Exh. DRH-1T

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

DOCKET NO. UE-22_____

DIRECT TESTIMONY OF

DAVID R. HOWELL

REPRESENTING AVISTA CORPORATION

I. INTRODUCTION

Q. Please state your name, employer and business address.

A. My name is David R. Howell and I am employed as the Director of Electric Operations and Asset Maintenance for Avista Corporation (Avista or Company). My business address is 1411 East Mission Avenue, Spokane, Washington.

Q. Would you briefly describe your educational background and professional experience?

A. Yes. I graduated from Washington State University in 1992 with a B.S. in Mechanical Engineering and earned my EMBA from the University of Washington in 2012. I am a registered professional engineer in the State of Washington for both electrical and mechanical engineering. I joined the Company in 2005 after spending five years with TransCanada-GTN. Between 2005 and 2015, I held various positions at Avista supporting both natural gas and electric operations, including Gas Design Engineer, Gas Design Manager, Gas Compliance Manager, Operations Manager, and Director of Gas Delivery. In 2015, I transitioned to support the electric business as the Director of Electrical Engineering. I became the Director of Electric Operations in 2016, where my primary responsibilities include the management and oversight of Avista's 13 operating districts, responsibility for construction services and design, as well as the Asset Maintenance and Wildfire teams.

Q. What is the scope of your testimony in this proceeding?

A. My testimony and exhibits discuss the status of the Company's Wildfire Resiliency Plan ("Wildfire Plan" or "Plan"), reiterate its goals and objectives, and summarize the technical and operational aspects of the Plan. As discussed in Avista's last general rate case, Avista's Wildfire Plan reflects the Company's 130-year operating history combined with recent

efforts to quantify and respond to the financial, safety-related, and service reliability risks associated with wildfires. While I discuss this plan in detail within my testimony and exhibits, Company witness Ms. Andrews incorporates O&M expenses associated with the Company's Wildfire Plan, and reflected in the Wildfire balancing account as well as any capital additions that transfer to plant prior to or during the Two-Year Rate as proposed by the Company. Ms. Andrews reflects these Wildfire plan expenditures within her electric Pro Forma Study (Exh. EMA-2) and direct testimony, (Exh. EMA-1T).

A table of contents for my testimony is as follows:

Q. Are you sponsoring exhibits in this proceeding?

A. Yes. I am sponsoring exhibits Exh. DRH-2 through Exh. DRH-4, as follows:

- Exh. DRH-2 – Wildfire Resiliency Plan 2022
- Exh. DRH-3 – Wildfire Resiliency 2021 Year End Report
- Exh. DRH-4 – Wildfire Resiliency Business Case

Q. What specific Wildfire Plan costs has Avista included in this general rate case for recovery?

A. Included in the testimony that follows is a summary of the Company's recommendations and expected costs, annually, for the ten-year period 2020 through 2029.

Specific costs proposed by Avista in this general rate case, however, as discussed by Ms. Andrews, include the level of Wildfire Plan transmission and distribution expenses to be recovered annually over the Two-Year Rate Plan, at $5.1 million (Washington share)[1], as well as Washington's share of Wildfire Plan capital additions transferring to plant between October 2021 and December 2024. Specifically, as discussed by Ms. Andrews at Exh. EMA-1T, and excerpted from Table No. 2 on page 27 of her testimony, the following transfers to plant for the Wildfire Plan are included:

Table Excerpted from Exh. EMA-1T, Table No. 2 – Wildfire Washington Additions

				Rate Year 1				Rate Year 2 *(Incremental)*	
Witness	Jan -Sept 2021	Oct - Dec 2021	Total 2021 TTP	Total 2022 TTP	Total 2023 TTP	**Rate Year 1 Total 2021-2023**	Total 2024 TTP	**Rate Year 2 Total 2024**
Mr. Howell	$ 8,752	$ 2,504	$ 11,256	$ 14,789	$ 7,938	**$ 33,983**	$ 17,694	**$ 17,694**
	Test Period Amounts Q'1-Q'3 2021	**Pro Forma Amounts Q'4 2021**	**Includes Pro Forma Q'4 2021**	**Provisional Adjustments 2022**	**Provisional Adjustments 2023**		**Provisional Adjustments 2024**	

As can be seen in the table above, Ms. Andrews has included in her electric Pro Forma Study, Washington's share of pro forma capital additions for October – December 2021 of $2.5 million, and "provisional" capital additions for 2022 and 2023 of $14.8 million, and $7.9 million, respectively, for Rate Year 1. For Rate Year 2, incremental "provisional" capital additions for 2024 have been included for Rate Year 2 of $17.7 million.[2] The overall electric revenue requirement included in this case associated with these costs is approximately $6.0 million in Rate Year 1, and $1.9 million in Rate Year 2. Approval of these proposed

[1]As discussed by Ms. Andrews, test period levels for the twelve-month period ending September 2021, reflect wildfire expenses for Washington at $2.2 million. The company has included an incremental increase of $2.9 million to reflect wildfire expense levels of approximately $8.2 million to $8.6 million annually, on a system basis, between 2022 and 2024. Therefore, the Company is proposing a new Wildfire Balancing Account baseline expense of $5.1 million annually in Rate Yea 1 (2023) and Rate Year 2 (2024).

[2] Capital additions included for 2023 in Rate Year 1 and 2024 in Rate Year 2, are reflected on an AMA basis.

incremental costs is an important element of the Company's Wildfire Plan and helps support the level of wildfire mitigation efforts proposed in the Company's Wildfire Plan.

Q. As noted above, Ms. Andrews discusses Washington allocated portions included in her electric Pro Forma Study. What level of capital additions do you discuss within your testimony?

A. While Ms. Andrews speaks to that included by the Company on a Washington allocated basis, similar to other capital witnesses, I will refer to total system transfers to plant planned per the Wildfire Plan Business Case, on an annual basis for the period 2021 through 2024.

Table No. 1 – Capital Additions for Wildfire Resiliency (2021 – 2024)

WA GRC Plant Group	Business Case	2021 TTP (System)	2022 TTP (System)	2023 TTP (System)	2024 TTP (System)	Exh. DRH-4 Page #
Wildfire	Wildfire Resiliency Plan	$ 17,278,280	24,544,986	27,000,000	29,000,001	2
Total Wildfire		**$ 17,278,280**	**$ 24,544,986**	**$ 27,000,000**	**$ 29,000,001**	
Exh. DRH-1T Total 2021-2024 Capital Additions		**$ 17,278,280**	**$ 24,544,986**	**$ 27,000,000**	**$ 29,000,001**	

II. AVISTA'S WILDFIRE PLAN OVERVIEW

Q. What are the stated goals of the Wildfire Plan?

A. Avista responded to the increasing threat of wildfires within our service territory with a robust and well-rounded Wildfire Plan focused on reducing the likelihood of a wildfire caused by Avista's electric operations, protecting the safety of our employees and customers, and preparing ourselves, our system, and external partners for a wildfire event. The goals of the Wildfire Resiliency Plan are to:

- Support safe and reliable operations by protecting physical assets, safeguarding property, and protecting human lives against the threat of wildland fires through the implementation of Plan programs and Company operations.

- Prepare and train for episodic wildfire events, ensure emergency preparedness, and align operating practices with fire threat conditions.

- Protect Avista's energy delivery infrastructure and mitigate the probability and consequence of direct financial and liability costs associated with large scale fire events.

- Reduce the risk of wildfire from the interaction of Avista's energy delivery system and the environment, as well as the impacts of wildfire to Avista's system.

These recommendations represent Avista's ongoing Wildfire Plan.

III. WILDFIRE PLANNING & OPERATIONS

Q. Please briefly describe the efforts undertaken by Avista to manage the risk around wildfires in its service territories.

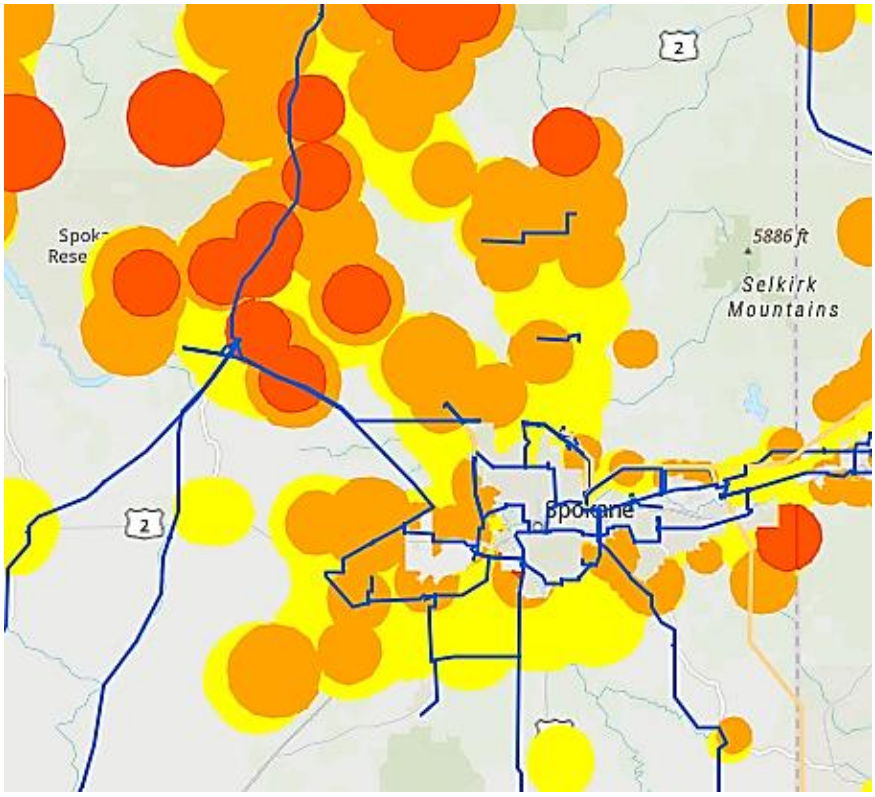
A. Avista has chosen a comprehensive approach to wildfire threats, which is designed to protect our customers and employees, adequately prepare for wildfire events, and protect our physical assets, while considering impacts to customer reliability and cost. We believe it is critical to act in protecting our customers as well as the infrastructure that serves those customers. Approximately 87,000 Avista customers[3] reside in elevated risk fire zones, commonly known as Wildland Urban Interfaces or "WUI Zones" which are the transition zones between wilderness and populated areas - basically where the built environment meets the natural environment. These areas are at greater risk of catastrophic wildfires. Thus, our primary risk reduction efforts are focused in these elevated threat areas.

