

**Wildfire Risk Governance Forum
November 13th, 2020**



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Safety

Earthquake
Duck, Cover & Hold

Emergency Plan & Exit Strategy
Have a plan for yourself and your household

24/7 Nurse Care Line
If you experience work related discomfort or injury, call [REDACTED] and notify your supervisor.

Wash your hands!

Wear a Mask

Practice social Distancing

Meeting Agenda

| Date: | 11/13/2020 | | | |
|-----------------------|--|----------------------|--------------|----------|
| Desire Outcomes: | <ul style="list-style-type: none"> Inform: Outline the inspections program key activities Decide: System Hardening "No Regrets" approach Decide: Enhanced Veg Management "No Regrets" approach Inform: Status of outstanding action items. | | | |
| Meeting Agenda | | | | |
| # | What / Content | Who / Facilitator(s) | Slide Number | Duration |
| 1 | Safety Moment and Agenda | [REDACTED] | 1-2 | 5 min |
| 2 | Decision and Action Item Review | [REDACTED] | 3-11 | 15 min |
| 3 | System Hardening | [REDACTED] | 12-15 | 20 min |
| 4 | System Inspections | [REDACTED] | 16-18 | 20 min |
| 5 | Enhanced Vegetation Management | [REDACTED] | 19-23 | 20 min |
| 6 | Follow-ups and Next Steps | [REDACTED] | 24-25 | 10 min |

Decision and Action Item Review

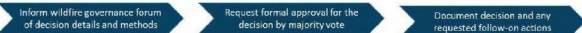


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Key Wildfire Risk Model Governance Forum Decision

Governance Forum Decision Approval Process



| Workstream | Decision | Description | Approval Vote | Date |
|-------------|--|---|--|------------|
| Risk Models | Accept on of the 2022 wildfire risk models for mitigation deployment | <ul style="list-style-type: none">Accept the proposed ignition model for vegetation ignition and technology use 2022 IOM workAccept the proposed ignition model for equipment ignition and technology use 2023 system hardening work | <ul style="list-style-type: none">ApprovedApprovedApprovedNot Present | 10/20/2023 |



Key Decision – Adoption of the 2021 Risk Model for Mitigation Deployment

Approval Status: Approved

Decision Detail

The approval is for moving from the 2018 wildfire risk model to the 2021 wildfire risk model to inform system hardening, enhanced vegetation management and operations. These changes included:

- Update to vegetation ignition model (LoRe)
- Update to conductor model (LoRe)
- Update to consequence (CoRe)

Concerns and Mitigations

- Inclusion of non-UTD areas requested in the next model iteration
- Inclusion of Egress model requested in the next model iteration
- Resource availability to complete "not-risk informed planned work" was challenged
- Detailed description of variables in particular "non-burnable area" requested
- The ability to calculate tree density within pixels was challenged

Approvals

| |
|-----------------------|
| Approved |
| Approved |
| Approved |
| Approved |
| Abstain - Not Present |

Action Items and Validations

| | |
|---|---|
| Adoption of the 2021 wildfire risk models for mitigation deployment Deep dive risk model session | Completed - Adopt the proposed ignition model for vegetation ignition and Technology for 2021 DNR work Completed - Adopt the proposed ignition model for equipment ignitions and Technology for 2021 System Hardening work session |
| Risk models comparison | Completed - Create risk comparison between the 2020 risk model and 2021 risk model to highlight movement of CPZ (Targeting top 100 circuits or CPZs) |
| Deep dive risk model session | Completed - Hold a Deep Dive Session with (1) the Federal Monitor and (2) the Operational Observer |
| Model process documentation | In Progress - Bring the Model Process Level Documentation to this forum for an official approval |
| Egress Consideration | Road Mapped - Factor in Egress into process for selecting the protection zones to be worked |



