

NORTHERN CALIFORNIA POWER AGENCY WILDFIRE MITIGATION PLAN

VERSION 1.1

VERSION HISTORY

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EXECUTIVE SUMMARY

Northern California Power Agency (NCPA) has prepared the following Wildfire Mitigation Plan (WMP) in accordance with California Public Utilities Commission (CPUC) regulation 8387 (SB 901). NCPA is a Joint Powers Agency, which owns and operates several electrical generation facilities to support its members' generation needs.

The objective of this WMP is to reduce the risk of wildfires that could be ignited or propagated by NCPA electrical equipment or facilities in high fire threat locations. The plan describes the range of activities that NCPA is taking to mitigate the threat of power line-ignited wildfires, including its current programs, policies, and procedures as well as future plans to decrease risk and improve resiliency. The plan has prioritized the prevention of elements that create a wildfire event: 1) fuel, or geographic conditions represented by the California Department of Forestry and Fire Protection (CAL FIRE) and the CPUC risk maps, and 2) ignition, represented by facilities subject to creating a fire. The facility types of highest interest are open wire power lines (transmission and distribution) that are near heavy vegetation or forest.

NCPA has no retail customers. As such, this report focuses exclusively on NCPA electrical facilities with minimal discussion regarding customer communication typical of other utility WMPs.

1. OVERVIEW

1.A. POLICY STATEMENT

The Northern California Power Agency (NCPA), a California Joint Action Agency, has an overarching goal to provide safe, reliable, and economic electric service to its public power members and associate members. To meet this goal, NCPA constructs, maintains, and operates its equipment in a manner that minimizes the risk of wildfire ignition and propagation caused by NCPA-owned and -operated electric utility equipment (generation, generation tie-lines, and distribution).

1.B. PURPOSE OF THE WILDFIRE MITIGATION PLAN

The objective of this Wildfire Mitigation Plan (WMP) is to reduce the risk of wildfires that could be ignited or propagated by NCPA electrical equipment or facilities in high fire threat locations.

The plan describes the range of activities that NCPA is taking to mitigate the threat of power line-ignited wildfires, including its current programs, policies, and procedures as well as future plans to decrease risk and improve resiliency. This plan is subject to direct supervision by the NCPA Commission and is implemented by the NCPA General Manager. This plan complies with the requirements of Public Utilities Code section 8387 (origin SB-901) for publicly owned electric utilities to prepare a wildfire mitigation plan by January 1, 2020, and to review and update it annually thereafter.

Historically, NCPA has continuously improved its practices to minimize wildfire risks. This includes:

- A transmission line vegetation management program that is compliant with North American Electric Reliability Corporation Standard FAC-003 and CAL FIRE regulations
- Compliance with CAL FIRE and California Public Utilities Commission regulations and guidance for overhead distribution and transmission lines
- CAL FIRE emergency response plans
- Power management/dispatch response procedures
- Periodic equipment inspections and safe work practices
- Workforce training

This WMP is in response to the requirements of California Senate Bill 901 (SB-901). It supersedes a prior plan drafted and approved prior to SB-901, specifically pursuant to Public Utilities Code, Division 4.1, Chapter 6 Wildfire Mitigation (effective January 1, 2017).

In 2019, NCPA initiated the development of this current WMP. NCPA hired POWER Engineers (POWER) to evaluate NCPA's electrical facilities, processes, and documentation based on the design, configuration, operations, maintenance, and condition of NCPA facilities in relation to their potential to initiate a wildfire event. The evaluation included consideration of NCPA system descriptions, record design/construction documents, typical facilities layouts, basic fire protection system features, data sheets, inspection practices and procedures, baseline vegetation conditions, potential climate change effects, vegetation management practices, fire threat and hazard maps, and other documentation.

The investigation also included limited on-site surveys for better understanding of the general design, configuration, and condition of NCPA equipment and the surrounding environment for identification of associated risks.

POWER then prepared a wildfire mitigation report with prioritized recommendations for potential improvement. The analysis and recommendations of that report formed the basis for development of site-specific implementation plans with action items scheduled on the basis of risk and cost. These plans provide guidance for NCPA to identify, correct, remediate, or employ new or better methods to be prepared for, reduce, and eliminate the risk of wildfires in and around NCPA facilities. The conclusions of the wildfire mitigation report also helped inform the development of this WMP.

1.B.1. COORDINATION WITH LOCAL AGENCIES

NCPA's local coordination efforts related to wildfire mitigation include regular meetings for its Emergency Action Plan process. For example, the NCPA Hydroelectric facility hosts an annual face-to-face meeting with local emergency management agencies including: the U.S. Forest Service; CAL FIRE; sheriff departments for Calaveras, Tuolumne, and Alpine Counties; California Highway Patrol; California Department of Parks and Recreation (Calaveras Big Trees State Park); and others. In addition, a separate annual meeting is held with the U.S. Forest Service, since many NCPA Hydroelectric facilities are located on U.S. Forest Service lands. Wildfire mitigation is one of the agenda items that is always explicitly discussed.

The NCPA Hydroelectric and Geothermal facilities also coordinate vegetation management activities with CAL FIRE and routinely utilize CAL FIRE (in cooperation with California Department of Corrections Conservation Fire Camp labor) for vegetation management and wildfire mitigation around the facilities. Additionally, NCPA Geothermal facility staff meet annually with Pacific Gas and Electric (PG&E), Calpine (operator of other geothermal facilities at the Geysers), CAL FIRE, the Bureau of Land Management, and Lake County Sanitation District.

1.C. ORGANIZATION OF THE WILDFIRE MITIGATION PLAN

This WMP includes the following elements:

- Objectives of the plan
- Roles and responsibilities for carrying out the plan
- Identification of key wildfire risks and risk drivers
- Description of wildfire prevention, mitigation, and response strategies and programs
- Metrics for evaluating the performance of the plan and identifying areas for improvement
- Review and validation of the plan
- Timelines

2. GOALS

2.A. MINIMIZING SOURCES OF IGNITION

The primary goal of this WMP is to minimize the probability that NCPA's transmission and distribution system may be the origin or contributing source for the ignition of a fire. NCPA's priorities include facility improvement projects as well as continued and improved inspection, maintenance, and vegetation management practices. NCPA has evaluated and will continue to evaluate and implement prudent and cost-effective improvements to its physical assets, operations, and training that can help to meet this objective.

2.B. RESILIENCY OF THE ELECTRIC GRID

The secondary goal of this WMP is to improve the resiliency of the electric grid. As part of the development of this plan, NCPA has assessed and will continue to assess new industry practices and technologies that will reduce the likelihood of an interruption (frequency) in service and improve the restoration (duration) of service.

2.C. IDENTIFYING UNNECESSARY OR INEFFECTIVE ACTIONS

The final goal for this WMP is to measure the effectiveness of specific wildfire mitigation strategies. Where a particular action, program component, or protocol is determined to be unnecessary or ineffective, NCPA will assess whether a modification or replacement is merited. This plan will also help determine if more cost-effective measures would produce the same or improved results.

