COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In The Matter of:

The Electronic Application of Duke Energy Kentucky, Inc. for a Certificate of Public Convenience and Necessity to Construct Phase Two of its West Landfill and for Approval to Amend its Environmental Compliance Plan for Recovery by Environmental Surcharge Mechanism	)	Case No. 2018-00156

APPLICATION OF DUKE ENERGY KENTUCKY, INC.

Now comes Duke Energy Kentucky, Inc. (Duke Energy Kentucky or the Company), by and through counsel, pursuant to KRS 278.020(1), KRS 278.183, and 807 KAR 5:001 Sections 14 and 15, and hereby respectfully requests the Kentucky Public Service Commission (Commission) to issue an Order approving: (1) a Certificate of Public Convenience and Necessity (CPCN) for the construction of Phase Two of the Company's West Landfill (Phase Two) located at its East Bend Generating Station (East Bend); (2) amendment of the Company's Environmental Compliance Plan to include Phase Two; (3) recovery of the costs of Phase Two construction through the Company' Environmental Surcharge Mechanism (ESM); and (4) any other necessary relief and approvals. In support of this Application, Duke Energy Kentucky states as follows:

Introduction

1. Duke Energy Kentucky is a Kentucky corporation with its principal office and principal place of business at 139 East Fourth Street, Cincinnati, Ohio 45202. The Company's local office in Kentucky is the Duke Energy Envision Center, 4580 Olympic Boulevard,

Erlanger, Kentucky 41018. The Company further states that its electronic mail address for purposes of this matter is KYfilings@duke-energy.com.

2. Duke Energy Kentucky is a utility engaged in the gas and electric business. Duke Energy Kentucky purchases, sells, stores and transports natural gas in the Boone, Bracken, Campbell, Gallatin, Grant, Kenton, and Pendleton Counties. Duke Energy Kentucky also generates electricity, which it distributes and sells, in the Boone, Campbell, Grant, Kenton, and Pendleton Counties.

3. Pursuant to 807 KAR 5:001, Section 14(2), Duke Energy Kentucky states that it was originally incorporated in the Commonwealth of Kentucky on March 20, 1901, and attests that it is currently in good standing in said Commonwealth.

4. Pursuant to KRS 278.380, Duke Energy Kentucky waives any right to service of Commission orders by mail for purposes of this proceeding only. Copies of all orders, pleadings, and other communications related to this proceeding should be directed to:

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and

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Duke Energy Kentucky, Inc.
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Background

5. On or about December 5, 2003, in Case No. 2003-00252, the Commission approved Duke Energy Kentucky's acquisition of three generating stations from Duke Energy Ohio; East Bend, Miami Fort Unit 6 and Woodsdale. Effective January 1, 2006, Duke Energy Kentucky completed the acquisition of these three generating stations. Effective December 31, 2014, Duke Energy Kentucky became the sole owner of East Bend, having completed the purchase of Dayton Power and Light Company's 31 percent interest in the station as was approved by the Commission in Case No. 2014-00201.[1]

6. Duke Energy Kentucky currently operates the West Landfill at East Bend that is used for the disposal of waste products resulting from the Company's flue gas desulfurization (FGD) and other waste material (Generator Waste). The West Landfill is used, incidentally, in the production and furnishing of electric service as it serves as a means for storage and disposal of generator waste material produced by East Bend. The Commission approved the Company's construction of the first phase of the West Landfill in Case No. 2015-00089 (Cell 1). Construction of Cell 1 was completed and placed into service on December 15, 2017. The presence of this onsite landfill has permitted Duke Energy Kentucky to manage its costs of providing safe and reliable electric service by eliminating the need to transport and pay for disposal of the Generator Waste in commercial landfills.

Request for Certificate of Public Convenience and Necessity

7. The Company's Application in Case No. 2015-00089 fully explained and supported the need to construct the West Landfill in order to support the operation of East Bend. The West Landfill is to be constructed in eight separate phases. Cell 1 was completed in 2017.

[1] *In the Matter of the Application of Duke Energy Kentucky, Inc., for a Declaratory Order that the Construction of a New Landfill constitutes an Ordinary Extension in the Usual Course of Business or, in the Alternative, for a Certificate of Public Convenience and Necessity,* Case No. 2015-00089 (Ky.P.S.C. Jul. 24, 2015).

The additional seven phases will be constructed in approximately three to seven year increments providing a waste disposal resource for at least thirty years. The West Landfill construction project (including all eight cells) will include construction of approximately 200 acres of lined landfill.

8. The West Landfill is permitted to receive various forms of Generator Waste, from a number of generating sources, including those generating stations currently owned and/or operated by Duke Energy Kentucky and for generating stations for other Kentucky utilities and Ohio-based electric generators. These additional permitted sources include, but are not limited to: 1) Zimmer Station; 2) Miami Fort Station; 3) Beckjord Station; 4) St. Bernard Station; 5) Spurlock Station; 6) Ghent Station; 7) Clifty Creek Station; 8) Miller Brewing; 9) City of Hamilton; and 10) Jefferson Smurfit (collectively Permitted Stations).[2] The West Landfill is permitted to receive Generator Waste from sources other than East Bend to ensure there is sufficient dry fly ash material to make the Poz-o-tec byproduct necessary to operate East Bend's FGD handling process. The West Landfill is designed to accept at least 30 years of Generator Waste from the East Bend Station, including other permitted stations.

9. The West Landfill Cell 2 will be lined with a leachate collection system in accordance with all applicable federal, state, and local requirements. The detail design of the West Landfill Cell 2 footprint is included in the Kentucky Division of Waste Management Permit number SW00800006 and the Kentucky Department of Environmental Protection permit number 7094A. The West Landfill Cell 1 construction included the construction of all infrastructure required to operate and maintain the further cell construction in the West Landfill (roads for access and operation, electric transmission line, electrical equipment for powering

[2] The Miami Fort Generating Station has two operational units, Units 7 and 8. Unit 6 was retired by Duke Energy Kentucky in 2015.

necessary equipment for use at the landfill as well as environmental monitoring). As such, the infrastructure needed to operate Cell 2 is already in place.

10. Statement of Need (807 KAR 5:001 § 15(2)(a): A repository for East Bend's Generator Waste remains necessary for purposes of environmental compliance with current and emerging regulations involving handling of Generator Waste. Cell 1 is projected to reach its capacity in approximately 2021. However, Cell 1 currently does not have sufficient acreage to allow the Poz-o-tec byproduct to properly set for ultimate disposal. In order to sufficiently allow the Poz-o-tec to properly form, approximately 55 open acres are needed. Because Cell 1 does not currently have sufficient space to support this process, the Company must commence construction of Cell 2 in sufficient time so that there remains an adequate onsite disposal resource for East Bend's Generator Waste and to enable its continued operation. If the Company is unable to commence and complete construction of Cell 2 in a timely manner, its only alternative would be to arrange to transport its Generator Waste to another landfill operated by a third party. Operating an onsite landfill continues to be the best and lowest cost option for Duke Energy Kentucky's customers.

11. Duke Energy Kentucky continues to believe that constructing and operating its own landfill is the best way to address Generator Waste disposal. Maintaining an onsite disposal facility minimizes any transportation expenses and disposal fees, and avoids contractual limitations, such as volume constraints, terms of use, and renegotiations that Duke Energy Kentucky would incur if it were to use a third-party commercial landfill. Since Duke Energy Kentucky already operates the West Landfill, it has the trained and skilled personnel capable of constructing and maintaining Cell 2 in accordance with good engineering practices. Cell 2 will be operational and in use prior to the West Landfill Cell 1 reaching its capacity so as to allow a

seamless transition. The construction of the West Landfill Cell 2 will take time and the Company must act now to begin construction in order to continue existing disposal processes.

12. As directed by this Commission, the Company is required to seek Commission approval for a CPCN prior to construction of each of the phases 2 through 8 and the cap of the West Landfill.[3] The Company has need to commence construction for Cell 2 in early 2019 so as to maintain sufficient landfill acreage to support current operations and additional disposal capacity once existing landfill cells reach capacity. Future cell construction will be timed so that the West Landfill can continue to operate without any interruption and in a way that reduces construction and operational costs.

13. Duke Energy Kentucky respectfully requests this Commission grant approval to commence construction of Cell 2.

14. In accordance with 807 KAR 5:001 Section 12(2)(a)-(i), Duke Energy Kentucky is filing the following information in Exhibit 1, which is incorporated herein and made a part of this Application filed in this proceeding:

Exhibit 1 Page	**Description**	**807 KAR 5:001 Section Reference**
	Financial Exhibit	12(2)
1	Amount and kinds of stock authorized	12(2)(a)
1	Amount and kinds of stock issued and outstanding	12(2)(b)
1	Terms of preference or preferred stock	12(2)(c)
1	Brief description of each mortgage on property of Duke Energy Kentucky	12(2)(d)
2	Amount of bonds authorized and issued and related information	12(2)(e)
2	Notes outstanding and related information	12(2)(f)
2-3	Other indebtedness and related information	12(2)(g)
4	Dividend information	12(2)(h)
4-6	Detailed Income Statement and Balance Sheet	12(2)(i)

[3] Id. at 11.

15. 807 KAR 5:001, Section 15 sets forth the requirements to receive a CPCN.

a. In accordance with Section 15(2)(a), the application herein describes the facts relied upon to show the Cell 2 is required by public convenience or necessity in that the West Landfill is necessary for the Company to continue to comply with environmental regulations and will allow Duke Energy Kentucky to continue to provide safe, reliable, and reasonably priced retail electric service to customers by not having to procure third-party disposal services for Generator Waste material.

b. In accordance with Section 15(2)(b), the Company has previously filed with the Commission the applicable franchises from the proper public authorities. In addition, Exhibit 2 of this application includes a copy of the environmental permit for the construction of the West Landfill. Duke Energy Kentucky is not required to seek amendment of any existing permits at East Bend to construct Cell 2 as this phase is included in the permit preciously obtained by the Company from the Kentucky Energy and Environment Cabinet.

c. In accordance with Section 15(2)(c) and (d), Exhibit 3 includes overhead maps of the site showing the proposed location of the West Landfill and construction. Exhibit 4 includes the design plans, specifications, and drawings of Cell 2.

d. In accordance with Section 15(2)(e), the Company states that the total projected costs for Cell 2 are $23,324,211 which Duke Energy Kentucky seeks to recover through its ESM as part of its ECP. Duke Energy

Kentucky expects to finance the costs of construction with a combination of new debt and equity and through ongoing operations. The mix of debt and equity used to finance the project will be determined so as to allow Duke Energy Kentucky to maintain its investment-grade credit rating.

e. In accordance with Section 15(2)(f), the proposed construction is not anticipated to create incremental operating and maintenance (O&M) costs. The O&M costs of Cell 2 will be similar to costs incurred in Cell 1 and are not distinguishable. On-site disposal expenses (*e.g.*, transportation) amount to approximately $3.5 million per year. This is far below the current estimated annual expense of approximately $76 million to use a third-party's landfill for waste disposal.

