BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

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Application of PACIFIC GAS AND ELECTRIC COMPANY, a California corporation, for a Permit to Construct the Windsor Substation Project Pursuant to General Order 131-D (U 39 E)	Application No. A1004024

APPLICATION OF PACIFIC GAS AND ELECTRIC COMPANY FOR A PERMIT TO CONSTRUCT THE WINDSOR SUBSTATION PROJECT

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April 21, 2010

TABLE OF CONTENTS

Page

I. BACKGROUND 1

II. REGIONAL CONTEXT AND PROJECT COMPONENTS 2

- A. Regional Context 2
  - 1. Existing Regional Electric System 2
- B. Project Components 3
  - 1. Substation 4
  - 2. Transmission Interconnection 5
  - 3. Distribution Lines 6
  - 4. Access and Ancillary Areas 7

III. THE APPLICANT 7

IV. ADDITIONAL INFORMATION REQUIRED BY SECTION IX(B) OF GO 131-D: 8

V. MEASURES TAKEN TO REDUCE EMF EXPOSURE 11

VI. PUBLIC NOTICE 12

VII. REQUEST FOR TIMELY ACTION 13

VIII. EXHIBITS 13

IX. CONCLUSION 14

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APPLICATION OF PACIFIC GAS AND ELECTRIC COMPANY FOR A PERMIT TO CONSTRUCT THE WINDSOR SUBSTATION PROJECT

Pursuant to Section IX(B) of General Order ("GO") 131-D and Rules 2.1 through 2.5 and 3.1 of the California Public Utilities Commission's ("Commission" or "CPUC") Rules of Practice and Procedure, PACIFIC GAS AND ELECTRIC COMPANY ("PG&E") respectfully requests a Permit to Construct ("PTC") the Windsor Substation Project ("project"), a new, three-bank, 115-12 kilovolt ("kV") distribution substation and related facilities in the Fulton-Fitch Mountain Distribution Planning Area ("DPA") in Sonoma County. The project is needed by the summer of 2012 to relieve the growing electric system deficiency projected to occur in the Town of Windsor area, to prevent interruptions or emergency conditions that could otherwise result from the deficiency, and to ensure safe and reliable electric service to existing and approved development.

I. BACKGROUND

The electric demand in the Fulton-Fitch Mountain DPA has had an historic annual growth rate of approximately 2.5 megawatts ("MW") per year. Even with the downturn in the economy and subsequent slowing of development, the Sonoma County area has experienced continued electric growth, resulting in a projected summer 2011 area deficiency of 1.5 MW (1.7 percent) and a summer 2012 area deficiency of 3.9 MW (4.4 percent). The greatest concentration of the load to be served is within the limits of the Town of Windsor.

The Windsor Substation Project proposes to meet the projected electric demand by constructing a new, three-bank, 115-12 kV substation (initially built at 60 kV), a short interconnecting power line to provide power to the substation, and new 12 kV distribution circuits. (*See* Proponent's Environmental Assessment ("PEA"),[1] Exhibit A). The project will relieve the electric system deficiency that is projected to occur in the Town of Windsor, and ensure the ability of the system to safely and reliably serve the area without interruptions or emergency conditions that would otherwise result from the deficiency. The proposed substation site, which is located near the center of the Town of Windsor's load growth, is 0.25 mile west of the intersection of Conde Lane and Mitchell Lane in the Town of Windsor, and is bounded by Mitchell Lane to the north and the Northwestern Pacific Railroad ("NWPRR") right-of-way to the west.

II. REGIONAL CONTEXT AND PROJECT COMPONENTS

A. Regional Context

1. Existing Regional Electric System

In the Sonoma County area, electric power is transmitted to regional substations at voltages of 230 kV, 115 kV, and 60 kV. The power is then stepped down at substations and distributed to customers using overhead or underground distribution lines at voltages of 21 kV, 12 kV, and 4 kV. The local delivery system voltage is stepped down further for individual customer use.

PG&E's existing regional transmission system serving the Fulton-Fitch Mountain DPA consists of two 60 kV power lines, the Fulton No. 1 and the Fulton-Hopland power lines. Two PG&E substations serve the DPA: Fulton and Fitch Mountain. Fitch Mountain Substation serves northern Windsor and the distribution facilities east and west of the City of

[1] The PEA is attached as Exhibit A to this application and incorporated herein by reference. References to PEA figures refer to figures within this exhibit.

