EVERSOURCE

Operations Project Authorization Form

Approved on February 29, 2024 EPAC

Link to Meeting Minutes

Project Title: Transformer Vacuum Processor Refurbishment	**Project Number: CS00626**
Date Prepared: 02/23/2024	**Company: Eversource CT**
Organization: Asset Management	**Class(es) of Plant: Other**
Project Initiator: [redacted]	**Project Category: Stations - General**
Managing Organization: Operations	**Schedule ID#: N/A (See Project Milestones)**
Project Manager: [redacted]	**Project Type: Specific**
Project Sponsor: [redacted]	**Capital Investment part of original Op Plan: Yes**
Estimated in service date: February 2024	**Emergency Related Request? No**
Eng./Constr. Resources Budgeted? Yes	**Facility Type (check all that apply):** ☐ **PTF** ☐ **non-PTF** ☐ **local PTF** ☐ **Distribution** ☒ **N/A (General Plant)**
EJ Community Impact: No	**Authorization Type: Full Funding**
Total Capital Request: $420K	

[1] Executive Summary

This Project Authorization Form (PAF) is requesting full funding authorization in the amount of $422K to refurbish an existing Eversource-owned transformer vacuum processor (TVP) to a like-new condition. The existing TVP is a BA-D-HV-1800 model manufactured by Baron in 2008. [redacted]

TVPs are used in the maintenance of transformers, tap changers, circuit breakers, and various other oil-filled devices. TVPs remove moisture, particulate matter, and dissolved gasses from oil, thereby improving the operating condition and lifespan of the equipment insulation (in the case of transformers) and improving the overall equipment performance (in the case of circuit breakers and other equipment). While the existing TVP is out of service, equipment vacuuming and oil processing services for maintenance are being performed using leased equipment, or the service in its entirety is being performed by external vendors.

The TVP was placed into storage due to a lack of labor resources available in the Substation Operations group to employ the unit in maintenance. The TVP was moved out of storage in 2022 to perform work relating to oil processing as part of Eversource maintenance on oil-filled

equipment. When deployed in the field, the TVP was found to have issues involving the vacuum pumps and was unable to perform its required function; the unit was then deemed to be not operational and placed out of service until it could be refurbished.

A more detailed evaluation of damage was conducted by the manufacturer, Baron in the summer of 2023, which identified specific issues with the TVP including outdated pumps, hoses, and gauges, as well as leaky valves and outdated microprocessor technology. The TVP was moved to the manufacturer's facilities in Cookeville, TN, following this inspection, where it currently resides. This inspection was performed under WO RMSQ0311 (Reference 1). Work for this project (refurbishment) was initiated in November 2023 under work order GXTBARON as part of annual project GXTD23 (Reference 2). The manufacturer cost for refurbishment will be posted under GXTBARON upon delivery of the refurbished unit in February 2024; all charges under GXTBARON will then be transferred to this project CS00626 following approval.

Refurbishment of the unit would bring the TVP to a like-new condition and would include many asset improvements consisting of upgrading the vacuum and booster pumps, software, hoses, flow meters and gauges, and oil filters.

In addition to the TVP refurbishment, a new dry air system will be installed. This dry-air system will support maintenance activities by eliminating the need for nitrogen air injection during transformer oil processing, allowing for the vacuum seal on transformers to be relieved using dry air. This will reduce the need to purchase canisters of nitrogen gas for regular maintenance procedures and directly reduce maintenance costs.

Refurbishment of the existing TVP is anticipated to take 18 – 20 weeks and consists of an equipment lead time of 12 weeks and 6 – 8 weeks to refurbish the TVP. This process was initiated under GXTBARON in November of 2023. Due to lead times for vacuum pumps being shorter than projected, the manufacturer was able to begin work earlier and the unit is now scheduled to have refurbishment complete at the end of February 2024. All costs associated with refurbishment will be paid upon delivery and will be charged to GXTBARON until this project CS00626 is approved, upon which all GXTBARON charges will be transferred over to this project.