Request for Recovery by Environmental Surcharge and to Amend Duke Energy Kentucky's Environmental Compliance Plan.

16. Duke Energy Kentucky is seeking Commission authorization to amend its Environmental Compliance Plan, (ECP) to include the construction of West Landfill Cell 2. Cell 2 will enable Duke Energy Kentucky to continue complying with the U.S. Environmental Protection Agency (U.S. EPA) federal Hazardous and Solid Waste Management System, Disposal of Coal Combustion Residual (CCR Rule), as well as other environmental compliance regulations.

17. This Application and supporting testimony and exhibits are available for public inspection at Duke Energy Kentucky's local Kentucky office located at the Duke Energy Envision Center, 4580 Olympic Boulevard, Erlanger, Kentucky 41018. The Company is giving notice to the public of the proposal to recover the cost of Cell 2 through its existing environmental surcharge by newspaper publication. The Company is also posting this

Application on its website at www.duke-energy.com. An initial Certificate of Notice and Publication is filed with this Application as Exhibit 5. A Certification of Completed Notice and Publication will be filed with the Commission upon completion of same pursuant to 807 KAR 5:001, Section 17(3)(b).

18. Pursuant to KRS 278.183(1), Duke Energy Kentucky is "entitled to the current recovery of its costs of complying with the Federal Clean Air Act as amended and those federal, state, or local environmental requirements which apply to coal combustion wastes and byproducts from facilities utilized for production of energy from coal in accordance with the utility's compliance plan."

19. Duke Energy Kentucky is seeking to amend its ECP to add one project, the construction of Cell 2. Cell 2 will enable Duke Energy Kentucky to continue complying with the Federal CCR Rule, and state environmental regulations by constructing additional landfill space and capacity to meet the Company's Generator Waste storage and disposal needs. The environmental regulations necessitating the construction of Cell 2 are detailed in the direct testimony of Ms. Jett. The testimony of Mr. Renner describes how Cell 2 will enable Duke Energy Kentucky to cost-effectively satisfy those regulatory requirements. The Testimony of Mr. Deller describes estimated cost and the design and construction of Cell 2.

20. A detailed summary of the facts and compliance requirements supporting this Application is set forth in the direct testimony and exhibits of the Company's witnesses:

a. The testimony of David Renner, Vice President of Coal Combustion Products Engineering describes the need to construct Cell 2 to meet environmental compliance regulations impacting the operation of East Bend, and the Company's analysis to determine that Cell 2 construction

was a cost-effective way to comply;

b. The testimony of Adam Deller, Engineer, describes the engineering and construction aspects of Cell 2;

c. The testimony of Tammy Jett discusses the environmental regulations that necessitate construction of Cell 2; and

d. The testimony of Ms. Sarah E. Lawler, Director Rates and Regulatory Planning presents an overview of the Company's ESM and requests the continued use of the recently established 9.725 percent return on equity (ROE) for purposes of calculating the overall return component of the ESM, until Duke Energy Kentucky's next base electric rate case.

21. Duke Energy Kentucky is not proposing any changes to its Environmental Surcharge Mechanism tariff sheet, K.Y.P.S.C. No. 19, Sheet No. 76 other than to change the issue and effective date. Duke Energy Kentucky is filing its ESM tariff sheet as Exhibit 6 to this application for the purpose of obtaining the Commission's approval of the recovery of costs of Cell 2 in its ECP by the proposed assessment through this tariff provision. In accordance with KRS 278.183(2), the ESM tariff has an issue date of June 15, 2018, and is proposed to be effective on July 15, to begin recovery of construction activities beginning on or about December 1, 2018, upon Commission approval of the requested CPCN. Therefore, the Company projects that bills issued on and after February 1, 2019 will reflect the revised environmental surcharge beginning with the expense month of December 2018 (*i.e.* beginning with the expense month six months after the filing of this Application).

WHEREFORE, Duke Energy Kentucky respectfully requests the Kentucky Public Service Commission to enter an order: 1) granting Duke Energy Kentucky a Certificate of Public Convenience and Necessity to construct Cell 2; 2) approving the amendment to Duke Energy Kentucky's ECP to include Cell 2 construction; 3) approving the proposed ESM tariff for recovery of the costs of Cell 2 construction effective for bills rendered on or after February 1, 2019 (*i.e.* beginning with the expense month of December 2018); 4) recovery of the overall ROE requested herein; and 5) granting such other relief as Duke Energy Kentucky may be entitled under the law.

Respectfully submitted,

DUKE ENERGY KENTUCKY, INC.

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CERTIFICATE OF SERVICE

In accordance with 807 KAR 5:001 Section 8(7), this is to certify that Duke Energy Kentucky, Inc.'s June 15, 2018 electronic filing is a true and accurate copy of the documents being filed in paper medium; that the electronic filing was transmitted to the Commission directly on June 15, 2018; that there are currently no parties that the Commission has excused from participation by electronic means in this proceeding; that an original and one copy of the filing is being delivered via 2nd day mail to the Commission on June 15, 2018; and that on June 15, 2018, electronic mail notification of the electronic filing will be provided to the following:

Rebecca Goodman
Office of the Attorney General
Office of Rate Intervention
700 Capitol Avenue, Ste. 20
Frankfort, KY 40601
Rebecca.Goodman@ky.gov

Rocco D'Ascenzo

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In The Matter of:

The Application of Duke Energy Kentucky, Inc.	)	
for a Certificate of Public Convenience and	)	
Necessity to Construct Phase Two of its	)	Case No. 2018-00156
West Landfill and for Approval to Amend	)	
its Environmental Compliance Plan for Recovery	)	
By Environmental Surcharge Mechanism	)	

DIRECT TESTIMONY OF

DAVID RENNER

ON BEHALF OF

DUKE ENERGY KENTUCKY, INC.

June 15, 2018

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I. INTRODUCTION AND PURPOSE

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am employed by Duke Energy Carolinas, LLC (Duke Energy Carolinas) as Vice President Coal Combustion Products Engineering. Duke Energy Carolinas is a utility subsidiary of Duke Energy Corporation (Duke Energy), and provides services to Duke Energy and its subsidiaries, including Duke Energy Kentucky, Inc. (Duke Energy Kentucky or the Company).

Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUNDS.

A. I graduated from Purdue University with a Bachelor of Science degree in Civil Engineering in 1980. I have been a registered Professional Engineer in Indiana since 1984. I started with Public Service Indiana in 1980 as a Construction Engineer, and have held various positions in the fossil generation construction and engineering areas, including Station Manager at Gallagher Station in Indiana and at Marshall Station in North Carolina for a combined total of 10 years. I was named as Vice President of Generation Engineering in May of 2010 and to my current position in October of 2014.

Q. PLEASE SUMMARIZE YOUR DUTIES AS VICE PRESIDENT OF COAL COMBUSTION PRODUCTS ENGINEERING SERVICES.

A. My duties include overseeing and managing the centralized geotechnical engineering and technical support functions for Duke Energy's fossil-hydro fleet

as it relates to coal combustion products and compliance, both in the Midwest and Carolinas.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE KENTUCKY PUBLIC SERVICE COMMISSION?

A. I provided direct testimony in support of the Company's application for a Certificate of Public Convenience and Necessity (CPCN) for its pond closure and water redirection project in Case No. 2016-000398.

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

A. I briefly describe Duke Energy Kentucky's East Bend Generating Station (East Bend). I then describe and support the Company's proposal in this proceeding to construct the second cell of Duke Energy Kentucky's West Landfill at East Bend (Cell 2).

II. GENERAL DESCRIPTION OF DUKE ENERGY KENTUCKY'S EAST BEND GENERATING STATION

Q. PLEASE DESCRIBE THE EAST BEND GENERATING STATION.

A. East Bend is a 648 megawatt (MW) (nameplate rating) coal-fired base load unit located along the Ohio River in Boone County, Kentucky. East Bend was commissioned in 1981 and is owned solely by Duke Energy Kentucky. The net rating for East Bend is 600 MW representing the amount available for dispatch after supplying internal station processes. East Bend has river facilities to allow barge deliveries of coal and lime and was designed to burn eastern bituminous coal.

Q. PLEASE SUMMARIZE THE MAJOR POLLUTION CONTROL FEATURES AND ASH HANDLING PROCESSES OPERATING AT EAST BEND.

A. The major pollution control features include a high-efficiency hot side electrostatic precipitator, a lime-based flue gas desulfurization (FGD) system, and a selective catalytic reduction control (SCR) system designed to reduce nitrogen oxide (NO_x) emissions by 85 percent. The FGD system was upgraded in 2005 to increase the sulfur dioxide (SO_2) emissions removal to an average of 97 percent. The station's electrical output is directly connected to the Duke Energy Midwest (consisting of Kentucky and Ohio) 345 kilovolt (kV) transmission system.

Duke Energy Kentucky currently operates a landfill at East Bend (East Landfill) and is in the process of constructing a replacement landfill (West Landfill), which together are used for the storage and disposal of waste products resulting from the Company's FGD system and other CCR material. Duke Energy Kentucky is in the process of closing the East Bend ash pond as was approved by the Commission in Case No. 2016-00398.

III. DUKE ENERGY KENTUCKY'S PROPOSAL TO CONSTRUCT WEST LANDFILL CELL 2

Q. PLEASE BRIEFLY SUMMARIZE DUKE ENERGY KENTUCKY'S PROPOSAL IN THIS APPLICATION.

A. Duke Energy Kentucky is requesting a CPCN to commence construction of Cell 2 for its East Bend West Landfill. The Company is also requesting Commission authorization to amend its Environmental Compliance Plan (ECP) so to recover

the costs of construction through Duke Energy Kentucky's Environmental Surcharge Mechanism (Rider ESM). Duke Energy Kentucky needs to begin construction of Cell 2 as the next scheduled step to supplement Cell 1, which lacks sufficient space to meet operational requirements for daily placement of Poz-o-tec. Current operational permit allows for 55 acres of open footprint for waste placement. Cell 1 is approximately 38 acres, which creates unnecessary operational constraints, particularly during winter months. In addition, the usable area at East Bend's East Landfill cells 15 and 16 is diminishing further dictating the need for Cell 2 construction. Duke Energy Kentucky needs to commence construction of Cell 2 so that the area is available prior to the winter 2019. Construction of Cell 2 will take approximately 10 months and allows East Bend to continue to have access to a dedicated repository for generator waste.

Q. WHY DOES CELL 1 NEED TO BE SUPPLEMENTED AT THIS TIME?

A. Cell 1 is estimated to reach capacity in 2021. As this Commission is aware, the disposal of dry fly ash at East Bend is through a process where the fly ash is mixed with FGD solids and ash to form the concrete-like substance, Poz-o-tec, which is ultimately disposed of in the onsite landfill. However, due to limitations with managing the Poz-o-tec byproduct in winter months, Cell 1 is lacking sufficient acreage to allow the Poz-o-tec byproduct to properly set for ultimate disposal. In order to sufficiently allow the Poz-o-tec to properly form, approximately 55 open acres are needed. From a logistical standpoint, Cell 1 will

soon no longer have adequate space to support this process, so the Company must commence construction of Cell 2 to ensure sufficient acreage is available.

