



Wildfire Safety Division (WSD)
Quality Control (QC) Report on GIS Data
Submitted by Southern California Edison (SCE)
on September 9, 2020

ISSUED BY CALIFORNIA PUBLIC UTILITIES COMMISSION (CPUC)

CONTENTS

1. BACKGROUND & INTRODUCTION	1
2. OVERALL FINDINGS	2
2.1 Completeness Summary	2
2.2 Quality of Entries in Excel Tracking Document	3
2.2.1 Reporting Accuracy	3
2.2.2 Data Absence and Timeframe Explanations	4
2.2.3 Confidentiality Assessments	5
2.3 Overall Schema and Requirement Adherence	6
2.4 Related Table Issues	6
2.4.1 Overview	6
2.4.2 Vegetation Management Inspection	7
2.4.3 Vegetation Management Project	7
2.4.4 Asset Inspection	7
2.5 Submission Procedure Adherence	8
2.6 Metadata	8
2.7 Data Absent in 9/9/20 Submission but Present in Previous Submissions	9
2.8 Photos	10
3. DETAILED SCHEMA COMPLIANCE ASSESSMENT	10
3.1 Overview and Section Organization	10
3.1 Asset Point (Feature Dataset)	11
3.1.1 Data Category Summary	11
3.1.2 Camera (Feature Class)	12
3.1.3 Connection Device (Feature Class)	13
3.1.4 Customer Meter (Feature Class)	14
3.1.5 Fuse (Feature Class)	15
3.1.6 Lightning Arrester (Feature Class)	17
3.1.7 Substation (Feature Class)	17
3.1.8 Support Structure (Feature Class)	18
3.1.9 Support Structure Crossarm Detail (Related Table)	19
3.1.10 Switchgear (Feature Class)	19
3.1.11 Transformer (Feature Class)	21
3.1.12 Transformer Detail (Related Table)	22
3.1.13 Weather Station (Feature Class)	23
3.2 Asset Line (Feature Dataset)	24
3.2.1 Data Category Summary	24
3.2.2 Transmission Line (Feature Class)	24
3.2.3 Primary Distribution Line (Feature Class)	26
3.2.4 Secondary Distribution Line (Feature Class)	28
3.3 PSPS Event (Feature Dataset)	29
3.3.1 Data Category Summary	29
3.3.2 Entity-Relationship Diagram for PSPS Events	29
3.3.3 PSPS Event Log (Related Table)	29
3.3.4 PSPS Event Line (Feature Class)	29
3.3.5 PSPS Event Polygon (Feature Class)	30
3.3.6 PSPS Event Customer Meter (Feature Class)	30
3.3.7 PSPS Event Asset Damage	30
3.3.7.2 PSPS Event Damage Point (Feature Class)	30
3.3.7.3 PSPS Event Conductor Damage Detail (Related Table)	30
3.3.7.4 PSPS Event Support Structure Damage Detail (Related Table)	30

3.3.7.5 PSPS Event Other Asset Damage Detail (Related Table)	30
3.3.7.6 PSPS Damage Photo Log (Related Table)	30
3.4 Risk Event (Feature Dataset)	30
3.4.1 Data Category Summary	30
3.4.2 Wire Down Event (Point Feature Class)	30
3.4.3 Ignition (Point Feature Class)	30
3.4.4 Transmission Outages (Point Feature Class)	30
3.4.5 Transmission VM Outage (Point Feature Class)	30
3.4.6 Distribution Outages (Point Feature Class)	30
3.4.7 Distribution VM Outage (Point Feature Class)	30
3.4.8 Risk Event Asset Log (Related Table)	30
3.4.9 Risk Event Photo Log (Related Table)	31
3.5 Initiative (Feature Dataset)	31
3.5.1 Data Category Summary	31
3.5.2 Vegetation Management Inspections	31
3.5.2.1 Vegetation Management Inspection Log (Related Table)	31
3.5.2.2 Vegetation Management Inspection Point (Feature Class)	32
3.5.2.3 Vegetation Management Inspection Line (Feature Class)	33
3.5.2.4 Vegetation Management Inspection Polygon (Feature Class)	34
3.5.3 Vegetation Management Projects	34
3.5.3.1 Vegetation Management Project Log (Related Table)	34
3.5.3.2 Vegetation Management Project Point (Feature Class)	36
3.5.3.3 Vegetation Management Project Line (Feature Class)	37
3.5.3.4 Vegetation Management Project Polygon (Feature Class)	37
3.5.4 Asset Inspections	38
3.5.4.1 Asset Inspection Log (Related Table)	38
3.5.4.2 Asset Inspection Point (Feature Class)	39
3.5.4.3 Asset Inspection Line (Feature Class)	40
3.5.4.4 Asset Inspection Polygon (Feature Class)	40
3.5.5 Grid Hardening	40
3.5.5.1 Grid Hardening Log (Related Table)	40
3.5.5.2 Grid Hardening Point (Feature Class)	41
3.5.5.3 Grid Hardening Line (Feature Class)	42
3.5.6 Data Related to Multiple Initiatives	43
3.5.6.1 Initiative Asset Log (Related Table)	43
3.5.6.2 Initiative Photo Log (Related Table)	43
3.6 Other Required Data (Feature Dataset)	43
3.6.1 Data Category Summary	43
3.6.2 Electrical Corporation Power Line-Other Power Line Connection Location (Point Feature Class)	43
3.6.3 Critical Facility (Point Feature Class)	43
3.6.4 Red Flag Warning Day (Polygon Feature Class)	45
3.6.5 Administrative Area (Polygon Feature Classes)	45
APPENDIX A. COMPLETENESS PERCENTAGE BREAKDOWN FOR MULTIPLE UTILITIES	46

TABLES

Table 1. Completeness of SCE 9/9/20 GIS data submission	2
Table 2. Summary of missing data with identification of previously received data that is absent in 9/9/20 submissions.....	9
Table 3. Review outcome icon definitions	11
Table 4. Review outcome issue resolution priority colors.....	11
Table 5. Asset Point data category completeness summary	11
Table 6. Camera data priorities and review outcomes.....	12
Table 7. Connection Device data priorities and review outcomes.....	13
Table 8. Customer Meter data priorities and review outcomes	14
Table 9. Fuse data priorities and review outcomes.....	15
Table 10. Substation data priorities and review outcomes	17
Table 11. Support Structure data priorities and review outcomes	18
Table 12. Switchgear data priorities and review outcomes	20
Table 13. Transformer data priorities and review outcomes	21
Table 14. Transformer Detail data priorities and review outcomes.....	22
Table 15. Weather Station priorities and review outcomes	23
Table 16. Asset Line data category completeness summary	24
Table 17. Transmission Line data priorities and review outcomes	25
Table 18. Primary Distribution Line data priorities and review outcomes.....	26
Table 19. Secondary Distribution Line data priorities and review outcomes.....	28
Table 20. Initiative data category completeness summary	31
Table 21. Vegetation Management Inspection Log data priorities and review outcomes.....	31
Table 22. Vegetation Management Inspection Point data priorities and review outcomes.....	32
Table 23. Vegetation Management Inspection Line data priorities and review outcomes.....	33
Table 24. Vegetation Management Inspection Polygon data priorities and review outcomes.....	34
Table 25. Vegetation Management Project Log data priorities and review outcomes	34
Table 26. Vegetation Management Project Point data priorities and review outcomes	36
Table 27. Vegetation Management Project Polygon data priorities and review outcomes	37
Table 28. Asset Inspection Log data priorities and review outcomes	38
Table 29. Asset Inspection Point data priorities and review outcomes	39
Table 30. Asset Inspection Line data priorities and review outcomes	40
Table 31. Grid Hardening Log data priorities and review outcomes.....	40
Table 32. Grid Hardening Point data priorities and review outcomes.....	42
Table 33. Grid Hardening Line data priorities and review outcomes.....	42
Table 34. Other Required Data data category completeness summary	43
Table 35. Critical Facility data priorities and review outcomes	43
Table 36. Administrative Area data priorities and review outcomes.....	45

1. BACKGROUND & INTRODUCTION

This document summarizes the Wildfire Safety Division's (WSD's) findings on completeness and quality of geographic information systems (GIS) data submitted by Southern California Edison (SCE), as part of its first quarterly report submission due on September 9, 2020. SCE's September 9, 2020 submission was its first attempt to adhere to the Draft WSD GIS Data Reporting Requirements issued in August 2020.¹ This review document, along with an Excel document with WSD notes ("SCE Status Spreadsheet with WSD Notes.xlsx") comprise the full package of quality control (QC) review deliverables that the WSD provides to SCE regarding its September 9, 2020 GIS data submission. This review document summarizes key findings, but the Excel document provides additional supporting details of the WSD's QC review. Although this review is being delivered after the submittal of SCE's December quarterly data report, this review was substantially completed before that submission, and addresses only the September quarterly data submission. If any issues identified in this report were rectified in the December data submission, that is appreciated, but will not be reflected in this report.

As part of its QC review, the WSD identified successes and problems with submitted data. For example, appropriately submitted data are acknowledged with star icons in tables throughout Section 3. Data problems are covered by icons and comments throughout Section 3 as well as by some commentary in Section 2. For example, Section 2.4 covers related table issues. Among other issues, it identifies the major problem of the absence of the required "Initiative Asset Log" table. This table's absence is not acceptable and diminishes the value of all initiative data that were submitted.

The WSD acknowledges that there was limited time, between the August publication of Draft WSD GIS Data Reporting Requirements and the September due date for the initial quarterly data submissions, to substantively reorganize data in accordance with the new reporting standard. The WSD also recognizes that a historically significant wildfire season in California may have impacted SCE's ability to prepare data submissions. SCE's efforts are appreciated, but there is also room for improvement, and this report emphasizes data absences and issues discovered during QC review. Due to the ongoing quarterly reporting nature, the WSD fully expects that future data submissions will continuously improve over prior submissions until high quality, standardized data submissions become routine.

This document summarizes overall data review findings and provides detailed schema compliance assessments that break down data quality and completeness for each individual field in the data tables. Throughout this document, the term "tables" is used to refer to both attribute tables associated with feature classes and related tables that can be joined to feature classes, as needed. The terms "feature class" and "layer" are used synonymously.

In the future, the WSD will address utility questions and concerns expressed in the Excel status report document² and provide details on planned data requirement changes. The WSD will also provide a revised "WSD GIS Data Preparation & Submittal Guidance.pdf" document. Additional next steps in the WSD's GIS data acquisition efforts will involve sharing revised data requirement and geodatabase (GDB) files with electrical corporations. If an electrical corporation

¹ The Draft WSD GIS Data Reporting Requirements are available at: ftp://ftp.cpuc.ca.gov/WSD/GISguidance/WSD%20GIS%20Data%20Reporting%20Requirements_DRAFT_20200821.pdf

² SCE's completed version of the "WSD_DataSchema_StatusReport_20200909.xlsx" file, which the WSD provided to SCE in August 2020 to track data submission status and progress.

fails to make a good faith effort to fulfill the next GIS data submission, the WSD will factor such actions into subsequent wildfire mitigation plan (WMP) compliance reviews, and may recommend enforcement actions if such issues persist.