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[2] Project Costs Summary

Note: Dollar values are in thousands and rounded to nearest thousand

Line item Category	Prior Authorized	Actuals to Date	2024 to Go	2025	2026	2027	2028	2029	Total Request
1. ROW / Easements / Land Acquisition	$	$	$	$	$	$	$	$	$
2. Environmental Approvals / Permits	$	$	$	$	$	$	$	$	$
3. Outreach	$	$	$	$	$	$	$	$	$
4. Siting Approvals / Permits	$	$	$	$	$	$	$	$	$
5. Engineering / Design	$	$	$	$	$	$	$	$	$
6. Materials (Eversource purchased)	$	$	$	$	$	$	$	$	$
7. Construction (incl materials by contractors)	$	$	$310	$	$	$	$	$	$310
8. Testing / Commissioning	$	$	$	$	$	$	$	$	$
9. Project Mgmt. Team	$	$	$	$	$	$	$	$	$
10. Removals	$	$	$	$	$	$	$	$	$
11. Other	$	$	$	$	$	$	$	$	$
12. Risks	$	$	$27	$	$	$	$	$	$27
SUBTOTAL DIRECTS W/ RISKS	**$**	**$**	**$336**	**$**	**$**	**$**	**$**	**$**	**$336**
13. Indirects/Overhead	$	$	$64	$	$	$	$	$	$64
14. AFUDC	$	$	$5	$	$	$	$	$	$5
PROJECT TOTAL – BASELINE BUDGET	**$**	**$**	**$405**	**$**	**$**	**$**	**$**	**$**	**$405**
15. Contingency	$	$	$15	$	$	$	$	$	$15
TOTAL CAPITAL REQUEST	**$**	**$**	**$420**	**$**	**$**	**$**	**$**	**$**	**$420**
16. Reimbursables/Customer Contribution	$	$	$	$	$	$	$	$	
PROJECT TOTAL (LESS REIMBURSABLES)	**$**	**$**	**$420**	**$**	**$**	**$**	**$**	**$**	**$420**
O&M	$	$	$	$	$	$	$	$	
TOTAL REQUEST	**$**	**$**	**$420**	**$**	**$**	**$**	**$**	**$**	**$420**

Detail other costs, project risk items and their allocations:

Risk	Allocation
1. Delayed Shipment, Additional Work Not Identified	$26.5K
2.	$
3.	$
4.	$
5.	$
Total	$26.5K

Explain unique payment provisions, if applicable:

All work (including the 2023 inspection by the manufacturer and associated shipping costs) will be transferred from work order GXTBARON to this project CS00626 following approval.

Refurbishment work was initiated in November 2023 under GXTBARON. The full cost of refurbishment will be paid upon delivery of the unit back to the Berlin campus at Eversource in February 2024 and charged to GXTBARON until CS00626 is approved, upon which GXTBARON charges will be transferred over to this project.

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

None

[3] Technical Justification

Project Need, Objective and Justification

TVPs are used in the standard maintenance of transformers, tap changers, circuit breakers, and various other oil-filled devices. TVPs remove moisture, particulate matter, and dissolved gasses from oil, thereby improving the operating condition and lifespan of the equipment insulation (in the case of transformers) and improvement in the overall equipment performance (in the case of circuit breakers and other equipment).

In addition to processing oil, TVPs are capable to creating sealed vacuum conditions within a transformer in order to dry out the transformer winding insulation following maintenance work. This improves the lifespan of the insulation and thus the transformer itself and reduces the likelihood of a winding insulation failure due to moisture.

While the existing TVP is out of service, equipment maintenance functions are being performed using leased equipment, or the service in its entirety is being performed by external vendors.

A dry air system is also being installed in the refurbished TVP to save on maintenance costs. In order to keep the transformer core and winding insulation dry during maintenance work, air must constantly flow over the unit and create positive pressure inside of the transformer tank to eliminate the possibility of external moisture and air from entering the transformer. Without a dry air system, this is accomplished via nitrogen gas canisters, which are expensive, bulky to store, and whose gas is difficult to recover after usage. The dry air system to be added in the TVP consists of an air compressor unit that would produce similar dry air conditions using regular air from the surrounding environment. This system would eliminate the need for nitrogen canisters and can also be configured to assist in nitrogen gas recovery in other work where nitrogen gas is a required option.

The existing TVP has been out of service since 2022, when it was moved out of long-term storage to be used in maintenance of oil-filled equipment. Upon deployment, the unit was found to exhibit many issues, including vacuum pump failure, and was deemed out of service, returning to the Berlin garage. The TVP was moved to the manufacturer's facilities in Cookeville, TN, following an inspection in July 2023, where it currently resides.

Project Scope

The TVP is currently located at the manufacturer's facilities in Cookeville, TN, following the unit's inspection in July 2023. Refurbishment will be performed by the manufacturer at the Cookeville, TN location. Upon completion of refurbishment and upgrade work, the manufacturer will ship the unit back to the Eversource garage in Berlin, CT. Round-trip shipping costs are included in the scope of work.

