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California Wildfire Safety Advisory Board

Recommendations to Office of Energy Infrastructure Safety on Additional Wildfire Mitigation Plan Requirements and Performance Metrics

Adopted April 26, 2022

California Wildfire Safety Advisory Board

Cover Photos

Shown: **Shrubs Under Utility Lines, Palm Springs**

Shrubs under utility lines can act as ember catchers and prevent the invasion of flammable grasses.

See Section 3 on Vegetation Management.

Shown: **Oak Trees in Snow Near Lines**

The Board recommends assessment of vegetation beyond the immediate area beneath and closely around power lines.

See Section 3 on Vegetation Management.

Shown: **Utility Workers Using Bucket Trucks**

New technologies and protocols can pose safety concerns for implementing workers

See Section 4 on System Design and Operation.

*Shown: **PG&E Signs Directing Traffic***

Sign providing directions to Pacific Gas and Electric shelter during Public Safety Power Shutoff (PSPS).

See Section 5 on Customer Outreach

Background

Following recent catastrophic wildfires in California, Senate Bill (SB) 901 established requirements that utilities file Wildfire Mitigation Plans (WMPs) at the California Public Utilities Commission (CPUC). Assembly Bill (AB) 1054 and AB 111established the Wildfire Safety Advisory Board (WSAB or the Board) consisting of seven members appointed by the Governor, Speaker of the Assembly, and Senate Committee on Rules, and established the Office of Energy Infrastructure Safety (OEIS) [1] as a department in the California Natural Resources Agency (CNRA). The legislation mandates that the WSAB develop and make recommendations to OEIS related to the electric corporations' WMPs. To meet its AB 1054 mandate, the WSAB operates as an independent entity from the OEIS and CNRA, ensuring its ability to provide separate analysis and expert guidance as the basis of its recommendations to the OEIS on wildfire safety issues.

Each member of the Board brings a unique perspective and expertise to their review of WMP requirements and performance metrics. Additional information about the Board and its members can be found on its website: https://energysafety.ca.gov/what-we-do/wildfire-safety-advisory-board/[2].

The current Board members are:

- Jessica Block, Chair
- Diane Fellman, Vice Chair
- Ralph Armstrong
- Chris Porter
- John Mader
- Alexandra Syphard

2021-2022 Activities and Accomplishments

On July 1, 2021, in keeping with SB 1054 and AB 111, the Board relocated within State Government to the California Natural Resources Agency. Prior to the move, the Board, during the first half of 2021:

[1] Formerly known as the Wildfire Safety Division at the CPUC.
[2] The Board approves the recommendations found here but individual recommendations may not reflect the views of individual Board members.

- Held four, public virtual Board meetings
- Developed three sets of recommendations to the CPUC Wildfire Safety Division (the precursor to OEIS), on large IOU WMPs; Small Medium and Jurisdictional (and ITO) WMPs; and 2022 Wildfire Mitigation Plan Guidelines, Performance Metrics, and Safety Culture Assessments

Later in 2021, the Board hired new staff to help the Board continue to accomplish its required duties. Subsequently, in the second half of 2021 and the first few months of 2022, the Board:

- Developed and adopted an Advisory Guidance Opinion providing recommendations to the State's publicly owned utilities on their 2022 Wildfire Mitigation Plans.
- Developed and adopted these recommendations to OEIS on additional WMP requirements and performance metrics.

Going forward in 2022, the Board intends to develop and adopt additional recommendations to OEIS on Safety Culture Assessments, and again provide recommendations to the State's POUs on their 2023 WMPs. In addition, the Board expects to hold several public workshops.

Acknowledgements

The Board recognizes California's investor-owned utilities' (IOU) dedication to continual improve wildfire suppression and mitigation as reflected in the 2021 and 2022 WMP Updates. We are appreciative of OEIS' efforts to create greater knowledge, insight and accountability by the IOUs. Last year, the Board expressed its support for broadening and deepening OEIS expertise. Under the leadership of Director Caroline Thomas-Jacobs and Deputy Director Melissa Semcer, Energy Safety has truly become the embodiment of its name. We want to acknowledge the deepened working relationship between the Board and OEIS and express excitement about its expanding depth and breadth, especially in risk-assessment. We look forward to continued collaboration with the investor-owned utilities, the publicly owned utilities, relevant government agencies and interested stakeholders.

The Board acknowledges that our work and this document would not be possible without the skill, creativity, and expertise of our advisor and staff, Timothy Tutt and Teresa Graber. These two staff are responsible for keeping the Board on schedule, building the foundation for the Board's expert recommendations, interacting with Board members and making sure that all statutory requirements are met for both our small group Bagley Keene committees and quarterly public meetings.

Table of Contents

Introduction

Pursuant to Public Utilities Code Section 326.2(b) and 8389(b)(1-3),[3] the Wildfire Safety Advisory Board provides these recommendations to the Office of Energy Infrastructure Safety (OEIS) as it updates its 2023 Wildfire Mitigation Plan) Guidelines and Performance Metrics applicable to the Investor-Owned Utilities and Small and Multi-Jurisdictional Utilities (SMJU) (collectively "IOUs" or "utilities").

The Board acknowledges and appreciates OEIS' review, consideration, and incorporation of many of the Board's recommendations in the 2022 WMP Guidelines[4]. The Board also acknowledges OEIS' efforts to hone the utilities' requirements since its first recommendations in 2021.[5] The large IOU's 2022 WMP filings are organized to be more accessible and transparent to the reviewer. Energy Safety's efforts have focused the utilities' mitigation efforts to the benefit of all Californians.