Q. PLEASE DESCRIBE THE WEST LANDFILL.

A. The West Landfill is permitted to receive various forms of generator waste, including, but not limited to, FGD waste, fly ash and bottom ash from a number of generating sources, including generating stations of other Kentucky utilities and Ohio-based electric generators. The West Landfill is permitted to receive generator waste from sources other than East Bend to ensure that Duke Energy Kentucky has sufficient dry fly ash material available to make the Poz-o-tec byproduct necessary to operate the station's FGD handling process. These stations include: 1) Zimmer Station; 2) Miami Fort Station; 3) Beckjord Station; 4) St. Bernard Station; 5) Spurlock Station; 6) Ghent Station; 7) Clifty Creek Station; 8) Miller Brewing; 9) City of Hamilton; and 10) Jefferson Smurfit. This permitting for multiple stations is a significant benefit to the Company as Duke Energy Kentucky, at times, does not produce sufficient quantities of fly ash necessary to make the Poz-o-tec recipe. As such, this newly constructed West Landfill provides the Company the ability to continue to dispose of its generator waste through the life of the station and also the ability to have sufficient levels of fly ash to properly make the Poz-o-tec byproduct.

East Bend has had access to an onsite landfill for generator waste since the station first went into operation. The presence of an onsite landfill has permitted Duke Energy Kentucky to manage its costs of environmental compliance while

providing safe and reliable electric service by eliminating the need to transport and pay to dispose of the generator waste in commercial landfills. West Landfill Cell 1 is projected to reach its capacity in 2021, thus Duke Energy Kentucky has an immediate need to address the landfill capacity issue with a reasonably priced solution. Construction of Cell 2 will enable the Company to continue to store waste material from East Bend on site, rather than incurring costs to transport and dispose of the waste material at third-party-owned landfills.

Q. PLEASE DESCRIBE THE CONSTRUCTION PLAN FOR THE WEST LANDFILL CELL 2.

A. Mr. Deller more fully supports the Company's Construction Plan in his direct testimony. The West Landfill Cell 2 will commence construction in early 2019, with preconstruction work commencing upon approval in late 2018. In total, the West Landfill is designed to include a total of eight phases or cells. The Company anticipates constructing each subsequent phase in three to seven-year increments with a projected completion date for cell 8 of 2056. Duke Energy Kentucky will own and operate the West Landfill. Duke Energy Kentucky already has the personnel and expertise in place to construct and operate the West Landfill Cell 2. The proximity of the West Landfill to the East Bend Generating Station will allow Duke Energy Kentucky to continue to control its costs for transporting and disposing of the generator waste material. As more fully explained by Mr. Deller, the construction and maintenance of the West Landfill is a more economic

solution for the Company and its customers than identifying and engaging a third-party landfill for disposal of generator waste.

Q. WHY DOES THE COMPANY NEED TO BEGIN CONSTRUCTION OF THE WEST LANDFILL CELL 2 AT THIS TIME?

A. As I previously stated, Duke Energy Kentucky needs to begin constructing the West Landfill Cell 2 because Cell 1 alone does not have sufficient acreage to properly operate the landfill and form the Poz-o-tec byproduct that is approved for disposing of the station's fly ash. Expected project field work is expected to take approximately 10 months. The Company must begin construction soon, in order to ensure the West Landfill remains operational and available to receive generator waste. The West Landfill Cell 2 will allow Duke Energy Kentucky to continue to provide stable and reasonably priced retail electric service to its customers by eliminating the need to transport and pay for disposal of generator waste at third-party owned and operated landfills once the East Bend Landfill reaches capacity.

Q. PLEASE DESCRIBE THE ESTIMATED COST OF CONSTRUCTING THE WEST LANDFILL CELL 2.

A. As Mr. Deller more fully explains in his direct testimony, the estimated fully-loaded costs for construction of Cell 2 is $23.3 million.

Q. PLEASE EXPLAIN WHY CONSTRUCTING THE WEST LANDFILL IS A BETTER ECONOMIC LONG TERM SOLUTION THAN THIRD PARTY LANDFILL DISPOSAL SERVICES.

A. The Company has explored that option through inquiries to third-party owned commercial landfills in the vicinity of East Bend. As Mr. Deller explains, over an assumed minimum thirty year life of the West Landfill, the construction of all eight phases and annual disposal expense equates to an annual investment that is far lower than the annual cost of hauling generator waste offsite to a third-party landfill. In addition, it is questionable whether a suitable third party landfill exists in reasonable proximity that can accept the generator waste.

Q. WILL CONSTRUCTION OF WEST LANDFILL CELL 2 IMPACT THE OPERATION OF EAST BEND OR RESULT IN WASTEFUL DUPLICATION OF SERVICES?

A. No. Duke Energy Kentucky will continue to be able to provide safe, reliable and adequate service to its customers during the construction of the West Landfill Cell 2. In fact, that is precisely why the Company is seeking to begin construction of the West Landfill Cell 2 at this time. The Company intends to have the Cell 2 fully operational to solve the immediate logistical constraint with Cell 1, and before the Cell 1 reaches its capacity so to ensure there is no interruption of service or impact to the plant's operation.

The fact that the West Landfill Cell 2 will be operational prior to Cell 1 reaching capacity is necessary so to ensure there is a seamless transition and that there is sufficient space available to continue current operations.

Q. HAS DUKE ENERGY KENTUCKY ACQUIRED THE NECESSARY ENVIRIONMENTAL PERMITS TO CONSTRUCT THIS WEST LANDFILL CELL 2?

A. Yes. Ms. Jett discusses this in her testimony.

Q. IS THE NEED TO CONSTRUCT THE WEST LANDFILL CELL 2 A RECENT DEVELOPMENT?

A. No. The Company discussed the need to develop the West Landfill in Case No. 2015-00089.[1] In that case, the Company explained the need to construct the West Landfill. As a condition to granting the Company's CPCN in that case, the Commission directed the Company to seek separate approval for the construction of each subsequent cell's construction. The Company's Application is in response to this directive.

Q. WILL THE CONSTRUCTION OF THE WEST LANDFILL CELL 2 COMPLETELY SOLVE DUKE ENERGY KENTUCKY'S FUTURE GENERATOR WASTE DISPOSAL NEEDS?

A. The Company anticipates that this West Landfill Cell 2 will address those needs under currently known environmental regulations for the next few years. The Company will need to seek Commission authorization for future cells.

[1] *In the Matter of the Application of Duke Energy Kentucky, Inc., for a Declaratory Order that the Construction of a New Landfill constitutes an Ordinary Extension in the Usual Course of Business or, in the Alternative, for a Certificate of Public Convenience and Necessity,* Case No. 2015-00089 (Ky.P.S.C. Jul. 24, 2015).

Q. DO YOU BELIEVE IT IS IN THE PUBLIC INTEREST FOR DUKE ENERGY KENTUCKY TO CONSTRUCT AND OPERATE THE WEST LANDFILL CELL 2?

A. Yes. In anticipation of reaching capacity at the East Bend Landfill, Duke Energy Kentucky began exploring alternatives to address the need to dispose of generator waste material. The Company has determined that operating its own landfill continues to be the best and lowest cost option for its customers and continues to believe that constructing and operating its own landfill is the best way to address generator waste disposal. Maintaining an onsite disposal facility minimizes any transportation expenses and disposal fees, and avoids contractual limitations, such as volume constraints, term of use, and renegotiations, that Duke Energy Kentucky would incur if it were to use a third-party commercial landfill.

Since Duke Energy Kentucky operates the existing East Bend landfill, it has the trained and skilled personnel capable of constructing and maintaining the Cell 2 in accordance with good engineering practices. Duke Energy Kentucky will be able to work to ensure that the West Landfill Cell 2 will be operational and in use prior to Cell 1 reaching capacity.

IV. DUKE ENERGY KENTUCKY'S ENVIRONMENTAL COMPLIANCE PLAN

Q. PLEASE IDENTIFY THE PROJECTS CURRENTLY IN DUKE ENERGY KENTUCKY'S ENVIRONMENTAL COMPLIANCE PLAN AND RECOVERED THROUGH ITS ESM?

A. Attachment DR-1 is a summary of the Company's ECP. The ECP consists of recovery of consumables (reagents and emission allowances) and four discrete projects that pertain to the amortization of the Company's East Bend ash pond closure/retirement obligation (ARO) accounting treatment as was previously approved in Case No. 2015-00187[2] and its process water system and redirection and pond repurposing strategy recently approved in Case No. 2016-00398.[3] The Company's initial Environmental Compliance Plan projects are as follows:

a. Project EB020290 Lined Retention Basin West;
b. Project EB020745 Lined Retention Basin East;
c. Project EB020298 East Bend SW/PW Reroute;
d. ARO amortization for Pond Closure; and
e. Emission allowance inventories and expenses and reagent expense.

Projects EB020290, EB0202745, and EB020298 (collectively the Ash Pond Projects) are interrelated and are for the closure and repurposing of the ash pond at East Bend and the associated water redirection necessary in response to the CCR Final Rule and the ELG Final Rule as well as various Kentucky groundwater regulations.

Q. WHAT RELIEF IS DUKE ENERGY KENTUCKY SEEKING IN THIS PROCEEDING FOR ITS ECP?

A. Duke Energy Kentucky is seeking authorization to amend its ECP to include the construction of Cell 2 and to amend its ESM to recover the costs of construction.

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[2] *In the Matter of the Application of Duke Energy Kentucky, Inc., for an Order Approving the Establishment of a Regulatory Asset for the Liabilities Associated with Ash Pond Asset Retirement Obligations*, Case No 2015-00187 Ky.P.S.C. December 15, 2015.

[3] *In the Matter of the Electronic Application of Duke Energy Kentucky, Inc., for a Certificate of Public Convenience and Necessity Authorizing the Company to Close the East Bend Generating Station Coal Ash Impoundment and for All Other Required Approvals and Relief*, Case No. 2016-00398 Ky.P.S.C. June 6, 2017.

As explained by Duke Energy Kentucky witness, Ms. Lawler, the costs of constructing Cell 2 are incremental to what is currently included in base rates.

Q. IS THE CONSTRUCTION OF CELL 2 AND THE COSTS FOR SUCH CONSTRUCTION NECESSARY FOR COMPLYING WITH THE FEDERAL CLEAN AIR ACT, AND THOSE FEDERAL STATE, OR LOCAL ENVIRONMENTAL REGULATIONS WHICH APPLY TO COAL COMBUSTION WASTES AND BY-PRODUCTS FROM FACILITIES UTILIZED FOR THE PRODUCTION OF ENEGRY?

