BEFORE THE PUBLIC UTILITIES COMMISSION OF THE

STATE OF CALIFORNIA

In the Matter of the Application of SOUTHERN CALIFORNIA EDISON COMPANY (U 338-E) for a Certificate of Public Convenience and Necessity for the Alberhill System Project.	A.09-09-022

THIRD AMENDED APPLICATION OF SOUTHERN CALIFORNIA EDISON COMPANY (U 338-E) FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE ALBERHILL SYSTEM PROJECT

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Dated: **June 2, 2023**

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I.
INTRODUCTION

Pursuant to California Public Utilities Commission ("Commission" or "CPUC") Rule of Practice and Procedure 1.12 and Administrative Law Judge ("ALJ") Sophia Park's *E-mail Ruling Granting Motion Seeking Leave to File Third Amended Application*, Southern California Edison Company ("SCE") hereby submits this third amended application ("Third Amended Application" or "Application") for a Certificate of Public Convenience and Necessity ("CPCN") for the Alberhill System Project ("ASP"). This Third Amended Application includes technical design modifications and engineering refinements to the ASP scope that decrease project costs and reduce greenhouse gas (GHG) emissions. Specifically, SCE proposes incorporating air-insulated switchgear at the Alberhill Substation in lieu of gas-insulated switchgear; leveraging the use of existing infrastructure that has already been constructed as part of the Valley-Ivyglen Project; and utilizing helicopter construction previously analyzed in the Final Environmental

Impact Report to eliminate three of the five transmission structure access roads originally proposed.

SCE has prepared an amended Proponent's Environmental Assessment ("Third Amended PEA") that analyzes the revised ASP scope. The Third Amended PEA is submitted concurrently with this Application. SCE also reviewed its cost/benefit analysis prepared pursuant to Decision (D.) 18-08-026 to determine whether any revisions or supplemental information was necessary due to the revised costs and concluded that the revised scope is equivalent to the original scope in terms of meeting capacity, reliability and resiliency needs. A supplement to SCE's analysis describing the updated scope and its impact on the cost/benefit analysis is attached as Appendix "G" to this Application.

II.

PROCEDURAL HISTORY

On September 20, 2009, SCE filed an Application for a Permit to Construct ("Application") and a PEA for the ASP. On March 12, 2010, SCE filed an amendment to the Application titled *Amendment To The Application Of Southern California Edison Company (U 338-E) For A Certificate of Public Convenience and Necessity: Alberhill System Project* ("Amended Application"). SCE filed amended sections of the PEA on April 11, 2011 ("First Amended PEA"). The CPUC issued a Final Environmental Impact Report ("FEIR") in April 2017.

On August 31, 2018, the CPUC issued D. 18-08-026 ("the Decision"), which considered, in part, whether to approve the CPCN for the ASP. The Decision neither issued nor denied the CPCN for the ASP. Rather, ordering paragraph ("OP") 4 of the Decision directed SCE to "supplement the [ASP] record with additional analyses of alternatives which may satisfy the needs of the Valley South System."[1] In response, SCE performed additional analyses to supplement the administrative record with quantitative and qualitative metrics that evaluate the

[1] Decision, at pp. 42-43, para. 4.

ability of a wide range of project alternatives to effectively meet project objectives and satisfy system planning criteria. SCE evaluated all alternatives using a cost/benefit analysis based on forward-looking system performance metrics and a range of monetized and non-monetized risks.

On May 11, 2020, SCE filed a Motion to Supplement the Record with its additional alternatives analysis ("Motion to Supplement"), a Second Amended Application, ("Second Amended Application") and an amended PEA ("Second Amended PEA"), which incorporated the additional alternative analyses. SCE amended its Motion to Supplement on February 1, 2021, to correct information related to the calculation of system benefits and the monetization of those benefits ("Amended Motion to Supplement"), and on June 22, 2021, to correct minor clerical errors ("Second Amended Motion to Supplement").

SCE submits this Third Amended Application and Third Amended PEA, which proposes technical design modifications and additional engineering refinements that have occurred since the time of the Original ASP (i.e., the project design documented in the FEIR (hereinafter referred to as the "Original Project"). Those changes involve converting the Alberhill Substation 500 kV switchgear from a gas-insulated design to an air-insulated design, utilizing helicopter construction previously analyzed in the FEIR to eliminate three of the five transmission structure access roads originally proposed, and further refining the project design due to the completion of the Valley-Ivyglen 115 kV Subtransmission Line Project (VIG Project). The Proposed Project, as redesigned, is hereinafter referred to as the "Proposed Project". SCE also reviewed the cost/benefit analysis prepared pursuant to the Decision and determined that the Original Project and the Proposed Project are equivalent in terms of the reported power system performance metrics and with respect to the prior conclusions made regarding the Valley South System capacity, reliability, and resilience needs. Further, the Proposed Project is superior in cost-effectiveness as reflected in the cost/benefit analysis. As detailed in this Application and the attached Third Amended PEA, the proposed changes reduce costs, decrease GHG emissions, and avoid or reduce potential environmental impacts to the maximum feasible extent.

III.

BACKGROUND AND SUMMARY OF REQUEST

On September 24, 2020, the California Air Resources Board ("CARB") adopted Resolution 20-28, which proposed certain amendments to the Regulation for Reducing Sulfur Hexafluoride Emissions[2]. In December 2021, the Office of Administrative Law ("OAL") approved the Final Regulation Order, adopting Resolution 20-28.[3] In recognition of this regulation, SCE evaluated whether changes could be made to the ASP scope that could reduce GHG emissions and costs without increasing the environmental impacts analyzed in the existing FEIR. SCE determined that the Alberhill Substation design could be converted from a gas-insulated 500 kV switchgear design to an air-insulated switchgear design, which would reduce annual operating GHG emissions by approximately 75 percent. As described in the Third Amended PEA, attached hereto as Appendix "A", by reducing the originally planned for full buildout substation scope, SCE was able to make space available on-site to accommodate air-insulated 500 kV switchgear without increasing environmental impacts.

SCE was also able to leverage existing infrastructure that has been constructed as part of the VIG Project to simplify and reduce the impacts of the Proposed Project. For example, SCE proposes installing 115 kV underground subtransmission circuit segments within existing VIG Project underground duct banks in order to avoid the construction of multiple new subtransmission poles and to reduce costs. SCE has also more clearly defined the use of helicopter construction methods—previously provided for in the FEIR—to eliminate the need to construct certain access roads, thereby reducing the temporary and permanent impacts associated with constructing those roads. As described below in Section V and shown in the cost table

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[2] See California Air Resources Board Resolution 20-28, Proposed Amendments to the Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear, available at https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2020/sf6/finalres2028.pdf (last accessed on 31 May 2023).

[3] See California Air Resources Board Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear, available at https://ww2.arb.ca.gov/rulemaking/2020/sf6 (last accessed on 31 May 2023).

attached hereto as Appendix "B", these revisions to the Proposed Project scope result in a reduction in costs from what was specified in SCE's Second Amended Application. Finally, the Third Amended PEA also provides clarifying language to support the FEIR project objectives, and details how those objectives are still met by the Proposed Project.

Chapter 3 (Project Description) and Appendix M: Revised Project Description of the Third Amended PEA describe in detail the principal design modification and engineering refinements made to the ASP, and the results of the environmental analysis associated with the Proposed Project design are reflected in Appendix O: Revised Environmental Impact Analysis, attached to the Third Amended PEA. Based on SCE's analysis, the Proposed Project would change the level of significance of Impact AQ-4 (ASP) from significant with mitigation, to less than significant, due to reductions in criteria air pollutant emissions during construction. In addition, while Impact GHG-1 (ASP) would remain less than significant, replacing the gas-insulated 500 kV switchgear design with an air-insulated design would reduce annual operating GHG emissions by approximately 75 percent.

As demonstrated in this Third Amended Application and the accompanying Third Amended PEA, the proposed revisions do not cause any new significant impacts or increase the severity of any impacts under CEQA. As a result, the changes proposed are not considered significant under Section 15162 (a) of the CEQA guidelines and the CPUC may incorporate the changes in the Third Amended PEA by preparing an addendum to the previously certified FEIR.[4]

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[4] CEQA establishes the type of environmental documentation required when changes to a project occur after an EIR is certified. Specifically, Section 15164 of the CEQA Guidelines states that it is appropriate for the lead agency to prepare an addendum to a previously certified EIR when the changes or additions to the EIR are not significant enough to require a Supplemental EIR. Changes or additions are only significant if they (1) change the Proposed Project to result in new significant environmental effects or a substantial increase in the severity of previously identified significant effects; (2) lead to substantial changes to the circumstances surrounding the Proposed Project such that there would be new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or (3) result in new information that shows the Proposed Project would result in new significant environmental effects, a substantial increase in the severity of previously identified significant effects, or that an alternative would substantially reduce one or more significant effects on the environment, and project proponents decline to adopt the alternative.

SCE requests that the Commission, upon completion of its review of this Application, issue and approve or certify an appropriate environmental document pursuant to CEQA, and issue a CPCN authorizing SCE to construct the ASP as set forth in this Application and the attached PEA.

IV.

PROJECT DESCRIPTION

As described in the Third Amended PEA, the Proposed Project, would include the following:

- Construction of a new 1,120 megavolt ampere (MVA) 500/115 kV substation (Alberhill Substation);
- Construction of two new 500 kV transmission lines (approximately 3.3 miles, combined) within a new right-of-way (ROW) to connect the proposed Alberhill Substation to the existing Serrano–Valley 500 kV Transmission Line;
- Double-circuit approximately 10.6 miles of existing single-circuit 115 kV subtransmission lines with structure replacement primarily in the existing ROW;
- Construction of approximately 3 miles of single-circuit 115 kV subtransmission lines with distribution lines underbuilt on the subtransmission line structures, and removal of about 3 miles of electrical distribution lines within the existing ROW;
- Installation of a second 115 kV circuit on approximately 6.2 miles of existing 115 kV subtransmission lines constructed as part of the VIG Project;
- Installation of approximately 550 feet of new 115 kV underground subtransmission circuit within new duct banks, and installation of approximately 4,000 feet of new 115 kV subtransmission circuit within existing duct banks;
- Installation of fiber optic lines overhead (approximately 9 miles) on sections of the new or modified subtransmission lines and underground (approximately 1 mile) in proximity to the proposed Alberhill Substation and several of the existing 115/12 kV substations;

- Construction of an approximately 120-foot microwave antenna tower at the proposed Alberhill Substation site; installation of microwave telecommunications dish antennas at the proposed Alberhill Substation, the existing Santiago Peak Communications Site, and Serrano Substation; and other telecommunications equipment installations at existing and proposed substations;
- Installation of a new 115 kV line position inside Newcomb Substation to accommodate the new Newcomb-Skylark 115 kV line, and modification to an existing position at Valley Substation to isolate the existing Valley-Newcomb 115 kV line which will be taken out of service as part of the Proposed Project; and
- Transfer of five of the 14 Valley South 115 kV System substations to the proposed Alberhill 115 kV System: the Ivyglen, Fogarty, Elsinore, Skylark, and Newcomb 115/12 kV Substations.

Please refer to Chapter 3 (Project Description) and Appendix M: Revised Project Description of SCE's Third Amended PEA for a detailed description of the Proposed Project.

V.

PROJECT COST INFORMATION

In compliance with Public Utilities Code § 1005.5(a),[5] SCE developed estimated costs associated with the Proposed Project, which includes both direct and contingency costs.[6] The following describes the estimated costs for the Proposed Project, broken down by cost type. All costs are provided in 2019 constant dollars, unless otherwise noted. SCE is currently updating the Proposed Project costs to 2023 constant dollars and will be including the updated costs with its revised cost testimony. However, any increases in costs are predominately due to inflationary

[5] Pub. Util. Code § 1005.5(a) provides that: "Whenever the commission issues to an electrical . . . corporation a certificate authorizing the new construction of any addition to or extension of the corporation's plant estimated to cost greater than fifty million dollars ($50,000,000), the commission shall specify in the certificate a maximum cost determined to be reasonable and prudent for the facility."

[6] The total cost of the Proposed Project, including contingency, is estimated at $429 million in 2019 constant dollars.

adjustments, division overhead, market conditions, and licensing costs, and said cost escalation factors similarly impact all project alternatives. Despite these escalation factors, SCE expects the 2023 cost estimate to reflect a decrease from the Original Project estimate of $508 million in 2019 constant dollars specified within SCE's Second Amended Application.[7]

SCE will seek to recover certain prudently incurred costs associated with the Proposed Project through Commission-jurisdictional rates, as may be warranted. Construction of the Proposed Project is scheduled to begin in June 2026 with a proposed completion date of June 2029. A Project construction schedule is included in this Application as part of the Project Plan at Appendix C.

A. Summary of Estimated Costs for the Proposed Project

The construction costs associated with the Project's scope of work are broken down in the project cost table, Appendix B. The left side of the table lists the scope elements grouped by the following categories: Licensing; Project Management Execution; Environmental; Real Properties; Substation; Transmission Greater Than 200 kV; Transmission Less Than 200 kV; Telecommunications; Distribution; Corporate Security; and Known Risk.

The estimated direct costs are provided next to each element. The estimated contingency costs are then added to the total direct costs at the bottom of the project cost table.[8] As noted in Appendix B, the direct cost estimates are represented in 2019 constant dollars. Including contingency, the total Alberhill Project construction costs are estimated to be $429 million in 2019 constant dollars.

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[7] SCE's Second Amended Application at p. 7, fn 4 (noting $545M in nominal dollars for the Original Project, which equates to $508M in 2019 constant dollars).

[8] Including contingency in any finding of maximum prudent costs would be consistent with Commission precedent based on all prior CPCNs granted to SCE. Excluding contingency would not only contradict recent precedent and industry best practices, but it would be unrealistic to assume that there will not be variances in material quantities or labor hour estimates once the project engineering is finalized, future market pricing at the time of expenditures is known, and the environmental requirements are determined.

Consistent with recent CPCNs, corporate overheads and financing costs during the project development and execution phases and, once in-service, operation and maintenance ("O&M") costs, should not be included in a CPCN's maximum cost.

VI.

PUBLIC UTILITIES CODE 1005 AND ADJUSTMENT OF THE MAXIMUM REASONABLE AND PRUDENT COST ESTIMATE

In D.07-01-040, the Commission recognized that the FERC will ultimately decide how much of the costs the utility may reflect in transmission rates.[9] However, SCE recognizes that Public Utilities Code Section 1005.5(a) directs the Commission to specify "a maximum cost determined to be reasonable and prudent for the facility."[10]

The Commission has recognized that the costs submitted in a CPCN application are based on conceptual or preliminary design estimates, and assuming the CPCN is granted, the cost estimates subsequently will be adjusted based on the route selected by the Commission, the final engineering design, final environmental mitigation requirements, and many other factors.

Public Utilities Code Section 1005.5(b) specifically allows the utility applicant to seek to increase the maximum cost after the decision granting the CPCN has been issued if the utility

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9 *See* D.07-01-040 ("DPV2") mimeo., p. 45. ("While FERC will ultimately decide how much of the costs for this project SCE may recoup in transmission rates, we have jurisdiction pursuant to Pub. Util. Code § 1005.5(a) and the responsibility to specify in the CPCN a "maximum cost determined to be reasonable and prudent for the DPV2 project.").

10 Pub. Util. Code § 1005.5(a) provides that: "Whenever the commission issues to an electrical . . . corporation a certificate authorizing the new construction of any addition to or extension of the corporation's plant estimated to cost greater than fifty million dollars ($50,000,000), the commission shall specify in the certificate a maximum cost determined to be reasonable and prudent for the facility." In specifying the maximum costs at which the project is within the public's convenience and necessity, the Commission is not setting a limit for actual spending or cost recover, as to do so would be outside the CPUC's authority and jurisdiction.

determines that the cost has increased.[11] Any future adjustments would be based on changes in cost estimates once SCE completes final, detailed design-based construction estimates necessary to reflect items such as:

1. Adjustments in Project costs because of any unanticipated delays in starting the project or inflation;

2. Adjustments in Project costs as a result of final design criteria;

3. Additional Project costs resulting from the adopted mitigation measures (and mitigation monitoring program); and

4. Events related to equipment and raw materials (e.g., the price of steel, concrete, other raw materials, and equipment) that increase the cost of the project.

For all the above reasons, SCE suggests the Commission (1) adopt a maximum reasonable and prudent cost estimate based on the numbers and scope presented by SCE and (2) authorize SCE to seek adjustments to the estimate through the advice letter process, should costs increase in the future.

A. Eligibility for California Public Utility Code § 399.2.5 Recovery

Similar to previous Commission decisions, specifically, D.07-03-012, D.07-03-045, and D.09-12-044, SCE requests the Commission explicitly establish that, pursuant to Pub. Util. Code § 399.2.5, SCE can recover through CPUC-jurisdictional rates all costs associated with the Proposed Project prudently incurred by SCE that FERC does not allow SCE to recover in its general transmission rates.[12]

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[11] As set forth in Pub. Util. Code § 1005.5(b): "After the certificate has been issued, the corporation may apply to the commission for an increase in the maximum cost specified in the certificate. The Commission may authorize an increase in the specified maximum cost, if it finds and determines that the cost has in fact increased and that the present or future public convenience and necessity require construction of the project at the increased cost; otherwise, it shall deny the application." (Pub. Util. Code § 1005.5(b).).

[12] Such costs could include SCE's Transmission Revenue Requirement (TRR) and CAISO's Transmission Access Charge (TAC).

VII.

LOCATION OF ITEMS REQUIRED BY PUBLIC UTILITIES CODE SECTION 1003, COMMISSION RULES, AND GENERAL ORDER 131-D

The Public Utilities Code, CPUC Rules, and G.O. 131-D require various items to be submitted with CPCN applications. The table below lists the items, the authority which dictates the submittal, and references where the information is located in SCE's various filings.

CPCN APPLICATION FILING REQUIREMENTS			
Requirement	**Authority**	**Testimony or Appendix**	**PEA**
A detailed description of the proposed project	G.O. 131-D, IX.A.1.a; Rule 3.1(a); Public Utilities Code 1003(a)		Chapter 3 (Third Amended PEA as supplemented by Appendix M)
A project map	G.O. 131-D, IX.A.1.b; Rule 3.1(c)		Chapters 1 and 4 (PEA); Chapters, 2 and 3 (Third Amended PEA as supplemented by Appendix M)
A purpose and need statement	G.O. 131-D, IX.A.1.c; Rule 3.1(c)		Chapter 2 (Third Amended PEA)
Project Implementation Plan	Public Utilities Code 1003(b)	Appendix C - Project Plan (attached to the Third Amended Application)	
Design, Construction Management and Cost Control Plan	Public Utilities Code 1003(e)	Appendix C - Project Plan (attached to the Third Amended Application)	
A detailed statement of the estimated cost	G.O. 131-D, IX.A.1.d; Rule 3.1(f); Public Utilities Code 1003(c)	Appendix B (attached to the Third Amended Application) Cost Testimony	
Route selection including comparison with alternative routes	G.O. 131-D, IX.A.1.e		Chapter 2 (Second Amendment to PEA)
A project schedule showing the program of right-of-way acquisition and construction	G.O. 131-D, IX.A.1.f	Appendix C - Project Plan (attached to the Third Amended Application)	
Governmental agency consultations	G.O. 131-D, IX.A.1.g		Appendix J (Attached to PEA)

PEA	G.O. 131-D, IX.A.1.h	Appendix A (attached to the Third Amended Application, as supplemented by Appendix O)	
EMF Field Study	G.O. 131-D, Section X.A	Appendix D to the Third Amended Application	
Notice of Application	G.O. 131-D, XI.A	Appendix D to the Application	
Articles of Incorporation	CPUC Information and Criteria List Appendix B, 2.2; Rule 2.2, Public Utilities Code 1004	Appendix E to the Third Amended Application	
Financial Statement; Statements and/or exhibits showing financial ability of applicant to render service; Annual Report and/or Proxy Statement	CPUC Information and Criteria List Appendix B, 2.3; Rule 3.1(g) and (l); Rule 2.3	Appendix F to the Third Amended Application	
Names/addresses of all utilities, corporations, persons or entities with which the proposed project is likely to compete	Rule 3.1(b)	Appendix C to the Amended Application	
Names of cities and counties within which service will be rendered	Rule 3.1(b)	Appendix B to the Application	
List identifying the permits required	Rule 3.1(d)	Appendix C to the Second Amended Application	
Annual Revenue Requirement[13]	Rule 3.1(h); Public Utilities Code 1003(d)		

VIII.

PROCEEDING CATEGORY, NEED FOR HEARINGS, AND SCHEDULE

In compliance with Rule 2.1(c) of the Commission's Rules of Practice and Procedure (California Code of Regulations Title 20), SCE is required to state in this application "the proposed category for the proceeding, the need for hearing, the issues to be considered, and a proposed schedule." SCE proposes to categorize this Third Amended Application as a rate-

[13] Because most of the facilities that comprise the Project are electric transmission facilities, the reasonableness of costs and the associated ratemaking for the portions of the Project that are FERC-jurisdictional are within the exclusive jurisdiction of FERC. Any rate changes associated with the CPUC jurisdictional portion of the Project will be addressed in SCE's future General Rate Case.

setting proceeding. This proceeding involves the Commission's issuance of a CPCN authorizing SCE to construct the Proposed Project.

SCE suggests the following proposed schedule for this Third Amended Application:

Date	Event
June 2023	Amended Application Filed
October 2023	Prepare Addendum to Final EIR
November 2023	Proposed Decision Issued
December 2023	Final Decision Issued

IX.

REQUEST FOR TIMELY RELIEF

SCE requests the Commission issue a decision within the time limits prescribed by Government Code Section 65920 *et seq*. (the Permit Streamlining Act), as provided for in G.O. 131-D, Section IX.A.2.

X.

CONCLUSION

Upon completion of its review of this Third Amended Application, SCE requests that the Commission prepare an addendum to the previously certified FEIR and issue a CPCN for the Proposed Project, as set forth in this Third Amended Application and Third Amended PEA, in accordance with the schedule set forth herein.

