

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

Electronic Application Of Kentucky Power Company	)	
For Approval Of (1) A Certificate Of Public	)	
Convenience And Necessity To Make The Capital	)	
Investments Necessary To Continue Taking Capacity	)	
And Energy From The Mitchell Generating Station	)	Case No. 2025-00175
After December 31, 2028, (2) An Amended	)	
Environmental Compliance Plan, (3) Revised	)	
Environmental Surcharge Tariff Sheets, And (4) All	)	
Other Required Approvals And Relief	)	

SUPPLEMENTAL DIRECT TESTIMONY OF
ALEX E. VAUGHAN
ON BEHALF OF KENTUCKY POWER COMPANY

**SUPPLEMENTAL DIRECT TESTIMONY OF
ALEX E. VAUGHAN ON BEHALF OF
KENTUCKY POWER COMPANY
BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY**

CASE NO. 2025-00175

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I. INTRODUCTION

1 **Q. ARE YOU THE SAME ALEX E. VAUGHAN THAT FILED DIRECT**
2 **TESTIMONY IN THIS PROCEEDING?**

3 **A. Yes, I am.**

II. PURPOSE OF TESTIMONY

4 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

5 **A.**The purpose of this Supplemental Direct Testimony is to update my Direct Testimony to
6 describe the need for additional necessary construction activities at the Mitchell Plant Unit
7 2 cooling tower to fully address the cooling tower's structural needs, identify the options
8 being considered and their projected costs, and present the impact of the options on the
9 economic analyses included in my Direct Testimony.

10 **Q. DOES THIS UPDATE CHANGE ANY OF THE CONCLUSIONS IN YOUR**
11 **DIRECT TESTIMONY?**

12 **A.**No, it does not. Regardless of the Unit 2 cooling tower option that is ultimately selected,
13 the additional capital required does not change the conclusion that the Mitchell Plant is the
14 lowest reasonable cost option available to the Company for the 2029-2031 period. The
15 Company's proposal—to make the investments necessary to continue receiving half of the
16 Mitchell Plant's energy and capacity after 2028—remains, from an economic standpoint,
17 the most cost-effective and reasonable alternative for Kentucky Power to meet a large
18 portion of its capacity and energy needs. The Unit 2 cooling tower options also do not alter

1 the Company's conclusions regarding the post-2031 outlook presented in my Direct
2 Testimony.

III. UNIT 2 COOLING TOWER STRUCTURAL NEEDS AND OPTIONS TO
ADDRESS THOSE NEEDS

3 **Q. PLEASE DESCRIBE THE UNIT 2 COOLING TOWER REINFORCEMENT**
4 **PROJECT.**

5 A. As Company Witness Snodgrass explained in his Direct Testimony, Kentucky Power
6 identified certain capital projects to extend the useful life, and to improve overall efficiency
7 and reliability, of both Mitchell Plant cooling towers.¹ Unit 2's cooling tower projects
8 consisted of reinforcement and shell structure updates, which included a fiber-reinforced
9 cementitious matrix.² This project was necessary to extend the life of the cooling tower
10 and cooling tower systems.³ After execution began on the original cooling tower
11 reinforcement and shell structure update, the AEP Generation Projects team determined in
12 late July 2025 that additional engineering solutions and repairs would be necessary to fully
13 address the cooling tower's structural needs so that Unit 2 could remain operational. Work
14 on the original reinforcement and shell structure update project has been temporarily halted
15 to determine the best engineering path and to evaluate the costs and project schedule going
16 forward. This pause was necessary to identify the most economic and efficient path
17 forward to ensure the continued safe and reliable operation of the Mitchell Plant for the
18 Company's customers.

¹ Snodgrass Direct Testimony at 8.

² *Id.* at 8-9.

³ *Id.* at 9.

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

A. The Company is evaluating four options for the cooling tower:

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

Options 2, 3, and 4 would require some degree of shortening or demolition of the existing Unit 2 cooling tower to ensure it can safely remain on site while the Mitchell Unit(s) continue operating.