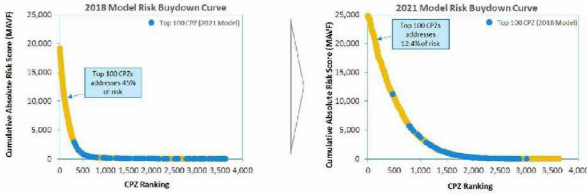
Action Items from 11/09/2020 (Federal Monitor Meeting)

| Workstream | Action Item | Description | Responsible | Resolution | Date |
|-------------|---|--|-------------|--|------------|
| Risk Models | Risk models comparison WSA – 10/02/2020 | Include high risk areas outside of NE ID (per long) in the next iteration of the DR Model | PSSTY | Road Mapped – This will be added as an enhancement to the model road map | XXX |
| Risk Models | Risk Model Enhancement | Include 2019 LIDAR data, and topographic data in the next iteration of the DR model | PSSTY | Road Mapped – This will be added as an enhancement to the model road map | XXX |
| Risk Models | Risk Model Enhancement | Include Egress on the consequence side for the next iteration of the DR Model | PSSTY | Road Mapped – This will be added as an enhancement to the model road map | XXX |
| Risk Models | Model documentation | Links to be added to charts on slide 22 (page 11) on 2020/11/09 (see Risk Models review for a-v) | PSSTY | Completed | 11/13/2020 |



Risk Model Action Items

| Workstream | Action Item | Description | Responsible party | Resolution | Date |
|------------|--|--|-------------------|---|------------|
| Risk Model | Risk model comparison WGR - 10/30/2020 | Create risk comparison between the 2018 risk model and 2021 risk model to highlight movement of CPZs (regarding top 100 results or CPZs) | [Redacted] | Complete - See the Risk Model Follow-up Section | 11/13/2020 |



- No CPZs in the top 100 overlap
- This will result in significant change to the prioritization and expected risk buydown of mitigations
- The 2018 risk results were not distance weighted, where the 2021 prioritization included a distance factor.

Risk Model Action Items


| Workstream | Action Item | Description | Responsible Party | Resolution | Date |
|------------|---|---|-------------------|---|------------|
| Risk Model | Deep-dive risk model session W88-15/10/2020 | Hold a Deep Dive session with (1) the Feder of Monitor and (2) the Operational Observer | [REDACTED] | Complete - Meetings have been scheduled for 11/10 & 11/12 | 11/12/2020 |

Updates

- First Deep Dive session held on Monday 11/10/2020 at 1:00pm PST
- Second session will be held on Thursday 11/12/2020 at 12:30pm PST

| Risk Model Action Items | | | | | |
|-------------------------|-------------------------|--|-------------------|---|------------|
| Workstream | Action Item | Description | Responsible Party | Resolution | Date |
| Risk Model | Risk model contributors | Provide a detailed description of the top model contributors | | Complete - Targeted for inclusion in next release | 11/17/2020 |

| Vegetation Model – Contributors Description | | Conductor Model – Contributors Description | |
|---|---|--|---|
| Variable | Description | Variable | Description |
| Flow height-avg | Maximum flow height, in meters, for each 100m pixel area along the distribution grid | High ignitable area | Used surface temperature similar to top temperatures, but vertices surface, that typically don't ignite when a spark occurs |
| 100-hour-fuel-avg | The dead fuel moisture data from GRDMET | Daily precipitation, mean | The average daily precipitation from the GRDMET dataset |
| Vapor pressure deficit-avg | The average vapor pressure deficit from the GRDMET dataset | Conductor material: ACOR | Alignment conductor steel voltage |
| Windy summer day pct | Percentage of days that have high frequency of gusts | Edwin index conductor age | Number of years since the installation year |
| WIND | High fire threat index | Max tree height | Maximum tree height, in meters, for each 100m x 100m pixel area along the distribution grid |
| Precipitation-avg | The average daily precipitation from the GRDMET dataset | Reliability Program splice | Spans with more than three splice per phase |
| Impervious | Impervious ground cover (i.e. non-forested) | Vapor pressure deficit, mean | The average vapor pressure deficit from the GRDMET dataset |
| Specific humidity-avg | The average specific humidity from the GRDMET dataset | Conductor size: 2 | Conductor size-2 |
| Burn index-avg | An derived variable based off of the geographical and topographical aspects of a location | Conductor size: 4 | Conductor size-4 |
| Wind-max | The maximum wind velocity at a height of 10 meters from the Real-Time Mesoscale Analysis (RTMA) dataset at a resolution of 2.5-km | 100-hour fuel, mean | The dead fuel moisture data from GRDMET |
| Temperature-avg | The average temperature from the GRDMET dataset | Max temperature, mean | The average maximum temperature from the GRDMET dataset |
| Windy summer: day pct | Percentage of days that have a high percentage of days with high average wind speed | Wind speed, mean | The average wind velocity at a height of 10 meters from the Real-Time Mesoscale Analysis (RTMA) dataset at a resolution of 2.5 km |
| Local topography | The topographic position index (TPI) was extracted from a 30m digital elevation model (DEM) at 100-meter resolution | Local topography | The topographic position index (TPI) was extracted from a 30m digital elevation model (DEM) at 100-meter resolution |
| 100-hour-fuel-avg | The dead fuel moisture data from GRDMET | | |
| Energy-release-avg | Average release of energy from fuels | | |