A. Yes, they are. Ms. Jett further explains this in her testimony.

V. CONCLUSION

Q. WAS ATTACHMENT DR-1 PREPARED UNDER YOUR DIRECTION AND CONTROL?

A. Yes.

Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?

A. Yes.

As explained by Duke Energy Kentucky witness, Ms. Lawler, the costs of constructing Cell 2 are incremental to what is currently included in base rates.

Q. IS THE CONSTRUCTION OF CELL 2 AND THE COSTS FOR SUCH CONSTRUCTION NECESSARY FOR COMPLYING WITH THE FEDERAL CLEAN AIR ACT, AND THOSE FEDERAL STATE, OR LOCAL ENVIRONMENTAL REGULATIONS WHICH APPLY TO COAL COMBUSTION WASTES AND BY-PRODUCTS FROM FACILITIES UTILIZED FOR THE PRODUCTION OF ENEGRY?

A. Yes, they are. Ms. Jett further explains this in her testimony.

V. CONCLUSION

Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?

A. Yes

VERIFICATION

STATE OF NORTH CAROLINA)
)
COUNTY OF MECKLENBURG)

SS:

The undersigned, David Renner, Vice President, CCP Engineering, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing testimony and that it is true and correct to the best of his knowledge, information and belief.

David Renner, Affiant

Subscribed and sworn to before me by David Renner on this 15th day of June, 2018.

NOTARY PUBLIC

My Commission Expires: Oct. 20, 2018

Duke Energy Kentucky, Inc.
Environmental Compliance Plan

Project #	Project Description	Air Pollutant or Waste/Byproduct to be controlled	Control Facility	Generating Station	Environmental Regulation	Environmental Permits[1]	Scheduled Completion	Actual (A) or Est. (E) Projected Capital Cost ($Million)
1.	EB020290 Lined Retention Basin West;	Bottom Ash	CCR/ELG	East Bend	EPA CCR and ELG Final Rules	Division of Surface Water, KPDES Permit #0040444 Dam Safety Permit from Division of Surface Water listed (Stream Construction Permit), Permit No. **26395P**	November 2018	$24(E)
2.	EB020745 Lined Retention Basin East;	Bottom Ash	CCR/ELG	East Bend	EPA CCR and ELG Final Rules	Division of Surface Water, KPDES Permit #0040444 Dam Safety Permit from Division of Surface Water listed (Stream Construction Permit), Permit No. **26395P**	2021	$18(E)
3.	EB020298 East Bend SW/PW Reroute; and	Bottom Ash, misc., CCR runoff	CCR/ELG KY groundwater regulations	East Bend	EPA CCR and ELG Final Rules, KPDES	KDWM, Permit number SW00800006, KDEP Division of Surface Water, KPDES Permit #0040444	2020	$22 (E)
4.	ARO for Pond Closure; and	Bottom Ash	CCR/ELG, KY Ground water regulations	East Bend	EPA CCR and ELG Final Rules and KPDES	KDEP Division of Waste Management concurrence for clean closure.	2021	$29 (E)
5.	EB021281 East Bend Landfill Cell 2	Bottom Ash, FGD, Fly Ash	CCR/KY CCR regulations	East Bend	EPA CCR and ELG Final Rules and KPDES, KY CCR Regulations	KDWM, Permit number SW00800006, KDEP	2020	$23 (E)
6.	Consumables (EAs Reagents, etc.)	SO_2, NOx, CO_2	CAIR	East Bend	CAIR		Ongoing	N/A

[1] Permits filed with Commission in Case No. 2016-00398

Duke Energy Kentucky, Inc.

Environmental Compliance Plan

Project #	Project Description	Air Pollutant or Waste/Byproduct to be controlled	Control Facility	Generating Station	Estimated Annual O&M			
					2018	2019	2020	2021
1.	EB020290 Lined Retention Basin West	Bottom Ash	CCR/ELG	East Bend	$0 (E)	$0 (E)	$0 (E)	$0 (E)
2.	EB020745 Lined Retention Basin East	Bottom Ash	CCR/ELG	East Bend	$0 (E)	$0 (E)	$0 (E)	$0 (E)
3.	EB020298 East Bend SW/PW Reroute	Bottom Ash, misc., CCR runoff	CCR/ELG KY groundwater regulations	East Bend	$0 (E)	$0 (E)	$0 (E)	$0 (E)
4.	ARO for Pond Closure	Bottom Ash	CCR/ELG, KY Ground water regulations	East Bend	$0 (E)	$0 (E)	$0 (E)	$0.1 (E)*
5.	EB021281 East Bend Landfill Cell 2	Bottom Ash, FGD, Fly Ash	CCR/ELG/KY CCR regulations	East Bend	$0 (E)	$0 (E)	$0 (E)	$0 (E)
6.	Consumables (Emission Allowances, Reagents, etc)	SO_2, NOx, CO_2	CAIR	East Bend	$13 (E)	$15 (E)	$13 (E)	$16 (E)

*O&M estimates represent post-closure maintenance costs related to all four bottom ash projects listed above: EB020290, EB020745, EB020298 and the ARO for Pond Closure.

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In The Matter of:

The Electronic Application of Duke Energy Kentucky, Inc. for a Certificate of Public Convenience and Necessity to Construct Phase Two of its West Landfill and for Approval to Amend its Environmental Compliance Plan for Recovery by Environmental Surcharge Mechanism	))))))	Case No. 2018-00156

DIRECT TESTIMONY OF

ADAM S. DELLER

ON BEHALF OF

DUKE ENERGY KENTUCKY, INC.

June 15, 2018

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ATTACHMENT:

ASD-1 East Bend Landfill Cell 2 Cost Estimate

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Adam S. Deller and my business address is 139 East Fourth Street, Cincinnati, Ohio 45202.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am employed by Duke Energy Indiana, LLC (DEI) as Engineer III. DEI provides various services to Duke Energy Kentucky, Inc., (Duke Energy Kentucky or the Company) and other affiliated companies of Duke Energy Corporation (Duke Energy Corp.).

Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUNDS.

A. I graduated with a Bachelor of Science in Civil and Environmental Engineering from the University of Cincinnati in 2008.

Q. PLEASE SUMMARIZE YOUR DUTIES AS ENGINEER III.

A. As an Engineer III, I have direct oversight of design and Engineering involving the landfills at East Bend Station.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE KENTUCKY PUBLIC SERVICE COMMISSION?

A. No.

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

A. The purpose of my testimony is to provide detail on the design, cost, construction, and impact to current operations for the West Landfill Cell 2 to be constructed at Duke Energy's East Bend Unit 2 Generating Station (East Bend).

II. DISCUSSION

Q. PLEASE PROVIDE A BRIEF OVERVIEW OF EAST BEND'S LANDFILLS.

A. East Bend has maintained an onsite landfill since the station's original commissioning in 1981. This original landfill is approaching full capacity in 2018. In anticipation of the original landfill reaching capacity, Duke Energy Kentucky received permission to begin construction of a replacement landfill, the West Landfill Cell 1 in Case No. 2015-00089. Like the original East Bend Landfill, the West Landfill is permitted to receive various forms of generator waste, including, but not limited to, FGD waste, fly ash and bottom ash (Generator Waste) from a number of generating sources, including generating stations of other Kentucky utilities and Ohio-based electric generators. The East Bend West Landfill is used, incidentally, in the production and furnishing of electric service as it serves as a means for storage and disposal of generator waste material produced by East Bend.

In total, the West Landfill includes eight cells that will be constructed over time, and is designed and permitted to encompass approximately 200 acres of lined landfill that will provide at least 30 years of generator waste disposal from the East Bend Station, and those other permitted sources. The West Landfill's construction includes a lined leachate collection system in compliance with all

applicable federal, state, and local requirements. Cell 1's construction included the infrastructure required to operate and maintain the entire West Landfill. The infrastructure includes, but is not limited to, roads for access and operation of the landfill, electric transmission lines and electrical equipment for powering necessary equipment for use at the landfill, a sedimentation pond for leachate collection, and environmental monitoring equipment.

The presence of an onsite landfill permits Duke Energy Kentucky to manage its costs of environmental compliance while providing safe and reliable electric service by eliminating the need to transport and pay to dispose of the generator waste in commercial landfills.

Q. PLEASE EXPLAIN THE DISPOSAL POZ-O-TEC PROCESS.

A. The dry fly ash material is mixed with the spent scrubber slurry, and lime to make a stable material called Poz-o-tec. This is done on an on-site waste stabilization plant (WSP) located near the current East Bend landfill. The mixture sets up much like concrete and is placed in the onsite landfill. The Poz-o-tec product is necessary to stabilize and solidify the slurry for proper waste disposal. On average the station produces a greater volume of the slurry than it does dry fly ash. Therefore, based upon the station's generation, East Bend must be able to receive additional fly ash waste from other sources to make sufficient Poz-o-tec to dispose of the slurry.

Q. PLEASE BRIEFLY EXPLAIN WHY THE COMPANY NEEDS TO BEGIN CONSTRUCTION ON THE WEST LANDFILL CELL 2.

A. Mr. Renner explains the need for the construction of Cell 2 in his direct testimony. In short, Cell 2 construction is driven by a logistic and an operational need to provide both sufficient space and capacity to properly dispose of Generator Waste material. Construction of Cell 2 will enable the Company to continue to store waste material from East Bend on site, rather than incurring costs to transport and dispose of the waste material at third-party-owned landfills.

Q. WHAT IS THE ESTIMATED COST OF CONSTRUCTING THE WEST LANDFILL CELL 2?

A. As the Company indicated in its initial West Landfill CPCN proceeding, the Company's estimated budgeted cost of construction for Cell 2 is approximately $18 million, excluding contingency, escalation, and allowance of funds used during construction (AFUDC). The fully loaded estimated cost of construction for Cell 2 (with contingency, escalation and AFUDC) is approximately $23.3 million. These figures include the cost of capping the cell. On-site disposal expenses (*e.g.* transportation) amount to approximately $3.5 million per year. On-site disposal expenses account for the fact that there will be some transportation expense to haul the Poz-o-tec material from the WSP to Cell 2 once it is constructed. It is important to note that these are not incremental for Cell 2, as Duke Energy Kentucky already incurs these costs today for transportation to Cell 1. Additionally, the construction of West Landfill Cell 1 included the necessary infrastructure such as roadways, trenches, and installation of necessary transmission line that is common and necessary for all future cells. Therefore, this infrastructure is already in service thereby resulting in a lower cost for Cell 2 than

what was experienced for Cell 1. Attachment ASD-1 includes a detailed estimate of the costs of construction.

Q. PLEASE DESCRIBE THE COMPANY'S CONSTRUCTION PLAN FOR THE WEST LANDFILL CELL 2.

A. As I previously stated, the West Landfill will be constructed in eight separate phases. Cell 1 was completed in 2017. The additional seven phases will be constructed in approximate three-to-seven year increments. Cell 2 is anticipated to commence construction in early 2019 with pre-construction activities commencing in late 2018, upon Commission approval of this certificate of public convenience and necessity. The Company recently completed engineering of Cell 2, so that construction may commence upon Commission authorization.