Q. ARE ALL OF THESE OPTIONS VIABLE SOLUTIONS TO ADDRESS THE STRUCTURAL NEEDS OF UNIT 2'S COOLING TOWER?

A. Although the engineering analysis is conceptual at this time, that conceptual analysis shows that Options 1, 3, and 4 are viable. However, each option comes with its own set of costs, risks, benefits, and implementation timelines. Option 2 – retiring the unit – is not a viable option because it would put the Company in an untenable position of being approximately 800MW short on capacity and energy beginning at some point in 2026.

Q. PLEASE PROVIDE ADDITIONAL INFORMATION ON THE UNIT 2 COOLING TOWER OPTIONS.

A. Table AEV-SD1 summarizes each option.

Table AEV-SD1

Repair Options	Incremental Capital Cost (Estimate Class)	Removal Cost	Energy/Capacity Loss	Outage Length	Derate	Demo Tower?	Key Risks	Key Benefits
Option 1: Exterior Shell Reinforcement (Current scope)			No			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			Yes			Yes	Replacement capacity and energy costs for 800MW loss	Eliminates structural risk
Option 3: Construct New Mechanical Draft Cooling Tower			No			Yes	Continue operations of Ex. Tower until 2028, congested construction area	Short outage & tower demo'd to stable condition
Option 4: Shorten tower			Yes			Yes	Challenging demo. Risk of extended outage. Would still need to do exterior shell reinforcement to a lesser extent	Utilizes current tower

The dollar figures set forth in Table AEV- SD1 are total plant amounts, such that Kentucky Power would only be responsible for its 50% share of the costs. These estimates are preliminary, based on conceptual engineering, and should be considered indicative for purposes of my analysis.

Q. DO THESE COSTS IMPACT THE ENVIRONMENTAL SURCHARGE OR THE 2025 ENVIRONMENTAL COMPLIANCE PLAN PROPOSED IN THIS CASE?

A. No. These incremental costs are non-environmental, so there would be no impact on the environmental surcharge, the 2025 Environmental Compliance Plan, or the rates that have been proposed and noticed in this case.

Q. HOW DO THESE OPTIONS IMPACT THE ECONOMIC ANALYSES YOU PROVIDED IN YOUR DIRECT TESTIMONY?

A. All of the cooling tower options involve higher capital costs than the original approximately \$43 million forecasted for the reinforcement and shell structure update project. This increase in capital investment will result in a higher annual revenue requirement for the Mitchell Plant.

Q. IS THE COMPANY PROPOSING TO CONSTRUCT ONE OF THE OPTIONS TO ADDRESS THE STRUCTURAL NEEDS OF THE UNIT 2 COOLING TOWER AT THIS TIME?

A. No. The Company is still in the due diligence phase of evaluating the available options. However, it has developed the cost estimates set forth in Table AEV-SD1 that can be used to inform the decision in this proceeding, and it is providing this update now in the interest of transparency and developing a robust record for the Commission's review. The Company will file a subsequent Certificate of Public Convenience and Necessity

(“CPCN”) for the Unit 2 cooling tower project, if necessary, once it determines which option offers the lowest reasonable cost solution for customers.

Q. ARE ANY OF THE OPTIONS MORE LIKELY TO BE CHOSEN THAN OTHERS BASED ON THE INFORMATION THE COMPANY HAS TODAY?

A. Options 1 and 2 (expanding and extending the exterior shell reinforcement project, and retiring Unit 2, respectively) are both very unlikely to occur due to the respective high costs and risks associated with those options. As such, the breakeven analysis that I discuss and sponsor below in my testimony is focused on the more-likely-to-occur Options 3 and 4 (constructing a new mechanical draft cooling tower, and reducing the height of the existing cooling tower, respectively).

Q. DOES THE COMPANY INTEND TO PURSUE ALTERNATIVE FUNDING SOURCES FOR THE UNIT 2 COOLING TOWER SOLUTION?

A. Yes. The Company intends to pursue grant funding from the recently announced Department of Energy funding for “investment to expand and reinvigorate America’s coal industry, aiming to boost energy production and support coal communities nationwide.”⁴ Whatever amount, if any, that the Company is awarded from this grant funding would go toward reducing the overall cost of the Unit 2 cooling tower project, and ultimately to customers.

