Wildfire Risk Governance Committee

System Hardening Project Approvals

February 25, 2021

PG&E System Hardening Strategy

Two (2) potential go-forward strategies for System Hardening have been contemplated:

1 **Recommended**

RSE Optimized Risk Buy-down

Objective: Reduce the most amount of risk possible, informed by the RSE score, within the GRC planning period.

Pros:
- Looks towards the long term as climatic risk is worsening
- Significantly lower residual risk for hardened segments addressed and additional risk reduction benefits (i.e., PSPS, ingress/egress) due to proportion of undergrounding likely

Cons:
- Reduced total miles addressable based on time constraints due to proportion of underground
- Due to operational time requirements of undergrounding, some high risk areas may not be mitigated in the near term and must be addressed by other risk mitigation programs (e.g., EVM)

2 **Accelerated Risk Buy-down**

Objective: Reduce the most amount of overall risk as quickly as possible.

Pros:
- Facilitates risk reduction across the broader service territory (i.e., more miles addressed) based on higher proportion of OH hardening

Cons:
- Residual risk may require "go-backs" with a different mitigation strategy
- Minimal reduction of other risks (e.g., PSPS) not accounted for in current risk modeling

Key Decision – Approve the PG&E System Hardening Strategy

Approval Status	Pending

Decision Detail

Approval of the recommended PG&E System Hardening Strategy

- ❑ **Option 1:** Reduce the most amount of risk possible, informed by the RSE score, within the GRC planning period.

Concerns and Mitigations

Approvals

[redacted]	

Action Items and Validations

System Hardening can target the riskiest 250 miles, while executing a multi-year plan to address adjacent high risk (top 20%) CPZs within the circuit

Situation

Adjacent high risk CPZ's may be overlooked because the current strategy is focused on mitigating the top 250 miles.

Complication

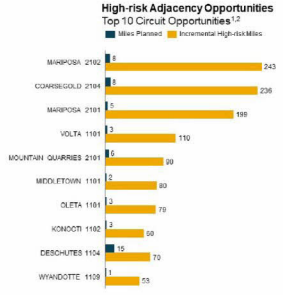
The current strategy (sequentially moving 1-n down the CPZ risk ranking) defers some high-risk (top 20%) CPZs which fall in a geographically similar areas. Prioritizing these adjacent CPZs, in conjunction with the already planned projects, the system hardening team can address the total circuit risk in a more thoughtful way.

Resolution

Evaluate nearby CPZ's, by circuit, to identify the adjacent high risk CPZs which could be addressed in series. The focus will remain on high-risk CPZ's, just not in a specific order.

- Evaluate in-process jobs to identify adjacent high-risk circuits
- Develop a time series scope and execute nearby high-risk CPZs

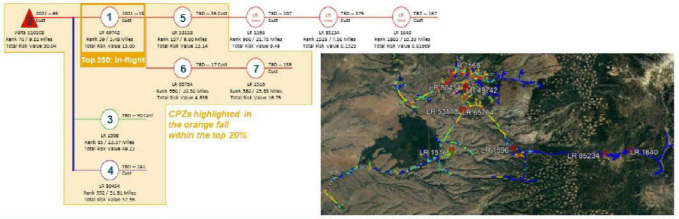
By evaluating opportunities in this way, we can address the total circuit risk and potentially achieve execution efficiencies



Notes: (1) In total, 94 high-risk CPZ (from 26 circuits) are unaddressed in the current workplan; (2) Incremental high-risk miles represents total miles not address in current top 250 mile projects

Illustrative: Approved project for Volta 110149742 sits on a circuit with six (6) other CPZs that fall within the top 20%

EXAMPLE: Volta 1101 Single Line Diagram



Illustrative Execution Timeline

2021		2022		2023+		
1 LR 49742 Rank = 39	2 Volta 1101CB Rank = 76	3 LR 1559 Rank = 85	4 LR 53118 Rank = 157	5 LR 80454 Rank = 532	6 LR 55764 Rank = 560	7 LR 1516 Rank = 580

Prioritized based on Risk Rank → *Decreasing Risk*

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There is an opportunity to maximize risk reduction from "on-hold" jobs where PG&E has already expended resources to scope and estimate

Situation

Based on the updated 2021 risk model, a significant quantity of scoped / estimated work has been placed on hold to prioritize higher risk segments.

Complication

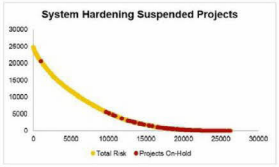
Certain segments of these on-hold projects contain higher risk segments (equivalent to the top 20% MAVF), even though the entire CPZ does not meet the top 20% threshold. These segments of CPZ's can be surgically targeted for system hardening in the highest risk locations to accelerate risk buy-down and achieve greater mileage in the near term.

Resolution

Evaluate the on-hold project list to identify high risk segments for targeted mitigation:

- Review project locations overlaid with risk scores
- Establish risk threshold for targeted mitigation (Recommended threshold is 0.1065 – equivalent to top 20% Mean MAVF score)
- Refine scope / estimates to address only the highest risk portions of the project

This strategy will maximize risk reduction in areas which have already expended resources in estimating / scoping and accelerate mileage capture in the near term



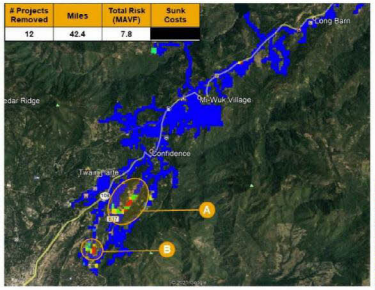
# Projects Removed	Miles	On-hold Project Risk (MAVF)	Sunk Costs
478	1,384	1,104	

Represents on-hold projects as of 1.13.2021

Illustrative: Miwuk 1701 has no CPZs that fall within the high-risk category (top 20%), however revisions to "on-hold" projects might be able to address targeted areas of risk

Miwuk 1701

# Projects Removed	Miles	Total Risk (MAVF)	Sunk Costs
12	42.4	7.8	



Key Takeaway

Although the **mean MAVF CPZ risk is relatively low** for the Miwuk 1701 CPZs, **specific locations warrant review for targeted system hardening** based high risk concentration.

