zero ignition incidents.
External	All Other OH	151	99%	149.49	This category accounts for potential factors in the overhead system that could impact underground equipment (e.g., contamination and non-utility fires). The effectiveness assumes that the enclosed nature of underground structures offers better protection and containment of potential ignitions, preventing them from spreading to surrounding areas.
External	Other OH Contact	47	100%	47	With the removal of overhead (OH) assets, it is assumed that there will be zero ignition incidents.
External	Vegetation Contact	72	95%	68.4	The enclosed nature of underground structures is assumed to help contain any ignition, preventing spread to surrounding areas. The effectiveness rate accounts for potential vegetation contacts such as roots growing and encroaching on underground structures.

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OH Distribution Ignition-Related Drivers		Total Number of CPUC Reportable Ignitions and Evidence of Heat Events [2019 - 2024]	2024/2025 SME Ignition-Related Reduction (%)	Estimated Number of Ignition-Related Events Reduced	Comments
External	Balloon Contact	27	100%	27	With the removal of overhead (OH) assets, it is assumed that there will be zero ignition incidents.
External	Animal Contact (OH)	20	100%	20	With the removal of overhead (OH) assets, it is assumed that there will be zero ignition incidents.
Total		902		896.89	

To calculate the OH to UG mitigation effectiveness (i.e., ignition reduction effectiveness), the total number of ignitions estimated to be reduced by locating assets underground is divided by the total number of distribution ignitions, as shown in the following equation:

$$\text{OH to UG Mitigation Effectiveness (All Ignition-Related Events)} = \frac{896.89}{902} = 99.43\%$$

$$\text{SUG Mitigation Effectiveness (All Ignition-Related Events)} = \text{OH to UG ME} - \text{Added Ignition-Related Risk from UG} = 99.43\% - 0.91\% = 98.52\%$$

C) The Mitigation Effectiveness of the Strategic Undergrounding mitigation, considering only ignition events that occurred within SDG&E’s HFTD is 98.73%.
For additional details, please refer to the attached file spreadsheet “SDGE Response SPD-SDGE-WMP2026-02_Q1c_HFTD_CPUC_Reportable_Ignitions_for_SUG_2025_07_16.xlsx” file.

QUESTION 2

Provide a workpaper which shows the study which demonstrates how the estimated effectiveness of covered conductor has degraded overtime as discussed on page 11 of "Joint IOU Grid Hardening Working Group Report: Update for 2026-2028 Wildfire Mitigation Plan."

a. How many of the equipment failures used on the "traditionally (bare conductor) hardening" related to non-exempt equipment?

RESPONSE 2

SDG&E utilized findings from its distribution hardening study to demonstrate asset degradation over a 10-year period for its Covered Conductor program. This approach was taken because both distribution hardening and covered conductor installations follow the same equipment installation processes. Please see the attached spreadsheet titled "SDGE Response SPD-SDGE-WMP2026-02 _Q2_Hardening Efficacy.xlsx", which includes the analysis.

Additionally, SDG&E does not currently track the exempt status of equipment in its historical data. However, efforts are underway to incorporate this capability, and going forward, SDG&E will be able to capture and report this information. Due to the current data limitations, SDG&E is unable to determine how many of the equipment failures associated with the traditional (bare conductor) hardening efforts were related to non-exempt equipment.

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QUESTION 3

Provide an update ignition dataset through 2024 to the one previously provided as part of, "WSPS-SDGE-2023WMP-02 SDG&E RESPONSE."

a. Provide non-reportable ignitions used in the covered conductor and undergrounding mitigation effectiveness study under the same format.

b. Include an additional column which classifies each ignition as one of the drivers used in the underground ignitions analysis slide 20 of "SDGE WMP 2026-2028_Presentation."

c. Include an additional column which classifies each ignition as the driver used for the covered conductor ignition mitigation effectiveness study on slide 21 of "SDGE WMP 2026-2028_Presentation."

d. Include a column which indicates which ignitions were used to determine the reduction in 10-year effectiveness of system hardening as described on page 11 of "Joint IOU Grid Hardening Working Group Report: Update for 2026-2028 Wildfire Mitigation Plan"

e. Include a column which classifies if the "equipment involved with ignition" was exempt or non-exempt.

RESPONSE 3

SDG&E has refined its methodology for calculating the Mitigation Effectiveness (ME) of its Strategic Undergrounding (SUG) and Covered Conductor (CCC) program in the recent WMP resubmission. The response below will reflect the updated ME values.

a-c. Please see attached spreadsheet titled "SDGE Response SPD-SDGE-WMP2026-02_Q3.xlsx."

d. SDG&E's distribution hardening study is primarily based on outage-related risk events, rather than ignition data. This approach was taken due to the limited availability of ignition data, which constrains the ability to draw statistically meaningful conclusions regarding mitigation effectiveness. SDG&E considers each risk event a potential ignition source, and therefore, a reduction in overall risk events is viewed as a proxy for ignition risk reduction.

e. SDG&E does not currently track the exempt status of equipment in its historical data. However, efforts are underway to incorporate this capability, and going forward, SDG&E will be able to capture and report this information. Due to the current data limitations, SDG&E is unable to determine how many of the equipment failures associated with the traditional (bare conductor) hardening efforts were related to non-exempt equipment.

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<u>QUESTION 4</u>

SPD understands SDG&E uses its "OH CMP Detailed Inspection Instructor Guide" to provide guide to its overhead inspectors. The guide provides little information as to how to prioritize corrective actions as level 1s, level 2s or level 3 per Rule 18 of General Order 95. What other guidance does SDG&E give its inspectors to ensure consistency between inspectors?

a. For instance – one can imagine a pole that is split at the top, which may need a different priority depending on the severity. How does SDG&E ensure their inspectors assign a similar priority level for these types of conditions? Does SDG&E provide pictures to its inspectors showing different priority levels?

<u>RESPONSE 4</u>

As part of the CMP inspection training, General Order 95, Appendices I and J are reviewed with overhead inspectors. These appendices provide additional detail assigning priority levels to issues depending on severity. Historically, SDG&E has identified all corrective actions related to potential safety and fire hazards as Level 1 or Level 2, with corrective action due dates between 6 to 12 months depending on the location of the facility. Accordingly, the need to distinguish between Level 2 and 3 for potential fire or safety issues has been minimal.

SDG&E-qualified inspectors go through both classroom and on-the-job training that provides real-world experience distinguishing between different types of issues, the potential risk associated with the issue, and considering factors such as location, weather conditions, and failure consequences when assigning severity. In the classroom, visual aids such as photos of actual field conditions are used extensively to help trainees recognize and differentiate between issue types before they encounter them in the field. The inspector training includes administration of tests, and upon successful completion, SDG&E's inspection audit program is designed to monitor performance, identify trends, and issue feedback to inspectors and management related to inspection quality.

Together, these elements support consistency between inspectors related to identifying issues and assigning appropriate severity levels, ensuring that the corrective action can be properly and consistently prioritized.