Major Refurbishment and upgrade items include:

- Replacement and upgrade of two (2) existing vacuum pumps.
- Replacement and upgrade of vacuum booster.
- Replacement and upgrade of flow meter.
- Replacement of HVAC (Heating, Ventilation, and Air Conditioning) and space heating systems.
- Replacement of five (5) non-functioning dial gauges of various systems.
- Replacement of two (2) leaking pressure relief valves.
- Upgrade of microprocessor hardware and software for the control panel.
- 200 feet of vacuum hose.
- Upgrade all fuses to circuit breakers.
- Replace cracked trailer window.
- Replace exterior flood lights.
- New 50cfm dry air system will be installed.

Refurbishment work was initiated by the manufacturer in November 2023 under WO GXTBARON. There is a 12 week lead time for materials. Refurbishment work is anticipated to take 6-8 weeks, following the arrival of necessary materials, and is anticipated to complete by the end of February 2024.

Background

The existing Baron TVP was purchased in 2008 for use by Eversource personnel in maintenance work. The unit was placed into storage several years ago due to inadequate labor resources available within Eversource to properly deploy and utilize the TVP in Eversource's maintenance of oil-filled equipment. This unit was brought out of long-term storage in 2022 and deployed in the field, upon which it was identified that some components had dried out and rotted, while others were broken or not functioning. Notably, the vacuum pumps were inoperable and not performing as intended. The unit was then deemed to be non-operational and was placed out of service until a further evaluation could be completed.

The unit was shipped to the manufacturer's plant (Baron USA) in Cookeville, TN for a diagnostic check and evaluation in July 2023. This evaluation resulted in the identification of many issues with the unit, including:

- Failure of the main vacuum pump units, requiring replacement.
- Five (5) non-functioning dial gauges.
- Two (2) leaking pressure relief valves.
- One (1) non-functioning space heating system.
- One (1) cracked window in the controls area.

Additional smaller component issues were identified that will require replacement and upgrade based on the unit's age and existing technology, including microprocessor units for the control

panel of the unit. The cost for this inspection service is included within the cost for this Project (CS00626). A quote was issued for repair work in November 2023.

[4] Alternatives Considered

1. Do Nothing. Estimated Cost = $35K (per maintenance activity).

   This alternative is not preferred, as it [redacted] Future work requiring a transformer vacuum processor would necessitate a rental of the required equipment, or a contract of the vacuuming service to an external vendor. Transformer vacuum processors are used in condition-based maintenance of power transformers and other oil-filled equipment, so rentals would be frequent. Historic rental prices have varied from $30K to $39K for a single maintenance activity. Deployment frequency varies but may range from one (1) to five (5) times a year, or more often as maintenance needs demand.

2. (Preferred) Refurbish Existing Equipment. Estimated Cost = $420K

   This is the preferred solution as it restores the unit to a like-new condition (with useful life comparable to that of a new unit), adds technology improvements via modern components, and adds the functionality of a dry air system.

3. Purchase New Transformer Vacuum Processor. Estimated Cost = $600K

   This solution is not preferred, as the overall TVP trailer unit is still in good condition as a whole. Refurbishment of the unit would bring the vacuum processor to a similar state as if a new unit were purchased today. Purchase of a new unit is more expensive than refurbishment.

[5] Project Schedule

Milestone	Scheduled Completion Date
IFR Approval (Annual WO GXTBARON)	November 2023
SDC Approval (for applicable projects)	N/A
Conversion of Tx development costs, 183 to 107 (applicable to projects that require SSF approval and/or ISO preferred alternative selection)	N/A
EPAC Partial Funding Approval (for applicable projects)	N/A
Preliminary Design Completion (or latest pre-full funding design phase)	N/A
EPAC Full Funding Approval	February 2024
Siting Approval (for applicable projects)	N/A
Start of Construction	N/A
Project In-Service Date (ISD)	February 2024
Project Need Date (for applicable projects)	N/A
ISO Related Milestones: (for applicable projects)	
• ISO Preferred Alternative Selected	N/A
• PAC Presentation	N/A
• TCA Submittal	N/A

[6] Regulatory Approvals

N/A

EJ Community Considerations:

N/A

[7] Risk and Risk Mitigation Plans

Contingency:

Contingency of $15.5K has been allocated for project unknowns.

Risk Mitigation:

Risk	Mitigation
1. Delayed Shipment, Additional Work Not Identified	Maintain regular communication with vendor to establish timeframe for refurbishment & identify potential delays. Risk dollars have been allocated.
2.	
3.	
4.	
5.	