A. This 0.7 mile segment contains risk equivalent to the top 20% or higher.

B. This 0.5 mile segment contains risk equivalent to the top 20% or higher.

If on-hold projects exist within these areas, we can revise the scope to address only these highest risk segments

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Key Decision – Approval to Expand Scope Prioritization and Approve Overarching System Hardening Strategy

Approval Status	Pending

Decision Detail

Seeking approval to expand the System Hardening Targeting Strategy to include:

- ❑ The top 20% riskiest CPZs in circuits where projects are already being scoped
- ❑ High risk sub-segments of the on-hold projects, which have equivalent risk scores to the top 20% CPZs

Concerns and Mitigations

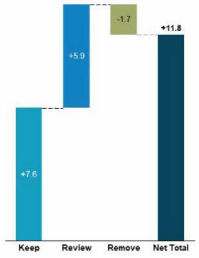
Approvals

[redacted]	

Action Items and Validations

Request to reconsider specific in-construction projects from the on-hold project list and remove from some approved project list (net impact of +11.8 miles)

Workplan Change Request Summary



Request to Keep (7.6 mi)

Add back projects which were previously placed on-hold based on work expended:
- In Construction (work started); missed during initial inventory of in construction work – 2 jobs, 3.2mi
- In construction (not started); significant effort to secure permit and relationships at risk – 1 job, 0.5mi
- In construction would that would complete an upstream mainline – 1 job, 1.6mi
- Pending; significant permitting effort which could damage relationships if not executed – 3 jobs, 2.4mi

Request to Review (5.9 mi)

Confirm the decision to place projects on-hold given efforts expended and other factors:
- Pending; Significant effort expended to secure easements – 1 jobs, 3.35mi
- Pending Significant effort expended to secure permit – 1 job, 1.1mi
- Pending; Completes a mainline for previously executed phases – 1 job, 1.5mi

Request to Remove (1.7 mi)

Remove from existing project list based on dependencies identified:
- Review of land requirements will require project redesign or imminent domain – 1 job, 1.7mi

- Project level details on following slide -

Workplan change request details - 11 projects added (13.5 mi) and 2 projects removed (3.3 mi)

	Order	Miles	Project	Risk Rank	Rationale; details
Request to keep	[redacted]	1.44	CWSP - PINE GROVE 1102 - LR1222 - PH 2.6	2,521 (69%)	**Significant progress;** 15 poles installed
		1.75	CWSP–STANISLAUS 1702-LR1888-PH 1.2	2,386 (66%)	**Significant progress;** 15 poles installed and SAP issues keeping project at UNSE status
		0.45	RECON 2300 FT - NUNS CANYON-DUNBAR 1101	1,794 (49%)	**Permit;** Required several years of discussion with the CDFW and messaging that the work is critical to the wildfire plan. PG&E also developed a mitigation plan and will be on the hook for implementing it regardless of whether or not this project moves forward
		1.57	CWSP-BRUNSWICK 1103-LR50070-PH 2.3	2,144 (59%)	**Completes CPZ:** Phase 3 of 5 of system hardening work in the CPZ. Other phases have been approved for construction (Phases 1&2 are 75% complete.
		0.51	RECON-BSPANS CAMP ONE TEN MILE FT BRAGG	2,140 (59%)	**Permit;** Anticipate coastal developed permit approval in early 2021, which took 2 years to obtain. Public hearing and emergency statutory exemption under CEQA already.
		1.00	OH RECONDUCTR ROB ROY 2105 - 5028CC117	3,283 (90%)	**Permit;** Applied for a Coastal Development Permit with the Santa Cruz County and have been working with them for a the last year. Permits expected by 11/21/21 and anticipate severe detriment to relationships with CDFW and Santa Cruz if project is cancelled.
		0.86	OH RECONDUCTOR - ROB ROY 2105 -5027CC118	3,283 (90%)	
Request to Retire	[redacted]	1.75	CWSP–STANISLAUS 1702-LR1888-PH 2.3	2,386 (66%)	**Easement;** 3 of 4 easements acquired [redacted] and 4th easement underway [redacted]
		1.60	PSPS - Clayton 2215 – CB	1,739 (48%)	**Easement;** 3 easements accepted or nearing acceptance
		1.06	HALF MOON BAY 1102 - FUCO 12457 REPL OH	2,874 (79%)	**Permit;** GGNRA permit received which took 2 years to acquire
		1.53	CWSP-MIWUK 1702-LR8018-PH 1.1	2,217 (61%)	**Completes Mainline;** Finalizes mainline hardening completed on either side via other projects
Remove	[redacted]	(1.72)	CWSP-MIWUK 1701-OCB-PH 1.5	2,353 (65%)	**Issue Identified;** location missed during land review that will require redesign of the project or imminent domain. Have been pursuing land rights since summer of 2020.

