

Exh. ALB-1T

Docket UE-230172

Witness: Allen L. Berreth

**BEFORE THE WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION**

WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION,

Complainant,

v.

PACIFICORP dba
PACIFIC POWER & LIGHT COMPANY

Respondent.

Docket UE-230172

PACIFICORP

DIRECT TESTIMONY OF ALLEN L. BERRETH

March 2023 (REFILED April 19, 2023)

TABLE OF CONTENTS

I. INTRODUCTION AND QUALIFICATIONS 1

II. PURPOSE OF TESTIMONY 1

III. BACKGROUND ON WILDFIRE RISK IN WASHINGTON..... 2

IV. WILDFIRE MITIGATION CAPITAL COSTS 5

 A. System Hardening 7

 B. Line Rebuild Program..... 8

 C. Advanced Protection and Control 10

 D. Replacement of Pole Mounted Overcurrent and Overvoltage Protection Equipment 12

 E. Situational Awareness 13

V. WILDFIRE MITIGATION INCREMENTAL EXPENSE 15

 A. Asset Inspections 16

 B. Stakeholder and Community Engagement..... 18

 C. Plan Monitoring 19

 D. Wildfire Mitigation Vegetation Management 20

VI. INCREASES IN BASELINE (NON-WILDFIRE) VEGETATION MANAGEMENT COSTS 21

VII. CONCLUSION..... 24

ATTACHED EXHIBIT

Exhibit No. ALB-2—PacifiCorp Service Territory with FHCA

1 **I. INTRODUCTION AND QUALIFICATIONS**

2 **Q. Please state your name, business address, and present position with PacifiCorp**
3 **d/b/a Pacific Power & Light Company (PacifiCorp or Company).**

4 A. My name is Allen L. Berreth. My business address is 825 NE Multnomah Street,
5 Suite 1700, Portland, Oregon 97232. My present position is Vice President of
6 Transmission and Distribution Operations for PacifiCorp. I am responsible for the
7 departments that support the operations, maintenance, and construction of
8 PacifiCorp’s transmission and distribution systems; such as Asset Management,
9 Investment Delivery, Finance, Real Estate, GIS, Facilities, Vegetation Management,
10 and Wildfire Mitigation Planning.

11 **Q. Briefly describe your education and professional experience.**

12 A. I have a Bachelor of Science degree in Electrical Engineering with a focus in electric
13 power systems from the University of Idaho and a Master of Business Administration
14 from Utah State University. I have been Vice President of Transmission and
15 Distribution Operations since October 2020. Before my current position, I have held
16 positions in delivery assurance, asset management, work planning, business
17 improvement, and field engineering since joining PacifiCorp in 1998.

18 **Q. Have you testified in previous regulatory proceedings?**

19 A. Yes, I have testified previously in Washington, Oregon, and California.

20 **II. PURPOSE OF TESTIMONY**

21 **Q. What is the purpose of your testimony?**

22 A. The purpose of my testimony is to describe PacifiCorp’s wildfire-related
23 transmission and distribution investments and vegetation management expenses
24 included in this rate case. I support the Company’s incremental investments in

1 wildfire mitigation to address the risks posed by the increased frequency, severity,
2 and costs of wildfires to customers, employees, and Company facilities. My
3 testimony also supports an increase to baseline vegetation management spend due to
4 cost escalations to improve its effectiveness and functionality. I recommend that the
5 Washington Utilities and Transportation Commission (Commission) approve these
6 new investments and proposed changes as prudent.

7 III. BACKGROUND ON WILDFIRE RISK IN WASHINGTON

8 **Q. How have the risks associated with wildfires evolved in PacifiCorp's service**
9 **territories?**

10 A. There has always been some degree of wildfire risk across PacifiCorp's service
11 territories, including in Washington. This risk is inherent to operating an electric
12 utility and is elevated for utilities in the Western United States where climates are arid
13 year-long in some areas, or seasonally in others. However, the frequency, severity,
14 and costs of catastrophic wildfires are increasing across the West. Recent experiences
15 with catastrophic and tragic wildfires have resulted in an even greater focus on
16 wildfire risk mitigation by public utilities in the region.

17 **Q. Has PacifiCorp developed a Wildfire Mitigation Plan (WMP) for its Washington**
18 **service area?**

19 A. Yes, PacifiCorp first developed a WMP for its Washington service area in 2019 and
20 provided its latest update of the plan on April 22, 2022, to the Commission.¹

21 **Q. What are the elements of the WMP?**

22 A. PacifiCorp is adapting to the changes in wildfire risk through adoption of accelerated

¹ *In the Matter of Utility Wildfire Preparedness*, Docket No. U-210254, Wildfire Mitigation Plan (Apr. 14, 2022).