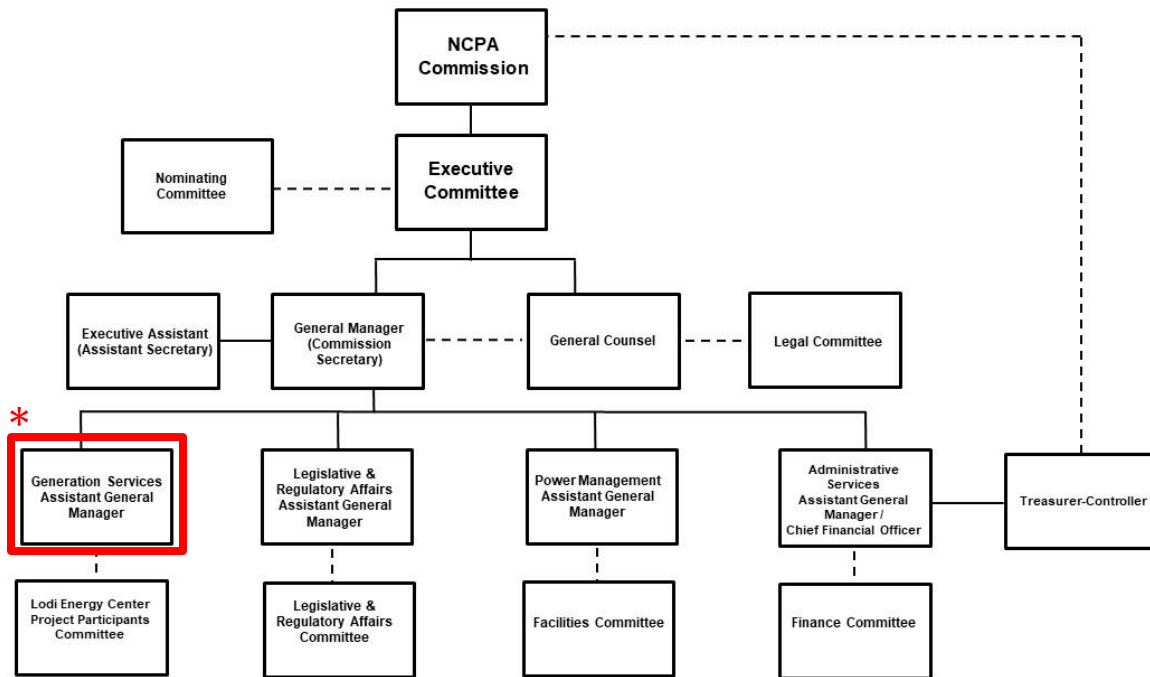
NCPA's current and planned wildfire risk mitigation activities will be formally reviewed annually according to this WMP regarding the effectiveness of ongoing practices, investigation of new technologies, and changing climate and ground conditions to continually prioritize the highest value activities for fire risk mitigation.

3. ROLES AND RESPONSIBILITIES

3.A. UTILITY GOVERNANCE STRUCTURE

NCPA is governed by a Commission that maintains several committees, including an Executive Committee, a Nominating Committee, a Legal Committee, a Legislative & Regulatory Affairs Committee, a Facilities Committee, and a Finance Committee. The Executive Committee includes a Chair, Vice Chair, and seven at-large representatives.

Among its approximately 160 employees, NCPA has an internal management team, including a General Manager; an Assistant General Manager for Legislative & Regulatory Affairs; an Assistant General Manager for Power Management; an Assistant General Manager for Generation Services; an Assistant General Manager for Finance & Administrative Services; a General Counsel; and an Executive Assistant & Assistant Secretary to the Commission.



*The red box above indicates the responsible department of the North Fork Stanislaus Hydroelectric Project (Hydro) and Geysers' Geothermal (Geo) Projects. NCPA Plant managers serve under the Generation Services General Manager.

3.B. WILDFIRE PREVENTION

NCPA's organizational responsibilities with respect to wildfire mitigation correspond to its two main facility locations that reside in high fire threat areas: the North Fork Stanislaus Hydroelectric Project (Hydro) and Geysers' Geothermal (Geo) Projects. Hydro and Geothermal plant managers have responsibility for operations at each respective generating facility. The plant supervisors at each location are responsible for the workforce training and execution of all policies and procedures related to fire risks, equipment design, maintenance, inspection, vegetation management, and operations for all activities at their facilities.

The NCPA Dispatch Center in Roseville, under the direction of the Assistant General Manager for Power Management, has jurisdictional and operational responsibilities for the generator tie lines, including procedures for Operating Instructions and Emergency Assistance (NCPA-PM-108) and Emergency Operating Guidelines for the Collierville-Bellota 230 kV Lines (NCPA-PM-201).

Under the direction of the Assistant General Manager for Generation Services, the plant managers are responsible for implementation and execution of the WMP with respect to their facilities (see notes in Section 3A, Governance Structure Diagram). In coordination with the NCPA Dispatch Center, the plant managers coordinate activities with internal and external entities necessary to operate and react to wildfire activity.

Additionally, all NCPA employees are responsible for:

- Performing good housekeeping practices
- Maintaining their work areas free of potentially flammable materials
- Participating in fire prevention and suppression training as required

3.C. WILDFIRE RESPONSE AND RECOVERY

The objective of crisis management is to provide direction for rapid performance of hazard assessment, prioritization, notification, and applicable actions. NCPA has evaluated potential hazards in the work environment and surrounding areas and has worked with local authorities to develop emergency response plans for each facility that address mitigation of hazards and effective response. The goals are to protect personnel, the public, the environment, and the assets of NCPA.

NCPA utilizes a number of resources to communicate emergency or hazardous conditions to personnel (including non-NCPA personnel) at geothermal plants, powerhouses, and associated facilities and locations. These resources include two-way radio communications equipment, cell phones, satellite phones, telephone landlines, email, and the Internet.

The agency maintains separate emergency response plans for Geothermal and Hydro generation projects. The plans provide guidance and emergency resources for: fire events, unplanned, sudden or non-sudden hazardous materials/waste releases, air emissions exceedances, natural or manmade disasters (earthquakes, floods, bomb threats, or suspected terrorist or sabotage events, etc.), or emergency hazards.

Any accident or incident requiring emergency response and support from external agencies shall be reported to the appropriate NCPA plant supervisor. The type and severity of the event(s) shall determine the appropriate response and course of action.

The NCPA Dispatch Center is the main point of contact for PG&E on any public safety power shutoff (PSPS) notification affecting any of NCPA's or members' generation and member loads. The NCPA Dispatch Center's responsibility is to provide relevant PG&E PSPS notification to affected members based on phone messages or emails received from PG&E through its Everbridge mass notification system. The NCPA Dispatch Center will also follow up on the Everbridge PSPS notifications with information on any planned power shutoff events based on PG&E's PSPS websites or direct PG&E communication where current and real-time information is available.

3.D. COORDINATION WITH WATER UTILITIES/DEPARTMENT

The power from the NCPA generation facilities is delivered to the California Independent System Operator (CAISO) grid. Unlike a typical public utility, NCPA does not have a defined service territory nor does NCPA deliver or provide power directly to any water utilities. However, the NCPA Hydroelectric Project does transport and deliver water owned by two (2) water utilities through infrastructure (dams and tunnels) operated by NCPA. One of those entities, the Calaveras County Water District (CCWD) owns the hydro facilities that NCPA operates to deliver this water. The Utica Water and Power Authority (UWPA) also receives some of their water through the same facilities. It is important to note that neither curtailment of NCPA generation facilities nor de-energization of the NCPA powerlines has any impact on the abilities of CCWD or UWPA to obtain water. NCPA routinely communicates and coordinates with CCWD and UWPA, and both entities are included on communication flow charts for the relevant emergency plans, such as the Emergency Response Plans.