The Board adopts these recommendations for consideration by OEIS to transmit to the CPUC.

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[3] Public Utilities Code § 8389(b) states that the Board shall make recommendations to OEIS on the following:

> "(1) Appropriate performance metrics and processes for determining an electrical corporation's compliance with its approved wildfire mitigation plan.
> (2) Appropriate requirements in addition to the requirements set forth in Section 8386 for the wildfire mitigation plan [the Guidelines].
> (3) The appropriate scope and process for assessing the safety culture of an electrical corporation."

This current document provides the Board's recommendations on the first part of (1) – performance metrics – and part (2) above. The remainder of the Board's recommendations will follow in June 2022.

[4] WSAB, *Recommendations on the 2022 Wildfire Mitigation Plan Guidelines, Performance Metrics, and Safety Culture Assessment*, available at: https://energysafety.ca.gov/wp-content/uploads/docs/misc/wsab/recommendations-on-the-2022-wmp-guidelines-issued-6.30.21.pdf. See also OEIS' adopted 2022 WMP Guidelines at: https://energysafety.ca.gov/what-we-do/electrical-infrastructure-safety/wildfire-mitigation-and-safety/wildfire-mitigation-plans/2022-wmp/

[5] WSAB, Recommendations on the 2021 Wildfire Mitigation Plan Updates for Large Investor-Owned Utilities, available at:. https://energysafety.ca.gov/wp-content/uploads/docs/misc/wsd/wsab-recommendations-on-2021-large-iou-wmp-updates-issued-4.16.2021.pdf.

1 Structure and Scope

As the WMP guidelines evolve, the Board continues to assess the structure of the WMPS as well as the technical requirements in two specific areas: agency coordination on wildfire-related regulation and topical organization of the WMPs. Recognizing improvements that have occurred in these areas and understanding that OEIS's current Guidelines workplan promises future improvements, the Board's recommendations below highlight additional measures.

The Board has revised this document from the April 18 draft posted for public comment to clarify that it is not the intent of the recommendations to alter the current structure of regulatory agency authority, but rather for the utility WMPs to clearly communicate the relevant regulatory proceedings upon which the risk mitigation efforts described therein are dependent, so that the effectiveness of the WMPs can be fully assessed with the purpose of developing better WMPs.[6]

Continued agency coordination on wildfire mitigation progress with emphasis on OEIS and CPUC. The IOU WMPs report increased information sharing and activity coordination between the utilities and federal, State, local and tribal governments, community-based organizations, the Access and Functional Needs (AFN populations), businesses, residents and the general public. There has been improvement over the past year based on feedback from stakeholders and the IOU efforts should continue that trajectory.

In particular, the Board supports close coordination between the two entities that have primary regulatory authority over IOU wildfire mitigation activities – the CPUC and OEIS. The Board recommends deepening the linkage between OEIS and the ongoing CPUC oversight of investor-owned utility general operations, including authorization of wildfire mitigation actions and the funding of those actions, recognizing that funding decisions are the purview of the CPUC.[7]

OEIS reviews and approves the IOU's wildfire mitigation activities, including the safety certificates.[8] A variety of CPUC proceedings address critical aspects of

[6] This additional paragraph was added by motion of revision in the April 26 Board meeting adopting this document.
[7] The last phrase in this sentence was added to the document for clarification in response to public comment.
[8] "To advance long-term utility wildfire safety by developing data-driven, comprehensive utility wildfire mitigation evaluation and compliance criteria, collaborating with local, State and

the overall utility wildfire mitigation and prevention efforts and factor into a utility's decision-making process in selecting specific wildfire mitigation activities and determining a long-range pathway or target for their wildfire mitigation efforts. The CPUC's efforts and outcomes in these proceedings and the actions required by the WMP guidelines demands synchronization, recognizing timing differences may lead to updated information in one venue or another,[9] to optimize the State's wildfire oversight and the IOUs ability to meet its objectives. Without it, unnecessary duplication of effort could occur, or actual conflicts may happen.

For example, Southern California Edison's (SCE) 2022 WMP, includes scope and cost forecasts for a variety of wildfire mitigation activities. This information is valuable for reviewers. However, care should be taken that it is also consistent with the utility's General Rate Case filings at the CPUC. As well, SDG&E's focus on making Public Safety Power Shutoff (PSPS) customer backup solutions green by minimizing greenhouse gas (GHG) emissions and local criteria pollutants should be consistent with similar information in the utility's CPUC dockets.

OEIS operations under the CNRA began less than 12 months ago. Coordination with its previous host entity, the CPUC, is ongoing but is not yet a fully mature structure. As OEIS builds out its organization, the Board continues to recommend designated resources to track and assess the impact of new developments in CPUC proceedings on the evaluation of WMPs and related wildfire activities. The in-house OEIS staff would follow CPUC wildfire-related proceedings, such as, safety, PSPS, microgrid, and general rate cases. Working with CPUC counterparts, the best path to provide input for the Administrative Law Judges and Commissioners on the interaction between these proceedings and OEIS's evaluation of WMPs can be established.

In addition, there should be broader collaboration with other important State agencies such as CAL FIRE. WMPs should briefly describe how utilities collaborate with CAL FIRE on vegetation management, including describing any support for or collaboration around prescribed fire in high fire threat districts and trends in collaboration over time (is collaboration improving). Such coordination will help ensure that proactive vegetation management practices by other agencies will mitigate the effects of any potential ignitions by utility infrastructure.