2. OVERALL FINDINGS

2.1 Completeness Summary

Table 1 below summarizes the overall completeness of SCE’s submitted data. Of the 53 required tables in the Draft WSD GIS Data Reporting Requirements, SCE submitted 28 that contained data. SCE did not include any photo log data or photos in its submission. Additionally, as shown in Table 1, SCE did not include any initiative asset log data. Lack of initiative asset log data prevents the WSD from being able to relate assets to specific WMP initiatives and significantly limits the value of data provided in the “Initiative” data category.

In the “Completeness” column of Table 1, two percentage values are presented. The percentage on the left represents the percent complete strictly based on null values. The percentage on the right represents the percent complete based on null, “-99,” and “Unknown” values. Neither percentage calculation accounts for null values in comment fields. Completeness percentages are approximate. Additional detail on the completeness breakdown methodology can be found in Section 3.1. Gray cells represent data that were not included in SCE’s September 9, 2020 submission. A table providing completeness percentages for all California electrical corporations subject to these requirements is provided in Appendix A. The table presented in Appendix A provides context on how complete SCE’s submission is relative to other utilities.

Table 1. Completeness of SCE 9/9/20 GIS data submission

DATA	COMPLETENESS
Asset Point	
1. Camera	64.7% 58.8%
2. Connection Device	54.7% 42.6%
3. Customer Meter	81.9% 81.9%
4. Fuse	72.8% 62%
5. Lightning Arrestor	
6. Substation	70.5% 64%
7. Support Structure	58.2% 54%
8. Support Structure Crossarm Detail	
9. Switchgear	63.9% 55%
10. Transformer	90% 81.7%
11. Transformer Detail	54.3% 52.8%
12. Weather Station	47% 41.2%
Asset Line	
13. Transmission Line	47.6% 45.6%
14. Primary Distribution Line	61.2% 55.5%
15. Secondary Distribution Line	58% 53.2%
PSPS Event	
16. PSPS Event Log	
17. PSPS Event Line	
18. PSPS Event Polygon	
19. PSPS Event Customer Meter Point	
20. PSPS Event Damage Point	
21. PSPS Event Conductor Damage Detail	
22. PSPS Event Support Structure Damage Detail	
23. PSPS Event Other Asset Damage Detail	
24. PSPS Damage Photo Log	
Risk Event	
25. Wire Down Event	
26. Ignition	

DATA	COMPLETENESS	
27. Transmission Outage		
28. Transmission VM Outage		
29. Distribution Outage		
30. Distribution VM Outage		
31. Risk Event Asset Log		
32. Risk Event Photo Log		
Initiative		
33. Vegetation Management Inspection Log	80.3%	80.3%
34. Vegetation Management Inspection Point	58.3%	58.3%
35. Vegetation Management Inspection Line	63.6%	63.6%
36. Vegetation Management Inspection Polygon	70%	70%
37. Vegetation Management Project Log	42.8%	42.8%
38. Vegetation Management Project Point	64.1%	64.1%
39. Vegetation Management Project Line		
40. Vegetation Management Project Polygon	67.7%	67.7%
41. Asset Inspection Log	78.3%	78.3%
42. Asset Inspection Point	75.6%	75.6%
43. Asset Inspection Line	64.6%	64.6%
44. Asset Inspection Polygon		
45. Grid Hardening Log	64.9%	64.9%
46. Grid Hardening Point	55.1%	55.1%
47. Grid Hardening Line	50.9%	50.9%
48. Initiative Asset Log		
49. Initiative Photo Log		
Other Required Data		
50. Other Power Line Connection Location		
51. Critical Facility	62.5%	62.5%
52. Red Flag Warning Day Polygon		
53. Administrative Area	91.5%	89.1%
Total number of submitted tables	28	

2.2 Quality of Entries in Excel Tracking Document

2.2.1 Reporting Accuracy

SCE's entries in the "WSD_DataSchema_StatusReport_20200909.xlsx" Excel document provided a sample for data completeness and provided explanations for data absence. The WSD appreciates the considerable effort involved with filling in the tables in this Excel document. However, there were several instances of inaccurate data reporting that the WSD does not want to see repeated in future submissions. This reporting did not adhere to the guidance³ provided by the WSD on how to complete the spreadsheets. Moreover, this inaccuracy in reporting resulted in delays to complete the QC review and squandered limited WSD staff resources. Of the 28 data tables provided, 23 (82%) had inaccurate status statements in the Excel tracking document that indicated data were provided when they were not. In the Excel status file with WSD notes ("SCE status spreadsheets with WSD Notes"), rows with major reporting concerns are highlighted in yellow. Rows with more minor concerns are highlighted in tan. In the future, the WSD will provide more specific responses to SCE's questions and concerns raised in the status spreadsheets, as part of additional guidance that addresses questions or concerns raised by all respondent electrical corporations.

Inaccurate submission status values were a major problem with the spreadsheets, resulting in significant impacts and wasted resources. In numerous cases, submission spreadsheets indicated

³ Guidance on how to complete the Excel status spreadsheets can be found in Section 3 of the "[WSD GIS Data Preparation & Submittal Guidance_20200821.pdf](#)" document the WSD provided to electrical corporations in August 2020.

data were either partially or completely provided, but no such GIS data were received. For example, the following table provided by SCE was completely empty, but SCE's status spreadsheets included entries for its as if it was populated (i.e. inputting values of "Yes" or "Partially" under the "Data provided in latest submission?" column):

- Vegetation Management Project Line

There were also cases in which individual fields within tables that had data still had inaccurate reporting. For example, for the tables below, some data in individual fields were inaccurately reported as being completely present (i.e. indicated by a "Yes" value under the "Data provided in latest submission?" column) when they were completely missing or only partially present. In many cases, "Partially" should have been entered instead of "Yes."

- Connection Device
- Customer Meter
- Fuse
- Substation
- Support Structure
- Switchgear
- Transformer
- Transformer Detail
- Weather Station
- Transmission Line
- Primary Distribution Line
- Secondary Distribution Line
- Vegetation Management Inspection Log
- Vegetation Management Inspection Point
- Vegetation Management Inspection Line
- Vegetation Management Project Log
- Vegetation Management Project Point
- Vegetation Management Project Polygon
- Asset Inspection Log
- Asset Inspection Point
- Grid Hardening Log
- Critical Facility

2.2.2 Data Absence and Timeframe Explanations

Several general explanations for data absence were repeated throughout the spreadsheets, and there were virtually no field-specific explanations. The only identified exception to this was a statement questioning the need for employee data. SCE said, "SCE expects the WSD to evaluate SCE's and other utilities' requests to not require employee data and will wait on the WSD to rule on those comments prior to extracting and providing employee name information." This statement was used for the "InspectorName" field for multiple initiative data tables.

The most frequently entered explanations for missing or partial data submissions were related to a need for more time and staff availability. Below are two data absence explanations that were commonly used by SCE:

- "SCE does not currently capture this data"

- “Due to the limited time to extract, compile, and review the requested information, the data not being readily available, and the focus on meeting the deficiency requirements of Guidance-10 and SCE-9, SCE is not able to provide this information for the 1st Quarterly Report”

Details on data procurement actions (i.e. what it would take to acquire and deliver the data) were also provided. Below are some commonly used data procurement statements:

- “SCE will continue to work with its business, information technology, and GIS subject matter experts to extract, compile, and review the data element and upload it into the Geodatabase”
- “SCE will establish a team to review the labor, operational, technical, and system requirements it will take to capture and store this data element as well as the costs to implement, the benefits this data element may provide in reducing wildfire risk, and the time it will take to complete”

These statements essentially say, “We’ll keep working on this,” but they do not provide real information on unique actions needed to provide data for specific fields. General statements were also used repeatedly for timeframe descriptions, but they provided some real commitments and insights into expected progress. Below are commonly used timeframe statements:

- “SCE expects to provide more data for the 2nd Quarterly Report due in December 2020 and to substantially comply with the GIS Schema data requirements in the 2021 WMP Update (anticipated in early February 2021) for data elements it currently captures.”
- “SCE will inform the WSD of its team review in its 2nd Quarterly Report due in early December 2020 and will either support collecting the data (providing approach and timeline) or request the data element be removed (providing supporting rationale including, for example, cost-effectiveness, labor constraints, etc., and will request WSD guidance)”

Although these statements mention dates, they are still general, and they do not provide field-specific information. Responses that are as vague as the explanation and procurement descriptions above are not acceptable. The timeframe explanations could also use improvement and must be field-specific as applicable. SCE must strive to provide meaningful updates via its Excel status tracker submissions. Highly detailed field-specific responses are not expected for all fields, but more detail is needed.

2.2.3 Confidentiality Assessments

As directed in the WSD submittal guidance, throughout the data status spreadsheets, SCE indicated whether data were confidential. Data that were not submitted did not have confidentiality status listed.

Contrary to directions from the WSD, SCE did not identify confidentiality status for each field. Instead, SCE generally identified confidentiality at the entire feature class or related table level such that an entire set of data was confidential or not. An exception to this was the primary and secondary distribution line data. For this data, SCE identified the overhead lines as non-confidential and the underground lines as confidential. SCE sometimes simply indicated “No” when data were not confidential. However, when a table was confidential, instead of just saying “Yes,” SCE repeatedly said:

- “SCE has identified confidentiality at the feature class. Data fields marked confidential are based on a confidentiality assessment of the feature class. SCE requests the WSD keep classified information at the feature class as opposed to the attribute level.”

This statement shows that SCE does not want to provide granular confidentiality status at the field level. Field-specific confidentiality status determinations are expected in future submissions for data tables with partially confidential information. The vast majority of SCE data tables were classified as confidential, but there were a few pieces of non-confidential data which are listed below:

- Overhead primary and secondary distribution lines
- Camera
- Weather Station
- Administrative Area

SCE seems to have strengthened efforts to restrict GIS data distribution, reverting from its more transparent approach during the initial 2020 WMP submission. Much of the WMP GIS data that were made publicly available on SCE’s website in early 2020 fits into required data layers now indicated as confidential by SCE. For example, data for the following were made available to the public online but are now considered confidential:

- Ignitions
- PSPS areas
- Underground distribution lines
- Substations
- Some initiative data

In accordance with General Order 66-D, Section 3.2, a confidentiality declaration document (“SCE 2020-2022 WMP - SCE Class B Deficiencies Confidential Declaration.pdf”) was provided. The confidentiality declaration document was signed by Bill Chiu (SCE Managing Director, Grid Modernization and Resiliency). The confidentiality declaration document is short, general, and does not specifically call out GIS data. The only description of confidential information provided is, “Specific asset information including location, age, manufacturer, and inspection information.” SCE lists security concerns (e.g., “planning an attack on critical infrastructure”) as part of its basis for a confidentiality claim.