Respectfully submitted,
SOUTHERN CALIFORNIA EDISON COMPANY

/s/ Heather D. Rivard
By: Heather D. Rivard

/s/ Tammy L. Jones
By: Tammy L. Jones

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Dated: June 2, 2023

VERIFICATION

I am an officer of the applicant corporation herein and am authorized to make this verification on its behalf. I am informed and believe that the matters stated in the foregoing document are true.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 2nd day of June 2023, at Rosemead, California.

/s/ Heather D. Rivard

By: Heather D. Rivard
Vice President, Transmission, Substations and Operations
SOUTHERN CALIFORNIA EDISON COMPANY
2 Innovation Way
Pomona, California 92821

Appendix A

PROPONENT'S ENVIRONMENTAL ASSESSMENT

Proponents' Environmental Assessment

Submitted Separately

Appendix B

COST TABLE ON AMENDED PEA

Alberhill System Project

2 0 1 9 D O L L A R S

Project Element	Cost[1]
Licensing	$36
Project Management/Execution	$18
Environmental	$25
Real Properties	$39
Substation	$128
Trans (>200kV)	$37
Trans (<200kV)	$42
Telecom	$8
Distribution	$9
Corporate Security	$3
Known Risk	$35
Direct Expenditures[2] :	**$380**
Contingency :	$49
Direct Expenditures w/ Contingency :	**$429**

NOTES:

[1] Costs in 2019 constant dollars, Millions

[2] Numbers may not add exactly due to rounding

Appendix C

PROJECT PLAN

PROJECT PLAN

1.0 INTRODUCTION

This document is part of Southern California Edison's (SCE) Alberhill System Project ("ASP") Application for a Certificateof Public Convenience and Necessity ("CPCN") to the California Public Utilities Commission ("CPUC"). This document either includes materials required by California Public Utilities ("PU") Code Section 1003 or indicates by reference to where they can be found in the ASP CPCN Application, Proponent's Environmental Assessment ("PEA"), or elsewhere.

2.0 PROJECT SCOPE

The scope of the ASP Project, including the preliminary engineering and design information required by PU Code Section 1003 (a), may be found in Chapter 3.0 as amended by Appendix M of the Third Amended PEA.

3.0 OBJECTIVES AND GOALS

The objectives of the ASP Project may be found in Section 1.3 of the PEA. During the execution (final engineering, procurement, and construction) phase, SCE's goals include:

- Ensuring the safety of our employees, contractors and the public
- Complying with all mitigation measures and any applicable environmental regulations
- Complying with applicable design, construction, and safety standards
- Ensuring sufficient resources are planned and available to perform work
- Completing engineering, procurement, and construction activities by the scheduled operating date
- Managing project budget and providing cost control and oversight

4.0 PROJECT IMPLEMENTATION PLAN

4.1 Introduction

The ASP Project will be managed by a Project Manager ("PM") with internal SCE subject matter experts and outside contractors reporting to the PM on a matrix basis. Given the critical time-dependent capacity, reliability and resiliency needs of the Valley South System and large project scope, cost, long material lead time, and the extended construction period, final engineering and procurement of major long-lead time materials may be authorized to begin prior to regulatory approval. Construction cannot begin until after regulatory approval.

Any required permits identified in the regulatory approval process or otherwise required, must also be obtained before construction can begin in the portion of the project scope requiring the specific permit. Extensive and well-coordinated project team support will be required throughout the duration of the project to ensure that the project goals are met.

4.2 Project Management Team

The Project Manager has overall responsibility and commensurate authority for successful completion of the ASP Project. These responsibilities include: planning; obtaining regulatory approvals; cost; scheduling; execution (final engineering, procurement, and construction); and the overall quality of the project. Project work will be conducted using a matrix-based Project Management model. All personnel assigned to the project functionally report to the Project Manager.

During the life of the project, the Project Management Team ("PMT") will consist of specialized teams and support personnel with special areas of expertise. Because of the changing nature of project needs as the project progresses through the development, regulatory approval, and construction phases, the PMT will also change to meet the project needs. The PMT is responsible for the successful implementation of the ASP Project. It is responsible for tracking costs, scope changes, schedules, and construction performance.

The PMT will have regular meetings to discuss project status, review performance, and identify any special needs or significant concerns.

4.3 Project Construction Management Plan

The complexities of the ASP Project may necessitate the use of alternative construction management approaches. The construction management option to be selected will be based on SCE's need to optimize its use of limited "in-house" resources and expertise in the most effective manner and optimize the process of being able to deliver the project on schedule, at or under budget while protecting the safety of project workers and members of the public and assuring environmental compliance as specified by the project mitigation measures or as required by Federal, State and local agencies. The major construction management approaches under consideration are:

- SCE performs engineering, design, and manages construction using SCE and contractor labor; or,
- SCE develops Engineering, Procurement, and Construction ("EPC") specifications which are the basis for selecting and managing any contractors needed to complete engineering, design, and/or construction activities; or,
- A combination of the first two alternatives

5.0 COST ESTIMATE

The cost estimate required by PU Code Section 1003 (c) may be found in Section V of the CPCN Application.

6.0 COST CONTROL PLAN

The ASP Project will have a project cost control plan. Depending upon which resource(s)is (are) utilized to perform final engineering, procurement, and construction activities on this project, a schedule of values or milestones consistent with the Work Breakdown Structure ("WBS") will serve as the basis for progress payments made to the contractor, or the measure of performance for SCE construction crews. If utilized, the contractor shall submit for SCE's review and approval its payment request, together with all required supporting documentation, for all work performed in the subject period. The contract price may only be changed by a Field Change Order ("FCO") or by a Change Request ("CR") approved by the Project Manager and if necessary, SCE management. The value of any work covered by a FCO or a CR will be determined by one of the following methods:

- Where the work involved is covered by unit prices contained in the Contract Documents – apply the unit prices to the quantities of the items.
- By a mutually agreed lump sum itemized and supported by substantiating data.
- Actual cost of the work plus a contractor's fee.

7.0 PROJECT SCHEDULE

The following table presents a nominal schedule for selected major project milestones, The duration and lead/lag of these activities may vary based on the selected project construction strategy.

Project Activity	Approximate Duration (months)	Approximate Start Date
CPCN	23	May 2023
Final Engineering	7	June 2025
Right-of-Way/Property Acquisition	19	January 2025
Acquisition of Required Permits	15	November 2024
Construction	24	June 2026
Cleanup	8	July 2028
Proposed Project Operational	N/A	June 2029

Appendix D

FIELD MANAGEMENT PLAN

Alberhill System Project

2023 Update

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LIST OF FIGURES

List of Terms

ACSR	aluminum conductor steel reinforced
CDHS	California Department of Health Services
C/L	center line
CPCN	Certificate of Public Convenience and Necessity
CPUC	California Public Utilities Commission
ELF	Extremely Low Frequency
EMF	electric and magnetic fields
FMP	field management plan
GO	General Order
IARC	International Agency for Research on Cancer
kV	kilovolt
LST	lattice steel tower
LWS	light weight steel
mG	milliGauss
MVA	megavolt-ampere
MW	megawatt
NIEHS	National Institute of Environmental Health Sciences
NRPB	National Radiation Protection Board
PTC	Permit to Construct
R-O-W	right-of-way
SCE	Southern California Edison
T/L	transmission line
TSP	tubular steel pole
VAR	volt ampere reactive
WHO	World Health Organization

I. Executive Summary

This document is Southern California Edison Company's (SCE) Field Management Plan (FMP) for the proposed Alberhill System Project (Proposed Project). The purpose of this project is to serve current and projected demand for electricity, and maintain electric system reliability in portions of southwestern Riverside County including the cities of Lake Elsinore, Canyon Lake, Perris, Menifee, Murrieta, Murrieta Hot Springs, Temecula, and Wildomar, as well as the surrounding unincorporated portions of Riverside County (Electrical Needs Area).

In addition to serving the forecasted demand for the Electrical Needs Area, the Proposed Project would relieve the Valley South 115 kilovolt (kV) System by transferring electrical demand from this system to the new Alberhill System. The Proposed Project would also improve electrical reliability, resiliency, capacity, and operational flexibility in southwestern Riverside County.

The Proposed Project would include the following major components:

- Construction of a new 1,120 megavolt ampere (MVA) 500/115 kV substation to increase electrical service capacity to the area presently served by the Valley South 115 kV System
- Construction of two new 500 kV transmission line (T/L) segments to connect the new substation to SCE's existing Serrano-Valley 500 kV T/L
- Construction of a new 115 kV subtransmission line (approximately three miles in length) and modifications to four existing 115 kV subtransmission lines to transfer five existing 115/12 kV substations (Ivyglen, Fogarty, Elsinore, Skylark, and Newcomb Substations)

presently served by the Valley South 115 kV System to the new Alberhill 500/115 kV System

SCE provides this FMP in order to inform the public, the California Public Utilities Commission (CPUC), and other interested parties of its evaluation of "no-cost and low-cost" magnetic field reduction design options for this project, and SCE's proposed plan to apply these design options to this project. This FMP has been prepared in accordance with CPUC Decision No. 93-11-013 and Decision No. 06-01-042 relating to extremely low frequency (ELF)[1] electric and magnetic fields (EMF). This FMP also provides background on the current status of scientific research related to possible health effects of EMF, and a description of the CPUC's EMF policy.

The "no-cost and low-cost" magnetic field reduction design options that are incorporated into the design of the Proposed Project are as follows:

- Utilize subtransmission structure heights that meet or exceed SCE's preferred EMF design criteria
- Utilize double-circuit construction that reduces spacing between circuits as compared with single-circuit construction for major portions of subtransmission lines
- Arrange the conductors of proposed T/L segments and subtransmission lines for magnetic field reduction
- Utilize subtransmission line construction that reduces the space between conductors compared with other designs
- Utilize underground construction in existing conduits

[1] The extremely low frequency is defined as the frequency range from 3 Hz to 3,000 Hz.

- Arrange underground subtransmission cables for magnetic field reduction
- Select route alignments through mostly undeveloped areas
- Place major substation electrical equipment (such as transformers, switchracks, buses and underground duct banks) away from the substation property lines

Table 1 below summarizes "no-cost and low-cost" magnetic field reduction design options that SCE considered for the Proposed Project.

SCE's plan for applying the above "no-cost and low-cost" magnetic field reduction design options for the Proposed Project is consistent with CPUC's EMF policy and with the direction of leading national and international health agencies. Furthermore, the plan complies with SCE's EMF Design Guidelines[2], and with applicable national and state safety standards for new electrical facilities.

[2] EMF Design Guidelines, August 2006.

Table 1. Summary of "No-cost and Low-cost" Magnetic Field Reduction Design Options

Area	Location[3]	Adjacent Land Use[4]	MF Reduction Design Options Considered	Estimated Cost to Adopt	Design Option(s) Adopted? (Yes/No)	Reason(s) if not adopted
Alberhill Substation	Located approximately 0.1 mile northeast of intersection of Interstate Highway 15 (I-15) and Temescal Canyon Road at Alberhill, California.	3,6	• Place major substation electrical equipment (such as transformers, switchracks, buses and underground duct banks) away from the substation property lines • Configure the transfer and operating buses with the transfer bus closest to the nearest property line	• No-Cost* • No-Cost	• Yes • No	• The 500 kV and 115 kV would not be an operating/transfer bus design
500 kV T/Ls	Alberhill-Serrano 500 kV Line and Alberhill-Valley 500 kV Line	2,6	• Select route alignments through mostly undeveloped areas	• No-Cost*	• Yes	

[3] This column shows the major cross streets, existing subtransmission lines, or substation name as reference points.

[4] Land usage codes are as follows: 1) schools, licensed day-cares, and hospitals, 2) residential, 3) commercial/industrial, 4) recreational, 5) agricultural, and 6) undeveloped land.

* Included in the preliminary design.

Area	Location[3]	Adjacent Land Use[4]	MF Reduction Design Options Considered	Estimated Cost to Adopt	Design Option(s) Adopted? (Yes/No)	Reason(s) if not adopted
115 kV Section 1	From Alberhill Substation along Concordia Ranch Road north of the I-15 to the intersection of Temescal Canyon Road and Bernard Street just south of the I-15. (Approximately one mile in length)	3,6	• Utilize subtransmission structure heights that meet or exceed SCE's preferred EMF design criteria • Utilize double-circuit construction that reduces spacing between circuits as compared with single-circuit construction for major portions of subtransmission lines • Arrange the conductors of subtransmission lines for magnetic field reduction	• No-Cost * • No-Cost* • No-Cost	• Yes • Yes • Yes	

* Included in the preliminary design.

Area	Location[3]	Adjacent Land Use[4]	MF Reduction Design Options Considered	Estimated Cost to Adopt	Design Option(s) Adopted? (Yes/No)	Reason(s) if not adopted
115 kV Section 2	From Temescal Canyon Road/Bernard Street to Lake Street/Nichols Road (Approximately 1.8 miles in length)	2,3,6	• Utilize subtransmission structure heights that meet or exceed SCE's preferred EMF design criteria • Utilize double-circuit construction that reduces spacing between circuits as compared with single-circuit construction for major portions of subtransmission lines • Arrange the conductors of subtransmission lines for magnetic field reduction	• No-Cost * • No-Cost* • No-Cost	• Yes • Yes • Yes	

* Included in the preliminary design.

Area	Location[3]	Adjacent Land Use[4]	MF Reduction Design Options Considered	Estimated Cost to Adopt	Design Option(s) Adopted? (Yes/No)	Reason(s) if not adopted
115 kV Section 3A	From Lake Street/Nichols Road to the Northwest end of Pasadena Street in Lake Elsinore. (Approximately 3 miles in length)	2,3,6	• Utilize subtransmission structure heights that meet or exceed SCE's preferred EMF design criteria • Utilize double-circuit construction that reduces spacing between circuits as compared with single-circuit construction for major portions of subtransmission lines • Arrange the conductors of subtransmission lines for magnetic field reduction	• No-Cost * • No-Cost* • No-Cost	• Yes • Yes • Yes	
115 kV Section 3B	Underground portion along Pasadena Street and Third Street to Third Street/Collier Ave (Approximately 0.8 mile in length)	3	• Utilize underground construction in existing conduits • Arrange underground subtransmission cables for magnetic field reduction	• No-Cost* • No-Cost	• Yes • Yes	

* Included in the preliminary design.

Area	Location[3]	Adjacent Land Use[4]	MF Reduction Design Options Considered	Estimated Cost to Adopt	Design Option(s) Adopted? (Yes/No)	Reason(s) if not adopted
115 kV Section 4A	From Third Street/Collier Ave to 350 feet southeast of Collier Ave/Chaney Street along Collier Ave. (Approximately 0.3 mile in length)	2,3	• Utilize subtransmission structure heights that meet or exceed SCE's preferred EMF design criteria • Utilize double-circuit construction that reduces spacing between circuits as compared with single-circuit construction • Arrange the conductors of subtransmission lines for magnetic field reduction	• No-Cost * • No-Cost * • No-Cost	• Yes • Yes • Yes	
115 kV Section 4B	From 350 feet southeast of Collier Ave/Chaney Street on Collier Ave crossing to the northeast side of the I-15 Freeway. (Approximately 650 feet in length)	3	• Utilize subtransmission structure heights that meet or exceed SCE's preferred EMF design criteria • Utilize double-circuit construction that reduces spacing between circuits as compared with single-circuit construction • Arrange the conductors of subtransmission lines for magnetic field reduction	• No-Cost * • No-Cost * • No-Cost	• Yes • Yes • Yes	

* Included in the preliminary design.

Area	Location[3]	Adjacent Land Use[4]	MF Reduction Design Options Considered	Estimated Cost to Adopt	Design Option(s) Adopted? (Yes/No)	Reason(s) if not adopted
115 kV Section 5	From East Hill Street/Flint Street in Lake Elsinore to Skylark Substation. (Approximately 4.5 miles in length)	2,3,6	• Utilize subtransmission structure heights that meet or exceed SCE's preferred EMF design criteria	• No-Cost *	• Yes	
			• Utilize double-circuit construction that reduces spacing between circuits as compared with single-circuit construction for major portions of subtransmission lines	• No-Cost *	• Yes	
			• Arrange the conductors of subtransmission lines for magnetic field reduction	• No-Cost	• Yes	

* Included in the preliminary design.

Area	Location[3]	Adjacent Land Use[4]	MF Reduction Design Options Considered	Estimated Cost to Adopt	Design Option(s) Adopted? (Yes/No)	Reason(s) if not adopted
115 kV Section 6	From Skylark Substation to the intersection of Scott Road and Murrieta Road in the City of Menifee. (Approximately 5.5 miles in length)	2,3,6	• Utilize subtransmission structure heights that meet or exceed SCE's preferred EMF design criteria • Utilize double-circuit construction that reduces spacing between circuits as compared with single-circuit construction for major portions of subtransmission lines • Arrange the conductors of subtransmission lines for magnetic field reduction	• No-Cost * • No-Cost * • No-Cost	• Yes • Yes • Yes	

* Included in the preliminary design.

Area	Location[3]	Adjacent Land Use[4]	MF Reduction Design Options Considered	Estimated Cost to Adopt	Design Option(s) Adopted? (Yes/No)	Reason(s) if not adopted
115 kV Section 7	From Scott Road/Murrieta Road to Newport Road/Murrieta Road. (Approximately 3 miles in length)	2,3,6	• Utilize subtransmission structure heights that meet or exceed SCE's preferred EMF design criteria • Utilize subtransmission line construction that reduces the space between conductors compared with other designs	• No-Cost * • No-Cost *	• Yes • Yes	

II. Background Regarding EMF And Public Health Research On EMF

There are many sources of power frequency[5] electric and magnetic fields, including internal household and building wiring, electrical appliances, and electric power transmission and distribution lines. There have been numerous scientific studies about the potential health effects of EMF. After many years of research, the scientific community has been unable to determine if exposures to EMF cause health hazards. State and federal public health regulatory agencies have determined that setting numeric exposure limits is not appropriate.[6]

Many of the questions about possible connections between EMF exposures and specific diseases have been successfully resolved due to an aggressive international research program. However, potentially important public health questions remain about whether there is a link between EMF exposures and certain diseases, including childhood leukemia and a variety of adult diseases (e.g., adult cancers and miscarriages). As a result, some health authorities have identified magnetic field exposures as a possible human carcinogen. As summarized in greater detail below, these conclusions are consistent with the following published reports: the National Institute of Environmental Health Sciences (NIEHS) 1999[7], the National Radiation Protection Board (NRPB) 2001[8], the International Commission on non-Ionizing Radiation Protection (ICNIRP) 2001, the California Department of Health Services (CDHS) 2002[9], and the International Agency for Research on Cancer (IARC) 2002[10].

The federal government conducted EMF research as a part of a $45-million research program managed by the NIEHS. This program, known as the EMF RAPID (Research and

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5 In U.S., it is 60 Hertz (Hz).

6 CPUC Decision 06-01-042, p. 6, footnote 10

7 National Institute of Environmental Health Sciences' Report on Health Effects from Exposures to Power-Line frequency Electric and Magnetic Fields, NIH Publication No. 99-4493, June 1999.

8 National Radiological Protection Board, Electromagnetic Fields and the Risk of Cancer, Report of an Advisory Group on Non-ionizing Radiation, Chilton, U.K. 2001

9 California Department of Health Services, An Evaluation of the Possible Risks from Electric and Magnetic Fields from Power Lines, Internal Wiring, Electrical Occupations, and Appliances, June 2002.

10 World Health Organization / International Agency for Research on Cancer, IARC Monographs on the evaluation of carcinogenic risks to humans (2002), Non-ionizing radiation, Part 1: Static and extremely low-frequency (ELF) electric and magnetic fields, IARCPress, Lyon, France: International Agency for Research on Cancer, Monograph, vol. 80, p. 338, 2002

Public Information Dissemination), submitted its final report to the U.S. Congress on June 15, 1999. The report concluded that:

- "The scientific evidence suggesting that ELF-EMF exposures pose any health risk is weak."[11]

- "The NIEHS concludes that ELF-EMF exposure cannot be recognized as entirely safe because of weak scientific evidence that exposure may pose a leukemia hazard."[12]

- "The NIEHS suggests that the level and strength of evidence supporting ELF-EMF exposure as a human health hazard are insufficient to warrant aggressive regulatory actions; thus, we do not recommend actions such as stringent standards on electric appliances and a national program to bury all transmission and distribution lines. Instead, the evidence suggests passive measures such as a continued emphasis on educating both the public and the regulated community on means aimed at reducing exposures. NIEHS suggests that the power industry continue its current practice of siting power lines to reduce exposures and continue to explore ways to reduce the creation of magnetic fields around transmission and distribution lines without creating new hazards."[13]

In 2001, Britain's NRPB arrived at a similar conclusion:

> "After a wide-ranging and thorough review of scientific research, an independent Advisory Group to the Board of NRPB has concluded that the power frequency electromagnetic fields that exist in the vast majority of homes are not a cause of cancer in general. However, some epidemiological studies do indicate a possible small risk of childhood leukemia associated with exposures to unusually high levels of power frequency magnetic fields."[14]

In 2002, three scientists for CDHS concluded:

> "To one degree or another, all three of the [C]DHS scientists are inclined to believe that EMFs can cause some degree of increased risk of childhood leukemia, adult brain cancer, Lou Gehrig's Disease, and miscarriage.
>
> They [CDHS] strongly believe that EMFs do not increase the risk of birth defects, or low birth weight.
>
> They [CDHS] strongly believe that EMFs are not universal carcinogens, since there are a number of cancer types that are not associated with EMF exposure.