1 and enhanced wildfire mitigation measures. PacifiCorp identified key goals to help
2 inform its wildfire mitigation approach: (1) minimize the risk of wildfires from
3 PacifiCorp equipment; (2) promptly address any problems attributed to PacifiCorp
4 equipment if they do occur; (3) be prepared to address wildfires from other sources;
5 and (4) respond when a wildfire puts utility equipment at risk. PacifiCorp took these
6 goals and engaged in an extensive modeling process to develop a risk-based approach
7 to achieving them. This risk-based approach facilitates smart investments targeted to
8 places on PacifiCorp's system where they will have the most impact and ensures that
9 PacifiCorp's human capital is also deployed in areas where they will have the greatest
10 impact. These targeted investments are incremental to PacifiCorp's investment in the
11 ordinary course of its business and will meaningfully reduce the wildfire risk on the
12 Company's system.

13 **Q. Please describe how the risk of wildfire has been modeled in PacifiCorp's service**
14 **area.**

15 A. PacifiCorp recognizes that if certain weather and fuel conditions are present, a
16 disruption of normal operations on the electrical network, called a "fault", can result
17 in the ignition of a fire. Under certain weather conditions and in the vicinity of
18 wildland fuels, such an ignition can grow into a harmful wildfire, potentially even
19 growing into a catastrophic wildfire causing great harm to people and property.
20 PacifiCorp's risk analysis reviews fire history, the recorded causes of the fires, the
21 acreage impact of the fires, and when in the year the fires typically occur. Using that
22 information, the risk analysis identifies the logic for a risk-informed method to
23 strategically address utility wildfire risks. PacifiCorp patterned its wildfire risk

1 modeling on the methodology developed after a long and iterative process in
2 California. To take advantage of the experience learned through that process,
3 PacifiCorp engaged REAX Engineering Inc., a fire-science engineering firm, to
4 identify areas of elevated wildfire risk, designated as Fire High Consequence Areas
5 (FHCA).

6 The data and process used in PacifiCorp's analysis are as follows:

- 7 1) Topography of the land, including elevation, slope, and aspect;
- 8 2) Fuel data which quantify fuel loading, fuel particle size, and other
9 quantities needed by fire models to calculate the rate of spread;
- 10 3) Weather Research and Forecasting, which is a hybrid of weather
11 modeling and surface weather observations (including temperature,
12 relative humidity, wind speed/direction, and precipitation);
- 13 4) Historical fire weather days spanning the period from January 1,
14 1979, through December 31, 2017;
- 15 5) Estimated live fuel moisture;
- 16 6) Ignition modeling, using Monte Carlo simulated ignition scenarios;
17 and
- 18 7) Fire spread modeling.

19 In addition, potential impact was considered by factoring population density.

20 In general, if population density did not correlate to fuel and fire weather history, an
21 area would not be considered a candidate for FHCA designation. A final confirmation
22 exercise was completed by evaluating the FHCA against historical fire perimeters
23 (which are the final recorded footprint for any given fire), existing Company facility
24 equipment, and the Company's service territories. The resulting FHCA and
25 PacifiCorp's service territories are shown in Exhibit No. ALB-2.

1 **Q. Based on this wildfire risk modeling, what components of PacifiCorp's system**
2 **have been identified as existing in a FHCA?**

3 A. Based on the wildfire risk modeling conducted in PacifiCorp's service area, a large
4 portion of PacifiCorp's service area in southern Oregon, northern California, and
5 parts of Washington and Utah are identified as having sections inside the FHCA and
6 are candidates for wildfire mitigation project investments.

7 **IV. WILDFIRE MITIGATION CAPITAL COSTS**

8 **Q. What are the planned capital costs for the wildfire mitigation projects through**
9 **2025?**