 **Risk Model Action Items**

| Workstream | Action Item | Description | Responsible Party | Resolution | Date |
|------------|-----------------------------|--|-------------------|---|------------|
| Risk Model | Model process documentation | Adding the Model Process Level documentation to this forum for an official approval. | [REDACTED] | In Progress - Targeted for discussion keep them available | 11/19/2020 |

1 User Guide
Model procedure and details will be provided in the user guide to the forum for review at the 11/20 session



Risk Model Action Items

| Workstream | Action Item | Description | Responsible party | Resolution | Date |
|-----------------------------|----------------|--|-------------------|--|------------|
| Wildfire Governance Charter | Charter update | Update charter to include review of broader set of WFF risk reduction activities and project ownership | [Redacted] | Completed. Risk charter has been updated, including attached materials | 11/06/2020 |

See updated slide for the updated wildfire governance Charter

Meeting Purpose:

- Drive charter meeting on
- Make certain that there is agreement on the charter. The charter is not to guide the work. Provide a system to review key risk-based considerations and associated impacts.
- **Work:**
 - Review resolution to understand the format and risks, risk mitigation work associated with investment, asset, resource and operations; needs, guide charter to needed
 - Ensure the approved work plan is completed and the quality of the completed work is assessed.

Meeting Objectives:

- Integrate established wildfire mitigation activities into high governance sessions
- Identify and define the system, processes, and project organization management, operations and equipment with regard to the review of wildfire and WFF mitigation work.
- Review topics and supporting material will be used in discussion and report from the meeting.

Attendees:

- **Global Chief Risk Officer**
- **Working Agreement:**
 - VP Global Risk Management & Community Risk Safety Program
 - VP Major Projects and Programs, Electric Operations
 - VP Global Safety and Health Engineering
- **VP Global Audit Officer**
- **Area Meeting Attendees:**
 - Sr. Director, Electric Asset Strategy
 - Sr. Director, Major Programs & Project Delivery
 - Sr. Director, Risk Management
 - Director, O&M & S&OP
- **Workstream Lead:**
 - Senior Leadership Director, Risk Reduction Strategy
 - Director, Operations Management, Strategic Operations Management
 - Responsible & Regional Manager, Program Area Standards
- **Facilitator:**
 - Sr Director, Risk - Special Projects

How Decisions are Made:

- Goal of meeting, resolution and key considerations for discussion to be made.
- A single member vote by attending committee members.
- The Director Chair holds the tie-break vote.