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11 National Institute of Environmental Health Sciences, NIEHS Report on Health Effects from Exposures to Power-Frequency Electric and Magnetic Fields, p. ii, NIH Publication No. 99-4493, 1999

12 *ibid.*, p. iii

13 *ibid.*, p. 37 - 38

14 NRPB, NRPB Advisory Group on Non-ionizing Radiation Power Frequency Electromagnetic Fields and the Risk of Cancer, NRPB Press Release May 2001

> To one degree or another they [CDHS] are inclined to believe that EMFs do not cause an increased risk of breast cancer, heart disease, Alzheimer's disease, depression, or symptoms attributed by some to a sensitivity to EMFs. However, all three scientists had judgments that were "close to the dividing line between believing and not believing" that EMFs cause some degree of increased risk of suicide. For adult leukemia, two of the scientists are 'close to the dividing line between believing or not believing' and one was 'prone to believe' that EMFs cause some degree of increased risk."[15]

Also in 2002, the World Health Organization's (WHO) IARC concluded:

> "ELF magnetic fields are possibly carcinogenic to humans"[16], based on consistent statistical associations of high-level residential magnetic fields with a doubling of risk of childhood leukemia...Children who are exposed to residential ELF magnetic fields less than 0.4 microTesla (4.0 milliGauss) have no increased risk for leukemia…. In contrast, "no consistent relationship has been seen in studies of childhood brain tumors or cancers at other sites and residential ELF electric and magnetic fields."[17]

In June of 2007, the WHO issued a report on their multi-year investigation of EMF and the possible health effects. After reviewing scientific data from numerous EMF and human health studies, they concluded:

> "Scientific evidence suggesting that everyday, chronic low-intensity (above 0.3-0.4 μT [3-4 mG]) power-frequency magnetic field exposure poses a health risk is based on epidemiological studies demonstrating a consistent pattern of increased risk for childhood leukaemia."[18]

> "In addition, virtually all of the laboratory evidence and the mechanistic evidence fail to support a relationship between low-level ELF magnetic fields and changes in biological function or disease status. Thus, on balance, the evidence is not strong enough to be considered causal, but sufficiently strong to remain a concern."[19]

> "A number of other diseases have been investigated for possible association with ELF magnetic field exposure. These include cancers in both children and adults, depression, suicide, reproductive dysfunction, developmental disorders, immunological

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15 CDHS, An Evaluation of the Possible Risks From Electric and Magnetic Fields (EMFs) From Power Lines, Internal Wiring, Electrical Occupations and Appliances, p. 3, 2002

16 IARC, Monographs, Part I, Vol. 80, p. 338

17 *ibid*., p. 332 - 334

18 WHO, Environmental Health Criteria 238, EXTREMELY LOW FREQUENCY FIELDS, p. 11 - 13, 2007

19 *ibid*., p. 12

> modifications and neurological disease. The scientific evidence supporting a linkage between ELF magnetic fields and any of these diseases is much weaker than for childhood leukemia and in some cases (for example, for cardiovascular disease or breast cancer) the evidence is sufficient to give confidence that magnetic fields do not cause the disease"[20]
>
> "Furthermore, given both the weakness of the evidence for a link between exposure to ELF magnetic fields and childhood leukemia, and the limited impact on public health if there is a link, the benefits of exposure reduction on health are unclear. Thus the costs of precautionary measures should be very low."[21]

III. Application Of the CPUC's "No-Cost And Low-Cost" EMF Policy To This Project

Recognizing the scientific uncertainty over the connection between EMF exposures and health effects, the CPUC adopted a policy that addresses public concern over EMF with a combination of education, information, and precaution-based approaches. Specifically, Decision 93-11-013 established a precautionary based "no-cost and low-cost" EMF policy for California's regulated electric utilities based on recognition that scientific research had not demonstrated that exposures to EMF cause health hazards and that it was inappropriate to set numeric standards that would limit exposure.

In 2006, the CPUC completed its review and update of its EMF Policy in Decision 06-01-042. This decision reaffirmed the finding that state and federal public health regulatory agencies have not established a direct link between exposure to EMF and human health effects,[22] and the policy direction that (1) use of numeric exposure limits was not appropriate in setting utility design guidelines to address EMF,[23] and (2) existing "no-cost and low-cost" precautionary-based

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[20] *ibid*., p. 12

[21] *ibid*., p. 13

[22] CPUC Decision 06-01-042, Conclusion of Law No. 5, mimeo. p. 19 ("As discussed in the rulemaking, a direct link between exposure to EMF and human health effects has yet to be proven despite numerous studies including a study ordered by this Commission and conducted by DHS.").

[23] CPUC Decision 06-01-042, mimeo. p. 17 - 18 ("Furthermore, we do not request that utilities include non-routine mitigation measures, or other mitigation measures that are based on numeric values of EMF exposure, in revised design guidelines or apply mitigation measures to reconfigurations or relocations of less than 2,000 feet,

EMF policy should be continued for proposed electrical facilities. The decision also reaffirmed that EMF concerns brought up during Certificate of Public Convenience and Necessity (CPCN) and Permit to Construct (PTC) proceedings for electric and transmission and substation facilities should be limited to the utility's compliance with the CPUC's "no-cost and low-cost" policies.[24]

The decision directed regulated utilities to hold a workshop to develop standard approaches for EMF Design Guidelines and such a workshop was held on February 21, 2006. Consistent design guidelines have been developed that describe the routine magnetic field reduction measures that regulated California electric utilities consider for new and upgraded electrical facilities rated 50 kV and above. SCE filed its revised EMF Design Guidelines with the CPUC on July 26, 2006.

"No-cost and low-cost" measures to reduce magnetic fields would be implemented for this project in accordance with SCE's EMF Design Guidelines. In summary, the process of evaluating "no-cost and low-cost" magnetic field reduction measures and prioritizing within and between land usage classes considers the following:

1. SCE's priority in the design of any electrical facility is public and employee safety. Without exception, design and construction of an electric power system must comply with all applicable federal, state, and local regulations, applicable safety codes, and each electric utility's construction standards. Furthermore, transmission and subtransmission lines and substations must be constructed so that they can operate reliably at their design capacity. Their design must be compatible with other facilities in the area and the cost to operate and maintain the facilities must be reasonable.

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the distance under which exemptions apply under GO 131-D. Non-routine mitigation measures should only be considered under unique circumstances.").

[24] CPUC Decision 06-01-042, Conclusion of Law No. 2, ("EMF concerns in future CPCN and PTC proceedings for electric and transmission and substation facilities should be limited to the utility's compliance with the Commission's low-cost/no-cost policies.").

2. As a supplement to Step 1, SCE follows the CPUC's direction to undertake "no-cost and low-cost" magnetic field reduction measures for new and upgraded electrical facilities. Any proposed "no-cost and low-cost" magnetic field measures, must, however, meet the requirements described in Step 1 above. The CPUC defines "no-cost and low-cost" measures as follows:

   - Low-cost measures, in aggregate, should:
     - Cost in the range of 4 percent of the total project cost.
     - Result in magnetic field reductions of "15% or greater at the utility ROW [right-of-way]…"[25]

   The CPUC Decision stated,

   > "We direct the utilities to use 4 percent as a benchmark in developing their EMF mitigation guidelines. We will not establish 4 percent as an absolute cap at this time because we do not want to arbitrarily eliminate a potential measure that might be available but costs more than the 4 percent figure. Conversely, the utilities are encouraged to use effective measures that cost less than 4 percent."[26]

3. The CPUC provided further policy direction in Decision 06-01-042, stating that, "[a]lthough equal mitigation for an entire class is a desirable goal, we will not limit the spending of EMF mitigation to zero on the basis that not all class members can benefit."[27] While Decision 06-01-042 directs the utilities to favor schools, day-care facilities and hospitals over residential areas when applying low-cost magnetic field reduction measures, prioritization within a class can be difficult on a project case-by-case basis because schools, day-care facilities, and hospitals are often integrated into residential areas, and many licensed day-care

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25 CPUC Decision 06-01-042, p. 10
26 CPUC Decision 93-11-013, § 3.3.2, p.10.
27 CPUC Decision 06-01-042, p. 10

facilities are housed in private homes, and can be easily moved from one location to another. Therefore, it may be practical for public schools, licensed day-care centers, hospitals, and residential land uses to be grouped together to receive highest prioritization for low-cost magnetic field reduction measures. Commercial and industrial areas may be grouped as a second priority group, followed by recreational and agricultural areas as the third group. Low-cost magnetic field reduction measures will not be considered for undeveloped land, such as open space, state and national parks, and Bureau of Land Management and U.S. Forest Service lands. When spending for low-cost measures would otherwise disallow equitable magnetic field reduction for all areas within a single land-use class, prioritization can be achieved by considering location and/or density of permanently occupied structures on lands adjacent to the projects, as appropriate.

This FMP contains descriptions of various magnetic field models and the calculated results of magnetic field levels based on those models. These calculated results are provided only for purposes of identifying the relative differences in magnetic field levels among various transmission or subtransmission line design alternatives under a specific set of modeling assumptions and determining whether particular design alternatives can achieve magnetic field level reductions of 15 percent or more. The calculated results are not intended to be predictors of the actual magnetic field levels at any given time or at any specific location if and when the project is constructed. This is because magnetic field levels depend upon a variety of variables, including load growth, customer electricity usage, and other factors beyond SCE's control. The CPUC affirmed this approach in D. 06-01-042 stating:

> "Our [CPUC] review of the modeling methodology provided in the utility [EMF] design guidelines indicates that it accomplishes its purpose, which is to measure the relative differences between alternative mitigation measures. Thus, the modeling indicates

relative differences in magnetic field reductions between different transmission line construction methods, but does not measure actual environmental magnetic fields."[28]

[28] CPUC Decision 06-01-042, p. 11

IV. Project Description

The proposed Alberhill System Project includes the following components:

- Construction of a new 1,120 MVA 500/115 kV substation to increase electrical service capacity to the area presently served by the Valley South 115 kV System
- Construction of two new 500 kV transmission line (T/L) segments to connect the new substation to SCE's existing Serrano-Valley 500 kV T/L
- Construction of a new 115 kV subtransmission line and modifications to existing 115 kV subtransmission lines to transfer five existing 115/12 kV substations (Ivyglen, Fogarty, Elsinore, Skylark, and Newcomb Substations) presently served by the Valley South 115 kV System to the new 500/115 kV system
- Installation of telecommunications improvements to connect the new facilities to SCE's telecommunications network

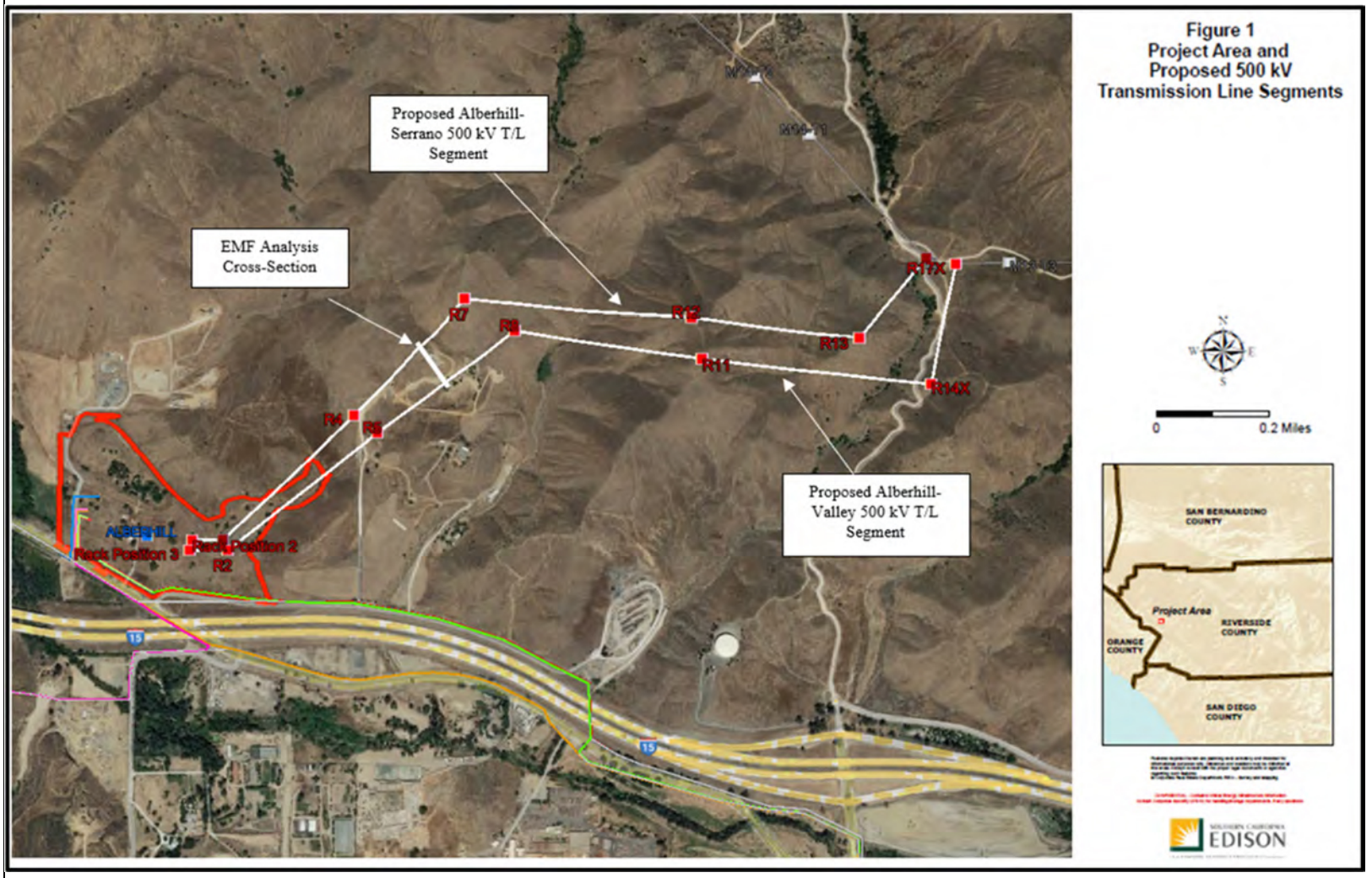
The Proposed Project is described in more detail below. The Alberhill Substation would be constructed in unincorporated Riverside County. Construction of the 500 kV T/L segments between the Alberhill Substation and the existing Serrano-Valley 500 kV T/L would occur in unincorporated Riverside County and within the northwestern boundary of the City of Lake Elsinore. The new and modified 115 kV subtransmission lines would be constructed in unincorporated Riverside County and the cities of Lake Elsinore, Wildomar, and Menifee.

500 kV T/L Connection

Two new 500 kV T/L segments would connect the Proposed Substation to the existing Serrano-Valley 500 kV T/L. To reliably operate the Proposed Project, two 500 kV T/L segments on separate structures are required to interconnect the substation to the Serrano-Valley 500 kV T/L as shown on Figure 1, Project Area and Proposed 500 kV T/L Segments. Construction of the two 500 kV T/L segments would require approximately ten single circuit lattice towers and two double-circuit towers. Approximately six towers would be utilized for the southern segment and approximately six towers would be utilized for the northern segment. One of the existing towers on the Serrano-Valley 500 kV T/L would be removed and replaced with a new tower to facilitate the connection.

Based on preliminary designs, the towers would have a dull galvanized steel finish and would range in height from approximately 95 to 190 feet, with span lengths between towers ranging between approximately 250 to 2,000 feet. See Figure 3 for a depiction of tower designs for the 500 kV line segment structures. The information presented in this section is based on preliminary engineering and design, and refinement during final engineering design may result in components that are modified from the descriptions provided in this FMP.

Figure 1. Project Area and Proposed 500 kV T/L Segments



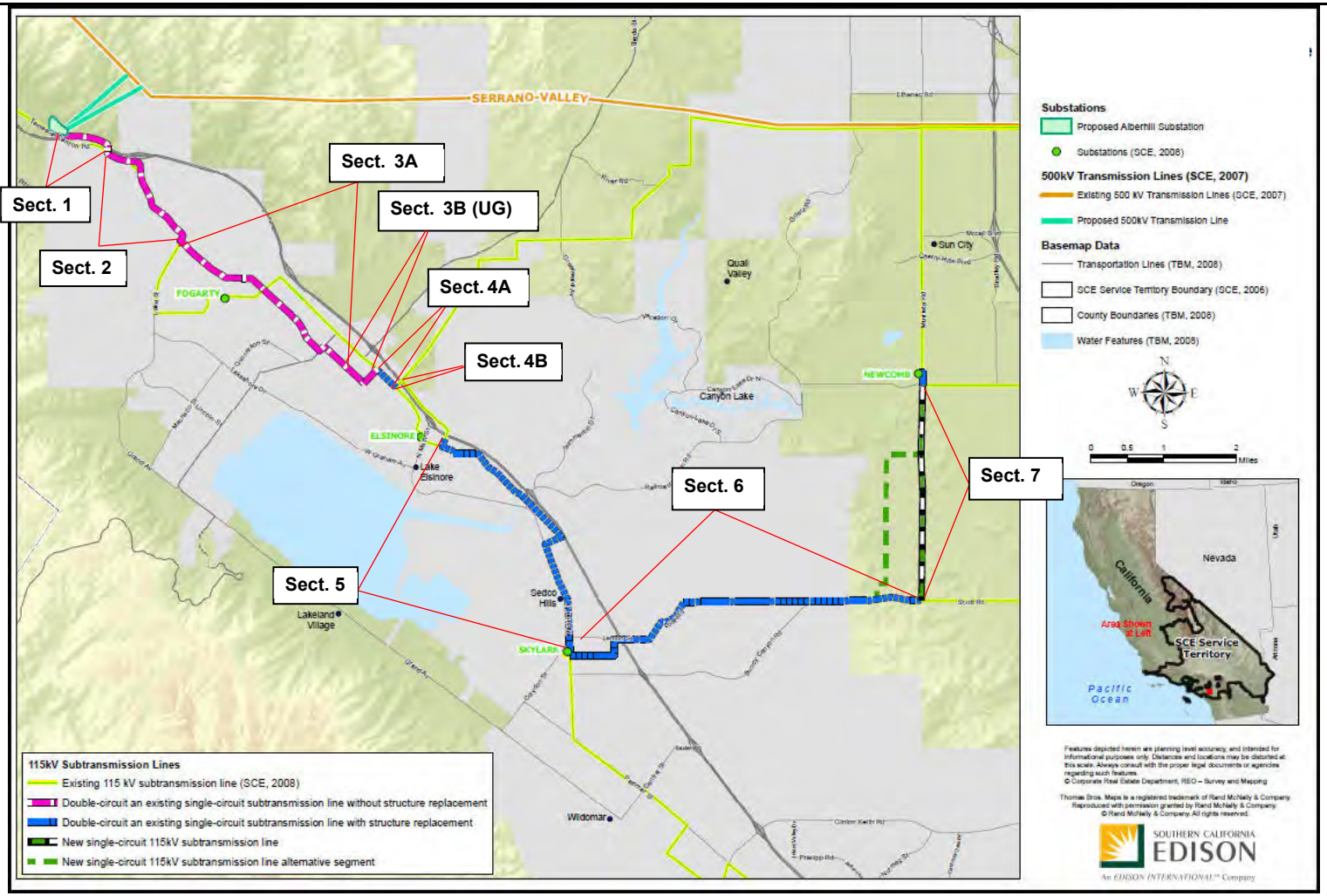
ALBERHILL 115 KV SYSTEM SUBTRANSMISSION LINES

For the purpose of identifying possible EMF reduction opportunities and measures, the Alberhill 115 kV subtransmission line routes are broken into seven sections as shown in Figure 2. These sections are different than the Proposed Project Segments in the Proponent's Environmental Assessment (PEA). These sections are as follows:

- **Section 1:** From Alberhill Substation along Concordia Ranch Road north of the I-15 to the intersection of Temescal Canyon Road and Bernard Street just south of the I-15. (Approximately one mile in length)
- **Section 2:** From Temescal Canyon Road/Bernard Street to Lake Street/Nichols Road (Approximately 1.8 miles in length)
- **Section 3A:** From Lake Street/Nichols Road to the Northwest end of Pasadena Street in Lake Elsinore. (Approximately 3 miles in length)
- **Section 3B:** Underground portion along Pasadena Street and Third Street to Third Street/Collier Ave. (Approximately 0.8 mile in length)
- **Section 4A:** From Third Street/Collier Ave to 350 feet southeast of Collier Ave/Chaney Street along Collier Ave. (Approximately 0.3 mile in length)
- **Section 4B:** From 350 feet southeast of Collier Ave/Chaney Street on Collier Ave crossing to the northeast side of the I-15 Freeway. (Approximately 650 feet in length)
- **Section 5:** From East Hill Street/Flint Street in Lake Elsinore to Skylark Substation. (Approximately 4.5 miles in length)
- **Section 6:** From Skylark Substation to the intersection of Scott Road and Murrieta Road in the City of Menifee. (Approximately 5.5 miles in length)
- **Section 7:** From Scott Road/Murrieta Road to Newport Road/Murrieta Road. (Approximately 3 miles in length)

Note: Some sections in the proposed Alberhill 115 kV subtransmission system are not being evaluated for EMF in this FMP because there are no changes to the structures or designs of the existing lines in those sections.

Figure 2. Alberhill 115 kV Subtransmission Line Sections for EMF Analysis



V. Evaluation of "No-cost and Low-cost" Magnetic Field Reduction Design Options

For the purpose of evaluating "no-cost and low-cost" magnetic field reduction design options, the Proposed Project is divided into three parts:

- Part 1: The proposed Alberhill-Valley and Alberhill-Serrano 500 kV T/L segments
- Part 2: The proposed Alberhill 115 kV system subtransmission lines
- Part 3: The proposed Alberhill 500/115 kV Substation

Please note that following magnetic field models and the calculated results of magnetic field levels are intended only for purposes of identifying the relative differences in magnetic field levels among various T/L and subtransmission line design alternatives under a specific set of modeling assumptions (see §VII-Appendix A for more detailed information about the calculation assumptions and loading conditions) and determining whether particular design alternatives can achieve magnetic field level reductions of 15 percent or more. The calculated results are not intended to be predictors of the actual magnetic field levels at any given time or at any specific location when the Proposed Project is constructed.

- **Part 1: The Proposed Alberhill-Valley and Alberhill-Serrano 500 kV T/L Segments**

Currently, there are no schools along the Proposed 500 kV T/L Routes. The Proposed Routes run through mostly undeveloped land areas. The proposed 500 kV T/L segments will be constructed mostly on single-circuit 500 kV lattice steel towers (LSTs). The typical proposed single-circuit 500 kV overhead T/L design is shown in Figure 3. There are no existing T/Ls along the Proposed route.

