COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

Electronic Application Of Kentucky Power Company	)	
For 1) A Certificate Of Public Convenience And	)	
Necessity To Construct A Mechanical Draft Cooling	)	
Tower At The Mitchell Plant 2) Approval Of Certain	)	Case No. 2026-00001
Regulatory And Accounting Treatments, And 3) All	)	
Other Required Approvals And Relief	)	

DIRECT TESTIMONY OF

SHAWN P. MALONE

ON BEHALF OF KENTUCKY POWER COMPANY

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**DIRECT TESTIMONY OF
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CASE NO. 2026-00001

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME, POSITION AND BUSINESS ADDRESS.

A. My name is Shawn P. Malone. My business address is 1 Riverside Plaza, Columbus, Ohio 43215. I am employed by American Electric Power Service Corporation ("AEPSC") as Director of Projects. AEPSC is a wholly owned subsidiary of American Electric Power Company Inc. ("AEP"), the parent Company of Kentucky Power Company ("Kentucky Power" or the "Company").

II. BACKGROUND

Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.

A. I received an Associate of Applied Science in Construction Management in 1987 and a Bachelor of Applied Science in Architectural Engineering in 1990 from the University of Cincinnati. Additionally, I earned my Project Management Professional certification in 2014.

I began my career with AEP in 2012 as a Project Manager, where I was responsible for executing projects with defined scopes, schedules, and budgets. My duties included coordinating with stakeholders, managing project timelines, and ensuring compliance with project standards and specifications.

Over the years, I have advanced within the Project Management group, handling increasingly complex and high-profile projects across both the Transmission and Fossil Generation groups. My experience includes managing multidisciplinary teams, optimizing resource allocation, and implementing best practices to improve project efficiency and effectiveness. I was promoted to the position of Director of Projects in the Generation Major Projects team in March of 2023. In this role, I lead a team of Project Managers overseeing capital projects across AEP's Generation Plant footprint.

Q. WHAT ARE YOUR RESPONSIBILITIES AS DIRECTOR OF PROJECTS?

A. I am responsible for strategic planning, budget oversight, and risk management associated with all major projects as well as ensuring that all projects align with the relevant project owner's overall goals and objectives.

Q. HAVE YOU PREVIOUSLY TESTIFIED IN ANY REGULATORY PROCEEDINGS?

A. Yes. I have submitted testimony before the Ohio Power Siting Board on behalf of AEP Ohio Transmission Company. I have also submitted testimony before the Virginia State Corporation Commission on behalf of Appalachian Power Company.

III. PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. The purpose of my testimony is to:

- provide an overview of the Mitchell Cooling Tower Project and of the scope of work;

- describe the steps that will be taken to complete the Mitchell Cooling Tower Project;
- present milestones for work activities and the estimated completion date for the Mitchell Cooling Tower Project; and
- present the estimated total project capital cost for the Mitchell Cooling Tower Project.

Q. ARE YOU SPONSORING ANY EXHIBITS?

A. I am sponsoring the following exhibits:

- Confidential Exhibit SPM-1 – Mitchell Cooling Tower Replacement Feasibility Study
- Exhibit SPM-2 – Capital Cost Estimates

IV. THE PROJECT

Q. PLEASE PROVIDE A HIGH-LEVEL DESCRIPTION OF THE PROJECT.

A. The Mitchell Cooling Tower Project is comprised of two components: (1) the construction of the new mechanical draft cooling tower for Unit 2 of the Mitchell Generating Station ("Mitchell" or "Plant") and (2) the partial demolition and eventual full demolition (when the Mitchell Plant retires) of the existing Unit 2 Cooling Tower. The Mitchell Cooling Tower Project (except for the ultimate full demolition of the tower upon Mitchell's retirement) is scheduled for completion in 2029 with the new mechanical draft cooling tower scheduled to be in service in the second quarter of 2028.

Q. HOW WAS THE NEED FOR THIS PROJECT IDENTIFIED?

A. In 2024, the Company initiated a capital project to address several areas of surface irregularities and deformations in the concrete shell of the Unit 2 Cooling Tower (the "Initial Repair Project"). In July 2025, the Initial Repair Project was paused due to the construction contractor's progress falling behind original projections when numerous additional cracks were encountered, producing schedule slippage and cost escalations. During the pause, AEPSC Engineering undertook a comprehensive reassessment of the scope of work and evaluated alternative solutions to optimize schedule, cost, and delivery risk. For more details regarding the need for the Mitchell Cooling Tower Project, please see the Direct Testimony of Company Witness Wolffram.

Q. WERE YOU INVOLVED IN THE INITIAL REPAIR PROJECT?

A. Yes. My role with this project included setting direction and managing high-level decisions; directing financial, scheduling, quality, and safety objectives; overseeing project execution and ensuring the project's strategic goals were prioritized.

Q. WHAT OPTIONS WERE CONSIDERED TO FULLY ADDRESS THE STRUCTURAL NEEDS OF THE MITCHELL UNIT 2 COOLING TOWER?

A. The engineering evaluation conducted during the pause of the Initial Repair Project identified and evaluated four options for the cooling tower:

- Option 1: Expand and extend the paused exterior shell reinforcement project;
- Option 2: Retire Unit 2 and partially demolish the existing cooling tower;
- Option 3: Construct a new mechanical draft cooling tower and partially demolish the existing cooling tower; and
- Option 4: Reduce the height of the existing cooling tower and continue with a reduced scope of exterior shell reinforcement.

