

COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC APPLICATION OF DUKE	)	
ENERGY KENTUCKY, INC. FOR A	)	CASE NO.
CERTIFICATE OF PUBLIC CONVENIENCE	)	2016-00398
AND NECESSITY AUTHORIZING THE	)	
COMPANY TO CLOSE THE EAST BEND	)	
GENERATION STATION COAL ASH	)	
IMPOUNDMENT AND FOR ALL OTHER	)	
REQUIRED APPROVALS AND RELIEF	)	

O R D E R

On December 2, 2016, Duke Energy Kentucky, Inc. (“Duke Kentucky”) filed an application seeking a Certificate of Public Convenience and Necessity (“CPCN”) for the construction of new water redirection and wastewater treatment processes and to close and repurpose its existing coal ash impoundment at its East Bend Generating Station (“East Bend”). Duke Kentucky estimates that the cost for the ash pond closure will be approximately \$29.02 million; the cost for repurposing the ash pond is approximately \$36.07 million; and the cost for the construction of water redirection and wastewater treatment processes is approximately \$28.10 million.<sup>1</sup> Duke Kentucky states that the dry bottom ash conversion project is needed to comply with certain recent federal environmental regulations impacting the operations at East Bend. On December 22, 2016, the Commission issued an Order establishing a procedural schedule for the processing of this matter. The procedural schedule provided for, among other things, a deadline for requesting intervention, two rounds of data requests upon Duke Kentucky’s

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<sup>1</sup> Application at 12.

application, an opportunity for the filing of intervenor testimony, and a deadline for requesting a formal hearing or stating that the matter could be decided upon the record. There are no intervenors in this matter. Commission Staff issued, and Duke Kentucky responded to, one round of discovery. An informal conference was conducted on May 18, 2017, to allow Duke Kentucky to discuss the impact, if any, of the recent stay of the U.S. Environmental Protection Agency's ("EPA") Steam Electric Effluent Limitation Guidelines rule ("ELG Rule") on the environmental projects proposed by Duke Kentucky in this proceeding. On March 2, 2017, Duke Kentucky filed a statement requesting that the matter be submitted for a decision based upon the existing record.

#### BACKGROUND

East Bend is a coal-fired base load unit located in Boone County, Kentucky.<sup>2</sup> The unit was commissioned in 1981 and has a nameplate rating of 648 megawatts.<sup>3</sup> Taking into account the internal load at the East Bend facilities, the unit has a net rating of 600 megawatts.<sup>4</sup> East Bend is currently equipped with a high-efficiency hot-side electrostatic precipitator, a lime-based flue gas desulfurization system ("FGD") and a selective catalytic reduction control system ("SCR").<sup>5</sup> The FGD system was upgraded in 2005 to increase the removal of sulfur dioxide emissions to an average of 97 percent.<sup>6</sup> The SCR system is designed to reduce nitrogen oxide emissions by 85 percent.<sup>7</sup> The

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<sup>2</sup> Direct Testimony of David A. Renner ("Renner Testimony") at 2.

<sup>3</sup> *Id.*

<sup>4</sup> *Id.*

<sup>5</sup> *Id.* at 3.

<sup>6</sup> *Id.*

<sup>7</sup> *Id.*

East Bend facilities also contain two landfills—the existing East Landfill and a new West Landfill that is currently under construction—as well as an ash pond.<sup>8</sup> The coal-combustion byproducts<sup>9</sup> from East Bend, primarily fly ash, are currently disposed of in the East Landfill, and wet bottom ash is stored in the ash pond.