The WUI map helps to identify and prioritize areas of greatest risk and serves to inform the recommendations and operational decisions related to wildfire resiliency. Using this map,

[3] This count is based on electric meters minus street and area lights, limited to Wildland Urban Interfaces "WUI Zones" 2 (elevated risk) and 3 (extreme risk).

we can target our programs where they have the potential to reduce the most risk and have the greatest positive impact in the safety and protection of our customers and our infrastructure.

Illustration No. 1 - Avista's WUI Map Sample



In order to manage risk, we created a Plan, with efforts grouped into four major program areas: (1) Grid Hardening, (2) Enhanced Risk-Based Vegetation Management, (3) Situational Awareness, and (4) Emergency Operations and Response. The elements within each of these program areas are specifically designed to address safety for human beings and infrastructure. Programs to reduce the risk of spark ignition events include distribution grid hardening measures, as well as identifying and mitigating risk-trees (trees with the potential of imminent fall-in hazard to energized facilities). The Plan increases the resiliency of our system with measures including replacing wood poles with steel or wrapping wood poles with fire resistant mesh in high fire threat locations. The Plan also has a strong focus on preparation

as a means of reducing risk, including the development of our Fire Weather Dashboard, which models fire risk on a feeder-by-feeder basis, use of the Dry Land Mode operating practice, installation of additional monitoring and control equipment in high fire threat areas, and "people" preparation, including formalizing procedures inside and outside of the Company to address wildfire situations, and working with external partners on training, coordination, and response.

Q. Would you please provide a short history of the development of the Plan, including those participating in its development, and explain how it has evolved over time?

A. Yes. Avista's first Wildfire Resiliency Plan was first published in May of 2020, the culmination of 18 months of development starting with project chartering and goal setting, risk tabletop analysis, risk assessment, cost forecasting, and various stages of internal review and approval. This was combined with feedback from various sources, including fire protection agencies, peer utilities, industry manufacturers, community leaders, and regulators. Since that time, we have been working to implement elements of the Plan. The Plan is comprised of four major categories. The first element is grid hardening to reduce spark ignition events and make the system more resilient. Second is enhanced risk-based vegetation management practices to reduce vegetation-related risk. Third involves situational awareness, primarily grid control and monitoring technology and use of Dry Land Mode. Fourth is emergency operations and planning, which includes partnerships and operational tactics.

The Plan was developed as a 'risk-based' approach to mitigating wildfires. It was developed in collaboration with internal subject matter experts and Northwest industry peers to ensure that the Plan included current industry best practices, was aligned where appropriate

with peer plans, and was specifically designed to address the unique geographic risks and operating conditions of Avista's service territory.

Revisiting the prior history, in May and June of 2019, a series of risk workshops were held to provide baseline information and risk matrices for several potential strategies. Avista drew from subject matter experts across the Company, including asset management, enterprise risk, engineering, line operations, system operations, regulatory compliance, and other groups.

External input to Avista's plan was provided through the Pacific Northwest Wildfire Working Group, a peer group of utilities from the Northwest that came together to specifically address the evolving threat of wildfire, to better understand the risk, share best practices, and ensure that the administration of wildfire plans are consistent where appropriate and aligned with the each company's unique geographic and operating conditions.

Avista leveraged subject matter experts from both within and outside of the Company to quantify the 10-year inherent/existing risk of fire versus the 10-year managed risk of deploying competing strategies, considering factors including safety, impacts to customers, and competing costs. Solutions to address wildfire risks, when possible, included re-tasking or retooling of existing programs to pivot from strictly reliability-based measures towards mitigating the risk of wildfire.

Avista's Wildfire effort focuses on the "Plan-Do-Check-Adjust" methodology, thus we are continually monitoring the impacts of our programs and the work happening in the industry, as well as seeking the guidance of our partners. We are continuously searching for areas of improvement and refinement, which is evidenced by the fact that our Fire Weather Dashboard risk model has been upgraded to new levels of sophistication, we have developed strong and invaluable partnerships with first responders and fire professionals, and we are

establishing data-driven means of determining the most cost-effective grid hardening and vegetation management strategies. These are examples which are defined in more detail throughout this testimony.

Q. Please describe the impact of wildfires and wildfire planning specific to Avista's electric <u>transmission</u> operations.

A. Avista operates and manages 2,270 miles of transmission in portions of western Montana, northern Idaho, and eastern Washington. In 2006, Avista adopted tubular steel poles as the standard for 115kV and 230 kV powerlines. Since that time, Avista has worked to replace its aging wooden structures with steel, and all new construction is exclusively steel. The combination of system hardening, and well-maintained rights-of-way, have increased the fire resiliency of our transmission system. In fact, transmission fire ignition events are now relatively rare. From 2009 to 2020 there were 5 individual transmission incidents classified as spark events (about 0.4% of the total sustained transmission outages).[4]

Conversely, the impact of fire on transmission structures can be significant when it does happen. Aside from the potential for extended outages, the replacement cost of a single wood transmission structure ranges from $7,500 to over $25,000, and damages to conductor can escalate into the millions of dollars.[5]

Q. Please describe the impact of wildfires and wildfire planning specific to Avista's electric <u>distribution</u> operations.

A. The vast majority of electric outages occur on the distribution system, but the

[4] These events were caused by an abandoned osprey nest catching on fire, two faulty switches, a burned-up jumper, and damage from a nearby fire.

[5] As an example, fire damage to the Company's Chelan-Stratford transmission line as a result of the Cold Springs Canyon/Pearl Hill fire in September 2020 resulted in capital replacement costs of over $8.5 million. This fire was caused by a campfire on private property that had not been properly extinguished. https://wildfirepartners.org/cold-springs-fire/

impact to customers is typically restricted by line-fuse action (limiting outages to an average of 51 customers typically).[6] To contrast this situation, transmission outages are infrequent (low probability) but can impact many more customers (the average number of customers affected by a transmission outage is 615).[7] However, from a fire prevention standpoint, the distribution system is the ignition source for most utility-related fires. Data from the Outage Management System (OMS) from 2009 to 2020 indicates that annually about 108 spark events are associated with overhead distribution lines, about 1.5% of all distribution outages. Many of these do not result in fire and if they do, in almost all cases these fires are naturally extinguished or were extinguished by first responders, including Avista line servicemen. However, in the current risk environment, the distribution system warrants enhanced focus with respect to fire ignition, and this risk is especially acute in the wildland-urban interface (WUI) areas previously discussed.

Fire ignition sources include tree contacts with powerlines, but also include animal contacts, equipment failure, and electrical pole fires. In the past twelve years there were 110 tree-related outages related to fires on the distribution system, with about 34 occurring during fire season (July through September). During that same time (past 12 years), there were 388 reported pole fires during fire season.[8] We believe that our Wildfire Resiliency programs will reduce these numbers over time.

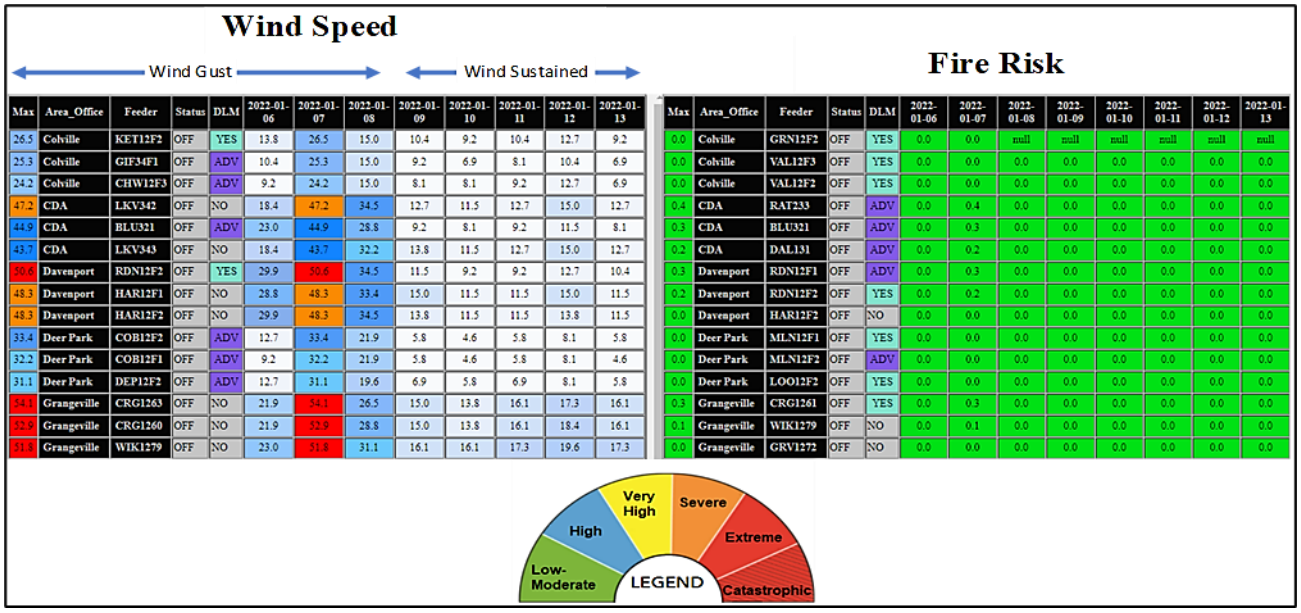
Q. Does the Wildfire Plan replace existing programs?

A. The Plan leverages existing asset programs and operating practices, building upon these where possible. Many of those projects already have benefits directly related to

[6] Based on Outage Management System data for 2009 to 2020.
[7] Ibid.
[8] Ibid.

reducing the risk of fire or in making our system more resilient, such as the existing Vegetation Management Program, as well as steel transmission pole replacements, which have been a Company practice since 2006. The Wildfire Plan added additional funding and created a focus for these types of programs specifically related to high fire threat areas. Other programs suggested by the Plan are new to Avista, including digital data collection (Light Detection and Ranging ("LiDAR") and satellite imaging) to better understand vegetation risk, cross-training with external fire professionals, and the Fire Weather Dashboard, an example of which is provided below in Illustration No. 2. All the Wildfire programs, new or enhanced, work in concert to provide a robust, prudent, and sensible approach to this critical issue.