Table SPM-1 provides more detail regarding the costs, risks and benefits of each option.

Table SPM-1 – Summary of Options

Repair Options	Incremental Capital Cost	Removal Cost	Outage Length	Demo Tower?	Key Risks	Key Benefits
Option 1: Exterior Shell Remediation **10-year life** ***(Current scope)*** **Complete in 2028-2029**	**$136M remaining**	**$3M** **(2038 full demo)** After Plant retirement	None	No	**High Risk** of Cost and schedule overruns. Worst condition of tower still to come	Work completed while unit in service
Option 2: Stop current project and retire/partial demo unit 2 **Complete in 2026**	**$0M**	**$29M** **(2026 partial demo)** Unit 1 still operational	N/A	Yes	Capacity impacts of an 800MW loss	Eliminates structural risk
Option 3: Construct new Mechanical Draft Cooling Tower **25-year life** **Complete in 2028**	**$162M**	**$29M** **(2029 partial demo)** Unit 1 still operational	Tie In Outage	Yes	Continue operations of Ex. Tower until 2028. Congested construction area	Short outage & Tower Demo'd to stable condition
Option 4: Shorten tower **10-year life** **Complete in 2027**	**$80M**	**$29M** **(2027 partial demo)** Unit 1 still operational	6 mos+	Yes Partial demo (120 ft)	Challenging demo. Risk of extended outage. Would still need to do FRCM and crack injections	Utilizes current tower

Q. PLEASE DESCRIBE THE PROCESS FOR DEVELOPING THE MITCHELL COOLING TOWER PROJECT PROPOSAL SCOPE, CAPITAL COST ESTIMATE, AND SCHEDULE?

A. Because of the scale and complexity of the Mitchell Cooling Tower Project, responsibility for managing the Project was assigned to the Generation Major Projects team. The Generation Major Projects team utilized internal subject matter experts and engaged an engineering consultant, Worley, to assist in defining scope, identifying environmental requirements, and performing design basis engineering to develop a cost estimate and project schedule. Worley assisted in putting together an Association for the Advancement of Cost Engineering ("AACE") cost estimate based on an in-service date of June 2028.

Q. PLEASE DISCUSS THE SCOPE OF WORK FOR THE MITCHELL COOLING TOWER PROJECT.

A. The Mitchell Cooling Tower Project will be comprised of the design, construction, and commissioning of a new mechanical-draft cooling tower for Mitchell Unit 2 and the decommission and partial demolition of the existing hyperbolic cooling tower. Key scope elements include:

- Constructing a mechanical draft cooling tower on a common cold-water basin;
- Installing circulating water pumps and associated piping;
- Installing a chemical feed system;
- Adding a fire protection system with electric and diesel pumps;
- Building a Power Distribution Center with a Motor Control Center and a Distributed Cooling System, and;
- Controlled, partial demolition of the existing hyperbolic cooling tower to ensure safety for personnel and critical equipment in the immediate proximity of the existing Mitchell Unit 2 Cooling Tower.

The Mitchell Cooling Tower Project will be executed using established project-management best practices such as clear scope definition and change control, phased scheduling with critical milestones, robust cost estimating and control, active risk management, contractor and vendor oversight, quality assurance and testing, and strict safety and environmental compliance. The process will include engineering, material procurement, construction and commissioning, with integrated commissioning and performance testing to validate acceptance criteria and ensure reliable operation upon turnover.

This disciplined approach provides a single accountable delivery framework to meet schedule, budget, performance, and safety objectives.

Q. PLEASE EXPLAIN WHAT A CONTROLLED, PARTIAL DEMOLITION OF THE EXISTING HYPERBOLIC COOLING TOWER ENTAILS.

A. Due to the layout of the Mitchell plant, the existing hyperbolic cooling tower cannot be safely imploded. Therefore, a more controlled, manual process will be used to ensure safety of personnel and the integrity of existing immediately adjacent structures. Reducing the height of the existing Mitchell Unit 2 Cooling Tower through the controlled, partial demolition will eliminate the risk associated with the structural defects described in the Direct Testimony of Company Witness Pizzino and allow the shortened Unit 2 Cooling Tower to remain on site until the Mitchell Plant is retired.

V. <u>DEVELOPMENT AND CONSTRUCTION OF THE PROJECT</u>

Q. WHAT RESPONSIBILITIES WILL AEPSC HAVE IN THE DEVELOPMENT AND CONSTRUCTION OF THE PROJECT?

A. On behalf of Kentucky Power, the AEPSC Generation Major Projects Team will be responsible for the development, environmental studies, permitting, engineering, procurement of all necessary equipment and materials, construction, and commissioning of the Project.

Q. PLEASE DESCRIBE AEPSC'S PROJECT MANAGEMENT AND CONSTRUCTION EXPERIENCE.

A. The AEPSC Generation Major Projects Team has a long history of safe project management and construction of large-scale complex utility projects including the construction of power plants, environmental retrofits, and plant upgrades. This currently comprises approximately 25,000 MWs of generating capacity and includes coal fired, gas fired, simple-cycle combustion turbine, combined-cycle, nuclear, and renewable resource facilities. AEPSC has also retrofitted assets with capacities totaling more than 15,000 MW with selective catalytic reduction technology as well as retrofitted assets with capacities of approximately 9,000 MW with flue gas desulfurization technology systems.