No-Cost Field Reduction Measures: The proposed 500 kV design includes the following no-cost field reduction measure:

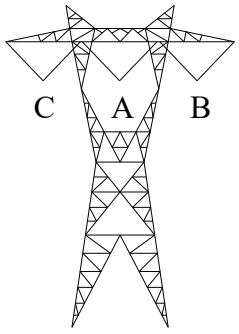
1. Select route alignments through mostly undeveloped areas.

Low-Cost Field Reduction Options: The 500 kV T/L routes will traverse through mostly undeveloped land; accordingly, there is no low-cost field reduction measure considered.

Magnetic Field Calculations: Figure 4 and Table 2 show the calculated magnetic field levels for proposed design at the right-of-way (R-O-W) edges.

Figure 3. Proposed 500 kV T/L Design (Looking Northeast)

Alberhill-Serrano
500 kV T/L Segment



Alberhill-Valley
500 kV T/L Segment

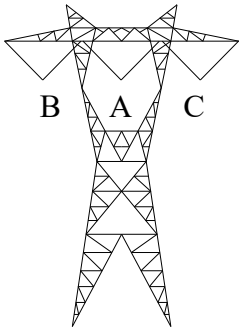


Figure 4. A Design Comparison of Calculated Magnetic Field Levels[29] For Proposed 500 kV T/Ls (Looking Northeast)

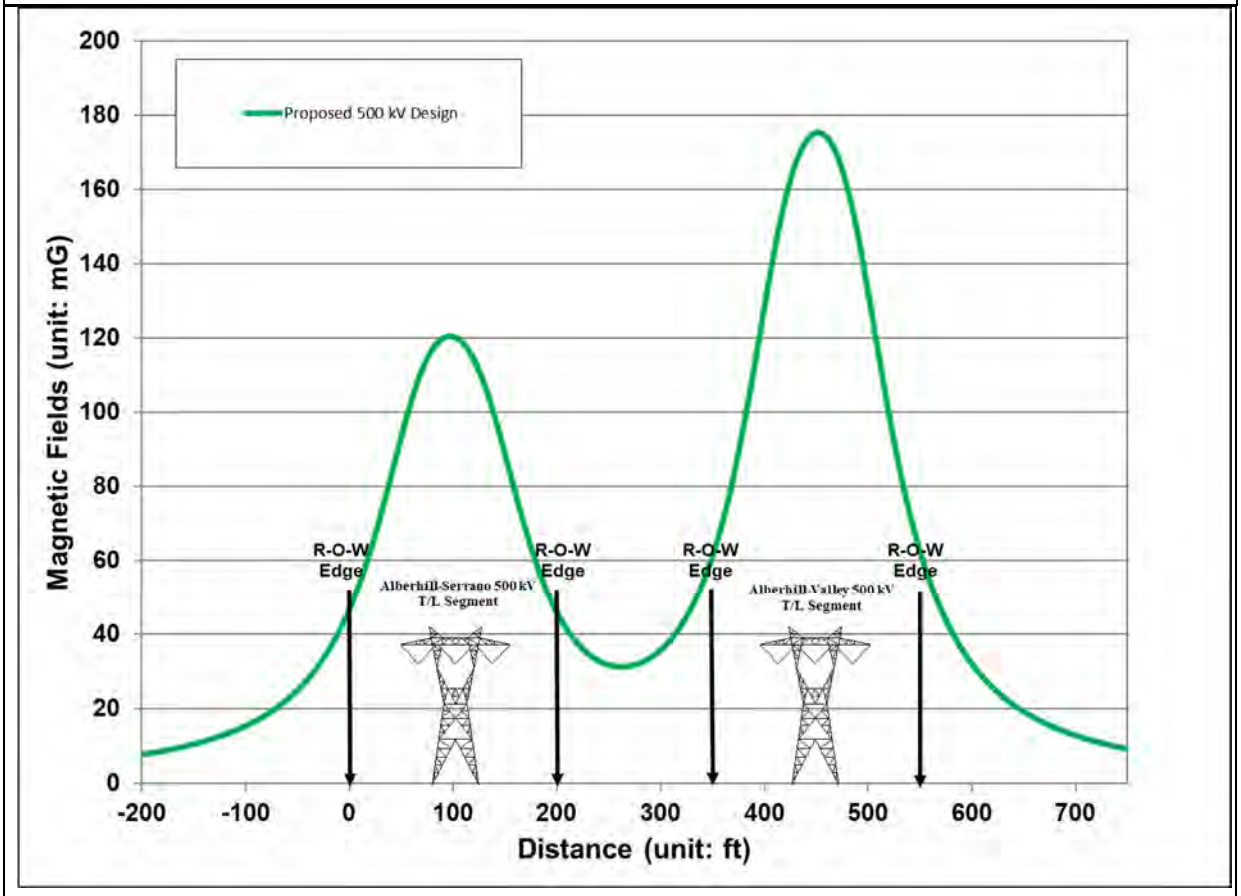


Table 2. A Comparison of Calculated Magnetic Field Levels[30] for the Proposed 500 kV T/L Segments

Design Options	Left Edge of R-O-W (mG)	% Reduction	Right Edge of R-O-W (mG)	% Reduction
Proposed Alberhill-Serrano 500 kV T/L Segment Design	46.7	N/A	45.8	N/A
Proposed Alberhill-Valley 500 kV T/L Segment Design	61.2	N/A	62.3	N/A

[29] This table lists calculated magnetic field levels for design comparison only and is not meant to predict actual magnetic field levels.

[30] This table lists calculated magnetic field levels for design comparison only and is not meant to predict actual magnetic field levels.

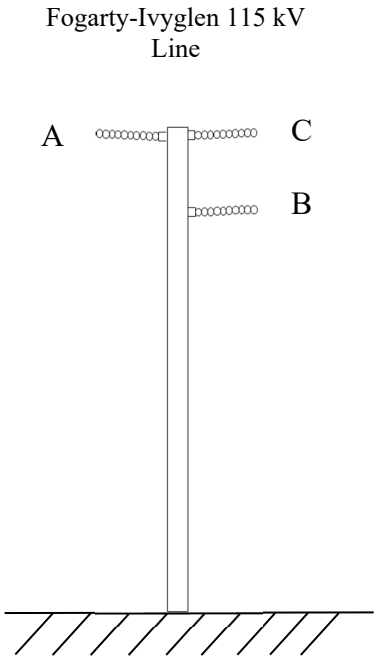
- **Part 2: Proposed Alberhill 115 kV System Subtransmission Lines**

The 115 kV lines of the Alberhill subtransmission system will be constructed on H-frame structures, light weight steel (LWS) poles, and tubular steel poles (TSPs). The structures will be located within utility franchise or easement. For the purpose of EMF analysis, magnetic field levels at 15 feet on both sides of the center line (C/L) of a structure will be examined.

SECTION 1

This section consists of mostly undeveloped land and commercial/industrial areas. Figure 5 shows the existing 115 kV circuit design in this area, prior to construction of the Alberhill System Project. The proposed typical 115 kV design for Section 1 is shown in Figure 6.

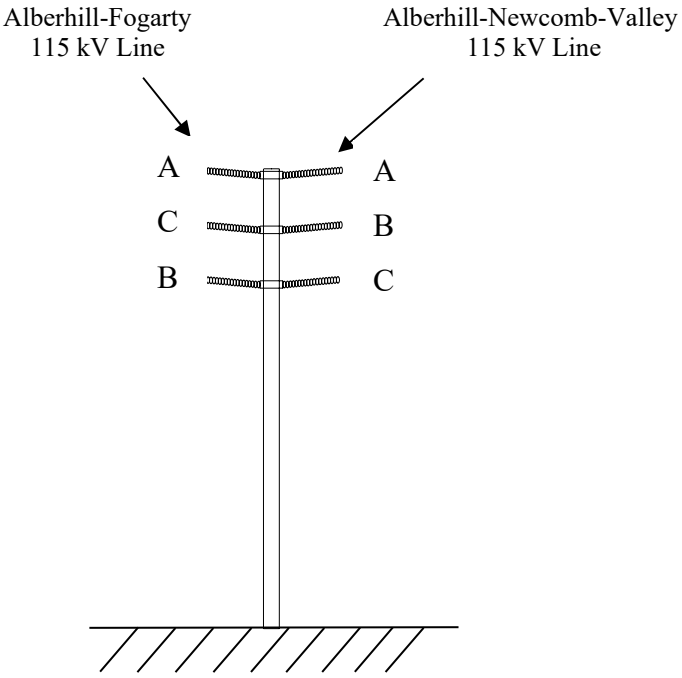
Figure 5. Existing 115 kV Design - Section 1 (Looking Southeast)



No-Cost Field Reduction Measures: The proposed design for Section 1 includes the following no-cost field reduction measures:

1. Utilize double-circuit construction that reduces spacing between circuits as compared with single-circuit construction.
2. Arrange the conductors of the proposed 115 kV circuits for magnetic fields reduction.
3. Utilize structure heights that meet or exceed SCE's EMF preferred design criteria.

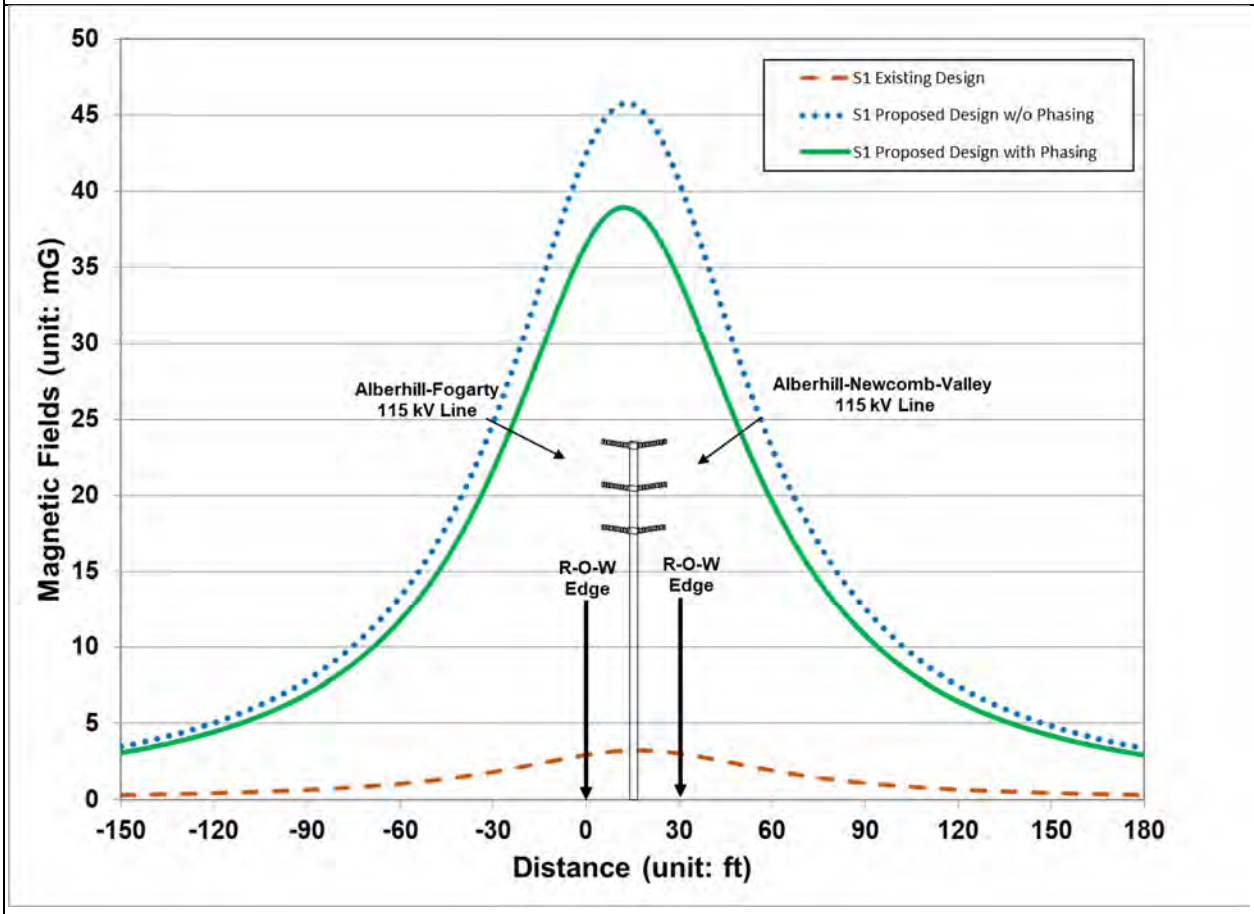
Figure 6. Proposed Alberhill 115 kV Design - Section 1 (Looking Southeast)



Low-Cost Field Reduction Options: Because the proposed design incorporates the above no-cost field reduction measures including structure heights that meet or exceed SCE's EMF preferred design criteria, no low-cost reduction measures such as utilizing taller structures were considered for this section of the Proposed Project.

Magnetic Field Calculations: Figure 7 and Table 3 show the calculated magnetic field levels for the existing and the proposed designs for Section 1.

Figure 7. A Design Comparison of Calculated Magnetic Field Levels[31] for Alberhill 115 kV Lines - Section 1 (Looking Southeast)



[31] This table lists calculated magnetic field levels for design comparison only and is not meant to predict actual magnetic field levels.

Table 3. A Comparison of Calculated Magnetic Field Levels[32] for Section 1				
Design Options	15 Feet Left of C/L (mG)	% Reduction	15 Feet Right of C/L (mG)	% Reduction
Existing Design	2.9	N/A	2.9	N/A
Proposed Design w/o Phasing	42.5	Increase	40.6	Increase
Proposed Design with Phasing	36.5	14.1	34.2	15.8

Recommendations for Section 1: *The proposed design includes the no-cost field reduction measures listed above. Because the proposed design already incorporates structures with heights meeting or exceeding SCE's preferred design criteria, no low-cost field reduction measures are recommended.*

SECTION 2

This section consists of mostly undeveloped land, some commercial/industrial areas, and a few scattered homes along the proposed route. Figure 8 shows the existing 115 kV circuit design in this area, prior to construction of the Alberhill System Project. The proposed typical 115 kV design for Section 2 is shown in Figure 9.

No-Cost Field Reduction Measures: The proposed design for Section 2 includes the following no-cost field reduction measures:

1. Utilize structure heights that meet or exceed SCE's EMF preferred design criteria.
2. Utilize double-circuit construction that reduces spacing between circuits as compared with single-circuit construction.
3. Arrange the conductors of the proposed 115 kV circuits for magnetic fields reduction.

[32] This table lists calculated magnetic field levels for design comparison only and is not meant to predict actual magnetic field levels.

Figure 8. Existing 115 kV Design - Section 2 (Looking Southeast)

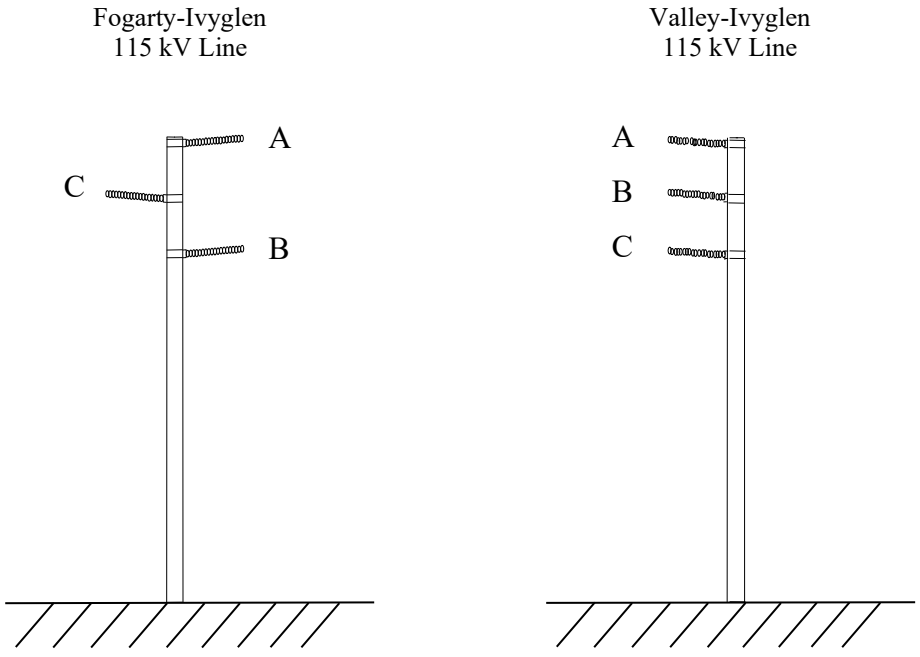
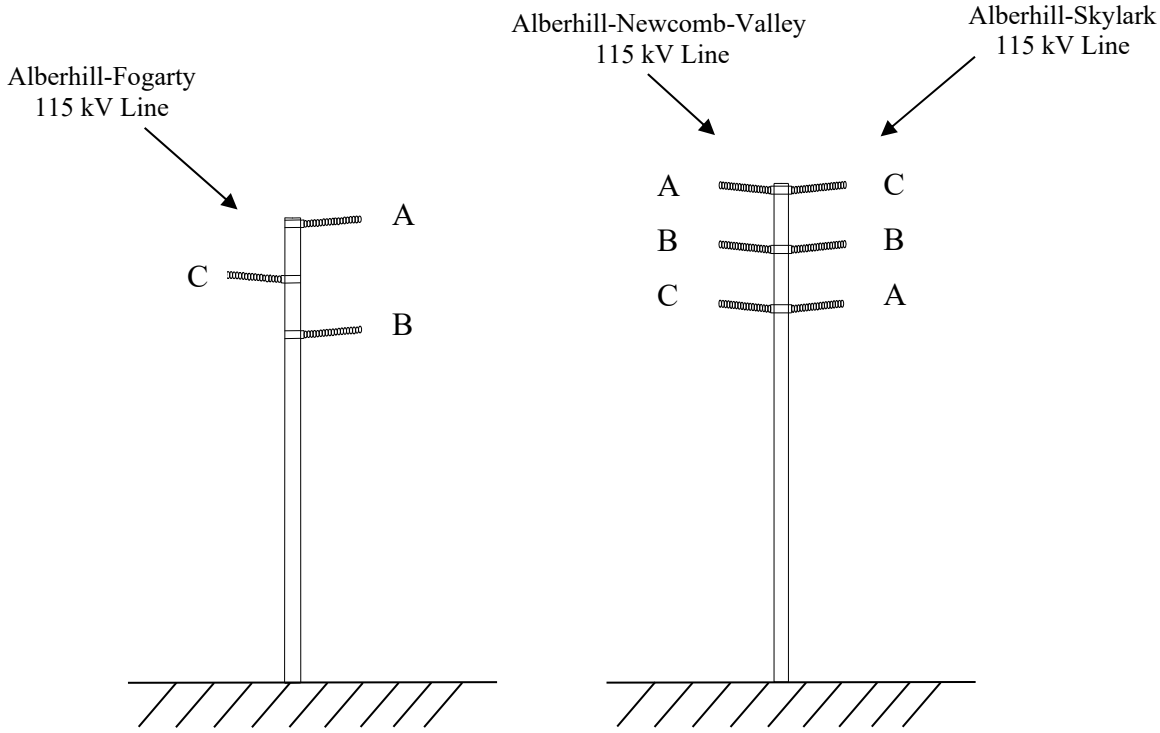


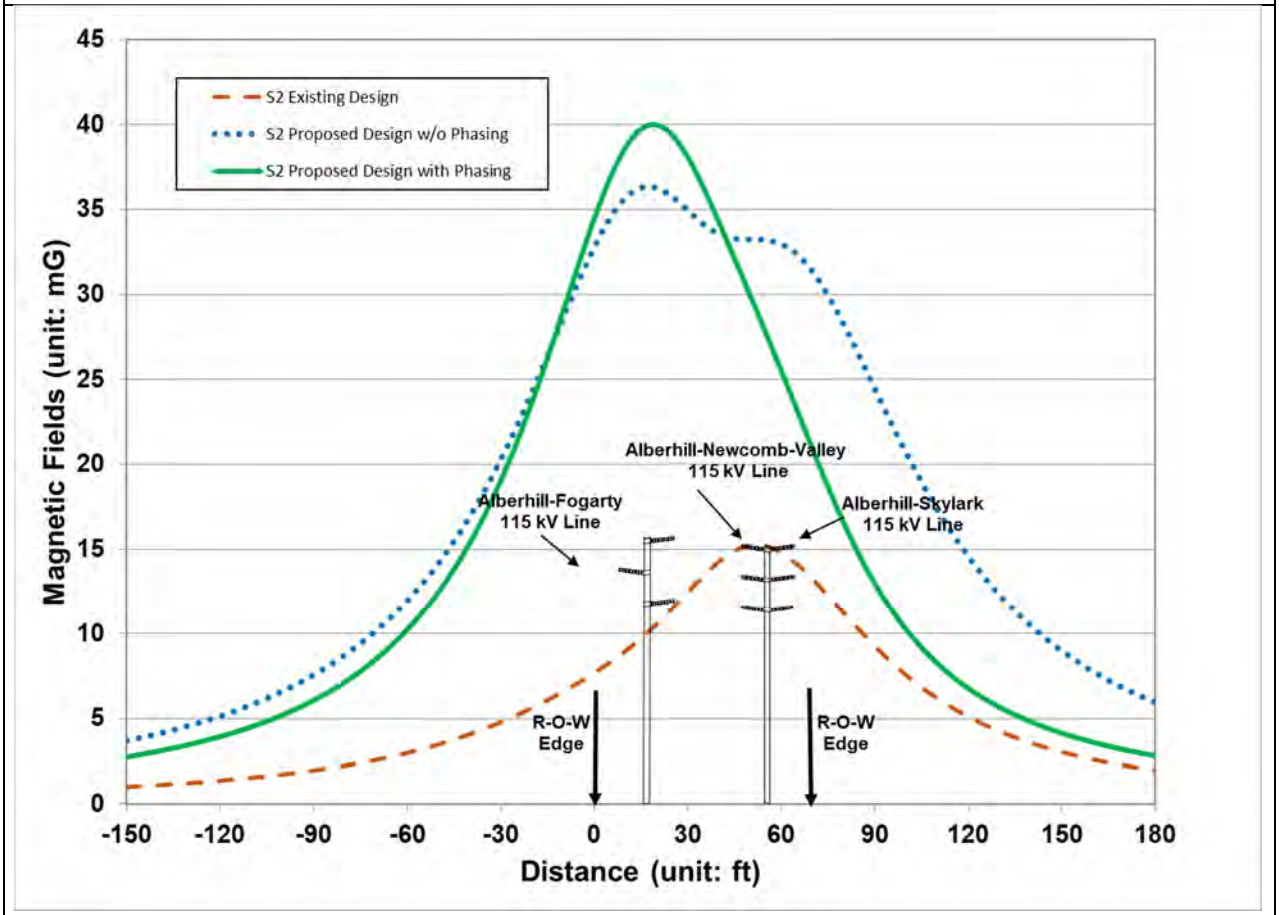
Figure 9. Proposed Alberhill 115 kV Design - Section 2 (Looking Southeast)



Low-Cost Field Reduction Options: Because the proposed design incorporates the above no-cost field reduction measures including structure heights that meet or exceed SCE's EMF preferred design criteria, no low-cost reduction measures such as utilizing taller structures were considered for this section of the Proposed Project.