Note: Full notes from project management team available in appendix

Key Decision – Approval of workplan change request

Approval Status	Pending

Decision Detail

Seeking approval / confirmation of on-hold projects which have been placed on hold at request of this committee in light of additional information shared:

- ❑ ADD 7 projects for 7.6 miles
- ❑ CONFIRM 4 projects for 5.9 miles

Removed projects which no longer make sense based on new information / other projects which have been placed on hold:

- ❑ REMOVE 1 project for 1.7 miles

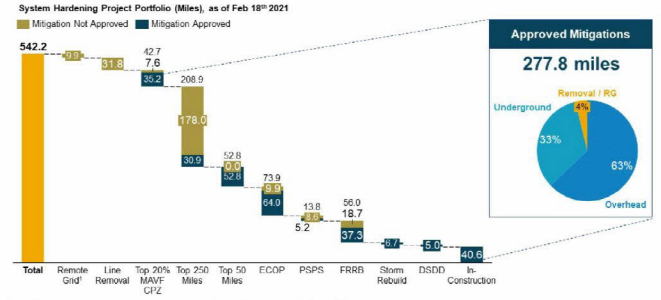
Concerns and Mitigations

Approvals

[redacted]	

Action Items and Validations

System Hardening Status – Total Portfolio And Approved Mitigations



System Hardening Status – Progress Towards WMP Commitments and Public Safety Metrics

2021-2023 WMP Mileage Commitment

Public Safety Metrics

Condition 1: 80% of system hardening miles have to be highest risk miles over the three-year period

Risk Profile (Highest Risk Miles defined as)

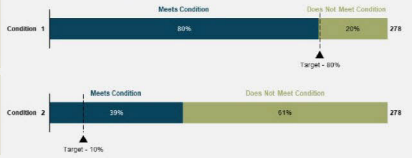
1. Top 20% of risk buydown curve
2. Fire re build miles
3. PSPS mitigation miles

Condition 2: Minimum percentage of miles mitigated with either Line Removal or Undergrounding over the three-year period

Risk Effectiveness

- 10% of Undergrounding or Line Removal work in the System Hardening project portfolio

Percent (%) of Scoped miles that meet public safety conditions, as of 2/18/2021



Execution Team Quality Assurance

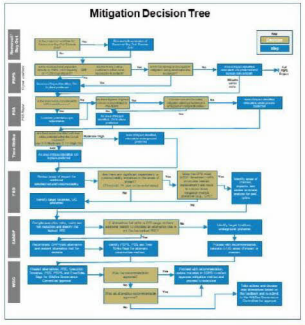
As of 2/19/2021

Today's discussion will include various mitigation recommendations for decision and inform (25.3 miles total)

The following projects have recommended mitigations:

	Order No.	CPZ	Work Bucket	Total MAVF Core Risk Value	Mean MAVF Core Risk Rank	Recommendation	WGC Request
	WGC Decision (7.83 miles)						
1	[redacted]	Wildwood 11011454	Top 250 Miles	0.4188	52	OH	DECISION
	WGC Inform (17.45 miles)						
2	[redacted]	Middletown 11011548	ECOP – Top 20%	0.1594	474	HYBRID	INFORM
3		Brunswick 1110CB	PSPS	0.0064	2134	UG	INFORM
4		Placerville 21061104	REMG	0.0064	2131	REMOTE GRID	INFORM
5		Mountain Quarries 21016953	Top 250 miles	0.4353	45	HYBRID	INFORM
6		Bangor 1101CB	PSPS	0.1938	355	UG	INFORM

Decision: Top 50 Miles - Wildwood 1101 - LR 1454 - PM [redacted] (7.83 Miles)



	Key Questions			Outcome
PSPS	Is this an area that is impacted directly by PSPS (>8 Frequency or >1,200 Cust Impact)?	Y	N	1 event, 18 Cust impact
	Are there any critical customers within zone necessary to protect?	Y	N	
	Is OH hardening an acceptable mitigation using distribution line exclusion?	Y	N	N/A
PSS	Is the area being considered for HFRA Add/Remove?	Y	N	
	Ingress/Egress concerns identified by PSS professionals cannot be mitigated by utilizing intumescent wrapped or composite poles.	Y	N	
Tree Strike	Moderate (6-14) or high (15+) strike tree potential areas in the segment	Y	N	3 spans Moderate
FSD	Are there any significant dependency or constructability limitations in the areas of impact? *(Threshold: 2+ year incremental delay)*	Y	N	Gas Tx line, overland route, significant relocation
	Does the GPZ meet ECOP threshold (>25% structures warrant replacement) and result in a more timely mitigation method preferred (e.g., OH)?	Y	N	
EASOP	If alternatives fall within a 100% range, is there additional benefit to choosing an alternative that is not the top ranked RSE?	Y	N	
				OH Preferred

Decision: Top 50 Miles - Wildwood 1101 - LR 1454 - PM [redacted] (7.83 Miles)

	Wildwood 1101 (7.83 miles)	No System Hardening	Overhead Hardening	Under-Grounding	Hybrid
	Project Scope Risk Reduced After Mitigation	-	8.05	12.85	10.10
	Project Scope Residual Risk Value	**12.98**	**4.93**	**0.13**	**2.88**
	Overall Miles Installed	7.83 Existing OH	7.83	9.64	9.94
	Overall Miles Removed	-	-	-	-
	OH System Hardening Cost [redacted]isk-mile	-	[redacted]		
	UG System Hardening Cost [redacted]/risk-mile	-			
	Line Removal Cost [redacted]isk-mile	-			
	Total Capital Cost (AACE Class 5)				
	Average O&M Cost (per year)				
	NPV @ 6.8% discount rate				
Primary Filter	**$ NPV per unit of rise (RSE)**				
Primary Filter	**PSS Preference (ingress/egress/fire history)**		Satisfactory	Satisfactory	Satisfactory
Secondary Filter	**Strike Tree Potential(36 Priority, 4.6/mi)**	High Fall-In Risk	Moderate Fall-In Risk	No Fall-In Risk	Moderate Fall-In Risk
Secondary Filter	**Ingress / Egress**	Non-satisfactory	Satisfactory	Satisfactory	Satisfactory
Secondary Filter	**PSPS Mitigation (18 cuts * 1 event)**	18 (0%)	18 (0%)	18 (0%)	18 (0%)
Secondary Filter	**Execution timeline (2021, 2022, 2022+)**		2021	2022+	2022+
Secondary Filter	**Other (Operational Considerations, etc.)**				
			Recommended		