Q. HOW DOES AEPSC PLAN TO MONITOR THE PROGRESS OF CONSTRUCTION OF THE MITCHELL COOLING TOWER PROJECT?

A. AEPSC and the Company will have experienced personnel on-site managing the site construction to ensure that the selected contractors perform the work safely while adhering to the contract specifications and requirements, scopes of work, and integrated project schedule. In addition, AEPSC has stringent project cost and schedule control requirements that require project vendors and contractors to develop and maintain integrated construction schedules utilizing Primavera P6 schedule software so that the schedule can be monitored and controlled. Project expenditures are planned. The project team regularly reviews and forecasts commitments in accordance with AEPSC and Company policies and procedures to control the budget.

Q. WILL THERE BE REQUIRED PERMITTING FOR THE MITCHELL COOLING TOWER PROJECT?

A. Yes. The major permits that are required for the Mitchell Cooling Tower Project are a Title V Air Permit and a Construction Stormwater Discharge Permit. Additionally, the existing National Pollution Discharge Elimination System permit will need to be modified; however, this is a minor update as all the discharge points from the cooling tower remain the same as before and the water quality for the blowdown is expected to remain the same as before. Finally, a flood plain permit will be required as a small portion of the piping will pass through an area that is designated as part of the flood plain of the Ohio River. This will be a minor permit as the affected area is well above the flood plain elevation. Permitting will be further investigated and sought as necessary during the engineering and design stages of the Project to ensure compliance.

Q. WHAT IS THE SCHEDULE FOR THE CONSTRUCTION OF THE MITCHELL COOLING TOWER PROJECT?

A. Please see Table SPM-2 below for construction milestones for the Mitchell Cooling Tower Project.

Table SPM-2 – Project Activities

Project Activities		
Activity Name	**Activity Detail**	**Target Quarter**
Conceptual Design Review Meeting (CDRM)	Meeting to evaluate and approve the proposed scope before moving into detailed design	Q1 2026
Detailed Design Start	Transition from conceptual design into the phase where engineers create constructible documentation needed for procurement, construction, fabrication, and commissioning	Q1 2026
Construction Start	Physical work on a project site begins and the project shifts to execution phase	Q4 2026
Cooling Tower at Site	Mechanical Draft Cooling Tower is transported to site and contractor can begin assembly	Q1 2027
Power Distribution Center (PDC) at Site	PDC is transported to site and installation construction can begin	Q4 2027
In-Service Date	Scope of work is complete and in operation phase	Q2 2028
Partial Demolition of Existing Unit 2 Cooling Tower	Manually controlled, partial height reduction of existing tower	Q1 2029

VI. PROJECT ESTIMATED COSTS

Q. WHAT IS THE ESTIMATED COST OF THE MITCHELL COOLING TOWER PROJECT?

A. The current estimated total capital cost for the Mitchell Cooling Tower Project is approximately $191,000,000. This estimate includes direct costs, indirect costs, and owner's costs. Kentucky Power's share of the capital cost for the Mitchell Cooling Tower Project is $95,500,000.

Q. PLEASE DESCRIBE HOW THE CAPITAL COST ESTIMATE WAS DEVELOPED.

A. Worley assisted in the development of the direct capital costs estimate based on budgetary quotes for major equipment and historical data for bulk items and minor equipment. A labor study was performed in the area to validate the estimated construction labor rates. Other direct costs in the proposal include conceptual and detailed engineering and design, owner's internal costs comprised of expenses associated with AEPSC internal resources to manage a project of this scope and complexity, and owner's allowances. Owner's allowances are used during early project phases when the design is not yet detailed enough to include a precise quantity needed of certain components. Therefore, as design progresses toward completion, allowances will be replaced with calculated quantities to increase budget certainty. Indirect costs are also included as part of the total capital cost estimate and are applied to all AEP capital Projects. Information regarding the process for developing the cost estimate is included in Confidential Exhibit SPM-1.

Q. DOES THE MITCHELL COOLING TOWER PROJECT COST ESTIMATE INCLUDE CONTINGENCY?

A. Yes, a contingency value of 10% is included in the project cost estimate. The contingency accounts for unexpected costs associated with major risk categories including estimate accuracy associated with pricing and quantities, defined scope omissions, escalation uncertainty, project assumption impacts, and schedule impacts.

Q. WHY IS THE INCLUSION OF A CONTINGENCY NECESSARY AND APPROPRIATE?

A. As with any complex generating facility project, there are risks that may impact the overall cost. In addition to general estimating accuracy, risks associated with the Mitchell Cooling Tower Project include market pressures in commodity pricing such as for steel, supply chain delays for equipment and material, transportation costs, and overall inflation. It is impossible to predict with certainty whether the market will return to more historical escalation rates or if it will continue to exceed expectations. These factors, as well as project implementation risks such as extended construction schedules and scope changes, extreme shortage of qualified labor and construction contractors, change in contracting approach, and force majeure events such as abnormal weather contribute to the need to include a contingency in the cost estimate for the Project. These risks were accounted for in the Company's assessment. It is standard industry practice to allocate contingency in a cost estimate to address identified risks. The Company has allocated a reasonable contingency and will work with all parties to manage the associated risks.