<u>QUESTION 5</u>

What steps has SDG&E taken to archive any data or models related to current and past risk models?

a. Have any aspects of the current version of the Wings-Planning risk framework not been archived? If so, explain why they were not archived.

i. If any aspects of the current version of the Wings-Planning risk framework were not archived, would this prevent a party from asking for data analysis the current version of the Wings-Planning risk framework in the future?

b. How long will SDG&E maintain its archive of the data or models related to the current version of the Wings-Planning risk framework?

c. What data is SDG&E maintaining of its previous asset data? What data would be missing if SDG&E wanted to backcast the risk in pre-2023 years using the current version of the Wings-Planning risk framework?

d. How is SDG&E working to ensure that future models have the data necessary to backcast the risk to current system configurations?

<u>RESPONSE 5</u>

SDG&E has implemented a robust data governance and version control system for its WiNGS-Planning and WiNGS-Ops models. Namely, SDG&E uses AWS cloud infrastructure to manage input/output and model versioning. This includes secure archiving of all input variables, Python library versions, and assumptions used in each model run. Additionally, every model run is timestamped and stored with metadata, ensuring full traceability and reproducibility of results.

a) As of the release of WiNGS-Planning 3.0 (the current version), all development and production versions of WiNGS-Planning are version controlled in code repository systems and are functionally archived to use for traceability, data analysis, and documentation. This current archiving and version control practice ensures that all model version outputs are traceable and reproducible.
   i. N/A

b) SDG&E's current retention policy requires that asset related data be retained for the life of the asset plus 10 years. This includes SDG&E's WiNGS-Planning data and model code.

c) SDG&E maintains and stores historical weather, outage, ignition, and vegetation data associated with its assets, along with asset characteristics maintained in its GIS systems. For example, daily snapshots of the GIS system data are captured and stored in the AWS Cloud data storage management systems, which capture a variety of asset attribute information. Historical records of data sources have varied date ranges, depending on the date when that data source was first archived in the company's cloud data storage systems.

For back casting risk to pre-2023 years using the current WiNGS-Planning framework, SDG&E does not have a majority of the necessary input data in the format needed to run the model. Most of the daily snapshot GIS cloud data archiving started in late 2022, though the exact date varies across data sources. As an example, if a model run of the current WiNGS-Planning framework was performed on a snapshot of 2022-01-01, the following GIS data input sources would not be available to be dynamically leveraged from the existing cloud data archive:

Dataset Name	**Dataset Description**	**Temporal Range**
gis_priohconductor_shape	Primary overhead spans shape records.	3/15/2023 to Present
gis_priugconductor_shape	Primary underground conductor spans shape records.	3/15/2023 to Present
gis_secohconductor_shape	Secondary overhead conductor spans shape records.	3/15/2023 to Present
gis_secugconductor_shape	Secondary underground conductor spans shape records.	07/04/2023 to Present
gis_customerinformation_sde	Customer meter records	5/10/2023 to Present
gis_surfacestructure	Surface structures records	5/24/2023 to Present
gis_workhistory_priohcondinfo	Work order history records join table to the Primary overhead conductor spans phase records	8/11/2022 to Present
gis_workhistory_priugcondinfo	Work order history records join table to the Primary underground conductor spans phase records	8/4/2022 to Present
gis_workhistory_surfstruct	Work order history records join table to the Surface structure records	7/20/2022 to Present
gis_workhistory_ugstruct	Work order history records join table to the Underground structure records	7/20/2022 to Present
gis_priohconductor_shape	Primary overhead spans shape records.	3/15/2023 to Present

d) SDG&E is leveraging its AWS Cloud data storage systems and data snapshot capture for all used data sources moving forward to ensure maximum back casting functionality, to enable a wide range of alternate analysis to be performed to help support improved insight into modeling results, which help support wildfire mitigation efforts.

QUESTION 6

In Response to Question 5.d.i of "SPD-SDGE-WMP2026-001," SDG&E stated the following:

> Trench mile is a unit of measure which includes civil construction (digging the trench & sub-structure locations, placement of conduit, etc.) required to complete a project(s), whereas Energized Mile is a unit of measure that also includes the use of existing underground facilities (spare conduit) that were cabled as part of the project(s).

SPD understands that the work that SDG&E is performing is usually new work and so is confused as to how the energized mile only relates to existing work. Because of this, SPD is interpreting that the energized cost per mile is in addition to the trench cost per mile – and so understands that the full cost per mile of undergrounding is 1.930+2.379=$4.309 million per mile. If this is not correct, provide a diagram which shows the difference between energized miles and trench miles.

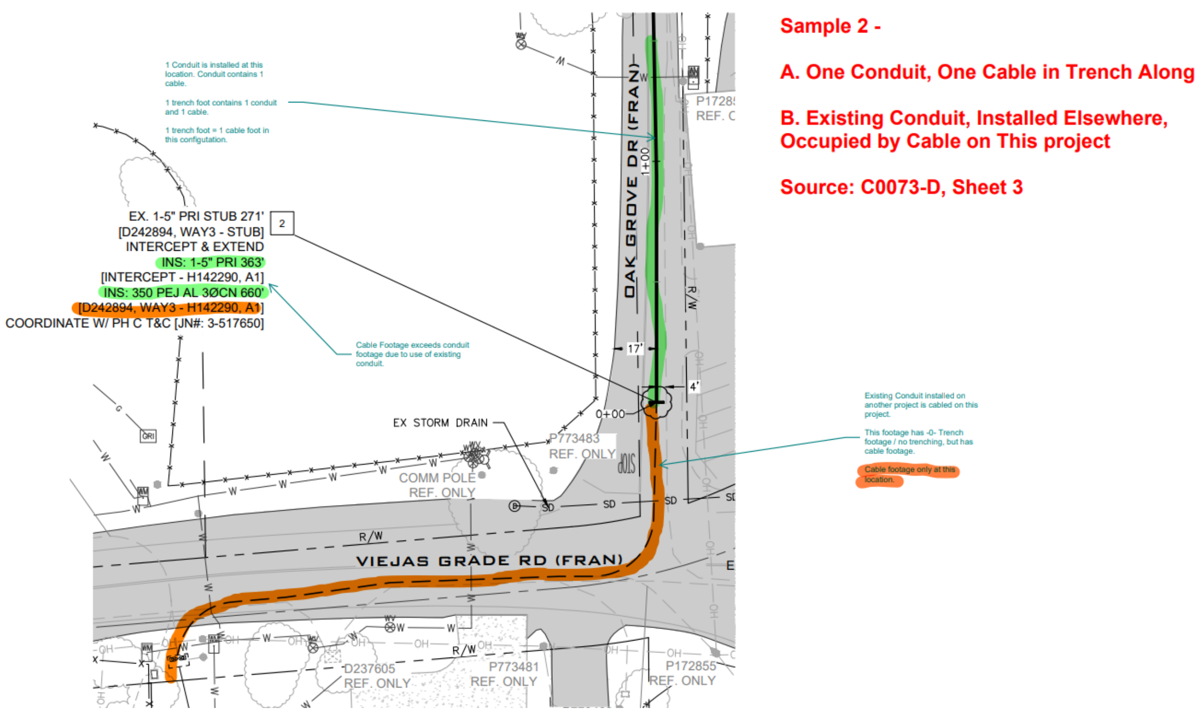
RESPONSE 6

SDG&E calculates the energized mileage of Strategic Undergrounding Projects from the installed cable footage for each underground cable installed. It is a common and expected occurrence that a trench may contain as few as one single conduit and cable, or as many as 10 conduits and cables, depending on the number and density of meters; the position on the line segment relative to the source and the load; the proximity or distance to isolation and switching devices; availability of existing, unoccupied conduits to the desired location; and other engineering factors which are considered during design.