Supporting Detail for Recommended Alternative: EDRS Link (2021-04308)
Public Safety Specialist: Shasta, Tehama Cnty. Platina E to ~Hwy 36 Tehama mile mark 3.42. Mainly grass/oak woodland dense brush with intermixed patches of conifers/Grey Pines. Fuel loading of brush can be very dense on all northern aspects and drainages and within the Beegum Gorge portion of Cottonwood Creek. Difficult fire terrain.
Platina pop ~120, ~40 mile W/o Redding/Red Bluff. Platina Rd
Strike Tree Potential: Moderate. Expect to mitigate tree strike hazard on 3 spans with tree removal.
Egress Considerations: Platina Rd, Hwy 36 main routes for Evac and Response. Satisfactory mitigation with overhead hardening and tree removal.
PSPS Mitigation: None
Execution Timeline (Land/Bio/Cultural/Constructability Frog and Fish issues. Buffer Zones for work, Monitoring. BLM Land, Minor Caltrans. ~3-8 Wk field work. Gas Tx line easement along much of route requires hand digging.
Overland route limits UG viability. Relocation of overhead assets requires entering Caltrans ROW with significant increase in circuit linearfeet (+25% minimum).

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Key Decision – Approval of workplan change request

Approval Status	Pending

Decision Detail

Approval of recommended mitigation(Overhead Hardening) for Wildwood 11011454 (PM# [redacted]

Additional details available: **EDRS Link** (2021-04308)

Approvals

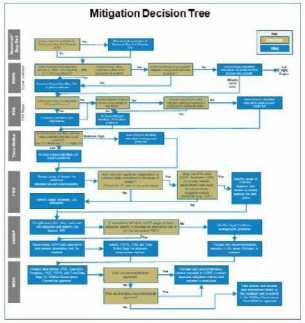
[redacted]	

Concerns and Mitigations

Action Items and Validations

Inform: ECOP Top 20% –Middletown 1101 - LR 548 H12 - Ph2 - PM[redacted]

Mitigation Decision Tree



	Key Questions			Outcome
PSPS	Is this an area that is impacted directly by PSPS (>8 Frequency or >1,200 Cust Impact)?	Y	N	2 events 309 custs
	Are there any critical customers within zone necessary to protect?	Y	N	
	Is OH hardening an acceptable mitigation using distribution line exclusion?	Y	N	High Tree Strike Risk
PSS	Is the area being considered for HFRA Add/Remove?	Y	N	
	Ingress/Egress concerns identified by PSS professionals cannot be mitigated by utilizing intumescent wrapped or composite poles.	Y	N	
Tree Strike	Moderate (6-14) or high (15+) strike tree potential areas in the segment	Y	N	High
FSD	Are there any significant dependency or constructability limitations in the areas of impact? *(Threshold: 2+ year incremental delay)*	Y	N	
	Does the CPZ meet ECOP threshold (>25% structures warrant replacement) and result in a more timely mitigation method preferred (e.g., OH)?	Y	N	
EASOP	If alternatives fall within a 100% range, is there additional benefit to choosing an alternative that is not the top ranked RSE?	Y	N	
				Hybrid Preferred

Inform: ECOP Top 20% –Middletown 1101 - LR 548 - H12 Ph2 - PM [redacted]

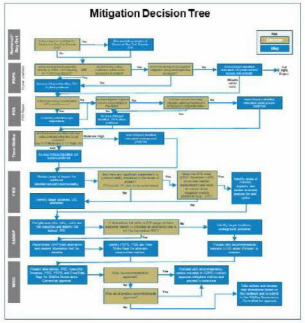
	Middletown 1101 (9.46 miles)	No System Hardening	OH-Hybrid-UG Preferred	Hybrid-UG-Hybrid Alt 1	UG-OH-OH Alt 2
	Project Scope Risk Reduced After Mitigation	-	14.32	13.44	12.90
	Project Scope Residual Risk Value	**16.40**	**2.08**	**2.96**	**3.50**
	Overall Miles Installed	9.46 Existing OH	8.40	8.62	2.79
	Overall Miles Removed	-	1.48	1.48	1.48
	OH System Hardening Cost [redacted] /risk-mile	-	[redacted]		
	UG System Hardening Cost [redacted] /risk-mile	-			
	Line Removal Cost [redacted] /risk-mile	-			
	Total Capital Cost (AACE Class 5)				
	Average O&M Cost (per year)				
	NPV @ 6.8% discount rate				
Primary Filter	**$ NPV per unit of rise (RSE)**				
Primary Filter	**PSS Preference (Ingress/egress/fire history)**		Satisfactory	Non-satisfactory	Non-satisfactory
Secondary Filter	**Strike Tree Potential**	High Fall-In Risk	Low Fall-In Risk	High Fall-In Risk	High Fall-In Risk
Secondary Filter	**Ingress / Egress**	Non-satisfactory	Satisfactory	Non-satisfactory	Non-satisfactory
Secondary Filter	**PSPS Mitigation (309 custs * 2 events)**	618 (0%)	618 (0%)	618 (0%)	618 (0%)
Secondary Filter	**Execution timeline (2021, 2022, 2022+)**		2022	2022	2022
Secondary Filter	**Other (Operational Considerations, etc.)**				Accessibility Issues
			Recommended		

Supporting Detail for Recommended Alternative (EDRS Link 2021 Scope):