Q. WHAT ARE THE ESTIMATED FUTURE CAPITAL COSTS FOR THE PROJECT?

A. The annual capital forecast for the Project for 2026 through 2029, including the remainder of demolition costs at Mitchell plant's retirement, is included in Exhibit SPM-2.

VII. CONCLUSION

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

American Electric Power

Mitchell Cooling Tower Replacement

Feasibility Study

Rev.: 0

15 Oct 2025

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Disclaimer

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Rev	Description	Originator	Reviewer	Approver	Revision Date
A	Issued for Review	Pradip Khan Matt Fennelly Agung Fu Larry Hesson Ning Wang Carl Dunn	T. Miller	G. Nadeau	19 Sep 2025
0	Issued for Record	Pradip Khan Matt Fennelly Agung Fu Larry Hesson Ning Wang Carl Dunn	T. Miller	G. Nadeau	14 Oct 2025

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1. Summary

1.1 Scope

American Electric Power (AEP) requested Worley to perform a feasibility study focused on replacing the existing Unit 2 natural draft cooling tower with a mechanical draft cooling tower. During a site trip in late August, AEP and Worley personnel qualitatively discussed options for the location of the new cooling tower. These options are presented in Appendix H and discussed in Section 2. Due to a limitation of three (3) weeks to complete the study, a single option was selected for evaluation. This document, along with its Appendices, outlines the engineering and design performed for the selected option. It also provides a Class 4 (+30% / -20% accuracy) TIC estimate and schedule for detailed engineering through commissioning of the new tower.

1.2 Permitting

Permitting is an important aspect for all projects, as it has an impact on feasibility, cost, and schedule. The site we chose to evaluate is the least complicated from a permitting aspect, which should minimize the risk for schedule and cost. The major permits that are required for this location are the Air Permit and Stormwater Pollution Prevention Plan (SWPPP). The air permit is expected to be a minor modification and take six (6) to nine (9) months to obtain from WVDEP. SWPPP approvals have recently been obtained for various projects at the Mitchell Plant without any issues within a short period of time. Another major permit that will be affected is the National Pollution Discharge Elimination System (NPDES) Permit. However, this is a minor update as all the discharge points from the cooling tower remain the same as before. In addition, the water quality for the blowdown is expected to remain the same as before. There is a small portion of the piping that would pass through an area that is designated as part of the flood plain of the Ohio River. This is a very minor permit as the area is well above the flood plain elevation. A similar permit was obtained for the CCR/ELG project for the Bottom Ash Bunker.

It is imperative, if this project moves forward, that a detailed permit plan is developed with the entire team to ensure that permits are obtained in a timely manner and all design meets the permit requirements.

For the alternative site along the river there are two additional major permits which would be required for the project. Both of these have major impacts on obtaining approval and cost impacts. The project is in the floodplain of the Ohio River. The floodplain elevation is approximately 645' and the present grade in the area is approximately 634'. Therefore, at least 12' depth of material would need to be added to the cooling tower area. This amount of fill requires a permit from WVDEP and the Army Corps of Engineers. Typically, it is a very extensive and potentially long permitting process as you need to prove that this fill would not increase the flooding on the Ohio River. The other permit of major concern is the crossing of the CSX railroad tracks. The timeline for approval (assuming can be obtained) would need to be negotiated with CSX. The pipes are extremely large and a plan would need to be developed to ensure absolutely no settlement of the track during installation nor during operations if the pipes were installed below the tracks. The other alternative would be to build a bridge over the tracks, which also would be very expensive.

2. Options

Multiple options have been considered for locating the new cooling tower(s) and auxiliary equipment following a site walkdown. Refer to Appendix H for sketch showing location of the options. The following table lists the options along with a ranking of critical considerations for ease of comparison. The options are ranked with 1 being "best" and 4 being "worst".

Topic	Rail Car Dumper	River	CSX / Railroad Property	West of Existing Cooling Towers
Most space for equipment	2 Requires demo of existing rail car dumper facility and conveyor	1	3 Property line between CSX and railroad splits area in half	4 Cuts off main road west of towers (completely during construction); limited ability to adjust for unknowns; space is likely a deal breaker
Limited impact on NERC/CIP	1 Inside existing fence	4 Outside existing fence and more difficult to extend barriers due to crossing railroad	3 Need to extend fence	2 Need to extend fence but less than at CSX/railroad property
Ease of access for operations	2	4	3	1
Limited permitting requirements	1 No major permits	4 Impact on flood plain	3	1 No major permits
Limited railroad interaction	1 No interaction	3 Need to cross railroad with piping, electrical, controls and potentially with NERC/CIP barriers	4 Would require purchasing land from the railroad	1 No interaction

Topic	Rail Car Dumper	River	CSX / Railroad Property	West of Existing Cooling Towers
Limited 345 kV transmission line icing potential	4 During winter less cells are operating and can be restricted to portion South of conveyor	2	3	1
Limited 765 kV transmission line icing potential	2 Lower risk than 345 kV but conceptually same distance away as 3 of the options	2 Lower risk than 345 kV but conceptually same distance away as 3 of the options	2 Lower risk than 345 kV but conceptually same distance away as 3 of the options	1
Limited potential for coal/limestone sediment in basin	4	2	3	1
Limited impact on underground 135 kV cables	4	1 No relocation required	1 No relocation required	1 No relocation required