Cell 2 construction services will be performed by an outside contractor with Duke Energy management oversight. These external resources will be procured through a competitive request for proposal process), similar to how Cell 1 was constructed. The construction of Cell 2 will not impact the operations of East Bend as it will be adjacent to and supplement Cell 1. Commencing Cell 2 construction in the first quarter of 2019 will enable sufficient time for the construction to be completed by fourth quarter of 2019.

Future cell construction will be timed so that the West Landfill can continue to operate without any interruption and in a way that reduces construction and operational costs.

In terms of overall footprint, the West landfill will cover approximately 200 acres of land on the East Bend campus with a total of eight cells. As the

Company explained in Case No. 2015-00089, Duke Energy Kentucky acquired this land several years ago through several transactions, including purchases from its parent Duke Energy Ohio, Inc., and as part of the Company's purchase of the Dayton Power and Light Company's interest in East Bend in 2014.

This 200 acre footprint is comprised of the first five cells and the eighth and final cell. Cells six and seven will be constructed directly on top of cells one through five. The Cell 1 footprint is approximately 38 acres of land and Cell 2 is approximately 37 acres of land.

Exhibits 3 and 4 to the Company's application include the maps and drawings that depict the construction of Cell 2.

Q. DOES DUKE ENERGY KENTUCKY HAVE THE NECESSARY ENVIRONMENTAL PERMITS TO CONSTRUCT THE WEST LANDFILL CELL 2?

A. Yes. Ms. Jett explains and supports these permits in her Direct Testimony.

Q. WHY IS THE WEST LANDFILL PERMITTED TO RECEIVE GENERATOR WASTE FROM SOURCES OTHER THAN EAST BEND?

A. The West Landfill is permitted to receive generator waste from sources other than East Bend to ensure there is sufficient dry fly ash material to make the Poz-o-tec byproduct necessary to operate the station's FGD handling process. As I previously described Duke Energy Kentucky produces Poz-o-tec to stabilize, solidify, and dispose of the slurry. Depending upon generation output, East Bend produces approximately 1.3 million tons of Poz-o-tec and including approximately 156,000 tons of fly ash annually. However, this volume of East

Bend-produced ash is not sufficient to properly mix with the slurry to create enough of the solid-state and stable Poz-o-tec material. As such there are times when the Company actually must import ash from other sources to mix with its slurry so that it can properly create the Poz-o-tec material for dry landfill disposal. In the past, Duke Energy Kentucky has imported ash from other permitted generating stations, including Miami Fort Station, Zimmer, City of Hamilton, and St. Bernard. In most of those instances, the costs of transporting ash from the permitted station was borne by Duke Energy Kentucky. That is because nearly all of the other permitted stations have their own disposal facilities on-site and transporting ash to Duke Energy Kentucky would've been an incremental cost to that permitted station. It is important to note that Duke Energy Kentucky has only imported ash from other sites when Duke Energy Kentucky was unable to produce sufficient ash on its own. The Company has never, nor does it intend to, simply offer its generator waste disposal services for sale.

Q. DID THE COMPANY CONSIDER ANY ALTERNATIVES TO CONSTRUCTING CELL 2?

A. Yes. In anticipation of reaching capacity at the East Bend Landfill, Duke Energy Kentucky examined the previously analyzed alternative of using a third party offsite landfill to address the need to dispose of generator waste material. The Company explored the possibility of off-site disposal at a third party owned landfill. However, the Company does not believe this is a practical or economically feasible solution in either the short or long-term.

Q. PLEASE EXPLAIN WHY THE THIRD PARTY LANDIFLL IS NEITHER A PRACTICAL OR FEASIBLE ALTERNATIVE TO CONSTRUCTING CELL 2.

A. The third party landfill solution is not practical because of the need for disposal of generator waste to be in a properly lined and constructed landfill to comply with current environmental regulations. Duke Energy Kentucky has not found a suitable alternative landfill in a reasonable proximity that could handle the nature and volume of generator waste. From an economic perspective, the Company had performed informal market inquiries periodically over the past few years. Based upon a recent market inquiry for transportation of generator waste offsite, Duke Energy Kentucky estimates that the costs of transporting and disposing of the generator waste material in a commercial landfill to be approximately $76 per ton. East Bend produces approximately 1 million tons of Poz-o-tec per year, resulting in an annual expense, based upon today's dollars, of more than $76 million per year to use a commercial landfill, assuming one is available. This is a significant annual disposal expense before even taking into account various concerns with short-term contracts, price escalations, and inflation. Further, constructing an onsite landfill will avoid significant public road traffic that would be necessary if the Company were to transport its waste to a third party-owned offsite disposal facility.

The budgeted cost of construction for all eight phases of the West Landfill is estimated to be approximately $159 million (includes Cell 1 and 2 costs). On-site disposal expenses (*e.g.,* transportation around East Bend campus) amount to

approximately $3.5 million per year. Over an assumed thirty-year life of the West Landfill, the construction of all eight phases and annual disposal expense equates to an annual investment of approximately $8 million to $9 million per year for the next thirty years. This is far below the current estimated annual expense of approximately $76 million to use a third-party landfill for waste disposal. The Company firmly believes that operating its own landfill continues to be the best and lowest cost option for its customers.

III. CONCLUSION

Q. WAS ATTACHMENT ASD-1 PREPARED BY YOU AND UNDER YOUR DIRECTION AND CONTROL?

A. Yes.

Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?

A. Yes.

VERIFICATION

STATE OF OHIO)
) **SS:**
COUNTY OF HAMILTON)

The undersigned, Adam Deller, Engineer III, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing testimony and that it is true and correct to the best of his knowledge, information and belief.

Adam Deller

Adam Deller, Affiant

Subscribed and sworn to before me by Adam Deller on this 11th day of June, 2018.

E Minna Rolfes-Adkins

NOTARY PUBLIC

My Commission Expires: July 8, 2022

NOTARY PUBLIC STATE OF OHIO

E. MINNA ROLFES-ADKINS
Notary Public, State of Ohio
My Commission Expires
July 8, 2022

East Bend Landfill Cell 2 (EB021281) - Advance 1 Funding

		TPC (Class 5)	ADV 1 Request	ETC
MOBILIZATION AND SITE PREPARATION		**$1,590,962**	**$0**	**$1,590,962**
	Utility and Field Surveying	$95,000	$0	$95,000
	Mobilization and Demobilization	$380,000	$0	$380,000
	Readiness Review	$20,000	$0	$20,000
	Dust Control	$637,200	$0	$637,200
	Staging/Laydown Area	$130,932	$0	$130,932
	ESC Installation and Maintenance	$173,711	$0	$173,711
	Clearing and Grubbing	$154,119	$0	$154,119
CONSTRUCTION		**$14,531,266**	**$0**	**$14,531,266**
	Topsoil Stripping and Stockpiling	$488,000	$0	$488,000
	Excavation Material to Stockpile	$2,661,429	$0	$2,661,429
	Excavation Material Reused	$1,107,936	$0	$1,107,936
	Structural Fill	$334,038	$0	$334,038
	Compacted Cohesive Soil	$46,475	$0	$46,475
	Ditch Cover (Topsoil Replaced)	$138,237	$0	$138,237
	Geocomposite Liner, Geosyntheitc Clay Liner	$2,567,763	$0	$2,567,763
	Geocomposite Liner, Textured Membrane Liner-Procure	$728,172	$0	$728,172
	Geocomposite Liner, Textured Membrane Liner-Install	$191,624	$0	$191,624
	Turf Reinforcement Mat, Temporary	$176,713	$0	$176,713
	Turf Reinforcement Mat, Permanent	$90,411	$0	$90,411
	Pipe Leachate Laterals	$414,619	$0	$414,619
	Pipe Leachate Collectors	$128,038	$0	$128,038
	Pipe Leachate Outlet	$860	$0	$860
	Drainage Layer, Protective Cover	$1,232,340	$0	$1,232,340
	Vegetative Cover	$36,491	$0	$36,491
	Hilltop Sand Barging	$4,123,410	$0	$4,123,410
	Flexamet & Powersafe	$64,710	$0	$64,710
ENGINEERING		**$1,062,900**	**$212,900**	**$850,000**
	GCL Testing	$64,900	$64,900	$0
	Feasability Study - Property Expansion	$30,400	$30,400	$0
	Document prepration (Engineered Drawings)	$88,600	$88,600	$0
	10 year master plan document	$29,000	$29,000	$0
	CQA and Field Engineering (@20K*40acres)	$800,000	$0	$800,000
	Permitting	$50,000	$30,000	$20,000
DUKE INDIRECTS		**$120,000**	**$6,000**	**$114,000**
	Indirects (@5% TPC estimate)	$120,000	$6,000	$114,000
DUKE LABOR		**$1,667,426**	**$378,310**	**$1,289,115**
	Project Manage. And Development	$601,968	$165,542	$436,426
	Staff Augmentation	$826,620	$86,112	$740,508
	Allocations	$238,838	$126,656	$112,181
	TPC SUBTOTAL	***$18,972,554***	***$597,210***	***$18,375,343***
CONTINGENCY		**$2,845,883**	**$131,386**	**$2,714,497**
	Estimate Uncertainty and Risk (15% TPC/22% for A1)	$2,845,883	$131,386	$2,756,301
ESCALATION		**$459,384**	**$0**	**$459,384**
	Escalation (2.5% of ETC)	$459,384	$0	$459,384
AFUDC		**$1,046,391**	**$20,300**	**$1,026,091**
	AFUDC	$1,046,391	$20,300	$1,026,091
	Totals:	**$23,324,211**	**$748,897**	**$22,617,119**

COMMONWEALTH OF KENTUCKY
BEFORE THE
KENTUCKY PUBLIC SERVICE COMMISSION

In The Matter of:

The Application of Duke Energy Kentucky, Inc., for a Certificate of Public Convenience and Necessity to Construct Phase Two of its West Landfill and for Approval to Amend its Environmental Compliance Plan for Recovery By Environmental Surcharge Mechanism	))))))	Case No. 2018-00156

DIRECT TESTIMONY OF

TAMMY JETT

ON BEHALF OF

DUKE ENERGY KENTUCKY, INC.

June 15, 2018

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I. INTRODUCTION AND PURPOSE

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Tammy Jett. My business address is 139 East Fourth Street, Cincinnati, Ohio 45202.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am employed by Duke Energy Business Services LLC. (Duke Energy Business Services) as a Principal Environmental Specialist in the Environmental Health and Safety (EHS) Programs and Environmental Sciences Department.

Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUNDS.