Healdsburg. Fulton Substation serves northern Santa Rosa, the unincorporated area of Larkfield, the Airport Business Park, and the majority of the Town of Windsor. These substations are presently built out to maximum capacity. The City of Healdsburg operates its own municipal electric distribution system and obtains its power from PG&E through a connection at its Badger Substation.

B. Project Components

PG&E proposes to construct and operate the Windsor Substation Project, including a three-bank distribution substation, interconnection with the electrical supply grid, and up to twelve distribution circuit outlets. Major elements of the project, which are described in more detail in the following sections, include:

- installing a new, three-bank, 115-12 kV distribution substation, initially energized at 60 kV;
- replacing an existing wood pole located along the Fulton No. 1 60 kV (eventually 115 kV) Power Line with a new, weathered TSP and installing one additional new TSP within PG&E's property, to support a new interconnecting power line between the new substation and the existing Fulton No. 1 power line;
- installing twelve distribution circuits;
- replacing five existing, approximately 45-foot-tall wood distribution poles located along Mitchell Lane with approximately 1000 feet of underground cable in conduit;
- reconductoring approximately 4,500 feet of existing overhead distribution line along Mitchell Lane, across Highway 101, and along Hembree Lane (involves replacement of 18 wood poles with new wood poles); and
- installing approximately 3,230 feet of underground distribution line along Mitchell Lane and Hembree Lane.

1. Substation

The proposed substation property is approximately 3.2 acres in size. The permanent footprint of the substation (walled- and fenced-in areas) will measure approximately 268 feet by 220 feet. A typical three-bank substation layout and corresponding profile of a typical substation is provided in Figures 1-4 and 1-5 of the PEA.

The substation will require installation of steel bus support racks, high voltage breakers, power transformers, and switchgears. Major equipment to be installed at ultimate build-out includes:

- 115 kv bus structures for up to six element bus sections in a ring bus configuration for up to three 115 kV power line circuits and up to three 115-12 kV power transformers,
- six 115 kV circuit breakers (for switching and protecting the power line and transformers),
- three 115-12 kv power transformers,
- eighteen 115 kV disconnecting switches,
- three 12 kV metal-clad switchgear enclosures,
- twelve 12 kV distribution circuits (four circuits per switchgear enclosure), and
- two 42-foot dead-end structures supporting the power lines.

The substation will have three transformers with four distribution circuits per transformer, as capacity needs dictate. Related electric equipment at the substation will include neutral grounding reactors, instrument transformers, protective relaying, metering and control equipment, remote supervisory control and data acquisition equipment, telemetering equipment, an auxiliary alternating current and direct current power system, an electric grounding system, and underground conduits or trench systems. The unmanned substation will have automated features and remote control capabilities.

At ultimate build-out, the substation will include three 12 kV metal-clad switchgear enclosures; one switchgear enclosure will be approximately 75 feet long, 18 feet wide, and 12 feet high, and two switchgear enclosures will be approximately 28 feet long, 18 feet wide, and 12 feet high. The switchgear enclosures are used to house sensitive recording and communication equipment that requires weather protection. Switchgear enclosures will be covered in steel sheeting with a sloped roof.

These structures and all the equipment in the substation will be a non-reflective gray in color. An 8-foot-tall, pre-cast wall will border the northern side of the substation along Mitchell Lane, as requested by the Town of Windsor, and the remaining sides will be enclosed by a chain linked mesh fabric fence for security. An earth-tone colored, decorative wall design and landscaping plan will be submitted for review by the Town of Windsor. Both the wall and landscaping will be appropriate for future adjacent land uses.

2. Transmission Interconnection

The project will require looping the existing Fulton No. 1 60 kV Power Line circuit into and out of the substation. PG&E will replace an existing wood pole located on Eagle Drive approximately 120 feet west of the substation property with a new, weathered TSP. The existing pole on the Fulton No. 1 60 kV Power Line will not be replaced in the same location, but approximately 20 feet to the north to comply with Sonoma Marin Area Rail Transit (SMART) Train track crossing requirements and to minimize its visibility and avoid tree trimming. PG&E will also install one new TSP within the substation parcel, and loop the circuits to the dead-end structures into the substation. The new TSPs will have sufficient spacing between the conductors and steel supports to minimize bird contacts with the line. Figure 1-6 of the PEA depicts a typical design for the TSP poles.