3. Basis of Estimate

3.1 Common

1. For the feasibility study, Worley has estimated the total installed cost (TIC) of the rail car dumper option. This has been done utilizing budgetary quotes for major equipment as well as material takeoffs and historical data for bulk items and minor equipment.
2. Refer to Appendix A for the layout.
3. Field Direct/Indirect Inputs
    a. The estimate includes a built-up, direct, and indirect, all-in wage rate, detail tab provided in the estimate workbook.
    b. A productivity adjustment factor (PAF) of 64%, (1.57 multiplier) was applied to ACCE system database unit man hour.
    c. ACCE v14 system database is the default cost basis for bulk materials, the database is escalated to date of estimate (3Q25).
    d. A percentage for this class of estimate was used as the basis for Engineering & HO cost.
4. Exclusions
    a. Handling of contaminated/ hazardous materials
    b. Underground obstructions, encumbrances, or improvement
    c. Sales & Use Taxes
    d. Start Up and Commissioning Cost (including contractor support cost)
    e. AEP “Owner Cost” (including field engineering, construction management, etc.)
    f. Future Escalation
    g. Contingency

3.2 Mechanical

3.2.1 General

3.2.1.1 Circulating Water

1. A conceptual P&ID is provided for circulating water in Appendix G. The intent is to match the existing system to the greatest extent possible.

2. Three (3) 33% capacity (86,700 gpm @ 110 ft) vertical pumps will be installed with a 52" discharge pipe. The pump discharge will supply a common 120" prestressed concrete cylinder pipe that will tie into the existing 120" pipe upstream of the cold weather bypass valve (RMO-50) West of the condenser for Unit 2. Cold weather bypass operation will still be available with the new design.
3. New 120" prestressed concrete cylinder pipe return water from the condenser will tie in downstream of the cold weather bypass valve (RMO-50) west of the condenser for Unit 2 and feed the new cooling tower. This pipe will reduce to 52" as fifteen (15) 36" feeds branch off for each cell of the tower.
4. Supply and return 120" cooling water piping will route above ground on grade supports around the North side of unit 2 cooling tower to the access road. There, it will be routed on a pipe bridge across the road. The piping will follow the abandoned railroad tracks, jog between conveyor supports, and continue to the new cooling tower. Existing circ water pump and chem feed structures/equipment will need to be demolished.
5. Circulating water supply and return piping will have manway access for inspection via blind flanges.

3.2.1.2 Cooling Tower

1. The design includes a split cooling tower with a total of fifteen (15) cells. Eight (8) cells will be South of the existing limestone conveyor and seven (7) North. The cells will discharge into a common basin feeding a common pump chamber.
2. 14" basin drains, normal overflow, and alternate blowdown will discharge from the cooling tower basin between the two tower structures. As with existing design, piping will continue below grade and feed into existing storm water piping downstream of the oil water separator south of the new cooling tower.
3. One 30" emergency overflow with weir will discharge from the cooling tower basin between the two sets of cells. As with existing design, piping will continue below grade and feed into existing 54" storm water piping downstream of the oil water separator south of the new cooling tower and east of catch basin A.
4. A new 20" branch will be added from the existing plant raw water line to provide makeup to the cooling tower. An insertion magmeter will be added as a new feature to monitor the makeup water flow.

3.2.1.3 Fire Water

1. Fire water will be supplied from the cooling tower basin by new diesel and electric driven fire water pumps. The pumps will be housed in a dry pit next to the circulating water pump chamber.
2. New 14" pipe will penetrate basin wall below water line, pass through a duplex strainer and supply each pump. Pump discharge will be 8" and increase to 12". The 12" discharge piping

will penetrate the pit wall and get routed underground to an existing 12” fire line located locally.

3. Existing fire protection pump area shall be isolated locally on north and south sides of the pump house area.
4. New 6” diesel exhaust will be routed above pit roof to a safe location.
5. New 1.5” diesel tank vent will be routed above pit roof to a safe location.
6. New 1.5” diesel tank fill connection will be routed above grade to a local truck fill connection adjacent to the fire pump area.
7. A sump pump will be located in the pit with a 2.5” outlet pipe. This pipe will be routed to the new cooling tower basin.

3.2.1.4 Potable Water

1. A new 3” potable water line will tee off 12-PW-3"-U75002-12J62S-N located southwest of fuel oil unloading tank. New 3” line will route underground to under the main road to the north side of the cooling tower.
2. The new 3” line will come above grade and split to two (2) emergency shower and eyewash stations for chemical feed (one indoor and one outdoor).

3.2.1.5 Chemical Feed

1. New chemical skid, tanks, totes and unloading pad will be located on the north side of the new cooling tower. Chemicals required are sodium hypochlorite, sodium bromide, dispersant, corrosion inhibitor, and sulfuric acid.
2. Pump skids and totes will be inside an enclosure and two (2) bulk storage tanks will be located adjacent to the enclosure with containment.

3.2.1.6 Instrument Air

1. Instrument air is not needed. Control valves are motor operated valves.

3.2.1.7 Piping Relocations

1. Station drain piping located under and parrel to the new cooling tower will be relocated. This is a 3” pipe (12-SD-3"-U70048-12J8S-N) that comes from sump TH-2 sump pump (SD-PP-70002-04) and goes to R2 Sump.
2. Existing bottom ash bunker sump pump discharge is a 2.5” above ground / 3” underground pipe that discharges to the Unit 2 cooling tower. Due to inability to find a pump with the required flow at such a small head loss, the ash bunker project installed an orifice plate. The existing pumps can be maintained by removing the orifice plate and installing a new 3” HDPE pipe to the new cooling tower.