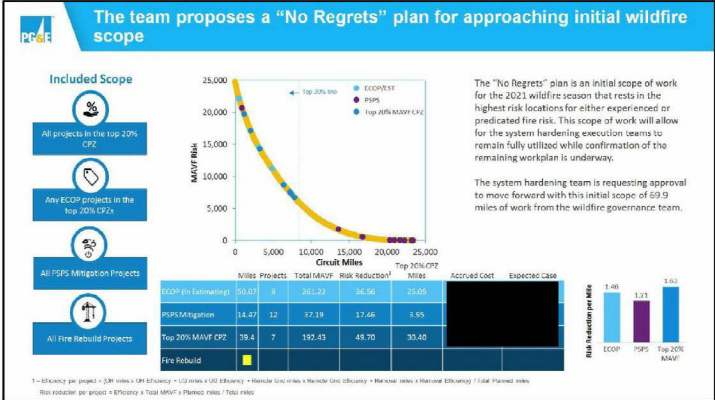
Meeting Logistics:

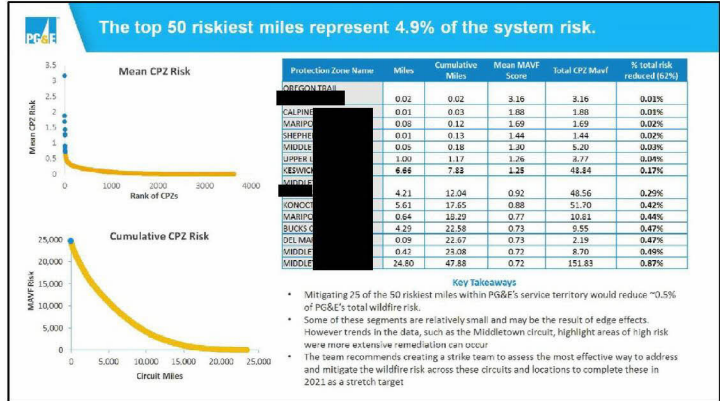
- Preparation/Execution: Weekly (over Friday)
- Minutes
- Pre-read material sent 2 days before meeting.
- Action items include achieving meeting material.
- Agenda: Sr Director Area - Special Projects or adjacent management.

System Hardening



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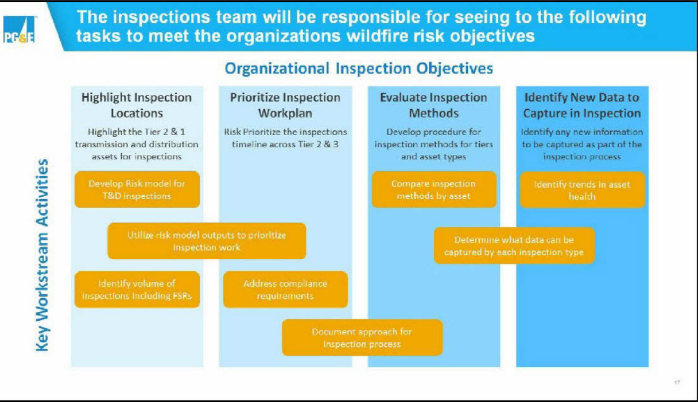
22 circuits have seen at least five unique PSPS events in the 2019-2020 timeframe