10 A. Table 1 below describes the specific wildfire mitigation capital costs by breakdown of
11 activity.

Table 1: Wildfire Mitigation System Hardening Program Capital Costs*

Investment Category	Mitigation Program(s) Included	Description of Program	Purpose/Risk Being Mitigated	Planned Capital Costs through 2024	Planned Capital Costs through 2025
Washington Distribution	System Hardening: Line Rebuild	Distribution line rebuilds including all or parts of the following: installation of covered conductor, transition to underground, pole replacements, and conductor replacements	Reduce equipment failure that may ignite a wildfire along with increased resiliency to a wildfire occurrence	\$14.0m	-
	System Hardening: Advance Protection & Control	Replace electro-mechanical relays protecting distribution lines in FHCA with modern microprocessor relays that provide more accurate data and faster relaying	Increasing ability to locate where a fault occurred on a line, which could result in increased patrol time		
	System Hardening: Pole mounted overcurrent and overvoltage protection replacement	Replacement of fuses, lightning arrestors and cutouts throughout the FHCA with non-expulsion type equipment	Reduce equipment failure that may ignite a wildfire along with increased resiliency to a wildfire occurrence		
Transmission	System Hardening: Line Rebuild	Transmission line rebuilds including all or parts of the following: installation of covered conductor, tree wire, pole replacement, and conductor replacements	Reduce equipment failure that may ignite a wildfire along with increased resiliency to a wildfire occurrence	\$7.2m	\$1.2m
Washington Situs	Situational Awareness	Invest in tools, software, and hardware to incorporate real time weather data, implement a risk forecasting and impact-based fire weather model, and inform key decision making and protocols	Develop a dynamic risk assessment tool to inform investment scenarios, initiative prioritization, and overall decision making to manage risk	-	-
TOTAL				\$21.2m	\$1.2m

*Transmission costs provided reflect the Washington allocation of total-company costs.

1 I discuss these mitigation programs included in system hardening and situational
2 awareness in more detail below.

3 **A. System Hardening**

4 **Q. Please explain what system hardening is in the context of the Company's wildfire
5 mitigation efforts.**

6 A. System hardening is an engineered response to an identified risk to the electrical
7 system. System hardening includes retrofitting specific devices or components within
8 the system to make it more resilient and may also include the wholesale replacement
9 of legacy equipment when retrofitting is not a viable solution. I will describe some of
10 the system hardening that PacifiCorp is and will be engaging in to mitigate wildfire
11 risks in more detail below.

12 **Q. How do these system hardening projects reduce the threat of wildfire?**

13 A. PacifiCorp's system hardening projects focus on reducing the potential that the power
14 system is the source of ignition by creating a spark during a fault event. A significant
15 ignition driver on electrical systems is contact from foreign objects (*e.g.*, trees,
16 wildlife, and mylar balloons) that can result in high-energy and high-temperature
17 arcing between two conductors or between one conductor and the ground.

18 **Q. What hardening efforts on distribution systems reduce potential ignitions?**

19 A. All of the Company's wildfire mitigation programs applied to distribution systems
20 work to either prevent ignitions or control the potential events to limit overall impact.
21 The key programs included in system hardening of distribution systems include the
22 line rebuild project, implementation of advanced protection and control schemes

1 through equipment upgrades, and the replacement of pole mounted overcurrent and
2 overvoltage protection equipment such as expulsion fuses.

3 **B. Line Rebuild Program**

4 **Q. Please explain what the line rebuild program is in the context of wildfire**
5 **mitigation.**

6 A. A key hardening effort for wildfire mitigation is the line rebuild program where
7 targeted lines or portions of lines are either moved, removed, transitioned to
8 underground, or retrofitted with more resilient materials such as covered conductor to
9 mitigate the risk of contact related faults on overhead conductor. Currently, the
10 majority of the program includes retrofitting existing lines with covered conductor.

11 Covered conductor, unlike bare conductor, is designed to withstand incidental contact
12 with vegetation, other debris, and even the ground in a wire down event. The program
13 will involve more than replacing existing bare conductor with covered conductor.

14 Poles will be replaced as necessary based on loading assessments of existing poles
15 where covered conductor is to be installed. This is because covered conductor is
16 heavier than bare conductor and, under the combination of ice and wind, has a larger
17 diameter which results in further additional pole loading. A secondary benefit to
18 covered conductor is an improvement in reliability. In certain applications standard
19 pole mounted overcurrent and overvoltage protection equipment, such as fuses,
20 lightning arrestors, and cutouts, will be replaced within the FHCA with non-expulsion
21 type equipment to eliminate any melted fuse material from falling to the ground when
22 operated.

1 **Q. Is it standard practice for PacifiCorp to install covered conductor, non-expulsion**
2 **fuses, or composite material distribution poles?**

3 A. No. Standard overhead circuit construction uses bare conductor and wood poles that
4 balance safety, reliability, and costs. The installation of covered conductor, non-
5 expulsion fuses, and composite material poles are in direct response to increased
6 wildfire risk and are specifically designed to accelerate and improve mitigation of
7 catastrophic wildfires associated with PacifiCorp's system.