[8] References

References
1. WO RMSQ0311 – RMSQ0311OPSNTRELEXPENSES11, approved 1/1/2014.
2. GXTD23 – 2023 CT Distribution SS Capital Tool Annual, approved 11/16/2022
3.
4.
5.

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

Attachment	Included in Submittal?
A. Cost Estimate	*YES*
B. P6 Schedule	*N/A*
C. Constructability Review	*N/A*
D. System and Station One-Lines	*N/A*

Attachment B. The schedule will be maintained through Substation Operations.

Attachment C. No constructability review has been conducted. No Eversource engineering is involved in the refurbishment of this equipment.

Attachment D. This unit of equipment is not associated with any nomenclature or one-line diagrams.

Project Checklist - Transmission & Substation Capital Project	
Project Name: Transformer Vacuum Processor Refurbishment	**Project Number: CS00626**

Facility Type:
☐BPS ☐BES ☐PTF ☐local PTF ☐non-PTF ☐CIP ☐Distribution ☒General Plant
☐CONVEX ☐SCADA

PLANNING	
Is a NX-9 required?	No
Is an ISO-NE PAC presentation required?	No
ISO-NE Presentation Date (if completed):	N/A
Cost in ISO-NE Presentation ($M) (if completed):	N/A
Is a PPA required?	No
ISO-NE Approval Date (if completed):	N/A
Is a TCA Application Required?	No
TCA Submittal Date (if submitted):	N/A
Cost in TCA Submittal ($M) (if submitted):	N/A
Enter ISO-NE RSP / Asset Condition ID, if assigned:	N/A

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?		No	
Has an outage schedule been approved?		NR	
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?	NR

Project Checklist - Transmission & Substation Capital Project	
Project Name: Transformer Vacuum Processor Refurbishment	**Project Number: CS00626**

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	
Has Siting reviewed this project?	No
Name of Siting contact:	N/A
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	
Has Project Services reviewed this project?	No
Name of Project Services contact:	N/A
What is the level of outreach expected?	None
Has ROW Coordination reviewed this project?	No
Is this project coordinating with other existing scheduled work?	No
ENVIRONMENTAL JUSTICE COMMUNITIES	
Has the Equity and Environmental Justice team reviewed this project?	N/A
Name of Equity and Environmental Justice contact:	N/A
Is any part of this project in an Environmental Justice Community?	No
Was the Equity Framework Checklist completed?	N/A
Has enhanced outreach required per State Regulatory requirements been completed?	N/A
INITIATOR	
Has a field constructability review been completed?	NR

Project Checklist - Transmission & Substation Capital Project	
Project Name: Xfrmr Vacuum Processor Refurbishment	**Project Number: CS00626**
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 the Eversource Estimating Team
Name of the person who prepared the estimate:	[redacted]
Was the estimate reviewed by Eversource Estimating?	Yes - Full Review

ESTIMATE SUMMARY

Project Title: Transformer Vacuum Processor Refurb
Project Mgr/Lead: Chris Nguyen
Project Number: CS00626
WO & Task #:
Estimate revision #: 00
Estimate Type - Station work

Estimate #: C-24-9
Date of Estimate:02/23/2024
Estimate done by: PAG
In Service date (ISD):02/29/2024

Template Revision # 02.00

Alt Estimate Summary for PP4 Calc (escalation separate)

Estimate #: C-24-9
Date of Estimate:02/23/2024

Project Number: CS00626
WO & Task #:

ESTIMATE SUMMARY

Estimate Type: Planning

WBS	Description	TOTAL	% of Directs	% of Total	Priors	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
1	ROW / Easements / Land purchases														
2	Environmental Approvals / Permits														
3	Outreach														
4	Siting Approvals / Permits														
5	Engineering / Design														
6	Materials (Eversource purchased)														
7	Construction (incl materials by contractors)	$309,600	92.1%	73.6%		$309,600									
8	Testing / Commissioning														
9	PMT Project Mgmt Team														
10	Removals														
11	Other (property taxes and BAR)														
12	Risks	$26,500	7.9%	6.3%		$26,500									
125	**Project Directs Total w/Risks**	**$336,100**	100.0%	79.9%		**$336,100**									
13	Indirects/Overhead	$64,100		15.2%		$64,100									
14	AFUDC	$4,700		1.1%		$4,700									
125	**Project Total - Baseline Budget**	**$404,900**		96.3%		**$404,900**									
15	Contingency	$15,500		3.7%		$15,500									
	Project Total - Funding Approval Level	**$420,400**		100.0%		**$420,400**									
16	Reimbursables/Customer Contribution														
---	**Project Total (less reimbursables)**	**$420,400**				**$420,400**									
	Cost per key qty (if appl)	420,400	$'s / EA Transformer refurbishment												
	Amount of Escalation included above														
6	Total materials - Eversource														
	Total materials - Contractor	$165,400				$165,400									
	Total materials	$165,400				$165,400									

NOTE: Risk / Contingency is 11.1% of Project Total Costs (incl escal/indirects/AFUDC but excl reimb.)