3.E. COORDINATION WITH COMMUNICATION INFRASTRUCTURE PROVIDERS

NCPA does not provide power directly to any communication infrastructure providers and therefore does not routinely coordinate or communicate with communication infrastructure providers related to wildfire mitigation or power outages.

3.F. MUTUAL AID AGREEMENTS

NCPA members are uniquely and ideally qualified to assist with the emergency replacement of poles and wires that are necessary to return electric distribution and communication facilities to normal operating condition. However, mutual aid agreements have also long been utilized by publicly owned utilities during times of need. These agreements are usually formed and exercised among neighboring utilities as proximity allows for quick response and less travel expenses. Additionally, mutual aid agreements that have a broader geographical reach, allowing for the provision of aid from utilities across the state or nation, can provide better protection from large regional events that may result in neighboring utilities having to respond to the same emergency events. NCPA is a member of the California Utilities Emergency

Association, which plays a key role in ensuring communications between utilities during emergencies and maintains a mutual aid agreement for its members. As a member of the American Public Power Association (APPA), NCPA and its members can also authorize APPA mutual aid agreements.

4. WILDFIRE RISKS AND DRIVERS

NCPA electrical infrastructure consists of the following facilities that are in Moderate to Very High CAL FIRE Hazard Severity Zones (2009) and/or Tier 2/3 CPUC Fire Threat Zones (2018). See Appendix 1.

NCPA Project	NCPA Facility	Cal Fire Hazard Severity Zone (2009)			CPUC Fire Threat Zone (2018)	
		Moderate	High	Very High	Tier 2	Tier 3
North Fork Stanislaus Hydroelectric Project (Hydro)	Collierville Powerhouse 11523 Camp 9 Rd., Murphys, CA	-	-	X	X	-
	New Spicer Meadows Powerhouse 38.393735, -	-	-	X	-	-
	McKay's Point Diversion Dam	-	-	X	-	X
	McKay's 17kV Service Line	-	-	600 ft.	-	600 ft.
	Beaver Creek 38°14'02.94" N 120°16'43.50" W	-	-	X	-	X
	Collierville-Bellota 230kV Gen-	10 miles	11 miles	15 miles	25 miles	-
Geysers Geothermal	Plant 1, Middletown, CA	-	-	X	-	X
	Plant 2, Middletown, CA	-	-	X	-	X
	230 kV Gen-Tie Line	-	-	2.5 miles	-	2.5 miles
	Effluent Pump System and 21 kV Service Line	-	-	3 miles	-	3 miles
	Steam Field and Delivery (includes	-	-	8 miles	-	8 miles

NCPA is also a 6.13% co-tenant of the Castle Rock Junction-Lakeville 230 kV Transmission Line in the Geysers area. This line is located in a Tier 3 CPUC Fire Threat Zone and is operated and maintained by PG&E; it is included within the scope of the PG&E Wildfire Mitigation Plan.

4.A. RISKS ASSOCIATED WITH TOPOGRAPHIC AND CLIMATOLOGICAL FACTORS

Multiple wildfire risk drivers have been identified from recent wildfires. These include drought conditions, vegetation type and density, weather conditions (high winds and climate change), and local topographic features (terrain). Vegetation and climate conditions are discussed in section 5.

Primary risk drivers are weather and climate. Weather and climate include extended drought periods, changing weather patterns, and high winds. These weather and climate factors affect vegetation conditions, including vegetation health, type and density. Stressed vegetation is prone to disease, insect infestations, and increased mortality rates.

Physical conditions, such as terrain and high winds, affect fire risks. These factors influence fire movement and direction, and control migration rates. Generally, fires move upslope without strong winds, while high winds (i.e. Diablo winds) rapidly drive fires primarily in the same direction

as the wind. Topographic features, such as steep canyons, create localized conditions that affect fire movement and rates.

Several of the risk drivers are interrelated:

- **Extended drought:** Extended drought periods result in multiple stress factors for vegetation: dry trees and brush, higher susceptibility to disease and insects, easier ignition, faster burn rate, etc.
- **Vegetation type:** Fire risk is partially dependent upon vegetation type. Some vegetation burns quickly (e.g. dry grass), while other types burn hotter (e.g. hardwood trees such as oak). Each vegetation type presents its own unique challenges for vegetation management and control.
- **Vegetation density:** Vegetation density directly affects wildfire hazards. Dense vegetation generally represents the highest hazard level, while sparse vegetation density is substantially lower risk. Vegetation density is often associated with weather conditions and local micro-climates.
- **Weather:** Weather conditions include precipitation, humidity, storms, and winds. Each factor affects wildfire risks. Lightning strikes associated with thunderstorms or dry lightning are a natural cause of wildfires.
- **High winds:** High winds drive wildfires. They also down trees and sometimes down power lines. In turn, downed power lines are potential ignition sources and the documented cause of some major wildfires in California.
- **Terrain:** Topographic features and terrain affect wildfire migration and area-specific risks. Fires generally burn uphill, especially within steep canyons. Wind-driven upslope and up-canyon fires spread rapidly and represent increased fire hazards.
- **Changing weather patterns (climate change):** Climate change alters vegetation habit, causing species migration. It may result in increased or decreased precipitation, precipitation type changes (e.g. more rain than snow), higher maximum temperatures, extended heatwaves, more frequent drought. In turn, these changes may cause increased tree mortality, increased stressed vegetation, greater susceptibility to disease or insect infestation.
- **Communities at risk:** Communities located in high-hazard zones are most at risk of wildfires. The risk level changes from year to year based on overall weather conditions, as well as during the year, changing from the wet season through the dry summer and fall.
- **Fire history:** Fire history affects wildfire risks. Vegetation changes are directly associated with wildfires. In addition to consuming existing vegetation, the new landscape is open to different vegetation types, both native and invasive. With native vegetation, a natural cycle occurs with different species dominating the environment and evolving over an extended timeframe. Since different vegetation types represent varied fire hazards, the risk level also evolves over time in conjunction with vegetation changes.

Wildfires have occurred in the general region of NCPA's hydro and geothermal facilities, however NCPA facilities have not been associated with any ignition source. The 2017 Tubbs and 2019 Kincadee Fires affected areas nearby, and immediately adjacent to the geothermal facilities. The 2015 Valley Fire destroyed much of the 21kV Service Line for the Effluent Pump System.