Illustration No. 2 – Avista Fire Weather Dashboard (example from January 2022)



Max	Area_Office	Feeder	Status	DLM	2022-01-06	2022-01-07	2022-01-08	2022-01-09	2022-01-10	2022-01-11	2022-01-12	2022-01-13
26.5	Colville	KET12F2	OFF	YES	13.8	26.5	15.0	10.4	9.2	10.4	12.7	9.2
25.3	Colville	GIF34F1	OFF	ADV	10.4	25.3	15.0	9.2	6.9	8.1	10.4	6.9
24.2	Colville	CHW12F3	OFF	ADV	9.2	24.2	15.0	8.1	8.1	9.2	12.7	6.9
47.2	CDA	LKV342	OFF	NO	18.4	47.2	34.5	12.7	11.5	12.7	15.0	12.7
44.9	CDA	BLU321	OFF	ADV	23.0	44.9	28.8	9.2	8.1	9.2	11.5	8.1
43.7	CDA	LKV343	OFF	NO	18.4	43.7	32.2	13.8	11.5	12.7	15.0	12.7
50.6	Davenport	RDN12F2	OFF	YES	29.9	50.6	34.5	11.5	9.2	9.2	12.7	10.4
48.3	Davenport	HAR12F1	OFF	NO	28.8	48.3	33.4	15.0	11.5	11.5	15.0	11.5
48.3	Davenport	HAR12F2	OFF	NO	29.9	48.3	34.5	13.8	11.5	11.5	13.8	11.5
33.4	Deer Park	COB12F2	OFF	ADV	12.7	33.4	21.9	5.8	4.6	5.8	8.1	5.8
32.2	Deer Park	COB12F1	OFF	ADV	9.2	32.2	21.9	5.8	4.6	5.8	8.1	4.6
31.1	Deer Park	DEP12F2	OFF	ADV	12.7	31.1	19.6	6.9	5.8	6.9	8.1	5.8
54.1	Grangeville	CRG1263	OFF	NO	21.9	54.1	26.5	15.0	13.8	16.1	17.3	16.1
52.9	Grangeville	CRG1260	OFF	NO	21.9	52.9	28.8	15.0	13.8	16.1	18.4	16.1
51.8	Grangeville	WIK1279	OFF	NO	23.0	51.8	31.1	16.1	16.1	17.3	19.6	17.3

Max	Area_Office	Feeder	Status	DLM	2022-01-06	2022-01-07	2022-01-08	2022-01-09	2022-01-10	2022-01-11	2022-01-12	2022-01-13
0.0	Colville	GRN12F2	OFF	YES	0.0	0.0	null	null	null	null	null	null
0.0	Colville	VAL12F3	OFF	YES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	Colville	VAL12F2	OFF	YES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.4	CDA	RAT233	OFF	ADV	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
0.3	CDA	BLU321	OFF	ADV	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
0.2	CDA	DAL131	OFF	ADV	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
0.3	Davenport	RDN12F1	OFF	ADV	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
0.2	Davenport	RDN12F2	OFF	YES	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
0.0	Davenport	HAR12F2	OFF	NO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	Deer Park	MLN12F1	OFF	YES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	Deer Park	MLN12F2	OFF	ADV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	Deer Park	LOO12F2	OFF	YES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.3	Grangeville	CRG1261	OFF	YES	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
0.1	Grangeville	WIK1279	OFF	NO	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
0.0	Grangeville	GRV1272	OFF	NO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Q. What are the forecasted wildfire resiliency risks and costs of the main focus areas?

A. Summarized risks along with costs are shown in Table No. 2 below, representing the 10-year electric system (Washington and Idaho) planning horizon for both

incremental operating expense as well as capital improvements to infrastructure. In simple terms, risk is the product of the probability of an event and its consequence. The values shown for risk in Table No. 2 are percentage-based and reflect a range for each category of mitigation effort.

Table No. 2 - Resiliency Risk and Cost Summary (System)

2020-2029 Operating Horizon	Existing Risk ($ Millions)	Managed Risk ($ Millions)	Capital Investment ($)	Operating Expense ($)
Grid Hardening	$1,383 - $3,372	$23 - $91	$246,174,759	$6,862,372
Enhanced Vegetation Management	$6,244-$12,923	$412 - $1,872	$0	$59,069,317
Situational Awareness & Dry Land Mode Operations	$151 - $585	$5 - $7	$35,703,680	$675,000
Operations & Emergency Response	$269 - $1,363	$73 - $319	$2,510	$0
Totals	$8,048 - $18,242	$512 - $2,289	$281,880,949	$66,606,689

Risk = (The likelihood of occurrence, or probability) X (The financial impact of an event)

- Existing Risk - describes the current-state risk level and reflects defense strategies already in place.

- Managed Risk - describes the future-state risk level with the addition of Wildfire Resiliency elements.

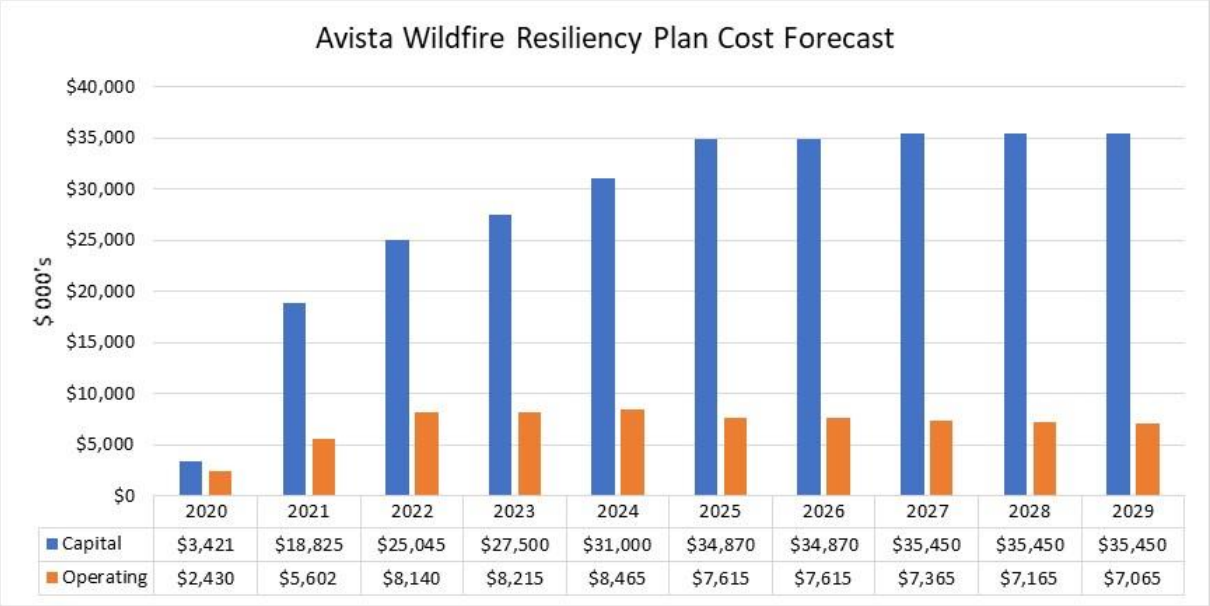
"Enhanced Risk-Based Vegetation Management" and "Grid Hardening" risk scores indicate a "bounded range" because the probability of occurrence is based on the frequency of forced outages. Although the probability of electrical outages is well understood, the impact of an event can vary widely based on many factors, including weather, fire risk levels, emergency response, and location. "Managed risk" scores represent future-state levels, and lower levels of event probability and event outcome as compared with the "existing risk" levels.

As noted in Table No. 2, the wildfire resiliency program includes a capital investment of $281,880,949 over a 10-year period with corollary operating expenses of $66,606,689 (all electric system numbers).[9]

Q. What is the estimated capital and operating expense on a year-by-year basis over the 10-year plan horizon of 2020 - 2029?

A. The following Illustration No. 3 shows the total estimated capital and operating expense, on a per year basis (Washington and Idaho electric) from 2020 to 2029.

Illustration No. 3 – Avista Annual Wildfire Resiliency Plan Cost Expected (System)[10]



	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Capital	$3,421	$18,825	$25,045	$27,500	$31,000	$34,870	$34,870	$35,450	$35,450	$35,450
Operating	$2,430	$5,602	$8,140	$8,215	$8,465	$7,615	$7,615	$7,365	$7,165	$7,065

While capital plan elements are projected to decline significantly after 10 years, the majority of operating expense items are on-going and are generally related to enhanced vegetation management. As shown above, both capital and operating expense levels are

[9] All operating expenses provided reflect incremental amounts above existing expense levels and are specific to the Wildfire Resiliency Plan.
[10] Capital shown in Illustration No. 3 from the Company's original 10-Year Plan have been revised slightly for planned transfers in 2022 through 2024 as shown in Table No. 1 above.

expected to flatten by 2025 and remain so during the balance of the ten year period.

As discussed above, the individual plan recommendations that result in these costs estimates are provided in the Wildfire Plan. By far the single largest capital investment is associated with electric distribution grid hardening. This accounts for $206,424,920 invested in distribution systems located in elevated fire risk areas, with another $38,073,567 invested to convert wood poles to steel on the transmission system. These two plan elements alone account for 87% of total capital spend over the ten-year period.

For operating expense, transmission and distribution digital data collection, annual risk-tree mitigations, fuel reduction partnerships, and the public safety initiative 'Customer Driven Right Tree Right Place,' account for $59,069,317 (89% of the total Wildfire operations budget) over the same 10-year period.

Q. What do the capital and expenses for the Rate Period consist of, and who will be addressing these?

A. As discussed above, the expenditures for the Wildfire Plan over the relevant Two-Year period from 2021 through 2024, are embedded in the adjustments sponsored by Ms. Andrews. Ms. Andrews, therefore, speaks to Wildfire's O&M expenses and net capital additions, in her testimony. She also discusses the application of the Wildfire O&M balancing account approved in the Company's last case, as well as any benefits being reflected within the balancing account on a go-forward basis.

Q. Are there potential operating and maintenance expense offsets (i.e. direct benefits) expected as a result of the Company's Wildfire Plan?

A. The goal of wildfire resiliency is to reduce the overall risk associated with wildfires. In short, the benefits of this plan are largely measured in terms of risk reduction for

all parties involved as well as cost avoidance. The Company, however, recognizes a potential for costs savings and cost shifts from operating and maintenance expense towards capital investment. The overall impact of cost savings and cost shifts will not be well understood until the plan is fully operational and longer-term performance data can be obtained and analyzed. However, one of the objectives of this plan is to reduce the number of equipment failures and tree-related outages and by doing so, avoid emergency response and customer outage costs.

The following Table No. 3 lists a number of potential cost savings opportunities associated with the Wildfire Resiliency Plan.

Table No. 3 – Potential Cost Savings Opportunities

Plan Element	Benefit	Cost Savings/Shift
Annual Risk Tree and Customer Driven Right Tree Right Place	Improved system performance (fewer outages)	Reduced spending on emergency response and unplanned repairs
Digital Data Collection	Automates data gathering process for vegetation and structure condition inspection	Reduces field inspection activities. Enables computerized quality analysis & control
Grid Hardening	Improved system performance (fewer outages)	Reduced spending on emergency response and unplanned repairs
Situational Awareness (Communications & Control Systems)	Enables remotely monitoring and controlling equipment	Reduced service-related truck rolls
Operations & Emergency Response	Better prepared & equipped first responders	Reduces risk of injury or accident

It should also be noted that this portrayal of program-level spend estimates does not differentiate between incremental and embedded cost elements. The bulk of Plan elements, however, including enhanced risk-based vegetation management and grid hardening, which represent additional activities and incremental costs, are discussed below.