Magnetic Field Calculations: Figure 10 and Table 4 show the calculated magnetic field levels for the existing and proposed designs of Section 2. These calculations were made using the typical structural length of 75 feet for double-circuit structures and 70 feet for single-circuit structures.

Figure 10. A Design Comparison of Calculated Magnetic Field Levels[33] for Alberhill 115 kV Lines - Section 2 (Looking Southeast)



[33] This table lists calculated magnetic field levels for design comparison only and is not meant to predict actual magnetic field levels.

Table 4. A Comparison of Calculated Magnetic Field Levels[34] for Section 2				
Design Options	15 Feet Left of C/L (mG)	% Reduction	15 Feet Right of C/L (mG)	% Reduction
S2 Existing Design	7.7	N/A	13.2	N/A
S2 Proposed Design w/o Phasing	32.8	Increase	31.3	Increase
S2 Proposed Design with Phasing	34.4	Less than 15% increase	20.9	33.2

Recommendations for Section 2: *The proposed design includes the no-cost field reduction measures listed above. Because the proposed design already incorporates structures with heights meeting or exceeding SCE's preferred design criteria, no low-cost field reduction measures are recommended.*

SECTION 3A

This section consists of undeveloped land and commercial/industrial areas with some residential homes. Figure 11 shows the existing 115 kV circuit design in this area, prior to construction of the Alberhill System Project. The proposed typical 115 kV design for Section 3A is shown in Figure 12.

No-Cost Field Reduction Measures: The proposed design for Section 3A includes the following no-cost field reduction measures:

1. Utilize structure heights that meet or exceed SCE's EMF preferred design criteria.
2. Utilize double-circuit construction that reduces spacing between circuits as compared with single-circuit construction.

[34] This table lists calculated magnetic field levels for design comparison only and is not meant to predict actual magnetic field levels.

3. Arrange the conductors of the proposed 115 kV circuits for magnetic fields reduction.

Figure 11. Existing 115 kV Design - Section 3A (Looking Southeast)

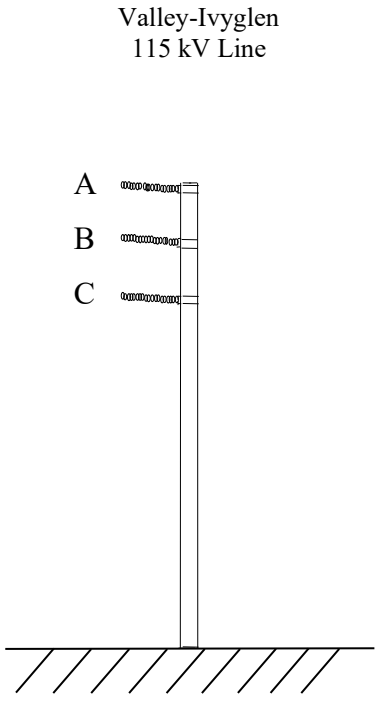
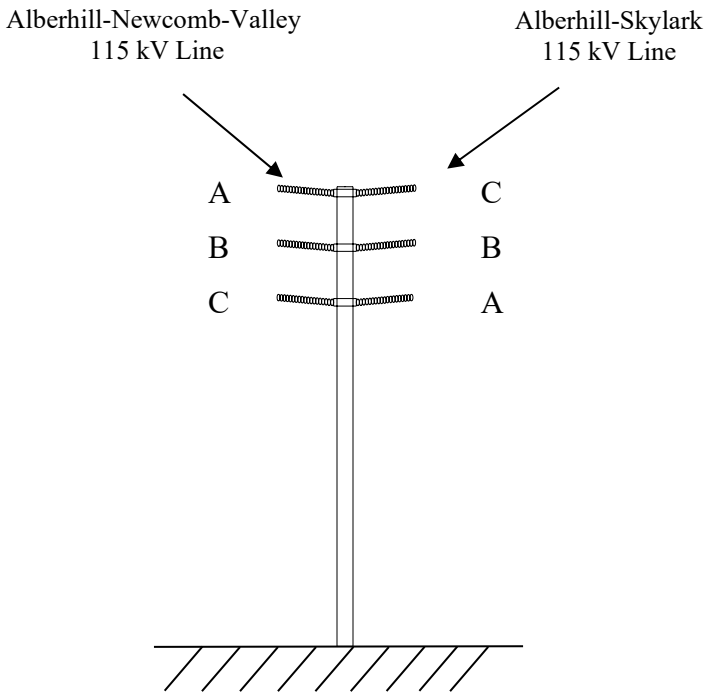


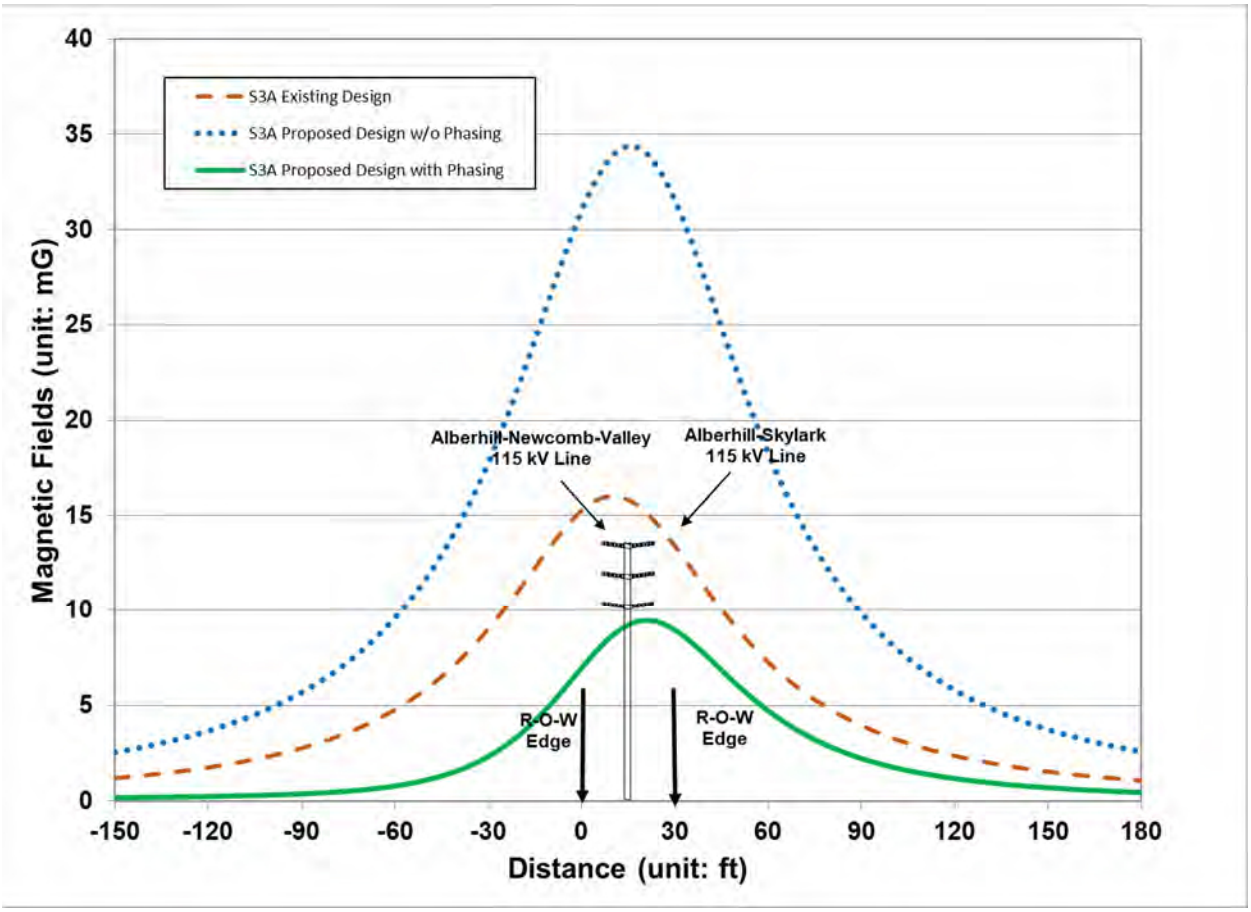
Figure 12. Proposed Alberhill 115 kV Design - Section 3A
(Looking Southeast)



Low-Cost Field Reduction Options: Because the proposed design incorporates the above no-cost field reduction measures including structure heights that meet or exceed SCE's EMF preferred design criteria, no low-cost reduction measures such as utilizing taller structures were considered for this section of the Proposed Project.

Magnetic Field Calculations: Figure 13 and Table 5 show the calculated magnetic field levels for the existing and the proposed designs. These calculations were made using the typical structural length of 75 feet.

Figure 13. A Design Comparison of Calculated Magnetic Field Levels[35] for Alberhill 115 kV Lines - Section 3A (Looking Southeast)



[35] This table lists calculated magnetic field levels for design comparison only and is not meant to predict actual magnetic field levels.

Table 5. A Comparison of Calculated Magnetic Field Levels[36] for Section 3A				
Design Options	15 Feet Left of C/L (mG)	% Reduction	15 Feet Right of C/L (mG)	% Reduction
S3A Existing Design	15.3		13.4	
S3A Proposed Design w/o Phasing	31.0	Increase	31.5	Increase
S3A Proposed Design with Phasing	7.0	77.4	9.0	71.4

Recommendations for Section 3A: *The proposed design includes the no-cost field reduction measures listed above. Because the proposed design already incorporates structures with heights meeting or exceeding SCE's preferred design criteria, no low-cost field reduction measures are recommended.*

SECTION 3B

This section consists of commercial/industrial areas. Figure 14 shows the existing 115 kV circuit design in this area, prior to construction of the Alberhill System Project. The proposed typical 115 kV design for Section 3B is shown in Figure 15.

No-Cost Field Reduction Measures: The proposed design for Section 3B includes the following no-cost field reduction measures:

1. Utilize underground construction in existing conduits
2. Arrange underground subtransmission cables for magnetic field reduction

[36] This table lists calculated magnetic field levels for design comparison only and is not meant to predict actual magnetic field levels.

Figure 14. Existing Underground 115 kV Design - Section 3B
(Looking Toward Newcomb Substation)

Valley-Ivyglen
115 kV UG Line

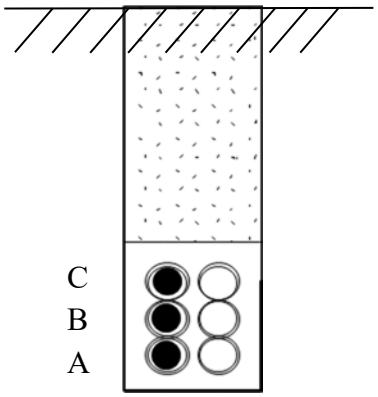
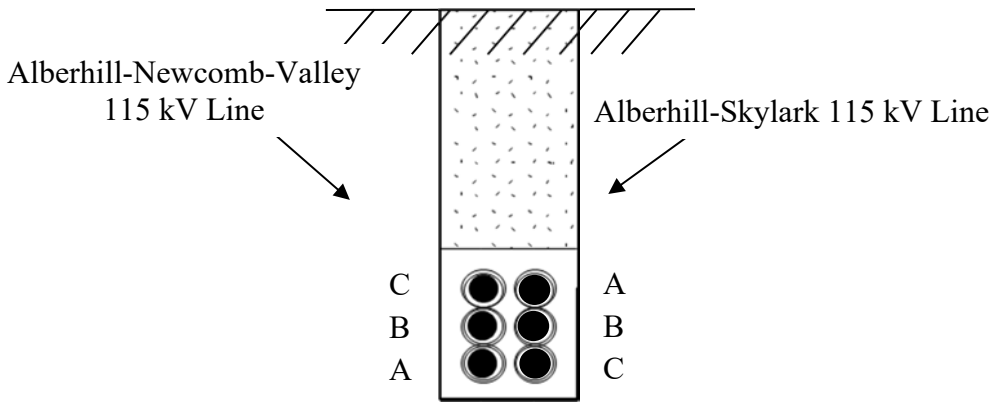


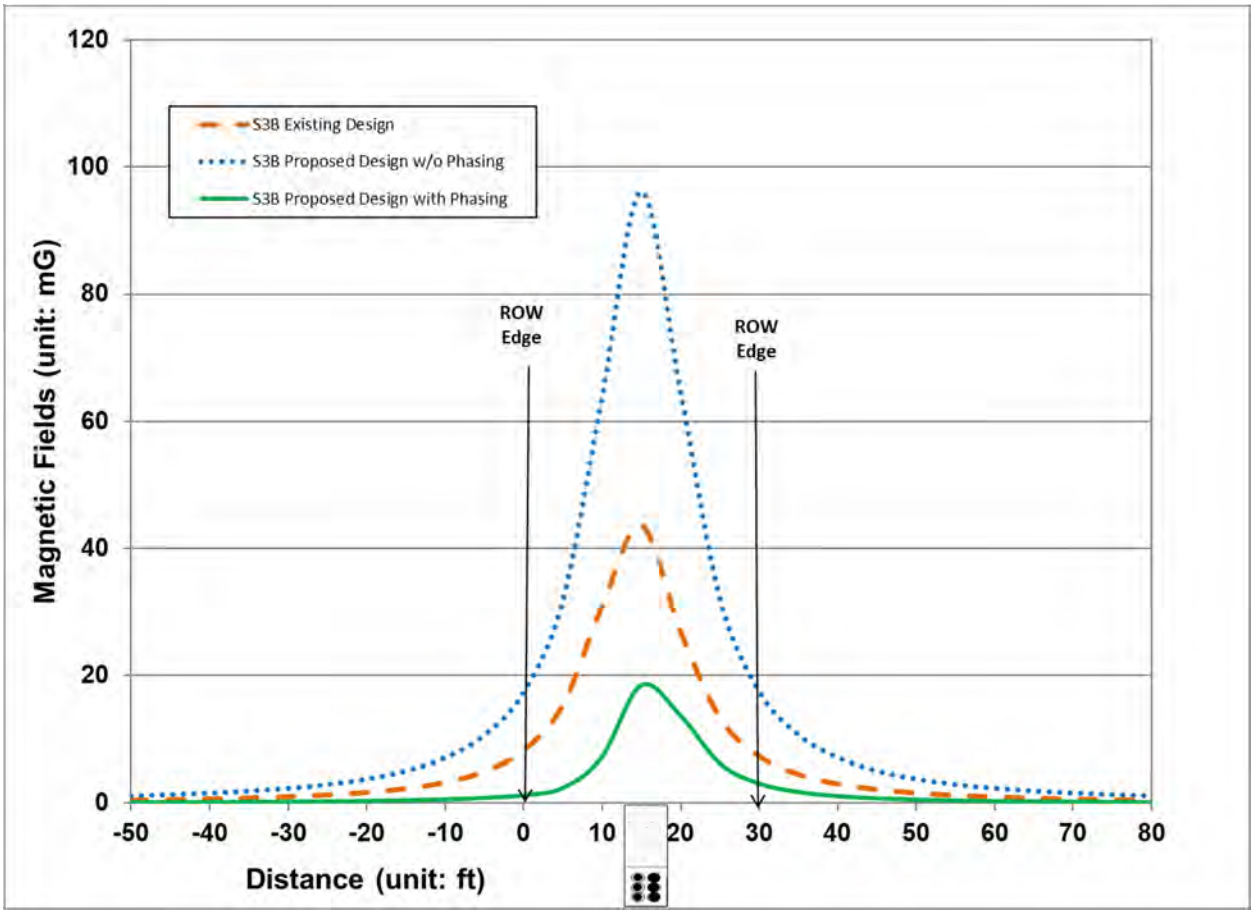
Figure 15. Proposed Alberhill Underground 115 kV Design - Section 3B (Looking Toward Newcomb Substation)



Low-Cost Field Reduction Options: Because the proposed design incorporates the above no-cost field reduction measures including utilizing underground existing construction and arranging underground cables for magnetic field reduction, no low-cost reduction measures were considered for this section of the Proposed Project.

Magnetic Field Calculations: Figure 16 and Table 6 show the calculated magnetic field levels for the existing and the proposed designs.

Figure 16. A Design Comparison of Calculated Magnetic Field Levels[37] for Alberhill 115 kV Lines - Section 3B (Looking Toward Newcomb Substation)



37 This table lists calculated magnetic field levels for design comparison only and is not meant to predict actual magnetic field levels.

Table 6. A Comparison of Calculated Magnetic Field Levels[38] for Section 3B				
Design Options	15 Feet Left of C/L (mG)	% Reduction	15 Feet Right of C/L (mG)	% Reduction
S3B Existing Design	8.2	N/A	7.4	N/A
S3B Proposed Design w/o Phasing	17.3	Increase	17.5	Increase
S3B Proposed Design with Phasing	1.3	92.5	3.1	82.3

Recommendations for Section 3: *The proposed design includes the no-cost field reduction measures listed above. Because the proposed design already incorporates underground construction and arranging underground cables for magnetic field reduction, no low-cost field reduction measures are recommended.*

SECTION 4A

This section consists of commercial/industrial areas with a few scattered homes on the northeast side of Collier Ave. Figure 17 shows the existing 115 kV circuit design in this area, prior to construction of the Alberhill System Project. The proposed typical 115 kV design for Section 4A is shown in Figure 18. The proposed 115 kV subtransmission lines will be constructed on double-circuit structures.

No-Cost Field Reduction Measures: The proposed design for Section 4A includes the following no-cost field reduction measures:

1. Utilize structure heights that meet or exceed SCE's EMF preferred design criteria.
2. Utilize double-circuit construction that reduces spacing between circuits as compared with single-circuit construction.

[38] This table lists calculated magnetic field levels for design comparison only and is not meant to predict actual magnetic field levels.

3. Arrange the conductors of the proposed 115 kV circuits for magnetic fields reduction.

Figure 17. Existing 115 kV Design - Section 4A (Looking Southeast)

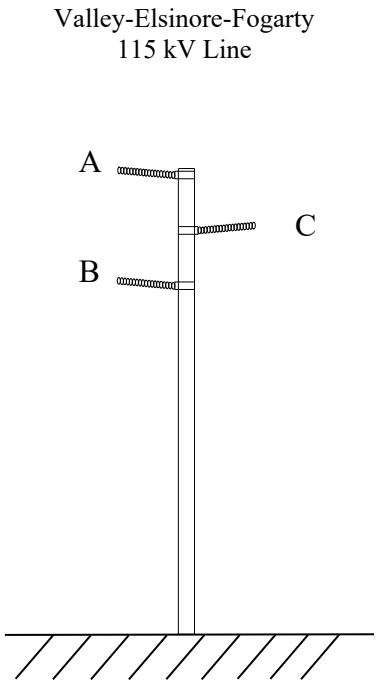
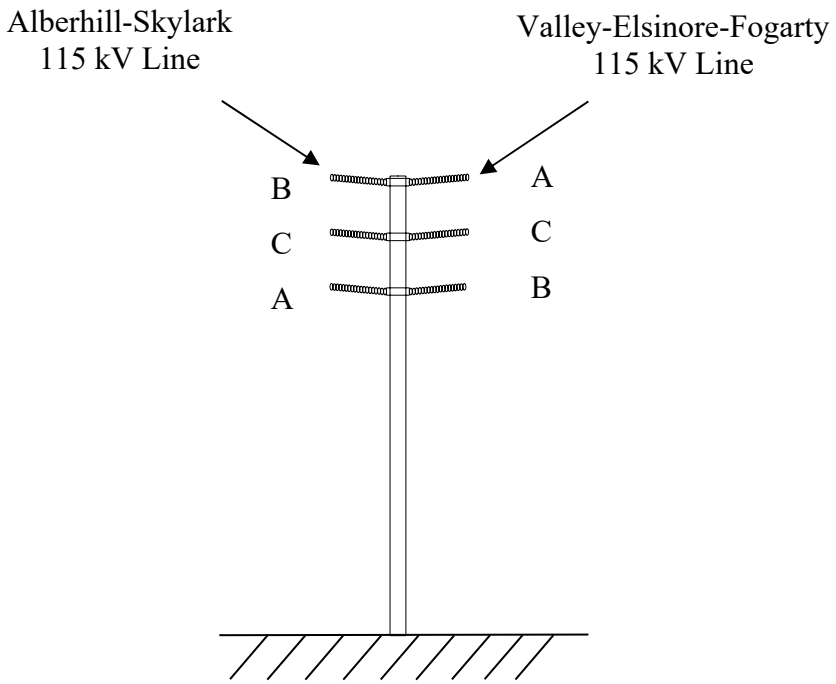


Figure 18. Proposed Alberhill 115 kV - Section 4A (Looking Southeast)



Low-Cost Field Reduction Options: Because the proposed design incorporates the above no-cost field reduction measures including structure heights that meet or exceed SCE's EMF preferred design criteria, no low-cost reduction measures such as utilizing taller structures were considered for this section of the Proposed Project.