4.B. ENTERPRISE-WIDE SAFETY RISKS

Enterprise-wide safety risks are NCPA facility actions or events that could create fire ignition sources. The methodology for identifying, monitoring, analyzing, planning, evaluating safety-wide risks are defined in NCPA's Preventative Strategies and Programs in Section 5.A. below. These risks include:

- **Equipment/structure/facilities:** Inherent risk of facilities, primarily open wire transmission and distribution ignition events
- **Object to wire or equipment contact:** Trees, birds, balloons, downed conductors, lightning strikes, or high wind events resulting in contact of equipment
- **Wire to wire contact:** Wires touching one another, and dropping molten metal to the ground
- **Vehicle operations:** Maintenance, inspection or vegetation clearing crew vehicles causing fires (i.e. catalytic converters contacting dry brush)
- **Vegetation clearing:** Chain saws and other mechanized equipment use
- **Hot Work:** Welding or other activity that could cause ignition in the area of work

4.C. CHANGES TO CPUC FIRE THREAT MAP

A key concern for NCPA is the historical risk of wildfires in the vicinity of the agency's facilities, particularly within potential fire hazard zones. Both CAL FIRE and the CPUC have developed maps to identify potential fire hazard zones, published in 2007 and 2018, respectively. NCPA has reviewed current CAL FIRE hazard severity zone and CPUC fire-threat maps with respect to agency facilities, as shown in Appendix 1. These maps have not been adjusted since the noted publication dates nor have any local agencies imposed any expansions to the maps.

CPUC Fire Threat Maps are static, based on data available at the time they were created. As noted below, wildfire risks evolve over time in response to the risk drivers listed above. In section 5, annual tree mortality data illustrates a migration of tree mortality, with the risk area expanding from year to year. NCPA will review available data and adjust fire threat hazard zones when applicable to NCPA facilities.

4.C.1. MAP COMPARISONS AND UPDATES

Currently published wildfire hazard maps from CAL FIRE and the CPUC show different boundaries for the risk areas delineated. They also use different terminology for hazard zones. Several factors could account for these boundary differences between agency maps: publication dates, study methodology, vegetation changes over time, recent wildfires, and potential climate change effects. The zones delineated by the CAL FIRE and CPUC maps are discussed below.

CAL FIRE CALIFORNIA FIRE HAZARD SEVERITY ZONE MAP

CAL FIRE generated and published Fire Hazard Severity Zone Maps for the entire state of California in 2007, including separate maps for each county. These maps delineate three hazard zone levels: moderate, high, and very high. The figures in Appendix 1 illustrate these fire hazard severity zones.

CAL FIRE is currently updating these maps. It is not known if the zones in these maps will correspond more closely to the 2018 CPUC Fire Threat Zone map boundaries. The agency will release draft versions of these updated maps for public review.

CPUC FIRE-THREAT MAPS

The CPUC has developed and published Fire-Threat Maps. These 2018 maps include Tier 2 (elevated fire risk) and Tier 3 (extreme fire risk) zones. Additionally, the CPUC uses a Tier 1 (zero to moderate fire risk) category, which includes a High Hazard Zone (HHZ) designation based on a 2018 U.S. Forest Service-CAL FIRE joint map of tree mortality HHZs. This Tier 1 information addresses the hazard areas with large expanses of dead trees and associated fire risks.

4.C.2. FIRE ZONE REVIEW PROCESS

The existing fire zone review process, set forth by regulatory agencies such as CAL FIRE and CPUC, is an important tool for reducing wildfire risks and hazards. Preparing and executing adequate vegetation management plans is a critical component of this process. The current fire zone process incorporates lessons learned from past major wildfire events, with each new occurrence adding knowledge and forming the basis for improving the process.

Since differences exist between currently published CAL FIRE and CPUC wildfire hazard zone maps, NCPA uses the most conservative approach to vegetation management and asset protection, assuming the highest risk factor from the combined datasets.

5. WILDFIRE PREVENTATIVE STRATEGIES

5.A. PREVENTATIVE STRATEGIES AND PROGRAMS

NCPA's strategies to reduce wildfire risk include continuous evaluation and improvement of its programs and procedures. Current strategies include facility maintenance programs, inspection programs, vegetation management programs, and asset documentation programs. These programs include all details such as goals, objective or percentage, monitor ongoing work, accomplishments, internal and external audits, and detailed reports.

Facility Maintenance Programs: NCPA has a robust preventive maintenance program to maintain the safe and reliable operation of its transmission and distribution lines. Given the growing risk of wildfires, opportunities for improvement have been identified and will be explored as part of each facility's improvement plan. Additionally, NCPA will utilize risk factors as identified in Section 4.B. to during improvement plan evaluations. Improvement may be implemented based on workable solutions and relative priorities:

- **The Collierville-Bellota (CB) 230 kV Gen-Tie Line:** This transmission line is NCPA's longest. Much of the line is within a Tier 2 fire threat zone. NCPA prioritizes the safe and reliable operation of the CB line. The line is over 30 years old, and a thorough review of the line and its attendant facilities was recently undertaken. A listing of maintenance improvements includes insulation, hardware, and conductor damping improvements. An avian protection plan is currently underway.
- **Mackay's Point 17 kV Overhead Line:** This three-span distribution line is in a Tier 3 fire threat zone. This short line has been maintained and is monitored consistently. Because of its location and danger tree threat, NCPA is considering hardening improvements to the line.
- **Geothermal 230 kV Gen-Tie Transmission Line:** This nine-span line connects with PG&E's 230 kV system. The line is characterized by long dead-ended spans and thick vegetation. The line is consistently inspected and maintained.
- **Geothermal Effluent Pump System 21 kV Line:** This 6-mile distribution line is in a Tier 3 fire threat zone. This line was largely rebuilt following damage caused by the 2017 Valley Fire. The wood pole line has construction framing typical to distribution construction. NCPA is considering the implementation of avian protection on this line.

NCPA Programs: NCPA will consider several of its ongoing programs including:

- **Asset documentation:** NCPA will review its current facility documentation including geographically referenced facility locations and to improve accessibility of current facility drawings, materials lists, and design criteria.
- **Emergency operating procedures:** NCPA will review existing procedures in light of current fire threat risks and lessons-learned from recent events.
- **Technology and services:** NCPA will continually explore technology and services that can improve situational awareness and timely response to emerging threats to equipment and facilities.

5.B. HIGH FIRE-THREAT DISTRICT

NCPA directly participated in the development of the CPUC's Fire-Threat Map,¹ which designates a High Fire-Threat District. In the map development process, NCPA served as a territory lead, and worked with utility staff and local fire and government officials to identify the areas of NCPA's service territory that are at an elevated or extreme risk of power line-ignited wildfire. NCPA has incorporated the High Fire-Threat District into its construction, inspection, maintenance, repair, and clearance practices, where applicable.

A key concern for NCPA is the historical risk of wildfires in the vicinity of the agency's facilities, particularly within potential fire hazard zones. Both CAL FIRE and the CPUC have developed maps to identify potential fire hazard zones, published in 2007 and 2018, respectively. NCPA has reviewed current CAL FIRE hazard severity zone and CPUC fire-threat maps with respect to agency facilities, as shown in Appendix 1.

NCPA reviewed facilities and determined the hazard zones where these facilities are located. These facilities and their locations are described in section 4.

The CPUC defines a High Fire-Threat District consisting of three areas:

- Tier 1 High Hazard Zones on the U.S. Forest Service-California Department of Forestry and Fire Protection (CAL FIRE) joint map of Tree Mortality High Hazard Zones
- Tier 2 of the CPUC Fire-Threat Map where there is an elevated risk for utility-associated wildfires
- Tier 3 of the CPUC Fire-Threat Map where there is an extreme risk for utility-associated wildfires

NCPA facilities in relation to CPUC and CAL FIRE threat maps are shown in Appendix 1 of this report.