- **Public Safety Specialist:** The Fuel types for this project area mostly consist of grassy oak woodland intermixed with patches of brush and grassy pine-conifer. Fuel loading is mostly light in areas of the 2015 Valley fire burn scar with little regrowth, however some areas (mostly on the North end) of the project you will still find medium to heavy fuel loading where the areas of Whispering Pines to Pine Grove/Cobb and Golf Rd were left unburned. Population density for this project area is all considered light to light/Medium with Middletown (pop 1200=Medium) being the largest community located approximately 2 miles East of the project and Cobb/Pine Grove (pop 1000) located at the North end of the project area.
- **Strike Tree Potential:** High (>15) tree strike potential in this segment does not suggest UG hardening is needed. There is extreme tree strike risk in the northern portion of this job and any alternative other than "all UG" is not preferred.
- **Egress Considerations:** Both ingress and egress concerns. If this route were compromised fire suppression and evacuation efforts would be significantly hampered.
- **PSPS Mitigation:** No mitigation potential due to limited scope of this hardening project. To achieve PSPS reductions, additional scope would have to be included
- **Execution Timeline (Land/Bio/Cultural/Constructability):** Work required during the dry season (May 15 - Oct 15) and/or biomonitoring.
- **Other (Operational Considerations, etc.):** There are accessibility issues on the existing line for the middle portion of this job so OH hardening in-place is not preferred for that area
- **Note:** This job is comprised of three distinct and unique taps. Each tap was reviewed individually and given a separate and unique preferred alternative. The preferred alternative recommends OH for the southern most tap, hybrid for the middle tap, and UG for the northernmost tap.

Inform: PSPS - Brunswick 1110 - LR 94768 - PM [redacted] - Morgan Ranch

Mitigation Decision Tree



	Key Questions			Outcome
PSPS	Is this an area that is impacted directly by PSPS (>8 Frequency or >1,200 Cust Impact)?	Y	N	18 events
	Are there any critical customers within zone necessary to protect?	Y	N	
	Is OH hardening an acceptable mitigation using distribution line exclusion?	Y	N	N/A
PSS	Is the area being considered for HFRA Add/Remove?	Y	N	If HFRA removal approved, project would not be required
	Ingress/Egress concerns identified by PSS professionals cannot be mitigated by utilizing intumescent wrapped or composite poles.	Y	N	
Tree Strike	Moderate (6-14) or high (15+) strike tree potential areas in the segment.	Y	N	Based on Alternative plans
FSD	Are there any significant dependency or constructability limitations in the areas of impact? *(Threshold: 2+ year incremental delay)*	Y	N	
	Does the CPZ meet ECOP threshold (>25% structures warrant replacement) and result in a more timely mitigation method preferred (e.g., OH)?	Y	N	
EASOP	If alternatives fall within a 100% range, is there additional benefit to choosing an alternative that is not the top ranked RSE?	Y	N	
				Underground Preferred

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Inform: PSPS - Brunswick 1110 - LR 94768 - PM [redacted] - Morgan Ranch

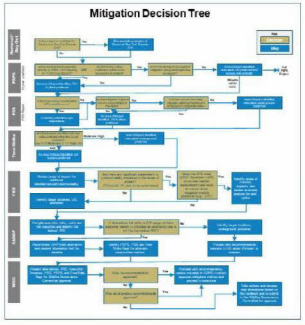
	Brunswick 1110 (0.34 miles)	No System Hardening	Overhead Hardening	Under-Grounding	Hybrid
	Project Scope Risk Reduced After Mitigation	-	0.02	0.04	0.03
	Project Scope Residual Risk Value	**0.036**	**0.01**	**0.00**	**0.01**
	Overall Miles Installed	0.34 Existing OH	0.34	0.06	0.38
	Overall Miles Removed	-	-	-	0.12
	OH System Hardening Cost [redacted] /risk-mile	-	[redacted]		
	UG System Hardening Cost /risk-mile	-			
	Line Removal Cost /risk-mile	-			
	Total Capital Cost (AACE Class 5)				
	Average O&M Cost (per year)				
	NPV @ 6.8% discount rate				
Primary Filter	**$ NPV per unit of risk (RSE)**				
Primary Filter	**PSS Preference (Ingress/egress/fire history)**		Satisfactory	Satisfactory	Satisfactory
Secondary Filter	**Strike Tree Potential**	High Fall-In Risk	High Fall-In Risk	No Fall-In Risk	Moderate Fall-In Risk
Secondary Filter	**Ingress / Egress**	Satisfactory	Satisfactory	Preferred	Satisfactory
Secondary Filter	**PSPS Mitigation (178 custs * 18 events)**	3204 (0%)	3204 (0%)	3204 (0%)	3204 (0%)
Secondary Filter	**Execution timeline (2021, 2022, 2022+)**		2021	2022	2022+
Secondary Filter	**Other (Operational Considerations, etc.)**				
				Recommended	

Supporting Detail for Recommended Alternative (EDRS Routing 2021-08160):

- **Public Safety Specialist:** Fuel type broken up between grass and residential landscaping. Population density is considered moderate to heavy. There is no fire history around this project area. Preference for action to be taken based on increased risk of ignition on tagged equipment.
- **Strike Tree Potential:** 80 total strike tree potentials in the CPZ.
- **Egress Considerations:** Main routes of travel for ingress and egress would be Sierra College Drive. Ingress and egress into and out of the area by way of Sierra College Drive or Ridge Road would not be an issue.
- **PSPS Mitigation:** If HFRA removal is approved would eliminate PSPS shutdowns.
- **Execution Timeline (Land/Bio/Cultural/Constructability):** UG hardening could be accomplished by 12/31/2021: Spotted owl near project area.
- **Note:** 0.34 miles of project represents the project miles for the alternative (OH & Hybrid) scopes in Tier 2 area. Mileage for OH scope is only 0.021 mi for preferred scope in Tier 1 area.