In the provided table below, the specified quantities of 36.59 Energized Miles and 29.70 Trench Miles represent the same work – 29.7 miles of trench were used to install 36.59 miles of energized cables. In general, SDG&E contracts for both the design and construction of this work on a per-project basis, and the unit cost, either by Energized Miles or Trench Miles is calculated by dividing the total recognized cost (subject to the assumptions provided in the cost figure for what costs are included therein) by the units of work which were completed using those dollars.

The provided table seeks to clarify that because fewer trench miles are required than energized cable miles, the cost per trench mile is higher than the cost per cable mile. These figures **are not additive,** as they represent different evaluation criteria of the same total cost, outlined in the leftmost column. The Total Cost of the Project, represented in the second column from Left labeled "Total Cost", may be divided by the Trench miles (column 3) or the energized miles (column 4), depending on purpose of the reporting. These values for Trench and Energized miles **are not additive,** as they represent the same total cost value.

Cost Category	Total Cost ($)	$/Trench Mile	$/Energized Mile
Mileage		*29.70*	*36.59*
Civil	$36,755,597	$1,237,771	$1,004,526
Electrical	$4,077,458	$137,311	$111,436
Material	$4,644,616	$156,411	$126,937
Design	$14,198,830	$478,156	$388,052
Project Support	$10,308,278	$347,139	$281,724
Other/Uncategorized	$653,251	$21,999	$17,853
Total Direct	**$70,638,029**	**$2,378,785**	**$1,930,528**



As illustrated in the diagram above, the section highlighted in brown utilizes existing conduit infrastructure. Therefore, only the cable length needs to be accounted for, and the appropriate cost metric in this case is the energized cost per mile.

In contrast, the green-highlighted section requires the installation of both conduit and cable. Accordingly, the trench cost per mile should be applied to reflect the full scope of work.

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QUESTION 7

In response to SPD-SDGE-WMP2026-001 Question 2, SDG&E provided SPD with the file SDGE Response SPD-SDGE-WMP2026-001-Q02.b.Lifecycle Cost Dataset.xlsx. This Excel workbook includes the "lifecycle cost all territory" spreadsheet and each field in this spreadsheet is defined in the "metadata definition" spreadsheet. In the "metadata definition" spreadsheet of SDGE Response SPD-SDGE-WMP2026-001-Q02.b.Lifecycle Cost Dataset.xlsx it is explained that the field "total_if_ug_cost_per_mile"[5] is calculated using the following formula: "total_ug_asset_cost_per_mile + total_ug_psps_cost_per_mile". Additionally, the field "total_ug_asset_cost_per_mile" is calculated using the following formula: total_ug_inspection_cost_per_mile + total_ug_repair_cost_per_mile.

a. Explain how SDG&E calculated values for each of the following fields:
   i. total_ug_inspection_cost_per_mile
   ii. total_ug_repair_cost_per_mile
   iii. total_ug_psps_cost_per_mile

b. Explain why the total_ug_repair_cost_per_mile field includes a value of $247,280 for every feeder segment.

c. Explain how each of the fields discussed in Question 7a. relate to corresponding values in the "Unit Cost" spreadsheet found in SDGE Response SPD-SDGE-WMP2026-001-Q02.b.Lifecycle Cost Dataset.xlsx. For instance, did SDG&E use the estimate of $1.43M/year for Total UG Inspection Cost in the "Unit Cost" Spreadsheet to inform total_ug_inspection_cost_per_mile field found in the "lifecycle cost all territory" spreadsheet.
   i. If not, explain why not.

d. Provide any datasets that informed the calculation of the fields listed in Question 7a.

e. Explain why Appendix G does not include separate spreadsheets for "UG Inspections".

f. For each of the fields listed in Question 7a., explain if the costs associated with that field fund a Mitigation or Control "Program" as defined in Row 28 of the RDF.[6]
   i. Provide the page number in D.24-12-074 or its Appendices that discuss this Program and its costs.

   ii. Provide the page number in the Sempra 2024 Risk Spend Accountability Report (RSAR) that discusses this Program and its costs. 1. Provide an Excel version of the Sempra 2024 RSAR

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[5] This field is defined as the "total cost of combined covered conductor related cost divided by the length of the circuit miles of the given segment".
[6] D.24-05-064, Appendix A at A-19 – A-20.

iii. Explain which budget code SDG&E used in its 2024 Test Year GRC to recover the costs presented in each field.

iv. Explain if SDG&E intends to use a similar budget code to present these forecasted costs in its 2028 Test Year GRC.

v. Explain which workpaper and cost center(s) SDG&E used in its 2024 Test Year GRC to recover the costs presented in this field.

vi. Explain if SDG&E intends to use a workpaper and cost center(s) to present these forecasted costs in its 2028 Test Year GRC.

g. In the "Unit Cost" spreadsheet for the SS10 Inspection (Subsurface) and AGI Inspection (Padmount) SDG&E has indicated that this would occur on a 10 and 5 year frequency, respectively.

i. Explain how these frequencies comply with GO 165 inspection requirements.

ii. Explain any other inspections and patrols that are required for undergrounded feeder segments by GO 165 that are not listed in the Unit Cost spreadsheet.

1. What are the costs associated with these inspections and patrols.

h. For each location where SDG&E references "Historical Data" in Column H of the "Unit Cost" spreadsheet, provide SPD with said dataset.

i. The name of each dataset must only include the name of the Activity (Column A) and timespan of the data. For instance, for the data referenced in cell H17, the dataset must be named "UG Repair and Replacement Capital 2020-2024.xlsx".

ii. For each dataset, explain why only 1 or 5 years of data were used.

RESPONSE 7

a. SDG&E has provided an updated version of the lifecycle costs that are used in the WMP2026-2028 resubmission. The on-going mitigation cost component of the lifecycle costs is renamed as "Long-term Operational Mitigation Costs". See attached excel file titled "SDGE Response SPD-SDGE-WMP2026-02_Q7_Long-term Operational Mitigation Costs.xlsx". SDG&E also updated some of the unit costs after the enhancement, see excel file name "SPD-SDGE-WMP2026-02_Long-Term Operational Mitigation Unit Costs.xlsx". The location (column **C#**) of "Unit Cost" is indicated in the formula below:

i. total_ug_inspection_cost_per_mile (Now named as "total_ug_insp_cost_per_mile") = (Subsurface Capital&OM Unit Cost +Padmount Capital&OM Unit Cost)× (∫frequency of inspection × years in age bracket)

ii. total_ug_repair_cost_per_mile =
(Subsurface Capital&OM Unit Cost +Padmount Capital&OM Unit Cost) × (∫age based finding rate per mile per year × years in age bracket)

iii. total_ug_psps_cost_per_mile = ug_psps_comm_outreach_cost_per_mile + ug_psps_activation_cost_per_mile

ug_psps_activation_cost_per_mile = (PSPS Activation Baseline unit cost + PSPS Activation unit cost × oh miles) × simulated frequency × 55 years ÷ segment oh circuit miles

ug_psps_comm_outreach_cost_per_mile = PSPS Customer Outreach unit cost × 55 years

b. The updated unit cost used for underground asset related repair can be found in the excel file named as "SPD-SDGE-WMP2026-02_Long-Term Operational Mitigation Unit Costs.xlsx". This underground asset-related repair cost is estimated based on the estimated assets per segment. Repair costs are based on the inspection finding rate in HFTD per asset age group, number of assets per mile in HFTD based current GIS data, and unit cost of repair to calculate the total cost in 55 years. This total cost is then divided by the total converted underground miles to derive the cost per mile. The unit cost is the same, but once it's applied to segments, the cost per mile is different.