8 **Q. How do transmission line rebuilds help mitigate and protect against wildfire**
9 **risk?**

10 A. Rebuilding transmission lines helps to reduce equipment failures and incidental
11 contacts that pose a risk of wildfire ignition. Such equipment failures, while
12 infrequent occurrences, could result in substantial arc energy that can result in
13 wildfire ignition. Due to the cross-country nature of many portions of PacifiCorp's
14 system (particularly on the local transmission network) the risk of ignition sources is
15 heightened. Rebuilding transmission lines in areas where this risk is heightened
16 allows PacifiCorp to improve structures / hardware and reduce the probability of a
17 fault event and improve resiliency to the extent rebuilt structures can better withstand
18 localized wildfire events.

19 **Q. What criteria did the Company use to select areas in the FHCA to replace**
20 **existing conductor with covered conductor?**

21 A. PacifiCorp targeted areas within the FHCA to determine what areas in its system were
22 at elevated risk based on proximity to population centers, historical weather patterns,

1 and vegetation. Covered conductor was selected for use where there is risk of
2 incidental contacts, such as large branches or trees striking the phase conductors.

3 **Q. Are there reliable measurements or metrics the Company can use to determine**
4 **how successful the use of covered conductor is in mitigating wildfire risks over**
5 **time?**

6 A. Yes, although such measurements will not be immediately informative. Over time, the
7 Company anticipates that comparisons of fault rates resulting from incidental tree
8 contacts for the areas where covered conductor is employed versus the same areas
9 before replacement with the covered conductor will demonstrate the effectiveness of
10 this measure.

11 **Q. What kind of monitoring does the Company plan to use to ensure that the use of**
12 **covered conductor is meeting expectations in the absence of such metrics?**

13 A. As noted in my response to the preceding question, the Company will track fault rates
14 resulting from incidental tree contacts on rebuilt sections. This information will
15 enable the Company to compare faults both before and after installation of covered
16 conductor to better understand how successful it has been in mitigating wildfire risks
17 over time. Unfortunately, the data needed to quantitatively provide useful metrics for
18 such a comparison will not be available for several years.

19 **C. Advanced Protection and Control**

20 **Q. Please explain what advanced protection and control measures are in the context**
21 **of wildfire mitigation.**

22 A. Advanced protection involves the deployment of sophisticated protection control
23 strategies, particularly advanced relay technologies on distribution and transmission

1 lines. In the context of wildfire risk mitigation, these protection control strategies
2 involve the device operations that take place when fault events occur. In contrast to
3 the wildfire mitigation strategies discussed above, which relate to limiting the
4 occurrence of fault events, advanced protection and control strategies relate to
5 limiting the length and magnitude of a fault event. Specifically, the window of time
6 after fault events represents the time when electrical system facilities pose the highest
7 risk of igniting adjacent fuel, which could result in a wildfire. Reducing the time
8 between when a fault occurs and that fault condition is cleared may reduce the risk of
9 igniting adjacent fuel.

10 **Q. Please describe the differences between legacy electro-mechanical relays and**
11 **modern microprocessor relays.**

12 A. Unlike an electro-mechanical relay, microprocessor relays are able to exercise
13 programmed functions nearly immediately (near the speed of light), which results in
14 much faster device response during fault conditions. Microprocessor relays also allow
15 for greater customization to address environmental conditions through multiple
16 settings groups; they are also better able to incorporate complex logic to execute
17 specific operations. Also, in contrast to electro-mechanical relays, microprocessor
18 relays retain event logs that provide data for fault location and later analysis.

19 **Q. Will these modern microprocessor relays provide the Company more data**
20 **regarding line contacts and other faults on the system than the electro-**
21 **mechanical relays currently used on PacifiCorp's system?**

22 A. Yes. These new relays will capture a variety of event logs, including waveforms
23 during fault events.

1 **Q. How will the additional data provided by these new relays help the Company in**
2 **its wildfire mitigation efforts?**

3 A. In addition to faster fault clearing schemes, these relays improve response times since
4 they can identify locations where disturbances emanate from, which will be used by
5 field and office teams to assess these situations. PacifiCorp will also use this data
6 during investigations of events to ensure that the devices performed consistent with
7 the programmed settings and to evaluate other wildfire mitigation technologies.

8 **D. Replacement of Pole Mounted Overcurrent**
9 **and Overvoltage Protection Equipment**

10 **Q. Please explain what the replacement of pole mounted overcurrent and**
11 **overvoltage protection equipment means in the context of wildfire mitigation.**

12 A. The replacement of pole mounted overcurrent and overvoltage protection equipment
13 includes the proactive replacement of all expulsion type fuses, lightning arrestors, and
14 cutouts in the FHCA.