2.3 Overall Schema and Requirement Adherence

Overall, for the data that were provided, SCE generally adhered to the Draft WSD GIS Data Reporting Requirements. Submitted data were provided in the geodatabase, feature classes, and tables provided by the WSD, which ensured formatting was often correct. However, there were still some issues with SCE’s submission. Below are some areas where PG&E did not adhere to the WSD’s requirements that repeatedly appeared in the data:

- Domain values provided by the WSD were not always used.

2.4 Related Table Issues

2.4.1 Overview

A major related table problem is the absence of the required “Initiative Asset Log” table. This table enables initiative data to be linked to specific assets that are the focus of initiatives or in the proximity of initiatives, thereby enabling one to identify the specific location and attributes of an asset involved with an initiative. Without “Initiative Asset Log” data, the value of all initiative

data provided is significantly diminished and is unacceptable. The missing “Initiative Asset Log” data is a significant failing of SCE’s submission, as these data are of critical importance–The “Initiative Asset Log” table must be provided in future submissions.

There were apparent SCE misunderstandings regarding the WSD’s expectations for some related tables. The group of data associated with gird hardening was submitted appropriately with table relationships that made sense. However, there were relationship issues with data submitted for the following data categories:

- Vegetation Management Inspection
- Vegetation Management Project
- Asset Inspection

2.4.2 Vegetation Management Inspection

For vegetation management inspection data, the “Vegetation Management Inspection Log” related table was supposed to have a one-to-many relationship with the “Vegetation Management Inspection Point” and “Vegetation Management Inspection Line” feature classes.⁴ So, the WSD’s expectation was that this table would have individual entries that could be related to multiple vegetation management inspection points or lines. For example, “InspectionDate,” “InspectorName,” and “InspectionType” are all fields covered by the Vegetation Management Inspection Log. Various points or lines could have the same values for the aforementioned fields multiple times (i.e. a one-to-many relationship). For instance, the same inspector might do the same inspection for multiple line segments on the same day. In this case, there would be one row for these inspections in the Vegetation Management Inspection Log and multiple line geometry segments to which that row would be related via the “VmiLogID” field value.

The one-to-many relationship scenario described above did not occur with SCE’s submitted data. Instead, the Vegetation Management Inspection Log has 254,455 rows, and the point and line feature classes to which it relates have fewer rows (252,766 point rows and 739 line rows, respectively). The total of lines and points (253,505) is still fewer than the number of Vegetation Management Inspection Log rows. This indicates many-to-one and one-to-one relationships and was not what the WSD intended in the data requirements.

2.4.3 Vegetation Management Project

Vegetation management project data were submitted with the same issues as the vegetation management inspection data. A one-to-many relationship was expected and implied by entity-relationship diagrams (ERDs). However, the “Vegetation Management Project Log” table has more rows (365,583) than the total (365,470) of its associated “Vegetation Management Project Point” feature class (364,867) and “Vegetation Management Project Polygon” feature class (603). This indicates many rows in the log table have a one-to-one relationship with associated geometry data, and some rows may have a many to one relationship with geometry.

2.4.4 Asset Inspection

The same issue emerged with the asset inspection data. A one-to-many relationship between the “Asset Inspection Log” table and its associated feature classes was expected. However, instead, the “Asset Inspection Log” table has slightly more rows (346,640) than the total (346,342) of its associated “Asset Inspection Point” feature class (346,048) and “Asset Inspection Line” feature

⁴ The one-to-many relationship was implied by the line connection symbology in the entity-relationship diagrams (ERDs) that occur in section 3.5.1.1 and Appendix 1 of the WSD’s data reporting requirements. A legend in the ERD found in the appendix defines the line symbology used for the “VM Inspection Log” table as “One or many.”

class (294). This indicates one-to-one and many-to-one relationships with associated geometry data.

2.5 Submission Procedure Adherence

SCE mostly adhered to submission procedure guidance with data submitted in the geodatabase provided by the WSD. Per submission requirements, SCE also did not submit empty feature classes back to the WSD when they did not have data available for submission. However, the data were not initially submitted to the correct location, which made retrieving it difficult. As described on page 4 of the reporting requirements: “Zipped GDBs must be transmitted through the CPUC’s Kiteworks secure file transfer portal available at: <https://cpucftp.cpuc.ca.gov/>.”⁵

To address this issue, the WSD sent a letter⁶ to SCE and other electrical corporations emphasizing proper submission procedures. This resulted in successful acquisition of available data. The WSD will provide more clarity on electronic submission guidance in the revised version of the “WSD GIS Data Preparation & Submittal Guidance.pdf” document.

2.6 Metadata

Metadata requirements are described in detail in the data preparation and submittal guidance document provided by the WSD.⁷ When the WSD provided electrical corporations with customized geodatabase file templates, the WSD included prepopulated metadata. However, information covering the following items was required to be added to the metadata by each electrical corporation: data availability, data development methodology, timeframes, communication protocols, credits, use limitations, and definitions for certain fields. SCE made no metadata additions covering these items.

Field definitions are among the higher priority metadata that were absent. Per page 6 of the submittal guidance⁸, electrical corporations are required to provide “definitions for electrical corporation-generated field values for fields that do not have predetermined values assigned as attribute domains in the provided GDB (e.g., the ‘SwitchgearType’ field in the ‘Switchgear’ feature class).” In ArcGIS Pro, field definitions can be added under “Entity and Attribute Information” in the “Fields” section.

Defining field values is important both when there are no preset domains and when preset domains are not followed. For example, the values entered for the “SwitchgearType” field of the “Switchgear” feature class included a variety of apparent abbreviations without clear meanings (e.g., “Ai,” “Bds,” “Ds1,” etc.). With no definitions for what these values mean, they provide no useful information to the WSD.

Another portion of high priority absent metadata concerns the methodology for how data were pulled from original sources and cross-walked into the schema provided by the WSD. Page 7 of

⁵ Additional information regarding the CPUC’s Kiteworks secure file transfer portal is available at: <https://www.cpuc.ca.gov/General.aspx?id=6442459667>

⁶ “[WSD Spatial Data Submission Pursuant to WSD Quarterly Report and Guidance 20200917.pdf](#)”

⁷ Metadata requirements can be found in section 4.5 of “[WSD GIS Data Preparation & Submittal Guidance 20200821.pdf](#)” document the WSD provided to electrical corporations in August 2020.

⁸ “[WSD GIS Data Preparation & Submittal Guidance 20200821.pdf](#)” document the WSD provided to electrical corporations in August 2020.

the data submittal guidance⁹ states: “Describe the methodology for how the data were developed. This includes, at a minimum, identifying the sources (by filename) from which the data were derived and an explanation of how data were pulled from those sources. Also, describe any data field collection techniques.” Knowing this information can help the WSD better understand the effort and practicality (or impracticality) involved with specific data requests.

2.7 Data Absent in 9/9/20 Submission but Present in Previous Submissions

A substantial amount of requested data that were not included in SCE’s September 9, 2020 GIS data submission had been previously submitted to the WSD as part of 2020 WMP data requests made in the winter and spring. Table 2 below summarizes these instances and only covers entirely absent tables. All entries of “Yes” in the “Previously Received in Some Form” column of Table 2 indicate some form or portion of the data (i.e., geometry or values for one or more fields) were previously submitted. Gray values indicate data from a table was not previously received.¹⁰

The scope of applicable previously submitted data that was not included in SCE’s September 9, 2020 submission ranges from a few fields to entire layers with key geometry (e.g., PSPS event data). Because much of the data exists, the WSD expects to receive all previously provided data layers in future submissions.

Table 2. Summary of missing data with identification of previously received data that is absent in 9/9/20 submissions

ABSENT DATA	PREVIOUSLY RECEIVED IN SOME FORM?
Asset Point	
1. Lightning Arrestor	
2. Support Structure Crossarm Detail	Yes
PSPS Event	
3. PSPS Event Log	Yes
4. PSPS Event Line	Yes
5. PSPS Event Polygon	Yes
6. PSPS Event Customer Meter Point	
7. PSPS Event Damage Point	Yes
8. PSPS Event Conductor Damage Detail	
9. PSPS Event Support Structure Damage Detail	
10. PSPS Event Other Asset Damage Detail	
11. PSPS Damage Photo Log	
Risk Event	
12. Wire Down Event	Yes
13. Ignition	Yes
14. Transmission Outage	
15. Transmission VM Outage	
16. Distribution Outage	Yes
17. Distribution VM Outage	Yes
18. Risk Event Asset Log	Yes
19. Risk Event Photo Log	
Initiative	
20. Vegetation Management Project Line	
21. Asset Inspection Polygon	
22. Initiative Asset Log	
23. Initiative Photo Log	
Other Required Data	

⁹ “[WSD GIS Data Preparation & Submittal Guidance_20200821.pdf](#)” document the WSD provided to electrical corporations in August 2020.

¹⁰ The WSD is grateful that SCE submitted a tremendous amount of data in early 2020. However, because of the large amount of data, review for the presence of some previously submitted data was somewhat cursory. As such, a few previously submitted fields matching the latest requests may have been missed.

ABSENT DATA	PREVIOUSLY RECEIVED IN SOME FORM?
24. Other Power Line Connection Location	Yes
25. Red Flag Warning Day Polygon	Yes
Total absent data tables for which some data items were previously received	12

2.8 Photos

SCE did not submit any photo log data or photos, but photos are a requirement and expected in future submissions. Photo submission requirements are described in guidance the WSD provided in August 2020.¹¹

3. DETAILED SCHEMA COMPLIANCE ASSESSMENT

3.1 Overview and Section Organization

This section provides detailed summaries of how data submissions complied with data reporting requirements. It is broken down into subsections organized by dataset categories (e.g., “Asset Point,” “PSPS Event,” etc.). Each subsection has the same organization, which starts with a checklist table of all required category data. The presence or absence of an **x** in the checklist indicates submitted data or missing data.







Completeness percentages are also featured to the right of checklist entries. Completeness percentages are approximate. In determining them, nulls in comment fields were not counted toward percent incomplete because comment fields are often supposed to have null values, unless a corresponding field value is “Other – See comment” or there is another reason to provide a comment. Completeness percentages show the following:

- Left value: % complete based strictly on nulls without counting nulls in comment fields
 - This value represents what utilities filled in. However, it includes “-99” and “Unknown” values as if they are components of complete data.
- Right value: % complete based on nulls, “-99,” and “Unknown” without counting nulls in comment fields
 - This value reflects a truer picture of data completeness. “-99” and “Unknown” both indicate immediate data absence but do not provide the data being sought. These values can indicate data are unknowable or that data were not immediately known to staff filling in the feature classes and tables but could become known with more extraction from existing data and/or new data collection efforts in the future.