c. A new unit cost table is created and included in this data request as file name "SDGE Response SPD-SDGE-WMP2026-02_Q7_Long-Term Operational Mitigation Unit Costs.xlsx".
The location (column **C#**) of "Unit Cost" is indicated in the formula below:

total_ug_insp_cost_per_mile =
(Subsurface Capital&OM Unit Cost**-C24** +Padmount Capital&OM Unit Cost-**C23**)× (∫frequency of inspection × years in age bracket)

total_ug_repair_cost_per_mile =
(Subsurface Capital&OM Unit Cost-**C28&C29** +Padmount Capital&OM Unit Cost-**C26+C27**) × (∫age based finding rate per mile per year × years in age bracket)

ug_psps_activation_cost_per_mile = (PSPS Activation Baseline unit cost-**C22** + PSPS Activation unit cost-C**21** × simulated frequency) × 55 years

ug_psps_comm_outreach_cost_per_mile = PSPS Customer Outreach unit cost-**C18** × 55 years

d. Below are the sheet names provided for the datasets that informed the calculation of the fields listed in Question 7a.
   i. total_ug_inspection_cost_per_mile (Now named total_ug_insp_cost_per_mile):

a. "SDGE Response SPD-SDGE-WMP2026-02_Q7_Long-Term Operational Mitigation Unit Costs.xlsx"
b. "SDGE Response SPD-SDGE-WMP2026-02_Q7_Underground Inspection Costs 2024.xlsx"

ii. total_ug_repair_cost_per_mile
a. "SDGE Response SPD-SDGE-WMP2026-02_Q7_Long-Term Operational Mitigation Unit Costs.xlsx"
b. "SDGE Response SPD-SDGE-WMP2026-02_Q7d_Underground Repair Costs (2023-24).xlsx"

iii. total_ug_psps_cost_per_mile:
a. "SDGE Response SPD-SDGE-WMP2026-02_Q7_PSPS Costs (2021-2024).xlsx"
The average cost is calculated for years where there was no de-energization (2022 & 2023), this annual average is used to calculate the baseline cost (preparedness for PSPS) per mile; for years there were de-energization (2021 & 2024), the annual average is used to subtract the average of annual cost without de-energization to get the cost that represents the activation in addition to baseline cost. The average annual cost associated with de-energization and baseline cost are divided by the total HFTD miles to get the unit cost per mile. Community Outreach Cost per mile is based on the 2024 annual cost since it represents the programs that will continue. This total cost is estimated to be reduced for the underground scenario given some programs will not be needed.

e. The excel tabs included in Appendix G are within the scope of wildfire mitigation related activities according to the WMP Guideline[7], such as overhead asset inspection (tab name OH_Detail_Inspection). However, underground asset inspections are not in scope and not included in Appendix G.

f.
i. These costs are associated with the following programs in SDG&E's 2025 RAMP Report "Chapter SDG&E-Risk-5: Electric Infrastructure Integrity".

[7] FINAL 026-2028_Wildfire_Mitigation_Plan_Guidelines

Date Received: 07-01-2025
Date Submitted: 07-24-2025

Field Name	WMP Lifecycle Cost Component Subcategory Name	Control/ Mitigation Plan ID	Control/ Mitigation Description	D.24-12-074 Page Number for programs	Page Number Costs
Total_ug_inspection_cost_per_mile	UG Asset Inspection	C212	GO165 Corrective Maintenance Program Underground	445-446	445-446
ug_failure_repair_cost_per_mile	Unplanned UG Outage Restoration and Repair Costs	C212	GO165 Corrective Maintenance Program Underground	445-446	445-446
total_ug_psps_cost_per_mile	PSPS	n/a	n/a	n/a	n/a

ii. RSAR

Please see the attached file:

- "SDGE Response SPD-SDGE-WMP2026-02_Q7.f.ii_SDGE"

Field Name	WMP Lifecycle Cost Component Subcategory Name	RSAR Page Number
Total_ug_inspection_cost_per_mile	UG Asset Inspection	A-217, 223, 229, 235
total_ug_repair_cost_per_mil	UG Asset Inspection	A-217, 223, 229, 235
ug_failure_repair_cost_per_mile	Unplanned UG Outage Restoration and Repair Costs	A-217, 223, 229, 235

Field Name	WMP Lifecycle Cost Component Subcategory Name	RSAR Page Number
total_ug_psps_cost_per_mile	PSPS	n/a

iii. Budget code SDG&E used in its 2024 Test Year GRC to recover the costs presented in each field.

Field Name	WMP Lifecycle Cost Component Subcategory Name	2024 Test Year GRC Budget Code	2024 Test Year GRC Workpaper/ Cost Center
Total_ug_inspection_cost_per_mile	UG Asset Inspection	N/A	1ED008
total_ug_repair_cost_per_mil	UG Asset Inspection	00227	1ED008
ug_failure_repair_cost_per_mile	Unplanned UG Outage Restoration and Repair Costs	00230, 00236	1ED008
total_ug_psps_cost_per_mile	PSPS	N/A	N/A

iv. SDGE intends to use the same budget code in its 2028 Test Year GRC, however, this is subject to change.

v. workpaper and cost center used in its 2024 Test Year GRC is shown in iii.

vi. SDGE intends to use the same workpaper and cost center(s) in its 2028 Test Year GRC, however, this is subject to change.

g.

i. SDG&E performs the following electric distribution inspections in compliance with GO 165 at the frequency described in the table below:

Equipment Type	Patrol	Detailed
Transformers		
Underground (Subsurface)	1 year	3 years
Pad Mounted (live front)	1 year	5 years
Pad Mounted (dead front)	1 year	5 years

Switching/Protective Devices		
Underground (Subsurface)	1 year	3 years
Pad Mounted (live front)	1 year	5 years
Pad Mounted (dead front)	1 year	5 years
Oil & Gas switches (above or below surface)	1 year	3 years
Regulators/Capacitors		
Underground (Subsurface)	1 year	3 years
Pad Mounted (live front)	1 year	5 years
Pad Mounted (dead front)	1 year	5 years

- Pad-Mounted Equipment or Above-Ground Equipment

This cycle consists of Above Ground Dead-front (AGDF) and Above Ground Live-front (AGLF) detailed external and internal inspections of dead-front and live-front pad-mounted facilities to identify conditions that are out of compliance with GO 128. This is a five-year inspection cycle. These are identified as "AGE" inspections.