[redacted]

3.2.3 Material Takeoffs

The following Material Takeoffs are included:

1. Bulk piping, valves, fittings
2. Insulation and heat tracing
3. Simple and engineered pipe supports

3.3 Electrical

3.3.1 General

3.3.1.1 Power Distribution Center (PDC):

1. A new PDC is included to support loads associated with Cooling Tower Replacement. Two (2) incoming 13.8kV power supplies from Unit 2 FGD 13.8kV Switchgear (Bus 12A and 12B) are planned to support the new Cooling Tower loads and provide redundancy. Additional One (1) stack of 13.8kV Switchgear and One (1) 13.8kV Switchgear breaker would be required.
2. Two (2) new 13.8/0.48kV Outdoor Transformers, 2500/3333kVA, ONAN/ONAF and 480V Main-Tie-Main switchgear. The 13.8kV incoming power supplies from Unit 2 FGD Electrical building would be stepped down to 480V and connected to 480V switchgear. The 480V Switchgear would supply power to a fire pump skid and 480V Motor Control Centers (MCC).
3. The 480 MCC would support new 480V Cooling Fans.
4. The estimated HP rating for 480V Fire Pump is 300HP. The Electrical Design Criteria DC-ELEC-001-R3 section 19.2.3 states “Motors greater than 250HP and less than 5,000HP shall be 4kV, three phase”. For cost effectiveness, we recommend AEP to take exception to allow Fire Pump to be fed from 480V Switchgear. Similar AEP Rockport SCR Air Compressors were fed from the existing 600V Switchgear.

3.3.1.2 Circulating Water Pumps:

1. The new Three (3) Circulating Water Pumps are planned to be fed from Unit 2 4kV Switchgear 2A, 2B, and 2C (see Drawings 2-1200A1, and 2-1200A2)
2. The existing Two (2) Circulating Water Pumps motors are synchronous motors which have DC exciter. Unless there are special circumstances that require synchronous motors, we recommend using induction motors due to cost effectiveness. The difference between Synchronous and Induction motors as follows:
   a. Synchronous motor slip=0, efficiency>90% while Induction motor slip is between 0 and 1, efficiency between 80% to 90%.
   b. Synchronous motor power factor can be operated at a leading, lagging, or unity power factor by adjusting its field excitation while induction motor operates at lagging power factor.
   c. Synchronous motor has a higher cost, requires more maintenance than Induction motor.
3. Based on the pre-liminary Load Flow Study, the Medium Voltage Circulating Pump induction motor voltage indicated above 80% (See Figure 1 below)

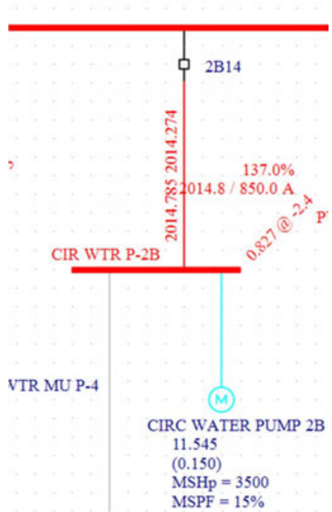

Figure 1. New Circulating Water Pump 2B

3.3.2 Budgetary Quotes

Budgetary quotes are obtained for the following equipment:

1. 13.8kV Switchgear Breakers
2. 13.8/0.48kV Transformers
3. Power Distribution Center (PDC) which includes, 480V Switchgear, 480V MCC's, 480V Panelboards, 480-208/120V Transformers, 208/120V Panelboards, HVAC units, etc.

3.3.3 Material Takeoffs

The following Material Takeoffs are included:

1. Underground Duct Banks, Conduits, Cable Trays
2. Power Cables
3. Grounding
4. Lighting
5. Lightning Protection
6. Heat Trace

3.4 Instrumentation

3.4.1 General

The following control and instrumentation equipment is envisioned to be required for the project:

1. DCS RIO cabinets to be located in the Electrical PDC
2. CT Basin Level
3. CT Pump control
4. CT Pump Vibration
5. CT Pump Bearing Temperature
6. CT Pump Power monitoring
7. CT Pump Discharge Pressure
8. CT Blowdown Flow
9. CT Blowdown Valve control
10. CT Makeup Flow
11. CT Makeup Valve control
12. CT Fan control
13. CT Gearbox Oil Level
14. CT Fan/Gearbox Vibration
15. Fire Water Main Electric Pump control
16. Fire Water Jockey Electric Pump control
17. CT Fire Detection

3.4.1.1 DCS Architecture Changes

Being that the Cooling Tower is a vital aspect to operation of the power plant/STG, redundancies are considered in the overall design. Part of this redundancy is having half of the cooling tower fans split between MCC's and DCS RIO cabinet controls. Two (2) DCS RIO drops will be added to the DCS network tying into the Drop 10/60 controllers and 2-BTS-10-2 cabinet MAU's. There are two available Fiber Optic ports on the primary and secondary MAU RIO interface cards as shown on AEP marked up diagram EC2031012 in Appendix D. New Fiber Optic cable will be installed from the Unit 2 DCS Room out to a new Electrical PDC near the new Cooling Tower to control the new equipment. The new RIO cabinets will have RIO interface modules, I/O drops/rails, marshalling terminations, and required power supply. Two (2) sets of RIO cabinet sections are anticipated for the amount of I/O.