3. Distribution Lines

At ultimate build-out, PG&E will install twelve new 12 kV distribution circuits. Initially, PG&E will install two distribution circuits (Circuit 1 and 2). Circuit 1 will extend underground west from the substation on the south side of Mitchell Lane, bore under the railroad, and rise up on the existing pole on the west side of the railroad tracks. Circuit 2 will extend underground east on the south side of Mitchell Lane approximately 450 feet, cross Mitchell Lane to the north side, and rise up on an overhead pole. The overhead line will continue east along the north side of Mitchell Lane until it crosses Conde Lane and then continues north across Highway 101. After crossing Highway 101, Circuit 2 will continue southeast on replaced poles along the west side of Hembree Lane until it crosses Victory Lane, and then will extend south underground for 1,200 feet to intercept the existing main feeder line that crosses Highway 101 on Shiloh Road.

At the present rate of growth in electric demand, the remaining ten circuits would be installed roughly every other year. PG&E anticipates that three circuits will be designed to extend underground west of the substation underneath the NWPRR tracks and rise up on the existing Fulton No. 1 60 kV power line, and seven circuits will extend underground east of the substation along Mitchell Lane and tie into the existing underground lines.

At the request of the Town of Windsor, PG&E will replace the existing overhead distribution line (including five existing wood poles) along Mitchell Lane in front of the substation site with approximately 1000 feet of underground cable in the roadway. PG&E will also reconductor approximately 4,500 feet of existing overhead distribution line along Mitchell Lane, across Highway 101, and along Hembree Lane until it crosses Victory Lane, where it will extend south underground for 1200 feet to intercept the existing feeder main

line that crosses Highway 101 at Shiloh Road.. The reconductoring work will require replacement of eighteen wood poles with new wood poles.

4. Access and Ancillary Areas

Access to the substation site during construction will be via Highway 101, Shiloh Road, Conde Lane, and Mitchell Lane as described in Chapter 14 of the PEA. Access to the substation site parcel will be directly off of Mitchell Lane via the existing curb cuts and driveways. The entire 3.2-acre site will be used during construction for parking and lay down areas, and for staging of construction materials and equipment; no additional lay down areas will be required.

III. THE APPLICANT

Since October 10, 1905, PG&E has been an operating public utility corporation, organized under the laws of the State of California. PG&E is engaged principally in the business of furnishing gas and electric service in California. PG&E's principal place of business is 77 Beale Street, San Francisco, California 94105.

Communications with regard to this Application should be addressed to:

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Incorporated herein by reference is a certified copy of PG&E's Articles of Incorporation, effective April 12, 2004, which was filed with the Commission in connection with PG&E's Application No. A.04-05-005 on May 3, 2004.

A copy of PG&E's most recent proxy statement was filed with the Commission on April 9 2010 in Application 10-04-017, and is incorporated herein by reference. Copies of PG&E's most recent financial statements (contained in the Form 10-Q Quarterly Report filed

on February 19, 2010, by PG&E Corporation and the Pacific Gas and Electric Company for the period ending December 31, 2009) were filed with the Commission in connection with PG&E's Application No. A.10-02-028, filed on February 26, 2010, and are incorporated herein by reference.

IV. ADDITIONAL INFORMATION REQUIRED BY SECTION IX(B) OF GO 131-D:

Pursuant to Rule 2.4 (b) of the Commission's Rules of Practice and Procedure, PG&E has submitted a Proponent's Environmental Assessment, which is attached as Exhibit A to this Application. The following information is required by Section IX.B of GO 131-D:

> *a. A description of the proposed power line and substation facilities, including the proposed power line route; proposed power line equipment, such as tower design and appearance, heights, conductor sizes, voltages, capacities, substations, switchyards, etc., and a proposed schedule for authorization, construction, and commencement of operation of the facilities.*

A detailed description of the proposed project and equipment is contained in Section II.B above and in Chapter 1 of the PEA, Exhibit A. A Preliminary Project Schedule is attached as Exhibit C.

> *b. A map of the proposed power line routing or substation location showing populated areas, parks, recreational areas, scenic areas, and existing electrical transmission or power lines within 300 feet of the proposed route or substation.*

A regional area map showing the proposed substation site, power lines, populated areas, parks, and recreational areas in the project area is attached as Exhibit B and is also provided as Figure 1-1 of the PEA, attached as Exhibit A. Detailed maps showing the proposed substation site, proposed 115 kV power line loop, and 12 kV distribution lines are provided in Chapter 1 of the PEA, Exhibit A, at Figures 1-2 and 1-7. There are no scenic areas in the project vicinity.