A. I received a Master's Degree in Environmental Science from Miami University in 1989. I have also earned a Bachelor's Degree in Urban Ecology and an Associate's Degree in Psychology from Thomas More College in 1987. I began my career with The Cincinnati Gas & Electric Company in 1989 as an Intern as part of my graduate degree curriculum. I was hired as a Junior Licensing Specialist in 1989 after my internship was completed. I have held a number of environmental compliance related positions over the last twenty-nine years in the environmental organizations, within Duke Energy and predecessor companies. These positions involved increasing responsibility and include Regulatory Compliance Coordinator, Environmental Scientist III and Senior and Lead Environmental Specialist. In 2015, I was promoted to Principal Environmental Specialist, which is the highest technical (non-managerial) position currently available in the Duke Energy Environmental organization.

Q. PLEASE SUMMARIZE YOUR DUTIES AS PRINCIPAL ENVIRONMENTAL SPECIALIST.

A. As Principal Environmental Specialist, I am the subject matter expert for environmental coal ash compliance for Duke Energy Kentucky's East Bend, Generating Station (East Bend). I have responsibility for permitting and specialize in all facets of the coal ash program. I obtain permits for the Company's coal ash facilities, such as coal ash landfills, and then assist with monitoring, record keeping, reporting and other facets of our compliance program. I am also responsible for reviewing new Federal and State regulations which include the regulation of coal ash, such as the United States Environmental Protection Agency's (U.S. EPA) Coal Combustion Residual rule (CCR Final Rule) and the Kentucky Special Waste rules, among others, and determining their impact on our generating coal ash facilities. I am involved in strategic planning across all the Duke Energy service areas, including Ohio, Kentucky, Indiana, North Carolina, South Carolina and Florida, for federal coal ash compliance issues to provide a consistent strategy for implementing the CCR Final rule.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE KENTUCKY PUBLIC SERVICE COMMISSION?

A. Yes. I provided testimony in Case No. 2015-00089 supporting Duke Energy Kentucky's request for a Certificate of Public Convenience and Necessity for construction (CPCN) of its West Landfill at the East Bend Generating Station (East Bend). I provided testimony in Case No. 2016-00268, Duke Energy Kentucky's application for a CPCN for constructing a dry bottom ash handling system at East Bend and in Case No. 2016-00398 involving the Company's

application for a CPCN for water redirects and basin closure and repurposing. Most recently, I provided testimony in Case No. 2017-00321 in support of Duke Energy Kentucky's Base Electric Case.

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

A. The purpose of my testimony is to discuss the environmental requirements applicable to Duke Energy Kentucky's operation of East Bend that specifically relate to the Company's need to construct the second cell of the West Landfill (Cell 2) and request for an amendment to Duke Energy Kentucky's Environmental Compliance Plan (ECP) to include the Cell 2 construction and recovery as part of the environmental surcharge mechanism (ESM). In doing so, I provide an overview of the environmental controls that exist today at East Bend and the regulations that require such controls.

II. ENVIRONMENTAL REGULATIONS IMPACTING DUKE ENERGY KENTUCKY'S EAST BEND GENERATING STATION

Q. WHAT ARE THE MOST SIGNIFICANT ENVIRONMENTAL REGULATIONS CURRENTLY IMPACTING DUKE ENERGY KENTUCKY'S EAST BEND STATION?

A. There are several programs promulgated by the U.S. EPA under the Clean Air Act (CAA) that impact all of the Company's generating stations, and particularly East Bend. These regulations are the primary drivers of Duke Energy Kentucky's compliance strategies for its plants. They are as follows: the Mercury and Air Toxics Standard (MATS Rule) and the Cross State Air Pollution Rule (CSAPR) including the U.S. EPA's September 2016 final CSAPR Update Rule.

The CCR Final Rule and Steam Electric Effluent Limitation Guidelines (ELG Final Rule), in addition to other emerging regulations under the Clean Water Act (CWA), are likely to impact the Company's generating stations. The regulations that most directly impact the Company's ash handling strategy as it pertains to East Bend are the CAA and the CCR Final Rule and ELG Final Rule.

Q. PLEASE BRIEFLY DESCRIBE THE CAA.

A. The CAA is the comprehensive federal law that regulates air emissions from stationary and mobile sources. Among other things, this law authorizes EPA to establish a number of programs to regulate air emissions so as to protect public health and public welfare. Many of these programs overlap and at times regulate the same pollutants.

Q. CAN YOU PROVIDE A BRIEF SUMMARY OF THE MATS RULE?

A. The MATS Rule regulates mercury and other toxic air pollutant emissions from new and existing coal- and oil-fired steam electric generating units (EGUs) that are greater than 25 MWs in capacity. It is a command and control program that imposes unit-by-unit restrictions on emissions of mercury, acid gases such as hydrogen chloride, and certain non-mercury metals, including arsenic, chromium, nickel and selenium. The MATS Rule allows EGUs, as one option, to demonstrate compliance by measuring mercury, hydrogen chloride, and non-mercury metal emissions directly. It also allows the EGUs the option of demonstrating compliance by measuring surrogates for acid gases and for non-mercury metals.

Q. DOES EAST BEND CURRENTLY COMPLY WITH THE MATS RULE?

A. Yes. East Bend began complying with MATS Rule in April 2015.

Q. PLEASE PROVIDE A SHORT DESCRIPTION OF THE HISTORY AND STATUS OF THE CLEAN AIR INTERSTATE RULE (CAIR) AND CSAPR.

A. On August 8, 2011, the EPA published the final CSAPR rule to replace the existing CAIR. CSAPR established new state-level annual SO_2 and NO_x budgets and ozone-season NO_x budgets. The rule was initially scheduled to take effect January 1, 2012; however, on December 30, 2011, the D.C. Circuit stayed the rule. On August 21, 2012, the D.C. Circuit then vacated CSAPR and directed that EPA continue administering CAIR pending completion of a new rulemaking to replace CSAPR. However, on April 26, 2014, the United States Supreme Court reversed the D.C. Circuit's decision and remanded the case back to the D.C. Circuit for further proceedings. Because of the litigation, the CSAPR deadlines were tolled by three years and CSPAR ultimately went into effect on January 1, 2015. On December 3, 2015, the U.S. EPA proposed to further update and reduce ozone season state NO_x allowance budget beginning in 2017. The U.S. EPA finalized this change with the Cross-State Air Pollution Rule Update (CSAPR Update) for the 2008 Ozone NAAQs published in the Federal Register on October 26, 2016. This change reduced the number of ozone season NO_x allowances for East Bend. It also maintains the restriction on trading contained in the original CSAPR by placing a penalty on excess emissions of NOx if statewide ozone season NOx emissions exceed the statewide budget by more than 21 percent (CSAPR Assurance provisions).

Q. HOW HAS CSAPR'S IMPLEMENTATION IMPACTED EAST BEND?

A. Because it has a well performing wet flue gas desulfurization (FGD) system and a selective catalytic reduction control (SCR), East Bend has, to date, been able to comply with CSAPR without the installation of additional controls. This is also the case with the U.S. EPA's CSAPR Update rule, which went into effect on May 1, 2017. Because of the restrictions on trading and the more limited state allowance budgets for ozone season NO_x, the allowance prices under the CSAPR Update rule are higher than they were under the original CSAPR. While the East Bend SCR design, coupled with the availability of allowances from the Company's retired Miami Fort Unit 6 station, is expected to be robust enough to comply with the CSAPR Update rule, if it is economically prudent, East Bend could also opt to buy allowances on the market.

Q. PLEASE DESCRIBE THE MAJOR EFFORTS TO REGULATE GREENHOUSE GASES THAT RELATE TO ELECTRIC GENERATING UNITS.

A. In 2007, the Supreme Court ruled in *Massachusetts v. EPA*[1] that greenhouse gases are a pollutant subject to regulation under the CAA. Subsequently, the U.S. EPA undertook a number of rulemakings targeting greenhouse gas emissions from EGUs. The first was the 2010 Tailoring Rule, which required major stationary sources of greenhouse gases to obtain preconstruction and operating permits. The U.S. Supreme Court eventually ruled that the U.S. EPA could only require a source to obtain a preconstruction permit for greenhouse gases if it also had to obtain a preconstruction permit for conventional pollutants such as sulfur dioxide.

[1] *Massachusetts v. Environmental Protection Agency*, 549 U.S. 497 (2007).

On April 13, 2012, the U.S. EPA proposed a rule to establish New Source Performance Standards for CO_2 emissions from new natural gas and coal-fired EGUs. Then on January 8, 2014, the U.S. EPA withdrew that proposal and proposed emission guidelines for states to follow in developing plans to address CO_2 emissions from existing fossil fuel-fired EGUs. On the same day, the U.S. EPA proposed a replacement establishing CO_2 emission limits for new, modified, and reconstructed fossil fuel-fired EGUs. On June 18, 2014, EPA proposed a rule, known as the Clean Power Plan (CPP) to regulate CO_2 emissions from existing fossil fuel-fired EGUs. The EPA finalized both rules on October 23, 2015.

Q. PLEASE DISCUSS THE STATUS OF THE EPA'S CPP RULE AND WHETHER THERE WILL BE ANY IMPACT TO EAST BEND.

A. The CPP established an emission performance rate of 1,305 pounds of CO_2 per net megawatt-hour of electricity produced for all existing coal-fired EGUs, including East Bend. The final rule also established state-level pounds of CO_2 per net megawatt-hour of electricity produced emission performance rates and state-level mass-based annual CO_2 tonnage limits for all states. The CPP required each state to develop and submit an implementation plan to EPA detailing how it would achieve the CO_2 emission limitations specified in the CPP. The CPP gave states the option of developing a rate-based or a mass-based implementation plan. The EPA in the CPP outlined three rate-based and three mass-based approaches states could select from when developing their implementation plans.

Numerous petitions for review were filed with the D.C. Circuit Court challenging the legal status of the CPP. On February 9, 2016, the U.S Supreme Court granted a stay of the CPP effective until its legal status is resolved. Oral

argument before the full D.C. Circuit was held on September 27, 2016. The court has not issued a decision in the case.

The Supreme Court's stay of the CPP means that Kentucky is under no obligation at this time to develop and submit an implementation plan to EPA and would not be unless the CPP were ultimately upheld by the courts. If the CPP is ultimately overturned or otherwise repealed, there will be no obligation to reduce CO_2 emissions at East Bend. If the CPP were to be upheld by the courts, the September 6, 2018, date in the final CPP for states to submit final implementation plans to EPA for approval will need to be revised. The new date would depend on when the final legal status of the CPP is resolved.

On April 4, 2017, the U.S. EPA announced in the Federal Register that it is conducting a review of the CPP, in accordance with an Executive Order by the President issued on March 28, 2017. The EPA indicated that it "if appropriate, will as soon as practicable and consistent with law, initiate proceedings to suspend, revise or rescind this rule." On April 28, 2017, the D.C. Circuit issued an order temporarily suspending the litigation while it considers EPA's motion to stay the litigation while the Agency reviews the rule. On June 8, 2017, EPA sent a proposed rule to the Office of Management and Budget to repeal the CPP.