Q. How will any offsetting benefits be captured in the form of O&M savings?

A. As discussed by Ms. Andrews, the operation of the balancing account for O&M costs will be net of cost savings, thereby capturing over time any embedded cost savings.

IV. GRID HARDENING

Q. Please describe your Grid Hardening programs in more detail.

A. Grid Hardening is the single largest capital investment in the Wildfire Plan. Grid hardening programs are key to protecting both our customers and our electric transmission and distribution systems from wildfire risk. Grid Hardening comprises 87% of the total wildfire capital expenditures over the ten-year period of the Plan. It includes elements designed to reduce the number of spark ignition events and to make our system more resilient to the impacts of wildfire. Grid Hardening comprises the programs described below.

Distribution Infrastructure Upgrades

This includes replacing aging and deteriorated poles, replacing wood crossarms with fiberglass,[11] changing out obsolete copper wire with more resilient modern steel reinforced aluminum wire, installation of wildlife guards to reduce animal-related events, eliminating uninsulated open wire secondary conductors, installing wedge connected stirrups[12] to provide protection and strength at hot tap connection points, and undergrounding conductor on a case-by-case basis when cost-justified. The Grid Hardening program existed at Avista before the Wildfire Plan, but was condition-based and aligned with reliability objectives. The Wildfire

[11] In the early 2000s Avista, like many within the industry, began installing fiberglass crossarms in new construction and replacing wood crossarms with fiberglass. This virtually eliminates fires on poles, as the wood against wood of the old structures allowed electrical tracking under some common weather conditions, creating spark events. Source: John Lauletta, "The Industry's Most Definitive Pole Fire Fact Sheet," https://www.exacterinc.com/resources/uploaded/Brochures/Exacter%20Pole%20Fire%20Fact%20Sheet%20Final.pdf In addition, these crossarms are inherently self-extinguishing so perform well in fire situations. Source: Megan Headley, "Utilities Ready to Invest in FRP Solutions," March 5, 2020, http://compositesmanufacturingmagazine.com/2020/03/utilities-ready-to-invest-in-frp-solutions/ Avista has never experienced a pole fire with a fiberglass crossarm.

[12] The traditional hot line tap is attached via a bolt. Over time this type of connection can come loose and arc and spark and can melt through the conductor, allowing it to drop to the ground. The wedge connected stirrup device prevents the hot tap from being directly connected to the conductor, reducing spark potential, and the stirrup attaches in such a way that if the connection loosens and if the stirrup melts, the conductor is still intact and does not fall to the ground.

Plan's Distribution Grid Hardening program is focused on feeders specifically located in high fire threat districts and is targeted primarily on safety objectives.

Steel Pole Conversion

Avista has systematically replaced wood transmission poles and structures with steel since 2006, typically for poles which were damaged or failed, or in the course of routine transmission line build projects. With the Wildfire Plan, this replacement effort is now focused on making the transmission system resilient to wildfire in high fire threat areas. The Company has created a prioritized list of wood structures to be replaced with steel based upon WUI zone location, historical fire patterns, and high canopy areas where steel poles would be the best choice versus low-vegetation areas where fire protection may be provided with fire mesh wrap.

Steel poles have the added benefit of increasing reliability, as they are less likely to fail. Steel poles are stronger and less prone to wind damage, catastrophic "domino effect" failure when a tension release can cause a long line of consecutive poles to snap,[13] and structural failure, which can lead to an ignition if it results in a wire down. Steel poles are resistant to the impacts of fire, thus increasing resiliency.[14]

Steel poles that are incorporated within a steel structure that includes a steel cross arm, commonly referred to as an H-Structure, provide more resistance to failure from severe weather events. Avista's experience indicates that wooden crossarms are more susceptible to failure than steel cross arms when they are incorporated into steel transmission structures as

[13] Snyder, Dan, "Steel Poles Are Strong, Cost-Effective Option for Distribution System," https://electricenergyonline.com/print_article.php?ID=243

[14] McQuillan, Lawrence J., Park, Hayeon Carol, Summers, Adam B, Dwyer, Katherine, "California Wildfires: Key Recommendations to Prevent Future Disasters," June 25, 2019, https://www.independent.org/publications/article.asp?id=12834

part of the steel pole installation program.

Enhancing Transmission Inspections

Transmission Design Engineering has conducted annual aerial and ground inspections for many years, as required by NERC regulations[15] and Avista's Transmission Maintenance Inspection Plan (TMIP), which requires inspection of 100% of our transmission lines annually. Current inspection programs (ground and aerial) are geared towards identifying reliability risks (e.g. osprey nests, gunshot insulators, cracked crossarms, woodpecker damage, etc.). The Wildfire Plan adds LiDAR inspections to the existing transmission inspection methods, which will be able to specifically identify and mitigate vegetation-related risk and additional issues such as corroded attachment hardware, ground profile changes, excessive sag, and thermal issues.

Transmission Wood Pole Fire Resistant Wrap

The Company is installing fire resistant mesh wrap on transmission wooden poles in high fire threat areas to mitigate the impact of wildfire to the transmission system. The Company has installed fire-resistant paint on wood poles in low-level vegetation areas for many years and has found it to be effective in protecting our structures in fire events. This paint typically lasts for about 5 years, sometimes longer under the right weather conditions, but must be checked and replaced regularly, as it cracks, chips, and literally falls off the poles over time. Fire resistant mesh wrap is a new product. Avista learned about this product from Southern California Edison[16] and tested it in March of 2020 with positive results. The mesh

[15] NERC FAC-003-4 R6: 100% of applicable (interconnected) transmission lines must be inspected/patrolled at least once a year with no more than 18 months between inspections. https://www.nerc.com/pa/Stand/Reliability%20Standards/FAC-003-4.pdf

[16] Southern California Edison "2020-2022 Wildfire Mitigation Plan," U 338-E, February 7, 2020, page 5-4, https://www.sce.com/sites/default/files/AEM/SCE%202020-2022%20Wildfire%20Mitigation%20Plan.pdf

has been proven to be more effective than the paint for approximately the same installation cost per pole, requires no maintenance, and has an estimated life of over 20 years. The Company is moving away from paint after any existing inventory is used up and moving strictly to fire mesh wrap for pole protection.

V. ENHANCED RISK-BASED VEGETATION MANAGEMENT

Q. Please describe the Wildfire Enhanced Risk-Based Vegetation Management Program.

A. The Enhanced Risk-Based Vegetation Management Program is a major O&M expenditure category in the Wildfire Plan. Avista has had a robust vegetation management program in place for many years. The existing program consists of routine maintenance cycle-trimming and risk-tree inspection and mitigation. In the past, these were focused on about 1,500 miles (20% of the system) annually. In 2020 this existing program was separated into two programs based on the new Wildfire Resiliency Plan: Routine Maintenance and Risk-Tree Identification and Mitigation ("Risk-Tree"). Each of these programs have different scopes and budgets in order to continue our routine cycle trimming and to give additional focus to risk-trees as per the Wildfire Resiliency Plan.

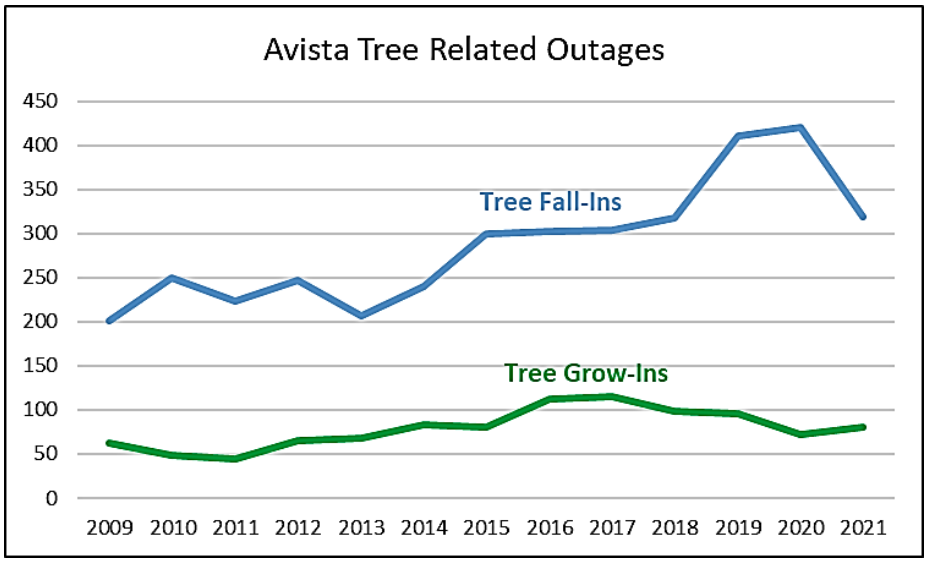
With the additional focus on protecting lives and property from wildfire, the Wildfire Plan Risk-Based Vegetation Management Program has also enhanced the existing tree trimming program with additional measures: 100% risk-tree identification on an annual basis versus a five-year cycle, as well as transmission LiDAR and distribution satellite data collection in order to identify risk-trees and existing or potential vegetation issues. In addition, we have added two new programs, Fuel Reduction Partnerships, and Customer Choice Right

Tree Right Place as described below.

Q. Please explain the Risk-Tree Identification and Mitigation Program.

A. Avista collects data related to outages caused by tree "grow-ins" and tree "falls-ins." Analysis of this data shows that trees falling into our lines account for many more outages than tree grow-ins (see Illustration No. 4 below). The Company's existing vegetation management efforts target dead, dying, diseased or structurally defective trees on both the transmission and distribution systems. Based on the Wildfire Plan recommendations, this existing risk-tree program will be migrated from a 5-year cycle (20% of the system per year) to an annual risk tree inspection (100% of the system per year) of the distribution system, focused on rural areas in our service territory that have the highest potential fire threat.