> *c. Reasons for adoption of the power line route or substation location selected, including comparison with alternative routes or locations, including the advantages and disadvantages of each.*

Early in the planning process, PG&E planning engineers considered several electric planning solutions and system alternatives to address the need for additional reliability and

distribution capacity, including capacity increases at existing substations, load transfers to adjacent distribution planning areas, additional distribution circuit feeders from more remote distribution planning areas, and combining distribution generation, load management, and customer energy efficiency programs. As discussed in Section 2.5 of the PEA, PG&E determined that these alternatives were either infeasible, or were not desirable due to increased construction costs without corresponding environmental benefit. PG&E then moved forward with the investigation and selection of sites for a new substation.

PG&E investigated numerous sites between the existing Fulton and Fitch Mountain Substations that could support a new substation. Of these sites, PG&E eventually identified three sites near the central part of the Fulton-Fitch Mountain DPA for further evaluation. All three alternative sites met the project's basic objectives and could be developed without prohibitive engineering or economic constraints. Although similar in some respects in terms of impacts to the environment, the sites differed with respect to potential impacts to aesthetics, air quality, biological resources, hydrology, land use and planning, and noise.

The preferred site, as detailed in Chapter 2 of the PEA, Exhibit A, was chosen due its location roughly midway between the two existing substations in the middle of the electrical load, providing the least costly and most efficient network of future distribution feeders. It was also selected because it was located near fewer sensitive receptors, was the only site located outside of Special Flood Hazard Areas, and did not impact any natural drainage. In addition, the preferred site would cause fewer impacts to environmental resources, is already owned by PG&E, and is preferred by the Town of Windsor.

d. A listing of the governmental agencies with which proposed power line route or substation location reviews have been undertaken, including a written agency response to applicant's written request for a brief position statement by that agency. (Such listing shall include The Native American Heritage Commission, which shall constitute notice on California Indian Reservation Tribal governments.) In the absence of a written agency position statement, the utility may submit a statement of its understanding of the position of such agencies.

United State Fish and Wildlife Service ("USFWS")

On May 11, 2009, PG&E spoke with the USFWS and discussed the project and the potential for the California red-legged frog ("CRLF") to occur at the proposed substation site. USFWS advised PG&E that it was unlikely that the CRLF would occur at the proposed substation site and, for this reason, that the CRLF would not be an issue in permitting for the site.

Sonoma County Permit and Resource Management Department ("PRMD")

On August 10, 2009, PG&E contacted the Airport Land Use Commission staff at the PRMD to discuss the project and inquire whether pole heights at the substation would conflict with adopted Airspace Plan for the Sonoma County Airport. All proposed poles and substation structures were subsequently confirmed to be well under the aircraft approach horizontal surface elevation.

Town of Windsor

On April 19, 2005, PG&E met with the Town of Windsor's planning staff and the Town Manager to discuss the siting of a new distribution substation in the Windsor area. On March 17, 2009, PG&E met again with the Town of Windsor's planning staff to discuss the project and to obtain relevant plans, reports, and surveys. On March 21, 2009, PG&E attended the Windsor Town Council Meeting and made a presentation on electrical system reliability and the need to locate a new substation within the Town of Windsor. The Town Council expressed a strong endorsement regarding the construction of a new substation in

Windsor. On April 17, 2009 PG&E met with Town of Windsor staff to discuss potential alternative project sites and other project issues. On July 31, 2009, PG&E spoke with Town of Windsor staff to update them on the project status. The Town responded with a letter of support dated September 21, 2009, a copy of which is included in the PEA as Attachment A.

The Native American Heritage Commission ("NAHC"):

The NAHC was consulted to determine if any cultural resource sites recorded in the Commission's Sacred Lands File occur in or near the project area. The NAHC responded that it had no sites within the study area listed on its Sacred Lands Inventory, but recommended further contacts. Additional follow-up was completed as suggested. All correspondence on this issue is included in the PEA as Attachment D.

V. MEASURES TAKEN TO REDUCE EMF EXPOSURE

Section X(A) of GO 131-D requires that applications for a PTC include a description of the measures taken or proposed by the utility to reduce the potential exposure to electric and magnetic fields ("EMF") generated by the proposed facilities. In accordance with Section X(A) of GO 131-D, CPUC Decision No. D.06-01-042 ("EMF Decision"), and PG&E's EMF Design Guidelines prepared in accordance with the EMF Decision, PG&E will incorporate the following "no-cost" and "low-cost" magnetic field reduction steps in the design of the proposed substation and related facilities:

- The interconnection to the substation will be optimally phased as a no-cost magnetic field mitigation.
- High current devices, transformers, and capacitors, reactors will be kept away from the substation property lines.
- For underground duct banks, the minimum distance will be 12 feet from the adjacent property lines or as close to 12 feet as practical.
- The new substation is located close to existing power lines to the extent practical.
- The substation property boundary has been increased to the extent practical.

