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Operations Project Authorization Form

Approved on June 22, 2022 EPAC

Link to Meeting Minutes

Project Title: [redacted] Transformer Relaying Replacement	**Project Number: CS00403**
Date Prepared: 06/17/2022	**Company: Eversource CT**
Organization: Asset Management	**Class(es) of Plant: D SS**
Project Initiator: [redacted]	**Project Category: Stations - Relays**
Managing Organization: Transmission / Major Projects	**Schedule ID#: 80053189**
Project Manager: [redacted]	**Project Type: Specific**
Project Sponsor: [redacted]	**Capital Investment part of original Op Plan: Yes**
Estimated in service date: 1/13/2023	**Emergency Related Request? No**
Eng./Constr. Resources Budgeted? Yes	**Facility Type** (check all that apply): ☐ PTF ☐ non-PTF ☒ Distribution ☐ N/A (General Plant)
Total Capital Request: $2.568M	**Authorization Type: Full Funding**

[1] Executive Summary

This project is requesting full funding in the amount of $2.568M to replace [redacted]

This project will replace the existing [redacted] During maintenance testing, Field Engineering identified that a primary [redacted]

[redacted]

[redacted]

[redacted], CS00407, approved at the Solution Design Committee (SDC) meeting on May 17, 2021. The scope of work to address these needs is being included in this project for engineering and outage efficiencies.

The CT Electromechanical Relay Replacement Program (CS00488) had initial funding approved in PowerPlan on April 1, 2022 and will be developed to replace all electromechanical relays and obsolete microprocessor relays still in service at all Eversource CT distribution substations. This work is being performed prior to the program level Project Authorization Form (PAF) approval due to specific known issues [redacted].

Initial funding of $75K was approved on March 1, 2021 in PowerPlan and revised initial funding of $250K was approved on April 26, 2022 for this project. To date, approximately $232K has been spent to complete preliminary engineering, complete a constructability review and develop an outage schedule. This project was presented to and approved at the Solution Design Committee meeting on June 8, 2022.

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[2] PROJECT COSTS SUMMARY

Note: Dollar values are in thousands

Line item Category	Prior Authorized	Actuals to Date	2022 to Go	2023	2024	2025	2026	2027	Total
1. ROW / Easements / Land Acquisition	$				$	$	$	$	
2. Environmental Approvals / Permits	$				$	$	$	$	
3. Outreach	$				$	$	$	$	
4. Siting Approvals / Permits	$				$	$	$	$	
5. Engineering / Design	$	$89	$298	$20	$	$	$	$	$407
6. Materials (Eversource purchased)	$		$91	$1	$	$	$	$	$91
7. Construction (incl matl's by contractors)	$	$22	$461	$83	$	$	$	$	$567
8. Testing / Commissioning	$		$210	$24	$	$	$	$	$234
9. Project Mgmt Team	$		$41	$8	$	$	$	$	$49
10. Removals	$		$14		$	$	$	$	$14
11. Other	$				$	$	$	$	
12. Risks	$		$129	$8	$	$	$	$	$137
SUBTOTAL DIRECTS W/ RISKS	**$250**	**$111**	**$1,245**	**$143**	**$**	**$**	**$**	**$**	**$1,499**
13. Indirects/Overhead	$	$83	$718	$95	$	$	$	$	$896
14. AFUDC	$	$3	$77		$	$	$	$	$80
PROJECT TOTAL – BASELINE BUDGET	**$250**	**$197**	**$2,039**	**$238**	**$**	**$**	**$**	**$**	**$2,475**
15. Contingency	$		$81	$13	$	$	$	$	$93
TOTAL CAPITAL REQUEST	**$250**	**$197**	**$2,120**	**$251**	**$**	**$**	**$**	**$**	**$2,568**
16. Reimbursables/Customer Contribution	$				$	$	$	$	
PROJECT TOTAL (LESS REIMBURSABLES)	**$250**	**$197**	**$2,120**	**$251**	**$**	**$**	**$**	**$**	**$2,568**
O&M	$				$	$	$	$	
TOTAL REQUEST	**$250**	**$197**	**$2,120**	**$251**	**$**	**$**	**$**	**$**	**$2,568**

Detail other costs, project risk items and their allocations:

Risk	Allocation
1. Potential UG Obstructions	$30K
2. Severe Weather, Delays, OT	$96.5K
3. Design Development	$10K
4.	$
5.	$
Total	$136.5K

Explain unique payment provisions, if applicable:

NA

Identify and detail any unique O&M impacts resulting from this project:

NA

[3] TECHNICAL JUSTIFICATION

Project Need, Objective and Justification

This project will replace the [redacted]

HU differential relays have been identified, with other relays, on the 2020 Mis-operation reduction team's list of relays that drift. Taking the opportunity to replace these relays will alleviate mis-operation concerns and, over time, will reduce the need to carry emergency stock of these relays.

[redacted] were identified during the creation of the DSCADA LTC Receivers Program (CS00407). The scope of work to address these needs is being included in this project for engineering and outage efficiencies.

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Project Scope

[redacted]

Scope of work includes the following:

[redacted]

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[redacted]

Substation Equipment

Station	Device Position / Nomenclature	Device Removals *include manufacturer*	Device Additions *include manufacturer*
[redacted]			

A constructability review was performed on 4/28/2022 and found no significant barriers to construction. New underground conduit will be routed to avoid existing underground. See Attachment C for the completed form.

Background

HU differential relays have been identified, with other relays, on the 2020 Mis-operation reduction team's list of relays that drift. Eversource has a goal of replacing all of these relays. Program CS00488 has been initiated to replace all distribution substation electromechanical relays. The work at [redacted] is being performed prior to the program due to specific issues identified with the relays at this site.

[redacted]

During maintenance testing, Field Engineering identified that [redacted]

[4] ALTERNATIVES CONSIDERED

This project was presented to and approved at the Solution Design Committee meeting on June 8, 2022.

Alternative #1

Do nothing and [redacted]

Estimated costs for this alternative are $68K per transformer, assuming work is performed with in house resources and does not require an LCE or construction rep. For these reasons this alternative is not preferred.

Alternative #2 (Preferred Solution)

[redacted] The full funding cost for this solution is $2.57M.

[5] PROJECT SCHEDULE

Milestone	Scheduled Completion Date
IFR Approval	2/18/2021; 4/20/2022 R1
SDC Approval (for applicable projects)	6/8/2022
Conversion of Tx development costs, 183 to 107 (applicable to projects that require SSF approval and/or ISO preferred alternative selection)	NA
EPAC Partial Funding Approval (for applicable projects)	NA
Preliminary Design Completion (or latest pre-full funding design phase)	5/9/2022
EPAC Full Funding Approval	6/22/2022
Siting Approval (for applicable projects)	NA
Start of Construction	11/15/2022
Project In-Service Date (ISD)	1/13/2023
Project Need Date (for applicable projects)	NA
ISO Related Milestones: (for applicable projects)	
• ISO Preferred Alternative Selected	NA
• PAC Presentation	NA
• TCA Submittal	NA

See Attachment B for the P6 schedule.

[6] Regulatory Approvals

NA

[7] Risk and Risk Mitigation Plans

Contingency:

Contingency of $93K is in included in this release estimate for project unknowns.

Single Contingency Load Loss (SCLL) was evaluated. Transformer must be able to be recalled in four hours. Therefore, one relay system at a time will be replaced to allow the transformer to be returned to service in four hours if needed.

Risk Mitigation:

Risk	Mitigation
1. Potential UG Obstructions	Investigate underground prints during engineering and route conduits to avoid existing ones
2. Severe Weather, Delays, OT	Allow time in schedule for delays and OT
3. Design Development	Check in regularly with EOC
4.	
5.	

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[8] REFERENCES

References
1. CS00403 - [redacted] – SSF, dated 5/27/2022
2. CS00403 - [redacted] IFR R1, dated 4/25/22
3. CS00407 - [redacted] Prgm Upgrades - Prgm Level Initial Funding – PAF, dated 5/20/21
4. CS00488 - [redacted] - IFR, dated 3/28/22

[9] ATTACHMENTS (One-Line Diagrams, Images, etc.)