Drop 10/60 presently has the existing CT control within these processors. Tying back into this processor pair will keep the structure of the Unit 2 controls intact. Modifications will need to be made to the existing logic to change the Cooling Tower controls to the new CT style.

3.4.1.2 Instrumentation Additions/Modifications

With the new Cooling Tower design, a number of new instrumentation devices are required for reliable and continuous operation. The following instrumentation and controls additions and modifications are envisioned:

1. CT Basin Level – AEP has standardized on a submersible type pressure transmitter for measurement of tank/basin levels. Three (3) Mercoid model PBLT2 pressure sensing transmitters will be installed in the basin area for pump suction protection and basin level control. Location of the transmitters will be determined during detailed design.
2. CT CW Pump Controls – The CT CW Pumps are 3500 HP, 4160 VAC powered pumps. Control of these pumps will be from existing U2 4KV Bus 2A and 2B utilizing spare or new switchgear breakers/trucks. Two (2) DO for START/STOP, four (4) DI for Racked In/RUNNING/STOPPED/TCC, and thirteen (13) AI for current/voltage/stator temp/radial vibration/axial or accelerometer vibration/bearing temp/and discharge pressure are included in I/O counts. Partial Discharge monitoring of the DOL Motors is not included at this time.
3. CT CW Pump Discharge MOV's – Each CT CW Pump will have a discharge MOV to isolate the pump from the circulating water header when not in operation. These MOV's are full open/full closed with two (2) DO for OPEN/CLOSE commands and four (4) DI's for OPND/CLSD/High Torque/In Remote included as I/O in counts.
4. CT Fan Motor controls – Each CT Fan/Motor is 250 HP, 480 VAC powered. Control of these fans will be from new MCC's located in a new PDC building housing the electrical gear and DCS RIO's. Two (2) DO for Forward/Reverse directional operation, two (2) DI for Forward/Reverse Running, one (1) DI for Gearbox Oil level, and one (1) AI for Accelerometer vibration are included at this time for I/O count.
5. CT CW Return Riser Isolation – each riser pipe for circulating water return to the CT will have a manually operated valve for isolation of the riser. A power operated hand held drive will be provided to assist with closing each riser as required. MOV's were considered for these larger 32" valves, but since they are not operated on a frequent basis, it was not justified to provide MOV's to these valves. A GFCI protected power outlet will be provided in the vicinity of the valves to allow operations to close or open the valves with the power tool.
6. CT Basin Blowdown, Alternate Blowdown, Make up Water– The basin level and contaminant cycles of the CT requires control. One (1) CT Basin Blowdown butterfly valve is provided that will connect to the normal drain path. One (1) CT Basin Alternate Blowdown valve is provided that drains to the local storm water drain (treated). The Emergency Overflow of the CT has no restrictions and dumps to drain also. A Make up valve is provided for adding water to the CT. The Normal Blowdown and Make up valves are MOV driven. The MOV's will be electronically controlled with One (1) AO for modulating

control and one (1) AI for valve position feedback included in I/O count. Due to the possibility of Failure in Place on loss of power to MOV's, two (2) DI's are provided for loss of power/fault and In Remote. Demand versus position deviation alarming will be provided within logic for each valve to alert the operator to a valve that is not driving to the commanded position. Flow into and out of the CT is monitored by a flow transmitter/element. One (1) AI for each flow is included in the I/O count for the Normal blowdown and Makeup water only.

7. Electrical PDC – The new PDC will have new electrical switchgear and MCC sections with feed breakers for electrical control. One hundred (100) DI and (40) DO are included in the I/O counts.
8. Wet bulb/Dry Bulb Temp – Two (2) AI signals from these transmitters are included in I/O counts for performance monitoring of the CT.
9. Electric Main Fire Water Pump – Power for this pump will be from the new PDC electrical gear. Two (2) DO and two (2) DI are included in I/O Count for this control. Other signals may be required as design is developed. One (1) AI for fire pump discharge flow will be provided per AEP specification acf_na_aep_dc-mech-001_r4_4, section 7.3.2.4.3.
10. Electric Fire Water Jockey Pump - Power for this pump will be from the new PDC electrical gear. Two (2) DO and two (2) DI are included in I/O Count for this control. Further investigation / design is required for accurate I/O count.
11. Chemical Treatment – Each CT Chemical Pump will be a DOL fractional HP motor at 480 VAC. There will be two (2) pumps each with stroke control and "In Remote" indication and one (1) tank with level monitoring for each chemical dosing to be accomplished. The pumps require the following I/O per pump: one (1) maintained DO for START command and two (2) DI for Running/In Remote; one (1) AI for level monitoring of the chemical tank; one (1) AO for pump stroke control. The following Chemicals are considered for the Cooling Tower:
    a. Sodium Hypochlorite
    b. Sodium Bromide
    c. Dispersant
    d. Corrosion Inhibitor
    e. Sulfuric Acid
12. Chemical Treatment Area Eye Wash Stations – CT Chemical feed area will be provided with eye wash stations per AEP specification acf_na_aep_dc-mech-001_r4_4, section 6.7. DCS I/O will include tank temperature, flow switch activation, visible strobe commands for Chem Feed Enclosure Door and outdoor unit.