⁴ *Energy Department Announces \$625 Million Investment to Reinvigorate and Expand America’s Coal Industry*, U.S. Dep’t Energy (Sept. 29, 2025), <https://www.energy.gov/articles/energy-department-announces-625-million-investment-reinvigorate-and-expand-americas-coal>.

Q. HOW CAN THE COMMISSION MAKE A DETERMINATION REGARDING THE COMPANY'S REQUESTS IN THIS PROCEEDING IF A SOLUTION TO ADDRESS THE STRUCTURAL NEEDS OF UNIT 2'S COOLING TOWER HAS NOT YET BEEN IDENTIFIED?

A. To inform the Commission's decision-making in this proceeding, the Company conducted a break-even analysis to assess how much the capital cost of the Unit 2 cooling tower project would need to increase—relative to current estimates—before an alternative to the Mitchell Plant would become more economic for customers. For this comparison, a new gas combined cycle plant was used as the benchmark in the break-even calculations.⁵ I then compared the results of that analysis to both the 2029-2031 and post-2031 evaluations presented in my Direct Testimony.

Q. PLEASE DESCRIBE HOW YOU CONDUCTED THE "BREAK-EVEN" ANALYSIS YOU REFERENCED?

A. The breakeven analysis was conducted in a stepwise fashion: Step 1 was to add capital dollars to the Mitchell Plant cost of service, leaving all other inputs and assumptions unchanged, until the metric being compared was equal to that of Alternative E4 discussed in my Direct Testimony. Essentially, it is evaluating the tipping point at which it would no longer be more advantageous for the Company's customers to continue receiving capacity and energy from the Mitchell Plant after 2028. The two metrics evaluated in the break-even analysis were the average annual revenue requirement and the total present value revenue requirement metrics. These were chosen because they represent

⁵ Alternative E4 from the post-2031 analysis in the Vaughan Direct Testimony.

estimates of the cost that would be paid by customers for continued service from the Mitchell Plant after 2028.

Step 2 was to compare the new annual revenue requirements at the break-even level of incremental capital to the 2029-2031 analysis presented in my Direct Testimony, as well as the current indicative estimates for Option 3 and Option 4.

Step 3 was to also compare the results to the post-2031 analysis that was presented in my Direct Testimony.

Q. WHAT ARE THE RESULTS OF YOUR BREAK-EVEN ANALYSIS?

A. The results of the break-even analysis are presented in Table AEV-SD2 below.

Table AEV SD2 – 2029-2031 Cost to Customers Analysis

FILED IN DIRECT

	2029	2030	2031	Total
Alternative 1 - Mitchell				
Mitchell COS	\$ 86,378,348	\$ 113,272,572	\$ 135,755,059	\$ 335,405,979
Alternative 2 - PPAs				
Thermal PPAs from RFP	\$ 82,746,107	\$ 84,763,986	\$ 87,792,986	
Remaining NBV Recovery	\$ 75,154,986	\$ 72,045,688	\$ 68,936,390	
Total Cost	\$ 157,901,093	\$ 156,809,674	\$ 156,729,376	\$ 471,440,143
Alternative 3 -Market				
Remaining NBV Recovery	\$ 75,154,986	\$ 72,045,688	\$ 68,936,390	
Replacement Market Energy	\$ 224,514,595	\$ 176,454,655	\$ 140,564,210	
Replacement Market Capacity	\$ 44,696,074	\$ 45,911,294	\$ 47,027,351	
Total Cost	\$ 344,365,656	\$ 294,411,638	\$ 256,527,951	\$ 895,305,244
Option 3 - New Mechanical Draft				
Option 3 COS	\$ 100,424,954	\$ 126,791,835	\$ 148,739,968	\$ 375,956,757
Option 4 - Shorten Tower				
Option 4 COS	\$ 93,381,846	\$ 120,164,842	\$ 142,485,087	\$ 356,031,775
Break Even Ceiling				
Ceiling COS	\$ 150,890,971	\$ 175,295,837	\$ 195,277,884	\$ 521,464,693
Break Even Floor				
Floor COS	\$ 148,323,215	\$ 172,834,264	\$ 192,920,710	\$ 514,078,188