Attachment	Included in Submittal?
A. [redacted]_ Cost Estimate_Rev1, dated 5/19/22	*YES*
B. 80053189 [redacted] Schedule 26MayA	*YES*
C. Constructability Review	*YES*
D. System and Station One-Lines	*N/A*

Project Checklist - Transmission & Substation Capital Project			
Project Name: [redacted] and [redacted] **Transformer Relaying Replacement**		**Project Number: CS00403**	
Facility Type: ☐BPS ☐BES ☐PTF ☐PTF non-regional ☐non-PTF ☐CIP ☒Distribution ☐General Plant			
PLANNING			
Is a NX-9 required?		Yes	
Is an ISO-NE PAC presentation required?		No	
ISO-NE Presentation Date (if completed):		Enter Date	
Cost in ISO-NE Presentation ($M) (if completed):		Enter Cost ($M)	
Is a PPA required?		No	
ISO-NE Approval Date (if completed):		Enter Date	
Is a TCA Application Required?		No	
TCA Submittal Date (if submitted):		Enter Date	
Cost in TCA Submittal ($M) (if submitted):		Enter Cost ($M)	
Enter ISO-NE RSP / Asset Condition ID, if assigned:		Enter ISO-NE ID	
PLANNING/PROTECTION & CONTROLS			
Are RAS/SPS/UVLs affected?		No	
OPERATIONS			
Outage Required?	☒ Primary Equipment (Power Transfer)	☐ Secondary Equipment (P&C only)	☐ Outage Not Required
Do SCLL Conditions Exist?		Yes	
Has an outage schedule been approved?		No	
Are Operations & Maintenance procedures/training required?		No	
STANDARDS			
Does the project include standard equipment and designs?		Yes	
SUBSTATION ENGINEERING			
Does this impact Revenue Metering		No	
Is preliminary short circuit/ breaker duty analysis required?		No	
Are there any changes to the baseline audible noise?		No	
Is there an impact to the existing ground grid?		No	
Is a Transient Over Voltage (TOV) analysis required?		No	

Project Checklist - Transmission & Substation Capital Project	
Project Name: [redacted] **Transformer Relaying Replacement**	**Project Number: CS00403**

P&C ENGINEERING	
OP-22 - Are PMUs and DDR required?	No
If BPS, is an NPCC Directory #4 presentation required?	No
Are ISO-NE OP-24 Appendix B updates necessary?	No
TRANSMISSION LINE ENGINEERING	
Are there any changes that affect the baseline EMF?	No
Are there any changes that affect the baseline EMI?	No
SITING	
Is a Siting filing required? *(If yes, list in regulatory approvals section)*	No
PERMITTING	
Is there any permitting required? *(If yes, list in regulatory approvals section)*	No
PROJECT SERVICES (OUTREACH) and ROW WORK COORDINATION	
What is the level of outreach expected?	None
Is any part of this project in an Environmental Justice Community?	No
Has ROW Coordination reviewed this project?	No
Is this project coordinating with other existing scheduled work?	No
INITIATOR	
Has a field constructability review been completed?	Yes
INVESTMENT RECOVERY	
Does the project require development of an Investment Recovery plan?	No
COST ESTIMATING	
What team/firm prepared the cost estimate?	Estimate was prepared by Eversource Engineering
Name of the person who prepared the estimate:	[redacted]
Was the estimate reviewed by Eversource Estimating?	Yes - Partial Review

ESTIMATE SUMMARY

Project [redacted] 3X Transformer Relaying Replacement
Project [redacted]

Project Number: CS00403
WO & Task #: 80053189
Estimate revision #: 00
Estimate Type - Station work

Estimate #:
Date of Estimate:05/16/2022

Estimate done by [redacted]
In Service date (ISD):01/13/2025

Template Revision #01.73b1

ESTIMATE SUMMARY

Estimate Type: Planning

WBS	Description	TOTAL	% of Directs	% of Total	Priors	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
1	ROW / Easements / Land purchases														
2	Environmental Approvals / Permits														
3	Outreach														
4	Siting Approvals / Permits														
5	Engineering / Design	$407,400	27.2%	15.9%	$89,300	$298,500	$19,600								
6	Materials (Eversource purchased)	$91,400	6.1%	3.6%		$90,700	$700								
7	Construction (Incl mat'ls by contractors)	$566,500	37.8%	22.1%	$22,000	$461,300	$83,200								
8	Testing / Commissioning	$234,300	15.6%	9.1%		$210,200	$24,100								
9	PMT Project Mgmt Team	$48,600	3.2%	1.9%		$40,900	$7,700								
10	Removals	$14,200	0.9%	0.6%		$14,200									
11	Other														
12	Risks	$136,500	9.1%	5.3%		$129,000	$7,500								
13	**Project Directs Total w/Risks**	**$1,498,900**	100.0%	58.4%	**$111,300**	**$1,244,800**	**$142,800**								
14	Indirects/Overhead	$896,000		34.9%	$82,500	$718,100	$95,400								
15	AFUDC	$80,100		3.1%	$3,500	$76,600									
16	**Project Total - Baseline Budget**	**$2,475,000**		96.4%	**$197,300**	**$2,039,500**	**$238,200**								
17	Contingency	$93,100		3.6%		$80,600	$12,500								
18	**Project Total - Funding Approval Level**	**$2,568,100**		100.0%	**$197,300**	**$2,120,100**	**$250,700**								
19	Reimbursable/Customer Contribution														
20	**Project Total (less reimbursables)**	**$2,568,100**			**$197,300**	**$2,120,100**	**$250,700**								
	Cost per key qty (if appl)	-	$'s / EA												
	Amount of Escalation included above	$6,700					$6,700								
8	Total materials - Eversource	$91,400				$90,700	$700								
	Total materials - Contractor														
	Total materials	$91,400				$90,700	$700								

NOTE: Risk / Contingency is 9.8% of Project Total Costs (incl escal/indirects/AFUDC but excl reimb.)

Estimate Range	**-25%**	**25%**
	$1,926,000	**$3,210,000**

COMMENTS

Project Scope:
Key qty's and UOM (tie to inputs on est sheets) - EA

[redacted]

Indirect rates based on: 11 - CT . Station work

Assumptions/Clarifications:
- Engineering to be outsourced with internal review
- Estimate assumes LCE, PM, Electrical construction and construction rep to be outsourced
- Switching to be done with in house resource
- Existing infrastructures to be reused
- Material based on previous projects with similar scope
- The estimate assumes a December 2022 ISD
- No regulatory-siting/permitting required
- Mobile transformer is not required per field engineering. There would be a 4 hour recall time
- December 31, 2022 In Service Date assumes that all material will be available to support construction

RISKS

Potential UG Obstructions	$ 30,000
Severe Weather, Delays, OT	$ 96,500
Design development	$ 10,000

Alt Estimate Summary for PP4 Calc (escalation separate)

Estimate #:
Date of Estimate:05/16/2022

Project Number: CS00403
WO & Task #: 80053189

		TOTAL w/ escal broken out
ROW / Easements / Land purchas	$	-
Environmental Approvals / Permi	$	-
Outreach	$	-
Siting Approvals / Permits	$	-
Engineering / Design	$	406,800
Materials (Eversource purchased	$	91,300
Construction (Incl mat'ls by cont	$	564,200
Testing / Commissioning	$	233,600
PMT Project Mgmt Team	$	48,400
Removals	$	14,200
Other	$	-
Risks	$	136,500
		$1,495,000
Indirects/Overhead	$	893,200
AFUDC	$	80,100
	$	-
		$2,468,300
	$	-
Contingency	$	93,100
		$2,561,400
	$	-
	$	-
		$2,561,400
	$	6,700
Excel total		**$2,568,100**
Check total		

[redacted]