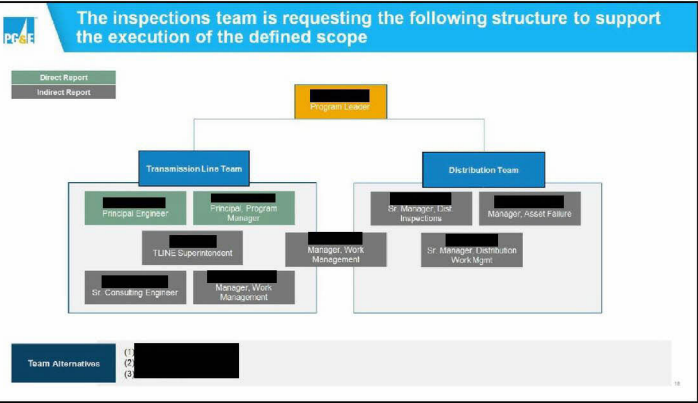
| Seven PSPS Events | | | Six PSPS Events | | | Five PSPS Events | | |
|-------------------|--------|-----------------------|-----------------|--------|-----------------------|------------------|--------|-----------------------|
| Circuit Name | County | Total Customer Events | Circuit Name | County | Total Customer Events | Circuit Name | County | Total Customer Events |
| ORO FINO 1101 | BUTTE | 2503 | WYANDOTTE 1103 | BUTTE | 13105 | WYANDOTTE 1107 | BUTTE | 1454 |
| ORO FINO 1102 | BUTTE | 2156 | NOTRE DAME 1104 | BUTTE | 4317 | BANGOR 1101 | YUBA | 12328 |
| PARADISE 1104 | BUTTE | 14710 | PARADISE 1106 | BUTTE | 3503 | DOBBINS 1101 | YUBA | 7096 |
| PARADISE 1105 | BUTTE | 12054 | | | | CHALLENGE 1102 | YUBA | 6719 |
| CLARK ROAD 1102 | BUTTE | 10410 | | | | KANAKA 1101 | BUTTE | 4572 |
| PARADISE 1103 | BUTTE | 5234 | | | | BANGOR 1101 | BUTTE | 4215 |
| BUTTE 1105 | BUTTE | 3194 | | | | KANAKA 1101 | YUBA | 417 |
| BIG BEND 1102 | BUTTE | 2772 | | | | CHALLENGE 1102 | BUTTE | 266 |
| WYANDOTTE 1105 | BUTTE | 2560 | | | | BUCKS CREEK 1101 | PLUMAS | 25 |
| BIG BEND 1101 | BUTTE | 2332 | | | | | | |

Overhead Inspections



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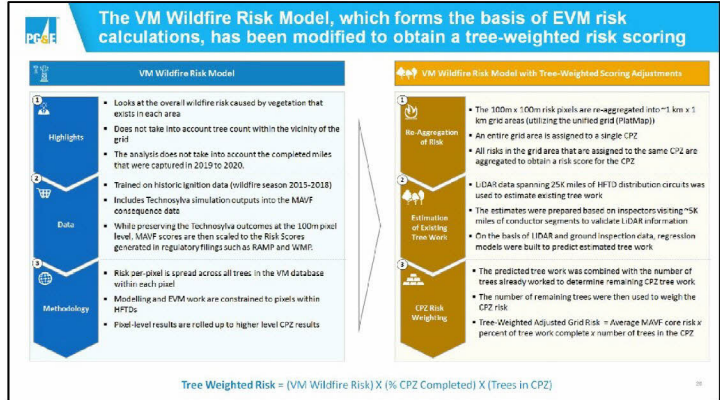