Illustration No. 4 - Tree Related Outages[17]



Q. Please discuss the use of Transmission LiDAR Imaging.

A. Avista inspects transmission powerlines via ground and aerial patrols each year

[17] From 2009 to 2020 our outage data indicates 948 incidents of tree grow-ins (average of 79 per year) compared to 3423 tree fall-ins (average of 285 per year).

as part of our NERC compliance requirements. To enhance our vegetation inspections related to wildfire risk, Avista added the supplementary layer of LiDAR imagery and data collection for the transmission grid. LiDAR is a laser survey technique that is highly accurate and able to identify tree health as well as tree height and distance from powerlines. It can clearly identify dead, dying, or diseased trees both inside and outside our corridor rights-of-way, tracks vegetation growth over time, and is very accurate in calculating fall-in risk. LiDAR works well for transmission inspections because it provides a high level of detail and accuracy, including the placement of the conductor in the corridor, so areas where vegetation might impact the lines are identifiable. Wide transmission corridors (versus the narrow or non-existent corridors around most distribution lines) make it easy for a helicopter or airplane to fly over them to collect LiDAR data. Beginning in 2022, the transmission system will be inspected about twice a year using LiDAR.

Q. What about imaging for the Distribution system?

A. For the distribution system, we use a satellite-based methodology which allows for a system-wide approach rather than conventional corridor collection (e.g. LiDAR) because it works very efficiently for the compact trunk-and-lateral, non-linear configuration of the distribution system, which lacks well-defined flyable corridors. Satellite-based data, however, is not as sophisticated as LiDAR, requiring several passes over the system to collect the data needed. In addition, satellite images are not detailed enough to include conductor placement. However, with satellite imaging, successive overpasses are paired with computer machine learning algorithms, commonly referred to as artificial intelligence (AI), to effectively assess the risk of both tree encroachment (grow-in) and strike potential (fall-in), thereby providing a data-driven approach to identifying and managing the risk of vegetation encroachment on our

distribution system.

We believe that the detailed, over-time analysis provided by the LiDAR and satellite tools will change the way our Vegetation Management programs are managed. Because these images are taken on a regular basis, they show us where vegetation risk exceeds both reliability and fire mitigation thresholds and give us valuable information regarding the location of problem (or potential problem) vegetation issues over time. The analysis provided is invaluable in directing planners and line clearing crews to specific locations on the system to perform maintenance and mitigate risk trees rather than the traditional method of working on an entire circuit or polygon. This data gives us the ability to send crews to the areas of greatest need with accuracy. The satellite system is also artificial intelligence-integrated, so the model will learn with each flight, combining historical data with specific tree species and growth cycles. The models will essentially learn Avista's system and the vegetation around our lines. Both of these technologies allow planning work in a more precise and predictable way, streamlining our vegetation management programs and helping to maximize their value.

Q. Have you also developed fuel reduction partnerships?

A. Yes. We are actively engaged with several land management agencies to financially assist them with fuel reduction near our facilities. This includes mitigating dead trees on or adjacent to Avista-owned facilities and corridors, thinning small diameter trees, and removing brush. As an example, the State of Idaho identified several communities that Avista serves with overhead electrical service that they classify as communities at risk of wildfire. Avista can work with the State to help pay for fuels reduction in order to reduce the potential for spark events. While this benefits the customers in that area directly, it also will have a positive impact in developing additional partnerships in Idaho counties, which would

ideally lead to partnerships with fire suppression and prevention agencies. Current discussions are also underway with the Washington Department of Natural Resources to develop similar efforts.

Q. What is meant by "Customer Driven Right Tree Right Place"?

A. Avista is spearheading a new program we call "Customer Driven Right Tree Right Place." This program is designed to work proactively with customers in elevated fire threat areas who have tall-growing trees under or adjacent to our powerlines. Over the next few months, we will be piloting a program to contact these specifically identified customers with an offer to replace trees which are likely to fall into or grow into our lines with a low growing variety at no cost to the customer. We see a real win-win here as we protect our customers from a potential hazard situation and reduce reliability risk.

Q. What kinds of partnerships has Avista developed?

A. Avista has always had good relationships with firefighting agencies that have jurisdiction on the lands that our facilities occupy. These partnerships have been created in part due to Avista's willingness to quickly respond to fires at the request of fire officials. In 2021 we responded to eight separate fire incidents, opening fuses on our distribution facilities to protect firefighters. In addition, we also de-energized two transmission lines at the request of fire commanders last fire season. Avista is recognized as a partner with fire agencies and has been invited to pre-fire season planning meetings, post-fire season reviews, and we have been able to formalize agreements with Spokane County fire districts for expedited response to transmission line trips.

Q. What are you learning/gaining from these partnerships?

A. The benefits of these relationships are too numerous to list. Our external

partners have helped design, create, and shape our Wildfire Resiliency Plan since the beginning. They have worked with us in actual fire situations, advised and guided policy and strategy, and shared ideas and best practices to help us make the best possible choices. Synergy is a very powerful force when bringing diverse groups of people together to address an issue that is of concern to them all.

Avista has also taken a lead role in information sharing and learning regarding wildfire with other utilities in the Pacific Northwest. Starting in 2019, Avista began organizing and hosting the Pacific Northwest Wildfire Working Group meetings. This group shares information on planning, mitigation strategies, and logistical constraints on a regular basis. In November of 2021, attendees in this meeting included Idaho Power, Portland General Electric, Puget Sound Energy, Northwestern Energy, PacifiCorp, and Chelan County Public Utility District. These meetings have been helpful for all participants in understanding the components of neighboring utilities wildfire plans and the challenges that implementing them has brought.

In addition, Avista is an active participant in the Inland Empire Fire Chiefs Association. We were asked to join in their meetings to add input on critical infrastructure capabilities and needs during wildfire and other emergency response. This group includes the Fire Chief of the City of Spokane and the Chiefs of Spokane County as well as the Spokane County Department of Emergency Management and the Spokane County Sheriff's Department. Along with information sharing, this relationship has brought a heightened awareness of how fire and emergency response is coordinated as well as how the utility can integrate into emergency response efforts.

Avista is also involved with the Western Energy Institute and other utility-based

organizations to gain learning and information-sharing related to emerging issues pertinent to utilities. Recently, the risk that wildfire poses to utilities throughout the West has become a central topic. Along with regular attendance, Avista has shared what we are doing in response to the wildfire threat and have gained a better understanding of what other utilities are doing to address the same issues.

VI. SITUATIONAL AWARENESS STRATEGIES

Q. What are your Situational Awareness Strategies?

A. Avista's Situational Awareness strategies are designed to enable remote monitoring and control of equipment and provide operating horizon risk analytics. Automation equipment will provide "eyes" on some of our most critical infrastructure in high risk areas. Many of Avista's circuit breakers do not support monitoring or control, which means they cannot be remotely operated, requiring manual intervention to make changes to settings or to identify an issue. This may take several hours depending on location and crew availability. Part of the Wildfire Resiliency Plan is installing modern circuit reclosers on circuits deemed potentially at risk. These new reclosers are capable of remote monitoring and operation. The Plan also includes Dry Land Mode operation, which can reduce spark potential significantly, and the Wildfire Fire Weather Dashboard, a computer-based risk analysis system that combines elements of the 7-day weather forecast (National Weather Service) with metrics associated with infrastructure performance and underlying fire risk, helping decision makers see potential fire-related conditions days in advance and giving us more time to prepare.

There are four programs under the Situational Awareness part of the Plan: Dry Land

Mode Operations, the Fire Weather Dashboard, Substation SCADA Installations, and Dry Land Mode Automation Devices. I will describe these programs in more detail below.

Dry Land Mode Operation

During fire season, the Company transitions into the mode of limiting the number of circuit recloses. This operating mode, which we call Dry Land Mode (DLM), involves both identifying electric circuits that operate in elevated fire threat areas and the reconfiguration of protection systems to allow these protection devices to be remotely and automatically adjusted for wildfire threat based on the operating location. All of these methodologies reduce the potential for spark events and the risk of fire. The Wildfire Plan proposes Dry Land Mode with four levels of reclosing operations:

1) Non-Fire Season Mode – Normal operations where circuit breakers automatically reclose multiple times before locking out, with a focus on reliability.

2) Base Level Dry Land Mode – If a circuit is set to this protection level, when it trips it waits a predetermined length of time then recloses to test the circuit. If it tests bad the second time it will stay off until manually inspected before being placed back in service.

3) Elevated Risk: Fire 2 Shot – A circuit placed at this protection level it will stay off if it trips and tests bad. There is no time delay. This allows the circuit to close back in for temporary faults but de-energizes for permanent faults by tripping off the breaker.

4) Extreme Risk: Fire 1 Shot – Circuits considered in extreme danger are configured for instantaneous tripping and non-reclosing so if the circuit trips, it does not test or try to reclose. It stays off until it is inspected and released back into service. This extreme protection level will only be used for severe weather conditions. This level of protection operates at significantly reduced energy levels and once the feeder trips due to a fault condition, mitigates the impact of future system faults due to the feeder being in an off status until the feeder is patrolled and re-energized. This can significantly impact customer reliability, as it may take several hours to patrol the line and mitigate any issues found.

For extreme weather events exceeding Fire One Shot, the Company will selectively

implement de-energization on feeders or sections of feeders as a measure of last resort in coordination with our partners and first responders. This will only be done in a situation where there are no customer impacts or if no other mitigation actions are available, and when it is clear that the safety benefits exceed the cost of shutting off power to customers. We have implemented de-energization at the request of first responders as a course of business throughout our history. As mentioned earlier, in 2021 we responded to eight separate fire incidents to open fuses on our distribution facilities to protect firefighters, and de-energized two transmission lines at the request of fire commanders.

Q. How does this strategy differ from California's use of Public Safety Power Shutoffs?

A. When administering protection using a public safety power shutoff (PSPS), circuits are preemptively removed from service based on calculated level of fire risk. Circuits can be out of service for several hours to several days depending upon conditions as they must be manually inspected before reenergizing. The major difference between Dry Land Mode Operations and PSPS is that Dry Land circuits are only removed from service when an actual fault is experienced on the line, while PSPS circuits are proactively disconnected based on an assessment of risk. Avista selectively de-energizes circuits based on a spectrum of criteria, primarily impacts to customer service and safety, and only as a measure of last resort. As indicated, the PSPS concept is not currently a formal level of our protection plan but the implications of a "California style" PSPS are being evaluated. The Company believes that the trade-off between a perceived and a real threat must be carefully considered, as moving to a PSPS plan similar to what is used in California can have a significant impact on our customers in the number of outages they may experience, in the length of those outages, and the costs

involved.