Inform: REMG – Placerville 2106 - LR 1104 - PM [redacted]

Mitigation Decision Tree



	Key Questions	Outcome		
PSPS	Is this an area that is impacted directly by PSPS (>8 Frequency or >1,200 Cust Impact)?	Y	N	15 events 15 cust impact
	Are there any critical customers within zone necessary to protect?	Y	N	
	Is OH hardening an acceptable mitigation using distribution line exclusion?	Y	N	N/A
PSS	Is the area being considered for HFRA Add/Remove?	Y	N	
	Ingress/Egress concerns identified by PSS professionals cannot be mitigated by utilizing intumescent wrapped or composite poles.	Y	N	
Tree Strike	Moderate (6-14) or high (15+) strike tree potential areas in the segment	Y	N	Moderate (6-14)
FSD	Are there any significant dependency or constructability limitations in the areas of impact? *(Threshold: 2+ year incremental delay)*	Y	N	
	Does the CPZ meet ECOP threshold (>25% structures warrant replacement) and result in a more timely mitigation method preferred (e.g., OH)?	Y	N	
EASOP	If alternatives fall within a 100% range, is there additional benefit to choosing an alternative that is not the top ranked RSE?	Y	N	
				Remote Grid Preferred

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Inform: REMG – Placerville 2106 - LR 1104 - PM [redacted]

	Placerville 2106 (0.70 miles)	No System Hardening	Overhead Hardening	Under-Grounding	Remote Grid
	Project Scope Risk Reduced After Mitigation	-	0.02	0.03	0.03
	Project Scope Residual Risk Value	**0.03**	**0.01**	**0.00**	**0.00**
	Overall Miles Installed	0.70 Existing OH	0.7	0.7	0
	Overall Miles Removed	-	-	-	0.70
	OH System Hardening Cost [redacted] /risk-mile	-	[redacted]		
	UG System Hardening Cost /risk-mile	-			
	Line Removal Cost /risk-mile	-			
	Total Capital Cost (AACE Class 5)				
	Average O&M Cost (per year)				
	NPV @ 6.8% discount rate				
Primary Filter	**$ NPV per unit of risk (RSE)**				
Primary Filter	**PSS Preference (ingress/egress/fire history)**		Non-satisfactory	Satisfactory	Satisfactory
Secondary Filter	**Strike Tree Potential**	Moderate (6-14)	Moderate Fall-in Risk	No Fall-In Risk	Low Fall-In Risk
Secondary Filter	**Ingress / Egress**	Non-satisfactory	Non-satisfactory	Satisfactory	Satisfactory
Secondary Filter	**PSPS Mitigation (1 custs * 15 events)**	68 (0%)	68 (0%)	34 (50%)	17 (25%)
Secondary Filter	**Execution timeline (2021, 2022, 2022+)**		2021	2022+	2022
Secondary Filter	**Other (Operational Considerations, etc.)**				
					Recommended

Supporting Detail for Recommended Alternative (EDRS Link 2020-22384):

- **Public Safety Specialist:** The fuel types for this project area were not noted on the previously held field scoping meeting. Population density for this project area is all considered low. Numerous fires below Volcano.
- **Strike Tree Potential:** Moderate (6-14) tree strike potential in this segment suggests UG or Remote Grid hardening is required.
- **Ingress/Egress Considerations:** No major egress concern.
- **PSPS Mitigation:** Remote Grid would allow PSPS mitigation
- **Execution Timeline: (Land/Bio/Cultural/Constructability):** No known construction or EPS constraints

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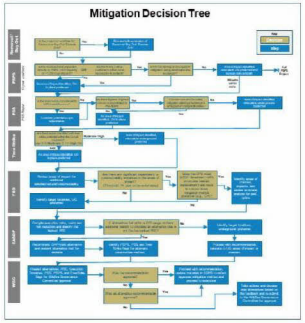
Inform: PSPS - Mountain Quarries 2101 - TS 6953 - PM [redacted]

Mitigation Decision Tree



	Key Questions			Outcome
PSPS	Is this an area that is impacted directly by PSPS (>8 Frequency or >1,200 Cust Impact)?	Y	N	
	Are there any critical customers within zone necessary to protect?	Y	N	
	Is OH hardening an acceptable mitigation using distribution line exclusion?	Y	N	N/A
PSS	Is the area being considered for HFRA Add/Remove?	Y	N	
	Ingress/Egress concerns identified by PSS professionals cannot be mitigated by utilizing intumescent wrapped or composite poles.	Y	N	Ingress/Egress route limited
Tree Strike	Moderate (6-14) or high (15+) strike tree potential areas in the segment	Y	N	Moderate tree strike potential
FSD	Are there any significant dependency or constructability limitations in the areas of impact? *(Threshold: 2+ year incremental delay)*	Y	N	
	Does the CPZ meet ECOP threshold (>25% structures warrant replacement) and result in a more timely mitigation method preferred (e.g., OH)?	Y	N	
EASOP	If alternatives fall within a 100% range, is there additional benefit to choosing an alternative that is not the top ranked RSE?	Y	N	Hybrid accounts for Egress/Ingress and Tree Risk
				Hybrid Preferred

Inform: PSPS - Mountain Quarries 2101 - TS 6953 - PM [redacted]