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federal agencies, and supporting efforts to improve utility wildfire safety culture and innovation." OEIS mission statement

[9] This phrase was added to the document for clarification in response to public comment.

OEIS should also describe their engagement with Cal OES and CAL FIRE, aimed at creating a database of all fires, even those less than one acre. The wildland-urban interface (WUI) has different fuels in general than more remote wildlands, and WUI fire data should also be included in the process. This will require larger coordination across agencies to reach a coherent, ongoing process. Future work should include consideration of ways that emergency data can be better documented and included and point to more accurate lessons to be learned.

Topical organization for 2023 WMP Guidelines. Utilizing the lens of a public reader, whether government, community-based organization or general citizen, the Board assesses the accessibility of the WMPs content. The goal is eliminating as much redundancy and unneeded cross-referencing as possible. For 2023, OEIS's stated intention is to fully revise the guidelines in advance of the IOUs preparation of comprehensive new WMPs (as required, rather than updates, every three years). It has engaged the consulting firm of Jensen Hughes[10] to advise and assist in this massive undertaking, the public portion of which began with a workshop on Friday, April 22. Jensen Hughes will present high-level Guideline proposals and take initial public comment on the direction of modifications. The Board's recommendations herein are developed to inform the 2023 Guidelines in conjunction with the Jensen Hughes output and create a full and comprehensive revision of the Guidelines.

To that end, the Board recommends revamping the Executive Summary section of the WMPs to be both comprehensive yet simplified. This could be achieved by including an overview at the front of the WMPs so that reviewers, including interested members of the general public, can relatively quickly understand the utility's wildfire mitigation efforts, its progress from the last WMPs filing, and plans to enhance the efforts in the near and long term to reduce the wildfire risk for their customers and the State. This initial section does not have to create new material and could incorporate relevant and illustrative charts and figures such as the very effective visual aids that utilities often create for workshop presentations. Pacific Gas and Electric's (PG&E) 2022 WMP has excellent examples, such as Figure ES-3 on page 6.

This would be followed by detailed sections or appendices organized by specific broad topics and mitigation measures, so that all information relevant to a particular topic can be found in one section, avoiding extensive duplicative narratives and cross-referencing. Broad topical sections could focus for example on "grid enhancement and operations" or on "vegetation

[10] Safety, Security & Risk-Based Engineering & Consulting | Jensen Hughes

management and inspections" or on "emergency planning and community coordination." This would allow subject matter expert reviewers a comprehensive but relatively concise section with information in the detail necessary for them to fully understand and vet the WMPs.

The goal should be as much transparency and accessibility to the WMPs as possible. SCE's links in the Table of Contents of the WMP are a good example of a helpful practice. In general, a reviewer should be able to get a complete picture from the utility WMPs as stand-alone documents. Those interested in more detail on a particular topic or aspect of a utility's plans should be able to access any detail background or supporting documents through links in the actual WMP, without having to resort to having the knowledge to find a multitude of separate utility filings and documents.

In the current 2022 WMPs, the Board notes that reviewers need to jump around from page to page and section to section to find relevant topical information. The Board believes that one factor is the Guidelines structure which is currently under review and supports all efforts by OEIS to develop the 2023 Guidelines with an eye to minimize redundancy amongst disparate sections, covering one part of a topic on one page an another somewhere else in the document. At the same time, the Board recognizes that it is a challenge to eliminate redundancy while maximizing the continued inclusion of meaningful and necessary information.

Access to Government Wildfire Mitigation and Suppression Requirements. The Board appreciates that the 2022 WMP Updates contain Section 9.2 "Citations for Relevant Statutes, Proceedings, and Orders" that requires the IOUs to include the citations for relevant State and federal statutes, CPUC directives, orders, and proceedings and refer to the specific WMP section where discussed. This is an extremely useful first step. For 2023, the Board recommends similar information to that in Section 9.2 remain with the further addition of links to: 1) the WMP sections referenced (as does PG&E) and 2) the appropriate reference material (as does SCE in its supplemental materials). In this manner, the reader can easily see the reference in the document and read the source material, if desired.

Specific guidance to SMJUs and ITOs. The Board continues to suggest that OEIS develop a revised set of Guidelines for the small and multi-jurisdictional utilities (SMJUs) and the independent transmission owners (ITOs), that have smaller service territories than the three large utilities. These separate and specific Guidelines could provide specific guidance to the SMJUs and ITOs to help them

best allocate limited resources and relieve these smaller entities from detailed reporting requirements that are more applicable for the large IOUs.

OEIS should consider a simplified template such as that recommended by the Board for the Publicly Owned Utilities (POUs). These summary templates may not apply well to the large IOUs, but perfectly acceptable and reasonable for the smaller SMJU and ITO WMPs. At the same time, OEIS should continue to ensure that these jurisdictions are still providing WMPs that provide reviewers the information they need to understand wildfire risks, mitigation activities, and plans and targets in these areas.

The Board looks forward to working with OEIS as the 2023 Guidelines are developed to direct the structure of WMPs.