Q. Please elaborate on the Fire Weather Dashboard.

A. During fire season Avista continuously tracks localized weather patterns to identify consistently dry conditions that promote lower fuel moisture, as well as extreme wind conditions, as an acute risk-based warning system for wildfires. Because weather cannot be controlled, Avista desires to prioritize where there is increased potential for wildfire given current conditions, fuel, terrain, and prior ignition events. Avista's Fire Weather Dashboard is our primary tool for identifying transient fire danger potential on our system. The Dashboard is a risk-based model developed using historical data based on our service territory. This tool allows insights into each feeder in the distribution system, providing a risk level based on a robust spectrum of information including wind speed and direction, sustained winds, humidity level, type of vegetation, temperature, condition of equipment, mode of operation, and more. It provides a dynamic look at Avista's daily fire risk and weather conditions, identifying areas and times where problems may arise and when the risk is increasing beyond a desirable point. It provides notice to take actions to mitigate potential risk on individual facilities throughout our system. It has the ability to track current fire paths and relationships to our facilities as well as to estimate potential risk to Avista's infrastructure. When combined with the dynamic operating capability provided by automation equipment, it guides the decision to enable various levels of operations (Dry Land Mode operations) to mitigate risk.

Q. Do you employ Substation SCADA Installations?

A. Yes. Fifteen Avista substations are located in high fire threat districts and lack communications equipment. Another thirty substations require hardware upgrades to support a fully automated Dry Land Mode operating system. We plan to modernize 4-5 substations

per year, with forty-five stations capable of remote monitoring and control by the end of 2029. These upgrades will provide the functionality for remote deployment/enactment of DLM, as well as the ability to enact the various protection schemes for dynamic DLM.

Q. And what about Dry Land Mode Automation Devices?

A. Avista has over 240 circuit reclosers (both midline and substation) that require installation hardware or upgraded protection software upgrades to be fully automated, Dry Land Mode capable, and to aid in implementing wildfire protection measures. These 240 devices were selected based on the downstream WUI tier zones that are served (Tiers 2 and 3 were mandated by the Program, while some Tier 1 were also included based on historical events.)

Avista already makes a great effort to reduce the number of "faulted circuits" with programs such as Wood Pole Management, Vegetation Management, and adding sectionalizing devices such as reclosers. Equipment failures, vegetation contacts, wind, snow, and lightning are significant contributors to line faults, and each line fault represents interruptions to electric service. When line faults occur, distribution system protection is called upon to isolate the fault location.

VII. OPERATIONS AND EMERGENCY RESPONSE

Q. Back to the elements of the Plan, please describe your Operations and Emergency Response.

A. This part of the Plan encompasses both internal and external resources with a goal of reacting to wildfire threat in a thoughtful, proactive, and coordinated manner, along with the ability to rapidly respond as needed. Its purpose includes building solid working

relationships with outside entities and first responders, developing response strategies, and tracking the progress and benefits of the Wildfire Plan programs. That cooperation with third parties has already been discussed.

Weekly Fire Threat Assessment Meetings

During the 2020 and 2021 fire seasons, the Wildfire Team held weekly fire risk meetings to provide updates and information sharing as well as gather feedback from operations managers and other stakeholders. Approximately 75 people were invited to these calls including district managers, communications, system and distribution operations, line crew leaders, legal, and more. These meetings often included personnel from the Idaho Department of Lands and the Washington Department of Natural Resources. These meetings were highly interactive and included a forum for Avista district managers to report on fires in their operating districts including impacts or potential impacts to our infrastructure.

Formalized Emergency Operating Plan

In 2021 the Wildfire team held regular meetings and developed initial policies for working with outside agencies and internal stakeholders during wildfire events. In 2022 the Wildfire Team will enact Emergency Operations Procedures similar to those that exist for storm situations, but which will be specific to issues related to wildfire. The goal is to formalize internal and external processes and develop a consistent approach. This includes defining key roles and responsibilities for personnel, identifying communications channels, and developing strategies for engaging with fire protection professionals and emergency operations agency staff.

Emergency First Responder Training

Another element of the Wildfire Plan is to partner directly with fire protection agencies

and to cross-train personnel so that Avista first-responders understand fire incident command structures and their role during an active event and, in turn, fire professionals understand the hazards associated with electric operations.

Expedited Fire Response

As mentioned earlier, in 2020 a Memorandum of Understanding was executed with the Spokane County Fire Department that included the dispatch of fire patrol personnel to transmission-level outage locations. This was a pilot program with Spokane County intended to be extended to other counties.

Fire Ignition Tracking System

Avista's Outage Management System (OMS) is used to track electric outages including causation information such as: tree fall-ins, car-hit-pole, wind, animal, underground cable failure, overhead equipment, pole fires, etc. Fire is listed as an outage category, but generally relates to structure fires and is not typically associated with Avista equipment.[18] The OMS was designed to record actual events based upon cause, not impact, with the goal of repairing or replacing equipment that has or could lead to an outage. Currently we can use the OMS dataset to capture spark-ignition and fire events by searching the text strings of Dispatcher comments.

[18] Many structure fires require Avista to turn off the power onsite to protect firefighters. Thus "fire" may be noted in the logs as the reason personnel were dispatched.

VIII. AVAILABLE WILDFIRE METRICS

Q. What metrics are you currently collecting related to Wildfire?

A. Our Wildfire programs are tracking a variety of data, statistics, and achievements related to our programs. For example, a decreasing number of tree-related outages should indicate the benefits of our Risk-Based Vegetation Management program. We are also tracking overhead equipment outages and pole fires, as these should be positively impacted by grid hardening investments. However, most of the benefits of the Wildfire programs will not show up immediately. Wildfire metrics are intended to reflect long-term trends on our system. Only long-term trends are truly meaningful here; it is not practical or reasonable to look merely to end-of-year results due to the variability of a variety of factors, most specifically weather conditions. In addition, a marked change in these statistics will take the time it requires to replace thousands of crossarms across the system, change out aged equipment, and mitigate vegetation issues system wide, for example. None of these programs will be completed within a year time frame but will be ongoing and offering continual improvement.

We group our Wildfire metrics into three primary categories: Performance, Infrastructure, and Vegetation Management. We also monitor our budgets and actual expenditures, and look at both actual the year-to-date and the five-year average, updated over time.

Q. What metrics are you currently collecting in the Performance category?

A. We collect information about several performance-based elements. Descriptions are below. Related outages for the past five years are summarized in Table No. 4 below:

Table No. 4 – 5 Year Primary Outage Issues

Outage Issue	2016	2017	2018	2019	2020
Pole Fires	72	92	79	68	66
Tree "Fall-In"	303	304	317	411	420
Tree "Grow-In"	113	115	99	96	72
Overhead Equipment	650	629	659	655	608

Pole Fires

Pole fires become more pronounced during periods of hot dry weather. In most cases, ignition occurs between the interface of a wood pole and a wood crossarm. Replacing wood crossarms with fiberglass crossarms has proven to be effective in reducing pole fires, and Avista has taken this to heart, as reflected in the distribution grid hardening program. Every structure in a Wildland Urban Interface (WUI) tier 2 or 3 (elevated or extreme fire threat areas) will eventually receive a fiberglass crossarm if a wood crossarm is currently in place. This action should reduce pole fires over time.

Tree Fall-In

Vegetation issues, especially tree fall-ins, are a primary factor in spark ignition. For Avista, tree fall-ins account for far more tree-related outages than tree grow-ins as mentioned earlier. We have increased our annual hazard tree program by 80% (full system) and, with the Wildfire Resiliency Plan, will be completing 100% inspection of the distribution and transmission systems each year through a combination of boots-on-the-ground, aerial surveys, LiDAR and satellite imaging. Tree fall-ins are a good representation of the number of dead, dying, diseased or structurally defective trees impacting our system. Identifying risk trees and mitigating them will drive down this metric. Decreasing numbers in this category will indicate the success of our Risk Tree Vegetation Management Program over time.

Tree Grow-In

Left untrimmed, trees and branches can grow into powerlines. Though vegetation management is prioritizing routine trimming in the WUI 2 and 3 areas, we are moving away from cycle-based trimming and toward a risk-based approach, identifying 100% of the risk trees on our system, which should be a more effective way of dealing with this issue. The use of LiDAR and satellite imaging will help identify tree growth over time to highlight the areas to prioritize for mitigation. We anticipate our statistics showing the benefits of this approach over time.

Overhead Equipment

We are tracking events that could result in a primary wire (15 kV) on the ground, which is both hazardous to the public and a fire risk. The involved equipment typically includes broken conductor, failed splices, and failed crossarms. Our Grid Hardening efforts should significantly reduce these types of outages over time as this equipment is methodically replaced, starting in the highest fire threat zones.

Q. Why is there a lack of specific fire data available at this time for the analysis of metrics?

A. The Company has not specifically tracked wildfires in the past because our current outage management data is based upon cause, not impact, with the goal of repairing or replacing equipment that has caused or could cause an outage. Avista's Outage Management System (OMS) includes causation information such as: tree fall-ins, car-hit-poles, wind, animal, underground cable, overhead equipment, pole fires, etc. As mentioned earlier, fire is listed as an outage category, but generally relates to structure fires and is not typically related to Avista equipment. Fire information must be obtained by looking through

the dispatcher comments. This will be the methodology used until we replace our outage management system within the next few years.

Q. What metrics are you currently collecting in the Infrastructure category?

A. As mentioned previously, we group our Wildfire metrics into three primary categories: Performance, Infrastructure, and Vegetation Management. We also monitor our budgets and actual expenditures, and look at both actual the year-to-date and the five-year average, updated over time. The Infrastructure category program results and 2022 goals are shown in Table No 5. This category has three primary components:

Table No. 5 – Performance Program Category Results and 2022 Goals

Infrastructure Programs	2020	2021	2022 (Plan)
Distribution Grid Hardening (miles)	61.2	146	200
Transmission Steel Pole Conversion (units)	368	1,016	852
Transmission Wood Pole Fire Resistant Mesh Wraps (units)	1,235	1,938	1,600

Distribution Grid Hardening (miles)

Grid hardening includes several elements all focused on reducing fire-likely distribution outages. This includes replacing wood crossarms with fiberglass units, replacing obsolete small copper wire with modern steel-reinforced aluminum conductor, installing wildlife guards, and replacing obsolete equipment and devices. We track grid hardening efforts on a mileage-achieved basis, because each segment that undergoes this procedure is discrete and constructed based upon existing equipment and what is required.

Transmission Steel Pole Conversion (units)

Replacing wood structures and poles with steel specifically in high-canopy areas is highly effective in preventing burndowns and fire induced transmission outages. We set goals for replacing a specific number of wood transmission poles each year, focused in high fire

threat districts. We are in the process of refining the prioritization process to include not only fire risk areas, but also historical fire information and topography. We monitor replacement goals while noting that situations outside of our control such as a line suffering unanticipated damage could reprioritize budget dollars.

Transmission Wood Pole Fire Mesh Wraps (units)

As explained elsewhere, transmission wood poles in low vegetation areas that are subject to recurring grass fires can be protected by wrapping the pole with fire resistant materials. Avista has been painting poles with fire resistant paint since the mid 2000s, but as recommended in the Plan, we are moving to a fire resistant mesh wrap which has an effective life of 20 years compared to the 2-5 year life we have experienced with our fire resistant paint. The number of installations completed is tracked year by year.

