**BEFORE THE PUBLIC UTILITIES COMMISSION**
**OF THE STATE OF COLORADO**

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| **IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF COLORADO FOR APPROVAL OF WILDFIRE MITIGATION PLAN AND WILDFIRE PROTECTION RIDER** | **)** | **PROCEEDING NO. 20A-____E** |

# DIRECT TESTIMONY OF RANDY L. LYLE

**ON**

**BEHALF OF**

**PUBLIC SERVICE COMPANY OF COLORADO**

**July 17, 2020**

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO**

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## GLOSSARY OF ACRONYMS AND DEFINED TERMS

| Acronym/Defined Term | Meaning |
|---|---|
| BOF | California Board of Forestry |
| CAL FIRE | California Department of Forestry and Fire Protection |
| Commission | Colorado Public Utilities Commission |
| CO-WRAP | Colorado Wildfire Risk Assessment Portal |
| California PUC | California Public Utilities Commission |
| DSAP | Defensible Space Around Poles |
| GIS | Geographic Information System |
| IOU | Investor-Owned Utility |
| HFTD | High Fire-Threat District |
| NFDRS | National Fire Danger Rating System |
| OMS | Outage Management System |
| Public Service or Company | Public Service Company of Colorado |
| SDG&E | San Diego Gas & Electric Company |
| SME | Subject Matter Expert |
| UAS | Unmanned Aerial Systems |
| WMP or Plan | Wildfire Mitigation Plan |
| WRZ | Wildfire Risk Zone |
| Xcel Energy | Xcel Energy Inc. |

**BEFORE THE PUBLIC UTILITIES COMMISSION**
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# DIRECT TESTIMONY OF RANDY L. LYLE

## I. INTRODUCTION, PURPOSE OF TESTIMONY, AND RECOMMENDATIONS

**Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

A. My name is Randy L. Lyle. My business address is 1390 Manzanita Drive, Julian, California 92036.

**Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT POSITION?**

A. I am the owner and principal consultant of Wildfire Mitigation Strategies.

**Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?**

A. While I am employed as an independent consultant, I am testifying on behalf of Public Service Company of Colorado ("Public Service" or the "Company"), which is a utility operating company subsidiary of Xcel Energy Inc. ("Xcel Energy").

**Q. WHAT IS THE SCOPE AND PURPOSE OF YOUR DIRECT TESTIMONY?**

A. The purpose of my Direct Testimony is to support the Company's Wildfire Mitigation Plan ("WMP" or "Plan"). In my Direct Testimony I first set forth my background and experience as they relate to utility wildfire mitigation. I then explain my involvement in reviewing and advising on the Company's WMP, and

finally I provide my assessment of the Plan, explaining why I have found it to be reasonable, prudent, and effective at mitigating wildfire risk.

**Q. WAS THIS TESTIMONY PREPARED BY YOU OR UNDER YOUR DIRECTION?**

A. Yes.

**Q. ARE YOU SPONSORING ANY ATTACHMENTS AS PART OF YOUR DIRECT TESTIMONY?**

A. No, I am not.

**Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS AND CONCLUSIONS.**

A. Based on the documents I have reviewed and multiple discussions with the Wildfire Mitigation Team and supporting Subject Matter Experts ("SME"), I conclude that Public Service's proposed Plan takes a logical and rational approach to mitigating the utility's wildfire risk. It looks at landscape-level hazards (conditions present) and potential impacts on values at risk in the event of an ignition, and recommends reasonable strategies for reducing the instance of utility-caused ignitions, which are consistent with industry-accepted practices and emerging best practices. It also shows significant progress and evolution in the sophistication of Public Service's wildfire mitigation efforts, reflecting an ongoing commitment to safety and reliability. As a result, I recommend that the Colorado Public Utilities Commission ("Commission") approve Public Service's WMP as presented in this proceeding.

## II. BACKGROUND, ROLE IN THIS PROCEEDING, AND EXPERIENCE

**Q. PLEASE EXPLAIN YOUR MOST RECENT BACKGROUND AND EXPERIENCE AS IT RELATES TO UTILITIES AND WILDFIRE MITIGATION ISSUES.**

A. I recently retired from the San Diego Gas & Electric Company ("SDG&E") as the Fire Science and Coordination Program Manager after working there for 11 years and 9 months. I went to work at SDG&E in September of 2007, three weeks before the outbreak of certain major wildfires that were later attributed to SDG&E electric facilities. In the ensuing period, I helped investigate the cause and spread of those fires and provided support to the SDG&E legal and regulatory team. In response to those fires, I also mapped hazardous fire areas for SDG&E using Geographic Information Systems ("GIS") and later was involved in a statewide California Public Utilities Commission ("California PUC") effort to map hazardous fire areas where enhanced design, construction, inspection, and maintenance practices across all utilities might apply.

I also did preliminary work on siting SDG&E weather stations, responded to utility-caused fires, and helped coordinate on-site suppression and restoration efforts. I collected and analyzed ignition data for the utility and created an Ignition Management Program that methodically collects and analyzes ignition data to inform and focus future risk reduction efforts. I advised on various cutting-edge modeling programs, helping to conceptualize and build requirements for a Wildfire Risk Reduction Model. During my service at SDG&E, I was involved with exploring fire spread modeling and how it might be used in

the utility context. I was responsible for writing portions of SDG&E's 2019 wildfire mitigation plan and for reviewing other portions of the same. Prior to that, the California PUC required annual Fire Prevention Plans of the investor-owned utilities ("IOU"). I helped draft portions of SDG&E's annual Fire Prevention Plans which were precursors to SDG&E's wildfire mitigation plan.