If the CPP were to survive legal challenge and regulatory review and were implemented as written, the regulatory requirements that would apply to East Bend will be established by the Commonwealth of Kentucky through its implementation plan. Therefore, Duke Energy Kentucky would not know the exact regulatory requirements that would apply to East Bend until the Commonwealth of Kentucky completes its implementation plan and it is approved

by the U.S. EPA, which could occur as late as 2021. Duke Energy Kentucky cannot predict what GHG-related regulatory requirements might ultimately apply to East Bend.

III. GENERAL DESCRIPTION OF ENVIRONMENTAL CONTROLS AT DUKE ENERGY KENTUCKY'S EAST BEND GENERATION STATION

Q. PLEASE DESCRIBE THE ENVIRONMENTAL CONTROLS AT EAST BEND.

A. The major environmental and pollution control features at East Bend are: a mechanical draft cooling tower, a high-efficiency hot side electrostatic precipitator, a lime-based flue-gas desulfurization (FGD) system, low nitrogen oxide (NO_x) burners and a selective catalytic reduction (SCR) system. The SCR is designed to reduce NO_x emissions by approximately 85 percent. The FGD system was upgraded in 2005 to increase the sulfur dioxide (SO_2) emissions removal capability to about 97 percent. The station electrical output is directly connected to the Duke Energy Midwest (consisting of Kentucky and Ohio) 345 kilovolt (kV) transmission system.

Q. PLEASE DESCRIBE HOW ASH IS CURRENTLY HANDLED AT EAST BEND.

A. Duke Energy Kentucky currently operates two landfills at East Bend (collectively, the Landfills), which are used for the disposal of materials and ash resulting from the Company's FGD process and other CCR-producing processes.

The original or "East" Landfill is comprised of approximately 162 acres and has been in place since East Bend was constructed in 1981. The East Landfill's original construction pre-dated the CCR rule's effective date. The East

Landfill will eventually have to be closed in a manner that complies with the CCR rule.

The newer or "West" Landfill, once all phases are completed, will consist of approximately 200 acres of lined landfill that is designed to accept approximately 30 years of CCR waste from the East Bend Station and other permitted sources, as needed, to make fixated scrubber sludge. Duke Energy Kentucky received CPCN approval to construct the first cell of the West Landfill in Case No. 2015-00089. As part of that approval, the Commission directed the Company to file a new CPCN request prior to commencing construction of each additional phase or cell.

The West Landfill is permitted to receive various forms of CCR waste, including, but not limited to, FGD waste, fly ash and bottom ash (Generator Waste), from a number of generating sources, including those generating stations currently owned and/or operated by Duke Energy Kentucky and from generating stations owned by other Kentucky utilities and Ohio-based electric generators. Dry fly ash is combined into a mixture of FGD solids, fly ash, and lime, and forms a substance called Poz-o-Tec, that sets up much like concrete, and is placed in the Landfills. Depending upon generation output, East Bend produces approximately 1 million tons of Poz-o-Tec, including approximately 156,000 tons of fly ash annually. The remaining 20 percent of CCR material is bottom ash. This bottom ash has historically been treated in an ash pond (Pond) located on site at East Bend. Duke Energy Kentucky is in the process of converting its East Bend ash handling system to a complete dry ash system and closing this pond as was

approved by the Commission in Case No's 2016-00268 and in Case No. 2016-00398

The presence of the Landfills and Pond has permitted Duke Energy Kentucky to manage its costs of environmental compliance and provide safe and reliable electric service by eliminating the need to transport and pay for sending Generator Waste to commercial landfills.

Q. PLEASE DESCRIBE THE CURRENT STATUS OF, AND THE COMPANY'S MODELING ASSUMPTIONS FOR, THE CCR AND ELG FINAL RULES.

A. In April 2009, the EPA began assessing the integrity of ash dikes nationwide, and began developing regulations to manage CCRs. CCRs primarily include fly ash, bottom ash, and FGD byproducts (typically calcium sulfate (gypsum) or calcium sulfite) that are destined for disposal. In June 2010, the EPA proposed a rule containing two options for handling CCRs: 1) as a special waste listed under the Resource Conservation and Recovery Act (RCRA) Subtitle C Hazardous Waste Regulations; and 2) as a solid waste under RCRA Subtitle D Non-Hazardous Waste Regulations. Both options included dam safety requirements and had strict new requirements regarding the handling, disposal, and beneficial use of CCRs except when reused in encapsulated applications (such as ready mix concrete and the production of wallboard).

In the CCR proposal, the EPA said that there could be strong support for a conclusion that regulation of CCR disposal under RCRA Subtitle D would be adequate because of 1) potentially lower CCR risk assessment results, 2) the ELG requirements that the EPA may promulgate, and 3) increased federal oversight

such requirements could achieve. The CCR Final Rule and/or ELG Final Rule result in conversions to dry handling of fly ash and bottom ash; increased use of landfills; the closure of existing wet ash storage ponds; and the addition of alternative wastewater treatment systems. When the EPA published its proposed ELG revisions, it indicated that it was working to integrate the ELG rule with the CCR rule. The EPA indicated that the requirements of the two rules needed to be harmonized before either rule was released. The CCR Final rule was published as final as a Subtitle D, non-hazardous waste rule on April 17, 2015.

Q. PLEASE DESCRIBE THE IMPACT OF THE CCR AND ELG FINAL RULES ON EAST BEND'S OPERATIONS.

A. The ELG Final Rule was published on November 3, 2015. This rule sets new or additional requirements for wastewater streams from several processes and byproducts at steam electric generating plants. Some of these wastewater streams are generated at East Bend Station, including but not limited to fly ash and bottom ash wastewaters. This rule will require the Company to take action to achieve compliance that includes conversion of the existing wet ash system to a dry ash handling system. As part of converting to dry ash handling, new wastewater treatment systems must be installed. The existing Pond can no longer be used in its current form as an ash transport water treatment system. Additionally, due to East Bend site limitations (*e.g.,* proximity to the river, availability of other land, *etc.*) the existing Pond must be repurposed through closure by excavation to comply with the ELG Final Rule. Compliance with some aspects of the CCR Final Rule began within 6-12 months after publication, while other actions will require 5 years or more. Compliance with the ELG Final Rule was set to begin as

early as November 1, 2018, but no later than December 31, 2023. On August 14, 2017, EPA filed a motion with the 5th Circuit to put portions of the 2015 ELR Final Rule litigation on hold while they reconsider certain ELG Final Rule limits. The EPA requested to sever and hold in abeyance the issues related to bottom ash transport water, FGD wastewater, and IGCC gasification wastewater. The EPA also proposed reconsideration of the effluent limits and pre-treatment standards for only bottom ash transport water and FGD wastewater. This action alone does not have a direct impact on any compliance needs or implementation schedules for East Bend projects because the drivers for the station's ash-related projects were not limited to the ELG Final Rule. However, the action does provide an indication that EPA will review and potentially change the ELG limits for the two waste streams listed above. Duke Energy expects EPA will move quickly to finalize this rule once the court rules on the recent motion for reconsideration. The reconsideration process could take between a year and 18 months to complete.

As expected, the combination of ELG Final Rule, CCR Final Rule, and Kentucky groundwater regulations implementation require East Bend's conversion to dry ash handling (bottom ash). The Commission approved the Company's CPCN request to convert East Bend to a dry ash handling system on February 23, 2017, in Case No. 2016-00268. Additionally, these rules require the initiation of closure of the active wet ash storage Pond; installation of balance-of-plant wastewater treatment systems, including Pond repurposing. The Commission approved the Company's CPCN request for the water redirection, and Pond closure and repurposing on June 6, 2017 in Case No 2016-00398.

Q. PLEASE EXPLAIN HOW THE CCR AND ELG REGULATIONS IMPACT DUKE ENERGY KENTUCKY'S ENVIRONMENTAL COMPLIANCE STRATEGY.

A. The CCR Final Rule and ELG Final Rule have implications to ash handling and impoundment basins across the industry, not just Duke Energy Kentucky. In Duke Energy Kentucky's situation, compliance strategies now must include provisions that necessitate the conversion to dry handling of ash and closure of its existing Pond and repurposing it in accordance with more stringent CCR and ELG Final Rule standards. Specifically, as it relates to East Bend, the CCR Final Rule required implementation of an altered groundwater monitoring program for the Landfills and the Pond.

Q. PLEASE EXPLAIN WHY CONSTRUCTION OF CELL 2 IS NECESSARY FOR DUKE ENERGY KENTUCKY TO CONTINUE TO COMPLY WITH ENVIRONMENTAL REGULATIONS AND OPERATE EAST BEND.

A. A repository for East Bend's Generator Waste is necessary for purposes of environmental compliance for current and emerging regulations involving handling of CCR. To satisfy these compliance requirements, the Company sought Commission authorization to commence construction of the West Landfill several years ago. The West Landfill will consist of eight phases or cells that will encompass approximately 200 acres of lined landfill. It is designed to accept at least 30 years of Generator Waste from the East Bend Station and other sources, as permitted. All West Landfill cells will be lined and include a leachate collection system in accordance with all applicable federal, state, and local requirements. Each subsequent cell will be constructed in approximately three-to-

seven year increments in order that the next cell will be in service to maintain operations and prior to the active cell reaching capacity. The West Landfill, will be owned and operated by Duke Energy Kentucky just as it has owned and operated the East Landfill. Duke Energy Kentucky already has the personnel and expertise in place to construct and operate the West Landfill. The proximity of the West Landfill to East Bend will allow Duke Energy Kentucky to continue to control its costs for transporting and disposing of the Generator Waste material. The West Landfill construction will also include the construction of all infrastructure required to operate and maintain the West Landfill. Much of this infrastructure has already been established during the construction of the West Landfill Cell 1 project.

Q. WILL THE CURRENT WEST LANDFILL CELL 2 BE CONSTRUCTED TO COMPLY WITH CCR RULE?

A. Yes. The West Landfill Cell 2 will be constructed to meet all applicable environmental requirements, including the US EPA's requirements for CCR Final Rule.

Q. WILL THE CONSTRUCTION OF THE WEST LANDFILL CELL 2 ALLOW THE COMPANY TO COMPLY WITH THE CCR RULE?

A. Yes. Duke Energy Kentucky must have a way to dispose of its Generator Waste, especially the CCRs from the FGD process. An onsite landfill is the most reasonable and cost effective manner in which to satisfy this need.

IV. DUKE ENERGY KENTUCKY'S ENVIRONMENTAL COMPLIANCE PLAN

Q. PLEASE IDENTIFY THE PROJECTS THAT DUKE ENERGY KENTUCKY CURRENTLY INCLUDES IN ITS ENVIRONMENTAL COMPLIANCE PLAN AND RECOVERS THROUGH THE ESM.

A. There are four projects, as well as compliance inventories, that Duke Energy Kentucky currently includes in its ECP. These projects are as follows as follows:

a. Project EB020290 Lined Retention Basin West;
b. Project EB020745 Lined Retention Basin East;
c. Project EB020298 East Bend SW/PW Reroute;
d. ARO amortization for Pond Closure; and
e. Emission allowance inventories and expenses and reagent expense.