15 **Q. Is it standard practice to use non-expulsion type fuses and lightning arrestors?**

16 A. No. Non-expulsion type fuses and lightning arrestors are not standard practice.

17 **Q. How does the replacement of expulsion type fuses and lightning arrestors help**
18 **mitigate and protect against wildfire risk**

19 A. Overhead expulsion fuses serve as one of the primary system protection devices on
20 the overhead system. The expulsion fuse has a small metal element within the fuse
21 body that is designed to melt when excessive current passes through the fuse body,
22 interrupting the flow of electricity to the downstream distribution system. Under
23 certain conditions, the melting action and interruption technique will expel an arc out
24 of the bottom of the fuse tab. To reduce the potential for ignition as a result of fuse

1 operation, PacifiCorp has identified alternate methodologies and equipment that do
2 not expel an arc for installation within the FHCA.

3 **E. Situational Awareness**

4 **Q. Please explain what situational awareness is in the context of the Company's**
5 **wildfire mitigation efforts.**

6 A. Having a sophisticated, dynamic risk model grounded in situational awareness is
7 pertinent to ensure electric utilities know when, where, how, and why to take action to
8 mitigate the risk of wildfire. PacifiCorp's approach to situational awareness includes
9 the acquisition of data to run real time, daily simulations, forecast and assess the risk
10 of potential or active events to inform operational strategies, response to local
11 conditions, and influence decision making. Decision making could include the
12 implementation of augmented protection and control schemes or activation of
13 additional resources for supplemental patrols to assess local conditions.

14 **Q. What key investments need to be made to support this approach toward**
15 **situational awareness?**

16 A. To support the development of a robust, repeatable, dynamic risk assessment tool, a
17 combination of investments must be made including the acquisition of data, collection
18 of Company-owned data through new devices, storage and processing of data, and
19 mapping or visualization of data into dashboards and tools. Software, hardware, data
20 storage, data management, and data processing tools must be purchased to move
21 forward an enterprise type solution with built in redundancy.

22 **Q. Has the Company incurred any costs for situational awareness?**

23 A. Yes. Before June of 2022, the Company incurred capital expenditures to implement
24 situational awareness projects and programs described above.

1 **Q. What capital expenditures overall will the Company make through 2025 with**
2 **respect to system hardening and situational awareness?**

3 A. As shown in Table 1, through 2024, PacifiCorp will make capital expenditures of
4 approximately \$14 million in its Washington distribution system and \$7.2 million
5 Washington-allocated in its transmission system on system hardening. Through 2025,
6 PacifiCorp will make capital expenditures of approximately \$1.2 million Washington-
7 allocated in its transmission system on system hardening.

8 **Q. Please describe the benefits of PacifiCorp’s wildfire mitigation investments.**

9 A. Proactively investing in wildfire mitigation projects in identified FHCAs reduces the
10 risk of catastrophic fire caused by PacifiCorp’s facilities, directly benefiting
11 PacifiCorp customers. In addition, reducing the risk of catastrophic fire benefits fire
12 response agencies, preserves customer property and Company facilities, and
13 minimizes the cost of rebuilding.

14 **Q. How do PacifiCorp’s wildfire mitigation efforts relate to the Company’s**
15 **standard safety and compliance activities?**

16 A. Many of the wildfire mitigation strategies I discuss above go beyond standard utility
17 practice. For example, PacifiCorp does not, in the normal course, install covered
18 conductor. These measures are in direct response to changing best practices for
19 mitigating wildfire and are incremental to work PacifiCorp would do in the ordinary
20 course of its business. Similarly, activities such as replacement of existing equipment
21 (replacing distribution poles with composite material poles, replacing electro-
22 mechanical relays, etc.) are now informed by the potential for the replacement to

1 mitigate wildfire risk, location of the existing equipment within FHCA, and may
2 involve accelerated replacements.

3 **V. WILDFIRE MITIGATION INCREMENTAL EXPENSE**

4 **Q. Are the capital investments described above the only type of investments being**
5 **made in Washington to mitigate wildfire risk?**

6 A. No. As mentioned above, PacifiCorp provided its latest WMP on April 14, 2022. This
7 plan reflects a comprehensive approach to mitigating the risk of wildfires and
8 includes increased capital investment as well as operating expense to move forward
9 critical maintenance programs. Table 2 below describes the specific incremental
10 wildfire mitigation expense planned in 2024 by breakdown of activity due to an
11 increase in scope above legacy programs. No additional incremental expense is
12 forecasted between 2024 and 2025.