**Q. PLEASE DESCRIBE OTHER RELEVANT MATTERS YOU HAVE WORKED ON IN THE PAST.**

A. Prior to employment with SDG&E, I retired as a Division Chief after 32 years of service with the California Department of Forestry and Fire Protection ("CAL FIRE"), where I worked in both field operations and staff positions including GIS, pre-fire engineering, and aerial firefighting. In particular, while there I worked on developing and implementing the California Fire Plan. This was a program initiated at the direction of the California Board of Forestry ("BOF"). In its 1995 Fire Plan, the BOF decided to incorporate the use of GIS for the first time in an effort to minimize government costs and citizen losses from wildfire. To do this, they also included an approach that relied heavily on stakeholder participation. GIS was used to assess landscape-level hazards and values at risk (*i.e.*, virtually any man-made or geologic feature that could be attributed with some amount of value, as I explain in more detail in the next section of my Direct Testimony). Stakeholders were brought into discussions, data was displayed, and solutions were built collaboratively. I was involved in all of these processes at the local level and then became the Northern California Fire Plan Coordinator, programmatically directing the local unit pre-fire coordinators doing the same.

This approach parallels similar processes involved in developing a wildfire mitigation plan, where assessments are made and solutions advanced based on data and analysis.

**Q. IN YOUR CURRENT ROLE AS A CONSULTANT, DO YOU HAVE ANY RECENT EXPERIENCES WITH OTHER UTILITIES' WILDFIRE MITIGATION PLANS?**

A. Yes. I have been working with a number of utilities across the western United States, assisting in the development of their wildfire mitigation plans, though I am unable to specifically disclose specific details of these engagements due to confidentiality provisions. Wildfires pose different levels of risk to different regions throughout the country, so there is no one-size-fits-all approach that applies to every jurisdiction or every utility. Although there is a lot of attention on what California utilities have accomplished, due to the well-known fire situation there, California programs are not always a perfect fit for other utilities. At the same time, given California's experiences with wildfires, I believe that the California wildfire mitigation plans provide valuable best practices to be evaluated and considered for other utilities when developing their own plans. My recent experience in developing wildfire mitigation plans has helped guide other utilities in creating reasonable, prudent programs best suited to their particular circumstances.

**Q. HAVE YOU TESTIFIED BEFORE OTHER UTILITY COMMISSIONS?**

A. I have not provided written or oral testimony, but have served as an SME for SDG&E in several complex proceedings, including Phase I and Phase II of the

California PUC's Fire Safety Proceedings[1] and High Fire-Threat District ("HFTD") mapping effort, which continued for over nine years.[2] In that role, I provided examples of how SDG&E approached the mapping of its own hazardous fire areas and was selected to be part of the California PUC-commissioned team to develop and advise on best practices for doing the same across the entire state of California. The team was assembled by CAL FIRE and the California PUC from experts with fire, GIS, and utility experience. The end result of these efforts was a statewide HFTD map and accompanying risk-differentiated regulations for enhanced design, inspection, and maintenance criteria set forth in the California PUC's General Order No. 95.[3]

**Q. WHEN DID XCEL ENERGY RETAIN YOU AS AN INDEPENDENT FIRE CONSULTANT?**

A. I was retained in May of 2020.

**Q. WHAT IS YOUR ROLE IN THIS PROCEEDING?**

A. As an Independent Fire Consultant to the Company, my role as it relates to this proceeding is to evaluate the Company's WMP based on my industry wildfire experience, and provide a thorough, independent review of the Plan and its constituent programs. I provide my evaluation of the WMP, relying on general industry wildfire mitigation best practices and insights from the experiences of

[1] California PUC Proceeding Nos. R08-11-005 and R15-05-006.
[2] More information on these proceedings is available on the California PUC's *CPUC Fire Safety Rulemaking Background* webpage, available at https://www.cpuc.ca.gov/firethreatmaps/.
[3] General Order No. 95, available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M338/K730/338730245.pdf.

California utilities, the California PUC, and other utilities. I also provide recommendations to areas of the Plan and respond to various SMEs' inquiries with respect to wildfire mitigation and response.

**Q. WHAT IS THE SCOPE OF YOUR WORK WITH XCEL ENERGY IN YOUR ROLE AS INDEPENDENT FIRE CONSULTANT?**

A. I have reviewed the Company's updated WMP and supporting testimony, as well as its 2019 WMP and testimony filed in the Company's 2019 Electric Rate Case (Proceeding No. 19AL-0268E). I have also met with the Wildfire Mitigation Team and other SMEs from groups throughout the Company that provided input into the WMP or are otherwise executing the WMP. These include the Company's Risk, Emergency Preparedness and Response, Vegetation Management, Standards, Transmission, and Distribution groups. I also attended a Stakeholder Group meeting in June 2020 held consistent with the Company's Wildfire Settlement Agreement approved in its 2019 Electric Rate Case (Proceeding No. 19AL-0628E), in addition to a Company public Town Hall meeting in early June 2020.

**Q. HAVE YOU PREVIOUSLY WORKED WITH OR FOR PUBLIC SERVICE OR XCEL ENERGY?**

A. No.

## III. APPROACH TO UTILITY WILDFIRE MITIGATION

**Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR DIRECT TESTIMONY?**

A. The purpose of this section of my Direct Testimony is to discuss my general approach to and recommendations regarding utility wildfire mitigation and wildfire risk assessment, based on my experience in the industry.

**Q. PLEASE DESCRIBE YOUR GENERAL PHILOSOPHY IN DEVELOPING WILDFIRE MITIGATION STRATEGIES.**

A. While there is no one-size-fits-all approach to utility wildfire mitigation, my general philosophy is to first assess the landscape agnostic to fire source and assign hazard classifications. I further consider asset location juxtaposed onto the classified landscape. The next step is to explore outage data and its relationship to ignitions. Finally, I assist the utility in targeting solutions based on likelihood of ignition and consequence of resulting fire. In doing so, it is of the utmost importance that a utility is well-aware of its most hazardous areas. The utility also needs to know why and where it is having, and is likely to have, asset-caused ignitions. By bringing this data together, the utility can focus and prioritize resources where they can provide the best return on its investments in terms of risk reduction.