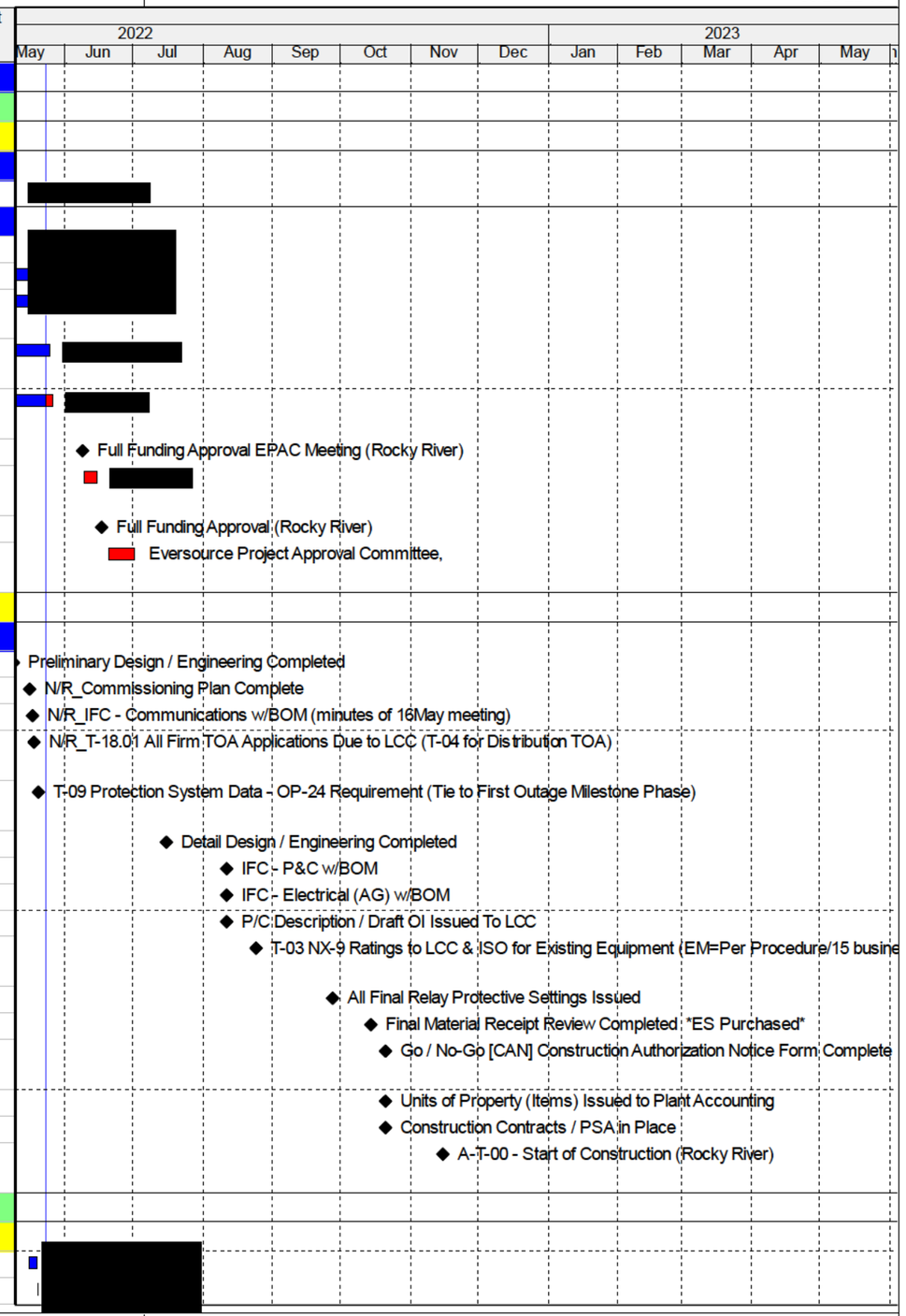
6/24/2022

UNESCALATED LINE ITEM DOLLARS

Project Number CS004403
Date of Estimate 09/16/2022
Estimate revision # 00

CSTXX-CONSTRUCTION	R	Escalation Rate	E Rate $	Price Mhrs	Price DOLLARS	2022 Mhrs	2022 DOLLARS	2023 Mhrs	2023 DOLLARS	1 2024 Mhrs	2024 DOLLARS	2 2025 Mhrs	2025 DOLLARS	3 2026 Mhrs	2026 DOLLARS	4 2027 Mhrs	2027 DOLLARS	5 2028 Mhrs	2028 DOLLARS	6 2029 Mhrs	2029 DOLLARS	7 2030 Mhrs	2030 DOLLARS	8 2031 Mhrs	2031 DOLLARS	9 TOTAL Mhrs	TOTAL DOLLARS
Electrical Construction	LT																										
General Construction	LT																										
SCADA / Automation	LT																										
Telecom - Field	LT																										
Construction Area / Interwll	LT																										
Support Switch/Tag	LT						$18,348		$3,670																		$22,018
Other (specify)	LT																										
Other (specify)	LT																										
Other (specify)	LT		$14,676																								$14,676
LT Total			$14,676		$18,348		$3,670																				$36,694
Employee Expenses	AE		$447		$917		$184																				$1,548
Construction Purchased Material	AM				$1,850		$661																				$4,539
Outside Construction Vendor	AQ		$6,800		$385,833		$68,088																				$460,520
Sales tax on Constr. Vendor																											
Vehicles (now in Indirects section)	AV																										
Inspection services / Outside Vendor1	AQ																										
Construction fee (Outside vendor)	AQ				$56,240		$8,880																				$65,120
Rents and Leases	BR																										
CSTXX Subtotal			$22,024		$465,196		$81,533																				$568,722
Escalation																											
CSTXX Total			$22,024		$465,196		$81,533																				$568,722
ENRXX-TG ENGINEERING/DESIGN																											
Project Services/Drafting	LT				$19,260		$1,936																				$21,296
T- Line Engineering/Design	LT																										
D- Steel Engineering/Design	LT																										
Cirt Engineering/Design	LT																										
Substation (T) Engineering/Design	LT																										
Substation (D) Engineering/Design	LT				$14,700		$2,100																				$16,800
Protection & Controls Engineering	LT				$11,340		$2,268																				$13,608
Survey Engineering	LT																			0							
SCADA / Automation Engineering	LT																										
Telecom Engineering	LT																										
Other - specify (PE)	LT																										
Other - specify	LT		$23,836																								$23,836
LT Total			$23,836		$46,400		$6,304													0							$76,540
Employee Expenses	AE				$2,270		$315																				$2,585
Contractor Engineering - T-Lines	AQ																										
Contractor Engineering - D-Street	AQ																										
Contractor Engineering - T -Station	AQ																										
Contractor Engineering - D-Station	AQ																										
Contractor Engineering - P&C	AQ																										
Contractor Engineering - Survey	AQ																										
Contractor Engineering - SCADA / Automation	AQ																										
Contractor Engineering - Telecom	AQ																										
Contractor Engineering - Specify	AQ																										
Contractor Engineering - Specify	AQ																										
Contractor Engineering - Specify	AQ		$65,477		$250,790		$12,400																				$328,667
Vehicles (now in Indirects section)	AV																										
ENRXX Subtotal			$89,313		$296,460		$19,019																				$404,792
Escalation																											
ENRXX Total			$89,313		$296,460		$19,019													0							$404,792
LNDXX-TG LAND																											
Real Estate	LT																										
Employee Expenses	AE																										
Purchase Land	AM																										
Vehicles (now in Indirects section)	AV																										
Fees and Payments	BF																										
LNDXX Subtotal																											
Escalation																											
LNDXX Total																											
MATXX-TG MATERIAL																											
Eversource	AM				$63,492																						$63,492
Outside Services	AM																										
	AM																										
Freight																											
Sales Tax Eversource/outside services	0.0%				$3,300																						$3,300
Other																											
MATXX Subtotal					$66,792																						$66,792
Escalation																											
MATXX Total					$66,792																						$66,792
PSMXX-PROJECT MANAGER & SUPPORT																											
Project Management (PM)	LT																										
Project Planning/Cost (PP)	LT																										
Contracts/Purchasing (CPP)	LT																										
System Planning	LT																										
Environmental	LT																										
SCS - None	LT																										
Legal	LT																										
Siting/ROW	LT																										
Siting - None	LT																										
Asset Management	LT																										
Other -	LT																										
Other -	LT																										
Other -	LT																										
LT Total																											
Employee Expenses	AE																										
Project Support Vendor - PM	AQ				$34,720		$7,440																				$42,160
Project Support Vendor - PP	AQ																										
Project Support Vendor - CPP	AQ																										
Project Support Vendor - System Planning	AQ																										
Project Support Vendor - Environmental	AQ																										
Project Support Vendor - SCS - None	AQ																										
Project Support Vendor - Legal	AQ																										
Project Support Vendor - Siting/row	AQ				$6,200																						$6,200
Project Support Vendor - Siting - None	AQ																										
Project Support Vendor - Asset Management	AQ																										
Project Support Vendor - Other	AQ																										
Project Support Vendor - Other	AQ																										
Project Support Vendor - Other	AQ																										
Project Support Vendor - Other	AQ																										
Vehicles (now in Indirects section)	AV																										
Property or CWIP tax large proj. allowance	BR																										
Builder All risk Insurance excluding deductables(if project is over $50m)	BR																										
Fees and Payments - Environmental	BF																										
Fees and Payments - Siting	BF																										
Fees and Payments - Other	BF																										
PSMXX Subtotal					$40,920		$7,440																				$48,360
Escalation																											
PSMXX Total					$40,920		$7,440																				$48,360
REMXX-TG REMOVAL																											
Engineering/Design	LT																										
Internal Construction	LT																										
LT Total																											
Employee Expenses	AE																										
Outside Services	AQ																										
Contractor Labor	AQ				$14,208																						$14,208
Vehicles (now in Indirects section)	AV																										
Rents and Leases	BR																										
REMXX Subtotal					$14,208																						$14,208
Escalation																											
REMXX Total					$14,208																						$14,208
TSTXX-TG TEST																											
Test / Field Engr. Labor (In House)	LT																										
Lead Coordinator/the Engr. (LCE) / Interwll	LT																										
Employee Expense	AE																										
Test / Field Engr. Labor (contractor)	AQ				$133,200		$14,800																				$148,000
Lead Coordinator/the Engr. (LCE) (contractor)	AQ				$77,040		$8,560																				$85,600
Vehicles (now in Indirects section)	AV																										
TSTXX Subtotal					$210,240		$23,360																				$233,600
Escalation																											
TSTXX Total					$210,240		$23,360																				$233,600
SUBTOTAL PROJECT DIRECT COST			-	$111,336	$1,116,916		$191,322													0							$1,308,473
Risk																											
Risk					$129,000		$7,500																				$136,500
					$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		
					$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		
Risk Total					$129,000		$7,500																				$136,500
TOTAL PROJECT DIRECT COST (w risk)			-	$111,336	$1,244,916		$198,822													0							$1,444,973
INDIRECTS																											
Non-Productive Time Allocation (DNP)	17.0%		$3,843		$10,837		$1,846																				$16,526
Payroll Benefits Allocation (DPB) Incl NPT	44.0%		$38		$6,445		$1,889																				$11,372
Gen SVC CO Overhead (DSB) Incl NPT	80.0%		$17,280		$42,494		$8,901																				$68,595
S&S Allocations (DSI, DE, DSI)	50.0%		$51,764		$542,376		$69,814																				$663,955
A&AE Allocations (DAE)	1.8%		$1,966		$21,512		$2,633																				$26,135
Stores Expense Allocation (DST)	8.0%				$8,679																						$8,679
Lobby Stock																											
MOEC (DM)	6.0%		$6,793		$66,007		$7,954																				$81,814
Vehicles (DVE)	38.0%		$160		$17,849		$2,793																				$20,835
Indirects Subtotal			$82,510		$718,052		$80,590																				$880,152
TOTAL PROJECT COST - Direct & Indirect (excl AFUDC)			$193,847		$1,962,967		$281,412																				$2,388,139
AFUDC																											
AFUDC (2k)			$3,468	0.50%	$76,619	0.50%		0.50%		0.50%		0.50%		0.50%		0.50%		0.50%		0.50%		0.50%		0.50%		1	$80,087
In Service Dollars																											
Cumulative ISS					-		-		-		-		-		-		-		-		-		-			
AFUDC Subtotal			$3,468		$76,619																						$80,087
TOTAL PROJECT COST - Baseline Budget			$197,314		$2,039,586		$281,412																				$2,468,312
Contingency																											
Contingency					$60,589		$12,502																				$60,091
Other			$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		
Contingency SubTotal					$60,589		$12,502																				$60,091
TOTAL PROJECT COST - Approved Funding			$197,314		$2,130,175		$293,914																				$2,391,585
Reimbursables / Customer Contribution																											
Reimbursables / Customer Contribution (enter as negative)			$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		