Table 2: Wildfire Mitigation System Hardening Program Incremental Annual Expense

Investment Category	Programs / Incremental Scope Included	2024 Planned Spend Total Co. (\$)²	2024 Planned Spend WA Alloc. (\$)³
WMP Transmission (Non-Vegetation Management)	<ul style="list-style-type: none"> • Annual asset inspections in the FHCA • Annual Enhanced Inspections (Infrared) inspections in the FHCA 	\$33,422	\$2,667
WMP Distribution (Non-Vegetation Management)	<ul style="list-style-type: none"> • Annual asset inspections in the FHCA • Transition from a 10-yr to a 5-yr detail inspection cycle in the FHCA (100% increase in annual detailed inspections) • Situational awareness (Described above in testimony) • Stakeholder and community engagement • Plan monitoring 	\$229,261	\$229,261
WMP Administrative (Non-Vegetation Management)	<ul style="list-style-type: none"> • Situational awareness (Described above in testimony) 	\$4,959,818	\$310,684
WMP Vegetation Management - Transmission	<ul style="list-style-type: none"> • Annual vegetation management inspections in the FHCA • Implementation of new maintenance cycles 	\$906,604	\$72,336
WMP Vegetation Management - Distribution³	<ul style="list-style-type: none"> • Annual vegetation management inspections in the FHCA • Radial pole clearing of subject poles in the FHCA • Implementation of new maintenance cycles 	\$126,219	\$126,219
Total		\$6,255,324	\$741,167

1 **Q. Is there additional incremental operation & maintenance expense (O&M)**
2 **identified for wildfire mitigation in this case for 2025 beyond 2024 levels?**

3 A. No.

4 **A. Asset Inspections**

5 **Q. How do asset inspections mitigate wildfire risk?**

6 A. Inspection and correction programs are the cornerstone of a resilient system. These
7 programs are tailored to identify conditions that could result in premature failure or
8 potential fault scenarios, including situations in which the infrastructure may no

² Planned incremental wildfire mitigation spend in this table includes Washington’s allocation only but reflects the same planned spend and programs included in PacifiCorp’s 2022 WMP.

³ This spend is not due to escalation of existing vegetation management costs but is incremental spend due to increased scope and activities.

1 longer be able to operate per code or engineered design, or may become susceptible
2 to external factors, such as weather conditions. The existing inspection and correction
3 programs are effective at maintaining regulatory compliance and managing routine
4 operational risk. They also mitigate some wildfire risk by identifying and correcting
5 conditions which, if uncorrected, could potentially ignite a fire. Recognizing the
6 growing risk of wildfire, PacifiCorp is supplementing its existing programs to further
7 mitigate the growing wildfire specific operational risks and create greater resiliency
8 against wildfires. These changes are meant to increase the frequency of inspections or
9 how assets are inspected to accelerate identification and correction of conditions.

10 **Q. What are these specific changes?**

11 A. PacifiCorp's asset inspection program involves three primary types of inspections:
12 (1) visual assurance inspection; (2) detailed inspection, and (3) pole test & treat.
13 Legacy inspection cycles, which dictate the frequency of inspections, are set by
14 PacifiCorp asset management to align with state specific compliance requirements. In
15 general, visual assurance inspections are conducted more frequently, to quickly
16 identify any obvious damage or defects that could affect safety or reliability. Detailed
17 inspections have a more detailed scope of work, so they are performed less frequently
18 than visual assurance inspections. The frequency of pole test & treat is based on the
19 age of wood poles, and such inspections are typically scheduled in conjunction with
20 certain detailed inspections. Regarding distribution, PacifiCorp is proposing to move
21 from a two-year cycle to an annual frequency for visual assurance inspection in the
22 FHCA and from a 10-year cycle to a five-year cycle for detailed inspections in the
23 FHCA, effectively increasing the number of each type of inspection annually in the

1 FHCA by 100 percent over legacy programs. PacifiCorp also plans to introduce new,
2 annual enhanced inspections annually on overhead transmission.

3 **Q. What are enhanced inspections?**

4 A. PacifiCorp's enhanced inspection utilizes alternate technologies to identify hot spots,
5 equipment degradation, and potentially substandard connections that are not
6 detectable through a visual inspection. Infrared data is gathered using a helicopter
7 flying over the designated lines near peak loading intervals and is performed
8 incrementally to existing inspection programs.

9 **Q. How do these enhanced inspections mitigate wildfire risk?**

10 A. Hot spots on power lines identified through infrared data gathering can be indicative
11 of loose connections, deterioration, and/or potential future fault locations. Therefore,
12 identification and removal of hot spots on overhead transmission lines can prevent
13 further deterioration, reduce the potential for equipment failure and faults, and reduce
14 ignition probability related to equipment failure.