5.C. POTENTIAL CLIMATE CHANGE EFFECTS

Climate change has affected vegetation in many ways. Droughts are longer and more severe. Large storm events are more common and intense. Summers are hotter and may include more thunderstorms. These climate change factors affect vegetation and the associated wildfire risks:

- Vegetation adapts, with plant migration into different areas
- Vegetation dries out during droughts, presenting increased fire danger
- Stressed vegetation is more susceptible to insect infestations, damaging trees, or accelerating mortality
- Thunderstorms present lightning strike risks along with strong wind events

Extended periods of intense rainfall also typically increase landslide risks. In turn, landslides could damage or topple structures, limit access, or create safety hazards by damaging roads, or

¹ Adopted by CPUC Decision 17-12-024.

cause localized tree mortality by severing root systems. Note that heavy rainfall is not the only landslide trigger mechanism, but it is the one most closely associated with climate change.

5.D. POTENTIAL CLIMATE CHANGE RISK MANAGEMENT IMPACTS

Climate change has affected the risks associated with wildfires, especially in fire hazard zones. Shifting weather patterns result in impacts to vegetation and increased wildfire risks. Some of the specific climate change impacts that affect wildfire risks include:

- Tree and underbrush growth rates
- Vegetation type changes
- Vegetation migration from existing habitats
- Stress and disease contributing to higher tree mortality

As potential impacts shift over time, fire hazard management practices will evolve and adapt to changing risk management requirements.

5.E. TREE MORTALITY

It is estimated that over 100 million trees in California died from drought-related stress between 2012 and 2017. The extended drought period left millions of acres of forestland highly susceptible to insect attacks. Drought stress is aggravated in forests with too many trees competing for limited water resources.

In 2015, California established the Tree Mortality Task Force (<https://frap.fire.ca.gov/frap-projects/tree-mortality/>). This task force was established to identify and map tree mortality areas with the greatest potential for causing harm to people and property. The High Hazard Zones were prioritized for tree removal.

Dead, rotten, and diseased trees represent two potential wildfire risks for NCPA. Tall trees adjacent to power line right-of-way represent a hazard due to falling branches or potential toppling. This threat increases substantially with tall dead trees or tall trees with dead tops. Dead or highly stressed trees are also an easily ignitable fuel source. They ignite quicker and generally burn faster than healthy trees.

5.F. VEGETATION MANAGEMENT

NCPA has developed and implemented a Transmission Vegetation Management Program (TVMP) to establish the vegetation maintenance requirements for each facility to achieve reliability of its generation interconnection system. The NCPA document, Generation Services Common Procedure GS-305: Transmission Vegetation Management Program, defines NCPA procedures for vegetation management.

NCPA meets or exceeds the minimum industry standard vegetation management practices. For transmission-level facilities, NCPA complies with NERC FAC-003-4. For both transmission and distribution-level facilities, NCPA meets: (1) Public Resources Code section 4292; (2) Public

Resources Code section 4293; (3) General Order 95 Rule 35; and (4) General Order 95 Appendix E Guidelines to Rule 35.

The TVMP enhances reliability by preventing outages from vegetation located within or adjacent to the power line right-of-way, by maintaining required clearances between power lines and vegetation within or adjacent to the right-of-way, by reporting vegetation-related outages of the system to WECC, and by documenting the process for an annual vegetation work plan. The program satisfies the requirements for vegetation management specified in NERC FAC-003-4, which requires a Generator Owner to have documented maintenance strategies, procedures, processes, or specifications to prevent the encroachment of vegetation into the Minimum Vegetation Clearance Distance of applicable lines as specified in requirement R3.

The objectives of the TVMP are to:

- Adhere to the Power Line Fire Prevention Field Guide published by CAL FIRE in November 2008 and used by California utilities for the care and maintenance of trees, shrubs, and other woody plants when pruning vegetation near electric facilities.
- Maintain defined clearance distances between the generation interconnection facilities and all trees, brush, and other vegetation that could grow too close to electrical facilities including conductors, poles, and guy wires. Since the clearances specified in the Power Line Fire Prevention Field Guide are more stringent than the MVCD described in FAC-003-4, NCPA adheres to the CAL FIRE field guide.
- Where appropriate and necessary, develop site-specific, environmentally sensitive, cost-effective and socially responsible solutions to vegetation control near the NCPA generation interconnection facilities. Document the process for the annual vegetation work plan for applicable power lines.
- Maintain public and worker safety, maintain compliance with NERC standards and other regulatory and legal requirements, provide reliable electric service that allows for operational flexibility, and promote environmental stewardship and habitat enhancement.
- Potential improvements to its programs include increasing the frequency and scope of aerial lidar surveys on its transmission and distribution facilities, and a continued emphasis on identification and timely removal of danger and hazard trees that threaten overhead transmission and distribution lines.

5.G. INSPECTIONS

NCPA performs annual inspections of its transmission and distribution facilities in accordance with General Order 95 and General Order 165. The following additional inspections have been performed on the CB 230 kV line:

- Lidar vegetation flights
- Corona scans of insulators for the past three years
- Infrared "hot-spot" inspections of conductor, conductor splices, and dead-end hardware.

In addition to its annual ground-based inspection, the Geothermal 230 kV line performed an aerial drone survey in 2019.

These inspections are documented and issued by NCPA's computerized maintenance management system (CMMS), and records of those inspections are maintained.

Strategic improvements to the inspection program include increasing the frequency and scope of inspections, increasing the use of drone-based visual inspections, consideration of new technology, improving the inspection methodology approach, and consideration of fire threat zones in the inspection programs.

The TVMP also establishes requirements for the type and schedule of right-of-way vegetation inspections.

5.H. WORKFORCE TRAINING

NCPA has implemented work rules and complementary training programs for its workforce to help reduce the likelihood of the ignition of wildfires.

Trainings for employees to cover fire hazards and NCPA's Fire Prevention Plan consists of fire extinguisher training, fire prevention training, hazardous materials handling training, and emergency response training. These trainings are conducted by an outside vendor and/or NCPA supervisors or environmental health and safety specialists.

NCPA employees also receive training on emergency response plans when the employee is assigned initially to the job, when the plan changes, and when the employee's responsibilities or designated actions under the plans change.

Each facility manager is responsible for conducting site-specific training to ensure that the purpose and function of NCPA safety procedures are understood by employees and that knowledge and skills required for safe operation are acquired by employees. Refresher training is performed and documented on an annual basis, and retraining is conducted when:

- An annual audit reveals there are deviations from or inadequacies in the employee's knowledge of the procedure or changes in the regulations
- A new or revised control method of a system or piece of equipment

The following procedures provide additional guidance for employee training specific to the areas described in these NCPA documents:

- Generation Services Common Procedure GS-101: Lock Out Tag Out Try Procedure
- Generation Services Common Procedure GS-103: Electrical Safety Procedure
- Generation Services Common Procedure GS-107: Proper Handling of Hazardous Waste
- Generation Services Common Procedure GS-111: Hot Work Procedure
- Generation Services Common Procedure GS-115: Welding Safety Procedure
- Generation Services Common Procedure GS-126: Fire Protection and Prevention Plan
- Power Management Common Procedure PM-108: Operating Instructions and Emergency Assistance

- Power Management Common Procedure PM-201: Emergency Operating Guidelines, Collierville Power House Bellota-Collierville 230kV Lines

5.I. RECLOSING POLICY

NCPA does not employ automatic reclosers on its 230 kV lines. This is a typical approach for utility operations in rugged and remote terrain, for both personnel and fire hazard safety reasons. In the event of a planned or emergency line trip, close coordination with NCPA generation services and dispatch as well as with PG&E's grid control center is mandatory, and lines are only re-energized after extensive line patrol visual confirmation. If the lines are tripped due to a forecasted or imminent wildfire or if a wildfire is believed to be caused by downed lines, close coordination with CAL FIRE's onsite representative and control center are required before NCPA's generation services attempts to energize the line.