According to Duke Kentucky, approximately 80 percent of the ash produced at East Bend is dry fly ash and 20 percent is bottom ash.<sup>10</sup> The fly ash is collected from the boiler exhaust using electrostatic precipitators and is conveyed to holding silos.<sup>11</sup> The fly ash is then mixed with the spent scrubber slurry and lime to make a stable material called Poz-O-Tec, which sets up like concrete once it is placed in the East Landfill.<sup>12</sup> Duke Kentucky states that the Poz-O-Tec is necessary to stabilize and solidify the slurry for proper waste disposal.<sup>13</sup> Currently, the bottom ash is collected in a wet bottom ash hopper at the base of the boiler and then sluiced to the ash pond.<sup>14</sup> The ash pond is used to separate bottom ash from the water used to convey the ash before the water is discharged to the Ohio River in compliance with existing permits.<sup>15</sup> The ash

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<sup>8</sup> *Id.*

<sup>9</sup> Coal combustion residuals (“CCR”) primarily include fly ash, bottom ash, and FGD byproducts such as calcium sulfate, or gypsum, and calcium sulfite. See, Direct Testimony of Tammy Jett (“Jett Testimony”) at 11.

<sup>10</sup> Jett Testimony at 9–10.

<sup>11</sup> Direct Testimony of Joseph G. Potts (“Potts Testimony”) at 3.

<sup>12</sup> Jett Testimony at 9.

<sup>13</sup> Potts Testimony at 3.

<sup>14</sup> Renner Testimony at 3.

<sup>15</sup> *Id.*

pond is also used to treat other plant wastewater streams, such as coal pile runoff and landfill leachate, before they are discharged.<sup>16</sup> Duke Kentucky notes that the presence of the ash pond and the current landfill has enabled it to manage its costs of providing safe and reliable electric service by eliminating the need to transport and pay for disposal of the CCR in commercial landfills.<sup>17</sup>

Duke Kentucky asserts that the recent regulations, the Coal Combustion Residuals Rule (“CCR Rule”) and the ELG Rule, require Duke Kentucky to close the ash pond and install balance-of-plant wastewater treatment systems, including repurposing the ash pond.<sup>18</sup> These regulations also require Duke Kentucky to convert East Bend’s bottom ash-handling system from a wet process to a dry process.<sup>19</sup> Duke Kentucky contends that compliance with the CCR Rule would require implementation of an altered groundwater-monitoring program for the landfills and the ash pond.<sup>20</sup> Duke Kentucky notes that compliance with some aspects of the CCR Rule began within six to 12 months after publication, while other actions will require five years or more.<sup>21</sup>

With respect to the ELG Rule, Duke Kentucky states that the rule sets new or additional requirements for wastewater streams from several processes and byproducts

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<sup>16</sup> *Id.*

<sup>17</sup> Jett Testimony at 10.

<sup>18</sup> *Id.* at 12.

<sup>19</sup> *Id.* See also Case No. 2016-00268 *Electronic Application of Duke Energy Kentucky, Inc. for a Certificate of Public Convenience and Necessity for Dry Bottom Ash Conversion of the East Bend Generating Station* (Ky. PSC Feb. 23, 2017).

<sup>20</sup> Jett Testimony at 13.

<sup>21</sup> *Id.* at 12.

at steam electric generating plants.<sup>22</sup> The wastewater streams generated at East Bend includes fly-ash and bottom-ash wastewaters.<sup>23</sup> Duke Kentucky contends that the ELG Rule will require East Bend to convert the existing wet-ash system to a dry-ash handling system.<sup>24</sup> As part of converting to dry-ash handling, Duke Kentucky will need to install new wastewater treatment systems at East Bend.<sup>25</sup> Duke Kentucky states that the ash pond can no longer be used in its current form as an ash transport water treatment system.<sup>26</sup> Duke Kentucky maintains that due to site limitations at the East Bend facility, the ash pond must be repurposed through clean closure to comply with the ELG Rule.<sup>27</sup> Duke Kentucky states that there are two separate but interrelated projects that it is proposing in this case to bring East Bend into compliance with the CCR Rule and ELG Rule.<sup>28</sup> Those two projects are the ash pond closure and repurposing the ash pond to convert into a retention basin and use for water re-direction.<sup>29</sup> Duke Kentucky states that compliance with the ELG Rule will begin as early as November 1, 2018, but no later than December 31, 2023.<sup>30</sup> Duke Kentucky contends that the proposed projects will permit it to comply with the CCR Rule and the ELG Rule in the most reasonable and

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<sup>22</sup> *Id.*

<sup>23</sup> *Id.*

<sup>24</sup> *Id.*

<sup>25</sup> *Id.*

<sup>26</sup> *Id.*

<sup>27</sup> *Id.*

<sup>28</sup> *Id.* at 13.