Individual summaries of review findings for each feature class and table submitted follow the data category checklists. These start with a description of data table size and completeness. This description is followed by a data quality table that features review outcome icons for all fields and color coding for some fields. It includes the following icons to give the report reader a quick sense of data quality.

¹¹ Photo guidance can be found in Section 5 of “[WSD GIS Data Preparation & Submittal Guidance_20200821.pdf](#),” which the WSD provided to electrical corporations in August 2020.

Table 3. Review outcome icon definitions

Symbol	Definition
	Correct values have been input where applicable, and capitalization is correct. Great job! ¹²
	A field is slightly incomplete with 95% or more of the records containing data. Good job! Still not 100% complete, though.
	A field is partially incomplete with 50% to 95% of the records containing data. Good job, but there is potential for improvement.
	A field is mostly incomplete with 50% or fewer of the records containing data. The effort is appreciated, but improvements could be made.
	A field has incorrect values, incorrect capitalization, and/or or some other problem. Including data in the field is a step in the right direction, but there's room for improvement. ¹³
	Every value is null, "Unknown," and/or "-99." The strategy for completing this field needs improvement and possibly further discussion with the WSD.

Colors in the table below are used to indicate the priority of data issue resolution.

Table 4. Review outcome issue resolution priority colors

Color	Priority
Red	HIGH
Orange	MEDIUM
Yellow	LOW

Comments on data issues and listings of fields with no data are included below each icon/priority table summary. When no data were submitted for a feature class or table, the statement "No data" is used.

3.1 Asset Point (Feature Dataset)

3.1.1 Data Category Summary

Of the 12 "Asset Point" data layers/tables required, 10 were submitted and have an **x** in the checklist below.

Table 5. Asset Point data category completeness summary

#	Status	Name	Completeness	
1	x	SCE_Camera_20200909	64.7%	58.8%
2	x	SCE_ConnectionDevice_20200909	54.7%	42.6%
3	x	SCE_CustomerMeter_20200909	81.9%	81.9%
4	x	SCE_Fuse_20200909	72.8%	62%
5		SCE_LightingArrestor_20200909		
6	x	SCE_Substation_20200909	70.5%	64%
7	x	SCE_SupportStructure_20200909	58.2%	54%
8		SCE_SupportStructureCrossarmDetail_20200909		
9	x	SCE_Switchgear_20200909	63.9%	55%
10	x	SCE_Transformer_20200909	90%	81.7%
11	x	SCE_TransformerDetail_20200909	54.3%	52.8%
12	x	SCE_WeatherStation_20200909	47%	41.2%

¹² This icon may also be applied to empty comment fields for which no values are needed.

¹³ This icon may be used in conjunction with one of the other icons to express that a field is incomplete and has another problem.

3.1.2 Camera (Feature Class)

The attribute table of this feature class includes 17 fields with 163 rows. Based on the number of null values, this table is 65% complete, but with “-99” and “Unknown” values treated as absent data, this table is only 59% complete

Table 6. Camera data priorities and review outcomes

Field Name	Review Outcome
AssetID	★
UtilityID	★
AssetType	★
MakeandManufacturer	★
ModelNumber	★
HFTDClass	⊘
County	⊘
LastInspectionDate	⊘
LastMaintenanceDate	⊘
InstallationDate	⊘
InstallationYear	⊘
UsefulLifespan	★
CameraHeight	⊘
CameraURL	!
AssetLatitude	★
AssetLongitude	★

Empty value fields

- HFTDClass
- County
- LastInspectionDate
- LastMaintenanceDate
- InstallationDate
- CameraHeight

Field comments






- **InstallationYear:** There is no value for this field but -99.
- **Camera URL:** Hyperlinks don't work.

3.1.3 Connection Device (Feature Class)

The attribute table of this feature class includes 29 fields with 28,482 rows. Based on the number of null values, this table is 55% complete, but with “-99” and “Unknown” values treated as absent data, this table is only 43% complete.

Table 7. Connection Device data priorities and review outcomes

Field Name	Review Outcome
AssetID	★
UtilityID	★
AssetType	★
AssetOHUG	⊘
ConnectionDeviceType	⬤
ConnectionDeviceTypeComment	★
ConnectionDeviceSubtype	⊘
ConnectionDeviceSubtypeComment	⊘
AssociatedNominalVoltagekV	⊘
AssociatedOperatingVoltagekV	⊘
FromStructureID	⬤ !
ToStructureID	⊘
CircuitID	⬤
CircuitName	⬤
SubstationID	⬤
SubstationName	⬤
MakeandManufacturer	⊘
ModelNumber	⊘
HFTDClass	⊘
County	★
LastInspectionDate	⊘
InstallationDate	⊘
InstallationYear	⊘

Field Name	Review Outcome
EstimatedAge	
UsefulLifespan	
ExemptionStatus	
AssetLatitude	
AssetLongitude	

Empty value fields

- ConnectionDeviceTypeComment
- ConnectionDeviceSubtype
- ConnectionDeviceSubtypeComment
- AssociatedNominalVoltagekV
- AssociatedOperatingVoltagekV
- ToStructureID
- HFTDClass
- LastInspectionDate
- InstallationDate
- InstallationYear
- EstimatedAge
- UsefulLifespan
- ExemptionStatus







Field comments











- **AssetOHUG:** All the rows for the field have value *Unknown*.
- **ConnectionDeviceType:** 14,788 rows (51.9%) of the field have value *Unknown*.
- **FromStructureID:** 984 rows (3.4%) have values *NO #*, and 873 rows (3%) are *NULL*.
- **CircuitID:** 14,808 rows (52%) of the field are *NULL*.
- **CircuitName:** 14,846 rows (52.1%) of the field are *NULL*.
- **SubstationID:** 14,913 rows (52.4%) of the field are *NULL*.
- **SubstationName:** 15,214 rows (53.4%) of the field are *NULL*.
- **MakeandManufacturer:** All the rows for the field have value *Unknown*.
- **ModelNumber:** All the rows for the field have value *Unknown*.

3.1.4 Customer Meter (Feature Class)

The attribute table of this feature class includes 17 fields with 927,812 rows. Based on the number of null values, this table is 82% complete. There are no “Unknown” or “-99” values.

Table 8. Customer Meter data priorities and review outcomes

Field Name	Review Outcome
MeterID	
UtilityID	
AssetType	
CircuitID	
CircuitName	
SubstationID	

Field Name	Review Outcome
SubstationName	
MakeandManufacturer	
ModelNumber	
HFTDClass	
County	
InstallationDate	
InstallationYear	
EstimatedAge	
AssetLatitude	
AssetLongitude	

Empty value fields

- MakeandManufacturer
- ModelNumber
- HFTDClass







Field comments

- **CircuitID:** 1,951 rows (0.2%) of the field are *NULL*.
- **CircuitName:** 693 rows (0.07%) of the field are *NULL*.
- **SubstationID:** 1,951 rows (0.2%) of the field are *NULL*.
- **SubstationName:** 64,482 rows (6.9%) of the field are *NULL*.
- **County:** 4 rows of the field are *Unknown*.
- **InstallationDate:** The required format, YYYY-MM-DD, excludes time, but the date was entered with the format 11/22/2011 0:00:00.

3.1.5 Fuse (Feature Class)

The attribute table of this feature class includes 27 fields with 14,529 rows. Based on the number of null values, this table is 73% complete, but with “-99” and “Unknown” values treated as absent data, this table is only 62% complete.

Table 9. Fuse data priorities and review outcomes

Field Name	Review Outcome
AssetID	
UtilityID	
AssetOHUG	
AssociatedNominalVoltagekV	
AssociatedOperatingVoltagekV	
SubstationID	

Field Name	Review Outcome
SubstationName	
CircuitID	
CircuitName	
MakeandManufacturer	
ModelNumber	
HFTDClass	
County	
LastInspectionDate	
LastMaintenanceDate	
InstallationDate	
InstallationYear	
EstimatedAge	
UsefulLifespan	
ExemptionStatus	
FuseRating	
AssetType	
AssetTypeComment	
AssetSubtype	
AssetLatitude	
AssetLongitude	

Empty value fields

- AssociatedOperatingVoltagekV
- HFTDClass
- LastInspectionDate
- LastMaintenanceDate
- UsefulLifespan
- ExemptionStatus
- AssetType
- AssetTypeComment

Field comments

- **AssetID:** There are no *NULL* values, but there are duplicate values for the field.
- **AssociatedNominalVoltagekV:** 11,594 rows (79.8%) of the field have value -99.

- **SubstationID:** 13,959 rows (96%) of the field have the value 2215106. 570 rows or 3.9% of the field are *NULL*.
- **SubstationName:** 570 rows (3.9%) of the field are *NULL*.
- **CircuitID:** 570 rows (3.9%) of the field are *NULL*.
- **CircuitName:** 570 rows (3.9%) of the field are *NULL*.
- **MakeandManufacturer:** 13,208 rows (90.9%) of the field have value *Unknown*.
- **ModelNumber:** All rows (100%) of the field have value *Unknown*.
- **InstallationDate:** 1,416 rows (9.7%) of the field are *NULL*.
- **InstallationYear:** 1,416 rows (9.7%) of the field have value -99.
- **EstimatedAge:** 1,431 rows (9.7%) of the field have value *Unknown*.
- **'AssetSubtype':** 1,391 rows (9.6%) of the field are *NULL*. Need description for the values which include "Smu-Smu-20", "Co-Cut Out", and "Aidr-Asset Information Detail".

3.1.6 Lightning Arrester (Feature Class)

No data.

3.1.7 Substation (Feature Class)

The attribute table of this feature class includes 16 fields with 210 rows. Based on the number of null values, this table is 71% complete, but with “-99” and “Unknown” values treated as absent data, this table is only 64% complete.

Table 10. Substation data priorities and review outcomes

Field Name	Review Outcome
SubstationID	★
UtilityID	★
AssetType	★
SubstationName	★
SubstationNominalVoltagekV	●
AssociatedOperatingVoltagekV	⊘
SubstationRating	⊘
SubstationType	⊘
HFTDClass	⊘
County	★
LastInspectionDate	⊘
InstallationDate	●
InstallationYear	●
AssetLatitude	★
AssetLongitude	★

Empty value fields

- SubstationRating
- SubstationType
- HFTDClass
- LastInspectionDate

Field comments






- **SubstationNominalVoltagekV**: 148 rows (70.5%) of the field are *NULL*.
- **AssociatedOperatingVoltagekV**: All values are -99.
- **InstallationDate**: 5 rows (2.4%) of the field are *NULL*.
- **InstallationYear**: 5 rows (2.4%) of the field are -99.