5.J. DE-ENERGIZATION

In the event of active fire situations in the vicinity of the CB 230 kV transmission line, NCPA may be directed by CAL FIRE to de-energize the line's two circuits for firefighter and/or aircraft protection. The on-call Hydro Supervisor will coordinate Hydro personnel response to any wildland fires in and around the CB 230 kV transmission lines and contact on-site CAL FIRE personnel if necessary. If CAL FIRE requests de-energizing both of the 230 kV lines, the NCPA Dispatch Center will shut down both Collierville units before de-energizing these lines. NCPA is currently able to de-energize both circuits of the CB 230 kV line via SCADA and other procedures within 20 minutes.

The Collierville 480 VAC station service is designed to automatically transfer to the offsite PG&E 17 kV source. If the 17 kV source is not available, the 480 VAC standby diesel generator will start and provide station service power. The NCPA Dispatch Center will notify Generation Services Hydro staff of any issues with the 17 kV source or if the diesel generator is in operation. The NCPA Dispatch Center will notify the CAISO and work with PG&E's Grid Control Center to de-energize both 230 kV lines.

NCPA's Geothermal plant manager relies on PG&E to determine de-energization. NCPA's Hydro plant manager has the authority to preemptively shut off power due to fire-threat conditions; however, this option will only be used in extraordinary circumstances. NCPA will make a case-by-case decision to shut off power.

NCPA also maintains transmission line trip procedures to significantly reduce fire risk, including requiring patrols prior to restoring transmission lines. Requiring patrols during high fire risk scenarios is typical and recommended of California utilities.

5.J.1. IMPACTS TO PUBLIC SAFETY

NCPA has no retail customers, and de-energizing agency facilities will not directly affect retail customers, who will be notified by their specific utility providers of PSPS.

5.J.2. CUSTOMER NOTIFICATION PROTOCOLS

NCPA has no retail customers, so no customer notification protocols are in place. However, NCPA is the primary point of contact between PG&E PSPS and its member utilities. Formal procedures are currently in draft form to notify NCPA member utilities of de-energization activities and the protocol has been implemented several times in 2019.

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7. RESTORATION OF SERVICE

After a de-energization event, NCPA will restore service in coordination with PG&E's restoration efforts. NCPA's PM-201 and Geothermal Facilities Maintenance Procedure (GO-646) specifically address restoration for Hydro and Geothermal facilities respectively.

Evaluating of the Plan

7.A. METRICS AND ASSUMPTIONS FOR MEASURING PLAN PERFORMANCE

NCPA will track two metrics to measure the performance of this Wildfire Mitigation Plan: (1) number of fire ignitions; and (2) number of NCPA wires down.

METRIC 1: FIRE IGNITIONS

NCPA will track fire ignitions in their territory as follows:

- Self-ignited or human-caused
- An NCPA facility failure was associated with the fire
- An NCPA electrical facility wire-to-wire contact was associated with the fire
- The ignition was a result of an extreme weather event

All fires will be documented in terms of the number of acres and facilities impacted.

METRIC 2: WIRES DOWN

The second metric is the number of NCPA distribution and transmission wires downed. A wires down event includes any instance where an electric transmission or primary distribution conductor falls to the ground or on to a foreign object. NCPA will divide the wires down metric between wires down inside and outside of High Fire Threat Districts. All wires down events will be documented.

7.B. IMPACT OF METRICS ON PLAN

NCPA anticipates that tracking these metrics will help with identification of which lines are most susceptible to unexpected outages, time-of-year risks, as well as fire threat district risks. From this, NCPA will identify lines that are disproportionately impacted and will then evaluate potential improvements to the plan.

7.C. MONITORING AND AUDITING THE PLAN

This WMP will be presented to the NCPA Commission on an annual basis. Additionally, a qualified independent evaluator will present a report on this plan to the NCPA Commission. See section 8.

7.D. IDENTIFYING AND CORRECTING DEFICIENCIES IN THE PLAN

NCPA may correct deficiencies and implement plan improvements as needed. Some of these activities are defined in Section 2C. See section 1B, 4th paragraph identifying this WMP is in response to SB901 and superseding previous versions. Improvements will be documented in the annual report to the NCPA Commission.

7.E. MONITORING THE EFFECTIVENESS OF INSPECTIONS

Line inspections for NCPA fall into two categories:

1. Line patrol and evaluation of line facilities on a structure-by-structure basis. This is either ground or aerial (drone or helicopter) based.
2. Vegetation monitoring and evaluation, either ground-based on a structure-by-structure and span-by-span basis or by lidar aerial methods.

Measuring the effectiveness of these inspections can be performed by review by independent professionals of the inspection documentation and analysis in the case of the lidar vegetation inspection. A second method would include "ride-alongs" with inspection personnel to review their methodology and reporting. Lastly, an independent review of similar facilities can be performed and compared and reviewed with inspection personnel. Additional objectives are stated in Section 2C above.