**Q. WHY DO YOU CHOOSE TO TAKE AN AGNOSTIC APPROACH TO ASSESSING THE LANDSCAPE?**

A. I think it is important to look at the landscape from a very high level – one that is agnostic to the cause of a fire. Fire will behave the same regardless of the

source of ignition. Fuel and terrain will influence the movement of fire as will overall weather and wind conditions. This knowledge is fundamental to assessing hazard and risk from any cause and should be used to inform construction, inspection, and maintenance practices at a utility.

**Q. WHAT IS SIGNIFICANT ABOUT ASSET LOCATION ON THE LANDSCAPE?**

A. Once the burning environment is understood, the utility needs to know where its assets are in relation to areas of highest concern. Knowing which areas are most receptive to ignition and likely to produce fires that are the most resistant to control will help the utility decide what specific mitigative actions it should take. These might include enhanced building standards (stronger poles, wider cross arms, heavier or covered conductor, enhanced inspection and vegetation management routines, etc.). This helps to decide what programs to consider and which programs the utility should prioritize.

**Q. HOW ARE THE MOST HAZARDOUS AREAS IDENTIFIED?**

A. The most hazardous areas are identified to be where the highest fire threat (critical fuel loads and burning conditions), presence of utility assets (potential source of ignition) and proximity to homes or other development (values) are found together. Public Service's Wildfire Risk Zone ("WRZ") provides a good example of a utility effectively identifying the most hazardous areas and assets within its service territory.

**Q. HOW DOES THIS RELATE TO THE DEVELOPMENT OF AN EFFECTIVE AND PRUDENT UTILITY WILDFIRE MITIGATION PLAN?**

A. This approach is borne out by California's experience with its utility Fire Prevention Plans and wildfire mitigation plans, which have been around long enough to demonstrate results in ignition reduction as the approach has evolved.

**Q. ARE THERE ANY CODES, STANDARDS, OR STATUTES THAT DICTATE WHAT ACTIONS A UTILITY MUST BE TAKING TO MITIGATE WILDFIRE RISK?**

A. No. There is no manual of best practices for utility wildfire mitigation efforts. Wildfire mitigation plans and utility fire prevention plans are evolving. In California, this evolution is being required by legislation. In other parts of the western U.S., a desire to operate electric systems safely in light of climate change and its effect on the environment and fire season severity is driving utility wildfire risk mitigation efforts. Utility wildfire mitigation plans are the product of an emerging field that does not yet have a uniform set of codes and standards. While traditionally utility safety efforts have focused on building systems that, if necessary, fail in a safe manner so that the public is not endangered by a live line, wildfire risk evaluation and mitigation have the added focus of minimizing the potential of utility systems becoming a source of ignitions.

**Q. IN YOUR OPINION, WHAT ARE THE MOST IMPORTANT CONSIDERATIONS UTILITIES SHOULD TAKE INTO ACCOUNT IN DEVELOPING WILDFIRE MITIGATION PLANS?**

A. Key considerations utilities should take into account in developing wildfire mitigation plans include:

- Hazard assessment: knowing conditions present that pose a threat.
- Asset location, health, and failure rates: knowing what assets are present, where they are on the landscape, and their potential to start potentially consequential wildfires.
- Mapping of values at risk: an inventory of homes, critical infrastructure, habitat, endangered species, commercial timber, watershed, etc. Proximity to and possible impact on power lines or other electric facilities should be taken into account when a utility is developing and implementing mitigation measures.
- Fire simulations to allow analysis of potential impacts: this advanced modeling allows a glimpse into what might happen under given circumstances if a fire were to start at a particular location and under certain burning conditions.
- Metrics, especially regarding outages and other likely sources of ignitions: existing outage and other metrics (construction, inspection, maintenance records, GIS, etc.) that might be useful should be identified. Gaps in useful data and metrics should also be identified so a collection scheme can be devised. Knowing where and when utility outages (*i.e.*, potential ignitions) are occurring is essential to the prevention of utility ignitions.

**Q. HOW DO YOU BELIEVE RISK SHOULD CONSIDERED IN THE CONTEXT OF WILDFIRE MITIGATION?**

A. Understanding risk is an essential component of any wildfire mitigation plan. The definition of risk is likelihood times consequence where likelihood is a function of asset failure or operational practices, and consequence is a function of hazard

(landscape) and proximity to values at risk. Values at risk are defined as anything that has value to a stakeholder. It may be a monetary value or a more esoteric value such as a viewshed or value found in sacred land.

**Q. BROADLY SPEAKING, HOW SHOULD A UTILITY ASSESS THIS RISK?**

A. Utilities should assess risk by using available data that contributes to an understanding of what impacts might result from utility ignitions at a given time and location within their service territory. Impacts that should be considered include potential fire size and the damage a fire might cause to homes, commercial timber, watershed, and habitat, to name a few. The factors that go into this include fire intensity, weather conditions, and vulnerability of values at risk. The modeling that Technosylva is preparing for Public Service will do exactly that by considering fire spread, burn intensity and values impacted. Their model does this by simulating fire perimeters under current and forecasted burning conditions and then using these perimeters in a GIS to analyze impacts as described immediately above.

**Q. IN YOUR EXPERIENCE, WHAT KINDS OF UTILITY APPROACHES ARE MOST EFFECTIVE AT MITIGATING WILDFIRE RISK?**

A. Initiating actions that have a direct impact on reducing ignition likelihood include:

- Additional inspections. To this end, Public Service's program aimed at enhanced ground level and pole top inspections to help focus repair and replacement efforts where they are needed most is spot on. Priority is given to areas identified as most hazardous (for example, Public Service's WRZ).