Table AEV-SD2 shows that the Mitchell Plant remains the best option for the Company's customers to fill its current place in the Company's capacity resource portfolio. The break-even analysis indicates that it would require an **incremental** investment of approximately [REDACTED] ([REDACTED] under total present value and [REDACTED] under average annual revenue) before the Mitchell Plant would no longer be considered the least cost reasonable resource. And while the break-even analysis yields a total cost of service that is more than Alternative 2 for the time-period of 2029-2031, one should keep in mind that Alternative 2 from my Direct Testimony utilizes dated PPA information that the Company believes to be lower than today's market for PPAs, and as such, is a conservatively low estimate. More

1 importantly, with the indicative estimates for Options 3 [REDACTED] and 4 [REDACTED]
2 [REDACTED], the Mitchell Plant cost of service continues to be the lowest reasonable cost
3 option. Both options are not only significantly below the much higher break-even level of
4 capital investment, they are still well below the very conservative PPA estimate set forth
5 in Alternative 2. Also to be clear, Options 3 and 4, and the break-even analysis, assume
6 approval of this Application, so the resulting investment and capital catch-up investment
7 are included in the updated analysis just as they originally were in Alternative 1 from my
8 Direct Testimony.

9 The same conclusion applies to the post-2031 analysis discussed in my Direct
10 Testimony. The break-even level of capital investment at which the Mitchell Plant would
11 no longer be a lower-cost option compared to a new natural gas combined cycle plant is
12 significantly higher than any of the current estimates for the Unit 2 cooling tower repair
13 options, as demonstrated below in Confidential Table AEV-SD3.