<sup>29</sup> *Id.*

<sup>30</sup> *Id.* at 14.

cost-effective manner.<sup>31</sup> Although the 2015 amendments to the ELG Rule are currently stayed by the EPA and will be subject to additional review, Duke Kentucky does not anticipate any significant changes to the ELG Rule and notes that the proposed environmental compliance projects will be needed to address not only the ELG Rule but also the CCR Rule as well as the National Pollution Discharge Elimination System (“NPDES”) requirements and the Kentucky Groundwater assessment plan.<sup>32</sup>

In addition to its own internal evaluation of compliance measures with respect to the CCR Rule and the ELG Rule, Duke Kentucky stated that it retained two engineering firms, Burns & McDonnell and Amec Foster Wheeler PLC, to assist in developing the strategy, scope, design, schedule, and cost estimates to ensure East Bend’s continued operation in compliance with the two environmental regulations.<sup>33</sup> With respect to the closing the ash pond, Duke Kentucky stated that it evaluated options such as closure by removal, closure in place, and a hybrid closure approach for consolidating ash in one half of the basin and closing it in place.<sup>34</sup>

The proposed project to close the ash pond would entail dewatering, excavation, and disposal of the existing bottom ash in the pond.<sup>35</sup> The ash pond closure project would be completed in two phases, with the first phase beginning April 2017 and continuing through December 2018 and the second phase commencing December

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<sup>31</sup> *Id.* at 17–18.

<sup>32</sup> IC Memo dated May 25, 2017.

<sup>33</sup> Renner Testimony at 7.

<sup>34</sup> Direct Testimony of Brandon Delis (“Delis Testimony”) at 8.

<sup>35</sup> Potts Testimony at 3–4.

2018 and continuing through April 2020.<sup>36</sup> The retention basin construction and water re-direction would consist of repurposing the existing ash pond following ash removal and converting it into a lined industrial impoundment.<sup>37</sup> The retention basin construction will also occur in two phases, timed in sequence with the ash pond closure.<sup>38</sup> Duke Kentucky states that the two-phase approach is necessary to continue East Bend's commercial operation during the construction timeline.<sup>39</sup> The ash pond closure and repurposing will be separated into an east basin and a west basin.<sup>40</sup> While ash removal and construction is commencing on the west-basin section, East Bend will still be able to remain in operation because the plant's process and storm water will be directed to use the east section of the existing ash pond.<sup>41</sup> After the west retention basin construction is completed, process and storm water flows will be re-directed to the west retention basin so that construction work can commence on the east retention basin.<sup>42</sup> Duke Kentucky notes that this two-phase process will allow the construction work to be accomplished with East Bend on line, with the necessary tie-ins for piping and electrical feeds to occur during planned maintenance outages.<sup>43</sup> Duke Kentucky states that the steps necessary to close the ash pond are consistent with recognized and generally

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<sup>36</sup> *Id.*

<sup>37</sup> *Id.* at 4.

<sup>38</sup> *Id.*

<sup>39</sup> *Id.* at 6.

<sup>40</sup> *Id.* at 5.

<sup>41</sup> *Id.* at 6.

<sup>42</sup> *Id.*

<sup>43</sup> *Id.*

accepted good engineering practices.<sup>44</sup> Duke Kentucky further states that its decision to close the ash pond in the proposed manner is intended to minimize the need for long-term maintenance and to control the post-closure release of contaminants.<sup>45</sup>

The proposed water redirection process consists of routing low-volume wastewater, landfill leachate, coal pile runoff, and contact storm water runoff to the new retention basin once it is completed.<sup>46</sup> Water from the new West Landfill will also be included as part of the redirection activities.<sup>47</sup> The water redirection process will also include an 850,000-gallon FGD maintenance tank for East Bend absorber slurry and will reclaim water to eliminate the need for emergence FGD wastewater discharges.<sup>48</sup>

Duke Kentucky states that it evaluated several closure options for the ash pond, including closure by removal, closure in place, and a hybrid closure approach for consolidating ash in one half of the basin and closing it in place.<sup>49</sup> Duke Kentucky evaluated and ranked the options based on factors such as environmental protection and impacts, relative cost, schedule, regional factors, and constructability.<sup>50</sup> Duke Kentucky noted that the proposed closure by removal and repurposing the ash pond as a lined retention basin was selected because of its advantages in constructability,

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<sup>44</sup> Delis Testimony at 7.