- Enhanced vegetation management inspections and trimming. The Company's Mountain Hazard Tree Program, for example, addresses risk

of ignition from vegetation contact by enhanced patrol and trimming in mountainous areas known to host trees that are dead, dying and damaged from drought and insect infestation. There are also the Transmission Wildfire Protection Program (fuel reduction in proximity to transmission structures) and the Weed Abatement and Landscaping Program (fuel reduction in substations to reduce vegetation contact and likelihood of animal contacts).

- Fire hardening strategies. For example, Public Service has undertaken efforts to replace high-risk poles, replace reconductor with stronger and/or covered wire, and use non-expulsion equipment.

- System settings that take into account escalating fire weather conditions. For instance, Public Service is initiating efforts to utilize new recloser technology to do just that.

- Collection and tracking of useful metrics. For example, Public Service is collecting and analyzing useful data such as through its Wires Down reporting.

- Risk Modeling. For example, the modeling that Public Service proposes in its WMP is very forward-thinking. It will use world class modeling techniques to identify areas of highest potential impact in the event of ignition from utility infrastructure.

**Q. HOW DO THESE APPROACHES MITIGATE RISK?**

A. Asset-caused ignition reduction is key to preventing utility-caused catastrophic wildfires. It is the only wildfire variable the utility can directly impact. The utility cannot change the weather, declining forest health, number of people who choose to move into high fire risk areas, building codes, fire agency response capabilities, or timing and location of other fires that draw fire fighting resources away. However, the more a utility can reduce its instance of asset-caused ignition, the less chance it has of being a contributing factor to a significant wildfire.

**Q. WHAT OTHER TYPES OF INITIATIVES OR ACTIONS DO YOU CONSIDER NECESSARY FOR A COMPREHENSIVE WILDFIRE PLAN?**

A. Training, emergency response, and community and stakeholder engagement activities are critical to a comprehensive approach to wildfire mitigation and necessary for the overall success of a wildfire mitigation initiative. While a utility can only manage the elements of its system and the grid that it has control over, it is critical that a utility appropriately train its own relevant personnel to effectively carry out the plan to ensure that its personnel are equipped with the needed technical know-how, and so that its personnel can properly carry out inspections, operations, data gathering, data management, and other aspects of the utility's wildfire mitigation plan and wildfire response activities. With respect to community and stakeholder engagement, these initiatives are likewise critical to developing and executing a comprehensive plan. Understanding the local conditions, protocol, and ongoing initiatives, along with a collaborative, team-oriented approach will help the utility more effectively and efficiently carry out its plan.

**Q. YOU PREVIOUSLY MENTIONED THE IMPORTANCE OF DATA AND ANALYSIS IN THE CONTEXT OF INSPECTION AND MAINTENANCE PROGRAMS. CAN YOU ELABORATE MORE BROADLY ON THE TYPES OF DATA AND ANALYSIS YOU BELIEVE ARE FOUNDATIONAL TO GOOD UTILITY WILDFIRE MITIGATION PRACTICE?**

A. Certainly. Some of the types of data and analysis that I believe are key to effective utility wildfire mitigation include:

- Asset health data derived from enhanced inspections, which can point to areas where local weather and topographic conditions affect the rate at which asset health declines;
- Asset age data, which can be derived from GIS or other records and used to inform replacement strategies;
- Metrics derived from outage management systems to identify either geographic regions or facility types that are prone to consequential ignitions.
- Metrics regarding specific ignition-producing events, such as wire downs, which can help a utility track and pinpoint areas and assets for remediation; and,
- Inspection and maintenance records, which can yield valuable information regarding both individual asset health and geographic areas of concern.

**Q. DO YOU HAVE ANY OTHER GENERAL STATEMENTS TO MAKE REGARDING WILDFIRE MITIGATION OR RISK ASSESSMENT?**

A. An understanding of risk is important to helping prioritize various activities and projects within a wildfire mitigation plan. To help understand and assess risk, utilities are applying a variety of approaches to model and assess risk to their systems. A prudent wildfire mitigation plan will do the same. Important considerations utilities should take into account when they model risk are: asset health, which contributes to likelihood of failure and potential ignition; critical burning conditions, including excessive fuel loading; and proximity to human development or other values at risk.

## IV. ASSESSMENT OF PUBLIC SERVICE'S WILDFIRE MITIGATION PLAN

**Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR DIRECT TESTIMONY?**

A. The purpose of this section of my Direct Testimony is to describe in more detail my review and assessment of Public Service's WMP.

**Q. ARE YOU FAMILIAR WITH PUBLIC SERVICE'S WMP, SUBMITTED AS ATTACHMENT SLJ-1 TO MS. JOHNSON'S DIRECT TESTIMONY?**

A. Yes.

**Q. PLEASE EXPLAIN YOUR ROLE TO DATE IN ASSESSING THE WMP.**

A. My role has been to review, form opinions on, and make comments and suggestions on the Company's WMP. More specifically, I have thoroughly reviewed the entire WMP. Some of my general observations to date are as follows:

- Public Service's forward-thinking Plan demonstrates leadership in Colorado and the Mountain West region in mitigating wildfire risks. The Company has also demonstrated strong leadership through its participation in trade and industry initiatives, collaboration with other utilities, and openness to considering new and emerging technologies for its WMP.

- Given the overall lack of an industry-wide "manual of best practices," the Company's approach of analyzing other utilities' wildfire mitigation programs that have demonstrated effective risk reduction is a reasonable and appropriate approach consistent with good and emerging utility practice in this field.