Confidential Table AEV-SD3 Updated Post – 2031 Analysis

A	1	2	3	4	5	6
	7	8	9	10	11	12
	13	14	15	16	17	18
B	19	20	21	22	23	24
	25	26	27	28	29	30
C	31	32	33	34	35	36
	37	38	39	40	41	42
D	43	44	45	46	47	48
	49	50	51	52	53	54
E	55	56	57	58	59	60
	61	62	63	64	65	66
F	67	68	69	70	71	72
	73	74	75	76	77	78
G	79	80	81	82	83	84
	85	86	87	88	89	90
H	91	92	93	94	95	96
	97	98	99	100	101	102
I	103	104	105	106	107	108
	109	110	111	112	113	114
J	115	116	117	118	119	120
	121	122	123	124	125	126
K	127	128	129	130	131	132
	133	134	135	136	137	138
L	139	140	141	142	143	144
	145	146	147	148	149	150
M	151	152	153	154	155	156
	157	158	159	160	161	162
N	163	164	165	166	167	168
	169	170	171	172	173	174
O	175	176	177	178	179	180
	181	182	183	184	185	186
P	187	188	189	190	191	192
	193	194	195	196	197	198
Q	199	200	201	202	203	204
	205	206	207	208	209	210
R	211	212	213	214	215	216
	217	218	219	220	221	222
S	223	224	225	226	227	228
	229	230	231	232	233	234
T	235	236	237	238	239	240
	241	242	243	244	245	246
U	247	248	249	250	251	252
	253	254	255	256	257	258
V	259	260	261	262	263	264
	265	266	267	268	269	270
W	271	272	273	274	275	276
	277	278	279	280	281	282
X	283	284	285	286	287	288
	289	290	291	292	293	294
Y	295	296	297	298	299	300
	301	302	303	304	305	306
Z	307	308	309	310	311	312
	313	314	315	316	317	318
AA	319	320	321	322	323	324
	325	326	327	328	329	330
AB	331	332	333	334	335	336
	337	338	339	340	341	342
AC	343	344	345	346	347	348
	349	350	351	352	353	354
AD	355	356	357	358	359	360
	361	362	363	364	365	366
AE	367	368	369	370	371	372
	373	374	375	376	377	378
AF	379	380	381	382	383	384
	385	386	387	388	389	390
AG	391	392	393	394	395	396
	397	398	399	400	401	402
AH	403	404	405	406	407	408
	409	410	411	412	413	414
AI	415	416	417	418	419	420
	421	422	423	424	425	426
AJ	427	428	429	430	431	432
	433	434	435	436	437	438
AK	439	440	441	442	443	444
	445	446	447	448	449	450
AL	451	452	453	454	455	456
	457	458	459	460	461	462
AM	463	464	465	466	467	468
	469	470	471	472	473	474
AN	475	476	477	478	479	480
	481	482	483	484	485	486
AO	487	488	489	490	491	492
	493	494	495	496	497	498
AP	499	500	501	502	503	504
	505	506	507	508	509	510
AQ	511	512	513	514	515	516
	517	518	519	520	521	522
AR	523	524	525	526	527	528
	529	530	531	532	533	534
AS	535	536	537	538	539	540
	541	542	543	544	545	546
AT	547	548	549	550	551	552
	553	554	555	556	557	558
AU	559	560	561	562	563	564
	565	566	567	568	569	570
AV	571	572	573	574	575	576
	577	578	579	580	581	582
AW	583	584	585	586	587	588
	589	590	591	592	593	594
AX	595	596	597	598	599	600
	601	602	603	604	605	606
AY	607	608	609	610	611	612
	613	614	615	616	617	618
AZ	619	620	621	622	623	624
	625	626	627	628	629	630
BA	631	632	633	634	635	636
	637	638	639	640	641	642
BB	643	644	645	646	647	648
	649	650	651	652	653	654
BC	655	656	657	658	659	660
	661	662	663	664	665	666
BD	667	668	669	670	671	672
	673	674	675	676	677	678
BE	679	680	681	682	683	684
	685	686	687	688	689	690
BF	691	692	693	694	695	696
	697	698	699	700	701	702
BG	703	704	705	706	707	708
	709	710	711	712	713	714
BH	715	716	717	718	719	720
	721	722	723	724	725	726
BI	727	728	729	730	731	732
	733	734	735	736	737	738
BJ	739	740	741	742	743	744
	745	746	747	748	749	750
BK	751	752	753	754	755	756
	757	758	759	760	761	762
BL	763	764	765	766	767	768
	769	770	771	772	773	774
BM	775	776	777	778	779	780
	781	782	783	784	785	786
BN	787	788	789	790	791	792
	793	794	795	796	797	798
BO	799	800	801	802	803	804
	805	806	807	808	809	810
BP	811	812	813	814	815	816
	817	818	819	820	821	822
BQ	823	824	825	826	827	828
	829	830	831	832	833	834
BR	835	836	837	838	839	840
	841	842	843	844	845	846
BS	847	848	849	850	851	852
	853	854	855	856	857	858
BT	859	860	861	862	863	864
	865	866	867	868	869	870
BU	871	872	873	874	875	876
	877	878	879	880	881	882
BV	883	884	885	886	887	888
	889	890	891	892	893	894
BW	895	896	897	898	899	900
	901	902	903	904	905	906
BX	907	908	909	910	911	912
	913	914	915	916	917	918
BY	919	920	921	922	923	924
	925	926	927	928	929	930
BZ	931	932	933	934	935	936
	937	938	939	940	941	942
CA	943	944	945	946	947	948
	949	950	951	952	953	954
CB	955	956	957	958	959	960
	961	962	963	964	965	966
CC	967	968	969	970	971	972
	973	974	975	976	977	978
CD	979	980	981	982	983	984
	985	986	987	988	989	990
CE	991	992	993	994	995	996
	997	998	999	1000	1001	1002

1 **Q. DOES THIS CONCLUDE YOUR SUPPLEMENTAL DIRECT TESTIMONY?**

2 **A. Yes, it does.**

VERIFICATION

The undersigned, Alex E. Vaughan, being duly sworn, deposes and says he is the Managing Director of Regulated Pricing – Generation and Fuel Strategy 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.



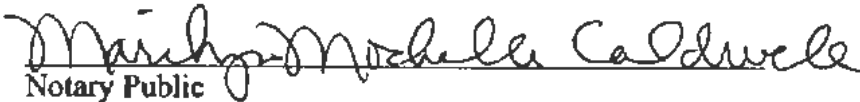
Alex E. Vaughan

Commonwealth of Kentucky)

County of Boyd)

Case No. 2025-00175

Subscribed and sworn to before me, a Notary Public in and before said County and State, by Alex E. Vaughan, on October 10, 2025.


Notary Public

My Commission Expires May 5, 2027

Notary ID Number KYNP71841