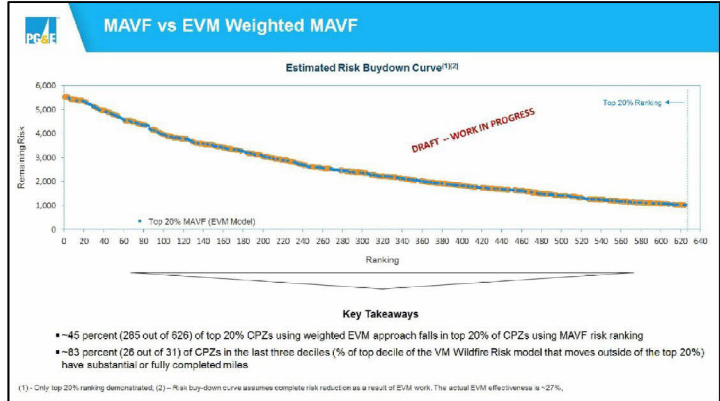


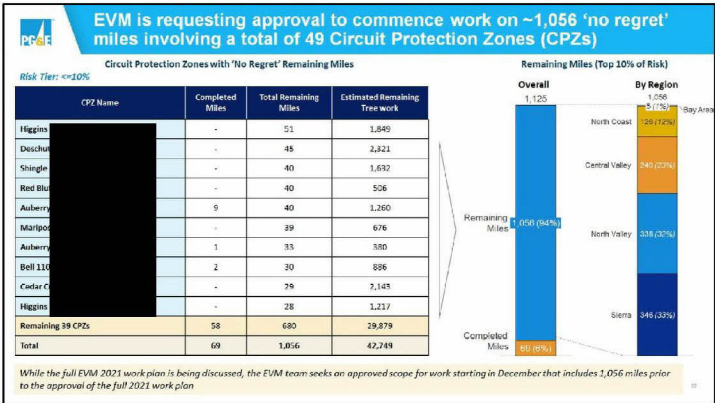
Enhanced Vegetation Management

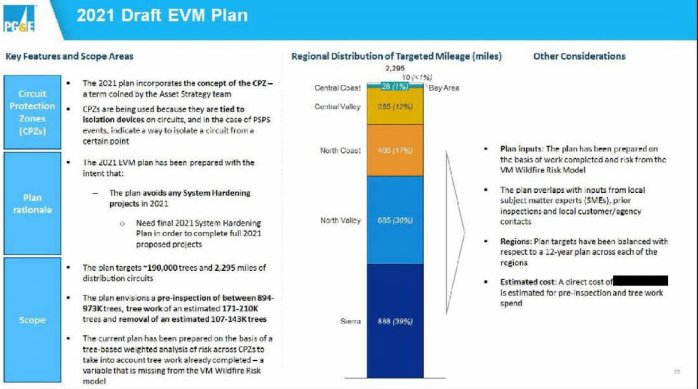



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|  Action Items | | | | | |
|---|--|---|-----------------------------------|--|------------|
| Workstream | Action Item (Initial Date) | Description | Responsible party | Resolution | Date |
| Enhanced Vegetation Management | EVM Risk Buydown Curve WGR- 11/3/2020 | Plot and above the 1332 miles (80-90% Carry Over Work that needs to be finished on the EVM-CP; 20 for Trees and Overhang, Weighted) Risk Buydown Curve | ██████████ Support- ██████████ | Not Applicable – Scope has moved away from the prior Carryover plan | 11/13/2020 |
| Enhanced Vegetation Management | EVM programs timeframes WGR- 11/3/2020 | Determine the overall time frame and pace for the 4 VSM programs for or for potential trees and fractured into the 25000 miles of EFTD. Consider the total of the 25000 miles need EVM work | ██████████ | In Process – Forecast program time is being developed alongside tree weighted risk | 11/20/2020 |
| Enhanced Vegetation Management | EVM programs and resources WGR- 11/3/2020 | Provide a full picture of all vegetation management work, excluded just the enhanced vegetation management. | ██████████ | In Process – Review of other programs underway, dependent upon total EVM scope for resourcing | 11/26/2020 |
| Enhanced Vegetation Management | System hardening and EVM work overlay WGR- 11/3/2020 | Evaluate the areas that are being targeted by system hardening to align for operational efficiencies between the two programs. Dependency on 2021 SH Work Plan | ██████████ | Not Applicable – Changes to system assets and structure limit ability to complete to EVM standards | 11/13/2020 |
| Enhanced Vegetation Management | Tree density statistic WGR- 11/3/2020 | Show Tree Density from the 2018 and 2020 Work. Provide tree density by number per mile proposed as we show future work 2022, 2023 | ██████████ Support- ██████████ | Road Mapped – I-GART Tree density will be examined for inclusion in future risk modeling | 11/13/2020 |

Follow-Ups and Next Steps



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Upcoming Review Agenda Items

11/20/2020

- Final Decision on System Hardening Plan (if feasible)
- Initial Review into Inspections 2021 Plan
- Initial Review into Repairs 2021 Plan
- Close out Completed Action Items

12/01/2020

- Final Decision on EVM 2021 Plan (if feasible)
- Decision Items needed for Inspections 2021 Work Plan
- Close out Completed Action Items

12/08/2020

- Decision needed on Inspection. Initial views of 2021 Work Plan
- Decisions needed on Repairs 2021 Work Plan
- Tier 1 – Overhead Conductor Replacement Discussion