BOARD RECOMMENDATIONS

1. The Board recommends that OEIS continue to coordinate wildfire mitigation plan evaluation efforts with other governmental entities and, in particular, the California Public Utilities Commission and its relevant proceedings.
2. OEIS should revise the WMP guidelines to include a simplified and comprehensive utility overview and mitigation plan summary at the beginning of WMPs. These initial sections should include relevant and illustrative charts and figures to assist in reviewers understanding.
3. WMPs should briefly describe how utilities collaborate with CAL FIRE on vegetation management, including describing any support for or collaboration around prescribed fire in high fire threat districts and trends in collaboration over time (is collaboration improving).
4. The Board recommends that OEIS incorporate a topical organizational approach to the 2023 WMP Guidelines.
5. The material contained in Section 9.2 of the 2022 Guidelines should be included in 2023. Additionally, the Board recommends that links to the relevant WMP sections and to the reference materials be included.
6. OEIS should consider creating separate guidelines for the SMJUs and ITOs and consider relieving them of some of the reporting requirements, while at the same time continuing to ensure sufficient information for understanding of wildfire mitigation efforts.

2 Risk Modelling and Reporting

Reporting modeling methods, assumptions, inputs, outputs, and decision-making. The Board has previously recommended that the 2022 WMP Guidelines require that the utilities provide a deeper explanation of how they use all the components of their modeling approaches, the inputs and outputs of each of their models, more detail about modeling algorithms and assumptions, how modeling outputs affect decision-making, and further detail about the experts that they are relying upon to assess and conduct their modeling work.

The Board believes that progress has been made in this area with the 2022 WMPs but remains concerned that there are times when the utilities describe particular risks or modeling parameters as, "unknown." If modeling methods, assumptions, or uncertainties are not known, the utilities should be very cautious in using the results of such modeling for planning and operations. Contracted scientists and modelers know or can estimate these uncertainties and they must be entered in the WMPs or made available upon request if too detailed – entering "unknown" for any factor is not good practice.

The WMPs also need to articulate or point to any model customizations that have been developed, in general or for utility-specific needs, so that scientists familiar with the specific models used are made aware of any changes that may affect their understanding of results. What is needed is a definition of what the intended purpose of modelling software and modifications being used and how that purpose for the WMPs may differ from other uses of the models.

The Board is encouraged by the ongoing benchmarking of models, using recent fires and historical weather data. These validation results, including work by Technosylva using CAL FIRE data should be shared with OEIS. This helps to evaluate the quality of the models and facilitate model improvements. The current drought and similar future circumstances exacerbated by climate change imply that adjusting the models to changing conditions will be a constant effort.

The weather stations installed by IOU's have illuminated regions where particularly high wind gusts can occur, increasing risk. The utilities should report on the wind data being gathered and used to identify those regions of greatest risk and consequences, eventually leading perhaps to revision of high fire threat districts. OEIS should also be monitoring these regions in their own live dashboard.

The Board suggests that OEIS build upon the risk modelling working group meetings to hold public workshops and/or create a wildfire modeling expert review panel (including open-source academic/research modeling stakeholders such as the Pyregence Group[11]) to review possible biases in modeling. To facilitate interested stakeholder involvement, some educational content should be created so that stakeholders can better understand how the different kinds of fire behavior models and related grid and consequence models perform, for what purpose, and how they are integrated are out there and what they are good for.

The Board looks forward to seeing progress in risk modeling by: 1) incorporating better fuel moisture data and modeling of future (not just current) fuel regimes to better estimate ongoing risk; 2) including projected wind speed increases (which exponentially affects risk); and 3) determining what features best contribute to model performance.

The Board also encourages increased development and incorporation of social and ecological factors in risk modeling. This would include risks related to social vulnerability due to economic or physical factors such as access to vehicles for egress and mobility challenges. Consideration of pregnancy, asthma, and other life and health conditions should be included in the risk models. Ecological value should also be incorporated.

Including Notices of Violation in the WMPs. The Board understands that a variety of State agencies have responsibility for issuing and tracking notices of violations where utility assets are not compliant with requirements or good practices. When the Board recommended reporting on notices of violations in the 2022 WMPs, OEIS rejected the recommendation, stating that while such capability may exist in the future tracking and reviewing notices of violation is not the current focus of the WMP Guidelines.[12]

The Board believes that a utility's record on notices of violations, and particularly the trend over time in the number and type of violations, is an indicator of utility progress in managing wildfire risks on their system, and so is appropriate to include a requirement that utilities report on these in the WMPS. The Board suggests that utilities provide a tracking over time of the number of notices of violation on their systems. These should be tracked separately for violations

[11] https://pyregence.org/

[12] https://energysafety.ca.gov/wp-content/uploads/docs/misc/wsab/2021-energy-safety-recommendations-to-cpuc-on-wsab-report-8389.c-final.pdf

within high fire threat areas and without, providing intelligence about the utility's prioritization of system inspection and maintenance. In addition, utilities should provide short descriptions of any violations found categorized as "severe" and requiring immediate correction. This recommended reporting is intended to be limited, structured to be informative without being overly burdensome. For example, descriptions of all NOVs from all agencies is not contemplated.[13]

Visual Mapping of priorities and scope. The recent State Auditor's report appears to point to a degree to which the current WMPs lack sufficient clarity to easily understand the scope, priority, and sufficiency of mitigation efforts. The Board recommends that maps be created that define polygons of priority, indicating where efforts are being focused in relation to risks, with mitigation efforts also detailed by type, scope, region and timeline. A version of this kind of mapping should be publicly available, not confidential, to allow clarity to the public and interested parties in understanding what regions are being addressed and in what timelines.

BOARD RECOMMENDATIONS

1. The Board recommends that utility WMPs avoid describing risks or model parameters, etc. as, "unknown."
2. The 2023 WMP Guidelines should include tracking over time of the number of notices of violation on their systems -- tracked separately for violations within high fire threat areas and without, and providing intelligence about the utility's prioritization of system inspection and maintenance. In addition, utilities should provide short descriptions of any violations found categorized as "severe" and requiring immediate correction. OEIS should also coordinate with other State agencies and experts to review these notices of violations and recommend changes to wildfire mitigation practices.
3. The Board recommends maps be created defining polygons of priority, showing where mitigation efforts are focused in relation to risks and indicating mitigation efforts by type, scope, region, and timeline.