- The Company's core planned programs and targeted studies are all consistent with good and emerging utility practice in this field. It is well-accepted that the Colorado Wildfire Risk Assessment Portal ("CO-WRAP") administered by the Colorado State Forest Service is an excellent source

for performing a science-based risk assessment utilizing historical data. The Company's application of CO-WRAP data is a reasonable and appropriate method for defining its WRZ as well as developing asset-level risk scores.

- The use of Red Flag Warning information is reasonable and appropriate and consistent with good and emerging utility practice.

- I have also advised the Company's Wildfire Mitigation Team on the communications process used for emergency response and ways to most efficiently track and report annual wildfire statistics as required by the Wildfire Settlement Agreement reached in the Company's 2019 Phase I Electric Rate Case.

**Q. PLEASE ELABORATE ON YOUR ASSESSMENT OF THE COMPANY'S PLAN.**

A. In my opinion, the Company's WMP takes a very pragmatic approach to wildfire risk mitigation. It looks at hazard conditions across the Company's Colorado service territory, logically defines the areas of highest risk, and then takes reasonable and logical steps to minimize ignition risks, focusing on the areas of highest potential impact should an ignition occur. In addition, I am pleased that the Plan directly states and incorporates the notion of safety as being a primary goal alongside reliability. This shows a recognition of evolving utility operating philosophies, and also shows that Public Service is a learning organization that applies lessons learned elsewhere to its own enterprise.

Additionally, Public Service's WMP is consistent with my general philosophy regarding wildfire mitigation, as explained in the previous section of my Direct Testimony. It is proactive and forward-thinking. It also proposes

solutions in keeping with good utility practice, which is especially commendable given that there is no regulatory mandate in Colorado to produce a WMP.

**Q. UPON YOUR REVIEW OF THE COMPANY'S PLAN, WERE THERE ELEMENTS YOU FOUND TO BE ESPECIALLY STRONG?**

A. Yes. I noted the Company's systematic approach in general, but especially the way that Public Service uses the current CO-WRAP model to assess wildfire hazard on the landscape so it knows where to begin prioritizing its risk reduction efforts, as well as the Company's assignment of a risk score to individual assets and its pragmatic approach to focused ignition reduction via enhanced inspections and hardening efforts.

The Company's systematic approach to wildfire mitigation is an effective strategy and is similar to the approach I have used, and am using, with other utility clients as they develop their own wildfire mitigation initiatives. Each step in the Company's process is considered individually and holistically, from the early stages of assessing the landscape, to calculating and evaluating fire risk and potential fire impacts, to implementing sound strategies across both infrastructure and operations to reduce ignition likelihood.

Public Service's cross-functional Wildfire Mitigation Team, as described in Ms. Johnson's Direct Testimony, is also a strong indicator of the Company's commitment and its likelihood of being successful in its wildfire mitigation efforts. Because ignitions can occur for various reasons and require a variety of coordinated solutions, a multi-disciplinary team will be most effective at reducing them. System operations, engineering, field crews, and design engineers (to

name a few) can, independent of one another, each contribute to an ignition either directly or indirectly. Working together allows for synergy between connected, but perhaps unrelated, business groups. The Company's cross-functional team, with its many multidisciplinary SMEs, meets as a group on a regular basis to discuss the Plan as a whole, progress with projects, conflicts with other projects, new technologies, and overall strategy under the direction of the Wildfire Mitigation Team. This holistic approach is thorough, eliminates siloed thinking, and brings the best people together to jointly meet the overall Company objective of reducing equipment-caused ignitions.

**Q. WERE THERE ANY ELEMENTS OF THE COMPANY'S PLAN YOU FOUND UNIQUE OR INTERESTING?**

A. Yes. I particularly noted the Company's planned use of sophisticated modeling in developing its WMP, as discussed by Company witness Mr. Steven Rohlwing. This modeling blends cutting-edge fire behavior or fire spread predictions with current and forecasted weather to simulate millions of virtual fire perimeters across the service area. These perimeters are then used to inform which fire origins are likely to result in the most damage and which Company assets should be the focus of pre-fire activities. This use of fire spread modeling is widespread in California. Its extension into other parts of the western US is a testament to its usefulness and value.

The Company's WMP also incorporates an ignition management plan, "Wires Down and Ignition Reporting," which is an effort to harvest useful heat data from actual repair calls; this is very forward-looking and an important

investment toward creating an informed response and mitigation plan for known ignition sources. When utilities know where and when they are having ignitions, they can begin to ascertain why those ignitions are occurring and take informed steps to reduce them. This data harvesting approach is similar to the one used at SDG&E and other California utilities. Outside of California utilities, this is not yet a common practice, but it likely should be.

In addition, my review of the Company's WMP and interactions with the Company have shown that Public Service is a learning organization. That is, it is continuously seeking to improve the effectiveness and sophistication of its wildfire mitigation efforts, as reflected in the evolution of the WMP from earlier versions toward its updated Plan presented in this proceeding, and the Company has worked with an increasing number of cross-functional internal and external experts to further that goal. I am personally aware of not only the effort the team has made to learn from the California utilities who have more mature plans, but also their initiatives to bring together other Colorado utilities to jointly work toward the common goal of protecting Colorado customers from wildfires caused by utility equipment. In my experience, the shared learnings will provide the most beneficial information, providing the benefit of "hindsight" to any utility only beginning to develop a wildfire mitigation plan. This evolution provides insight into the Company's strong and sustained commitment to risk mitigation.