Estimate Range	**-25%**	-	**25%**
	$315,000	-	**$526,000**

	TOTAL w/ escal broken out
ROW / Easements / Land purchas	$ -
Environmental Approvals / Permi	$ -
Outreach	$ -
Siting Approvals / Permits	$ -
Engineering / Design	$ -
Materials (Eversource purchased	$ 158,483
Construction (incl materials by c	$ 151,117
Testing / Commissioning	$ -
PMT Project Mgmt Team	$ -
Removals	$ -
Other (property taxes and BAR)	$ -
Risks	$ 26,500
	$336,100
Indirects/Overhead	$ 64,100
AFUDC	$ 4,700
	$ -
	$404,900
	$ -
Contingency	$ 15,500
	$420,400
	$ -
	$ -
	-
	$420,400
	$ -
Escal total	**$420,400**
Check total	

COMMENTS:

Project Scope:

Key qty's and UOM (tie to inputs on est sheets): 1 EA Transformer refurbishment

#DIV/0! Factor (total $/Eversource Mat'l $'s)

#DIV/0! Factor (Total directs $/Total Eversource mat'l $'s)

Transformer Vacuum Processor Refurbishment, Mobile Fleet, Berlin CT.
Refurbishment of vacuum processor
Replace Exterior flood lights
Replace wall mounted HVAC
Replace Vacuum pumps
Replace Vacuum Boosters
Replace Vacuum gauges
Replace oil and hoses, AOV air lines, belly box lights.
Preventive maintenance service of oil filters, chamber elements and o-rings.
Replace dial gauges, relief valves,and flow meter.
Replace space heater and cascade cold trap

Assumptions/Clarifications:

Indirect rates based on: 11 - CT Station work

ISD is 2/29/2024 provided by requestor
Estimate based on Quotation #20231004cw3 dated 11/3/2023
Estimate includes freight to Baron and testing and evaluation of unit.