[13] This sentence added to the final recommendation document in response to public comment.

3 Vegetation Management: Strategies and Environmental Stewardship

The Board understands that environmental stewardship is not the focus of vegetation management for utility wildfire mitigation. However, environmental concerns are inextricably linked because they are of concern to stakeholders and so can impact these plans. The Board has heard stakeholder comments about "clear cutting" and removing legacy trees or too many trees. The Board has heard comments about potential coordination difficulties with other forest-management entities. These have come from utilities resisting some vegetation management practices because of customer opposition and from being unable to engage in desired vegetation management in a timely fashion due to environmental policies in place at forest management agencies. While the WMP guidelines may not be the most relevant place to require environmental stewardship broadly, the nexus is powerful, and the guidelines should require the utilities to report in WMPs on how their vegetation management plans interact with or are impacted by environmental stewardship policies, actions, and regulations.

This is not a one-way street where environmental policies in general impact specific vegetation management actions. Rather, as the Board has previously commented, vegetation management practices can harm surrounding ecosystems by removing old growth or legacy trees, altering hydrological systems, removing carbon, or facilitating vegetation change that reduces biodiversity. Some vegetation management practices that are harmful to ecological systems may ironically also create increased fire risk if more flammable vegetation establishes after management activities conclude. This could happen, for example, by intentionally or unintentionally converting woody shrublands to grasslands.

Smarter, more coordinated, long-term vegetation management. There is evidence that in some circumstances removal of vegetation under power assets can have unintended near and long-term consequences, such as: 1) increasing local wind speeds around power lines; 2) increasing local temperatures around power lines (meaning faster drying out of nearby vegetation); and 3) being related to tree failure in the surrounding woodlands, with potential ecological and increased wildfire implications. These changes could also facilitate larger scale vegetation changes, moving from higher moisture green vegetation to more flashy, invasive fuels that are likelier to ignite.

In short, vegetation management practices that achieve the least "fuel" around assets in the short-term may end up exacerbating long-run fire danger through growth in flammable grassland ecosystems and other unintended changes in the broader ecosystem. Indigenous vegetation that is suited to the local environment is likely to burn more slowly than many introduced species allowing more time for responders to address a wildfire.

The Board recommends that utility WMPs report on how their vegetation management plans and activities: 1) are informed by the latest fire science related to tradeoffs between fire intensity and flammability, and how these relate to specific ecosystems; 2) reflect consideration of potential longer-term ecosystem changes that may increase fire hazards, and 3) are reflective of consideration about unintended changes in wind speeds, temperatures, moisture content, and other wildfire factors. These factors vary by region and ecology and hence require input from ecologists for proper consideration and result.

The Board's vegetation management workshop in 2020 just scratched the surface of what fire scientists and ecologists are learning about vegetation management for long-term, sustainable wildfire mitigation. The ongoing utility pilot projects will also provide practical, empirical research and evidence into current and future practices. The Board understands that ecosystem wide vegetation management is not under the regulatory authority of OEIS. However, the Board intends to hold another vegetation management workshop in the second half of this year to further explore the latest science and information. The Board welcomes the opportunity to collaborate with OEIS and other agencies on utility vegetation management practices and plans, broader ecosystem interactions and impacts, and sustainable management in the long run. The Board also will collaborate on changes to G.O. 95 and other protocols to enhance the OEIS authority to consider environmental factors in their wildfire mitigation oversight efforts.

Tree replacement programs. The Board stands by the statements in the June 2021 recommendations that "Utilities must work with ecologists and data scientists to determine where tree replacement is needed to prevent damage to the environment and to maintain healthy, green, native vegetation that has the capacity to absorb embers and can mitigate against increases in local wind speeds. Trees help prevent climate change by being natural carbon sinks. Although replanting and replacing trees may have a high cost in the short-term, the potential negative impact in the long-term of tree removal will be borne by

the ecosystem where the tree was removed, the local community, and future Californians because of climate change." OEIS has responded that there will be consideration of requiring reporting on tree replacement programs and inclusion of expert consultation in utility vegetation management in the 2023 WMP Guidelines.[14] The Board looks forward to collaborating with OEIS and their Guidelines consultant, Jenson Hughes, as the 2023 Guidelines are developed and adopted, and will continue to advocate for greater inclusion of fire science expertise and reporting on consideration of a sustainable tree replacement program.

Tree removals after fires. Another fire-related aspect of long-term ecosystem management is consideration of whether and how to remove damaged trees after a wildfire, and which trees to leave for ecosystem management. The Board received public input on this issue at its vegetation management workshop in March 2, 2021 and Board Meeting on March 3 2021.[15]. Local residents care about wildfire dangers and consequences, but they also care about their natural heritage and local environmental resources. They must be informed of all planned removal activities. One public commentor from Santa Rosa described a post-fire vegetation clearance activity where a utility came through and bulldozed vegetation, potentially affecting the plants and animals in the watershed, the soil and water resources in the area, and the longer term-fire hazard. While the utility was fined for this action, more may need to be done to prevent similar actions, intended to reduce fire risk, but with unintended consequences or even opposite effects. The Board notes SCE's sponsorship of and reporting about the Electric Power Research Institute's Fuel Removal research project, scheduled to be completed as this document is being written (if not just before), and looks forward to considering the results of this study in future efforts.