- Subsurface with Equipment

This cycle consists of a detailed inspection of subsurface structures (manholes, vaults, primary hand-holes and subsurface enclosures) containing distribution equipment. Structures with only cable taps, splices or pass-throughs are not required to be inspected under GO 165. These detailed inspections identify conditions out of compliance with GO 128. This is a three-year inspection cycle.

- Switch

This consists of a specialized inspection of all subsurface and pad-mounted oil and gas switches. Oil samples and gas pressure readings are obtained and recorded. Other conditions out of compliance with GO 128 are also identified. This is a three-year inspection cycle.

- Patrols

This cycle consists of a simple visual inspection of applicable aboveground and underground facilities. Note that the facilities are not opened, as patrols may be performed by a qualified inspector that is not a qualified electrical worker. While GO 165 requires patrols of these facilities every year in urban areas and within SDG&E's designated Tier 2 & Tier 3 areas of the High Fire-Threat District as per D. 17-12-024 in R. 15-05-2006, SDG&E performs patrols of pad-mounted and subsurface manholes, vaults, primary hand-holes and subsurface enclosures on a one-year inspection cycle.

In addition to the underground system inspections required under GO 165, SDG&E inspects primary distribution underground structures not containing distribution equipment on a 10-year cycle. These are identified as SS10 inspections.

ii. Inspections required for new underground assets in HFTD by GO 165 are included in the Unit Cost spreadsheet. SDG&E also includes the cost of inspections (SS10) that is not required by

GO 165 as described above. For new underground assets, live front pad mount equipment is no longer used, therefore, there are no costs associated with live front pad mount equipment inspections. Additionally, equipment (such as switches) is not typically installed in subsurface; therefore, subsurface equipment (identified as SS3) is also not included. However, these inspections still apply to some underground assets developed in the past. Below are the 2024 average unit costs for these inspection types:

Switch or SW3: $cost/unit = $477
Subsurface with equipment or SS3: $cost/unit = $338
Pad Mount Equipment or AGE: $cost/unit = $57

h.

i. Datasets used as "Historical Data" in the unit cost spreadsheet:

Activity Data File Name	**WMP Cost Component**	**Dataset Time Span**	**Reason (for using 1 vs more years of data)**
"SDGE Response SPD-SDGE-WMP2026-02_Q7d_Underground Inspection Costs 2024.xlsx"	Underground Inspections	2024	2024 data is available to access at the time of the analysis; due to time constraints, only one year of data was requested.
"SDGE Response SPD-SDGE-WMP2026-02_Q7d_Underground Repair Costs (2023-24).xlsx"	Underground Repair	2023-2024	Structure replacement cost needs to be removed. The goal is to quantify only repair related cost; therefore, the last two years of data were used since the pole replacement related cost is separated.
"SDGE Response SPD-SDGE-WMP2026-02_Q7_Overhead Repair Costs (2023-24).xlsx"	Overhead Repair	2023-2024	Structure replacement cost needs to be removed. The goal is to quantify only repair related cost; therefore, the last two years of data were used since the pole replacement related cost is separated.
"SDGE Response SPD-SDGE-WMP2026-02_Q7_Vegetation	Vegetation Management	2015-2023	Dataset was available at the time of the analysis and these years are

Activity Data File Name	WMP Cost Component	Dataset Time Span	Reason (for using 1 vs more years of data)
Management Costs (2015-2023).xlsx”			sufficient to represent the average unit cost.
“SDGE Response SPD-SDGE-WMP2026-02_Q7_PSPS Costs (2021-2024).xlsx”	PSPS	2021-2024	Community Outreach Cost per mile is based on the 2024 annual cost since it represents the programs that will continue. This total cost is estimated to be reduced for the underground scenario given some programs will not be needed. PSPS activation related costs are based on the years 2021-2024.
“SDGE Response SPD-SDGE-WMP2026-02_Q7_Unplanned Outage Restoration and Repair Costs (2019-2024).xlsx”	Unplanned OH Outage Restoration and Repair Costs	2019-2024	Dataset was available at the time of the analysis, and these years are sufficient to represent the average unit cost.

ii. See the table above.

QUESTION 8

In the "metadata definition" spreadsheet of SDGE Response SPD-SDGE-WMP2026-001-Q02.b.Lifecycle Cost Dataset.xlsx it is explained that the field "total_if_cc_cost_per_mile"[8] is calculated using the following formula: "total_oh_asset_cost_per_mile + total_oh_veg_cost_per_mile + total_cc_psps_cost_per_mile + total_oh_peds_cost_per_mile + microgrid_cost_per_mile". Additionally, the field "total_oh_asset_cost_per_mile" is calculated using the following formula: "total_oh_inspection_cost_per_mile + total_oh_repair_cost_per_mile + pole_replacement_cost_per_mile".

a. Explain how SDG&E calculated values for each of the following fields:
   i. total_oh_veg_cost_per_mile
   ii. total_cc_psps_cost_per_mile
   iii. total_oh_peds_cost_per_mile
   iv. microgrid_cost_per_mile
   v. total_oh_inspection_cost_per_mile
   vi. total_oh_repair_cost_per_mile
   vii. pole_replacement_cost_per_mile

b. Explain how each of the fields discussed in Question 8a. relate to corresponding values in the "Unit Cost" spreadsheet found in SDGE Response SPD-SDGE-WMP2026-001-Q02.b.Lifecycle Cost Dataset.xlsx. For instance, did SDG&E use the estimate of $35.62M/year for OH Replacement Capital in the "Unit Cost" spreadsheet to inform the pole_replacement_cost_per_mile field found in the "lifecycle cost all territory" spreadsheet.
   i. If not, explain why not.

c. Provide any datasets that informed the calculation of the fields listed in Question 8a.

d. For each of the fields listed in Question 8a., explain if those seven fields are representative of, connected to and/or directly calculated from the costs listed in any of the spreadsheets in Appendix G of the 2026-2028 Base WMP? For instance, do the values found in the total_oh_veg_cost_per_mile field correspond to any of the cost fields (i.e. PV Total Cost Capital + O&M, Mitigation Annual Cost etc.) found in the Pole_Clearing, Fuel_Management, Trim_and_Removal, Off_Cycle_Partrol and/or Veg_Detail_Inspection spreadsheets found in Appendix G. Explain.
   i. If not, explain why not.

e. For each of the fields listed in Question 8a., explain if the costs associated with that field fund a Mitigation or Control "Program" as defined in Row 28 of the RDF.[9]

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[8] This field is defined as the "total cost of undergrounding related cost divided by the length of the circuit miles after the given segment is undergrounded"
[9] D.24-05-064, Appendix A at A-19 – A-20.

i. Provide the page number in D.24-12-074 or its Appendices that discuss this Program and its costs.

ii. Provide the page number in the Sempra 2024 Risk Spend Accountability Report (RSAR) that discusses this Program and its costs.

iii. Explain which budget code SDG&E used in its 2024 Test Year GRC to recover the costs presented in each field.

iv. Explain if SDG&E intends to use a similar budget code to present these forecasted costs in its 2028 Test Year GRC.

v. Explain which workpaper and cost center(s) SDG&E used in its 2024 Test Year GRC to recover the costs presented in this field.