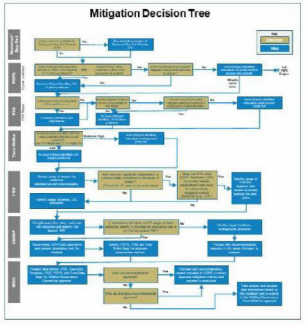
	Mountain Quarries 2101 (5.72 miles)	No System Hardening	Overhead Hardening	Under-Grounding	Hybrid
	Project Scope Risk Reduced After Mitigation		15.65	24.99	22.27
	Project Scope Residual Risk Value	**25.247**	**9.59**	**0.25**	**2.98**
	Overall Miles Installed	5.72 Existing OH	5.72	6.36	5.96
	Overall Miles Removed	-	-	-	-
	OH System Hardening Cost [redacted] /risk-mile	-	[redacted]		
	UG System Hardening Cost [redacted] /risk-mile	-			
	Line Removal Cost [redacted] /risk-mile	-			
	Total Capital Cost (AACE Class 5)				
	Average O&M Cost (per year)				
	NPV @ 6.8% discount rate				
Primary Filter	**$ NPV per unit of risk (RSE)**				
	PSS Preference (Ingress/egress/fire history)		**Non-satisfactory**	**Satisfactory**	**Satisfactory**
Secondary Filter	**Strike Tree Potential**	**High Fall-in Risk**	**Moderate Fall-in Risk**	**No Fall-in Risk**	**Low Fall-in Risk**
	Ingress / Egress	**Non-satisfactory**	**Non-satisfactory**	**Satisfactory**	**Satisfactory**
	PSPS Mitigation (65 custs * 7 event)	**455 (0%)**	**455 (0%)**	**455 (0%)**	**455 (0%)**
	Execution timeline (2021, 2022, 2022+)		**2021**	**2022+**	**2022**
	Other (Operational Considerations, etc.)				
					Recommended

Supporting Detail for Recommended Alternative (EDRS Routing 2021-10593):

- **Public Safety Specialist:** Fuels in the project area are grass, oak woodland and grey pines with patches of brush and scrub oak. Fuel loading is low in the project area, but transition to heavy in some of the brush fields located in the adjacent canyons to the south. The topography is rolling foothills and ridge top at approximately 1000 ft elevation. There have been no recent fires, however, project area is surrounded by major fires from the Trailhead Fire (2016), the Mammoth Fire (2009) Cool Fire (2008) and the Cutter Fire (2003).
- **Strike Tree Potential:** 284 total strike tree potentials in the CPZ.
- **Egress Considerations:** Main roads are Hwy 193 and Hwy 49. Both roads are two lanes paved with no shoulder that would be quickly become inundated in the event of a mass evacuation or rapidly expanding wildfire incident.
- **PSPS Mitigation:** 7 operations for PSPS in last 10 years. Approximately 4 miles to get to power source to accommodate PSPS resiliency.
- **Execution Timeline (Land/Bio/Cultural/Constructability):** California red-legged frog: targeted pre-activity survey may be required for overland and UG section of the project.

Inform: PSPS – PM# [redacted] – Bangor 1101 CB - Microgrid

Mitigation Decision Tree



	Key Questions			Outcome
PSPS	Is this an area that is impacted directly by PSPS (>6 Frequency or >1,200 Cust Impact)?	Y	N	Over 1200 cust.
	Are there any critical customers within zone necessary to protect?	Y	N	Fire Department, telecom & Community Center
	Is OH hardening an acceptable mitigation using distribution line exclusion?	Y	N	N/A
PSS	Is the area being considered for HFRA Add/Remove?	Y	N	
	Ingress/Egress concerns identified by PSS professionals cannot be mitigated by utilizing intumescent wrapped or composite poles.	Y	N	
Tree Strike	Moderate (6-14) or high (15+) strike tree potential areas in the segment.	Y	N	
FSD	Are there any significant dependency or constructability limitations in the areas of impact? *(Threshold: 2+ year incremental delay)*	Y	N	
	Does the CPZ meet ECOP threshold (>25% structures warrant replacement) and result in a more timely mitigation method preferred (e.g., OH)?	Y	N	
EASOP	If alternatives fall within a 100% range, is there additional benefit to choosing an alternative that is not the top ranked RSE?	Y	N	
				ALL UG Preferred

Inform: PSPS – PM# [redacted] – Bangor 1101 CB - Microgrid

	Bangor 1101 (0.57 mile)	No System Hardening	Overhead Hardening	Under-grounding
	Project Scope Risk Reduced After Mitigation	-	0.62	1.00
	Project Scope Residual Risk Value	**1.01**	**0.38**	**0.01**
	Overall Miles Installed	0.57 Existing OH	0.57	0.85
	OH System Hardening Cost [redacted]/risk-mile	-	[redacted]	
	UG System Hardening Cost [redacted]/risk-mile	-		
	Line Removal Cost [redacted]/risk-mile	-		
	Total Capital Cost	[redacted]		
	Average O&M Cost (per year)			
	NPV @ 6.8% discount rate			
Primary Filter	**$ NPV per unit of risk (RSE)**	-		
Primary Filter	**PSS Preference (Ingress/egress/fire history)**	**Satisfactory**	**Satisfactory**	**Preferred**
Secondary Filter	**Strike Tree Potential**	**Low Fall-in Risk**	**Low Fall-in Risk**	**N/A**
Secondary Filter	**Ingress/Egress – Preferred option**	**Satisfactory**	**Satisfactory**	**Preferred**
Secondary Filter	**PSPS Mitigation (2621 Customers * 1 event)**	**2621 (0%)**	**2621 (0%)**	**2572 (1.9%)**
Secondary Filter	**Execution timeline (2021, 2022, 2022+)**	**-**	**2022**	**2022**
Secondary Filter	**Other (Operational Considerations, etc.)**	Fire department, telecom, & community center	Fire department, telecom, & community center	Fire department, telecom, & community center
				Recommended