Activity ID	Activity Name	OD	Start	Finish	Predecessors	T Float
Rocky River 12Y-2X and 12Y-3X (Transformer Relaying Replacement CS00403)		320	03/18/22 08 A	06/23/23 16		0
INITIALIZATION AND SCOPE DEVELOPMENT		167	03/18/22 08 A	11/15/22 08		0
Project Initiation		75	03/18/22 08 A	07/01/22 16		-13
P&C Engineering Preliminary Design		10	04/11/22 08 A	05/09/22 16 A		
DE2100	ES Engineering Review P&C Preliminary Design (Rocky River)	10	04/11/22 08 A	05/09/22 16 A	DE2090	
EPAC Full Funding		75	03/18/22 08 A	07/01/22 16		-13
PAFF2220	Submit Full Funding PAF for Internal Review (Rocky River)	2	05/09/22 08 A	05/10/22 16 A	DE2140, DE2130, DE2120	
DE2130	Project Constructability Review Complete (Rocky River)	2	05/02/22 08 A	05/17/22 16 A	DE2090	
DE2140	Create Planning Grade Estimate (+/-25% Partial Funding) (Rocky River)	9	03/18/22 08 A	05/25/22 16 A	DE2090	
DE2120	Conduct Initial Risk Management & SCLL Review (Project Initiator & PM) (Rocky River)	2	04/25/22 08 A	05/25/22 16 A	DE2110, DE2100	
PAFF2230	Incorporate Internal Review Comments & Submit Full Funding PAF to EPAC for Review (Rocky River)	1	05/09/22 08 A	05/26/22 16	PAFF2220	-5
PAFF2240	Full Funding Approval EPAC Meeting (Rocky River)	0		06/08/22 16*	PAFF2230	0
PAFF2250	Incorporate EPAC Full Funding PAF Review Comments (Rocky River)	5	06/09/22 08	06/15/22 16	PAFF2240, PAFF2230	-13
FF1630	Full Funding Approval (Rocky River)	0		06/17/22 16	PAFF2250	-13
FF1640	Full Funding PowerPlan Approval (Rocky River)	10	06/20/22 08	07/01/22 16	FF1630, PAFF2250, DE2140	-13
T-Minus Milestones		183	05/09/22 08 A	11/15/22 08		0
T-Minus Milestones "A" Group		183	05/09/22 08 A	11/15/22 08		0
AT2605	Preliminary Design / Engineering Completed	0		05/09/22 08 A	DE2100	
AT1301	N/R_Commissioning Plan Complete	0		05/16/22 16 A		
AT0805M	N/R_IFC - Communications w/BOM (minutes of 16May meeting)	0		05/17/22 16 A	PC1330	
AT1801	N/R_T-18.01 All Firm TOA Applications Due to LCC (T-04 for Distribution TOA)	0		05/18/22 16 A	A22640, A1250	
AT0901	T-09 Protection System Data - OP-24 Requirement (Tie to First Outage Milestone Phase)	0		05/20/22 16 A	OP1030	
AT1811	Detail Design / Engineering Completed	0		07/15/22 16	PC1120	122
AT0805PC	IFC - P&C w/BOM	0		08/11/22 16	PC1330	95
AT0805E	IFC - Electrical (AG) w/BOM	0		08/11/22 16	PC1330	95
AT1202	P/C Description / Draft OI Issued To LCC	0		08/11/22 16	PC1330	95
AT0301	T-03 NX-9 Ratings to LCC & ISO for Existing Equipment (EM=Per Procedure/15 business days before DOE)	0		08/24/22 16*	NX9A-EM310	60
AT0404	All Final Relay Protective Settings Issued	0		09/27/22 16	PC1410	48
AT0401	Final Material Receipt Review Completed *ES Purchased*	0		10/14/22 16	460, 390, 400	31
AT3211	Go / No-Go [CAN] Construction Authorization Notice Form Complete	0		10/20/22 16	PC1330, A22020	25
AT0602	Units of Property (Items) Issued to Plant Accounting	0		10/20/22 16	A22020	25
AT0814	Construction Contracts / PSA in Place	0		10/20/22 16	A22020	25
AT00	A-T-00 - Start of Construction (Rocky River)	0	11/15/22 08*		AT0805M, AT2605, AT0805E, AT1805, AT1801, AT3181, AT3041, AT0404	0
ENGINEERING & DESIGN		174	05/16/22 08 A	01/25/23 16		105
P&C Engineering		94	05/16/22 08 A	09/27/22 16		32
OP1020	P&C Updates OP-24 Appendix B (Rocky River)	4	05/16/22 08 A	05/19/22 16 A	OP1010	
OP1030	P&C Submits OP-24 Appendix B to ISO-NE (Rocky River)	1	05/20/22 08 A	05/20/22 16 A	OP1020	