Q. What metrics are you currently collecting in the Vegetation Management category?

A. As noted, we group our Wildfire metrics into three primary categories: Performance, Infrastructure, and Vegetation Management, monitoring budgets and actual expenditures for each, including both actual the year-to-date and the five-year average. The Vegetation category is focused on hazard tree identification and remediation. We track several metrics related to this program including number of hazard trees identified and mitigated, number of miles inspected, and number of satellite (Distribution) or LiDAR (Transmission) miles completed.

Table No. 6 – Risk-Based Veg. Management Program Category Results and 2022 Goals

Risk-Based Vegetation Management Programs	2020	2021	2022 (Plan)
Transmission LiDAR (miles)	850	1,143	1,982
Distribution Satellite Imaging (miles)	n/a	7,675	7,675
Distribution Risk Tree (miles patrolled)	3,429	5,245	7,675
Distribution Risk Tree (miles remediated)	1,649	2,815	TBD
Transmission Risk Tree (miles patrolled)	1,355	2,270	2,270
Transmission Risk Tree (miles remediated)	2,715	1,362	TBD

Q. Do you have a proposed performance-based metric related to the Wildfire Resiliency Program?

A. Yes. As discussed by Company witness Mr. Ehrbar (Exh. PDE-1T), Avista is proposing a Performance Metric related to wildfire resiliency. As we have discussed, Avista's Wildfire Resiliency Program has identified four categories of mitigative-actions related to wildfire: 1) Enhanced Vegetation Management, 2) Grid Hardening, 3) Operations and Emergency Response, and 4) Situational Awareness. All four of the mitigative categories work together, but if there was only a single mitigative action, perhaps the most important would be the inspection and removal of risk trees that are in, or adjacent to, Avista's rights of way. Avista has made a commitment as part of its Wildfire Resiliency Program to inspect 100% of its non-urban distribution system on an annual basis to identify and schedule for mitigation the removal of risk trees that have the potential to contact conductor if they were to fall. Risk trees are those that are dead, dying, diseased or those that exhibit obvious structural defects such as a co-dominate stem and pose an increased fall-in risk with conductor during more severe weather. Therefore, Avista is proposing the following measure:

> **Measure 11**: **Wildfire Resiliency Performance Measure** - Complete a risk tree inspection of non-urban transmission and distribution electrical feeder miles on an annual basis, and schedule or plan for mitigation.

It is proposed that the inspection be completed utilizing multiple methodologies – the use of digital data collection methodologies as well as physical field inspections utilizing certified arborists and/or qualified utility personnel.[19] Successfully achieving the risk tree inspection metric will identify trees to be removed that will reduce potential contacts between vegetation and electrical conductor during extreme weather events. Vegetation, especially tree "fall-ins", are a primary factor in spark ignitions. For Avista, tree "fall-ins" account for far more tree-related outages than tree "grow-ins". Analysis of historical Avista tree-related outage data indicates that nearly 90% of all outages that are vegetation related are due to tree "fall-ins". Again, Mr. Ehrbar provides more information on this performance measure.

IX. WILDLAND URBAN INTERFACE

Q. Please explain the importance and use of the Wildland Urban Interface.

A. As discussed at the outset of my testimony, we undertook a significant effort to specifically identify Wildland Urban Interface (WUI) zones and associated fire risk areas specific to our service territory. Knowing where the most high-risk areas lie allows us to focus our Wildfire programs where they should have the most positive impact and benefit in protecting both customers and the infrastructure that serves those customers.

Q. How are at-risk customers protected in Avista's Wildfire Plan?

A. Our goal with this Plan is always to balance reliability with risk and safety for all customers. The aim of the Wildfire Plan is to deliver risk mitigation to customers based upon where our analysis determines the risk to them is highest. Thus, the delivery of risk

[19] The probable inspection methodologies for transmission facilities include LiDAR, visual helicopter, and/or ground inspections. The probable inspection methodologies for distribution facilities included digital data collection and ground inspection.

mitigation is irrespective of socioeconomic status. However, we believe that our focus on high fire threat areas will help protect the customers most at risk for wildfire. These are often low-income rural areas that lack robust firefighting capability. To further enhance this effort, we are updating our existing risk maps to include the USDA's Wildfire Risk to Communities map,[20] which combines both likelihood of fire with exposure and susceptibility of property damage. This should help us further understand the impact of wildfire to people and property.

We also believe that the Wildfire Plan's Dry Land Mode operations will protect customers who are most impacted by outages, such as those dependent upon medical devices, those working from home, customers without access to reliable transportation, those who cannot afford to replace food that might perish, or who need water for themselves or their animals. Under Dry Land Mode operations, these customers will only experience an outage when an actual fault occurs on the line serving them.

X. WILDFIRE PLAN UPDATES AND LESSONS LEARNED

Q. Have you changed the Plan since 2020? If so, what are the primary differences between the two?

A. Yes. The initial risk assessments remain sound and are the foundation for our programs. However, the budgets have changed over time as we learn from the implementation of the Plan. Many of the original budget elements were best estimates at the time, and these have been refined to reflect what we have experienced. For example, we now have extended contracts with the LiDAR and satellite providers for digital data collection, so we know exactly what to budget for those programs. We have also combined some smaller programs

[20] https://www.fs.usda.gov/managing-land/fire/wildfirerisk

into the larger groups to streamline and simplify, for example including circuit recloser communications in the general category of Dry Land Midline Reclosers. A few programs were reorganized to more closely align with our experience in working with the Plan and based on what made sense.

Q. What are some of the other "lessons learned" as you have implemented your Wildfire Plan?

A. We apply a philosophy of "Plan Do Check Adjust" to our Wildfire Plan and its associated programs and strategies, so we are always looking for improvements through both experience and engagement with internal and external stakeholders. Some specific examples are described below.

2022 WUI Zone Map Refresh

Avista used the 2018 USDA Wildfire Hazard Potential Map (WHP)[21] to create its initial Wildland Urban Interface Map. This map indicates that 40% of Avista's electric distribution and 20% of the transmission grids are located in elevated fire risk zones (WUI Tiers 2 and 3). The original data did not reflect the potential impact to communities as well as newly available data does. Because of this, we are currently working on a revision to our wildfire risk tiers to incorporate data from the USDA and U.S. Forest Service called the "Wildfire Risk to Communities Housing Unit Impact Data."[22] This data reflects the potential for housing to be impacted by a wildfire.

[21] "Wildfire Hazard Potential (WHP) for the conterminous United States (270-m GRID), version 2018 continuous (2nd Edition)," 2018, https://www.fs.usda.gov/rmrs/datasets/wildfire-hazard-potential-whp-conterminous-united-states-270-m-grid-version-2018-continuous

[22] Scott, Joe H.; Brough, April M.; Gilbertson-Day, Julie W.; Dillon, Gregory K.; Moran, Christopher. 2020. Wildfire Risk to Communities: Spatial datasets of wildfire risk for populated areas in the United States. Fort Collins, CO: Forest Service Research Data Archive. https://doi.org/10.2737/RDS-2020-0060

Transmission Steel Pole Conversion Prioritization

Metrics suggest that electric transmission assets are vulnerable to the impact of fire but are generally not a significant driver in fire ignition events. The 2020 Wildfire Plan identified 20% of the transmission system as located in Wildland Urban Interface Tiers 2 and 3 (elevated and extreme). Starting in 2023, we are refining the Transmission Steel Replacement Program by including fire history. Fire occurrence data is available from a program called Monitoring Trends in Burn Severity (MTBS).[23] This program is managed by the Earth Resources Observation and Science Center (EROS)[24] and the USDA Forest Service Geospatial Technology and Applications Center (GTAC).[25] It includes names, locations, fire perimeters, acreage, start date, and fire type for all fires over 1000 acres that have occurred in the U.S. between 1984 and 2018. Fire data for 2019 and 2020 was unavailable from MTBS so was obtained from the National Interagency Fire Center (NIFC).[26]

Avista selected the MTBS and NIFC fire maps associated with our service territory and layered them over our transmission system. This allowed us to see the historic fires that have occurred within strike distance of our transmission lines as well as acquire a count of the frequency of the fires near each line, identifying lines or segments most likely to experience fire issues based on past actual events.

The Company has a contract with GeoDigital to provide annual LiDAR images of the transmission system for both vegetation management and to aid in inspection studies. The

[23] https://www.usgs.gov/centers/eros/science/monitoring-trends-burn-severity?qt-science_center_objects=0#qt-science_center_objects
[24] EROS studies land change based on millions of satellite images it collects. https://www.usgs.gov/centers/eros
[25] GTAC provides maps of forest service land, insect and disease areas, landscape change, and more. Combined with the EROS satellite images, it creates a comprehensive data source related to monitoring trends in fires, active fire mapping, and predictive services. https://www.fs.usda.gov/about-agency/gtac
[26] MTBS did not have data later than 2018 available online when this work was done but it was available from NIFC. https://data-nifc.opendata.arcgis.com/datasets/nifc::wfigs-wildland-fire-perimeters-full-history/about

GeoDigital GIS vegetation dataset can be layered over our transmission line maps to indicate where our lines are in high tree level or forested areas versus low-growth and/or developed areas to aid in prioritizing our resiliency efforts. We identified which areas of our service territory are forested versus low growing areas such as farmland, desert, or developed areas. This segregation is significant from a cost perspective, as it allows us to separate our mitigation efforts into poles in high canopy/forested areas which are candidates for steel replacement, and those in low vegetation areas, which may be adequately protected with fire resistant mesh. The cost for replacement of a wood pole with steel is several thousand dollars per pole versus a few hundred dollars for installing mesh wrap on a pole. Thus, knowing where the poles are physically located, and the geography of the area, has a significant budget impact.

Elevating Out of Base Dry Land Mode (DLM)

Historically, the DLM system has been used in a binary fashion, turned on in July when fire season traditionally begins and then back off in October when it ends. Avista is moving ahead with plans to automate our fire season with DLM operations, which is a multi-faceted operation versus simply on or off. Approximately half of Avista's distribution system is impacted by DLM. We now have capacity to use two additional fire modes (Fire 2 and Fire 1 Shot) which significantly reduces fire risk potential but also puts customers at greater risk for service disruptions due to the potential for extended duration of the outage (12-36 hours or more).

Partnerships Create Better Outcomes

As discussed previously, internal and external partners have been the key to our Wildfire Plan from the beginning, including fire protection experts, engineering consultants, federal agencies, peer utilities, and material suppliers, in addition to city, county, state, and

tribal governments and state utility commissions. We will continue to build on this expertise during Plan implementation.