**Q. PLEASE EXPLAIN IN MORE DETAIL HOW THE COMPANY'S WMP HAS EVOLVED OR PROGRESSED COMPARED TO PREVIOUS VERSIONS.**

A. What started in 2018 as an engineering and overall risk analysis became more robust in 2019 with the formation of a Wildfire Mitigation Team and the Company's first WMP. This brought the ability to explore implementation of a wider array of wildfire mitigation options. The updated Plan complements and builds on this previous work, adding the benefit of ongoing studies and many inspections already underway. Additionally, sophisticated modeling techniques as described in Mr. Rohlwing's Direct Testimony provide additional value and insight into the Company's updated Plan.

**Q. HOW HAS THE COMPANY APPROACHED RISK IN ITS WMP?**

A. The Company's WMP approaches risk by taking the following steps: (1) examine the landscape; (2) identify areas with the highest fire hazard; (3) identify areas within those high-hazard areas with the highest fire risk—that is, those areas which would be highly impacted by a fire event; and (4) take concrete steps to mitigate risk in the identified areas. In this effort, the Company has leveraged the extensive data found in the CO-WRAP. Using this CO-WRAP data, the Company was able to develop composite risk scores for each asset in the Company's service territory based on key attributes, identify high-risk areas on which to focus, and identify high-risk assets in most immediate need of attention. Likelihood of ignition is addressed by reviewing outage data from the Outage Management System ("OMS"), recognizing that not every outage results in an ignition. Nonetheless, an average number of actual ignitions can be extrapolated

from this outage data. This analysis can then be used to inform ignition likelihood. Based on historical California fire data normalized to Colorado, acreage per fire by asset type can be modeled and then applied to the various preventive measures Public Service is proposing in this WMP.

**Q. DO YOU AGREE WITH THAT APPROACH?**

A. Yes, as it follows similar, proven approaches consistent with good and emerging utility practice in this field. However, the Company's approach is further enhanced by sophisticated modeling and significant input from outside experts.

**Q. DOES THE CO-WRAP APPEAR TO BE A USEFUL TOOL TO EVALUATE RISK?**

A. Yes. The information that it provides (specific fire behavior characteristics, wildfire occurrence, fire intensity, values at risk, etc.) are exactly what should be used to make a proper risk assessment. In my experience as a former wildland firefighter, I fully appreciate the science behind the CO-WRAP, including its use of fire history to predict burn probability and the way it approaches the modeling of fire intensity. The use of values at risk when assigning composite risk scores is something I first became familiar with in the late 1990's when I was involved with the California BOF's Fire Plan; CO-WRAP considers values at risk in its modeling.

**Q. DO YOU SEE ANY LIMITATIONS TO THE CO-WRAP MODEL?**

A. As good as it is, the CO-WRAP model is a static model, meaning it is a fixed snapshot of landscape-level conditions. Public Service would benefit from the use of fire spread modeling which could be used to further inform and improve its

understanding of the consequences and impacts that might be expected from fires starting from specific asset locations under actual weather conditions. These kinds of fire simulations have been useful at other utilities to guide their risk reduction efforts. Knowing which asset-caused fires are likely to have the most consequential impacts, and under what conditions this can be expected, allows the utility to focus its mitigation efforts and expend its funds most effectively. The Company's WMP states that it is working to implement fire spread modeling, which will further enhance its situational awareness capabilities.

**Q. DO YOU HAVE ANY OTHER CONCLUSIONS RELATED TO HOW THE COMPANY'S RISK EVALUATION AFFECTS ITS WMP?**

A. Yes, based my observations of the results of the risk modeling, including the CO-WRAP, the consequences of a potential Company-caused wildfire could be incredibly serious and costly. It should therefore be considered imperative that the Company continue and develop its wildfire mitigation efforts.

**Q. IN YOUR ROLE AS INDEPENDENT FIRE CONSULTANT, HAVE YOU PROPOSED ANY CHANGES WHICH HAVE BEEN INCORPORATED INTO THE CURRENT PLAN?**

A. I emphasized the importance of having strong relationships with key stakeholders and how they will critical to the success of the WMP. Strong partnerships with fire agencies and other governmental and community stakeholders translate into improved data sharing, alignment of management objectives, and improved overall communications. Along these lines, I recommended that the Company

consider developing a tiered HFTD in collaboration with other utilities, expanding on the work they have already begun with the other utilities as well as the progress they have made with their WRZ development. This would bring consistency to regulations, best practices across the state and a common understanding of utility wildfire risk for all of the electric utility customers in the state. The Company is well-positioned to lead such an effort, given its proactive attitude and commitment to fire safety and joint planning.

**Q. BASED ON YOUR REVIEW, WHAT FOLLOW-UP DO YOU FEEL IS WARRANTED WITH RESPECT TO THE COMPANY'S WMP OR ITS WILDFIRE MITIGATION EFFORTS IN GENERAL?**

A. It is important to allow the results and metrics tracked to inform the next iterations of the WMP, along with its work and prioritization of work going forward. Understanding that it often takes years of metrics to provide meaningful data, there are opportunities along the way to determine if the tracking processes are working and if the most meaningful data is being captured. Additionally, it will be critical to evaluate if the implemented measures are producing results as expected and if not, assess why not and refine the approach. If the modeling mentioned earlier is successful as a study program, it should be incorporated more broadly. When the model can be improved with better data, this should be done. When results can inform model refinement, they should be incorporated into the model, studies, and additional work.

**Q. WHAT IS YOUR REACTION TO THE COMPANY'S PROPOSED REPORTING AND PERFORMANCE METRICS?**

A. The reporting metrics all seem reasonable with one exception. The requirement to track and report the number of wildfires in the Company's service territory is quite onerous. There are multiple agencies within the service territory. Fire records are not coordinated across the agencies. Some records may not be publicly available at all. One recommendation I have made is to limit the wildfire reporting requirement to only those federal agencies that make their data publicly available and further to refine the criteria for reporting to some consequential acreage or damage threshold. Further, this wildfire reporting metric will not provide any meaningful insights into the effectiveness of the Company's Plan given that most fires are not utility-caused.