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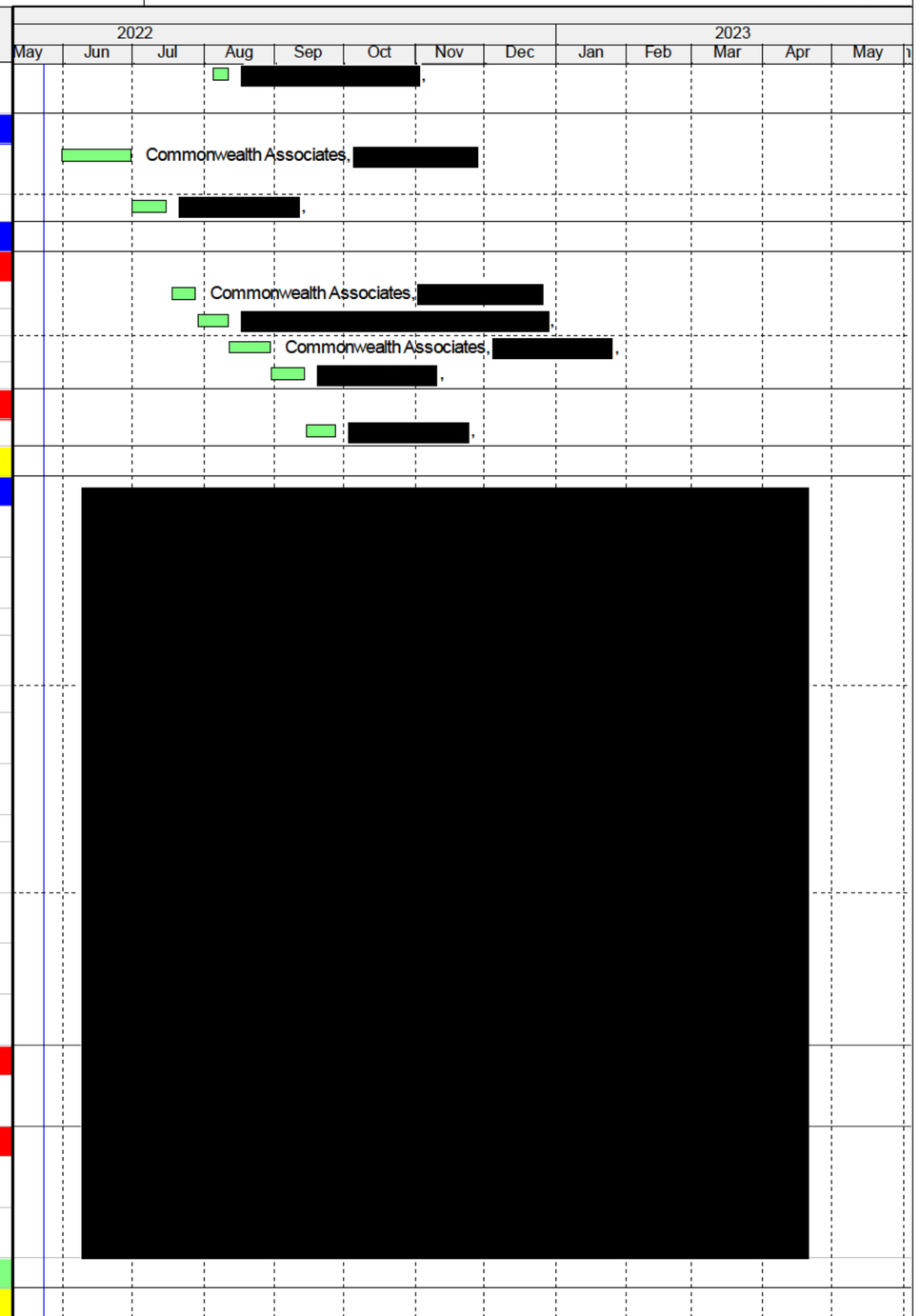
Activity ID	Activity Name	OD	Start	Finish	Predecessors	T Float
CSD1030	PE Initiate CASCADE Forms (Appendix A) for Construction Package (Rocky River)	5	08/05/22 08	08/11/22 16	PC1120, PC1330	64
P&C Engineering Detail Design		33	05/31/22 08	07/15/22 16		11
PC1110	Vendor Engineer Develop P&C Detail Design (Rocky River) to start after revisions to preliminary design	23	05/31/22 08*	06/30/22 16	DE2100	11
PC1120	ES Engineering Review P&C Detail Design (Rocky River)	10	07/01/22 08	07/15/22 16	PC1110	11
P&C Engineering IFC Design		51	07/18/22 08	09/27/22 16		11
P&C Design Package		41	07/18/22 08	09/13/22 16		11
PC1320	Vendor Engineer Develop P&C IFC (Rocky River)	9	07/18/22 08	07/28/22 16	PC1120	11
PC1330	ES Engineering Review P&C IFC (Rocky River)	10	07/29/22 08	08/11/22 16	PC1320	11
PC1340	Vendor Engineer Develop IFR Relay Settings (Rocky River)	12	08/12/22 08	08/29/22 16	PC1330	11
PC1350	ES Engineering Review IFR Relay Settings (Rocky River)	10	08/30/22 08	09/13/22 16	PC1340	11
Relay Settings		10	09/14/22 08	09/27/22 16		11
PC1410	Complete IFR Relay Settings (Rocky River)	10	09/14/22 08	09/27/22 16	PC1350	11
Electrical Engineering NX-9		155	06/13/22 08	01/25/23 16		105
Substation NX-9		155	06/13/22 08	01/25/23 16		105
NX9A-EM23	PE Updates 1-Line Nomenclature Dwgs & Complete PE Checklist M7-EN-3006.2 - e-mail link to project team & CONVEX	5	06/13/22 08*	06/17/22 16	DE2100	40
NX9A-EM22	LTRC Reviews and Makes "GO / NO-GO" Decision for 1-Line Nomenclature (Rocky River)	5	06/20/22 08	06/24/22 16	NX9A-EM230	40
NX9A-EM	LTRC Submits1-Line Nomenclature to TRC (Rocky River)	5	06/27/22 08	07/01/22 16	NX9A-EM220	40
NX9A-EM33	LTRC Reviews and Makes "GO / NO-GO" Decision for Thermal Ratings (Rocky River)	5	07/05/22 08	07/11/22 16	NX9A-EM320	40
NX9A-EM	LTRC Requests P&C Checklist (Rocky River)	5	07/12/22 08	07/18/22 16	NX9A-EM330	40
NX9A-EM24	P&C Develops and Provides LTRC with P&C Checklist (M7-EN-3006.1) (Rocky River)	5	07/19/22 08	07/25/22 16	NX9A-EM260	40
NX9A-EM30	LTRC Reviews and Sends Thermal Rating Data for TRC Review (Rocky River)	5	07/26/22 08	08/01/22 16	NX9A-EM240	40
NX9A-EM	TRC Reviews and Approves Thermal Rating Data (Rocky River)	5	08/02/22 08	08/08/22 16	NX9A-EM300	40
NX9A-EM28	LTRC Sends Thermal Rating Data for Approval & Submit to NURS (Rocky River)	5	08/09/22 08	08/15/22 16	NX9A-EM290	40
NX9A-EM27	Scheduler @ NURS email "Submitted for PP Review" - Updates NURS with DOE (Rocky River)	1	08/16/22 08	08/16/22 16	NX9A-EM280	40
NX9A-EM25	TRC Review and Submit NX-9 Data to LCC + ISO-NE for S/S Thermal Rating (Rocky River)	5	08/17/22 08	08/23/22 16	NX9A-EM270	40
NX9A-EM31	Scheduler @ NURS email "Submitted for DOE Monitoring" - Updates T-3, EquipDOE, Revs DOE per M7-EN-3006 (Rocky River)	1	08/24/22 08	08/24/22 16	NX9A-EM250	40
Substation - NX-9 Pre NX9-DOE		1	08/25/22 08	08/25/22 16		62
NX9A120	Scheduler - Send Email for 48Hrs Notification before DOE. (Rocky River)	1	08/25/22 08	08/25/22 16	NX9A-EM310	62
Substation - NX-9 Post NX9-DOE/ISD		8	01/13/23 08	01/25/23 16		105
NX9FINA	Review + Affirm Accuracy of NX-9 for ISO Submission (Tie after Equip DOE or ISD) (Rocky River)	3	01/13/23 08	01/18/23 16	ConsFin	105
NX9FINA	[If Required] Receive + Issue Final Affirmed NX-9 Data to NURS (Rocky River)	5	01/19/23 08	01/25/23 16	NX9FINAL80	105
MATERIAL		72	07/05/22 08	10/14/22 16		20
Electrial Material		25	07/05/22 08	08/08/22 16		67



Remaining Level of Effort | Remaining Work | Mile...
Actual Work | Critical Remaining Work