15 **Q. Are asset inspections the only proposed change to mitigate wildfire risk?**

16 A. No. PacifiCorp is also proposing enhancing programs in the areas of situational
17 awareness, which is already described above in my testimony, stakeholder and
18 community engagement, plan monitoring, and vegetation management.

19 **B. Stakeholder and Community Engagement**

20 **Q. What is stakeholder and community engagement in the context of wildfire
21 mitigation?**

22 A. PacifiCorp plans to employ a multi-pronged approach for community engagement
23 and outreach with the goal of providing clear, actionable, and timely information to
24 customers, community stakeholders, public safety partners, and regulators. Over the

1 past several years, the Company has engaged customers and the general public on the
2 topic of wildfire safety and preparedness through a variety of tactics and intends to
3 continue enhancing this outreach including webinars, in-person forums, targeted paid
4 media campaigns, press engagement, distributed print materials, social media
5 updates, and communication through owned channels such as bill messages and
6 website content, among others. Regarding coordination with public safety partners,
7 PacifiCorp plans to continue implementing tabletop and function exercises to
8 enhanced collaboration and prepare for emergencies.

9 Overall, the wildfire safety and preparedness community and stakeholder
10 engagement plan will continue to mature year-over-year as additional feedback and
11 regulatory guidance is incorporated to broaden engagement and outreach outside of
12 traditional engagement methods.

13 **C. Plan Monitoring**

14 **Q. How does incremental plan monitoring reduce the risk of wildfires?**

15 A. As previously stated in my testimony, PacifiCorp’s WMP reflects a comprehensive
16 approach to mitigating the risk of wildfires and impacts many programs and
17 departments across the Company. To successfully deliver the plan and obtain the plan
18 objectives of reducing wildfire risk, additional resources are needed to develop,
19 implement, and monitor the plan and the various programs or projects included.
20 Specific examples include meteorologists, emergency managers, program managers,
21 program controllers, and analysts to name a few. These key resources are critical to
22 ensuring the timely and quality completion of the program elements such as
23 community outreach, public safety partner coordination and planning, situational
24 awareness, asset inspections, and vegetation management.

1 **D. Wildfire Mitigation Vegetation Management**

2 **Q. How does vegetation management relate to reducing wildfire risks?**

3 A. Vegetation management is generally recognized as a significant strategy in any WMP.
4 Vegetation contacting a power line is a potential source of fire ignition. Thus,
5 reducing vegetation contacts reduces the potential of an ignition originating from
6 electrical facilities. While it is impossible to eliminate vegetation contacts completely,
7 at least without radically altering the landscape near power lines, a primary objective
8 of PacifiCorp's existing vegetation management program is to minimize contact
9 between vegetation and power lines by addressing grow-in and fall-in risks. This
10 objective is in alignment with core WMP efforts, and continuing dedication to
11 administering existing programs is a solid foundation for PacifiCorp's WMP efforts.
12 To supplement the existing program, PacifiCorp vegetation management is
13 implementing additional WMP strategies in Washington.

14 **Q. What are these strategies being implemented?**

15 A. The focus of PacifiCorp's vegetation management efforts generally includes pruning
16 and tree removals. PacifiCorp prunes trees to maintain a safe distance between tree
17 limbs and power lines. PacifiCorp also removes trees that pose an elevated risk of
18 falling into a power line. PacifiCorp's vegetation management specifically targets risk
19 reduction in the FHCA with three distinct strategies. First, PacifiCorp vegetation
20 management will conduct annual vegetation inspections on all lines in the FHCA,
21 with correction work also completed based on inspection results. Second, PacifiCorp
22 will use increased minimum clearance distances for distribution cycle work
23 completed in the FHCA. Third, PacifiCorp plans to complete annual pole clearing on
24 subject equipment poles located in the FHCA.

1 **Q. How does this compare to PacifiCorp’s existing or legacy vegetation**
2 **management program?**

3 A. Before the development of the WMP, PacifiCorp already had a vegetation
4 management program in place. While the legacy program contained similar elements
5 and objectives to the strategies just described, the incremental efforts reflect a shift
6 change in strategy and the costs reflect the incremental spend needed to accomplish
7 the new tasks and work to meet the objectives of the increase in scope. As such, it
8 should be viewed as incremental to baseline or legacy vegetation management
9 programs.