**Q. ARE THERE ANY OTHER ELEMENTS OF THE PLAN THAT STAND OUT TO YOU OR YOU WOULD OTHERWISE LIKE TO COMMENT ON?**

A. In particular, I would like to comment more specifically on the Company's inspection and system hardening programs, situational awareness and training, operations practices, and stakeholder outreach and engagement.

**Q. WHAT IS YOUR OPINION OF THE COMPANY'S INSPECTION AND SYSTEM HARDENING PROGRAMS?**

A. The inspection and hardening regimen as described in the WMP represents a reasonable and prudent starting point. It is ambitious, taking advantage of the best publicly available data, best practices, lessons learned from other WMPs and other utilities, and they have a direct effect on reducing ignitions. The

Company's use of Unmanned Aerial Systems ("UAS") to collect enhanced pole top degradation should prove beneficial in providing important information on asset condition; this should help focus its energies to the appropriate assets. The Defensible Space Around Poles ("DSAP") program is another example of a program that will have a direct effect on reducing Company-related ignitions; this program mimics best practices that are required in California. It establishes a 10-foot, fuel-free radius down to bare mineral soil around poles, which will reduce the chance that any equipment-related sparks can cause an ignition. These programs are fundamental in reducing wildfire ignitions and consistent with good and emerging utility practice in this field.

**Q. WHAT IS YOUR OPINION OF THE COMPANY'S SITUATIONAL AWARENESS AND TRAINING?**

A. Situational awareness is a new and emerging facet of the utility industry's response to wildfire. Public Service should be commended for taking steps to enhance its situational awareness; by doing so, I believe Public Service will gain valuable real-time information not available to it in the past. Public Service will learn more about its territory and the incidence and behavior of fire on the landscape, and its response to fires will be more informed. Utilities in California are enhancing their situational awareness of weather and burning conditions. Typically, weather and fuel conditions drive wildland fire behavior. Knowing what is happening in the burning environment helps a utility make informed operational decisions. Wind speed and direction are of paramount importance.

Publicly available weather data is decent but utility mesonets are becoming the norm in California. A mesonet is a network of specifically designed and located weather instrumentation deployed to collect data at very short intervals. Approximately 2,000 weather stations have been deployed by the IOUs in California. These weather stations adhere to the installation and calibration requirements of the U.S. Government's National Fire Danger Rating System ("NFDRS"). This was done specifically to make the weather data that they collect assimilable with that of other NFDRS systems. This way, the data is useful to wildland firefighters as well as utilities. Usually, mesonet readings are taken every six minutes instead of every hour like with public instrumentation. Even shorter intervals are being used in certain circumstances.

At some point, Public Service should consider deploying its own mesonet. As soon as it does, it will begin to either learn new things about its own wind and weather patterns, or it will have its current understandings of the same confirmed. This deeper understanding will help the Company to reduce wildfire risk by making more informed decisions. This will be especially useful at those times during fire season that don't meet Red Flag thresholds but pose a threat greater than an "average bad fire day." Cameras are also being used to improve situational awareness. A utility can watch smoke columns to assess the likelihood of system impacts. Multiple cameras can also be used to triangulate the exact locations of fires to further prepare for potential utility impacts or other actions they might take in the name of safety.

Public Service has indicated it will incorporate certain operational procedures to help reduce its likelihood of ignition. Likewise, the evaluation of Public Safety Power Shutoffs mentioned in the WMP indicates a willingness to explore new methods that may be necessary to reduce potentially catastrophic wildfire ignitions.

**Q. CAN YOU COMMENT ON TRAINING AS IT RELATES TO THE WMP?**

- The training referenced in Public Service's WMP covers a variety of relevant topics. Each is important to the success of the WMP. The training also serves to introduce and strengthen the notion of a fire safe culture at Public Service. Included is training on:

- Fire prevention covering the identification of at-risk work and appropriate behaviors;

- Situational awareness training including Red Flag Warnings and what they mean to field operations;

- Identification of useful outage metrics and their collection and application to risk reduction; and,

- Training on equipment such as non-expulsion fuses, lightning arrestors, and cutouts to help reduce the likelihood of ignition.

**Q. WHAT IS YOUR OPINION WITH RESPECT TO THE COMPANY'S STAKEHOLDER OUTREACH AND ENGAGEMENT?**

A. Utilities in California have learned that building strong relationships with external stakeholders is essential to the success of their wildfire mitigation plans; community outreach is an essential part of building those relationships. Public Service has done a great job of identifying external stakeholders, and also of creating opportunities for those stakeholders to provide input and partner with Public Service. The Colorado Utility Summit meetings that the Company led in

2020 bear particular mention in how it brought other utilities together in an effort to share best and emergent practices.

**Q. OVERALL, HOW DOES PUBLIC SERVICE'S WMP COMPARE TO OTHER UTILITY WILDFIRE MITIGATION EFFORTS?**

A. The Company's WMP contains all the elements that one would expect of a fully-developed wildfire mitigation plan. Further, it shows a significant evolution as the Company has gained more experience and confidence in its efforts in the last year. As described above, the Plan moves through the logical steps of assessing the hazard, assigning risk, and then providing specific steps to reduce the instance of ignition. Public Service's WMP is appropriately scaled to meet its needs. Outside of California, the Company's Plan is more sophisticated than any I have seen given their use of modeling, strong inspection, and system hardening efforts, and the Company's formation of a cross-functional team stands out as a promising development.