The Commission's EMF Decision and PG&E's EMF Design Guidelines require PG&E to prepare a Field Management Plan ("FMP") that indicates the no-cost and low-cost EMF measures that will be installed as part of the final engineering design for the project. The FMP evaluates the no-cost and low-cost measures considered for the project, the measures adopted, and reasons that certain measures were not adopted. A copy of the Field Management Plan for this project is attached as Exhibit D.

VI. PUBLIC NOTICE

Pursuant to Section XI(A)(1) of GO 131-D, notice of the application will be sent to the Planning and Building Department, Planning Commission and the Town Council of the Town of Windsor, the Sonoma County Supervisor's Office and Permit and Resource Management Department, the California Energy Commission, the State Department of Transportation and its Division of Aeronautics, the Secretary of the Resources Agency, the Department of Fish and Game, the Department of Public Health, the California Water Resources Control Board, the Air Resources Board, the Bay Area Air Quality Management District, the North Coast Regional Water Quality Control Board, the Native American Heritage Commission, the State Department of Transportation's District Office, the U.S. Fish and Wildlife Service, all owners of land within 300 feet of the proposed project (as determined by the most recent local assessor's parcel roll available to PG&E at the time the notice is sent), and any other interested parties that have requested such notification.

In accordance with Section XI(A)(2), within ten days after filing the application, PG&E will publish notice of the application once a week for two successive weeks in the Santa Rosa Press Democrat. In accordance with Section XI(A)(3), PG&E will also post a notice of the application on-site and off-site where the proposed substation, interconnecting

power line and distribution facilities are located. PG&E will deliver a copy of the notice to the CPUC Public Advisor and the CPUC's Energy Division in accordance with Section XI(A)(3), and will file a declaration of mailing and posting with the Commission within five days after completion.

VII. REQUEST FOR TIMELY ACTION

As described in Exhibit C, PG&E's Preliminary Project Schedule, the project must be complete and operational by June 2012 in order to relieve the electric system deficiency projected to occur in this DPA and to ensure the ability of the system to safely and reliably serve the area without interruptions or emergency conditions that could otherwise result from the deficiency. With continuing residential, commercial, and light-industrial electric growth in the area, the demand for electricity is expected to exceed the available capacity of the existing facilities. With an annual growth rate of approximately 2.5 megawatts per year, the need for increased capacity in this area is forecasted to occur in summer 2012. To meet these operations requirements, PG&E must begin construction by May 2011.

Given this pressing need and the lack of anticipated environmental issues or public controversy connected with this project, PG&E respectfully requests a streamlined review and approval of this application.

VIII. EXHIBITS

The following exhibits are attached and incorporated by reference to this Application:

Exhibit A: Windsor Substation Project PEA

Exhibit B: Project Map

Exhibit C: Preliminary Project Schedule

Exhibit D: EMF Field Management Plan

IX. CONCLUSION

WHEREFORE, Applicant Pacific Gas and Electric Company respectfully requests that the Commission issue an order pursuant to GO 131-D, effective immediately, granting PG&E a Permit to Construct the Windsor Substation Project.

Dated in San Francisco, California, this 21st day of April, 2010.

Respectfully submitted,

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By: _____*/s/ Jo Lynn Lambert*_____
JO LYNN LAMBERT

Attorneys for Applicant
PACIFIC GAS AND ELECTRIC COMPANY

SCOPING MEMO INFORMATION

Category:

Ratesetting. Pursuant to Rule 2.1(c) of the Commission's Rules of Practice and Procedure, the application must propose a category for the proceeding as defined in Rule 1.3. If none of the enumerated categories are applicable, proceedings will be categorized under the catch-all "ratesetting" category. (CPUC Rule 7.1 (e)(2).) The Commission has consistently found that applications for CPCNs and PTCs under GO 131-D do not fit within any of the enumerated categories and should therefore be considered as "ratesetting proceedings."

Need for hearing:

The CPUC has determined that issues related to project need and cost are not within the scope of PTC applications, leaving only environmental review as a relevant issue. No areas of environmental or other public concern are known. If concerns about the project are raised, PG&E recommends that a public participation hearing be held.