Data Date = 05/23/22

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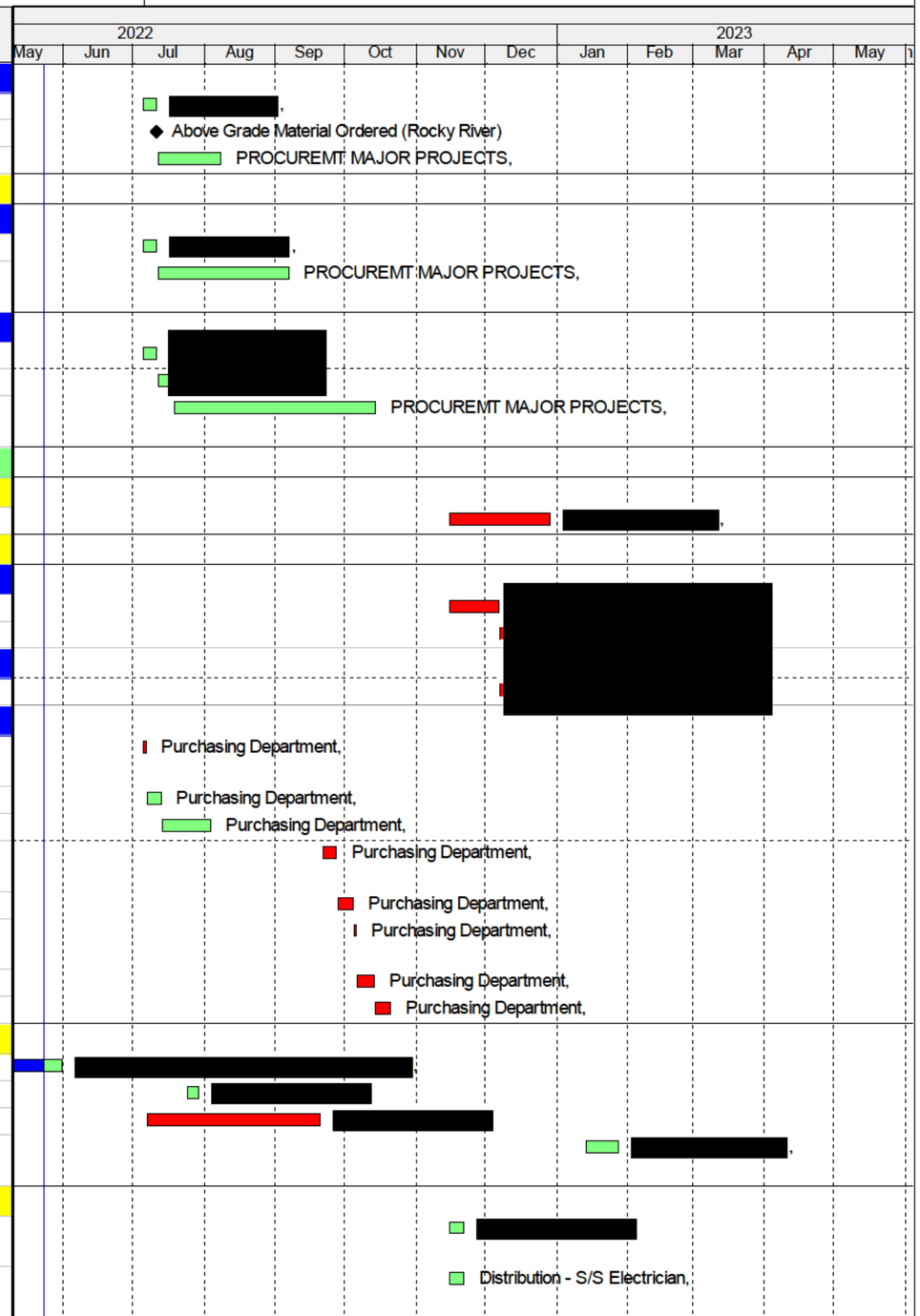
Activity ID	Activity Name	OD	Start	Finish	Predecessors	T Float
Electrical Material		25	07/05/22 08	08/08/22 16		67
450	Issue DR for Cable / Wire (Rocky River)	5	07/05/22 08	07/11/22 16	FF1640	58
480	Above Grade Material Ordered (Rocky River)	0		07/11/22 16	450	58
460	Issue PO and Procure Cable / Wire (Rocky River)	20	07/12/22 08	08/08/22 16	450	67
P&C Material		72	07/05/22 08	10/14/22 16		20
Relays		45	07/05/22 08	09/06/22 16		47
380	Issue DR for Microprocessor Relays (stock coded) (Rocky River)	5	07/05/22 08	07/11/22 16	FF1640	47
390	Issue PO and Procure Microprocessor Relays (stock coded) (Rocky River)	40	07/12/22 08	09/06/22 16	380	47
Panels - Installed Pre-Wired Relays		72	07/05/22 08	10/14/22 16		20
420	Prepare & Approve SPEC (approx 4 weeks) (Rocky River)	5	07/05/22 08	07/11/22 16	FF1640	20
410	Issue DR for Relay Panel (Rocky River)	5	07/12/22 08	07/18/22 16	420	20
400	Issue PO and Procure Relay Panel (approx 16 weeks) (Rocky River)	62	07/19/22 08	10/14/22 16	410, FF1640	20
CONSTRUCTION		207	04/01/22 08 A	01/27/23 16		73
CONSTRUCTION - P&C		30	11/15/22 08	12/28/22 16		-21
A1140	Construction - P&C Implement Relay Settings	30	11/15/22 08	12/28/22 16	FF1640, PC1410, GenCon	-21
Electrical Construction		131	07/05/22 08	01/11/23 16		-29
Equipment		39	11/15/22 08	01/11/23 16		-29
A22540	Remove Existing Relays (Rocky River)	15	11/15/22 08	12/06/22 16	A22020, 480, AT00	-29
A22550	Install New Equipment (Rocky River)	24	12/07/22 08	01/11/23 16	A22540	-29
Wiring / Terminating		24	12/07/22 08	01/11/23 16		-29
A22570	Install Wiring (Rocky River)	24	12/07/22 08	01/11/23 16	A22550	-29
Electrical Construction Service/Contracts		76	07/05/22 08	10/20/22 16		-13
A21950	Prepare Specifications / Scope of Work (Electrical Contractor) (Rocky River)	2	07/05/22 08	07/06/22 16	FF1640	-13
A21960	Prepare and Issue RFP (Electrical Contractor) (Rocky River)	5	07/07/22 08	07/13/22 16	A21950	20
A21970	Bid Period (Electrical Contractor) (Rocky River)	15	07/14/22 08	08/03/22 16	A21960	20
A21980	Evaluate Bids and Develop Short List (Electrical Contractor) (Rocky River)	5	09/21/22 08	09/27/22 16	A21970, A22650, A22655	-13
A21990	Negotiate Contract (Electrical Contractor) (Rocky River)	5	09/28/22 08	10/04/22 16	A21980	-13
A22000	Award contracts for Civil construction and testing services (Electrical Contractor) (Rocky River)	1	10/05/22 08	10/05/22 16	A21990	-13
A22010	Issue DR (Electrical Contractor) (Rocky River)	5	10/06/22 08	10/13/22 16	A21990, A22000	-13
A22020	Issue PO (Electrical Contractor) (Rocky River)	5	10/14/22 08	10/20/22 16	A22010	-13
CONSTRUCTION - CONST.REP TASKS		207	04/01/22 08 A	01/27/23 16		73
A1250	Construction Rep Issue Outage and Energization Plan	10	04/01/22 08 A	05/31/22 16	DE2100	12
A22650	Final Constructability Review	5	07/25/22 08*	07/29/22 16	A21950	23
A22655	TOA Outages Approved	53	07/07/22 08	09/20/22 16	A21950, A1250	-13
A1260	Construction Rep Finalize CASCADE Forms (within 14 days folloiwng ISD) (Rocky River)	10	01/13/23 08	01/27/23 16	ConsFin, CSD1030	73
CONSTRUCTION RESOURCE TRACKING		40	11/15/22 08	01/12/23 16		-31
ConRep-S	Dates TBS_RESOURCE ONLY ACTIVITY - CONSTRUCTION - CONSTRUCTION REP (Rocky River)	5	11/15/22 08	11/21/22 16	CONStart	4
CONSTelec	Dates TBS_RESOURCE ONLY ACTIVITY - CONSTRUCTION - ELECTRICIAN (Rocky River)	5	11/15/22 08	11/21/22 16	CONStart	4



Remaining Level of Effort | Remaining Work | Mile...
Actual Work | Critical Remaining Work

Data Date = 05/23/22

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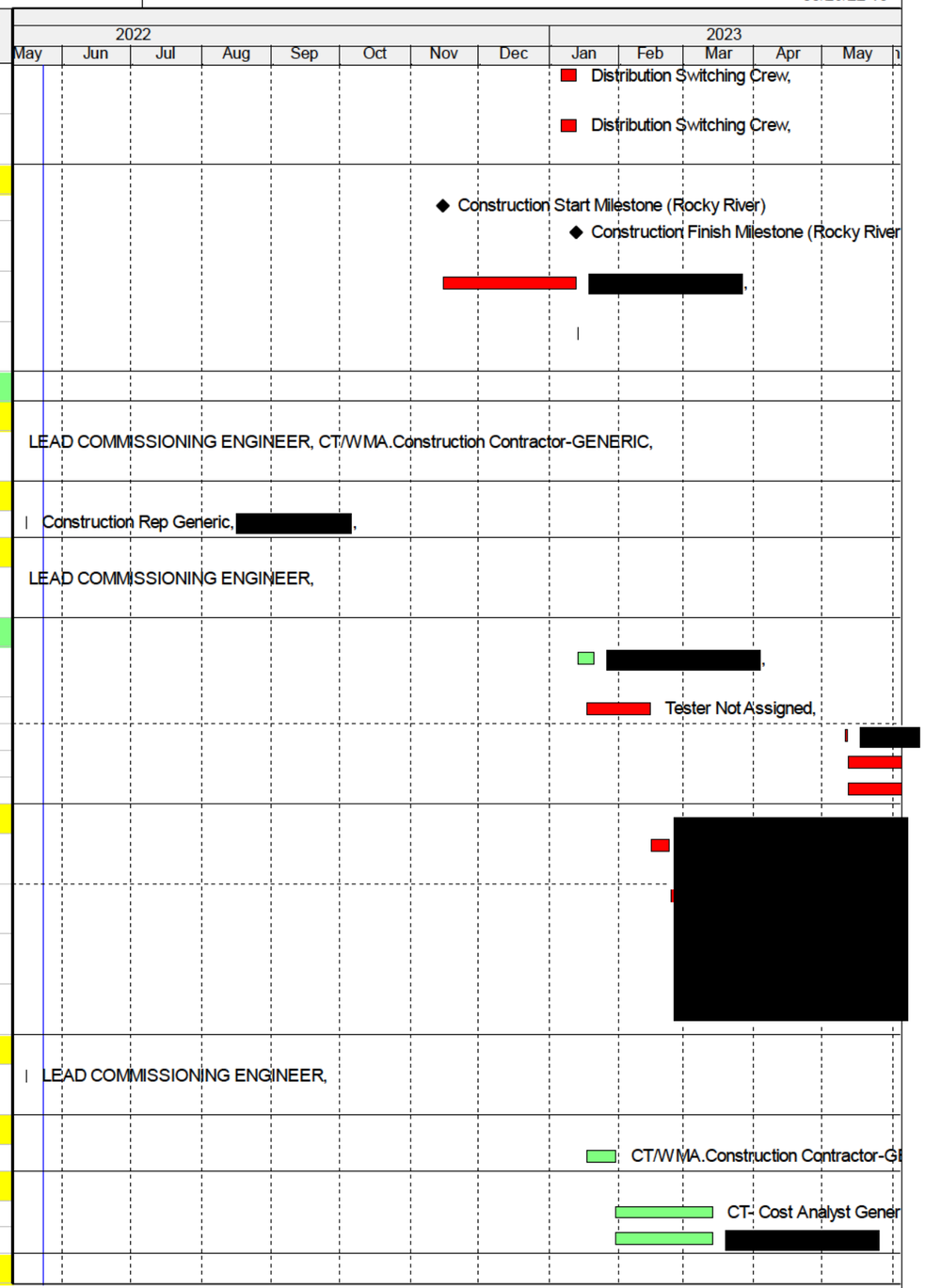
Activity ID	Activity Name	OD	Start	Finish	Predecessors	T Float
A1080	Dates TBS_RESOURCE ONLY ACTIVITY - CONSTRUCTION - SWITCH IN (Rocky River)	5	01/06/23 08	01/12/23 16	GenCon	-31
A1070	Dates TBS_RESOURCE ONLY ACTIVITY - CONSTRUCTION - SWITCH OUT (Rocky River)	7	01/06/23 08	01/12/23 16	GenCon	-45
CONSTRUCTION OUTAGES		41	11/15/22 08	01/13/23 16		-31
CONStart	Construction Start Milestone (Rocky River)	0	11/15/22 08*		AT00	0
ConsFin	Construction Finish Milestone (Rocky River)	0		01/12/23 16	CONSTelec, A1080, A1070, A1140, ConRep-S, GenCon, [illegible]	-45
GenCon	OUTAGE dates TBD / General Construction Work - Relays (Rocky River)	40	11/15/22 08	01/12/23 16	CONStart	-31
ISD	EQUIPMENT IN SERVICE DATE (requires FOOB constraint) (Rocky River)	1	01/13/23 08	01/13/23 16*	ConsFin, A22570	-39
TEST AND COMMISSION		21	04/18/22 08 A	05/16/22 16 A		
LCE PLANNING		15	04/18/22 08 A	05/10/22 16 A		
A22610	N/R_Internal Test_Evaluate Drawings and Plan for Construction Outages (Rocky River)	15	04/18/22 08 A	05/10/22 16 A	A22590	
TEST - SERVICES STAFFING DECISION		1	05/16/22 08 A	05/16/22 16 A		
A1010	STAFFING DECISION: TEST EVERSOURCE (Rocky River)	1	05/16/22 08 A	05/16/22 16 A	FF1640, DE2100	
LCE AUTHORIZATION		1	05/10/22 08 A	05/10/22 16 A		
A22630	N/R_Internal Test Review and approve Outage Sequence Document (Sign-off) (Rocky River)	1	05/10/22 08 A	05/10/22 16 A	A22590	
PROJECT CLOSE OUT		279	05/16/22 08 A	06/23/23 16		0
TD1100	Complete TD-707 Turnover Document / Forward to SOC & Mailing List	5	01/13/23 08	01/20/23 16	ConsFin	78
PC8000	FE Prepare Electrical Field Mark Ups	21	01/17/23 08	02/14/23 16	3290, ISD	0
PM1110	PM to Document Electrical As-Built Drawings Complete (P&C)	1	05/11/23 08	05/11/23 16	PC8540	0
EV1510	FE Files Substation Design Drawings at Station	30	05/12/23 08	06/23/23 16	PM1110, TD1100	0
PC8500	FE Files P&C Design Drawings at Station	30	05/12/23 08	06/23/23 16	PM1110, PC8540, TD1100	0
P&C As-Builts		60	02/15/23 08	05/10/23 16		0
PC8510	Eversource Engineering Prepares & Sends Electrical Field Mark Up Packge to Vendor	5	02/15/23 08	02/22/23 16	PC8000	0
PC8520	Vendor Engineering Verifies P&C/Electrical Mark Ups;Updates As-Built Drawing Package;Submits Final Package to ES	30	02/23/23 08	04/05/23 16	PC8510	0
PC8530	Eversource Engineering Verifies Quality of Submitted P&C Drawings	20	04/06/23 08	05/03/23 16	PC8520	0
PC8540	P&C Transmittal, Approve Final As-Built Package, and EDC Files and Issue Drawings to Field	5	05/04/23 08	05/10/23 16	PC8530	0
Test Closout		1	05/16/22 08 A	05/16/22 16 A		
3290	N/R_LCE Review Test Data and Issue Commissioning Report (tie to As-Built submit Print activity)	1	05/16/22 08 A	05/16/22 16 A	ISD	
SITE RESTORATION CLOSEOUT		10	01/17/23 08	01/30/23 16		102
1110	Restore / Remediate Site	10	01/17/23 08	01/30/23 16	ISD	102
MATERIAL, EQUIPMENT, COST, AND ASSET MANAGEMENT CLOSEOUT		30	01/30/23 08	03/13/23 16		73
1020	Cost Analyst Prepares FINAL Units of Property	30	01/30/23 08	03/13/23 16	ISD, A1260	73
1030	Asset Management Complete Asset Update(s) in CASCADE	30	01/30/23 08	03/13/23 16	A1260	73
PROJECT MANAGEMENT CLOSEOUT		112	01/17/23 08	06/23/23 16		0