3.1.8 Support Structure (Feature Class)

The attribute table of this feature class includes 24 fields with 488,945 rows. Based on the number of null values, this table is 58% complete, but with “-99” and “Unknown” values treated as absent data, this table is only 54% complete.

Table 11. Support Structure data priorities and review outcomes

Field Name	Review Outcome
SupportStructureID	!
UtilityID	★
AssetType	★
SubstationID	⊘
HFTDClass	● !
County	●
LastInspectionDate	● !
LastMaintenanceDate	● !
LastIntrusiveDate	⊘
InstallationDate	● !
InstallationYear	●
EstimatedAge	⊘
UsefulLifespan	● !
SupportStructureType	★
SupportStructureTypeComment	★
SupportStructureMaterial	!
SupportStructureMaterialComment	!
SupportStructureMaterialSubtype	●

Field Name	Review Outcome
Underbuild	
ConstructionGrade	
CrossarmAttached	
AssetLatitude	
AssetLongitude	

Empty value fields

- SubstationID
- LastIntrusiveDate
- EstimatedAge
- ConstructionGrade

Field comments

- **SupportStructureID:** 2,906 rows (0.6%) of the field have value *NO #*, 173 rows of the field have value *NO NUMBER*, and 51 rows of the field have value *???????E*.
- **HFTDClass:** 488,943 rows (99.9%) of the field are *NULL* and 2 rows of the field have value *Riverside*.
- **County:** 7 rows (0.001%) of the field are *NULL*.
- **LastInspectionDate:** 488,816 rows (99.9%) of the field are *NULL*.
- **LastMaintenanceDate:** 488,816 rows (99.9%) of the field are *NULL*. **InstallationDate:** 488,943 rows (99.9%) of the field are *NULL* and 2 rows of the field have value *-99*.
- **InstallationYear:** 488,941 rows (99.9%) of the field have value *-99* and 4 rows of the field are *NULL*.
- **UsefulLifespan:** 488,943 rows (99.9%) of the field are *NULL* and 2 rows of the field have value *Pole*.
- **SupportStructureType:** 4 rows of the field are *NULL*.
- **SupportStructureMaterial:** 112 rows of field are *NULL*. 8,681 rows (1.8%) of the field have value *Steel*, which is most likely should be entered as *Metal*. There are two versions of *Other* - *See Comment* which could be because of the white spaces; change the value to *Other* - *See comment*.
- **SupportStructureMaterialComment:** *Wd* - *Wood* should be entered in the *SupportStructureMaterial* field, *Pl* - *Plastic* should be entered as *Plastic*.
- **SupportStructureMaterialSubtype:** 1,566 rows (0.7%) of the field are *NULL*.
- **Underbuild:** 8,306 rows (1.7%) of the field are *NULL*.
- **CrossarmAttached:** 488,943 rows (99.9%) of the field are *NULL* and 2 rows were entered with latitude values.
- **AssetLatitude:** 1 row of the field is *NULL*.
- **AssetLongitude:** 1 row of the field is *NULL*.

3.1.9 Support Structure Crossarm Detail (Related Table)





No data.

3.1.10 Switchgear (Feature Class)

The attribute table of this feature class includes 31 fields with 19,329 rows. Based on the number of null values, this table is 64% complete, but with “-99” and “Unknown” values treated as absent data, this table is only 55% complete.

Table 12. Switchgear data priorities and review outcomes

Field Name	Review Outcome
AssetID	!
UtilityID	★
AssetType	★
AssetOHUG	★
AssociatedNominalVoltagekV	🔌
AssociatedOperatingVoltagekV	🚫
SupportStructureID	●
SubstationID	●
SubstationName	●
CircuitID	●
CircuitName	●
MakeandManufacturer	🔌
ModelNumber	🚫
HFTDClass	🚫
County	★
LastInspectionDate	🔌
LastMaintenanceDate	🚫
InstallationDate	🚫
InstallationYear	🚫
EstimatedAge	🚫
UsefulLifespan	🚫
ExemptionStatus	🚫
CurrentRating	🚫
AssetClass	★
SCADAEnabled	🚫
SwitchgearType	!

Field Name	Review Outcome
SwitchgearSubtype	
SwitchgearInsulatingMedium	
AssetLatitude	
AssetLongitude	

Empty value fields

- HFTDClass
- LastMaintenanceDate
- InstallationDate
- InstallationYear
- EstimatedAge
- UsefulLifespan
- ExemptionStatus
- CurrentRating
- SCADAEnabled
- SwitchgearInsulatingMedium






Field comments







- **AssetID**: 421 rows (2.1%) of the field has value *C*, 421 rows (2.1%) of the field has value *D*, and 421 rows (2.1%) of the field has value *B*, which is not a unique id for the field.
- **AssociatedNominalVoltagekV**: 5,544 rows (28.7%) of the field are *NULL*. 3,365 rows (17.4%) of the field are -99.
- **AssociatedOperatingVoltagekV**: All rows (100%) of the field have values -99.
- **SupportStructureID**: 100 rows (0.5%) of the field are *NULL*.
- **SubstationID**: 530 rows (2.7%) of the field are *NULL*.
- **SubstationName**: 530 rows (2.7%) of the field are *NULL*.
- **CircuitID**: 354 rows (1.8%) of the field are *NULL*.
- **CircuitName**: 363 rows (1.9%) of the field are *NULL*.
- **MakeandManufacturer**: 9,044 rows (46.8%) of the field are *NULL*.
- **ModelNumber**: All rows (100%) of the field have values *Unknown*.
- **LastInspectionDate**: 14,374 rows (74.4%) of the field are *NULL*.
- **SwitchgearType**: Need description for most of the field values.
- **SwitchgearSubtype**: WSD needs discussion about the values.

3.1.11 Transformer (Feature Class)

The attribute table of this feature class includes 12 fields with 161,017 rows. Based on the number of null values, this table is 90% complete, but with “-99” and “Unknown” values treated as absent data, this table is only 82% complete.

Table 13. Transformer data priorities and review outcomes

Field Name	Review Outcome
TransformerID	
UtilityID	
SupportStructureID	
AssetType	
AssetOHUG	

Field Name	Review Outcome
HFTDClass	
County	
InaBank	
QuantityinBank	
AssetLatitude	
AssetLongitude	

Empty value fields

- HFTDClass













Field comments








- **TransformerID:** 13,264 rows (8.2%) of the field are *NULL*.
- **SupportStructureID:** 18,506 rows (11.5%) of the field are *NULL*.
- **County:** 6 rows (0.004%) of the field are blank.
- **InaBank:** All values are “Unknown.”
- **QuantityinBank:** All the rows of the field have values 0.

3.1.12 Transformer Detail (Related Table)

The attribute table of this feature class includes 20 fields with 722,371 rows. Based on the number of null values, this table is 54% complete, but with “-99” and “Unknown” values treated as absent data, this table is only 53% complete.

Table 14. Transformer Detail data priorities and review outcomes

Field Name	Review Outcome
AssetID	
TransformerID	
TransformerSubtype	
AssociatedNominalVoltagekV	
AssociatedOperatingVoltagekV	
SubstationID	
SubstationName	
CircuitID	
CircuitName	
MakeandManufacturer	
ModelNumber	
LastInspectionDate	

Field Name	Review Outcome
LastMaintenanceDate	
InstallationDate	
InstallationYear	
EstimatedAge	
UsefulLifespan	
ExemptionStatus	
TransformerRating	

Empty value fields

- AssociatedOperatingVoltagekV
- ModelNumber
- LastInspectionDate
- LastMaintenanceDate
- InstallationDate
- InstallationYear
- EstimatedAge
- UsefulLifespan
- ExemptionStatus






Field comments












- **AssetID:** There are duplicate values for this field.
- **TransformerID:** 19,682 rows (2.7%) of the field are *NULL*.
- **AssociatedNominalVoltagekV:** 206,909 rows (28.6%) of the field have value -99.
- **SubstationID:** 20,952 rows (2.9%) of the field are *NULL*.
- **SubstationName:** 20,952 rows (2.9%) of the field are *NULL*.
- **CircuitID:** 20,952 rows (2.9%) of the field are *NULL*.
- **CircuitName:** 20,952 (2.9%) rows of the field are *NULL*.
- **MakeandManufacturer:** 4 rows of the field are *NULL*.
- **TransformerRating:** 606 rows (0.08%) of the field are *NULL*.

3.1.13 Weather Station (Feature Class)

The attribute table of this feature class includes 17 fields with 752 rows. Based on the number of null values, this table is 47% complete, but with “-99” and “Unknown” values treated as absent data, this table is only 41% complete.

Table 15. Weather Station priorities and review outcomes

Field Name	Review Outcome
StationID	
UtilityID	
AssetType	
MakeandManufacturer	
ModelNumber	

Field Name	Review Outcome
HFTDClass	
County	
LastInspectionDate	
LastMaintenanceDate	
InstallationDate	
InstallationYear	
EstimatedAge	
UsefulLifespan	
WeatherStationURL	
AssetLatitude	
AssetLongitude	

Empty value fields

- ModelNumber
- HFTDClass
- LastInspectionDate
- LastMaintenanceDate
- InstallationDate
- InstallationYear
- EstimatedAge
- UsefulLifespan
- WeatherStationURL

Field comments

- **MakeandManufacturer:** All rows (100%) of the field have values *Unknown*.

3.2 Asset Line (Feature Dataset)

3.2.1 Data Category Summary




























Table 16. Asset Line data category completeness summary




#	Status	Name	Completeness	
1	x	SCE_TransmissionLine_20200909	47.6%	45.6%
2	x	SCE_PrimaryDistributionLine_20200909	61.2%	55.5%
3	x	SCE_SecondaryDistributionLine_20200909	58%	53.2%

3.2.2 Transmission Line (Feature Class)

The attribute table of this feature class includes 32 fields with 31,194 rows. Based on the number of null values, this table is 48% complete, but with “-99” and “Unknown” values treated as absent data, this table is only 46% complete.