Magnetic Field Calculations: Figure 19 and Table 7 show the calculated magnetic field levels for the existing and the proposed designs. These calculations were made using the typical structural length of 75 feet for double-circuit structures and 70 feet for single circuit structures.

Figure 19. A Design Comparison of Calculated Magnetic Field Levels[39] for Alberhill 115 kV Lines - Section 4A (Looking Southeast)

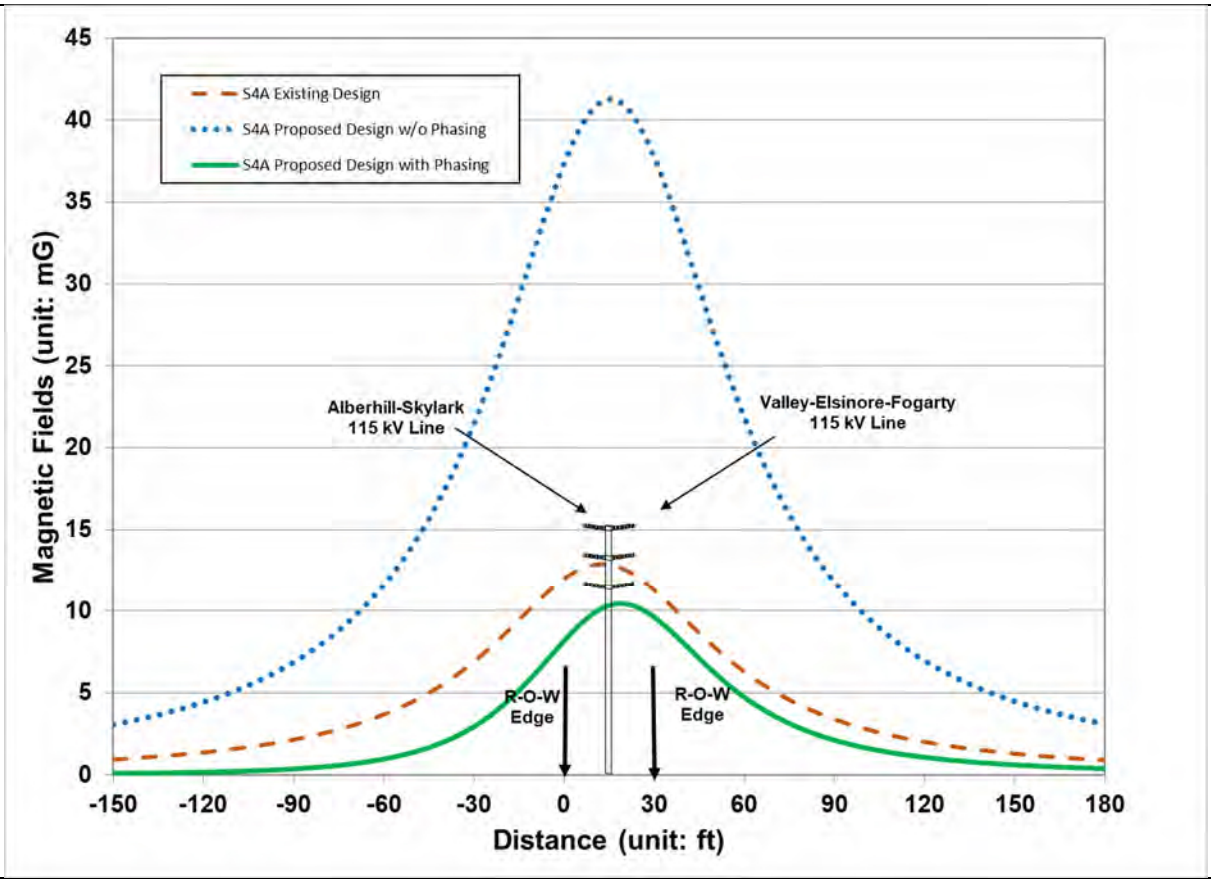


Table 7. A Comparison of Calculated Magnetic Field Levels[40] for Section 4A

Design Options	15 Feet Left of C/L (mG)	% Reduction	15 Feet Right of C/L (mG)	% Reduction
S4A Existing Design	12.0	N/A	11.3	N/A
S4A Proposed Design w/o Phasing	37.4	Less than 15% Increase	37.8	Less than 15% Increase
S4A Proposed Design with Phasing	8.1	78.3	9.6	74.6

39 This table lists calculated magnetic field levels for design comparison only and is not meant to predict actual magnetic field levels.

40 This table lists calculated magnetic field levels for design comparison only and is not meant to predict actual magnetic field levels.

Recommendations for Section 4A: *The proposed design includes the no-cost field reduction measures listed above. Because the proposed design already incorporates structures with heights meeting or exceeding SCE's preferred design criteria, no low-cost field reduction measures are recommended.*

SECTION 4B

This section consists of commercial/industrial areas. Figure 20 shows the existing 115 kV circuit design in this area, prior to construction of the Alberhill System Project. The proposed 115 kV subtransmission lines shown in Figure 21 will be constructed on double-circuit structures same as Section 4A, but the Alberhill-Skylark 115 kV Line and the Valley-Elsinore-Fogarty Line swap sides before crossing the I-15 freeway.

No-Cost Field Reduction Measures: The proposed design for Section 4B includes the following no-cost field reduction measures:

1. Utilize structure heights that meet or exceed SCE's EMF preferred design criteria.
2. Utilize double-circuit construction that reduces spacing between circuits as compared with single-circuit construction.
3. Arrange the conductors of the proposed 115 kV circuits for magnetic fields reduction.

Figure 20. Existing 115 kV Design - Section 4B (Looking Northeast)

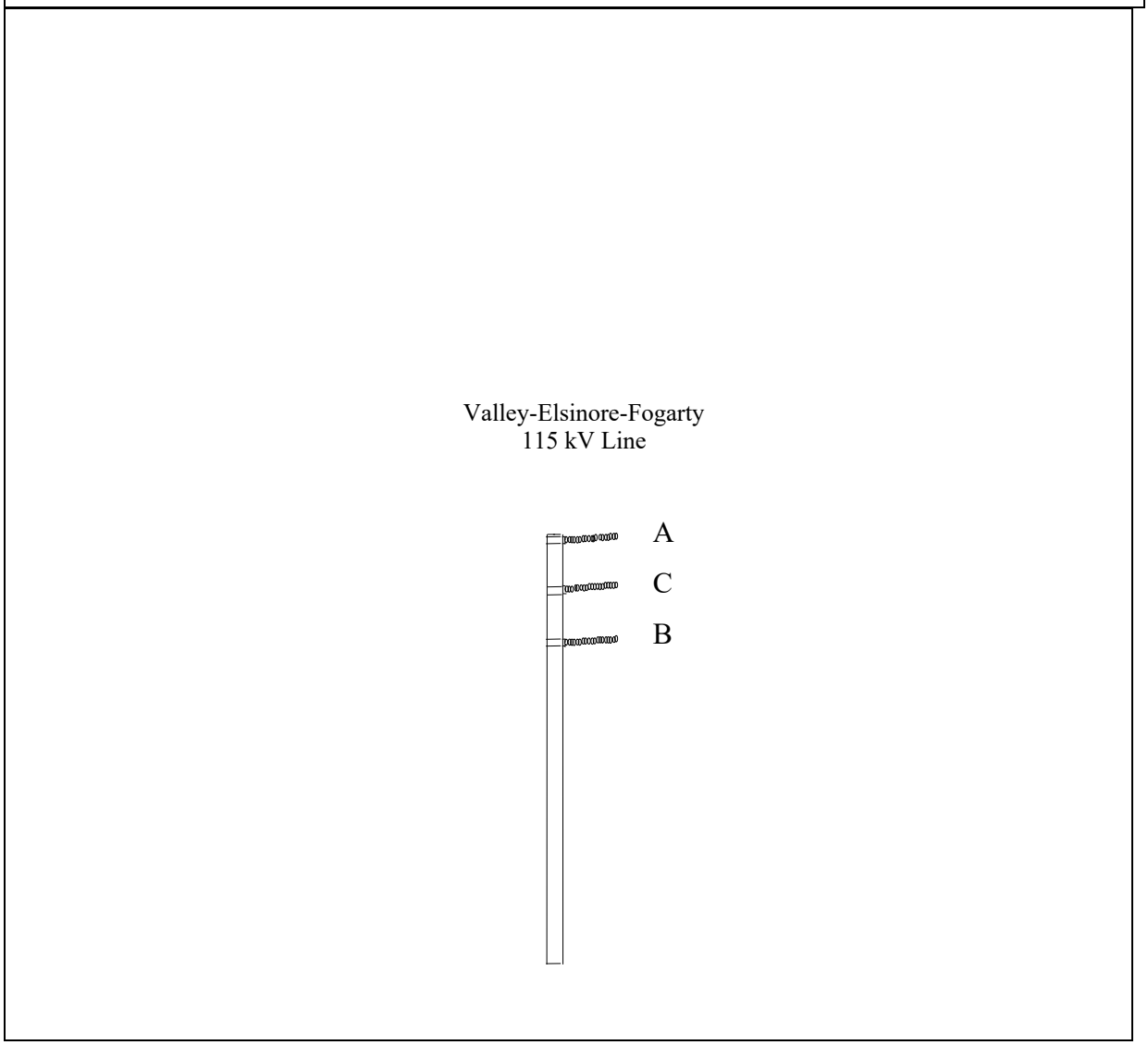
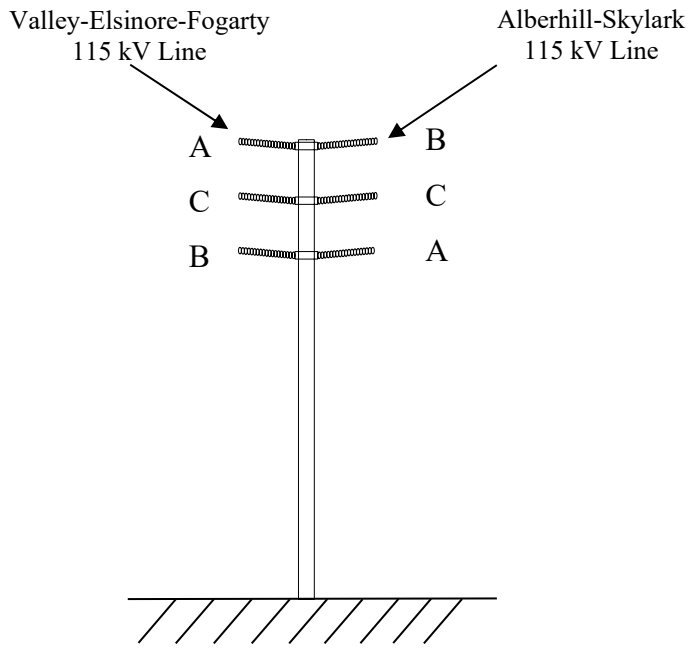


Figure 21. Proposed Alberhill 115 kV - Section 4B (Looking Northeast)



Low-Cost Field Reduction Options: Because the proposed design incorporates the above no-cost field reduction measures including structure heights that meet or exceed SCE's EMF preferred design criteria, no low-cost reduction measures such as utilizing taller structures were considered for this section of the Proposed Project.

Magnetic Field Calculations: Figure 22 and Table 8 show the calculated magnetic field levels for the existing and the proposed designs. These calculations were made using the typical structural length of 75 feet for double-circuit structures and 70 feet for single circuit structures.

Figure 22. A Design Comparison of Calculated Magnetic Field Levels[41] for Alberhill 115 kV Lines - Section 4B (Looking Northeast)

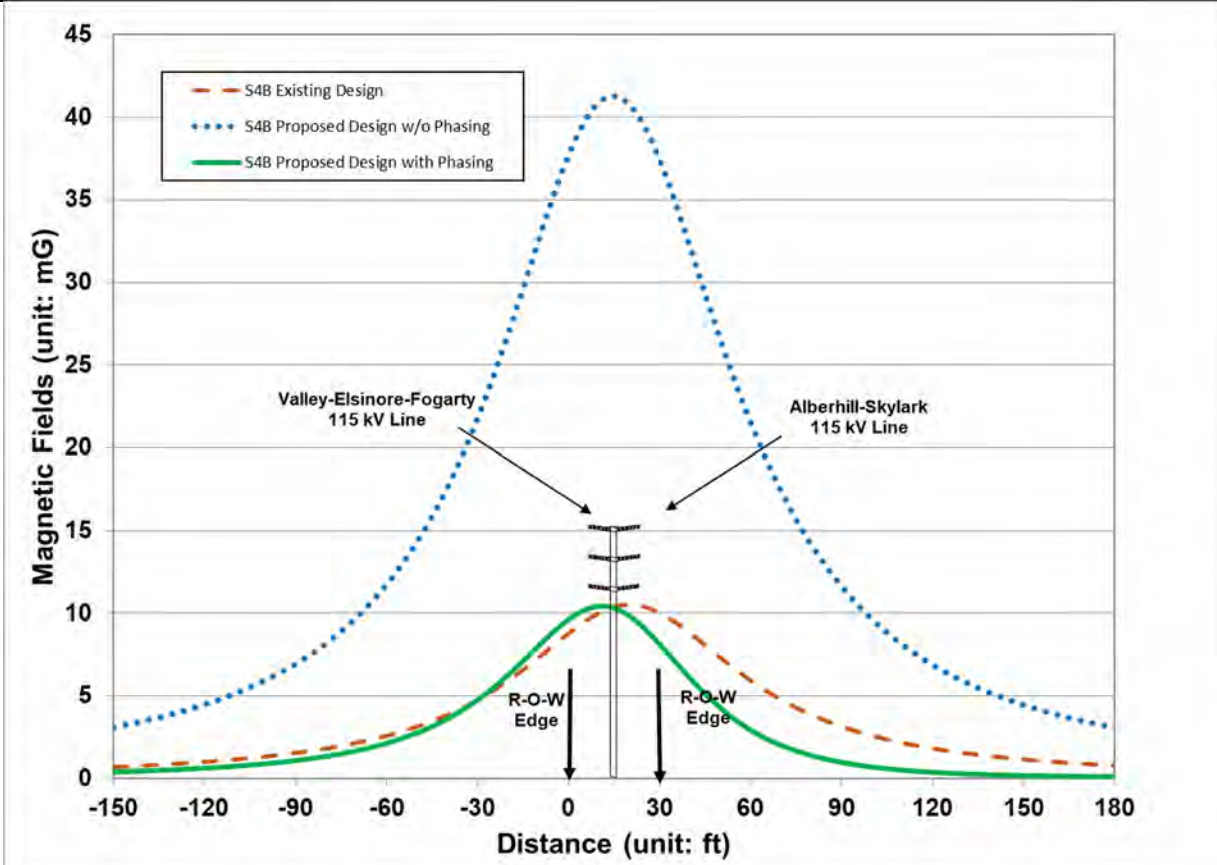


Table 8. A Comparison of Calculated Magnetic Field Levels[42] for Section 4B

Design Options	15 Feet Left of C/L (mG)	% Reduction	15 Feet Right of C/L (mG)	% Reduction
S4B Existing Design	8.8	N/A	10.0	N/A
S4B Proposed Design w/o Phasing	37.8	Less than 15% Increase	37.4	Less than 15% Increase
S4B Proposed Design with Phasing	9.6	74.6	8.1	78.3

Recommendations for Section 4B: *The proposed design includes the no-cost field reduction measures listed above. Because the proposed design already incorporates structures with*

41 This table lists calculated magnetic field levels for design comparison only and is not meant to predict actual magnetic field levels.

42 This table lists calculated magnetic field levels for design comparison only and is not meant to predict actual magnetic field levels.

heights meeting or exceeding SCE's preferred design criteria, no low-cost field reduction measures are recommended.

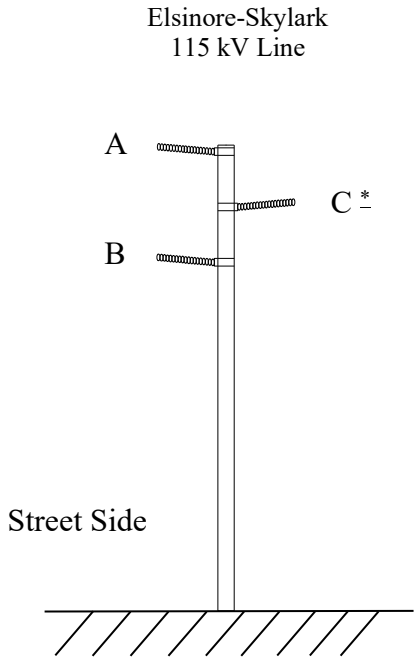
SECTION 5

This section consists of undeveloped land, commercial/industrial areas, and residential areas. Figure 23 shows the existing 115 kV circuit design in this area, prior to construction of the Alberhill System Project. The proposed typical 115 kV design for Section 5 is shown in Figure 24. The proposed 115 kV subtransmission lines will be constructed on double-circuit structures.

No-Cost Field Reduction Measures: The proposed design for Section 5 includes the following no-cost field reduction measures:

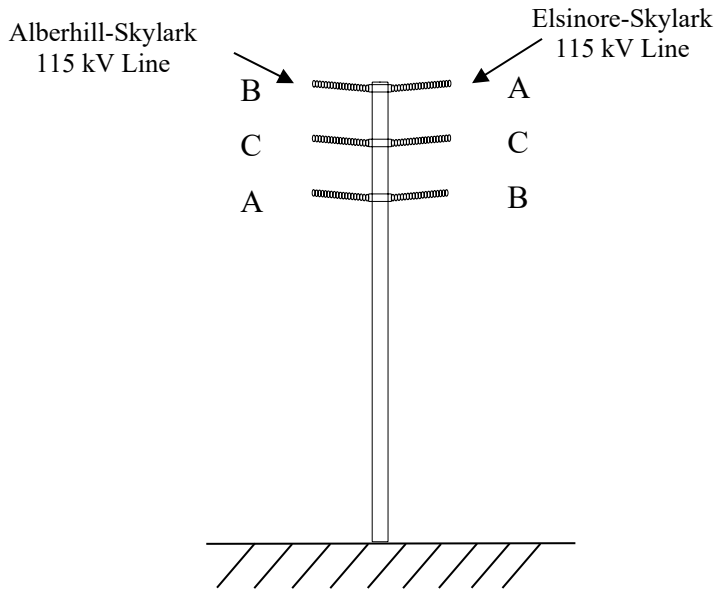
1. Utilize double-circuit construction that reduces spacing between circuits as compared with single-circuit construction.
2. Arrange the phase conductors of the proposed 115 kV circuits for magnetic fields reduction.
3. Utilize structure heights that meet or exceed SCE's EMF preferred design criteria.

Figure 23. Existing 115 kV Design - Section 5



* Existing Elsinore-Skylark is A-C-B top to bottom from Elsinore Sub to Auto Center Drive. From Auto Center Drive to Skylark Sub after transposition structures, it becomes A-B-C top to bottom. The Proposed Project construction will eliminate the transposition structures as Elsinore-Skylark poles will be replaced.

Figure 24. Proposed Alberhill 115 kV Design - Section 5
(Looking Toward Skylark Substation)



Low-Cost Field Reduction Options: Because the proposed design incorporates the above no-cost field reduction measures including structure heights that meet or exceed SCE's EMF preferred design criteria, no low-cost reduction measures such as utilizing taller structures were considered for this section of the Proposed Project.

Magnetic Field Calculations: Figure 25 and Table 10 show the calculated magnetic field levels for the existing and the proposed designs. These calculations were made using the typical structural length of 75 feet.

Figure 25. A Design Comparison of Calculated Magnetic Field Levels[43] for Alberhill 115 kV Lines Section 5 (Looking Toward Skylark Substation)

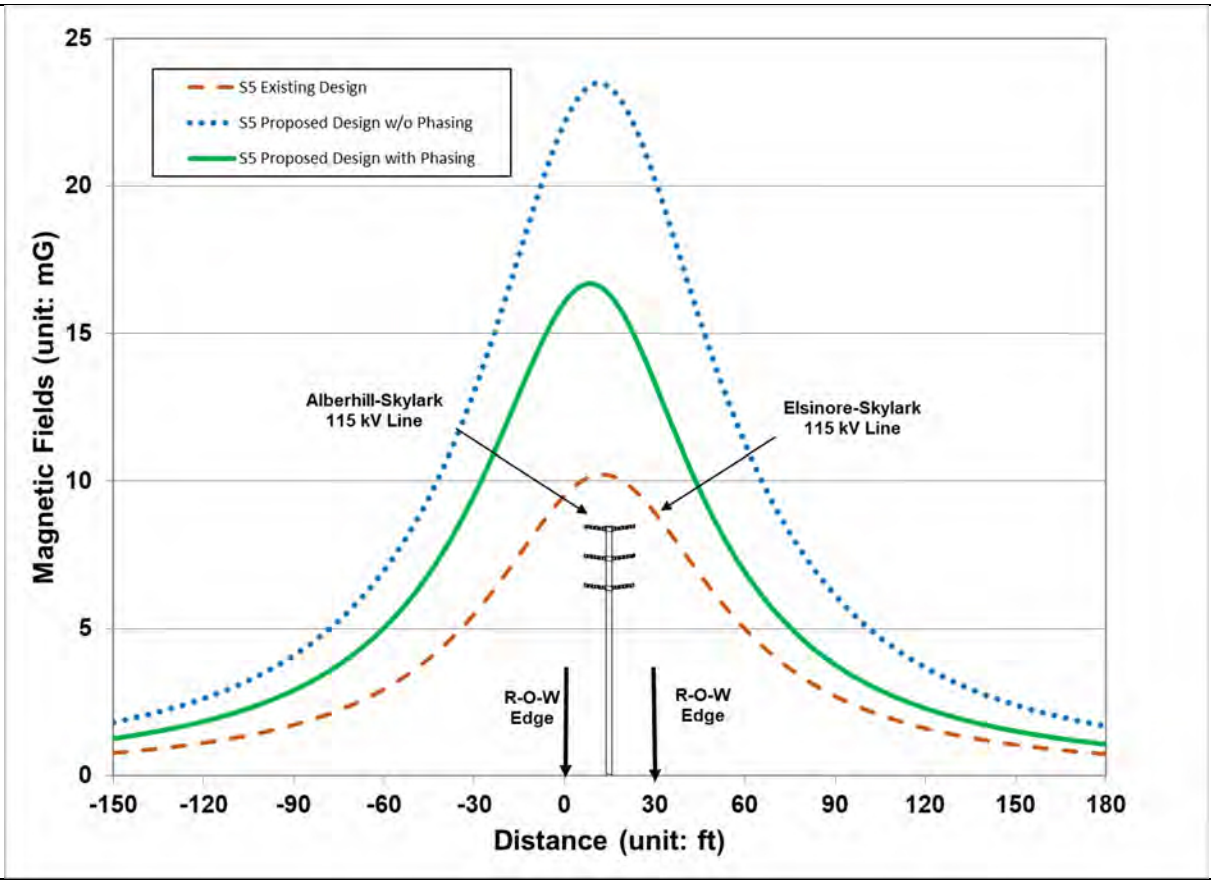


Table 9. A Comparison of Calculated Magnetic Field Levels[44] for Section 5				
Design Options	15 Feet Left of C/L (mG)	% Reduction	15 Feet Right of C/L (mG)	% Reduction

[43] This table lists calculated magnetic field levels for design comparison only and is not meant to predict actual magnetic field levels.