Issues:

None known.

Proposed Schedule:

See Exhibit C, attached.

VERIFICATION

I, the undersigned, declare:

I am an officer of PACIFIC GAS AND ELECTRIC COMPANY, a corporation, and am authorized to make this verification on its behalf. The statements in the foregoing document are true of my own knowledge, except as to matters which are therein stated on information or belief, and as to those matters I believe them to be true.

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

Executed on April 14, 2010, at San Francisco, California.

_*/s/ Des Bell*_____
Des Bell
Senior Vice President Shared Service and
Chief Procurement Officer

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EXHIBIT A

PROPONENT'S ENVIRONMENTAL ASSESSMENT

[Proponent's Environmental Assessment (PEA) was <u>filed separately in paper form</u>]

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EXHIBIT B

PROJECT MAP

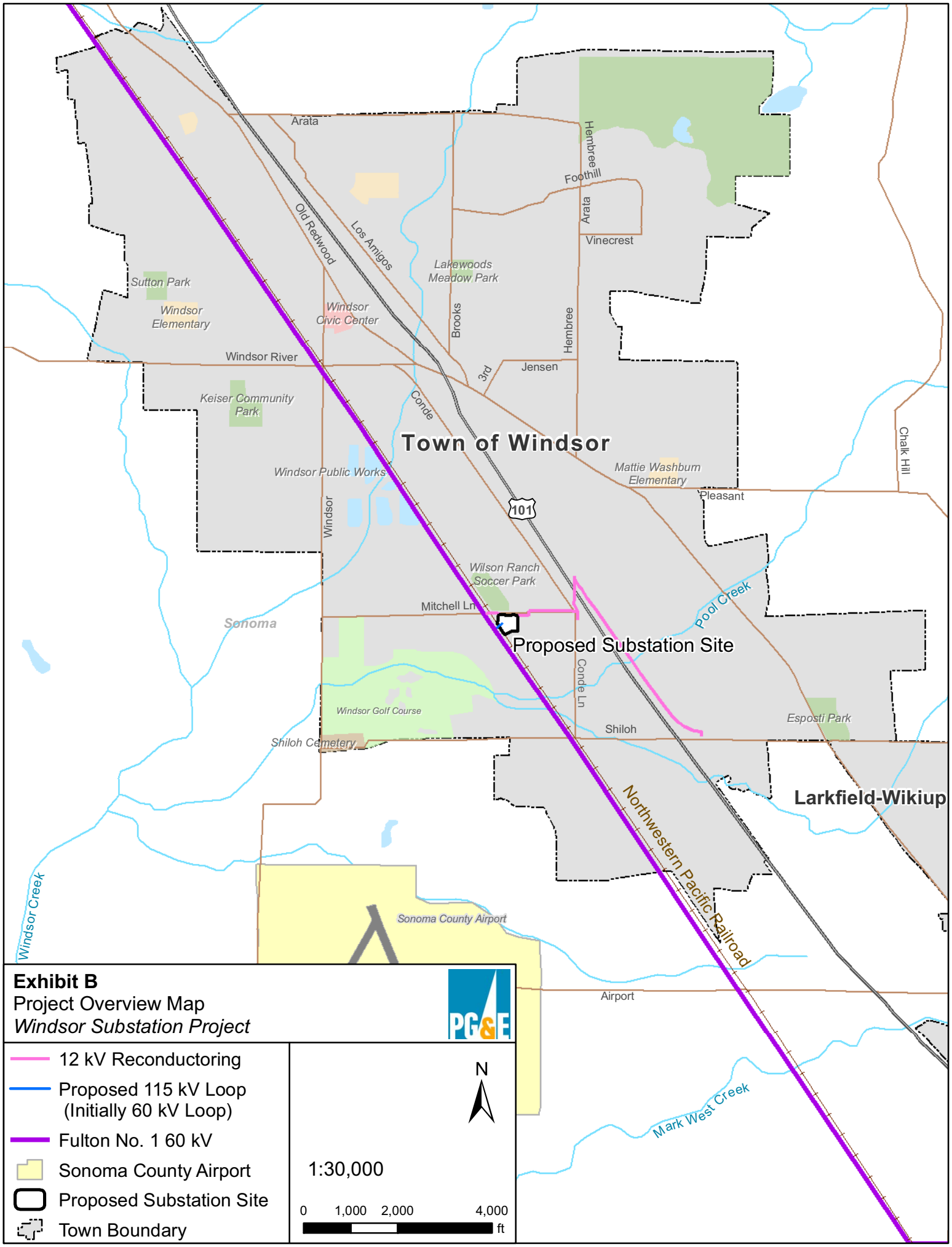

Exhibit B
Project Overview Map
Windsor Substation Project

- 12 kV Reconductoring
- Proposed 115 kV Loop (Initially 60 kV Loop)
- Fulton No. 1 60 kV
- Sonoma County Airport
- Proposed Substation Site
- Town Boundary