<sup>45</sup> *Id.*

<sup>46</sup> *Id.* at 6–7.

<sup>47</sup> *Id.* at 7.

<sup>48</sup> *Id.*

<sup>49</sup> *Id.* at 8.

<sup>50</sup> *Id.*

permitting, timeline for compliance, ability to meet groundwater protection standards, and least overall cost.<sup>51</sup>

Duke Kentucky also considered different water treatment technologies in addition to the retention basin.<sup>52</sup> Duke Kentucky evaluated an active solid removal system using tanks, clarifiers, and filter presses in lieu of the retention basin.<sup>53</sup> Duke Kentucky noted that the retention basin was selected because it was the least complex, with the lowest operational cost and lowest installed cost.<sup>54</sup> Duke Kentucky maintains that an active solids-removal system would be selected only if a suitable location for a retention basin of sufficient size could not be found.<sup>55</sup> Duke Kentucky asserts that a hybrid active/passive-treatment system was also considered utilizing a polishing filter after the retention basin, but noted that this option offered little to no advantage, given that the repurposed basin had more than sufficient area for settling solids.<sup>56</sup> Last, Duke Kentucky indicated that repurposing the ash pond was more advantageous than constructing a new separate retention basin.<sup>57</sup> Duke Kentucky stated that the water redirect pipe rerouting scope is significantly reduced, given that the streams already

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<sup>51</sup> *Id.*

<sup>52</sup> *Id.* at 9.

<sup>53</sup> *Id.*

<sup>54</sup> *Id.*

<sup>55</sup> *Id.*

<sup>56</sup> *Id.*

<sup>57</sup> *Id.*

flow to the existing ash pond.<sup>58</sup> In addition, the size of the ash pond allows the removal of a two-stage settling feature, which further reduces the cost.<sup>59</sup>

## DISCUSSION

The Commission's standard of review of a request for a CPCN is well settled. No utility may construct or acquire any facility to be used in providing utility service to the public until it has obtained a CPCN from this Commission.<sup>60</sup> To obtain a CPCN, the utility must demonstrate a need for such facilities and an absence of wasteful duplication.<sup>61</sup>

"Need" requires:

[A] showing of a substantial inadequacy of existing service, involving a consumer market sufficiently large to make it economically feasible for the new system or facility to be constructed or operated.

[T]he inadequacy must be due either to a substantial deficiency of service facilities, beyond what could be supplied by normal improvements in the ordinary course of business; or to indifference, poor management or disregard of the rights of consumers, persisting over such a period of time as to establish an inability or unwillingness to render adequate service.<sup>62</sup>

"Wasteful duplication" is defined as "an excess of capacity over need" and "an excessive investment in relation to productivity or efficiency, and an unnecessary

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<sup>58</sup> *Id.*

<sup>59</sup> *Id.*

<sup>60</sup> KRS 278.020(1). Although the statute exempts certain types of projects from the requirement to obtain a CPCN, the exemptions are not applicable.

<sup>61</sup> *Kentucky Utilities Co. v. Pub. Serv. Comm'n*, 252 S.W.2d 885 (Ky. 1952).