**Q. HOW DOES PUBLIC SERVICE'S PLAN COMPARE TO OTHER REGULATORY AND INDUSTRY GUIDELINES AND EFFORTS CURRENTLY UNDERWAY?**

A. Utility wildfire mitigation is a new niche brought about by recent catastrophic fires. Regulatory and industry guidelines have been somewhat slow to respond. WMPs are a tool that can be used by a utility to define and quantify its own wildfire risk and catalog its steps toward reducing that risk. Considering this, the Company's WMP is not only evidence of the Company's commitment to reducing

its wildfire risk – it also provides a framework for doing so that far exceeds existing regulatory or industry guidelines.

**Q. DO YOU HAVE ANY OTHER RECOMMENDATIONS ON HOW PUBLIC SERVICE COULD FURTHER IMPROVE ITS PLAN?**

A. The Company is doing all the right things. However, when it comes to wildfire mitigation, there are always improvements that can be made. First, there can never be too much situational awareness. The Company is taking the right steps to improve situational awareness. Anything that can be done to accelerate the advancement of situational awareness would be beneficial, especially with regard to increased awareness of weather and fuel conditions, and fire spread modeling. Second, the development of a fire potential index would be beneficial. California entities are able to take all of the situational awareness and distill it into a geographically-based index that provides a comprehensive, visual understanding of potential risk.

**Q. BASED ON YOUR EXPERIENCE, IS PUBLIC SERVICE'S PLAN REASONABLE, PRUDENT, AND CONSISTENT WITH GOOD AND EMERGING UTILITY PRACTICE?**

A. Yes.

## V. RECOMMENDATIONS AND CONCLUSION

**Q. PLEASE RESTATE YOUR RECOMMENDATIONS AND CONCLUSIONS.**

A. In sum, I conclude that the Company has set forth a reasonable and prudent WMP which will enhance the safety and reliability of its system and effectively mitigate wildfire risk. I recommend that the Commission approve the Company's WMP as presented in this filing.

**Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

A. Yes.

**Statement of Qualifications**

**Randy L. Lyle**

I am the owner and Principal Consultant of Wildfire Mitigation Strategies (MWS). My clients are electric utilities that are interested in reducing their risk of wildfire ignition. I started WMS one year ago, after retiring from the San Diego Gas & Electric Company where I worked for 12 years. I retired from SDG&E as the Fire Science and Coordination Program Manager. I was employed at SDG&E in their Vegetation Management Department as a contract administrator and had been there for 3 weeks before the 2007 wildfires in which SDG&E was implicated. I was asked to help with the investigation of those fires. I helped determine cause, origin and spread of the fires. I also assisted our legal team during depositions, and prepared and delivered my own deposition regarding my findings.

These and other Southern California fires caused the California PUC to initiate several lengthy proceedings aimed at improving utility fire safety; I was involved as a wildfire SME for SDG&E throughout these entire proceedings which resulted in a statewide High Fire Threat District map and attendant enhanced fire safety regulations. In that capacity, I attended numerous California PUC hearings over several years and made significant contributions during the process. I helped establish the Fire Program at SDG&E. I mapped SDG&E's hazardous fire areas; that mapping logic and process became the basis of the statewide HFTD map I mentioned just above. I was involved in the creation and refinement of the SDG&E Fire Potential Index and the Wildfire Risk Reduction Model and created and helped develop the SDG&E Ignition Management Program. I responded to going fires as a Company Representative and helped facilitate

scene safety for first responders and utility personnel alike. I wrote portions of the SDG&E Fire Prevention Plan and then the Wildfire Mitigation Plan as it became known in later years. Upon my retirement, I received SDG&E's Builder's Award from the SDG&E President and COO.

Prior to my employment at SDG&E, I served with the California Department of Forestry and Fire Protection for 32 years. I retired from CALFIRE as a Division Chief. I worked in all aspects of wildland fire prevention and suppression including aerial, engine and hand crew firefighting, and pre-fire engineering. I also held several staff positions including Northern California Regional Fire Plan Coordinator, a position that entailed programmatic oversight of the Board of Forestry's Fire Plan in the northern half of California. Along with others, I pioneered the use of Geographic Information Systems (GIS) in both emergency and pre-fire planning capacities where fire perimeter and hazard mapping were part of my duties. I conducted stakeholder meetings and participated on behalf of CALFIRE in many venues. I received the Director's Award for Innovation for GIS work I did during the 2002 fire siege in Northern California. Of note, I was involved with the seasonal, cooperative powerline inspection program both as a firefighter and as a utility employee. During these inspections, fire and utility personnel team up and conduct ground level inspections using the California Powerline Fire Prevention Field Guide as a basis.

I hold a current Remote Pilot Certificate from the Federal Aviation Administration. At the time of my retirement I held Incident Command System qualifications of Type I Incident Commander, Type I Operations Section Chief and Agency Representative to list a few. In all, I have 45 years of professional wildland fire experience.

**BEFORE THE PUBLIC UTILITIES COMMISSION**
**OF THE STATE OF COLORADO**

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| **IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF COLORADO FOR APPROVAL OF WILDFIRE MITIGATION PLAN AND WILDFIRE PROTECTION RIDER** | ) ) ) ) ) | **PROCEEDING NO. 20A-XXXXE** |

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**AFFIDAVIT OF RANDY L. LYLE**
**ON BEHALF OF**
**PUBLIC SERVICE COMPANY OF COLORADO**

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I, Randy L. Lyle, being duly sworn, state that the Direct Testimony was prepared by me or under my supervision, control, and direction; that the Direct Testimony is true and correct to the best of my information, knowledge and belief; and that I would give the same testimony orally if asked under oath.

Dated at Denver, Colorado, this 15 day of July 2020.

Randy L. Lyle
Fire Protection Consultant

Subscribed and sworn to before me this 15 day of July, 2020.

Dawn Moffit
Notary Public

My Commission expires 4.22.2024

DAWN MOFFIT
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20084013859
MY COMMISSION EXPIRES APRIL 22, 2024