Table 17. Transmission Line data priorities and review outcomes

Field Name	Review Outcome
CircuitID	
UtilityID	
LineClass	
CircuitName	
County	
ConductorType	
AssetOHUG	
NominalVoltagekV	
OperatingVoltagekV	
SubstationID	
SubstationName	
ConductorMaterial	
ConductorMaterialComment	
ConductorSize	
ConductorOD	
ConductorCodeName	
Terminal1	
Terminal2	
Terminal3	
Terminal4	
Terminal5	
Terminal(s)	
LastInspectionDate	
LastMaintenanceDate	
InstallationDate	
InstallationYear	
EstimatedAge	

Field Name	Review Outcome
UsefulLifespan	
AmpacityRating	
Greased	

Empty value fields

- ConductorType
- OperatingVoltagekV
- ConductorOD
- ConductorCodeName
- Terminal1
- Terminal2
- Terminal3
- Terminal4
- Terminal5
- Terminals
- LastInspectionDate
- LastMaintenanceDate
- UsefulLifespan
- Greased





Field comments





















- **CircuitID:** 1,362 rows (4.4%) of the field are *NULL*.
- **CircuitName:** 1,362 rows (4.4%) of the field are *NULL*.
- **NominalVoltagekV:** 69 rows (0.2%) of the field have value -99.
- **SubstationID:** 9,135 rows (29.3%) of the field are *NULL*.
- **SubstationName:** 9,135 rows (29.3%) of the field are *NULL*.
- **ConductorMaterial:** 31,133 rows (99.8%) of the field are *NULL*. The suggested attribute domain list was not utilized.
- **ConductorMaterialComment:** *Aac* and *Cu* should be entered as *All aluminum conductor (AAC)* and *Copper (Cu)* in the *ConductorMaterial* field.
- **ConductorSize:** 17,308 rows (55.5%) of the field have value *Unknown*, 1,116 rows (3.6%) of the field are *NULL*, and 18 rows of the field have value *Not listed*. Some of the values consist of unit *kcm*.
- **InstallationDate:** 1,554 rows (5%) of the field are *NULL*. **InstallationYear:** 1,554 rows (5%) of the field have value -99.
- **EstimatedAge:** 1,556 rows (5%) of the field have values *Unknown*.
- **AmpacityRating:** 31,187 rows (99.9%) of the field are *NULL*, and 7 rows of the field have value *0.0*.

3.2.3 Primary Distribution Line (Feature Class)

The attribute table of this feature class includes 26 fields with 280,969 rows. Based on the number of null values, this table is 61% complete, but with “-99” and “Unknown” values treated as absent data, this table is only 56% complete.

Table 18. Primary Distribution Line data priorities and review outcomes

Field Name	Review Outcome
CircuitID	
UtilityID	
LineClass	
CircuitName	

Field Name	Review Outcome
County	
ConductorType	
AssetOHUG	
NominalVoltagekV	
OperatingVoltagekV	
SubstationID	
SubstationName	
ConductorMaterial	
ConductorMaterialComment	
ConductorSize	
ConductorOD	
ConductorCodeName	
LastInspectionDate	
LastMaintenanceDate	
InstallationDate	
InstallationYear	
EstimatedAge	
UsefulLifespan	
AmpacityRating	
Greased	

Empty value fields

- OperatingVoltagekV
- ConductorMaterialComment
- ConductorSize
- ConductorOD
- ConductorCodeName
- LastInspectionDate
- LastMaintenanceDate
- UsefulLifespan
- Greased

Field comments

- **CircuitID:** 30,521 rows (10.9%) of the field are *NULL*.
- **CircuitName:** 30,632 rows (10.9%) of the field are *NULL*.







- **ConductorType:** 124,236 rows (44.2%) of the field have values *Unknown*.
- **NominalVoltagekV:** 1,019 rows (0.4%) of the field have value -99.
- **SubstationID:** 30,670 rows (10.9%) of the field are *NULL*.
- **SubstationName:** 30,670 rows (10.9%) of the field are *NULL*.
- **ConductorMaterial:** 280,968 rows (99.9%) of the field are *NULL*. The suggested attribute domain list was not utilized.
- **InstallationDate:** 145,600 rows (51.8%) of the field are *NULL*.
- **InstallationYear:** 145,600 rows (51.8%) of the field have value -99.
- **EstimatedAge:** 145,603 rows (51.8%) of the field have values *Unknown*.
- **AmpacityRating:** 110,692 rows (39.4%) of the field have value 0.0. 36,300 rows (12.9%) of the field are *NULL*.

3.2.4 Secondary Distribution Line (Feature Class)

The attribute table of this feature class includes 27 fields with 400,610 rows. Based on the number of null values, this table is 58% complete, but with “-99” and “Unknown” values treated as absent data, this table is only 53% complete.

Table 19. Secondary Distribution Line data priorities and review outcomes

Field Name	Review Comment
CircuitID	●
UtilityID	★
LineClass	★
CircuitName	●
County	★
ConductorType	⊘
ConductorTypeComment	⊘
AssetOHUG	★
NominalVoltagekV	◐
OperatingVoltagekV	⊘
SubstationID	●
SubstationName	●
ConductorMaterial	⊘
ConductorMaterialComment	⊘
ConductorSize	⊘
ConductorOD	⊘
ConductorCodeName	⊘
LastInspectionDate	⊘
LastMaintenanceDate	⊘

Field Name	Review Comment
InstallationDate	
InstallationYear	
EstimatedAge	
UsefulLifespan	
AmpacityRating	
Greased	

Empty value fields

- ConductorType
- ConductorTypeComment
- OperatingVoltagekV
- ConductorMaterial
- ConductorMaterialComment
- ConductorSize
- ConductorOD
- ConductorCodeName
- LastInspectionDate
- LastMaintenanceDate
- UsefulLifespan
- AmpacityRating
- Greased

Field comments

- **CircuitID:** 6,863 rows (1.7%) of the field are *NULL*.
- **CircuitName:** 7,979 rows (2%) of the field are *NULL*.
- **NominalVoltagekV:** 300,004 rows (74.9%) of the field have value -99.
- **SubstationID:** 10,574 rows (2.6%) of the field are *NULL*.
- **SubstationName:** 10,574 rows (2.6%) of the field are blank.
- **InstallationDate:** 104,583 rows (26.1%) of the field are *NULL*.
- **InstallationYear:** 104,583 rows (26.1%) of the field have value -99.
- **EstimatedAge:** 104,590 rows (26.1%) of the field have values *Unknown*.

3.3 PSPS Event (Feature Dataset)

3.3.1 Data Category Summary

No data.

3.3.2 Entity-Relationship Diagram for PSPS Events

No data.

3.3.3 PSPS Event Log (Related Table)

No data.

3.3.4 PSPS Event Line (Feature Class)

No data.

3.3.5 PSPS Event Polygon (Feature Class)

No data.

3.3.6 PSPS Event Customer Meter (Feature Class)

No data.

3.3.7 PSPS Event Asset Damage

3.3.7.2 PSPS Event Damage Point (Feature Class)

No data.

3.3.7.3 PSPS Event Conductor Damage Detail (Related Table)

No data.

3.3.7.4 PSPS Event Support Structure Damage Detail (Related Table)

No data.

3.3.7.5 PSPS Event Other Asset Damage Detail (Related Table)

No data.

3.3.7.6 PSPS Damage Photo Log (Related Table)

No data.

3.4 Risk Event (Feature Dataset)

3.4.1 Data Category Summary

No data.

3.4.2 Wire Down Event (Point Feature Class)

No data.

3.4.3 Ignition (Point Feature Class)

No data.

3.4.4 Transmission Outages (Point Feature Class)

No data.

3.4.5 Transmission VM Outage (Point Feature Class)

No data.

3.4.6 Distribution Outages (Point Feature Class)

No data.

3.4.7 Distribution VM Outage (Point Feature Class)

No data.

3.4.8 Risk Event Asset Log (Related Table)

No data.

3.4.9 Risk Event Photo Log (Related Table)

No data.

3.5 Initiative (Feature Dataset)

3.5.1 Data Category Summary

Of the 17 initiative data layers/tables required, x were submitted and have an **x** in the checklist below.

Table 20. Initiative data category completeness summary

#	Status	Name	Completeness	
1	x	SCE_VegetationManagementInspectionLog_20200909	80.3%	80.3%
2	x	SCE_VegetationManagementInspectionPoint_20200909	58.3%	58.3%
3	x	SCE_VegetationManagementInspectionLine_20200909	63.6%	63.6%
4	x	SCE_VegetationManagementInspectionPolygon_20200909	70%	70%
5	x	SCE_VegetationManagementProjectLog_20200909	42.8%	42.8%
6	x	SCE_VegetationManagementProjectPoint_20200909	64.1%	64.1%
7		SCE_VegetationManagementProjectLine_20200909		
8	x	SCE_VegetationManagementProjectPolygon_20200909	67.7%	67.7%
9	x	SCE_AssetInspectionLog_20200909	78.3%	78.3%
10	x	SCE_AssetInspectionPoint_20200909	75.6%	75.6%
11	x	SCE_AssetInspectionLine_20200909	64.6%	64.6%
12		SCE_AssetInspectionPolygon_20200909		
13	x	SCE_GridHardeningLog_20200909	64.9%	64.9%
14	x	SCE_GridHardeningPoint_20200909	55.1%	55.1%
15	x	SCE_GridHardeningLine_20200909	50.9%	50.9%
16		SCE_InitiativeAssetLog_20200909		
17		SCE_InitiativePhotoLog_20200909		








3.5.2 Vegetation Management Inspections

3.5.2.1 Vegetation Management Inspection Log (Related Table)

The attribute table of this feature class includes 16 fields with 254,455 rows. Based on the number of null values, this table is 80% complete. There are no “Unknown” or “-99” values.

Table 21. Vegetation Management Inspection Log data priorities and review outcomes

Field Name	Review Outcome
VmiLogID	★
VmpLogID	●
InspectionDate	● !
InspectorName	⊘
InspectionType	★
InspectionTypeComment	★
InspectionStatus	★
InspectionQA	●

Field Name	Review Outcome
TreeTrimmingCount	
TreeTrimmingAcreage	
InspectionComment	
InspectionMethod	
InspectionMethodComment	
InspectionTechnology	
InspectionTechnologyComment	

Empty value fields

- InspectorName
- TreeTrimmingAcreage
- InspectionMethodComment












Field comments





- **VmpLogID:** 96 rows (0.04%) of the field are *NULL*.
- **InspectionDate:** 1,570 rows (0.62%) are null.
- **InspectionQA:** 2 rows of the field are *NULL*.
- **TreeTrimmingCount:** 66,524 rows (26.1%) of the field are *NULL*.

3.5.2.2 Vegetation Management Inspection Point (Feature Class)

The attribute table of this feature class includes 16 fields with 252,766 rows. Based on the number of null values, this table is 58% complete. There are no “Unknown” or “-99” values.

Table 22. Vegetation Management Inspection Point data priorities and review outcomes

Field Name	Review Outcome
VmiID	
UtilityID	
VmiLogID	
InspectionLocationOrAddress	
ParcelAPN	
TreeHealth	
TreeSpecies	
TreeHeight	
TreeDiameter	
HFTDClass	
City	

Field Name	Review Outcome
County	
District	
Latitude	
Longitude	

Empty value fields

- ParcelAPN
- HFTDClass










Field comments

- **InspectionLocationOrAddress:** 37,805 rows (15%) of the field are *NULL*.
- **TreeHealth:** 248,935 rows (98.5%) of the field are *NULL*.
- **TreeSpecies:** 64,819 rows (25.6%) of the field are *NULL*.
- **TreeHeight:** 223,674 rows (88.5%) of the field are *NULL*.
- **TreeDiameter:** 248,935 rows (98.5%) of the field are *NULL*.
- **City:** 169,885 rows (67.2%) of the field are *NULL*.
- **County:** 179,878 rows (71.2%) of the field are *NULL*.
- **District:** 5,038 rows (2%) of the field are *NULL*.