Supporting Detail for Recommended Alternative (EDRS Routing 2021-38449) :

- **Public Safety Specialist:** Fuel types in the Bangor area consistent with grass, oak woodland, mixed brush and scattered conifers, primarily Grey Pine. The large fires in the Bangor have been driven under two primary factors, mid-summer fuel/topography driven fires such as the Swedes and Wall; and, wind driven, fall period fires such as the October Wind Complex fires of 2017.
- **Strike Tree Potential:** 19 total strike potential trees in the CPZ, LOW (0-5) tree strike potential.
- **Egress Considerations:** Ingress and egress for first responders and residents, depending upon fire location and spread would be by one or more roadways.
- **PSPS Mitigation:** Project is driven by keeping critical customers such as the fire department, telecom building, and community center energized during a PSPS event.
- **Execution Timeline (Land/Bio/Cultural/Constructability):** OH hardening will require coordination with transmission line. Monitoring may be required for UG trenching. Field work is anticipated to take less than 1 week.
- **Note:** Battery microgrid will be installed in the substation to keep critical customers energized.

Workplan change request details - 11 projects added (13.5 mi) and 2 projects removed (3.3 mi)

	Order	Project	Rationale; details
Request to Keep	[redacted]	CWSP - PINE GROVE 1102 - LR1222 - PH 2.6	• 15 poles installed. • Recommend that this project be moved to "Keep" status
		CWSP- STANISLAUS 1702-LR1888-PH 1.2	• 15 poles installed • BAF issues are keeping this project in UNSC status • Requests to move to "Keep" status
		RECON 2300 FT - NUNS CANYON - DUNBAR 1101	• Obtaining this permit required several years of discussion with the CDFW and messaging that the work is critical to the wildfire plan. PG&E also developed a mitigation plan and will be on the hook for implementing and paying for it regardless of whether or not this project moves forward. • Requests to move to "Keep" status
		CWSP- BRUNSWICK 1103-LR50070- PH 2.3	• PM team was told to keep 2.1, 2.2, 2.4, and 2.5 o [redacted] o o o • All of these projects are in CONS • 2.1 & 2.2 are 75%+ complete. • Requesting that this project (Phase 2.3 - [redacted] be moved to "Keep" status with the other phases.
		RECON-6 SPANS CAMP ONE TEN MILE FT BRAGG	• This is a project for which we have applied for a Coastal Development Permit with the Agency and has been one public hearing on the project already. It is anticipated that the permit will be issued in early 2021. This permit took 2 years to obtain, and many messages to the agency that it be prioritized due to the critical nature of the work. The agency has recently agreed to use an emergency statutory exemption under CEQA to approve the project, with the understanding that a longer CEQA process would prevent our ability to perform critical wildfire work. • Requests to move to "Keep" status
		OH RECONDUCTR ROB ROY 2105 - 5026CC117	• This is a project for which we have applied for a Coastal Development Permit with the Santa Cruz County and have been working with them for a the last year. In progress with Santa Cruz since Feb 2019. CDFW permit underway since Aug 2020. Permits expected by 1/12/21. Would be a detriment to our relationship with CDFW and Santa Cruz to cancel this project. • Request that this project be moved to "Keep" status to preserve relationship with CDFW and Santa Cruz county.
		OH RECONDUCTOR - ROB ROY 2105 - 5027CC118	• This is a project for which we have applied for a Coastal Development Permit with the Santa Cruz County and have also been working with CDFW on work within critical habitat on their property. Both agencies have been engaged on the project for the last year. In progress with Santa Cruz since Feb 2019. CDFW permit underway since Aug 2020. Permits expected by 1/12/21. Would be a detriment to our relationship with CDFW and Santa Cruz to cancel this project. • Request that this project be moved to "Keep" status to preserve relationship with CDFW and Santa Cruz county

Workplan change request details – 11 projects added (13.5 mi) and 2 projects removed (3.3 mi)

	Order	Project	Rationale; details
Request to Review	[redacted]	CWSP–STANISLAUS 1702–LR1888–PH 2.3	• 3 easements have been acquired for this project ([redacted]) • 4th easement is underway with an expected cost of [redacted] • No other critical reason to consider keeping this project. • Wanted to confirm the "Remove" status in light of easement status
		PSPS - Clayton 2215 – CB	• 3 easements - 1 with city of Walnut Creek all terms accepted - 1 with Save Mt. Diablo some language clarifications still underway. 5 amount accepted - 3rd with a development company $ amount accepted just need terms finalized. • No other critical reason to consider keeping this project. • Wanted to confirm the "Remove" status in light of easement status
		HALF MOON BAY 1102 - FUCO 12457 REPL OH	• CDNRA permit received and took two years • Want to confirm "Remove" status due the nature of the long lead permit.
		CWSP-MIWUK 1702-LR6018-PH 1.1	• This Phase 1.1 is mainline that sits in between Phase 1.2 and 1.3 both of which are mainline and have been hardened. • Want to confirm the "Remove" status in light of the hardening work performed on the phases on each end of this portion of mainline.
Remove	[redacted]	CWSP-MIWUK 1701–OCB–PH 1.5	• in CONS and only 5 poles installed • 1 location missed during land review that will require redesign of the project or Imminent domain. Have been pursuing land rights since summer of 2020. • Suggest that this project be moved to the remove list and we have GC either frame the 5 poles around the existing line if practical or remove the poles and close out the project.
		CWSP-BRUNSWICK 1103–LR2200–PH2	• PM team was told to keep this phase but told to remove Phase 1, [redacted] Phase 3, [redacted] & Phase 4 – [redacted] • No work has started on phase 2 • Suggest that either all phases are moved to "Keep" status or move phase 2 to "Remove" status.