vi. Explain if SDG&E intends to use a workpaper and cost center(s) to present these forecasted costs in its 2028 Test Year GRC.

f. In the "Unit Cost" spreadsheet the Average Annual Cost (HFTD) for OH Replacement Capital is $35.62M.

i. Explain why this value is $35.62M when $25,000/pole * 700 wood poles/year = $17.5M.
Lo

ii. Explain why the Frequency of OH Replacement Capital is 700 wood poles/year, but in the notes it says "700 poles on average were replaced in the last 5 years".

iii. How many wood poles currently exist in SDG&E's territory?

iv. How many wood poles currently support covered conductor on SDG&E's electric grid?

v. Provide a dataset that demonstrates the distribution of the age of wood poles that currently exist in SDG&E's territory. Include a variable in the dataset that designates wood poles that support covered conductor.

vi. Regarding the forecast that 700 poles supporting covered conductor on average would be replaced each year, does SDG&E's estimate of 700 wood poles per year for covered conductor include any other pole replacement programs related to the following issues:

1. deterioration,
2. overloading, and
3. emergencies.

<u>RESPONSE 8</u>

a. i. total_oh_veg_cost_per_mile (now named total_veg_cost_per_mile) = (veg_inspection_per_mile + tree_trimming_per_mile + tree_auditing_per_mile + veg_pole_clearance_inspection_per_mile + veg_pole_clearance_per_mile + veg_pole_clearance_auditing_per_mile + fuels_management_per_mile)

Tree related costs = (inspections + trim/removal + audit) × ∫ frequency per year × 55 years / segment oh circuit miles
Pole related costs = (inspections + clearing + audit) × ∫ frequency per year × 55 years / segment oh circuit miles
Fuel management costs = cost per year × 55 years / segment oh circuit miles

ii. total_cc_psps_cost_per_mile = cc_psps_comm_outreach_cost_per_mile + cc_psps_activation_cost_per_mile

cc_psps_activation_cost_per_mile = (baseline unit cost + activation unit cost × oh miles) × simulated frequency × 55 years ÷ segment oh circuit miles
cc_psps_comm_outreach_cost_per_mile = PSPSCustomer Outreach unit cost × 55 years

iii. total_oh_peds_cost_per_mile = efd_per_mile + fcp_per_mile
efd_per_mile = EFD Installation unit cost ÷ 3 × 55 years (This is divided by 3 as each node is expected to be present every 3 miles)
fcp_per_mile = FCP Maintenance unit cost x 55 years ÷ segment oh circuit miles

iv. microgrid_cost_per_mile
= Microgrid Maintenance unit cost ÷ total circuit miles × segment circuit miles × 55 years ÷ segment circuit miles

v. total_oh_inspection_cost_per_mile = oh_detailed_insp_cost_per_mile + oh_patrol_insp_cost_per_mile + oh_drone_insp_cost_per_mile

Inspection Costs = (Detailed Inspection + Patrol Inspection + Drone Inspection**)** × ∫ frequency per year × 55 years ÷ segment oh miles

vi. total_oh_repair_cost_per_mile

(Repair Capital&OM Unit Cost) × (∫age-based finding rate per mile per year × years in age bracket)

vii. pole_replacement_cost_per_mile
(Pole Replacement Unit Cost × estimated steel poles replaced per year due to vehicle contact × 55 years) ÷ segment oh circuit miles

b A new unit cost table has been created and included in this data request as file name "SDGE Response SPD-SDGE-WMP2026-02_Q7 Long-Term Operational Mitigation Unit Costs.xlsx". The cell location (column **C#**) of "Unit Cost" is indicated in the formula below:

Vegetation management related costs:
Tree related costs = (vegetation inspections-**C8** + tree trim/removal-**C9** + tree auditing-**C10**) × ∫ frequency per year × 55 year ÷ segment oh circuit miles
Pole related costs = (pole inspections-**C11** + pole clearing-**C12** + pole audit-**C13**) × ∫ frequency per year × 55 years ÷ total oh segment miles
Fuel management costs = cost per year-**C14** × 55 years ÷ segment oh circuit miles

PSPS related costs:
cc_psps_activation_cost_per_mile = (PSPS Activation-Baseline unit cost-**C20** + PSPS Activation unit cost-**C19** × oh miles × simulated frequency) × 55 years ÷ segment oh circuit miles

cc_psps_comm_outreach_cost_per_mile = PSPS Customer Outreach unit cost-**C17** × 55 years

Other Protective Equipment Device related:
efd_per_mile = EFD Installation unit cost-**C15** ÷ 3 × 55 years (This is divided by 3 as each node is expected to be present every 3 miles)
fcp_per_mile = FCP Maintenance unit cost-**C16** x 55 years ÷ segment oh circuit miles
microgrid_cost_per_mile = Microgrid Maintenance unit cost per year-**C32** ÷ total circuit miles × segment circuit miles × 55 years ÷ segment circuit miles

Overhead Asset inspection related:
Inspection Costs = (Detailed Inspection-**C2** + Patrol Inspection-**C3** + Drone Inspection-**C4)** × ∫ frequency per year × 55 years ÷ segment oh miles

Overhead repair cost:

(Repair Capital&OM Unit Cost-**C6&C7**) × (∫ age-based finding rate per mile per year × years in age bracket)

Steel Pole Replacement Vehicle Contact related:

pole_replacement_cost_per_mile =
(Steel Pole Replacement Unit Cost-**C5**) x (randomly selected steel poles damaged by car contact once every 55 years) ÷ segment oh circuit miles

b. Datasets that informed the calculation of the fields listed in Question 8a are listed below.
   i. total_oh_veg_cost_per_mile: "SDGE Response SPD-SDGE-WMP2026-02_Q7_Vegetation Management Costs (2015-2023).xlsx"
   ii. total_cc_psps_cost_per_mile: "SDGE Response SPD-SDGE-WMP2026-02_Q7_PSPS Costs (2021-2024).xlsx"
   iii. total_oh_peds_cost_per_mile: N/A
   iv. microgrid_cost_per_mile: N/A
   v. total_oh_inspection_cost_per_mile: N/A
   vi. total_oh_repair_cost_per_mile: "SDGE Response SPD-SDGE-WMP2026-02_Q7_Overhead Repair Costs (2023-24).xlsx"
   vii. pole_replacement_cost_per_mile: N/A

c. The long-term operational mitigation costs are the costs would accrue in the next 55 years, assuming the assets will be new from year 1 and using unit cost, and other variables defined or quantified under the scenario if combined cover conductor or underground assets were to be installed. These costs are not directly calculated from other tabs in Appendix G.

d.
   i. These costs are associated with the following programs in SDG&E's 2025 RAMP Report "Chapter SDG&E-Risk-4 Wildfire and PSPS".