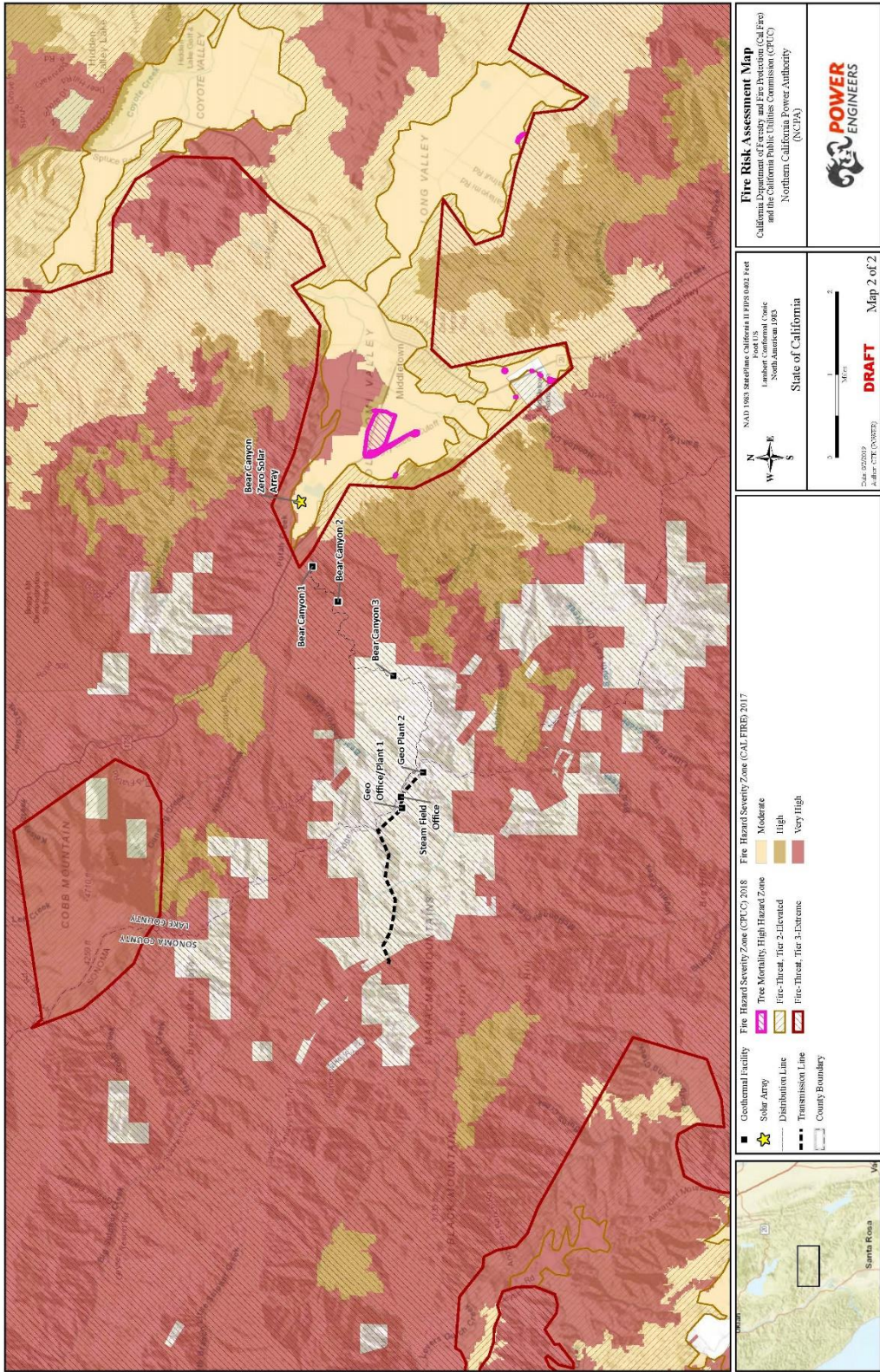
8. INDEPENDENT AUDITOR

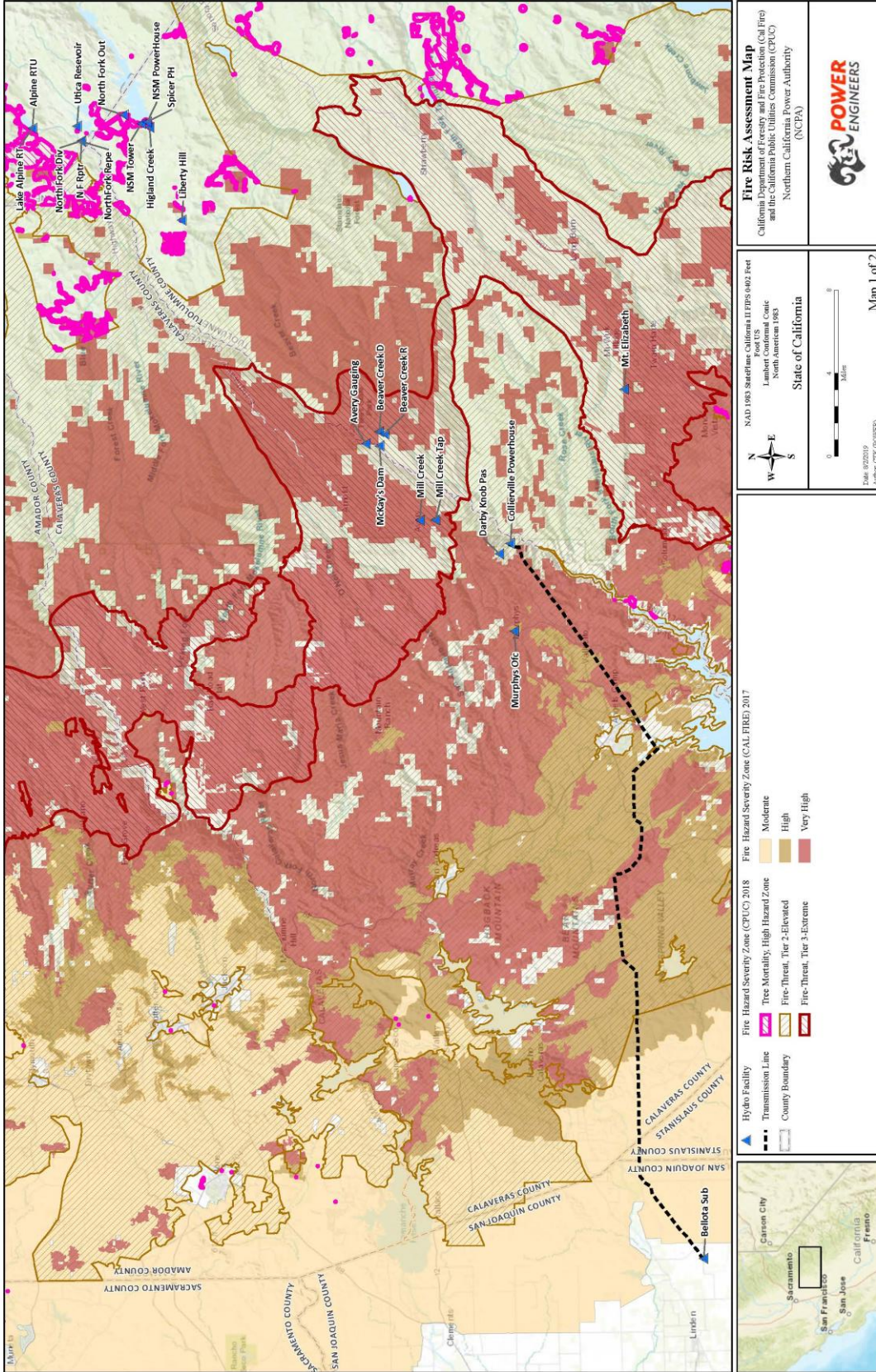
NCPA contracted with a qualified independent evaluator with experience in assessing the safe operation of electrical infrastructure to review and assess the comprehensiveness of this WMP. The independent evaluator issued a report (that is attached as an appendix to this report) and posted to the NCPA website. This report was presented to the NCPA Commission at a public meeting on May 28th 2020.

NCPA anticipated that the CPUC would provide a list of qualified independent evaluators. In lieu of such a list, NCPA will draw from a list it compiled following a Request for Qualifications issued in June 2019. The selection was based on competitive bid.

The independent evaluation and report were completed April 30th 2020.