3.5.2.3 Vegetation Management Inspection Line (Feature Class)

The attribute table of this feature class includes 11 fields with 739 rows. Based on the number of null values, this table is 64% complete. There are no “Unknown” or “-99” values.

Table 23. Vegetation Management Inspection Line data priorities and review outcomes

Field Name	Review Outcome
VmiID	
UtilityID	
VmiLogID	
InspectionLocationOrAddress	
HFTDClass	
HFTDClassComment	
City	
County	
District	

Empty value fields

- InspectionLocationOrAddress
- HFTDClass
- HFTDClassComment
- City
- County

Field comments

- **District:** 6 rows (0.81%) of the field are *NULL*.

3.5.2.4 Vegetation Management Inspection Polygon (Feature Class)

The attribute table of this feature class includes 12 fields with 847 rows. Based on the number of null values, this table is 70% complete. There are no “Unknown” or “-99” values.

Table 24. Vegetation Management Inspection Polygon data priorities and review outcomes

Field Name	Review Outcome
VmiID	★
UtilityID	★
VmiLogID	★
InspectionLocationOrAddress	🕒
HFTDClass	🕒
HFTDClassComment	🚫
City	🕒
County	🕒
District	★

Empty value fields

- HFTDClassComment

Field comments

- **InspectionLocationOrAddress:** 761 rows (89.4%) of the field are *NULL*.
- **HFTDClass:** 761 rows (89.4%) of the field are *NULL*. Project polygons exist that span multiple HFTD classes and should have comments listing the HFTD areas with which they intersect.
- **City:** 761 rows (89.4%) of the field are *NULL*.
- **County:** 761 rows (89.4%) of the field are *NULL*.




























3.5.3 Vegetation Management Projects

3.5.3.1 Vegetation Management Project Log (Related Table)

The attribute table of this feature class includes 32 fields with 365,583 rows. Based on the number of null values, this table is 43% complete. There are no “Unknown” or “-99” values.

Table 25. Vegetation Management Project Log data priorities and review outcomes

Field Name	Review Outcome
VmpLogID	!
DateStart	🕒
DateEnd	🕒
VmpStatus	★

Field Name	Review Outcome
VmpStatusComments	
PersonInCharge	
CoastalRedwoodExemption	
EncroachPermit	
EnvPermit	
EnvPermitProject	
EnvPermitDocumentation	
BMPApply	
AMMApply	
WoodManagement	
WoodManagementComments	
LandDesignation	
RiparianArea	
CaltransProp	
ProjectCategory	
ProjectCategoryComment	
TreeTrimCount	
TreeTrimAcreage	
TreeRemovalCount	
TreeRemovalAcreage	
TreeTrimCountActl	
TreeTrimAcreageActl	
TreeRemovalCountActl	
TreeRemovalAcreageActl	
VegetationTreatmentType	
VegetationTreatmentTypeComment	
DescriptionOfWork	

Empty value fields

- VmpStatusComments
- PersonInCharge
- EnvPermitProject
- EnvPermitDocumentation
- TreeTrimAcreage
- TreeRemovalAcreage
- TreeTrimAcreageActl
- TreeRemovalAcreageActl

Field comments

- **VmpLogID:** There are duplicate values for this field.
- **DateStart:** 233,380 rows (63.8%) of the field are NULL.
- **DateEnd:** 233,380 rows (63.8%) of the field are NULL.
- **CoastalRedwoodExemption:** 365,560 rows (99.9%) of the field are NULL.
- **EncroachPermit:** 365,560 rows (99.9%) of the field are NULL.
- **EnvPermit:** 335,333 rows (91.7%) of the field are NULL.
- **BMPApply:** 4,086 rows (1.1%) of the field are NULL.
- **AMMApply:** 365,560 rows (99.9%) of the field are NULL.
- **WoodManagement:** 4,098 rows (1.1%) of the field are NULL.
- **WoodManagementComments:** 68,903 rows (18.8%) of the field are NULL.
- **LandDesignation:** 365,560 rows (99.9%) of the field are NULL.
- **RiparianArea:** 365,572 rows (99.9%) of the field are NULL.
- **CaltransProp:** 365,560 rows (99.9%) of the field are NULL.
- **ProjectCategory:** 173,885 rows (47.6%) of the field are NULL.
- **ProjectCategoryComment:** 185,622 rows (50.8%) of the field are NULL.
- **TreeTrimCount:** 175,201 rows (47.9%) of this field have value 0. 107,988 rows (29.5%) of this field are NULL.
- **TreeRemovalCount:** 168,714 rows (46.1%) of the field have value 0. 153,717 rows (42%) of this field are NULL.
- **TreeRemovalCountActl:** 309,369 rows (84.6%) of the field are NULL.
- **VegetationTreatmentType:** Need to remove the white space for *Tree removal - tree mortality* value.
- **DescriptionOfWork:** 361,474 rows (98.9%) of the field are NULL.

3.5.3.2 Vegetation Management Project Point (Feature Class)

The attribute table of this feature class includes 19 fields with 364,867 rows. Based on the number of null values, this table is 64% complete. There are no “Unknown” or “-99” values.

Table 26. Vegetation Management Project Point data priorities and review outcomes

Field Name	Review Outcome
VmpID	★
UtilityID	★
VmpLogID	★
ProjectLocationOrAddress	🌑
ParcelAPN	🚫
TreeID	●
TreeHealth	🌑
TreeHazard	🌑

Field Name	Review Outcome
TreeSpecies	
SpeciesGrowthRate	
TreeHeight	
TreeDiameter	
HFTDClass	
City	
County	
District	
Latitude	
Longitude	

Empty value fields

- ParcelAPN

Field comments

- ProjectLocationOrAddress:** 57,006 rows (25.6%) of the field has white space as value. 16,264 rows (4.5%) of the field are *NULL*.
- TreeID:** 3,952 rows (1%) of the field are *NULL*.
- TreeHealth:** 121,394 rows (33.3%) of the field are *NULL*.
- TreeHazard:** 179,040 rows (49%) of the field are *NULL*.
- TreeSpecies:** 69,981 rows (19.2%) of the field are *NULL*.
- SpeciesGrowthRate:** 364,838 rows (99.9%) of the field are *NULL*.
- TreeHeight:** 179,170 rows (49.1%) of the field are *NULL*.
- TreeDiameter:** 354,637 rows (97.2%) of the field are *NULL*.
- HFTDClass:** 364,838 rows (99.9%) of the field are *NULL*.
- City:** 156,994 rows (43%) of the field are *NULL*.
- County:** 301,725 rows (82.7%) of the field are *NULL*.
- District:** 11,782 rows (3.2%) of the field are *NULL*.




3.5.3.3 Vegetation Management Project Line (Feature Class)







No data.

3.5.3.4 Vegetation Management Project Polygon (Feature Class)

The attribute table of this feature class includes 12 fields with 603 rows. Based on the number of null values, this table is 68% complete. There are no “Unknown” or “-99” values.

Table 27. Vegetation Management Project Polygon data priorities and review outcomes

Field Name	Review Outcome
VmplID	
UtilityID	
VmpLogID	

Field Name	Review Outcome
ProjectLocationOrAddress	
HFTDClass	
HFTDClassComment	
City	
County	
District	

Empty value fields

- HFTDClassComment

Field comments















- **ProjectLocationOrAddress:** 584 rows (96.8%) of the field are *NULL*.
- **HFTDClass:** 584 rows (96.8%) of the field are *NULL*.
- **City:** 584 rows (96.8%) of the field are *NULL*.
- **County:** 584 rows (96.8%) of the field are *NULL*.

3.5.4 Asset Inspections

3.5.4.1 Asset Inspection Log (Related Table)

The attribute table of this feature class includes 17 fields with 346,640 rows. Based on the number of null values, this table is 78% complete. There are no “Unknown” or “-99” values.

Table 28. Asset Inspection Log data priorities and review outcomes

Field Name	Review Comment
AiLogID	
VmpLogID	
InspectionStartDate	 
InspectionEndDate	 
PerformedBy	
PerformedByComment	
InspectorName	
InspectionType	
InspectionTypeComment	
InspectionQA	
InspectionComments	
ComplianceFinding	

Field Name	Review Comment
InspectionMethod	★
InspectionMethodComment	★
InspectionTechnology	★
InspectionTechnologyComment	★

Empty value fields

- PerformedByComment
- InspectorName
- InspectionTypeComment
- InspectionComments

Field comments

- VmpLogID: 141,955 rows (41%) are *NULL*.
- **InspectionStartDate**: 21,730 rows (6.3%) of the field are *NULL*. **InspectionEndDate**: 1,413 rows (0.4%) of the field are *NULL*.
- **PerformedBy**: 23,369 rows (6.7%) of the field are *NULL*.
- **InspectionQA**: 344,700 rows (99.4%) of the field are *NULL*.
- **ComplianceFinding**: 196543 rows (56.7%) of the field are *NULL*.

3.5.4.2 Asset Inspection Point (Feature Class)

The attribute table of this feature class includes 12 fields with 346,048 rows. Based on the number of null values, this table is 76% complete. There are no “Unknown” or “-99” values.

Table 29. Asset Inspection Point data priorities and review outcomes

Field Name	Review Outcome
AiID	★
UtilityID	★
AiLogID	★
InspectionLocationOrAddress	●
ParcelAPN	⊘
HFTDClass	●
City	●
County	●
District	●
Latitude	★
Longitude	★

Empty value fields

- ParcelAPN

Field comments

- **InspectionLocationOrAddress**: 246,874 rows (71.3%) of the field are *NULL*.
- **HFTDClass**: 4,308 rows (1.2%) of the field are *NULL*.
- **City**: 150,046 rows (43.3%) of the field are *NULL*.
- **County**: 257,278 rows (74.3%) of the field are *NULL*.
- **District**: 7,636 rows (2.2%) of the field are *NULL*.

3.5.4.3 Asset Inspection Line (Feature Class)

The attribute table of this feature class includes 11 fields with 294 rows. Based on the number of null values, this table is 65% complete. There are no “Unknown” or “-99” values.

Table 30. Asset Inspection Line data priorities and review outcomes

Field Name	Review Outcome
AiID	★
UtilityID	★
AiLogID	★
InspectionLocationOrAddress	●
HFTDClass	●
HFTDClassComment	★
City	⊘
County	●
District	●

Empty value fields

- City

Field comments

- **InspectionLocationOrAddress**: 212 rows (72.1%) of the field are *NULL*.
- **HFTDClass**: 268 rows (91.2%) of the field are *NULL*.
- **County**: 288 rows (98%) of the field are *NULL*.
- **District**: 82 rows (28%) of the field are *NULL*.