Field Name	WMP Lifecycle Cost Component Subcategory Name	Control/ Mitigation Plan ID	Control/ Mitigation Description	D.24-12-074 Page Number for programs	Page Number Costs	RSAR Page Number
total_oh_veg_cost_per_mile	Vegetation Management (trees and poles)	C554 C551 C544 C540 C537 C578	Detailed Inspection, Prune and Removal (clearance), Pole Clearing (Brushing), Fuels Management, Off-cycle Patrol, QA/QC of Veg	488-493	490, 493	A-154, 163, 172, 181, 190
total_cc_psps_cost_per_mile	PSPS	C571, C567, C557, C556,	Emergency Preparedness and Recovery Plan, Public Emergency	486, 487, 493, 494	486, 487, 493, 494	A-151, 160, 171, 180, 189

Field Name	**WMP Lifecycle Cost Component Subcategory Name**	**Control/ Mitigation Plan ID**	**Control/ Mitigation Description**	**D.24-12-074 Page Number for programs**	**Page Number Costs**	**RSAR Page Number**
		C516, C512	Communication Strategy, Public Outreach and Education Awareness, Engagement with AFN Population, Generator Assistance Program, Customized Resiliency Assessments			
total_oh_peds_cost_per_mile	Others	C573, C508	Early Fault Detection, Advanced Protection,	485	485	A- 148, 149, 157, 158, 166, 167, 175, 176, 184, 185, 321, 333, 345, 357, 369
microgrid_cost_per_mile	Others	C506	Microgrid	485	485	A-149, 158, 167, 176, 185, 332, 344, 356, 368, 380
total_oh_inspection_cost_per_mile	Asset Inspection	C526, C536, C534	Distribution Overhead Detailed Inspections, Distribution Overhead Patrol Inspection, Risk-Informed Drone Inspection	486, 493	486, 493	A-146, 147, 155, 156, 164, 165, 173, 174, 183, 183
total_oh_repair_cost_per_mile	Asset Inspection	C507	CMP Repair	493	493	A-322, 334, 346, 358, 370
cc_pole_replace_cost_per_mile	Asset Inspection	C507	CMP Repair	493	493	A-322, 334, 346, 358, 370

ii. See RSAR page number in the table provided above in i.

iii.

Field Name	WMP Lifecycle Cost Component Subcategory Name	2024 Test Year GRC Budget Code	2024 Test Year GRC Workpaper/ Cost Center
total_oh_veg_cost_per_mile	Vegetation Management (poles and trees)	N/A	1WM005.000
total_cc_psps_cost_per_mile	PSPS	N/A	1WM008.000
total_oh_peds_cost_per_mile	Others	15259, 22256	N/A
microgrid_cost_per_mile	Others	N/A	1WM003.000
total_oh_inspection_cost_per_mile	Asset Inspection	N/A	1WM004.000
total_oh_repair_cost_per_mile	Asset Inspection	Budget Code 00226[10]	1WM004.000
cc_pole_replace_cost_per_mile (vehicle contact only)	Asset Inspection	Budget Code 00236	N/A

iv. SDGE intends to use the same budget code in its 2028 Test Year GRC, however, this is subject to change.

v. workpaper and cost center used in its 2024 Test Year GRC is shown in iii.

vi. SDGE intends to use the same workpaper and cost center(s) in its 2028 Test Year GRC, however, this is subject to change.

f.

i. Wood pole replacement cost is not included in the updated lifecycle costs. This data no longer applies to updated operational mitigation costs, which estimates operational costs associated with new materials in the next 55 years.

ii. This data point is no longer used in the lifecycle costs.

iii. Total wood poles that currently exist in SDGE's territory is 183,306.

iv. SDG&E does not use wood poles to support covered conductor; there is no wood pole that supports covered conductor.

v. Dataset that demonstrates the distribution of the age of wood poles is included in the attached file named "SDGE Response SPD-SDGE-WMP2026-02_Q8_f_iii-v.xlsx".

vi. Wood pole replacement cost is not included in the updated lifecycle costs. This data no longer applies to the updated operational mitigation cost.

[10] This cost is the sum of the O&M and Capital, see the unit cost in the excel file. GRC budget code only applies to the Capital dollar.

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QUESTION 9

For every mitigation or control program spreadsheet[11] found in Appendix G of the 2026-2028 Base WMP, explain the following:

a. What is the capital investment associated with the "Capital Cost only in Year 0" field for this program

b. What are the "Long-term Ongoing costs" for this program

c. What are the "Additional Installation Cost (O&M) only in Year 0" for this program

d. Explain why SDG&E does or does not calculate the risk reduction for the safety and reliability attributes for this program.

e. Explain why SDG&E does or does not leave the "Mitigation Annual Cost (K$/year)" field empty for this program.

f. Explain why the Present Value fields in Row 16 all include "Year 55"

g. Explain why the Present Value fields in Row 20 all include "Year 40"

h. Explain why the BCRs do or do not change across the three discount rate scenarios.

RESPONSE 9

a-c. Definitions and explanations for these terms are available on the README tab of Appendix G ("SDG&E_2026-2028_Base-WMP_Appendix G Supporting Data_R1"), LINK: 2026 - 2028 Wildfire Mitigation Plan | San Diego Gas & Electric

d. Safety and reliability risk reductions are quantified only for the Strategic Undergrounding (SUG) and Combined Covered Conductor (CCC) programs, as these are the only mitigations modeled within the WiNGS-Planning probabilistic framework.

For all other mitigation strategies, total risk reduction is assumed to be captured within the Financial component. This approach simplifies the analysis and aligns with the Hybrid Discount Rate methodology, where assigning risk reduction to the Financial component yields the lowest cost-benefit ratio. See SDG&E's Chapter RAMP-3 at page 40 for more details available at: https://www.sdge.com/sites/default/files/regulatory/Vol1_Ch3_Joint_ERM_Risk_Quantification.pdf

[11] This includes SUG, CCC, Pole_Clearing, OH_Patrol, FCP, etc. The Microgrid(Capital) spreadsheet does not need to be included in SDG&E's response to this question.

e. "Mitigation Annual Cost (K$/Year)" is left blank for mitigations that do not have costs beyond the initial capital expenditure.

f. All PV years are aligned with the predicted lifespan of the mitigation in question.

g. All PV years are aligned with the predicted lifespan of the mitigation in question.

h. When the asset lifetime is assumed to be one year, as is typical for short-term programs like inspections, the impact of discounting is negligible. As a result, cost-benefit ratios calculated using different discount rates (such as the Weighted Average Cost of Capital [WACC], Hybrid Discount Rate, or Social Discount Rate) will converge to the same value.

In contrast, for long-term mitigation programs like Combined Covered Conductor (CCC) and Strategic Undergrounding (SUG), which deliver safety and reliability benefits over many years, the choice of discount rate becomes more significant. In these cases, cost-benefit ratios will vary depending on the discount rate applied. Specifically, the Hybrid Discount Rate assigns a lower rate to safety and reliability benefits, increasing their present value and resulting in a higher cost-benefit ratio compared to using WACC alone.