RISKS

Additional work not identified $ 26,500

UNESCALATED LINE ITEM DOLLARS

Project Number: CS00626
Date of Estimate:02/23/2024
Estimate revision #: 00

Escalation Rate | E Rate $ 59

CSTXX-CONSTRUCTION	R	Prior Mhrs	Prior DOLLARS	2024 Mhrs	2024 DOLLARS	TOTAL Mhrs	TOTAL DOLLARS
Electrical Construction	LT						
General Construction	LT						
SCADA / Automation	LT						
Other (specify)	LT						
Construction Reps (internal)	LT						
Support Switch/Tag	LT						
Other (specify)	LT						
Other (specify)	LT						
Other (specify)	LT						
LT Total							
Employee Expenses	AE						
Constr. Purchased Matl (Eversource)	AM						
Constr. Purchased Matl (contracted)	AM				$721		$721
Outside Construction Vendor	AQ			[redacted]	$144,157	[redacted]	$144,157
Sales tax on Constr. Vendor							
Vehicles (now in indirects section)	AV						
Insection services (Outside Vendor)	AQ						
Construction Rep (Outside vendor)	AQ						
Rents and Leases	BR						
CSTXX Subtotal					$144,878		$144,878
Escalation							
CSTXX Total				[redacted]	$144,878	[redacted]	$144,878
ENRXX-TG ENGINEERING/DESIGN							
Project Services/Drafting	LT						
T- Line Engineering/Design	LT						
D- Street Engineering/Design	LT						
Civil Engineering/Design	LT						
Substation (T) Engineering/Design	LT						
Substation (D) Engineering/Design	LT						
Protection & Controls Engineering	LT						
Survey Engineering	LT						
SCADA / Automation Engineering	LT						
Telecom Engineering	LT						
Other - specify	LT						
Other - specify	LT						
LT Total							
Employee Expenses	AE						
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						
Vehicles (now in indirects section)	AV						
ENRXX Subtotal							
Escalation							
ENRXX Total							
LNDXX-TG LAND							
Real Estate	LT	$ 60.30					
Employee Expenses	AE	5%					
Purchase Land	AM						
Easements	AM						
Vehicles (now in indirects section)	AV						
Fees and Payments	BF						
LNDXX Subtotal							
Escalation							
LNDXX Total							
MATXX-TG MATERIAL							
Eversource	AM						
Outside Services	AM				$158,483		$158,483
	AM						
Freight							
Sales Tax (Eversouce)		3.9%					
Sales Tax (outside services)		3.9%			$6,200		$6,200
Other							
MATXX Subtotal					$164,683		$164,683
Escalation							
MATXX Total					$164,683		$164,683
PSMXX-PROJECT MANAGER & SUPPORT							
Project Management (PM)	LT						
Project Planning/Cost (IP)	LT						
Contracts/Purchasing (C/P)	LT						
System Planning	LT						
Environmental	LT						
SCS - None	LT						
Legal	LT						
Estimating	LT						
Siting - None	LT						
Asset Management	LT						
Veg. Mgmt	LT						
Other -	LT						
Other -	LT						
Other -	LT						
LT Total							
Employee Expenses	AE						
Project Support Vendor - PM	AQ						
Project Support Vendor - IP	AQ						
Project Support Vendor - C/P	AQ						
Project Support Vendor - System Planning	AQ						
Project Support Vendor - Enviromental	AQ						
Project Support Vendor - SCS - None	AQ						
Project Support Vendor - Legal	AQ						
Project Support Vendor - Estimating	AQ						
Project Support Vendor - Siting - None	AQ						
Project Support Vendor - Asset Management	AQ						
Project Support Vendor - Veg. Mgmt.	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 - Enviromental	BF						
Fees and Payments - Siting	BF						
Fees and Payments - Other	BF						
PSMXX Subtotal							
Escalation							
PSMXX Total							
REMXX-TG REMOVAL							
Engineering/Design	LT						
Internal Construction	LT						
LT Total							
Employee Expenses	AE						
Outside Services	AO						
Contractor Labor	AQ						
Vehicles (now in indirects section)	AV						
Rents and Leases	BR						
REMXX Subtotal							
Escalation							
REMXX Total							
TSTXX-TG TEST							
Test / Field Engr. Labor (In House)	LT						
Test / Comm. Engr. Labor (In House)	LT						
Lead Commissioning Engr. (LCE) (internal)	LT						
Employee Expense	AE						
Test / Field Engr. Labor (contractor)	AQ						
Test / Comm. Engr. Labor (contractor)	AQ						
Lead Commissioning Engr. (LCE) (contactor)	AQ						
Vehicles (now in indirects section)	AV						
TSTXX Subtotal							
Escalation							
TSTXX Total							
SUBTOTAL PROJECT DIRECT COST		-		[redacted]	**$309,561**	[redacted]	**$309,561**
Risk							
Risk					$26,500		$26,500
					$ -		
					$ -		
Risk Total					$26,500		$26,500
TOTAL PROJECT DIRECT COST (w risk)		-		[redacted]	**$336,061**	[redacted]	**$336,061**
INDIRECTS							
Non-Productive Time Allocation (**ZNP**)	17.0%						
Payroll Benefits Allocation (**ZPB**) incl NPT	30.0%						
Gen SVC CO Overhead (**ZGS**) incl NPT	70.0%						
E&S Allocations (**ZES**,**ZEL**,**ZES**)	35.0%				$50,455		$50,455
AS&E Allocations (**ZAS**)	1.4%				$5,040		$5,040
Stores Expense Allocation (**ZST**)	8.0%						
Lobby Stock							
MDEC (**ZMI**)	6.0%				$8,649		$8,649
Vehicles (**ZVE**)	28.0%						
Indirects Subtotal					$64,144		$64,144
TOTAL PROJECT COST - Direct & Indirect (excl AFUDC)					**$400,205**		**$400,205**
AFUDC							
AFUDC (ZK)				7.00%	$4,669	1	$4,669
In Service Dollars / Land costs							
Cumulative ISS & Land Costs				-			
AFUDC Subtotal					$4,669		$4,669
TOTAL PROJECT COST - Baseline Budget					**$404,874**		**$404,874**
Contingecy							
Contingency					$15,478		$15,478
Other			$ -		$ -		
Contingency SubTotal					$15,478		$15,478
TOTAL PROJECT COST - Approved Funding					**$420,352**		**$420,352**