Remaining Level of Effort | Remaining Work | ◆ Mile...
Actual Work | Critical Remaining Work

Data Date = 05/23/22

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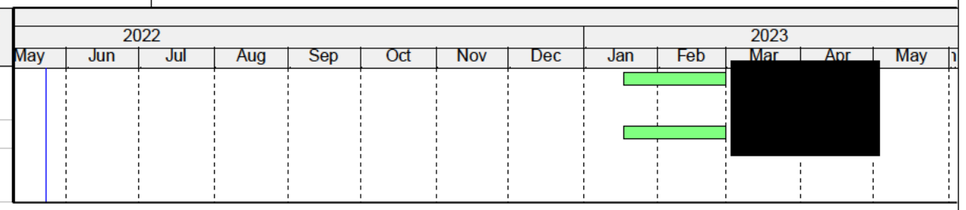
Activity ID	Activity Name	OD	Start	Finish	Predecessors	T Float
1040	PM Prepares Closeout Documentation, Lessons Learned Meeting, etc.	30	01/17/23 08	02/28/23 16	ISD	81
1270	Prepare TD-707 Document	30	01/17/23 08	02/28/23 16	ISD	81
PRJCOMP	Project / Work Order Complete (FINAL SCHEDULE TASK/MILESTONE)	0		06/23/23 16	1020, 1040, 1110, 1270, 1030, EV1510, PC8500, NYCFINAL70	0



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EVERSOURCE

Constructability Review Form: **Substation**

Project Title: [redacted] **Relaying Replacement**	☐	Prior Constructability Review Performed?
	☐	Program Related Site Specific Review?
Project Numbers(s): 80053189	**Project Constructability Phase:**	
Date(s) of Constructability Review: **04/28/2022**	☐ Conceptual Engineering Design	
Click to enter a date	☒ Preliminary Engineering Design	
	☐ Detailed Engineering Design	
Project Scope Statement: Replace 2X and 3X Transformer Relays and Automate 3X LTC		

Department Review/Walkdown Attendees*:

Required [X]	Attended [X]	Department	Name	Required [X]	Attended [X]	Department	Name
☐	☒	Project Management	[redacted]	☐	☒	S/S Engineering	[redacted]
☐	☐	Asset Management		☐	☒	P&C Engineering	
☐	☒	Constr. Management		☐	☐	Civil Engineering	
☐	☐	S/S Technical / LCE		☐	☐	Telecom	
☐	☐	S/S Operations**		☐	☐	Environmental	
☐	☒	Field Engineering		☐	☐	Real Estate	
☐	☐	Line Engineering		☐	☐	T&D ROW	
☐	☐	Vegetation Management		☐	☐	Survey Engineering	
☐	☐	Siting		☐	☐	Cost Estimating	
☐	☐	Safety		☐	☐	Outreach (SCS)	
☐	☐	SCADA		☐	☐	Material Procurement	

* **Sign-off in the table above for the Detailed Engineering Design Constructability Review indicates that all Action Items/Concerns from prior Constructability Reviews have been mitigated/resolved as documented in this form. Not every department is required to attend walkdowns for every project but should be consulted for project impact considerations**

** Internal Eversource Substation Operations must be included in the review even if external construction resources are planned

[redacted] certifies that this review was performed to completeness, that all applicable departments were informed of the project and have had opportunity to provide input to this review:

[redacted] _____ *5-16-22*

Name / Signature *Date*

EVERSOURCE

Constructability Review Form: **Substation**

Documents available for use prior to Constructability Review					
[X]	Document	[X]	Document	[X]	Document
☐	Initial Scope -Birdseye site plan -General Arrangement	☒	Preliminary Drawings -Civil Site Drawing -Electrical Drawing -Section Drawings	☐	Prints in hand for marking up -Panel Front/Read View -Control Enclosure Layout -Floor / Wall Plans
☐	Detailed Scope Document	☐	Proposed Schedule	☐	Construction Sequence/Timeline
☐	Previous Notes / Comments / Observations	☐	Major Material / Equipment List	☐	Replace / Reuse of equipment

Action Items and Resolutions:

Item No.	Const. Review Action Item/Concern	Design Resolution/Mitigation:
1	Underground work might conflict with existing conduit	Confirm underground coordination
2		
3		
4		
5		

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
A	**Engineering & Asset Management**		
1	**Scope of Work** - Is scope adequately developed and sufficiently detailed for intended deliverable? - Any complimentary projects or other adjacent obsolete equipment for inclusion? - Any overlapping projects that could impact work/outages? - Consider Physical Installation, P&C Scope, Civil Scope, Engineering studies, Design standard adherence - Any remote station impacts? - Engineering Estimates for Design and Technical Support? (EE and EOC) Total Project	☐	Scope is sufficient, no known other projects.