<sup>62</sup> *Id.* at 890.

multiplicity of physical properties.”<sup>63</sup> To demonstrate that a proposed facility does not result in wasteful duplication, we have held that the applicant must demonstrate that a thorough review of all reasonable alternatives has been performed.<sup>64</sup> Selection of a proposal that ultimately costs more than an alternative does not necessarily result in wasteful duplication.<sup>65</sup> All relevant factors must be balanced.<sup>66</sup>

Having reviewed the record and being otherwise sufficiently advised, the Commission finds that Duke Kentucky has established that there is a need to address how CCR and wastewater produced by East Bend will be treated and disposed of. These needs are particularly heightened under the CCR Rule and the ELG Rule. The CCR Rule establishes national regulations for the management and disposal of CCR, which includes fly ash, bottom ash, boiler slag, and FGD gypsum, by electric utilities in landfills and surface impoundments under Subtitle D of the Resource Conservation and Recovery Act. The ELG Rule regulates process wastewater discharges from power plants operating as utilities. The need to manage, treat, and dispose of CCR and wastewater in order to comply with the requirements of the CCR and ELG Rules is critical to the continued operation of East Bend, which is the only baseload unit in Duke Kentucky’s generation portfolio. We also note that the closure of the ash pond will

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<sup>63</sup> *Id.*

<sup>64</sup> Case No. 2005-00142, *Joint Application of Louisville Gas and Electric Company and Kentucky Utilities Company for a Certificate of Public Convenience and Necessity for the Construction of Transmission Facilities in Jefferson, Bullitt, Meade, and Hardin Counties, Kentucky* (Ky. PSC Sept. 8, 2005).

<sup>65</sup> See *Kentucky Utilities Co. v. Pub. Serv. Comm'n*, 390 S.W.2d 168, 175 (Ky. 1965). See also Case No. 2005-00089, *Application of East Kentucky Power Cooperative, Inc. for a Certificate of Public Convenience and Necessity for the Construction of a 138 kV Electric Transmission Line in Rowan County, Kentucky* (Ky. PSC Aug. 19, 2005), final Order.

<sup>66</sup> Case No. 2005-00089, *East Kentucky Power Cooperative, Inc.* (Ky. PSC Aug. 19, 2005), final Order at 6.

require Duke Kentucky to implement the proposed wastewater redirection system in order to comply not only with the ELG Rule but also with the NPDES requirements as administered by Kentucky through the Kentucky Pollution Discharge Elimination System permitting process.

The Commission further finds that there is sufficient evidence in the record to support the conclusion that the proposed water redirection and wastewater treatment processes and to close and repurpose the East Bend ash pond are the most reasonable least-cost alternatives for complying with the CCR Rule and the ELG Rule. The record shows that Duke Kentucky performed an analysis ranking the various options based upon several factors such as environmental protection and impacts, relative cost, schedule, regional factors,<sup>67</sup> and constructability. Duke Kentucky's evaluation revealed that the proposed projects were favorable in terms of overall project costs, constructability, permitting, timeline for compliance, and ability to meet groundwater protection standards. The next favorable option evaluated was the closure in place of the ash pond in a reduced footprint by excavating the ash from the east side of the ash pond and consolidating it in the west side and closing in place on the west side with geosynthetics and onsite soil. Duke Kentucky did not select this closure-in-place hybrid option because this alternative would require the construction of a separate new outfall, which would, in turn, have a negative impact on costs, permitting timeframe, and constructability. The record shows that the fully loaded construction cost of the proposed projects is estimated to be \$93.19 million. The closure in place options with

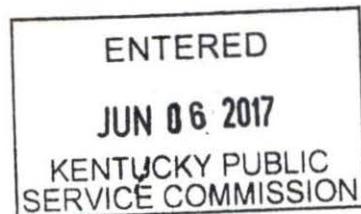
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<sup>67</sup> The regional factors included plan or potential reuse of the ash pond site, imported soil needs, beneficial reuse of the CCR, noise impact, and visual impact.

construction of a separate new pond would have cost approximately \$112.00 million. The Commission finds Duke Kentucky's selection to be reasonable. Accordingly, based on the foregoing reasons, the Commission will approve Duke Kentucky's application.

IT IS THEREFORE ORDERED that Duke Kentucky's request for a CPCN to construct new water redirection and wastewater treatment processes and to close and repurpose its existing coal ash impoundment at its East Bend Generating Station is granted.

By the Commission



ATTEST:

A handwritten signature in blue ink, appearing to read "Brian Burson".

Executive Director

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