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EXHIBIT C

PRELIMINARY PROJECT SCHEDULE

Exhibit C

WINDSOR SUBSTATION PROJECT
PRELIMINARY PROJECT SCHEDULE

PTC Application submitted	April 21, 2010
Preliminary CPUC review, notice of deficiencies, if any	May 20, 2010 or sooner (given pre-application review)
Response to any deficiencies	June 14, 2010 or sooner
Application complete	June 14, 2010 or sooner
Draft Mitigated Negative Declaration released	August 13, 2010
Public Review Period begins	August 13, 2010
Close of Public Review Period	September 13, 2010
Mitigated Negative Declaration completed and adopted (no later than 180 days (6 months) from complete application per CEQA Guidelines 15107)	December 14, 2010
PTC Decision Adopted and Effective	December 14, 2010
Acquisition of Required Permits	September 2010-May 2011
Materials Procurement (long lead)	September 2010-September 2011
Construction Begins	May 2011
Construction Complete	May 2012
Project Operational	June 1, 2012

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EXHIBIT D

EMF FIELD MANAGEMENT PLAN

WINDSOR SUBSTATION PROJECT

A. Power Line Loop EMF Field Management Plan

I. General Description of Project

Project Lead: Project Manager, Electric Transmission Maintenance and Construction

Transmission Lines: Fulton No. 1 60kv Line

Distribution line Underbuild: 12 kV.

Scope of Work:

This project will install a tap off an existing wood pole located along the Fulton No. 1 60 kV power line (at Eagle Drive) to a new TSP within PG&E's new Windsor Substation parcel, to support a interconnection between the substation and the Fulton No. 1 power line.

II. BACKGROUND: CPUC DECISION 93-11-013 AND EMF POLICY

On January 15, 1991, the CPUC initiated an investigation to consider its role in mitigating the health effects, if any, of electric and magnetic fields from utility facilities and power lines. A working group of interested parties, called the California EMF Consensus Group, was created by the CPUC to advise it on this issue. It consisted of 17 stakeholders representing citizens groups, consumer groups, environmental groups, state agencies, unions, and utilities. The Consensus Group's fact-finding process was open to the public, and its report incorporated concerns expressed by the public. Its recommendations were filed with the Commission in March 1992.

In August 2004 the CPUC began a proceeding known as a "rulemaking" (R.04-08-020) to explore whether changes should be made to existing CPUC policies and rules concerning EMF from electric transmission lines and other utility facilities.

Through a series of hearings and conferences, the Commission evaluated the results of its existing EMF mitigation policies and addressed possible improvements in implementation of these policies. The CPUC also explored whether new policies are warranted in light of recent scientific findings on the possible health effects of EMF exposure.

The CPUC completed the EMF rulemaking in January 2006 and presented these conclusions in Decision D.06-01-042:

- The CPUC affirmed its existing policy of requiring no-cost and low-cost mitigation measures to reduce EMF levels from new utility transmission lines and substation projects.

- The CPUC adopted rules and policies to improve utility design guidelines for reducing EMF, and provides for a utility workshop to implement these policies and standardize design guidelines.

- Despite numerous studies, including one ordered by the Commission and conducted by the California Department of Health Services, the CPUC stated "we are unable to determine whether there is a significant scientifically verifiable relationship between EMF exposure and negative health consequences."

- The CPUC said it will "remain vigilant" regarding new scientific studies on EMF, and if these studies indicate negative EMF health impacts, the Commission will reconsider its EMF policies and open a new rulemaking if necessary.

In response to a situation of scientific uncertainty and public concern, the decision specifically requires PG&E to consider "no-cost" and "low-cost" measures, where feasible, to reduce exposure from new or upgraded utility facilities. It directs that no-cost mitigation measures be undertaken, and that low-cost options, when they meet certain guidelines for field reduction and cost, be adopted through the project certification process. PG&E was directed to develop, submit and follow EMF guidelines to implement the CPUC decision. Four percent of total project budgeted cost is the benchmark in implementing EMF mitigation, and mitigation measures should achieve incremental magnetic field reductions of at least 15%.