The Board understands that various State agencies regulate utility vegetation management practices and that generally other agencies have the authority to prohibit specific vegetation removal practices. The Board also appreciates the inclusion of vegetation removal reporting in the 2022 Guidelines and WMPs. The Board encourages continued reporting on this topic in utility WMPs. In addition,

[14] https://energysafety.ca.gov/wp-content/uploads/docs/misc/wsab/2021-energy-safety-recommendations-to-cpuc-on-wsab-report-8389.c-final.pdf

[15] Public comments received by Nancy Macy and Dan Courtney at the WSAB Vegetation Management Workshop (March 2, 2021), and the WSAB Meeting (March 3, 2021), available at: :https://www.adminmonitor.com/ca/cpuc/workshop/202103022/ and 3.3.21 WSAB Board Meeting: https://www.adminmonitor.com/ca/cpuc/other/20210303/

the Board recommends that OEIS engage in interactions with and provide recommendations to these other agencies with authority on approving and prohibiting tree removals and other nearby vegetation management practices in the surrounding community. The Board again notes that old growth, native California trees cannot be replaced easily and should not be removed without due environmental consideration.

Utility Defensible Space Programs. The Board reiterates concerns about invasive grasses that might establish footholds in the open space from cleared vegetation (including enhanced clearances and extended pole brushing). There is increasing evidence that green trees and shrubs can absorb embers and act to reduce ignitions and hence wildfire risk, while invasive grasses can have the opposite effect. Clearance of low-growing, evergreen, woody shrubs could thus result in the opposite of the desired effect. There are trade-offs between reducing flame lengths and fire intensity (that tend to be higher in woody trees and shrubs) versus reducing ignitibility that is highest in cured herbaceous vegetation. This balance requires careful consideration, particularly when dealing with vegetation that does not pose a risk of falling or growing into a line. The Board continues to support SCE's examination of low-growing shrublands beneath lines and assets to serve as ember catchers to prevent the invasion of flammable grasses in these areas.[16] The Board supports expansion of pilot programs to plant low-growing shrubs beneath utility lines or in other areas near utility lines where the shrubs could prevent incursion of dry grasses that create a high risk of wildfire.

Use of tree growth regulators and herbicides. The Board remains concerned with use of herbicides and tree growth regulators in utility vegetation management activities due to potential environmental impacts to the surrounding ecological systems and health impacts to communities. OEIS agreed to evaluate inclusion of additional reporting requirements on these mitigation actions in the 2023 WMP Guidelines.[17] Utility WMPs should provide information on the chemical composition of tree growth regulators and herbicides used, the precautions and protocols for their application, the volumes, where and how applied (e.g. over how big of an area), the frequency of application, and plans for transitions to program alternatives that are more environmentally benign. The Board notes SDG&E's planned expansion of goat grazing for vegetation removal, building on a successful pilot.

[16] SCE 2021 WMP Update at 333.

[17] https://energysafety.ca.gov/wp-content/uploads/docs/misc/wsab/2021-energy-safety-recommendations-to-cpuc-on-wsab-report-8389.c-final.pdf.

BOARD RECOMMENDATIONS

1. The Board recommends that utility WMPs report on how their vegetation management plans and activities: a) are informed by the latest fire science related to vegetation management in different ecosystems; b) reflect consideration of potential longer-term ecosystem changes that may increase fire hazards, and c) are reflective of consideration about unintended changes in wind speeds, temperatures, moisture content, and other wildfire factors
2. The Board looks forward to collaborating on the inclusion in the 2023 WMP Guidelines of descriptions of tree replacement programs and how utility WMPs are informed by ecologists and fire scientists on staff or under contract.
3. The Board encourages continued reporting about tree removal activities in utility WMPs. In addition, the Board recommends that OEIS engage in interactions with and provide recommendations to those other agencies with authority on approving and prohibiting tree removals and other nearby vegetation management practices in the surrounding community.
4. The 2023 WMP Guidelines should require the additional and expanded pilot programs to plant low-growing shrubs as Utility Defensible Space under utility right of ways or in other areas near utility lines where the shrubs could act as ember catchers and prevent the incursion of dry grasses that create a high risk of wildfire ignition.
5. The 2023 WMP Guidelines should require WMPs to provide information on the chemical composition of tree growth regulators and herbicides used, the precautions and protocols for their application, the volumes, where and how applied (e.g. over how big of an area), the frequency of application, and plans for transitions to program alternatives that are more environmentally benign.

4 System Design and Operation

Emerging technology, research, and lessons learned. The Board appreciates the continued exploration of new technologies to reduce the risk of arcs and sparks from utility assets, as well as technology for more rapid recognition of faults that are the most problematic while rapidly restoring power where identified faults pose no danger. The utility reporting on research topics and results in the 2022 WMPs points to innovation and interesting advances. The Board recommends that the 2023 WMP Guidelines require a summary table for the utilities research efforts and pilot projects, to provide the reviewer with an overview of each utility's research projects and focus. In addition, the utility responses to the 2022 WMP Guideline requirements on research projects provide a bit of a disjointed or stilted picture of each research project as the utilities move through required descriptive elements. The Board recommends more flexibility in describing research projects, hopefully leading to a more cohesive picture of the research efforts. The Board also suggests including a clearer picture of potential technological improvements from research over the next two to five years.