3.5.4.4 Asset Inspection Polygon (Feature Class)

No data.
















3.5.5 Grid Hardening

3.5.5.1 Grid Hardening Log (Related Table)

The attribute table of this feature class includes 17 fields with 26,339 rows. Based on the number of null values, this table is 65% complete. There are no “Unknown” or “-99” values.

Table 31. Grid Hardening Log data priorities and review outcomes

Field Name	Review Outcome
GhLogID	★

Field Name	Review Outcome
AiLogID	
GhStatus	
GhChangeOrder	
GhChangeOrderDate	
GhChangeOrderType	
GhChangeOrderTypeComment	
DateStart	
DateEnd	
LineDeenergized	
PersonInChargeName	
PerformedBy	
PerformedByComment	
InitiativeActivity	
InitiativeActivityComment	
DescriptionOfGridHardening	

Empty value fields

- GhChangeOrder
- GhChangeOrderDate
- GhChangeOrderType
- GhChangeOrderTypeComment
- PersonInChargeName
- PerformedByComment












Field comments

- **AiLogID:** 18,372 rows (69.8%) of the field are *NULL*.
- **DateEnd:** 663 rows (2.5%) of the field are *NULL*.
- **LineDeenergized:** 24,190 rows (91.4%) of the field are *NULL*.
- **PerformedBy:** 8,634 rows (32.8%) of the field are *NULL*.
- **InitiativeActivity:** 15 rows (0.06%) of the field are *NULL*.

3.5.5.2 Grid Hardening Point (Feature Class)

The attribute table of this feature class includes 12 fields with 52,674 rows. Based on the number of null values, this table is 55% complete. There are no “-99” or “Unknown” values.

Table 32. Grid Hardening Point data priorities and review outcomes

Field Name	Review Outcome
GhID	
UtilityID	
GhLogID	
GridHardeningLocationOrAddress	
ParcelAPN	
HFTDClass	
City	
County	
District	
Latitude	
Longitude	

Empty value fields

- ParcelAPN








Field comments



- **GhID:** There are duplicate values for this field.
- **GridHardeningLocationOrAddress:** 44,622 rows (84.7%) of the field are *NULL*.
- **HFTDClass:** 44,614 rows (84.7%) of the field are *NULL*.
- **City:** 44,621 rows (84.7%) of the field are *NULL*.
- **County:** 52,570 rows (99.8%) of the field are *NULL*.
- **District:** 44,638 rows (84.7%) of the field are *NULL*.

3.5.5.3 Grid Hardening Line (Feature Class)

The attribute table of this feature class includes 11 fields with 982 rows. Based on the number of null values, this table is 51% complete. There are no “-99” or “Unknown” values.

Table 33. Grid Hardening Line data priorities and review outcomes

Field Name	Review Outcome
GhID	
UtilityID	
GhLogID	
GridHardeningLocationOrAddress	
HFTDClass	
HFTDClassComment	
City	

Field Name	Review Outcome
County	
District	

Empty value fields

- None

Field comments

- **GridHardeningLocationOrAddress**: 975 rows (99.2%) of the field are *NULL*.
- **HFTDClass**: 975 rows of the field are *NULL*.
- **HFTDClassComment**: 975 rows of the field are *NULL*.
- **City**: 975 rows of the field are *NULL*.
- **County**: 975 rows of the field are *NULL*.
- **District**: 975 rows of the field are *NULL*.

3.5.6 Data Related to Multiple Initiatives

3.5.6.1 Initiative Asset Log (Related Table)

No data.

3.5.6.2 Initiative Photo Log (Related Table)

No data.

3.6 Other Required Data (Feature Dataset)

3.6.1 Data Category Summary

Of the 4 initiative data layers/tables required, 2 were submitted and have an **x** in the checklist below.

Table 34. Other Required Data data category completeness summary

#	Status	Name	Completeness	
1		SCE_OtherPowerLineConnectionLocation_20200909		
2	x	SCE_CriticalFacility_20200909	62.5%	62.5%
3		SCE_RedFlagWarningDayPolygon_20200909		
4	x	SCE_AdministrativeArea_20200909	91.5%	89.1




3.6.2 Electrical Corporation Power Line-Other Power Line Connection Location (Point Feature Class)

No data.

3.6.3 Critical Facility (Point Feature Class)

The attribute table of this feature class includes 24 fields with 8,312 rows. Based on the number of null values, this table is 63% complete. There are no “Unknown” or “-99” values.

Table 35. Critical Facility data priorities and review outcomes

Field Name	Review Outcome
FacilityID	
UtilityID	
FacilityName	

Field Name	Review Outcome
FacilityCategory	!
FacilityCategoryComment	★
FacilityDescription	★
CircuitID	!
CircuitName	★
MeterID	★
BackupPower	⊘
BackupType	⊘
BackupTypeComment	⊘
BackupCapacity	⊘
PopulationImpact	⊘
HFTDClass	⊘
PSPSDays	⊘
PSPSDaysDateBasis	⊘
ParcelAPN	⊘
Address	★
City	★
Zip	●
Latitude	★
Longitude	★

Empty value fields

- FacilityID
- FacilityCategoryComment
- CategoryComment
- BackupPower
- BackupType
- BackupTypeComment
- BackupCapacity
- PopulationImpact
- HFTDClass
- PSPSDays
- PSPSDaysDateBasis
- ParcelAPN

Field comments

- **FacilityCategory:** Domains were not properly used.
- **CircuitID:** All values are identical to CircuitName values.
- **Zip:** 18 rows (0.2%) of the field are blank.

3.6.4 Red Flag Warning Day (Polygon Feature Class)

No data.

3.6.5 Administrative Area (Polygon Feature Classes)

The attribute table of this feature class includes 9 fields with 46 rows. Based on the number of null values, this table is 92% complete, but with “-99” and “Unknown” values treated as absent data, this table is only 89% complete.

Table 36. Administrative Area data priorities and review outcomes

Field Name	Review Outcome
AdminID	★
UtilityID	★
AreaType	★
SubAreaType	★
SubAreaTypeComment	!
Name	●

Empty value fields

- None

Field comments

- **SubareaTypeComment:** 10 rows (21.7%) of the field have value *Unknown*. This is not a particularly helpful comment. Defining “SCE PWRD Region” would be more useful. Also, if there’s nothing known to say for a comment, there does not have to be a comment.
- **Name:** 35 rows (76%) of the field are *NULL*.

APPENDIX A. COMPLETENESS PERCENTAGE BREAKDOWN FOR MULTIPLE UTILITIES

- PG&E = Pacific Gas and Electric
- SCE = Southern California Edison
- SDG&E = San Diego Gas and Electric
- BVES = Bear Valley Electric Service

- First % = percent complete strictly based on nulls without counting nulls in comment fields.
- Second % = percent complete based on nulls, “-99,” and “Unknown” without counting nulls in comment and most description fields.

	Utility									
Data	PG&E		SCE		SDG&E		Liberty	PacifiCorp	BVES	
Asset Point										
1. Camera	82.4%	82.4%	64.7%	58.8%	76.5%	49.7%				
2. Connection Device			54.7%	42.6%	68.7%	51.5%				
3. Customer Meter			81.9%	81.9%	68.7%	51.5%			94.4%	72.2%
4. Fuse	65%	54%	72.8%	62%	76.7%	57.5%				
5. Lightning Arrestor					64%	40%				
6. Substation	58%	58%	70.5%	64%	74.8%	60.5%			70.6%	70.6%
7. Support Structure			58.2%	54%	62.5%	50%			59.2%	51.8%
8. Support Structure Crossarm Detail										
9. Switchgear			63.9%	55%	72%	59%				
10. Transformer			90%	81.7%	83%	83%				
11. Transformer Detail			54.3%	52.8%	77.7%	57.7%				
12. Weather Station	68.1%	68.1%	47%	41.2%	70.6%	47%			67.2%	61.1%
Asset Line										
13. Transmission Line			47.6%	45.6%	56.2%	40.6%				
14. Primary Distribution Line	28.4%	28.4%	61.2%	55.5%	74.8%	61.5%				
15. Secondary Distribution Line			58%	53.2%						
PSPS Event										
16. PSPS Event Log										
17. PSPS Event Line										
18. PSPS Event Polygon										
19. PSPS Event Customer Meter Point	100%	100%								
20. PSPS Event Damage Point	62.6%	62.6%								
21. PSPS Event Conductor Damage Detail										
22. PSPS Event Support Structure Damage Detail										
23. PSPS Event Other Asset Damage Detail										
24. PSPS Damage Photo Log										
Risk Event										
25. Wire Down Event	56.2%	56.2%			80%	80%				
26. Ignition	57.5%	57.3%			61.1%	60%				
27. Transmission Outage					77.8%	77.4%				
28. Transmission VM Outage										
29. Distribution Outage	95.4%	95.4%								
30. Distribution VM Outage					84.8%	84.8%				
31. Risk Event Asset Log					30.5%	30.5%				
32. Risk Event Photo Log										
Initiative										
33. Vegetation Management Inspection Log	87.7%	87.7%	80.3%	80.3%	81.2%	81.2%				
34. Vegetation Management Inspection Point	68.8%	68.8%	58.3%	58.3%	84.9	84.9%				
35. Vegetation Management Inspection Line			63.6%	63.6%						
36. Vegetation Management Inspection Polygon			70%	70%						
37. Vegetation Management Project Log	49.9%	49.9%	42.8%	42.8%	48.6%	48.6%				
38. Vegetation Management Project Point	89.8%	89.8%	64.1%	64.1%	89.6%	89.6%				
39. Vegetation Management Project Line	81.8%	81.8%								
40. Vegetation Management Project Polygon			67.7%	67.7%						
41. Asset Inspection Log	88.1%	88.1%	78.3%	78.3%	80.4%	80.4%				
42. Asset Inspection Point	88.4%	81.2%	75.6%	75.6%	83.2%	83.2%				
43. Asset Inspection Line			64.6%	64.6%	81.8%	81.8%				
44. Asset Inspection Polygon										
45. Grid Hardening Log	70.6%	70.6%	64.9%	64.9%	71.2%	71.2%				
46. Grid Hardening Point	90.6%	82.8%	55.1%	55.1%	86%	86%				
47. Grid Hardening Line	90.4%	82.5%	50.9%	50.9%	84.4%	84.4%			84.6%	84.6%
48. Initiative Asset Log										
49. Initiative Photo Log										
Other Required Data										
50. Other Power Line Connection Location					82.6%	71.8%				
51. Critical Facility	62.8%	62.8%	62.5%	62.5%	76.8%	74%			59%	59%
52. Red Flag Warning Day Polygon					90.9%	90.9%			12.1%	12.1%
53. Administrative Area			91.5%	89.1%	100%	100%			100%	100%
Total submitted data	21		28		32		0	0	8	