[44] This table lists calculated magnetic field levels for design comparison only and is not meant to predict actual magnetic field levels.

S5 Existing Design	9.5	N/A	8.9	N/A
S5 Proposed Design w/o Phasing	22.2	Increase	20.3	Increase
S5 Proposed Design with Phasing	16.1	27.5	13.3	34.5

Recommendations for Section 5: *The proposed design includes the no-cost field reduction measures listed above. Because the proposed design already incorporates structures with heights meeting or exceeding SCE's preferred design criteria, no low-cost field reduction measures are recommended.*

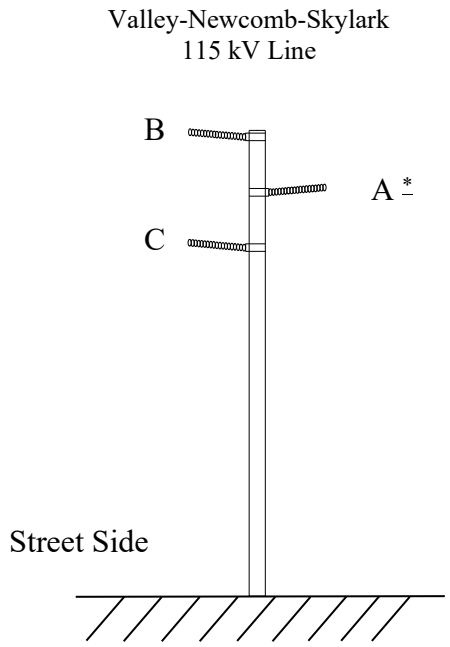
SECTION 6

This section consists of undeveloped land and commercial/industrial area with some scattered homes nearby. Figure 26 shows the existing 115 kV circuit design in this area, prior to construction of the Alberhill System Project. The proposed typical 115 kV design for Section 6 is shown in Figure 27. The proposed 115 kV subtransmission lines will be constructed on double-circuit structures.

No-Cost Field Reduction Measures: The proposed design for Section 6 includes the following no-cost field reduction measures:

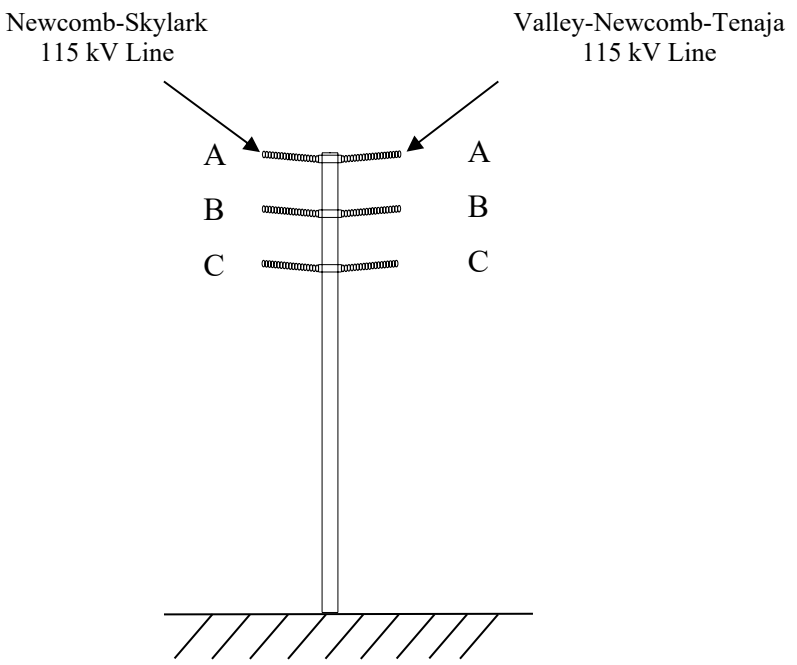
1. Utilize structure heights that meet or exceed SCE's EMF preferred design criteria.
2. Utilize double-circuit construction that reduces spacing between circuits as compared with single-circuit construction.
3. Arrange the conductors of the proposed 115 kV circuits for magnetic fields reduction.

Figure 26. Existing 115 kV Design - Section 6



* Existing Valley-Newcomb-Skylark circuit phasing is A-B-C top to bottom from Skylark Substation to the transposition structures over the hill and west end of Beverly Street in Wildomar. East of these transposition structures, the phasing is B-A-C top to bottom. The Proposed Project construction will eliminate the transposition structures as existing single circuit structures will be replaced with double-circuit ones.

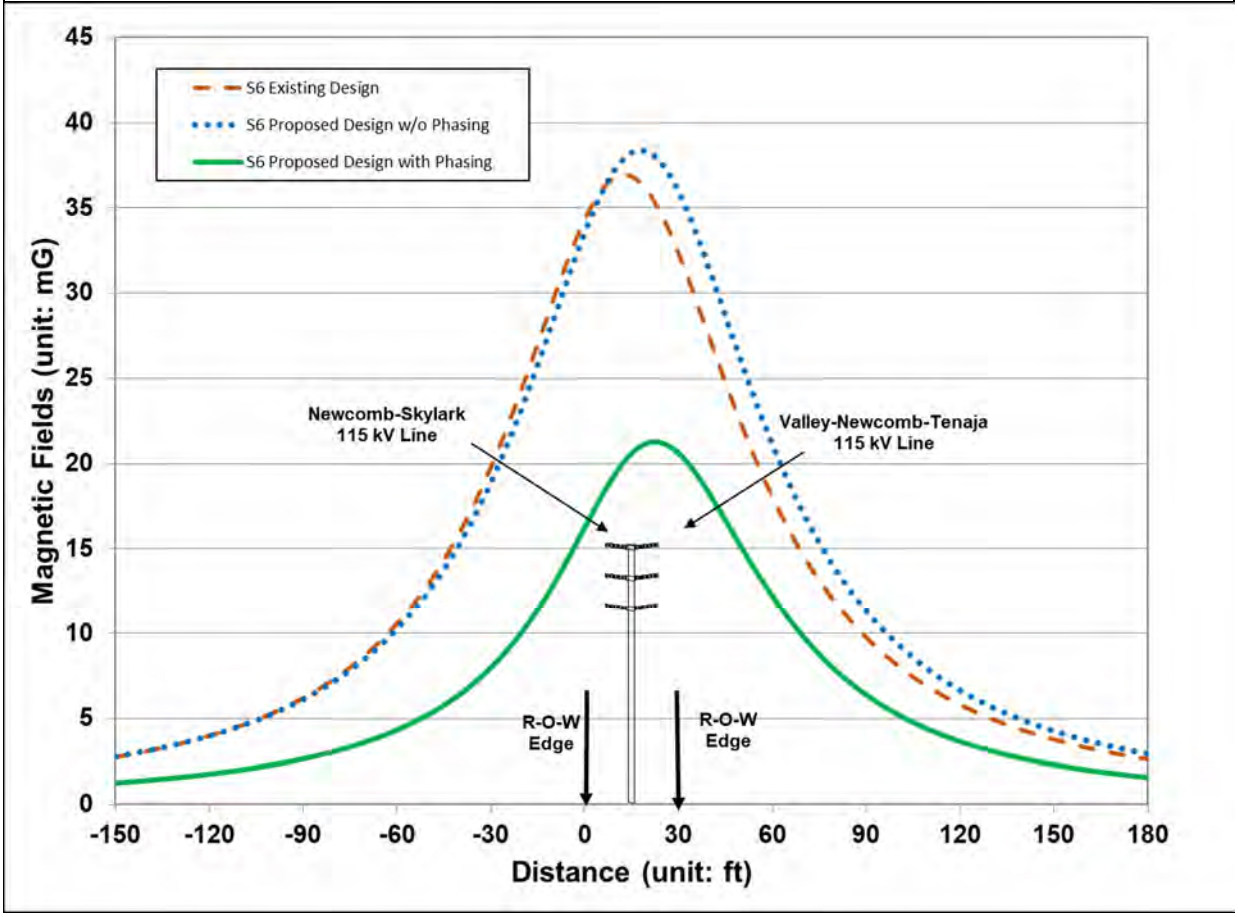
Figure 27. Proposed Alberhill 115 kV Design - Section 6 (Looking Toward Newcomb Substation)



Low-Cost Field Reduction Options: Because the proposed design incorporates the above no-cost field reduction measures including structure heights that meet or exceed SCE's EMF preferred design criteria, no low-cost reduction measures such as utilizing taller structures were considered for this section of the Proposed Project.

Magnetic Field Calculations: Figure 28 and Table 11 show the calculated magnetic field levels for the existing and the proposed designs. These calculations were made using the typical structural length of 75 feet.

Figure 28. A Design Comparison of Calculated Magnetic Field Levels[45] for Alberhill 115 kV Lines - Section 6 (Looking Toward Newcomb Substation)



[45] This table lists calculated magnetic field levels for design comparison only and is not meant to predict actual magnetic field levels.

Table 10. A Comparison of Calculated Magnetic Field Levels[46] for Section 6				
Design Options	15 Feet Left of C/L (mG)	% Reduction	15 Feet Right of C/L (mG)	% Reduction
S6 Existing Design	34.4	N/A	32.3	N/A
S6 Proposed Design w/o Phasing	33.6	2.3	35.9	Less than 15% Increase
S6 Proposed Design with Phasing	16.2	51.8	20.6	42.6

Recommendations for Section 6: *The proposed design includes the no-cost field reduction measures listed above. Because the proposed design already incorporates structures with heights meeting or exceeding SCE's preferred design criteria, no low-cost field reduction measures are recommended.*

SECTION 7

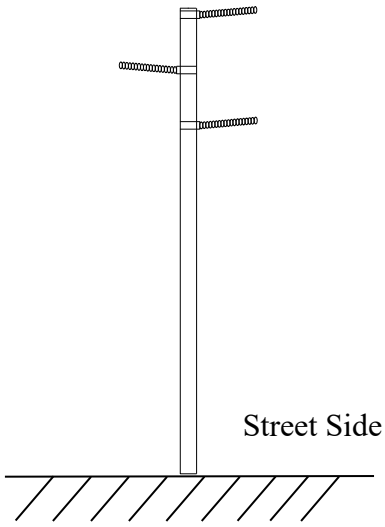
The land usages for this section are undeveloped land, commercial/industrial areas, with residential homes adjacent to the line route. There is no existing subtransmission circuit in this section. The proposed typical 115 kV design for Section 7 is shown in Figure 29. The proposed 115 kV subtransmission lines will be constructed on single-circuit structures.

No-Cost Field Reduction Measures: The proposed design for Section 7 includes the following no-cost field reduction measures:

1. Utilize structure heights that meet or exceed SCE's EMF preferred design criteria.
2. Utilize subtransmission line construction that reduces the space between conductors compared with other designs

[46] This table lists calculated magnetic field levels for design comparison only and is not meant to predict actual magnetic field levels.

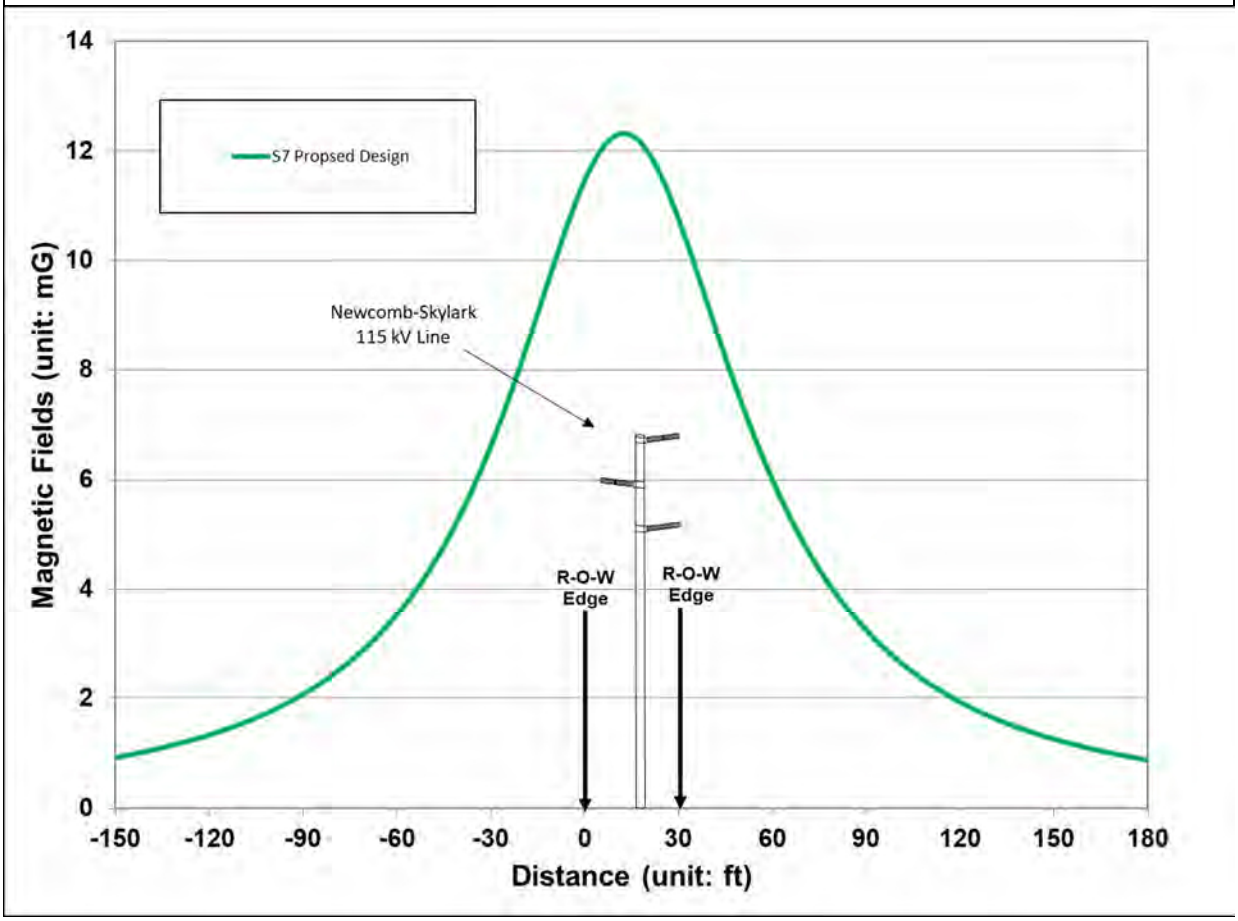
Figure 29. Proposed Alberhill 115 kV Design - Section 7
(Looking Toward Newcomb Substation)



Low-Cost Field Reduction Options: Because the proposed design incorporates the above no-cost field reduction measures including structure heights that meet or exceed SCE's EMF preferred design criteria, no low-cost reduction measures such as utilizing taller structures were considered for this section of the Proposed Project.

Magnetic Field Calculations: Figure 30 and Table 12 show the calculated magnetic field levels for the proposed design. These calculations were made using the typical structural length of 80 feet.

Figure 30. Calculated Magnetic Field Levels[47] for Alberhill 115 kV - Section 7 (Looking North)



47 This table lists calculated magnetic field levels for design comparison only and is not meant to predict actual magnetic field levels.

Table 11. Calculated Magnetic Field Levels[48] for Section 7				
Design Options	15 Feet Left of C/L (mG)	% Reduction	15 Feet Right of C/L (mG)	% Reduction
Proposed Single-Circuit 115 kV Design	11.5	N/A	10.8	N/A

Recommendations for Section 7: *The proposed design includes the no-cost field reduction measures listed above. Because the proposed design already incorporates structures with heights meeting or exceeding SCE's preferred design criteria, no low-cost field reduction measures are recommended.*

Part 3: Proposed Alberhill 500/115 kV Substation

Generally, magnetic field values along the substation perimeter are low compared to the substation interior because of the distance from the perimeter to the energized equipment. Normally, the highest magnetic field values around the perimeter of a substation result from overhead power lines and underground duct banks entering and leaving the substation, and are not caused by substation equipment. Therefore, the magnetic field reduction design options generally applicable to a substation project are as follows:

- Site selection for a new substation;
- Setback of substation structures and major substation equipment (such as bus, transformers, and underground cable duct banks, etc.) from perimeter;
- Field reduction for T/Ls and subtransmission lines entering and exiting the substation.

The Substation Checklist, as shown in Table 12, is used for evaluating the no-cost and low-cost design options considered for the substation project, the design options adopted, and reasons that certain design options were not adopted if applicable.

[48] This table lists calculated magnetic field levels for design comparison only and is not meant to predict actual magnetic field levels.

Table 12. Substation Checklist for Examining No-cost and Low-cost Magnetic Field Reduction Design Options			
No.	**No-Cost and Low-Cost Magnetic Field Reduction Design Options Evaluated for a Substation Project**	**Design Options Adopted? (Yes/No)**	**Reason(s) if not Adopted**
1	Are 500 kV rated transformers 50 feet or more from the substation property lines?	Yes	
2	Are 500 kV rated switch-racks, capacitor banks & bus 40 feet or more from the substation property lines?	Yes	
2A	Are 115 kV rated switch-racks, capacitor banks & bus 8 feet or more from the substation property line?	Yes	
3	Are 115 kV rated transfer & operating buses configured with the transfer bus facing the nearest property line?	N/A	Breaker & a Half Design

Part 3: Project Alternatives

This FMP includes only "no-cost and low-cost" magnetic field reduction design options for SCE's Proposed Routes and Proposed Substation site. SCE's PEA contains various alternative line routes and substation site(s). Comparable "no-cost and low-cost" magnetic field reduction options for the Proposed Project can be applied to all alternative transmission/subtransmission routes and substation sites. A Final FMP will be prepared should an alternative route be approved.

VI. Final Recommendations for Implementing "No-cost and Low-cost" Magnetic Field Reduction Design Options

In accordance with the "EMF Design Guidelines", filed with the CPUC in compliance with CPUC Decisions 93-11-013 and 06-01-042, SCE would implement the following "no-cost and low-cost" magnetic field reduction design options for Proposed Project:

For Proposed 500 kV T/L Segments:

- Select route alignments through mostly undeveloped areas

For Proposed Alberhill 115 kV Subtransmission Line Route Section 1:

- Utilize structure heights that meet or exceeds SCE's EMF preferred design criteria
- Utilize double-circuit construction that reduces spacing between circuits as compared with single-circuit construction
- Arrange the phase conductors of 115 kV circuits for magnetic field reduction.
    - Alberhill-Fogarty 115 kV Line: **A-C-B** (top to bottom)
    - Alberhill-Newcomb-Valley 115 kV Line: **A-B-C** (top to bottom); or other phasing combination except for matched phasing

For Proposed Alberhill 115 kV Subtransmission Line Route Section 2:

- Utilize structure heights that meet or exceeds SCE's EMF preferred design criteria
- Utilize double-circuit construction that reduces spacing between circuits as compared with single-circuit construction
- Arrange the conductors of 115 kV circuits for magnetic field reduction.
    - Alberhill-Fogarty 115 kV Line: **A-C-B** (top to bottom) on single circuit structures

- Alberhill-Newcomb-Valley 115 kV Line: **A-B-C** (top to bottom)
- Alberhill-Skylark 115 kV Line: **C-B-A** (top to bottom); or equivalent opposite phasing combination

For Proposed Alberhill 115 kV Subtransmission Line Route Section 3A:

- Utilize structure heights that meet or exceeds SCE's EMF preferred design criteria
- Utilize double-circuit construction that reduces spacing between circuits as compared with single-circuit construction
- Arrange the conductors of 115 kV circuits for magnetic field reduction.
  - Alberhill-Newcomb-Valley 115 kV Line: **A-B-C** (top to bottom)
  - Alberhill-Skylark 115 kV Line: **C-B-A** (top to bottom); or equivalent opposite phasing combination

For Proposed Alberhill 115 kV Subtransmission Line Route Section 3B:

- Utilize underground construction in existing conduits
- Arrange underground subtransmission cables for magnetic field reduction.
  - Alberhill-Newcomb-Valley 115 kV Line: **C-B-A** (top to bottom)
  - Alberhill-Skylark 115 kV Line: **A-B-C** (top to bottom); or equivalent opposite phasing combination

For Proposed Alberhill 115 kV Subtransmission Line Route Section 4A:

- Utilize structure heights that meet or exceeds SCE's EMF preferred design criteria
- Utilize double-circuit construction that reduces spacing between circuits as compared with single-circuit construction

- Arrange the conductors of 115 kV circuits for magnetic field reduction.
    - Alberhill-Skylark 115 kV Line: **B-C-A** (top to bottom)
    - Valley-Elsinore-Fogarty 115 kV Line: **A-C-B** (top to bottom); or equivalent opposite phasing combination

For Proposed Alberhill 115 kV Subtransmission Line Route Section 4B:

- Utilize structure heights that meet or exceeds SCE's EMF preferred design criteria
- Utilize double-circuit construction that reduces spacing between circuits as compared with single-circuit construction
- Arrange the conductors of 115 kV circuits for magnetic field reduction.
    - Valley-Elsinore-Fogarty 115 kV Line: **A-C-B** (top to bottom)
    - Alberhill-Skylark 115 kV Line: **B-C-A** (top to bottom); or equivalent opposite phasing combination

For Proposed Alberhill 115 kV Subtransmission Line Route Section 5:

- Utilize structure heights that meet or exceeds SCE's EMF preferred design criteria
- Utilize double-circuit construction that reduces spacing between circuits as compared with single-circuit construction
- Arrange the conductors of 115 kV circuits for magnetic field reduction.
    - Alberhill-Skylark 115 kV Line: **B-C-A** (top to bottom)
    - Elsinore-Skylark 115 kV Line: **A-C-B** (top to bottom); or equivalent opposite phasing combination with no transposition structures

For Proposed Alberhill 115 kV Subtransmission Line Route Section 6:

- Utilize structure heights that meet or exceeds SCE's EMF preferred design criteria
- Utilize double-circuit construction that reduces spacing between circuits as compared with single-circuit construction
- Arrange the conductors of 115 kV circuits for magnetic field reduction.
    - Newcomb-Skylark 115 kV Line: **A-B-C** (top to bottom)
    - Valley-Newcomb-Tenaja 115 kV Line: **A-B-C** (top to bottom); or equivalent matched phasing configuration with no transposition structures

For Proposed Alberhill 115 kV Subtransmission Line Route Section 7:

- Utilize structure heights that meet or exceeds SCE's EMF preferred design criteria
- Utilize subtransmission line construction that reduces the space between conductors compared with other designs

For Proposed Substation:

- Place major substation electrical equipment (such as transformers, switchracks, buses and underground duct banks) away from the substation property lines
    - Keep 500 kV rated transformers 50 feet or more from the substation property lines
    - Keep 500 kV rated switch-racks, capacitor banks & bus 40 feet or more from the substation property lines
    - Keep 115 kV rated switch-racks, capacitor banks & bus 8 feet or more from the substation property lines

The recommended “no-cost and low-cost” magnetic field reduction design options listed above are based upon preliminary engineering designs, and therefore, they are subject to change during the final engineering designs. If the final engineering designs are different than preliminary engineering designs, SCE, however, would implement comparable “no-cost and low-cost” magnetic field reduction design options. If the final engineering designs are significantly different (in the context of evaluating and implementing CPUC’s “no-cost and low-cost” EMF Policy) than the preliminary designs, a Final FMP will be prepared.