However, for mitigation programs where safety and reliability risk reductions are not explicitly quantified, such as those modeled only through financial impacts, the cost-benefit results under WACC and the Hybrid Discount Rate will be the same, since both approaches treat financial benefits identically. See SDG&E's Chapter RAMP-3 at page 40 for more details, available at: https://www.sdge.com/sites/default/files/regulatory/Vol1_Ch3_Joint_ERM_Risk_Quantification.pdf

SPD DATA REQUEST: SPD-SDGE-WMP2026-02
SDG&E RESPONSE

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QUESTION 10

For the PV Risk Reduced and PV Total Cost fields in the mitigation and control program spreadsheets found in Appendix G of the 2026-2028 Base WMP, explain why SDG&E chose to estimate Present Value using the method found in the Inflation_and_Discount spreadsheet rather than to use the PV or Sequence functions that are native to Excel.

a. Explain what are the values under WACC, Hybrid and Societal Discount rates in columns F, G, H on Rows 3-7 of the Inflation_and _Discount spreadsheet.

RESPONSE 10

SDG&E chose to manually implement the Present Value (PV) calculation in the Inflation_and_Discount spreadsheet rather than using Excel's built-in PV to ensure greater transparency and control in the cost-benefit analysis presented in Appendix G of the 2026–2028 Base WMP.

The SEQUENCE function in Excel essentially replicates the functionality of manually dragging cells up or down to create a series of numbers. While the SEQUENCE function could be useful for automating repetitive tasks, SDG&E did not find it necessary to use this function when developing Appendix G.

A. These values represent the cumulative post-inflation discount rate from now until the corresponding year in column E.

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QUESTION 11

SDG&E's underground cost is noticeably lower than that of other IOUs. SPD understands the contractors are paid at similar rates for the state of California.

a. Describe any changes in the contracts, such as a longer-term contract that helps reduce the costs of undergrounding.

i. In Appendix G of the 2026-2028 Base WMP, where would the costs of the longer-term contract be captured?

b. Provide a high level cost analysis that includes consideration of structure installations, such as Manholes, Vaults, Pads, or any other structures required for the support of an undergrounding effort.

i. Provide a cost analysis of each underground feeder segment submitted to Appendix G that includes structure installations, such as Manholes, Vaults, Pads, or any other structures required for the support of an undergrounding effort.

c. Provide a cost breakdown for a brand-new underground circuitry installed compared with a retrofit of an existing underground system.

d. For spare conduits installed, do they meet the requirements for the new UG cable, and what would be the additional cost to replace the conduits.

e. Provide relocation costs, if any, for both new and existing installation of UG circuitry.

i. Explain whether or not relocation costs would also involve the upgrade of the existing structures to accommodate the addition of cable and equipment.

f. If any of the UG structures contains third-party cables or equipment, what is the current process to relocate or retrofit the additional equipment/cable?

i. What would be the added cost to relocate or retrofit the third-party equipment/cable?

g. SPD understands that some costs of equipment are often centralized at company-wide level.[12] For example, SPD understands that many companies buy distribution overhead transformers in bulk, so if a line were to be added, the cost of the project may not include the distribution overhead transformer as its supplied by the company. What (if any) of the costs associated with SDG&E's undergrounding projects are centralized and therefore not included in the cost estimates?

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[12] See PG&E Response to Question 4 of TURN Data Request WMP-Discovery2026-2028_DR_TURN_003-Q004 and the workpaper WMP-Discovery2026-2028_DR_TURN_003-Q004Atch01.xlsx

<u>RESPONSE 11</u>

A. In 2023 SDG&E implemented a contracting strategy for the SUG program planned to improve key areas of the program, specifically to increase the total number of miles energized and to improve/reduce the cost per mile. This involved shifting the program management from a small internal team of employees with contracted support to a larger scale contracted program management office (PMO) led by an SDG&E senior program manager. The PMO focuses on key functional areas of the program to meet mileage and cost reduction targets, including, but not limited to the following: civil and electric construction, design/engineering, land rights & easement acquisition, permitting and stakeholder communication. Civil construction contracts, which make up a substantial portion of the program costs, were re-negotiated to capture longer term program benefits associated with the higher volume of planned work through 2032.
   i. Unit cost used in Appendix G only reflects the current estimated average installation cost (Capital) $2M/mile.

B. SDG&E's cost for the construction of undergrounding in the HFTD under the SUG program includes material procurement for utility structures (manholes, vaults, handholes, and pads), utility equipment (transformers, switches, terminating cabinets, breakers, etc), cables, and connectors; civil construction including the installation of structures, provision and installation of conduits, and surface restoration; and electrical construction including the installation of utility equipment, cables, and connectors, testing, and in-service activity. Taken as an average:
   Materials – 4% of the Total Cost of the Project
   Civil Construction – 41% of the Total Cost of the Project
   Electric Construction – 6% of the Total Cost of the Project

   i. SDG&E does not obtain cost from our installation contractors with granularity to the structure level – costs are at the project level.

C. SDG&E's realized cost for Strategic Undergrounding represents the cost for a newly-installed underground system in an area where there is existing load currently served by an overhead system.

   SDG&E does not have an explicit cost prepared for the "retrofit" of an existing underground system. An estimate for such a scope would require a substantial scope description and list of assumptions which is beyond the scope of this data request response.

   To date, SDG&E has not encountered any location where such a configuration exists which would warrant a "retrofit" project under the WMP.

   However, it is reasonable to estimate that the removal and replacement of existing underground systems where the existing underground is not in conduits would be the same as the installation of new underground systems, as the installation would require complete installation of new structures, conduits, and equipment, as well as new cabling.

If the existing UG system is entirely in conduit and only cabling and equipment needs to be replaced, a cost of between $475K and $1.25M per mile should be expected, depending on all of the design, field conditions, and contracting factors.

D. Any time spare conduits are installed, the spare conduits are identical to the occupied conduits, except that they have a pull rope or mule tape installed, and no cable. Such a conduit meets all requirements for the voltage level and cable type present or potentially proposed at the subject location.

The cost to remove and replace a spare conduit with another unoccupied conduit is the same as the cost to install a new trench with that conduit.

E. SDG&E understands that this question is asking about the cost to relocate customer metering equipment and distribution panels to accommodate new-to-be-installed underground service. SDG&E's practice is to install adapter components so as to avoid relocation of customer distribution panels.

Any "upgrade" is the responsibility of the customer, for both cost and work.

SDG&E's average cost per meter for the installation of the adapters, pull cans, and on-building conduit runs to connect the customer's existing meter panel with the new underground service is $2,712.

This figure is a calculated average which consists of the total cost on a selection of projects divided by the total number of customer meters worked on those projects. It is **not** a specific cost of any particular configuration or project.

F. SDG&E does not permit any third party to place equipment or cabling in an SDG&E owned structure. SDG&E's standards permit only SDG&E Power or Communications cabling and equipment to be installed in an SDG&E owned structure.

G. SDG&E performs centralized purchasing of utility equipment (such as transformers and switches), as well as cables and connectors, and allocates the cost of those materials from the SDG&E inventory to the projects when the materials are installed on an itemized basis. A similar procedure is used when SDG&E furnishes utility structures (as SDG&E has on its Strategic Undergrounding Program). These costs are reported in the project costs.

SDG&E also performs centralized purchasing of certain technical services, such as environmental compliance monitoring, permitting, and project management. These costs are also allocated to the project(s) using a weighted average allocation method.

SDG&E does not allocate to the project(s) the costs of enterprise level operations which support the project (such as regulatory affairs staff, engineering staff who perform general operations, including the operation of the WiNGS model and project scoping, finance and accounting, etc.).

END OF REQUEST