III. ELECTRIC AND MAGNETIC FIELDS (EMF)

EMF is a term used to describe electric and magnetic fields that are created by electric voltage (electric field) and electric current (magnetic field). Power frequency EMF is a natural consequence of electrical circuits, and can be either directly measured using the appropriate measuring instruments or calculated using appropriate information.

Electric fields are present whenever voltage exists on a wire, and are not dependent on current. The magnitude of the electric field is primarily a function of the configuration and operating voltage of the line and decreases with the distance from the source (line). The electric field can be shielded (i.e., the strength can be reduced) by any conducting surface, such as trees, fences, walls, buildings, and most types of structures. The strength of an electric field is measured in volts per meter (V/m) or kilovolts per meter (kV/m).

Magnetic fields are present whenever current flows in a conductor, and are not dependent on the voltage of the conductor. The strength of these fields also decreases with distance from the source. However, unlike electric fields, most common materials have little shielding effect on magnetic fields.

The magnetic field strength is a function of both the current on the conductor and the design of the system. Magnetic fields are measured in units called Gauss. However, for the low levels normally encountered near electric utility facilities, the field strength is expressed in a much smaller unit, the milliGauss (mG), which is one thousandth of a Gauss.

Power frequency EMF are present wherever electricity is used. This includes not only utility transmission lines, distribution lines, and substations, but also the building wiring in homes, offices, and schools, and in the appliances and machinery used in these locations. Magnetic field intensities from these sources can range from below 1 mG to above 1,000 mG (1 Gauss).

Magnetic field strengths diminish with distance. Fields from compact sources (i.e., those containing coils such as small appliances and transformers) drop off with distance "r" from the source by a factor of $1/r^3$. For three-phase power lines with balanced currents, the magnetic field strength drops off at a rate of $1/r^2$. Fields from unbalanced currents, which flow in paths such as neutral or ground conductors, fall off inversely proportional to the distance from the source, 1/r. Conductor spacing and configuration also affect the rate at which the magnetic field strength decreases, as well as the presence of other sources of electricity. The magnetic field levels of PG&E's power lines will vary with customer demand.

Magnetic field strengths for typical transmission power line loads at the edge of rights-of-way are approximately 10 to 90 mG.

IV. No Cost and Low Cost Magnetic Field Mitigation

The interconnection to the substation will be optimally phased to reduce the magnetic field at the edge of the right of way. The interconnection will have the same phasing on the top, middle, and bottom positions of the new poles (C-A-B Top-Middle-Bottom).

V. General Description of Surrounding Land Uses

Schools or Daycare: None.
Residential: One pole.
Commercial/Industrial: One pole.
Recreational: None.
Agricultural, Rural, and Undeveloped Land: None.

Priority Areas where Low Cost Measures are to be Applied

The one pole in the residential land use area is considered for magnetic field reduction.

VI. Conclusion - Field Reduction Options Selected

The interconnection to the substation will be optimally phased as a no cost magnetic field mitigation.

There are no feasible low cost field reduction measures that can be implemented on this project.

B. Substation EMF Field Management Plan Checklist

No.	No Cost and Low Cost Magnetic Field Reduction Measures Evaluated for a Substation Project	Measures Adopted? (Yes/No)	Reason(s) if not Adopted
1	Keep high current devices, transformers, and reactors away from the substation property lines.	Yes	
2	For underground duct banks, the minimum distance should be 12 feet from the adjacent property lines or as close to 12 feet as practical.	Yes	
3	Locate new substations close to existing power lines to the extent practical.	Yes	
4	Increase the substation property boundary to the extent practical.	Yes	

CERTIFICATE OF SERVICE BY HAND DELIVERY

I, the undersigned, state that I am a citizen of the United States and am employed in the City and County of San Francisco; that I am over the age of eighteen (18) years and not a party to the within cause; and that my business address is 77 Beale Street, B30A, San Francisco, California 94105

On April 21, 2010, I served a true copy of:

APPLICATION OF PACIFIC GAS AND ELECTRIC COMPANY FOR A PERMIT TO CONSTRUCT THE WINDSOR SUBSTATION PROJECT

by hand delivery, addressed to:

Jenny Au
Division of Ratepayer Advocates
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102

Eric Chiang
Energy Division
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102

I certify and declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on this 21st day of April 2010 at San Francisco, California.

/s/ Donna Lee
DONNA LEE