SCE’s plan for applying the above “no-cost and low-cost” magnetic field reduction design options uniformly for the Proposed Project is consistent with the CPUC’s EMF Decisions No. 93-11-013 and No. 06-01-042, and also with recommendations made by the U.S. NIEHS. Furthermore, the recommendations above meet the CPUC approved EMF Design Guidelines as well as all applicable national and state safety standards for new electrical facilities.

VII. APPENDIX A: TWO-DIMENSIONAL MODEL ASSUMPTIONS AND YEAR 2029 FORECASTED LOADING CONDITIONS

Magnetic Field Assumptions:

SCE uses a computer program titled "MFields"[49] to model the magnetic field characteristics of various transmission designs options. All magnetic field models and the calculated results of magnetic field levels presented in this document are intended only for purposes of identifying the relative differences in magnetic field levels among various T/L and subtransmission line design alternatives under a specific set of modeling assumptions and determining whether particular design alternatives can achieve magnetic field level reductions of 15 percent or more. The calculated results are not intended to be predictors of the actual magnetic field levels at any given time or at any specific location if and when the project is constructed.

Typical two-dimensional magnetic field modeling assumptions include:

- All subtransmission lines and T/Ls were modeled using forecasted peak loads (see Table 13 and 14 below)
- All conductors were assumed to be straight and infinitely long
- A 6-foot sag was assumed for all 115 kV subtransmission designs
- A 69-foot sag was assumed for the Alberhill-Valley 500 kV T/L segment design
- A 75-foot sag was assumed for the Alberhill-Serrano 500 kV T/L segment design
- Magnetic field strength was calculated at a height of three feet above ground
- Resultant magnetic fields values were presented in this FMP
- All line currents were assumed to be balanced (i.e. neutral or ground currents are not considered)
- Terrain was assumed to be flat
- Project dominant power flow directions were used.

49 Kim, C, MFields for Excel, Version 2.0, 2007.

Table 13. Year 2029 Forecasted Loading Conditions for Proposed 500 kV and 115 kV Lines	
Circuit Name	**Current (Amp)**
Alberhill-Valley 500 kV T/L	1675
Alberhill-Serrano 500 kV T/L	1272
Alberhill-Fogarty 115 kV Line	742
Alberhill-Newcomb-Valley 115 kV Line	368
Valley-Elsinore-Fogarty 115 kV Line	537
Alberhill-Skylark 115 kV Line	469
Elsinore-Skylark 115 kV Line	94
Newcomb-Skylark 115 kV Line	236
Valley-Newcomb-Tenaja 115 kV Line	693

Table 14. Projected Existing 115 kV Subtransmission Line Loads in 2029 Without Alberhill System	
Circuit Name	**Current (Amp)**
Valley-Elsinore-Fogarty (Fogarty Leg) 115 kV Line	247
Valley-Ivyglen 115 kV Line	376
Fogarty-Ivyglen 115 kV Line	105
Elsinore-Skylark 115 kV Line	196
Valley-Newcomb-Skylark (Skylark Leg) 115 kV Line	708

Note:

1. Forecasted loading data is based upon scenarios representing load forecasts for Year 2029. The forecasting data is subject to change depending upon availability of generations, load increase, changes in load demand, and by many other factors.
2. All existing line loading data are projected peak load in Year 2029 if the Alberhill System Project is not present. The load information presented is only approximation of the typical peak demand load, intended to be used for comparison of different designs for EMF reduction. It is not intended to predict the actual EMF levels.

Appendix E

CORPORATE INFORMATION

CORPORATE INFORMATION

SCE is a corporation organized and existing under the laws of the State of California, and is primarily engaged in the business of generating, purchasing, transmitting, distributing and selling electric energy for light, heat and power in portions of central and southern California as a public utility subject to the jurisdiction of the California Public Utilities Commission. SCE's properties, which are located primarily within the State of California, consist mainly of hydroelectric and thermal electric generating plants, together with transmission and distribution lines and other property necessary in connection with its business.

SCE's principal place of business is 2244 Walnut Grove Avenue, Rosemead, California, and its post office address and telephone number are:

Southern California Edison Company
Post Office Box 800
Rosemead, California 91770
Telephone: (626) 302-1212

Communications in regard to this Application are to be addressed to the attention of Tammy Jones, at the above address; at telephone number (626) 302-6634.

A copy of SCE's Certificate of Restated Articles of Incorporation, effective on March 2, 2006, and presently in effect, certified by the California Secretary of State, was filed with the Commission on March 14, 2006, in connection with Application No. 06-03-020, and is incorporated herein by this reference pursuant to Rule 2.2 of the Commission's Rules of Practice and Procedure.

A copy of SCE's Certificate of Determination of Preferences of the Series D Preference Stock filed with the California Secretary of State on March 7, 2011, and presently in effect, certified by the California Secretary of

State, was filed with the Commission on April 1, 2011, in connection with Application No. 11-04-001, and is incorporated herein by this reference.

A copy of SCE's Certificate of Determination of Preferences of the Series E Preference Stock filed with the California Secretary of State on January 12, 2012, and a copy of SCE's Certificate of Increase in Authorized Shares of the Series E Preference Stock filed with the California Secretary of State on January 31, 2012, and presently in effect, certified by the California Secretary of State, were filed with the Commission on March 5, 2012, in connection with Application No. 12-03-004, and is incorporated herein by this reference .

A copy of SCE's Certificate of Determination of Preferences of the Series F Preference Stock filed with the California Secretary of State on May 14, 2012, and presently in effect, certified by the California Secretary of State, was filed with the Commission on June 29, 2012, in connection with Application No. 12-06-017, and is incorporated herein by this reference.

A copy of SCE's Certificate of Determination of Preferences of the Series G Preference Stock filed with the California Secretary of State on January 24, 2013, and presently in effect, certified by the California Secretary of State, was filed with the Commission on January 31, 2013, in connection with Application No. 13-01-016, and is incorporated herein by this reference .

A copy of SCE's Certificate of Determination of Preferences of the Series H Preference Stock filed with the California Secretary of State on February 28, 2014, and presently in effect, certified by the California Secretary of State, was filed with the Commission on March 24, 2014, in connection with Application No. 14-03-013, and is incorporated herein by this reference .

A copy of SCE's Certificate of Determination of Preferences of the Series J Preference Stock filed with the California Secretary of State on August 19, 2015, and presently in effect, certified by the California Secretary of State was filed with the Commission on October 2, 2015, in connection with Application No. 15-10-001, and is incorporated herein by this reference .

A copy of SCE's Certificate of Determination of Preferences of the Series K Preference Stock filed with the California Secretary of State on March 2, 2016, and presently in effect, certified by the California Secretary of State, was filed with the Commission on April 1, 2016, in connection with Application No. 16-04-001, and is incorporated herein by this reference.

A copy of SCE's Certificate of Determination of Preferences of the Series L Preference Stock filed with the California Secretary of State on June 20, 2017, and presently in effect, certified by the California Secretary of State, was filed with the Commission on June 30, 2017, in connection with Application No. 17-06-030, and is incorporated herein by this reference.

Copies of SCE's latest Annual Report to Shareholders and Edison International's latest proxy statement was sent to its stockholders and has been sent to the Commission with an Energy Division Central Files Document Coversheet dated March 17, 2023, pursuant to General Order Nos. 65-A and 104-A of the Commission.

Appendix F

BALANCE SHEET AND STATEMENT OF INCOME

FOR MARCH 31, 2023

SOUTHERN CALIFORNIA EDISON COMPANY

(h) A balance sheet as of the latest available date, together with an income statement covering the period from close of last year for which an annual report has been filed with the Commission to the date of the balance sheet attached to the application.

STATEMENT OF INCOME
THREE MONTHS ENDED MARCH 31, 2023

(In millions)

OPERATING REVENUE	$ 3,950
OPERATING EXPENSES:	
Purchase power and fuel	1,318
Operation and maintenance	1,081
Wildfire-related claims, net of insurance recoveries	96
Wildfire insurance fund expense	52
Depreciation and amortization	656
Property and other taxes	139
Total operating expenses	3,342
OPERATING INCOME	608
Interest expense	(300)
Other income	120
INCOME BEFORE TAXES	428
Income tax expense	29
NET INCOME	399
Less: Preference stock dividend requirements	29
NET INCOME AVAILABLE FOR COMMON STOCK	$ 370

SOUTHERN CALIFORNIA EDISON COMPANY

BALANCE SHEET
MARCH 31, 2023
ASSETS
(in millions)

UTILITY PLANT:		
Utility plant, at original cost	$	61,535
Less- accumulated provision for depreciation and amortization		12,505
		49,030
Construction work in progress		4,801
Nuclear fuel - at amortized cost		124
		53,955
OTHER PROPERTY AND INVESTMENTS:		
Nonutility property - less accumulated depreciation of $95		209
Nuclear decommissioning trusts		4,093
Other investments		47
		4,349
CURRENT ASSETS:		
Cash and equivalents		690
Receivables, less allowances of $323 for uncollectible accounts		1,427
Accrued unbilled revenue		766
Inventory		500
Prepaid expenses		333
Regulatory assets		2,817
Wildfire insurance fund contributions		204
Other current assets		315
		7,052
DEFERRED CHARGES:		
Regulatory assets (Includes $827 related to VIEs)		8,151
Wildfire insurance fund contributions		2,104
Operating lease right-of-use assets		1,337
Long-term insurance receivables		133
Long-term insurance receivables due from affiliate		334
Other long-term assets		1,188
		13,247
	$	78,603

SOUTHERN CALIFORNIA EDISON COMPANY

BALANCE SHEET
MARCH 31, 2023
CAPITALIZATION AND LIABILITIES
(in millions)

CAPITALIZATION:	
Common stock	2,168
Additional paid-in capital	8,438
Accumulated other comprehensive loss	(8)
Retained earnings	8,264
Common shareholder's equity	18,862
Long-term debt (Includes $809 related to VIEs)	25,965
Preferred stock	1,945
Total capitalization	46,772
CURRENT LIABILITIES:	
Short-term debt	626
Current portion of long-term debt	2,214
Accounts payable	1,790
Wildfire-related claims	75
Customer deposits	172
Regulatory liabilities	425
Current portion of operating lease liabilities	419
Other current liabilities	1,592
	7,313
DEFERRED CREDITS:	
Deferred income taxes and credits	7,693
Pensions and benefits	103
Asset retirement obligations	2,733
Regulatory liabilities	8,555
Operating lease liabilities	918
Wildfire-related claims	1,600
Other deferred credits and other long-term liabilities	2,916
	24,518
	$ 78,603

Appendix G

CBA SUPPLEMENTAL ANALYSIS

ALBERHILL CONVERSION TO OPEN-AIR DESIGN: SUPPLEMENTAL ANALYSIS IMPACT

SUMMARY

Southern California Edison (SCE) is proposing technical design modifications and additional engineering refinements since the time of the Original Alberhill System Project (i.e., the project design documented in the Final Environmental Impact Report (FEIR) published in 2017 (hereinafter referred to as the "Original Project")). Specifically, SCE proposes to incorporate air-insulated 500 kV switchgear in lieu of gas-insulated 500 kV switchgear, which has identical electrical system performance characteristics to those of the Original Project. This variation of the Original Project, now deemed the "Proposed Project", is estimated to cost less than the Original Project (in 2021 nominal dollars). In supplemental data item responses provided in this proceeding[1] SCE concluded the Original Project was the superior project alternative in terms of system performance improvements relative to the project capacity, reliability, and resilience objectives, and that the Original Project was the most cost-effective alternative for meeting these objectives. Those same conclusions apply to the Proposed Project.

BACKGROUND

In Decision (D.) 18-08-026 the California Public Utilities Commission (CPUC) directed SCE to supplement the existing record with specific additional analyses. Four of the requested supplemental data items addressed the reliability performance and cost-effectiveness of the Original Project, in comparison to other project alternatives. These additional analyses included:

- A **planning study** that supports the project need and includes applicable planning criteria and reliability standards[2]
- The forecasted impact of the proposed (Alberhill System) project on **service reliability performance**, using electric service reliability metrics where applicable[3]
- **Cost/benefit analysis of several alternatives** for enhancing reliability and providing additional capacity, including the evaluation of energy storage, distributed energy resources, demand response, or smart grid solutions.[4]

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1 See Exhibits C-2, F-1, G-2 and I-1 of SCE's Amended Motion dated February 1, 2021.

2 See Alternate Proposed Decision of Commissioner Guzman Aceves, dated June 29, 2018, at p. 28, (Item c)

3 *See id.* at Item f.

4 *See id*. at Item g.

- Detailed justification of the **recommended solution** as the best solution, including an explanation of how the proposed project ranks in the SCE capital investment portfolio of infrastructure upgrades.[5]

The conclusion of these analyses was that the Original Project was the superior project in terms of system performance—relative to the project capacity, reliability, and resilience objectives—and that the Original Project was the most cost-effective alternative for meeting these objectives.

SCE subsequently developed a variation of the Original Project that incorporates air-insulated 500 kV switchgear (AIS), in lieu of the gas-insulated 500 kV switchgear (GIS) used in the original design. The drivers for this change are (1) a reduction of greenhouse gas emissions as a result of the incorporation of the AIS in lieu of the GIS, which contains sulfur-hexaflouride gas (SF_6); and (2) reduced project costs. Furthermore, a reduction in full buildout scope for the substation made additional space on-site to accommodate the AIS. The changes are almost exclusively associated with eliminating space that was allocated for future addition of equipment in the substation for both transmission and distribution functions that are no longer deemed essential. Other less significant value-engineering improvements were incorporated in the Proposed Project to reduce costs and environmental impacts.

The changes incorporated in the Proposed Project, including the change from GIS to AIS, have no impact on system electrical performance relative to the Original Project. Thus, both the Proposed Project and the Original Project perform identically in terms of meeting project objectives and the performance metrics, which are described in the aforementioned supplemental data responses, differing only in cost. Accordingly, the Original Project and the Proposed Project are equivalent in terms of the capacity, reliability and resilience conclusions provided in supplemental analysis Items c, f, g and i above. Because the costs for the Proposed Project are less than the Original Project, the cost/benefit analysis tables in supplemental data Items c and g are affected—with the Proposed Project showing improved cost-effectiveness performance over and above that of the already superior Original Project. The purpose of this document is to describe the scope and costs of the Proposed and to demonstrate the impact of the Proposed Project on the cost/benefit analysis.

DESCRIPTION OF PROPOSED PROJECT SCOPE AND COST CHANGES FROM ORIGINAL PROJECT

The Proposed Project includes the following changes from the Original Project scope:

- Change from GIS to AIS and associated reduction in civil scope.
- Assumed use of helicopter construction for two 500 kV tower sites, which eliminates approximately one mile of tough-terrain service road construction.
- Other engineering refinements which leverage existing facilities constructed as part of the Valley-Ivyglen 115 kV Subtransmission Line Project.

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[5] *See id*. at Item i.

These changes resulted in a nominal cost reduction of $72M[6] for the Proposed Project, relative to the Original Project.

IMPACT ON COST/BENEFIT ANALYSIS TABLES (ITEMS C and G)

The following tables are being provided as supplements to the cost/benefit analysis previously provided in support of SCE's Second Amended Motion dated June 2021.[7] All other study findings remain the same or result in the Proposed Project being superior to the Original Project. Note that costs in the cost/benefit analysis tables for the Proposed Project are based on escalated 2021 dollars while the costs for other alternatives are based on the 2019 estimates. As mentioned within SCE's Third Amended Application, updated cost estimates for the Proposed Project, reflecting 2023 constant dollars, will be provided in SCE's updated cost testimony. However, while SCE anticipates these updated 2023 cost estimates to increase, any increase results primarily from inflationary escalations, Transmission and Distribution (T&D) Overhead, and licensing costs—all of which similarly impact the Proposed Project and all project alternatives. Even assuming these cost increases, the overall cost of the Proposed Project is anticipated to be less than that of the Original Project, based upon the cost savings associated with the change from GIS to AIS, and the reduction in project scope, discussed above.

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[6] The cost estimate provided in the 2020 BCA filing for the Original Project (*See* SCE's Motion to Supplement the Record, dated May 11, 2020, Attachment G, at G150, Table 6-1) was $545M on a 2019 nominal cost basis. The Proposed Project cost estimate is $473M on a 2021 nominal cost basis. Nominal costs were used in the CBA because they are the proper input for the Present Value Revenue Requirement (PVRR) value that reflects the overall cost impact of a project to customer rates.

[7] *See* SCE's Second Amended Motion to Correct Clerical Error in Amended Motion to Supplement the Record, filed on 22 June 2021, Exhibit C-2 (Second Amended) – Revised Planning Study, Table 8-6, at p. 68; and June 2021 Motion Exhibit G-2 (Second Amended) – Cost/Benefit Analysis of additional alternatives to ASP, § 6 (Benefit-Cost Analysis (BCA))).

Alternative	PVRR ($M)	Benefits ($M)	Benefit-Cost Ratio	Meets Project Objectives?
Alberhill System Project - Open Air Alternative	$440	$4,282	9.7	Yes
Alberhill System Project	$474	$4,282	9.0	Yes
SDG&E	$453	$4,001	8.8	Yes
Mira Loma	$309	$2,601	8.4	Yes
SDG&E and Centralized BESS in Valley South	$531	$4,041	7.6	Yes
Mira Loma and Centralized BESS in Valley South	$560	$3,132	5.6	Yes
SCE Orange County	$748	$4,021	5.4	Yes
Menifee	$331	$3,882	11.7	No
Valley South to Valley North	$207	$2,156	10.4	No
Valley South to Valley North and Distributed BESS in Valley South	$232	$2,165	9.3	No
Valley South to Valley North to Vista and Centralized BESS in Valley South	$289	$2,479	8.6	No
Valley South to Valley North to Vista	$290	$2,470	8.5	No
Valley South to Valley North and Centralized BESS in Valley South and Valley North	$367	$2,542	6.9	No
Centralized BESS in Valley South	$525	$2,535	4.8	No

Figure 1 – Cost/Benefit Analysis Results

Alternative	PVRR ($M)	Benefits ($M)	Cost Ranking (least to greatest)	Cost Ranking Comparison	Δ Benefits / Δ Costs	Incremental Benefits > Costs?
Valley South to Valley North	$207	$2,156	1	-	-	-
Valley Sout to Valley North and Distributed BESS in Valley South	$232	$2,165	2	1 vs 2	0.36	No
Valley South to Valley North to Vista and Centralized BESS in Valley South	$289	$2,479	3	1 vs 3	3.94	Yes
Valley South to Valley North to Vista	$290	$2,470	4	3 vs 4	-9.00	No
Mira Loma	$309	$2,601	5	3 vs 5	6.10	Yes
Menifee	$331	$3,882	6	5 vs 6	58.23	Yes
Valley South to Valley North and Centralized BESS in Valley South and Valley North	$367	$2,542	7	6 vs 7	-37.22	No
Alberhill System Project - Open Air Alternative	$440	$4,282	8	6 vs 8	3.67	Yes
SDG&E	$453	$4,001	9	8 vs 9	-21.62	No
Alberhill System Project - (Gas-Insulated Design)	$474	$4,282	10	8 vs 10	0.00	No
Centralized BESS in Valley South	$525	$2,535	11	8 vs11	-20.55	No
SDG&E and Centralized BESS in Valley South	$531	$4,041	12	8 vs 12	-2.65	No
MiraLoma & Centralized BESS VS	$560	$3,132	13	8 vs 13	-9.58	No
SCE Orange County	$748	$4,021	14	8 vs14	-0.85	No

Figure 2 – Incremental Cost/Benefit Analysis Results

Based on the above results, the Proposed Project and Original Project alternatives rank as the most cost-effective alternatives that meet project objectives.