The Board is interested in alternatives between overhead hardening and undergrounding. The Board is aware of installations of lines in some areas where the circuits were placed along the ground surface and then reasonably covered for safety and reliability with cement or similar coverings. The Board suggests that the potential, where appropriate, for such "de-overheading" installations be researched by the utilities and reported on in the research efforts sections of future WMPs.

OEIS may wish to consider establishing a working group looking at grid innovation, aimed at finding improvements in future risk spend efficiency for grid hardening projects. Changes in the State's climate, as well as increased population and economic activity in high-risk areas, point to the need for continuing innovation in grid technologies and practices.

The 2023 WMP Guidelines should request that utilities provide specific information about responses to lessons learned from prior fires, from research projects, and fire or weather-related experiences elsewhere in the country and world. For example, if a particular piece of equipment such as a C-Hook is found to be at fault or a major contributor to a previous wildfire (Camp Fire) the utilities should provide information in subsequent WMPS about how they are focusing on correcting problems with that specific piece of equipment elsewhere in their systems, particularly in high fire threat districts. One-hundred-

year-old equipment should not be recertified without a thorough review process by engineers looking outside the box. Current line inspectors may not see all the risks that engineers would.

The utilities should also report on whether they are including analysis of fire events in other areas, including both utility-related wildfires and utility practices and equipment that was estimated to prevent or mitigate a wildfire, and describe how they are considering changing equipment and practices on their own systems in response.

Workforce protection with new technologies. The Board recommended in 2021 that utilities describe their protocols to ensure the safety of their workforce when introducing new technologies or equipment, implementing new work practices, or during the removal, installation, and repair of equipment. OEIS responded that the Board recommendation was best addressed by the California Division of Occupational Safety and Health and/or the CPUC health and safety standards. However, the Board believes that WMPs are a suitable vehicle for descriptions of how utilities are working to keep their personnel as safe as possible in wildfire-related situations. As the utilities adopt new technologies and practices, it is reasonable for them to describe how they intend to modify procedures to protect the workforce, and this is part of a comprehensive mitigation plan. Safety agencies can and should update safety protocols as procedures and equipment changes, but describing such changes, even prior to safety agency action, belongs in comprehensive WMPs.

Idle lines and equipment. The Board previously recommended that the WMP Guidelines require that utilities: 1) identify equipment and lines that may be energized but typically not serving any customer load; 2) evaluate the risk involved in keeping idle lines or equipment energized versus de-energizing and/or completely removing from service such lines, particularly in high fire threat districts. OEIS responded that they would evaluate requiring utility reporting on energized but idle (not serving load) equipment in the 2023 Guidelines. The Board believes essential that utilities understand this issue – energized lines not serving customers have caused wildfires. The utilities may not even know where such lines or equipment exists on their system and need to come up to speed with that knowledge and report their progress in this area to OEIS pursuant to the Guidelines. Again, any such equipment identified should be evaluated by the utilities to determine the risk-informed treatment for each – from temporary de-energization during high fire threat periods to decommissioning of these assets where feasible. Analysis should include

justification of the continued operation in service of any such equipment. The Board reiterates our support of this best practice, particularly in high fire threat areas where de-energization or decommissioning of idle lines and equipment would prevent sparks.

Legacy Equipment. The Board previously recommended that guidelines require reporting of information about legacy facilities and assets that were built prior to the initial establishment of G.O. 95 protocols in 1941, both inside and outside of HFTDs.[18] The utilities should identify any such legacy equipment and describe what modification, operation, and inspection protocols they are applying to that equipment. These older lines and assets can be risky, particularly if not inspected or operated per today's standard protocols. OEIS has indicated that they would collaborate with the Board in the 2023 WMP Guidelines process to better understand whether to and how best to increase reporting of these older assets and the potential risks associated with them, given that current data reporting protocols require age information that can underly explicit application or not of specific G.O. 95 or other protocols. The Board looks forward to further discussion of and collaboration on this issue as the 2023 WMP Guidelines are developed and adopted.

Interval inspection cycles for SMJUs: The Board previously recommended that all utilities, including SMJUs and ITOs, follow the large IOUs best practices for visual and detailed inspections.[19] The Board continues to believe that the smaller utilities should conduct more detailed, invasive inspections on a three-year cycle and that all Tier 3 lines be inspected annually, all lines in Tier 2 be inspected at least every three years. All other lines should be inspected on a five-year cycle, until there is sufficient baseline information for these utilities to understand their risks.

OEIS responded by pointing out that it is G.O. 95 that determines the required inspection timeframes for these utilities, not the Guidelines, but that utilities do get maturity model credit for going beyond the required minimums.[20] The Board

[18] See G.O. 95 Rule 12.1 on applicability stating that "[t]he requirements apply to all such lines and extensions of lines constructed hereafter" the adoption of G.O. 95, which was adopted in 1941.

[19] For example, PG&E performs detailed inspections on all Tier 3 lines annually and all Tier 2 lines every three years (1/3 inspected per year). PG&E 2021 WMP Update at 237.

[20] https://energysafety.ca.gov/wp-content/uploads/docs/misc/wsab/2021-energy-safety-recommendations-to-cpuc-on-wsab-report-8389.c-final.pdf.

still believes that there is a place in the WMPs for enhanced descriptions of inspection practices at the smaller utilities. The 2023 WMP Guidelines for SMJUs and ITOs should require descriptions of whether or how these entities plan to go beyond the minimum inspection requirements to achieve a better baseline understanding of their wildfire risks.