APPENDIX 1 – FIRE RISK ASSESSMENT MAPS





APPENDIX 2 – INDEPENDENT EVALUATOR REPORT

853 LINCOLN WAY, SUITE 208
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T 530.887.8500 F 530.887.1250

April 30, 2020

12108.02

Mr. Jeremy Lawson
Northern California Power Agency
651 Commerce Drive
Roseville, CA 95678

Subject: *Evaluation of Northern California Power Agency Wildfire Prevention and Mitigation Plan*

Dear Mr. Lawson:

Dudek conducted an evaluation of the City of Northern California Power Agency (NCPA) Wildfire Mitigation Plan (WMP), as required under California Public Utilities Code (CPUC) Section 8387(b). CPUC Section 8387(b), as modified by Senate Bill (SB) 901, and the Administrative Law Judge's Ruling issued on January 17, 2019 in CPUC Docket No. R.18-10-007 (ALJ Ruling), applies to publicly-owned electric utilities and requires preparation of a Wildfire Mitigation Plan before January 1, 2020. CPUC Section 8387(c) requires that an independent evaluator review and assess the comprehensiveness of a publicly-owned utility's WMP and issue a summary report.

Dudek, as an independent plan evaluator, conducted an initial review of NCPA's Draft WMP (version 1.0). On April 21, 2020, Dudek provided a summary matrix with recommendations for Draft WMP modifications. The focus of the evaluation was to determine whether the Draft WMP addressed all required elements under CPUC Section 8387(b)(2) (included in Attachment A). The following summarizes the recommended clarifications/modifications identified during the initial review of the Draft WMP (version 1.0), by required element:

- 8387(b)(A): Provide clarification and detail regarding plan implementation responsibility.
- 8387(b)(E): Identify previous plan metrics, as available.
- 8387(b)(L): Provide details regarding risk drivers, risk impacts, and how NCPA will identify, monitor, analyze, plan/evaluate and respond to risks.
- 8387(b)(N)(i): Clarify monitoring efforts associated with WMP implementation and clearly identify performance monitoring details in the plan. Clarify plan auditing and review procedures.
- 8387(b)(N)(ii): Provide clarification and detail regarding plan implementation, review, and plan deficiency correction responsibility.
- 8387(b)(N)(iii): Clarify line/equipment inspection responsibility, timeframes, work plan approach, and target inspection goals, and performance metrics.

Subsequently, NCPA elected to modify its Draft WMP that incorporated Dudek's recommended modifications. The Revised WMP (version 1.1) was provided to Dudek on April 29, 2020. Dudek reviewed the Revised WMP and determined that it appropriately addressed all elements required under CPUC Section 8387(b)(2).

DUDEK

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12108.02
April 2020

Mr. Jeremy Lawson

Subject: Evaluation of Northern California Power Agency Wildfire Prevention Mitigation Plan

Should you have any questions or require additional information, please do not hesitate to contact me at (530) 863-4650.

Sincerely,



Scott Eckardt, RPF
Project Manager

Att.: A. Required WMP Elements under PUC Section 8387(b)
cc: Michael Huff, Dudek
Jason Neuman, Dudek



Attachment A

Required WMP Elements under PUC Section 8387(b)

Required WMP Elements under PUC Section 8387(b)

PUC 8387(b)(2) Section	Description
A	An accounting of the responsibilities of the persons responsible for executing the plan.
B	The objectives of the wildfire mitigation plan.
C	Description of the preventative strategies and programs to be adopted by the publicly owned electric utility or electrical cooperative to minimize the risk of its electrical lines and equipment causing catastrophic wildfires, including consideration of dynamic climate change risks.
D	A description of the metrics the local publicly owned electric utility or electrical cooperative plans to use to evaluate the wildfire mitigation plan's performance and the assumptions made that underlie the use of those metrics.
E	A discussion of how the application of previously identified metrics to previous wildfire mitigation plan performances has informed the wildfire mitigation plan.
F	Protocols for disabling reclosers and de-energizing portions of the electrical distribution system that consider the associated impacts on public safety, as well as protocols related to mitigating the public safety impacts of those protocols, including impacts on critical first responders and on health and communication infrastructure
G	Appropriate and feasible procedures for notifying a customer who may be impacted by the de-energizing of electric lines. The procedures shall consider the need to notify, as a priority, critical first responders, health care facilities, and operators of telecommunications infrastructure.
H	Plans for vegetation management.
I	Plans for inspections of the local publicly owned electric utility's or electrical cooperative's electrical infrastructure.
J	A list that identifies, describes, and prioritizes all wildfire risks, and drivers for those risks, throughout the local publicly owned electric utility's or electrical cooperative's service territory. The list shall include, but not be limited to, both of the following:
J(i)	Risks and risk drivers associated with design, construction, operations, and maintenance of the local publicly owned electric utility or electrical cooperative's equipment and facilities.
J(ii)	Particular risks and risk drivers associated with topographic and climatological risk factors throughout the different parts of the local publicly owned utility's or electrical cooperative's service territory.
K	Identification of any geographic area in the local publicly owned electric utility's or electrical cooperative's service territory that is a higher wildfire threat than is currently identified in a commission fire threat map, and identification of where the commission should expand the high fire threat district based on new information or changes to the environment.
L	A methodology for identifying and presenting enterprise-wide safety risk and wildfire-related risk.
M	A statement of how the local publicly owned electric utility will restore service after a wildfire.
N	A description of the processes and procedures the local publicly owned electric utility or electrical cooperative shall use to do all of the following:
N(i)	Monitor and audit the wildfire mitigation plan.
N(ii)	Identify any deficiencies in the wildfire mitigation plan or its implementation, and correct those deficiencies.
N(iii)	Monitor and audit the effectiveness of electrical line and equipment inspections, including inspections performed by contractors, that are carried out under the plan, and other applicable statutes, or commission rules.

REVISION HISTORY

Version 1.0 - NCPA Commission approved on December 5, 2019 per Resolution 19-100

Version 1.1 – NCPA Commission approved recommendations provided by the qualified independent evaluator on May 28, 2020 per Resolution 20-xyz

Dudek's Report	Revisions to WMP
8387(b)(A): Provide clarification and detail regarding plan implementation responsibility.	Added (*) asterisks note on diagram in Section 3A.. to identify project responsibility. Also addressed in section 3B. within parenthesis.
8387(b)(E): Identify previous plan metrics, as available.	Added statement to in 7D to reference section 1B 4th paragraph identifying this WMP is in response to SB901 and superseding previous versions.
8387(b)(L): Provide details regarding risk drivers, risk impacts, and how NCPA will identify, monitor, analyze, plan/evaluate and respond to risks.	Added statement of methodology in Section 4B. Per recommendation, added balloon risk potential to bullets in Section 4B.
8387(b)(N)(i): Clarify monitoring efforts associated with WMP implementation and clearly identify performance monitoring details in the plan. Clarify plan auditing and review procedures.	Added recommended statement to Section 5A to ensure monitoring and auditing responsibility back to the facility maintenance programs
8387(b)(N)(ii): Provide clarification and detail regarding plan implementation, review, and plan deficiency correction responsibility.	Added statement in Section 7D to connect the annual review of wildfire mitigation activities, section 7D includes "these improvements will be documented in the annual report to the NCPA Commission."
8387(b)(N)(iii): Clarify line/equipment inspection responsibility, timeframes, work plan approach, and target inspection goals, and performance metrics.	Added additional reference in Section 7E back to 2C identifying effectiveness objectives additionally added statement in Section 5A to clarify the details are in the specified programs (now identified in the WMP).