Complete Action Items from 11/09/2020 (Federal Monitor Meeting)

| Workstream | Action Item | Description | Responsible party | Resolution | Date |
|------------|---|--|-------------------|---|-----------|
| Risk Model | Risk model comparison Work - 10/30/2020 | Include both risk areas outside of 10 10 in the next iteration of the DC Model | [REDACTED] | Royal Maggard - This will be added as an enhancement to the model next step | 11/7/2020 |
| Risk Model | Risk Model Enhancement | Incorporate 2020 LEAD data and species data in the next iteration of the DC model | [REDACTED] | Royal Maggard - This will be added as an enhancement to the model next step | 11/7/2020 |
| Risk Model | Risk Model Enhancement | Include Egress on the conservation plan for the next iteration of the DC Model | [REDACTED] | Royal Maggard - This will be added as an enhancement to the model next step | 11/7/2020 |
| Risk Model | Model Documentation | Also to be added to charts on slide 22 (ppt: 11.09.2020 Wildlife Risk Model Review final.v2) | [REDACTED] | Completed | 11/7/2020 |

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Complete Action items

| Workstream | Action Item | Description | Responsible party | Resolution | Date |
|---------------------|-----------------------------|---|-------------------|---|------------|
| Inspection | Inspection Workstream Owner | Schedule meeting to identify the owner of the inspection and repair workstream | | Completed – inspection lead identified | 10/21/2019 |
| Risk model | Risk Model Deep Dive | The risk model needed further detailed discussion before voting and approval could take place | | Completed – follow up meeting held provided in advance of 10/30 approval meeting | 10/23/2019 |
| EVM | EVM review meeting | Schedule additional meeting for EVM review | | Completed – Follow up meeting was held on 11/09 | 11/09/2019 |
| Government meetings | Meeting updates | Update meeting to be 90 minutes | | Completed – future meetings updated – effective 11/13 | 11/03/2019 |
| Government meetings | 2nd future meetings | to be asked to further meetings to provide additional direction from audit | | Completed – no items added to all future government meetings | 10/23/2019 |



Complete Action Items (Cont'd)

| Workstream | Action Item | Description | Responsible Party | Resolution | Date |
|-----------------------------|---|---|--|--|------------|
| Risk Models | Risk models comparison WGR - 10/30/2020 | Create the comparison between the 2018 risk model and 2013 risk model to highlight movement in CPD (Targeting Top 100 Criticality or CPD) | [REDACTED] | Completed | 11/18/2020 |
| Risk Models | Deep Dive risk model session WGR - 10/30/2020 | Hold a Deep Dive Session with (1) the Political Member and (2) the Operational Observer | [REDACTED] to [REDACTED] to be part of the meeting | Completed | 11/12/2020 |
| Risk Models | Risk model contributors | Highlight contributors to the risk model | [REDACTED] | Completed | 11/13/2020 |
| Risk Models | Model process documentation | Bring the Model Process Level Documentation to the Forum for an official approval | [REDACTED] | In Process - Targeted for inclusion in deep dive sessions | 11/23/2020 |
| Risk Models | Egress Consideration | Factor in Egress into process for selecting the protection zones to be scored | [REDACTED] | Road Mapping - Egress has been considered as a future enhancement for the risk model | 11/09/2020 |
| Wildfire Governance Charter | Charter updates | Update charter to include review of broader set of WGR risk reduction activities and project oversight | [REDACTED] | Complete EGIS charter has been updated, included in attached materials | 11/09/2020 |

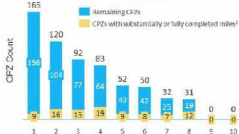
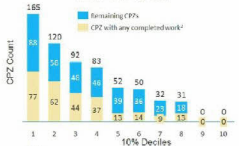
Appendix





Comparison of the Tree Weighted model to the Dx Model

% of top decile of risk (Dx model) that moves outside of the top 20%



Key Take-aways

- The correlation between the EVM weighted prioritization scores and the MAVF score is low at 0.0099
- Of the top 20% of circuits that were identified in the Dx model, only 147 remained in the top two deciles of the Tree Weighted model.
- Of the top 100 CPZs, only 14 were common across both prioritization lists
- Over 10% of the CPZs identified to have risk in the Dx model were zero risk locations in the tree weighted model.