BOARD RECOMMENDATIONS

1. The Board recommends that the 2023 WMP Guidelines require a summary table for the utilities research efforts and pilot projects and allow more flexibility in describing research projects, hopefully leading to a more cohesive picture of the research efforts.
2. The 2023 WMP Guidelines should request that utilities provide specific information about responses to lessons learned from prior fires, from research projects, and fire or weather-related experiences elsewhere in the country and world. For example, if a particular piece of equipment such as a C-Hook is found to be at fault or a major contributor to a previous wildfire, the utilities should provide information in subsequent WMPs about how they are focusing on any other installations of such equipment and considering modification or replacement to prevent similar wildfires.
3. The 2023 WMP Guidelines should require the utilities describe their protocols to provide for workforce safety when introducing new technologies or equipment and implementing new work practices.
4. The 2023 WMP Guidelines should require the utilities to identify any equipment or lines that may still be energized but not serving load and analyze whether and how best to de-energize those lines and equipment and/or remove them from service,
5. The 20223 WMP Guidelines should require reporting on utility protocols and practices applying to older legacy equipment installed prior to the current implementation of G.O. 95 standards, especially any equipment located in the high fire threat districts.
6. The 2023 WMP Guidelines for SMJUs and ITOs should require descriptions of whether or how these entities plan to go beyond the minimum inspection requirements to achieve a better baseline understanding of their wildfire risks.

5 Communication and Community Outreach

Provide better descriptions of coordination and interconnection between proceedings on stakeholder outreach. The Board previously recommended that OEIS should require in the 2022 WMP Guidelines that utilities use a CPUC-directed reporting framework on PSPS events to provide better, collaborative performance metrics in WMPs related to customer outreach on PSPS events and other wildfire mitigation actions. The OEIS in response suggested that more time was necessary to collaborate with the CPUC to determine what performance instructions and metrics in other proceedings may usefully be incorporated in WMP Guidelines and stated that such inclusion will be evaluated for the 2023 WMP Guidelines.[21] The Board encourages highlighting of that linkage in the 2023 WMP Guidelines.

Continued expansion of customer outreach: The Board is encouraged by the growing IOU customer outreach and increased collaboration with interested or impacted local stakeholders such as local governments, fire agencies, and Community Based Organizations as well as related State or national organizations and agencies that is evident in utility WMPs. The Board notes that SDG&E continues to set the bar on customer outreach, while SCE has followed close behind and PG&E has dramatically improved. Each IOU has provided detailed descriptions of expanded outreach efforts. PG&E does an excellent job of linking its outreach activities to CPUC and other public safety partner requirements and activities.

SCE targets the customers and areas most impacted by PSPS events and actively evaluates stakeholder input and refines efforts. It is also sharing its fire suppression equipment with communities when needed. SDG&E's Energy Solutions Partners Program works with a variety of local community-based organizations to help prepare customers for wildfires and related risks through presentations, meetings, emergency preparedness information, and PSPS information. With more and better information available about how community collaborations are succeeding, reviewers can help point to pathways to optimize these efforts. The Board recommends that the 2023 Guidelines continue this reporting.

[21] https://energysafety.ca.gov/wp-content/uploads/docs/misc/wsab/2021-energy-safety-recommendations-to-cpuc-on-wsab-report-8389.c-final.pdf.

Measuring effectiveness of outreach efforts. While the descriptions of outreach efforts in the 2022 WMPs are informative and make clear that progress is being made, the 2023 Guidelines should include discussion of how the utilities are optimizing ratepayer funded resources. Answering this question requires understanding of the IOU methodology for measuring outreach effectiveness.

The Board believes that public outreach and customer interaction is a critical component of the overall wildfire mitigation structure. Effective public outreach implies that a utility has been successful in reaching its customers and local stakeholders regarding the potential impacts of both wildfires and mitigation efforts. One element involves quantitative surveys with valid statistical results and the other is qualitative based on follow-up surveys with stakeholders. Presenting the utility's analytics in the WMP allows the reviewer to validate that the programs and actions are optimal in relation to effectiveness and expenditures. PG&E's 2022 WMP does this well.

The Board believes that an understanding of utility outreach efforts requires sufficient information about how the utilities have evaluated their outreach programs, what the results of those evaluations are, and how the utilities plan to make improvements based on those results.

Note that the Board is not recommending that the utilities prepare a separate, WMP-related evaluation effort. Rather, the Board recommends that the 2023 Guidelines include and/or reference material from the utilities on their evaluation efforts with and for other agencies, in particular the CPUC.

BOARD RECOMMENDATIONS

1. The 2023 WMP Guidelines should require a description of the linkage between the customer outreach and mitigation programs at the CPUC and other agencies and the OEIS requirements.
2. The 2023 WMP Guidelines should require the utilities to include continued and enhanced reporting on utility collaborative efforts with local governments and community-based organizations,
3. The 2023 WMP Guidelines should require the utilities to include additional reporting on their customer outreach evaluation analytics and how these measurements guide next steps in their WMPs utilizing reports to other agencies (such as the CPUC).

Approval

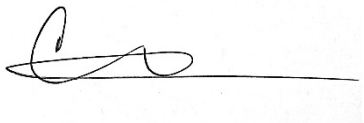
The California Wildfire Safety Advisory Board's Recommendations on additional Wildfire Mitigation Plan Guidelines and Performance Metrics were approved on April 26, 2022 and are hereby executed.

Jessica Block, Chair

Diane Fellman, Vice Chair

Ralph M. Armstrong Jr., Board Member

John Mader, Board Member



Christopher Porter, Board Member

Alexandra Syphard, Board Member