Fire Mesh Can Be Installed on an Emergency Basis

Our fire mesh installation team and project managers have developed a high level of speed and efficiency as well as rapid deployment skills. This past summer as a rapidly spreading wildfire headed toward our Cabinet-Noxon 230 kV line, the Wildfire Program Specialist joined with Avista's Transmission Mesh Wrap Project Managers and the Idaho Department of Lands fire crews to determine where and when the fire might impact our line. Working in partnership, the group deployed the mesh wrap crew ahead of the fire to protect these structures.

Digital Data Value

Avista partnered with aerial LiDAR (GeoDigital) and satellite imagery (AiDASH) providers to quantify the vegetation encroachment and tree "fall-in" risk for 100% of both our transmission and distribution systems. This is a valuable addition to manual inspection methods, providing detailed data and analytics across the system. We believe that this is the future of vegetation inspection, combining high levels of accuracy, speed of data collection, and ability to use the results to pinpoint areas for mitigation. We will also use the resulting data in other areas of the Company where possible.

Q. How did Avista's dynamic wildfire risk assessment compare to the actual events that occurred in 2021?

A. We are still working on a comprehensive comparison of the events of 2021, but the preliminary findings suggest good correlation between the dynamic forecasted risk and the actual events that took place in the fire season of 2021. The largest wind-driven fire

in the Avista service territory was the Ford-Corkscrew Fire north of Spokane and outside Deer Park, which started on August 15, 2021. This fire resulted in a total burned acreage of almost 16,000 acres with multiple structures lost. It was the largest non-lightning fire in Avista's service territory during the 2021 fire season, and provided a good data point for size and impact comparison to the projected impact resulting from our modeling efforts. The projected fire risk for our facilities near this fire showed strong correlation to the actual numbers that resulted from that fire. We will continue to analyze available data to summarize the 2021 fire year as we go through the winter, which should provide some information related to the probability of ignition during our elevated fire protection settings.

XI. COMMUNICATIONS

Q. With the importance of the Wildfire Plan, does the Company have a specific communications plan to inform its stakeholders?

A. Yes, it does. A key element of the Company's Wildfire Resiliency Plan is ensuring that Avista stakeholders know the Plan is in place and that the Company is taking the right precautionary steps to reduce the potential for and impact of a wildfire. A strong and effective strategic communications campaign is critical to ensuring broad awareness and to demonstrate Avista's commitment to reducing the impact of wildfires. This communications plan must be directed at all Avista's key stakeholders, including customers, employees, state and local government officials and regulators, law enforcement and fire departments, local media, and shareholders.

Our goals in wildfire-related communications are to create awareness of Avista's plan to prevent or mitigate the risk of wildfires, promote the safety and well-being of customers,

and to engage customers in programs that impact them and their communities. Some examples:

- *Avista Connections*: Articles in Avista's mailed and emailed customer newsletter in advance of fire season in May and June help educate customers about Avista's Wildfire Resiliency Plan and in preparing property for wildfires.

- *Customer email:* Information about wildfire safety and preparation is sent to all customers in early June in preparation for wildfire season.

- *Department of Natural Resources Wildfire Ready Neighbors Program:* Avista helped promote DNR's new Wildfire Ready Neighbors as it was piloted in Spokane County by including links to the program in customer emails, newsletters and on social media including posts on Facebook, Instagram and Twitter.

- *Dry Land Mode Specific Communications:* Emails are sent to all impacted customers and press releases are distributed to the appropriate areas of the electric service territory during Dry Land Mode operations.

- *Telephone Town Hall*: This meeting with community and business leaders was first implemented in July 2021 and will be repeated at least annually due to its success and the amount of helpful information we gained on how our customers are preparing and what is are most concerning to them.

XII. COMPARISON WITH OTHER UTILITIES

Q. How does Avista compare with other utilities in terms of costs and measures employed?

A. Avista is very proud of our Wildfire Plan. We have created, in a matter of a few years, a comprehensive, thoughtful, carefully planned set of programs that will make a difference in mitigating wildfire risk – and we have implemented them. We partnered with experts from across our industry, fire professionals, state and local agencies, and brought in our own inhouse expertise to ensure that our Plan and its elements are as comprehensive as possible and revised as necessary. When we compare our efforts to other utilities with years of wildfire experience such as those in California, we compare quite favorably to our peers.

Though we are implementing almost all of the same programs, we have kept our cost per customer quite low, as shown in Table No. 7 below.[27] In fact, Avista's spending per-customer-per-year (including operations and capital) is among the lowest of the group.

Table No. 7 - Wildfire Total Program Cost Comparison[28]

Program Total Costs (Combined)	2020 Actual Spend ($millions)	2021 Forecast Spend ($millions)	2022 Forecast Spend ($millions)	Customer Count	3-Year Ave. Cost/Customer
SDG&E	$569,237	$646,466	$669,869	1,400,000	$448.95
PG&E	$4,862,464	$4,955,161	$5,197,811	5,100,000	$981.40
SCE	$1,336,928	$1,705,672	$1,785,097	5,000,000	$321.85
PacifiCorp (CA only)	$19,416	$27,772	$24,015	44,732	$530.59
NV Energy	$45,348	$89,757	$101,632	1,335,164	$59.10
Rocky Mountain Power	$41,681	$55,692	$54,934	950,000	$53.44
Idaho Power	n/a	$2,006	$9,465	500,000	$11.47
Avista	$5,851	$22,577	$33,972	396,000	$52.53

Table No. 8 indicates that Avista also compares quite favorably with others on a "cost per mile" basis as well.

[27] Note that Idaho Power has a very different risk area profile than Avista, with approximately 17% of their total infrastructure in high risk zones versus Avista with about 60% of our infrastructure in elevated risk zones. The Idaho Power % information is based on our discussions with Idaho Power directly. Information that is available: https://puc.idaho.gov/Fileroom/PublicFiles/ELEC/IPC/IPCE2102/Staff/20210408Comments.pdf pg. 7-8

[28] San Diego: www.sdge.com/sites/default/files/regulatory/SDG%26E%202021%20WMP%20Update%2002-05-2021.pdf, page 7-8.
Portland General Electric: www.pge.com/pge_global/common/pdfs/safety/emergency-preparedness/natural-disaster/wildfires/wildfire-mitigation-plan/2021-Wildfire-Safety-Plan.pdf, pg. 36-37,
Southern California Edison: www.sce.com/sites/default/files/AEM/Wildfire%20Mitigation%20Plan/2021/SCE%202021%20WMP%20Update.pdf pg. 30-31
PacifiCorp: https://www.pacificorp.com/content/dam/pcorp/documents/en/pacificorp/wildfire-mitigation/R.18-10-007_PacifiCorp_2021_Wildfire_Mitigation_Plan_Update_3-5-21.pdf pg. 23-24
Nevada Energy: www.nvenergy.com/safety/ndpp - Download PUC Plan via this webpage. (Note that this was scanned in so is not searchable), pages 35-92, 109, 113, 124. Summary chart on pg. 129-131
Rocky Mountain Power: https://www.rockymountainpower.net/content/dam/pcorp/documents/en/rockymountainpower/rates-regulation/utah/filings/docket-20-035-04/10-05-20-phase-i-revenue-requirement-rebuttal-testimony/07_Mansfield_Testimony_and_Exhibits.pdf pg. 2

Table No. 8 - Wildfire Mitigation Cost Per Mile[29]

Wildfire Cost Per Mile	Miles of Distribution	Miles of Transmission	Total Line Miles (Approximate)	Average Total Wildfire Mitigation Cost 2020-2022	Wildfire Mitigation Cost Per Mile
SDG&E	22,360	1,920	24,280	$628,524,000	$25,886
PG&E	106,681	18,466	125,147	$5,005,145,333	$39,994
SCE	91,375	12,635	104,010	$1,609,232,333	$15,472
PacifiCorp (CA only)	2,522	729	3,252	$23,734,333	$7,299
NV Energy	14,000	1,900	15,900	$78,912,233	$4,963
Rocky Mountain Power	n/a	n/a	18,000	$50,769,020	$2,821
Idaho Power	27,968	4,830	32,798	$15,952,500	$486
Avista	19,000	2,770	21,370	$20,799,944	$973

Finally, as Table No. 9 shows, Avista is performing a range of industry-standard grid hardening measures that are largely consistent with our peers.

Table No. 9 - Wildfire Program Component Comparison[30]

Wildfire Programs	Wood to Steel	Fiberglass Crossarms	Fire Wrap	Covered Conductor	Fuses / Sectionalizing Devices	Small/Bare Wire Replace.	Enhanced Veg. Inspections	Installing Weather Stations / Cameras	Targeted Undergrounding
San Diego Gas & Electric	Yes	Yes	Unknown	Yes	Yes	Yes	Yes	Yes	Yes
Pacific Gas & Electric	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Southern California Edison	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PacifiCorp (California only)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NV Energy	Yes	Unknown	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rocky Mountain Power	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
BPA	Yes	n/a	Yes	Unknown	Yes	n/a	Yes	Yes	n/a
Idaho Power	Yes	Yes	Yes	No	Yes	Unknown	Yes	Yes	No
Avista	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes

Avista's Wildfire Resiliency Plan is built upon the concept of Plan-Do-Check-Adjust. We are continually evaluating the efficacy of our programs and adjusting them as we see opportunities for improvement. As described above, using our Plan-Do-Check-Adjust methodology we have made some significant improvements in just the past year including:

- Prioritizing steel transmission pole replacements in the highest risk areas based on a spectrum of inputs versus utilizing WUI zone alone.

[29] Ibid.
[30] Ibid.

- Differentiating areas where less costly solutions such as fire mesh wraps can provide suitable protection.
- Significantly improving the inputs to our WUI map to more clearly define risk areas and to specifically include structural and human impact.

- Adding additional modeling inputs and capability to our Fire Weather Dashboard to advance our ability to forecast and identify risk.

- Actively seeking out and building valuable partnerships and connections to support our wildfire efforts.

- Engaging with first responders such as the Washington Department of Natural Resources and the Idaho Department of Lands and other agencies both prior to and during actual fire events, as well as aiding them in reducing fuels near our facilities.

- Engaging with and learning from our utility peers and working closely with them to strategize and develop best practices.

- Developing and improving our communications with customers around wildfire.

- Acquiring digital data for both the transmission and distributions systems for identifying risk trees, providing detailed data about our grid and vegetation related issues for mitigation and reducing fire risk.

- Developing Enhanced Dry Land Mode operations to provide a comprehensive scale of risk reduction based upon actual conditions.

Q. Does this conclude your pre-filed direct testimony?

A. Yes.