10 **VI. INCREASES IN BASELINE (NON-WILDFIRE)**
11 **VEGETATION MANAGEMENT COSTS**

12 **Q. Is PacifiCorp proposing an increase in baseline vegetation management costs?**

13 A. Yes. Additional spending has been identified for the legacy vegetation management
14 due to cost escalation and change in program activities. Different than the wildfire
15 mitigation spending, which reflects an increase in scope to accomplish additional
16 work within the FHCAs and reduce the risk of wildfire, this spend has been identified
17 due to the increase in costs experienced to accomplish the core work of the program.
18 PacifiCorp’s forecast costs in this case reflect updates to the expenses PacifiCorp has
19 seen over the past year to meet its vegetation management goals and reflect the
20 ongoing cost to implement PacifiCorp’s vegetation management program outside the
21 scope of the wildfire mitigation spending. These proposed costs are summarized
22 below.

Table 3: Baseline Vegetation Management Incremental Annual Expense

Investment Category	Programs / Incremental Scope Included	2024 Planned Spend Total Co. (\$)	2024 Planned Spend WA Alloc. (\$)
Non-WMP Vegetation – Transmission	<ul style="list-style-type: none"> Scheduled work to maintain clearances (inspections, pruning, tree removal) 	\$9,619,546	\$767,522
Non-WMP Vegetation – Distribution	<ul style="list-style-type: none"> Routine cycle work to maintain clearances (inspections, pruning, tree removal) 	\$4,876,705	\$4,876,705
Non-WMP Vegetation – Administrative	<ul style="list-style-type: none"> Internal foresters, program oversight staff, and audit team 	\$2,130,749	\$133,471
Total		\$16,627,000	\$5,777,698

1 **Q. Can you provide some examples of what is driving the increased costs for**
 2 **PacifiCorp’s vegetation program?**

3 A. Similar to the wildfire vegetation management discussion above, the focus of
 4 PacifiCorp’s vegetation management efforts generally includes pruning and tree
 5 removals. PacifiCorp prunes trees to maintain a safe distance between tree limbs and
 6 power lines. PacifiCorp also removes trees that pose an elevated risk of falling into a
 7 power line. The volume of tree removals that pose an elevated risk of falling into a
 8 power line has also increased in recent years, which has increased the associated
 9 costs. In addition, increased labor costs have also been experienced as the market for
 10 vegetation management workers has become more competitive. This has not only
 11 increased the base labor costs for the vegetation management program as a whole, but
 12 has also increased costs for labor premiums to attract additional travel crews to the
 13 area.

1 **Q. What is the impact of these increased costs on the O&M included for vegetation**
2 **management in base rates?**

3 A. PacifiCorp is proposing to increase baseline O&M for vegetation management by
4 \$5,777,698 million.

5 **Q. Despite not being part of the formal wildfire mitigation incremental spend, will**
6 **these incremental costs mitigate wildfire risk?**

7 A. Yes. As described above in my testimony, vegetation contacting a power line is a
8 potential source of fire ignition. Thus, reducing vegetation contacts reduces the
9 potential of an ignition originating from electrical facilities. Similar to the wildfire
10 mitigation vegetation management program, a primary objective of PacifiCorp's
11 existing vegetation management program is to minimize contact between vegetation
12 and power lines by addressing grow-in and fall-in risks. This objective aligns with
13 core WMP efforts, and continuing dedication to administering existing programs is a
14 solid foundation for PacifiCorp's WMP efforts.

15 **Q. Despite this cost increase, what steps is the Company taking to control costs**
16 **while still achieving the goals of the program?**

17 A. PacifiCorp is implementing two strategies for cost control and delivering on the goals
18 of the vegetation management program as described above. The first strategy is
19 increasing the number of internal Company foresters that coordinate the vegetation
20 management activity within a geographic area. This will increase oversight of both
21 program efficiencies and deliverables. The second strategy is implementing an
22 internal vegetation management audit team that will bolster the quality assurance

1 reviews of the program. This will also help drive program performance in terms of
2 productivity, efficiency, and cost of program deliverables.

3 **VII. CONCLUSION**

4 **Q. Please summarize your recommendation to the Commission.**

5 A. My testimony demonstrates that there can be significant costs and impacts to the
6 Company and its customers associated with wildfires. Therefore, it is prudent and in
7 the public interest for PacifiCorp to make incremental investments in wildfire
8 mitigation projects to reduce the risk of wildfires caused by its facilities in its service
9 territories, especially as wildfires have grown in frequency and severity in the West.
10 Additionally, my testimony details the increases in costs for vegetation management
11 to improve its effectiveness and functionality. I recommend the Commission approve
12 these investments and proposed changes.

13 **Q. Does this conclude your direct testimony?**

14 A. Yes.