3.4.2 Budgetary Quotes

No formal budgetary quotes were issued for this study for Instrumentation and Controls. Recent quotes received by Worley on behalf of AEP were used for the approximate pricing of the DCS for this project. The I/O quantities of AEP Mitchell Bottom Ash for either U1 or Unit 2 were comparable to the I/O quantities for the AEP Mitchell Cooling Tower installation. Thus, the AEP Mitchell BA pricing is being used for this study phase. Worley in-house recent pricing will be used for costs related to MOV's and control valves. Worley in-house recent pricing or on-line web based pricing for some instruments will be used with a small amount of contingency.

3.4.3 Material Takeoffs

The following Material Takeoffs are included:

1. DCS Hardware Cabinets
2. Instruments (Flow, Pressure, Level, Valves, etc)
3. Instrument Cable
4. Fiber Optic Cable
5. Fiber Optic Patch panels
6. (Instrument Tray included with Electrical Tray quantities)

3.5 Structural

3.5.1 General

The following structural engineering services are envisioned to be required for the project:

1. Provide on grade supports with piles for new 10 feet diameter cooling water piping.
2. Reinforced concrete foundations supported on Auger cast concrete piles for the new cooling tower basin, Pump chamber and the fire pump pit.
3. Reinforced concrete foundations supported on Auger cast concrete piles for the new elevated PDC and two (2) new transformers.
4. Reinforced concrete foundations supported on Auger cast concrete piles for the new Chemical Feed area enclosure, tanks and truck unloading slab.
5. Structural steel for the new pump pit roof, PDC access platforms and transformer maintenance platforms.

3.5.2 Budgetary Quotes

No formal budgetary quotes were issued for this study for Structural Engineering.

3.5.3 Material Takeoffs

The following Material Takeoffs are included:

1. Auger Cast Pile quantities
2. Reinforced concrete quantities for various new foundations
3. Excavation and backfill quantities
4. Structural steel quantities
5. New Stairs, Platform grating and Handrail quantities
6. Quantities for metal roofing over new fire pump pit

3.6 Civil

3.6.1 General

The following engineering services to be required for the project:

1. Site topographic and existing feature surveying to provide the detailed information for site development.
2. Collection existing subsurface utility engineering data (SUE) to accurately determine the precise location, type, and condition of underground utilities for the project detail design.
3. Geotechnical investigation to provide complete subsurface soil properties and parameters as the recommendations for the engineering design and construction.
4. Permitting support to meet the federal, state, and local regulations for site construction.
5. Site civil engineering work, including existing stormwater pipe and structure relocation, site surfacing, and erosion and sediment control during construction.

3.6.2 Budgetary Quotes

No formal budgetary quotes were issued for this study for Civil. Worley in-house recent pricing will be used for costs related to the topographic survey, SUE survey, and geotechnical investigation services.

3.6.3 Material Takeoffs

The following Material Takeoffs are included:

1. Stormwater Drainage System Relocation
2. Asphalt Road Pavement and Gravel Area Surfacing
3. Erosion and Sediment Control

Appendix A Layout

Page 20 of Confidential Exhibit SPM-1 is redacted in its entirety.

Appendix B Estimate

Pages 22 through 51 of Confidential Exhibit SPM-1 are redacted in their entirety.

Appendix C Schedule

Pages 53 through 54 of Confidential Exhibit SPM-1 are redacted in their entirety.

Appendix D DCS Architecture Diagram

Page 56 of Confidential Exhibit SPM-1 is redacted in its entirety.

Appendix E Budgetary Quotes

Pages 58 through 116 of Confidential Exhibit SPM-1 are redacted in their entirety.

Appendix F Electrical

Pages 118 through 125 of Confidential Exhibit SPM-1 are redacted in their entirety.

Appendix G P&IDs

Pages 127 through 128 of Confidential Exhibit SPM-1 are redacted in their entirety.

Appendix H Options Sketch

Page 130 of Confidential Exhibit SPM-1 is redacted in its entirety.

Mitchell Cooling Tower Project - Forecasted Capital Costs (Net of AFUDC)						
Cost Type	**2026**	**2027**	**2028**	**2029**	**2040 (Plant Retirement)**	**TOTAL**
Construction of New Cooling Tower	$24,168,000	$104,365,000	$26,653,000	$0	$0	**$155,186,000**
Partial Demolition of Existing Cooling Tower	$2,100,000	$0	$0	$28,917,000	$5,000,000	**$36,017,000**
						$191,203,000

VERIFICATION

The undersigned, Shawn P. Malone, being duly sworn, deposes and says he is the Director of Projects for American Electric Power Service Corporation, that he has personal knowledge of the matters set forth in the foregoing testimony and the information contained therein is true and correct to the best of his information, knowledge, and belief after reasonable inquiry.

Shawn P. Malone
____
Shawn P. Malone

State of Ohio)
County Franklin) Case No. 2026-00001
)

Subscribed and sworn to before me, a Notary Public in and before said County and State, by Shawn P. Malone, on 2·9·26.

Dianna L Fields
____
Notary Public

My Commission Expires December 17, 2030

Notary ID Number 2025-RE-897557

DIANNA L FIELDS, NOTARY PUBLIC
COMM. EXP. DECEMBER 17, 2030
STATE OF OHIO