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Constructability Review Form: **Substation**

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2	**Materials Identified/Ordered** -Any concerns with BOM/Major Materials? Review BOM lead times and project need dates -Specialty Major Materials: Identify Specialty Equipment & Materials potentials - temporary/replacement - long lead items? -Any Materials needed to facilitate construction access?	☐	Panel 4P specification has not been received from the vendor at this time.
3	**Control House** - Review Unmapped equipment interferences, Control/Battery Enclosure Layout, HVAC System (if equipment added), space for new or modified equipment, AC / DC station breaker availability and service loading, Panel Space, Expansion, one-line and/or riser type panelboard drawings, other..	☐	
4	**Ratings & Dimensions** for Major Equipment. Any concerns upon field review? Equipment Rating One Line (and/or equipment thermal ratings tables) - Review for any errors in field	☐	
5	**Wall, Fence, Gate, and Foundation Considerations** -Any permanent / temporary alterations or relocations required? -Pre-Project Sound Measurements Needed? Sound Walls? -Take measurements for Foundation quantities, dimensions and concrete volumes -CIP Review/Ballistic needs. Any Physical Security Requirement Consideration? -Assess condition of existing yard equipment foundations and viability for reuse (if proposed) -Review station expansion areas (if needed) for structures, old foundations, etc. -Any Steel Structural Plan Considerations? -Any impacts to construction plan?		Concrete apron at the access door to the underground splice box could limit the underground conduit path.
6	**Below Grade / Enclosure Raceway** - If possible, evaluate existing raceway and review spacing requirements. Review for any subsurface investigation needs or potential below grade obstructions. GPR/test pits needed? Geotechnical Investigation - is soil boring or resistivity investigation needed?	☐	New underground conduit will need to be coordinated with existing.

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Constructability Review Form: **Substation**

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7	**Underground Obstructions** -Drawing review concerns? -Is preconstruction or test excavation needed? -Is reuse of underground control cables / Conduits /replace Non-Shielded Cable feasible (if applicable) -Are spare conduits available? Are they useable? -Review if any areas will need to be plated for increased load bearing for equipment access (i.e. large Xfmr, etc.)	☐	Will advise the designer to check the as builts for existing conduit.
8	**Grounding Plan (Ground Grid)** - Will footprint impact layout or other equipment? Identify locations to improve grounding. Impacts to foundations and ground grid plans. Observations on wetlands or ability to perform tests	☐	relay replacement only, no workmen's grounds needed
9	Nomenclature / Switching One-Line Diagram -Any obvious deviations from diagrams provided?	X	NA
10	BPS Separation Requirements - Is this BPS Substation? Y/N (part of PAF) - Changes to pre-existing BPS standards?	X	NA
11	IEC 61850 Substation Automation and Communication Requirements - Any Impacts/Retrofit needed?	X	NA
12	Any Upgrades to ES Standards - Is retrofit needed to bring up to ES standards? Can that be done?	X	NA
B	**Construction**		
1	**Any safety hazards specific to the facility? i.e. Low Bus, Deterioration, etc.**	☐	None noted.
2	**Prior known Site Specific Conditions** -Common or Obvious station Issues -Missing scope items that could impact costs?	☐	None noted.
3	**Identify/Consider Required Depts for Construction?** -Who is constructor: Internal vs External Resources -S/S Ops, GO, Test, Field Engineering, etc -Specialty Contractors Required? -Required Oversite Needed - Estimated level of CR and LCE support needed	☐	Checked, sufficient space appears to exist.

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4	**Site Plan, Access, and Temporary Construction Facilities:** -Confirm maintenance access for proposed new or replaced equipment -Verify clear footprint for yard equipment / Property Plan -General access to site, can areas outside substation be utilized? -Substation Entry Plan (driveway and drive path modifications) - Identification of Unique Requirements, i.e. (access bridges, station service, etc.) -Site Development Plan (grading and drainage) with Cut/Fill -Existing Rock Conditions? Potential Impacts (rock quantity)? -Any police details needed for deliveries, restricted hours, and/or need for extended hour approvals -Any Sanitary Civil Requirements? (Septic tanks, etc) -Review turning radius for delivery trucks (if critical) -Any Substation Access and site/yard access Limitations? -Office Trailer Needs: Facilities, Utilities, Restroom, Container, Dumpster Space -Weather impacts to Site (Snow Placement) -Identify Material Laydown and Security -Where will new vs removed equipment go? -Construction permit for trailers outside substation fence?		Will need 32x8 office trailer, porta john during pre-construction, construction time frame Daily CR oversight
5	Unique Equipment Considerations: Gas insulated substation, Gas insulated line, Gas insulated bus, Pass Breaker, Statcom, Sync Condenser	NA	

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Constructability Review Form: **Substation**

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6	**Outage & Energization Plan and Construction Sequence:** *Review electrical working clearances for equipment during construction, Detailed look at protection zone changes, Locked sequence or random outages, Outage durations minimized.* ***Considerations:*** -Approach Distances – Outage Requirements to maintain electrical clearances throughout proposed installation -Distribution Clearances -Clearance Holder Assignments -Drawings vs Field Conditions -Outage boundaries and interconnections -Phased approach needs for additional mobilizations -Verify outage sequence supports the planned construction sequence and timeline. (Lead Commissioning Engineer "LCE", Substation Operations, and Outage Planner input) -Any design alterations or considerations to Eliminate SCLL Conditions, Reduce Recall Time, Reduce Outage durations, Special Conditions -Additional outage requirements: Railroad Catenaries, Fiber outage, SCADA outage, Relay permissions -Seasonal or weather conditions impacts	☐	Outage boundaries established, outage duration still being discussed
7	**Equipment Testing & Acceptance** -Grounding plans / Resources? Will we need grounds hung? -Hi-pot testing and where will the equipment be set up?	NA	
8	Need for mobile generator and where connected (if needed)	☐	Still researching, not likely needed.
9	Need for mobile battery and where connected (if needed)	NA	
10	OT work required or Notable Permit Conditions (special hours)?	☐	Contractor and test overtime will be needed to mitigate outage durations.
11	Coordination of boundaries/seams (Identification of point of demarcation for connection to existing equipment and/or for coordination with other municipalities)	NA	

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Constructability Review Form: **Substation**

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C	**Environmental**		
1	Soil Pre-Characterization or Grab Sampling Completed/Planned	NA	NA
2	**Desktop investigation and EAD Review** -Required Permits -Stormwater Considerations -Dewatering requirements -Wetland and buffer review	NA	
3	Risk or presence of PCB's/Asbestos/Lead/SF6	NA	
4	Transformer Spill Containment Recommended?	NA	
5	Expanding Footprint / New Buildings or future Expansion Plans? (Enviro Impact)	NA	
6	Environmental oversight considerations? (Inspection type/Interval)	NA	
7	Environmental mitigations - Any matting or seasonal needs? Review D&M Plan with CR.	NA	
D	**Siting, S&CS, and T&D Real Estate**		
1	**Any regulatory concerns or approvals needed?** - Consider scope/design alterations to mitigate concerns - Consider Visual screening considerations (feasibility or location) -Zoning Relief and Permits required	NA	NA
2	**Neighbor/Abutter impacts:** - Any noise, visual impacts, or sensitive abutters - Any changes to lighting or additional lighting needed?	NA	
3	Review for roadway, gate access, trailers, equip height, noise, weekend/night work, or any potential public disturbance related to work	NA	
4	Installation within Eversource Rights - Is Rights and Restrictions Review required?	NA	
5	Expanding Footprint / New Buildings or future Expansion Plans?	NA	
6	Proposed Equipment on same property? - Any Encroachments	NA	

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
F	**Protection & Controls**		
1	Panel Graphic additions and/or Modifications	X	No concerns, no panel graphic changes are not needed
2	Space on existing panels for new equipment? (front & rear of panel fronts)	X	No concerns, space is adequate, Vendor to provide 4P cabinet specifications.
3	Panel fronts conform to drawings	X	No concerns, panels match existing prints
4	Access to bring new panels into control enclosure	X	No concerns, adequate spaced is available
5	Nameplate list and location of nameplates	☐	Nameplates on the new txf relays will be updated due to the conversion to the SEL relays.
6	Verifies that relays and meters that will be an interconnected project work are as shown on the drawings.	X	No Concerns, relays and meters that will be removed are accurately shown.
7	Temporary protection, relays, control cable needed? How long will they be required?		1) Mobile installation will require temporary settings for the length of the outage. 2) Temporary settings at Bulls Bridge and Carmel Hill are needed for the energization of the respective transformer.
8	Will relay setting changes be needed? Any additional outage requirements for changes?	☐	New SEL relay settings will be needed.
G	**Telecom Engineering**		
1	Review telecom equipment in existing control enclosure	NA	No telecom work required
2	Review path to get telecom circuits into the station and paths within the control house. Determine whether new underground duct or overhead tray work is needed.		
3	Review current or proposed Telecom equipment power connections and validate with P&C any need for system 1 and system 2 separation.		
4	Review current Telecom fiber diversity and validate with P&C any fiber diversity requirements.		
5	Review and list any remote station impacts/updates		
6	Confirm whether correct interface equipment is available (i.e.) for fiber termination or multiplexor termination		
7	Confirm whether existing communications cabinets are enough to support additional telecommunications equipment installed		

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Constructability Review Form: **Substation**

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8	Review space for any required additional communications cabinets which may be required to support additional telecommunications equipment installed	NA	No Telecom work required.
9	Review third party Telecommunications at substation and confirm whether additional capacity or Ground Potential Rise protection is required		

Photos

(Ex. Equipment control cabinet, Breakers, MODs, CCVTs, PTs, Transformers)

3X Existing Relays	2X Existing Relays
	
Panel 4P Existing	Panel 4P Existing, Backside
	

3X Control Panel Exterior	3X Control Panel Interior
[redacted]	
3X Control Panel 2nd	3X Radio Control Panel
[redacted]	

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DSCADA Panel 1	DSCADA Panel 2
[redacted]	
DSCADA Panel 3	UG Vault Access
[redacted]	