The projects are interrelated and include the water redirection, pond closure, post closure maintenance, and repurposing in compliance with ELG Final Rule and CCR Final Rules previously authorized by this Commission. The Commission approved these projects as part of the Company's ECP in Case No 2017-00321.

Q. PLEASE DESCRIBE DUKE ENERGY KENTUCKY'S PROPOSAL TO AMEND ITS ECP.

A. Duke Energy Kentucky is seeking authorization to amend its ECP to include the construction of Cell 2.

Q. HAS DUKE ENERGY KENTUCKY RECEIVED THE NECESSARY PERMITS FOR THE CONSTRUCTION OF THE WEST LANDFILL, INCLUDING CELL 2?

A. Yes. The Company has received a permit from the Kentucky Division of Waste Management, Permit number SW00800006. A copy of this permit is included as Exhibit 2 to the Company's Application. This permit, along with Kentucky

Department for Environmental Protection application form number 7094A, details the design of the West Landfill..

V. CONCLUSION

Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?

A. Yes.

VERIFICATION

STATE OF OHIO)
) **SS:**
COUNTY OF HAMILTON)

The undersigned, Tammy Jett, Principal Environmental Specialist, being duly sworn, deposes and says that she has personal knowledge of the matters set forth in the foregoing testimony and that it is true and correct to the best of her knowledge, information and belief.

Tammy Jett

Tammy Jett, Affiant

Subscribed and sworn to before me by Tammy Jett on this 15th day of June, 2018.

Ruth M. Loccisano

NOTARY PUBLIC

My Commission Expires: 06-18-2022

NOTARIAL SEAL
STATE OF OHIO

RUTH M. LOCCISANO
Notary Public, State of Ohio
My Commission Expires 06-18-2022

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In The Matter of:

The Application of Duke Energy Kentucky, Inc.	)	
for a Certificate of Public Convenience and	)	
Necessity to Construct Phase Two of its	)	Case No. 2018-00156
West Landfill and for Approval to Amend	)	
its Environmental Compliance Plan for Recovery	)	
By Environmental Surcharge Mechanism	)	

DIRECT TESTIMONY OF

SARAH E. LAWLER

ON BEHALF OF

DUKE ENERGY KENTUCKY, INC.

June 15, 2018

TABLE OF CONTENTS

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Sarah E. Lawler, and my business address is 139 East Fourth Street, Cincinnati, Ohio 45202.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am employed by Duke Energy Business Services, LLC (DEBS) as Director, Rates and Regulatory Planning. DEBS provides various administrative and other services to Duke Energy Kentucky, Inc., (Duke Energy Kentucky or Company) and other affiliated companies of Duke Energy Corporation (Duke Energy).

Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATION AND PROFESSIONAL EXPERIENCE.

A. I earned a Bachelor of Science in Accountancy from Miami University, Oxford, Ohio in 1993. I am also a Certified Public Accountant.

I began my career in September 1993 with Coopers & Lybrand, L.L.P. as an audit associate and progressed to a senior audit associate. In August 1997, I moved to Kendle International Inc., where I held various positions in the accounting department, ultimately being promoted to Corporate Controller. In August 2003, I began working for Cinergy Corp., as External Reporting Manager, where I was responsible for the company's Securities & Exchange Commission (SEC) filings. In August 2005, I then moved into the role of Manager, Budgets & Forecasts. In June 2006, following the merger between Cinergy Corp. and Duke Energy, I became Manager, Financial Forecasting. In February 2015, I was promoted to Utility Strategy Director, Midwest where I was responsible for the

preparation of business plans and other internal managerial reporting for Duke Energy Kentucky and Duke Energy Ohio, Inc. In December 2017, I began in my current role as Director, Rates and Regulatory Planning.

Q. PLEASE DESCRIBE YOUR RESPONSIBILITIES AS DIRECTOR RATES AND REGULATORY PLANNING.

A. As Director Rates, and Regulatory Planning, I am responsible for the preparation of financial and accounting data used in retail rate filings and various other rate recovery mechanisms for Duke Energy Kentucky and Duke Energy Ohio, Inc.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE KENTUCKY PUBLIC SERVICE COMMISSION?

A. Yes. Most recently, I provided testimony in support of the Company's electric base rate case.

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

A. The purpose of my testimony is to provide an overview of the Company's proposed financial and accounting treatment and corresponding rate impact of including the construction of Cell 2 in the Company's Environmental Surcharge Mechanism (Rider ESM).

II. DISCUSSION

Q. PLEASE BRIEFLY DESCRIBE THE COMPANY'S APPLICATION IN THIS PROCEEDING.

A. Duke Energy Kentucky is requesting a certificate of public convenience and necessity (CPCN) to construct the second phase of its West Landfill at the East

Bend Generating Station (Cell 2), to amend its current Environmental Compliance Plan (ECP) and to adjust its Rider ESM to include the costs of Cell 2 construction.

Q. HOW DOES DUKE ENERGY KENTUCKY INTEND TO FINANCE THE CONSTRUCTION OF CELL 2?

A. The Company is proposing to finance the construction through continuing operations and, if necessary, through debt issuances. The mix of debt and equity used to finance the amended project will be determined so as to allow Duke Energy Kentucky to maintain its investment-grade credit rating.

Q. HOW DOES DUKE ENERGY KENTUCKY PROPOSE TO RECOVER THE COST OF CELL 2 CONSTRUCTION?

A. Duke Energy Kentucky proposes to recover the cost of Cell 2 construction through its Rider ESM. A revised Rider ESM tariff is filed with this application as Exhibit 6 and proposed to be effective July 15, 2018 to begin recovery of Cell 2 construction activities upon Commission approval, currently estimated reflect the expense month December 2018. Therefore, the Company projects that bills issued on and after February 1, 2019 will reflect the revised environmental surcharge beginning with the expense month of December 2018 (*i.e.* beginning with the expense month six months after the filing of this Application). In other words, Duke Energy Kentucky proposes to recover the cost of Cell 2 beginning six months after the filing of the application in this proceeding, in accordance with KRS 278.183(2).

Q. WHY IS IT APPROPRIATE FOR DUKE ENERGY KENTUCKY TO RECOVER THE COST OF CELL 2 CONSTRUCTIN THROUGH RIDER ESM?

A. The ESM is authorized by KRS 278.183(1), which provides in relevant part:

> a utility shall be entitled to the current recovery of its costs of complying with the Federal Clean Air Act as amended and those federal, state, or local environmental requirements which apply to coal combustion wastes and by-products from facilities utilized for production of energy from coal in accordance with the utility's compliance plan as designated in subsection.

The statute goes on to state:

> Recovery of costs pursuant to subsection (1) of this section that are not already included in existing rates shall be by environmental surcharge to existing rates imposed as a positive or negative adjustment to customer bills in the second month following the month in which costs are incurred.

As more fully explained by the Company's application and the direct testimony of Messer's Renner, Deller and Ms. Jett, the construction of Cell 2 is necessary for the Company's East Bend Station to continue to comply with both state and federal environmental regulations. As Mr. Deller explains, the Company anticipates pre-construction activities to commence in December 2018 or early 2019 with actual construction commencing in the spring of 2019. These costs were not contemplated as part of the Company's recent electric base rate case, as the Company did not request approval and has not yet received Commission approval for the CPCN. Indeed, the Company only recently completed the engineering drawings for Cell 2 construction. As a result, none of the costs for construction of Cell 2 are currently reflected in the Company's base rates. Therefore, the costs of Cell 2 are appropriate for eventual recovery through the ESM.

Q. WHAT ARE THE ESTIMATED COSTS OF CONSTRUCTING THE WEST LANDFILL CELL 2?

A. As Mr. Deller explains, the estimated cost of Cell 2 construction is approximately $23.3 million.

Q. ARE THERE ANY OPERATIONS AND MAINTENANCE COSTS (O&M) FOR CELL 2 TO BE RECOVERED THROUGH RIDER ESM?

A. No. As explained in the testimony of Mr. Deller, O&M costs related to Cell 2 are expected be similar to costs incurred and reflected in base rates for Cell 1. They are not distinguishable once Cell 2 is placed into service and Cell 1 is replaced.

Q. HAS DUKE ENERGY KENTUCKY ESTIMATED THE IMPACT OF CELL 2 CONSTRUCTION ON RIDER ESM?

A. Yes. The table below shows the estimated annual impact on Total E(m), Jurisdictional E(m), and the incremental billing factors for Residential and Non-Residential customers associated with the Cell 2 project. As shown in the table, the estimated impact is an increase of .02% for residential and non-residential customers initially in 2018 and increasing to a maximum of .83% in 2020. For Residential customers using an average of 919 kWh per month, the initial monthly increase is expected to be $.02 for the expense month December 2018 first billed in in February of 2019, upon approval by the Commission. It is estimated that this amount will increase to a maximum of $0.75 per month by 2020. The table below provides the monthly bill impact on all Non-Residential customer rate schedules. Attachment SEL-1 shows the detailed calculation of the estimated annual impact on the environmental surcharge for 2018 through 2020.

These estimated bill impacts for Cell 2 construction reflect changes resulting from the Tax Cuts and Jobs Act, namely the reduction in the corporate income tax rate from 35% to 21% and the elimination of bonus tax depreciation for utilities beginning in 2018.

Landfill Cell 2	**2018**	**2019**	**2020**
Total E(m)	$73,936	$2,041,703	$2,657,953
Jurisdictional Allocation	96.62%	96.62%	96.62%
Jurisdictional E(m)	$71,437	$1,972,693	$2,568,097
Incremental Billing Factor: Residential	0.0232%	0.6409%	0.8344%
Residential Customer Bill Impact Monthly bill (919 kWh per month)	$0.02	$0.58	$0.75
Incremental Billing Factor: Non-residential	0.0232%	0.6408%	0.8342%
Bill Impact for Non-residential Rate Schedules:			
Distribution Service Secondary (Rate DS) Monthly bill (40KW; 14,000 kWh per month)	$0.29	$7.96	$10.36
Distribution Service Primary (Rate DP) Monthly bill (400KW; 140,000 kWh per month)	$2.69	$74.42	$96.89
Time of Day Distribution (Rate DT) Monthly bill (500KW; 200,000 kWh per month)	$4.53	$125.06	$162.81
Time of Day Transmission (Rate TT) Monthly bill (10,000 KW; 4,000,000 kWh per month)	$65.50	$1,809.19	$2,355.22
Electric Space Heating (Rate EH) Monthly bill (20,000 kWh per month)	$0.35	$9.52	$12.39
Seasonal Sports (Rate SP) Monthly bill (10,000 kWh per month)	$0.25	$6.94	$9.03
General Service Small Fixed Loads (Rate GSFL) Monthly bill (5KW; 3,500 kWh per month)	$0.38	$10.44	$13.58
Lighting Rates (SL, TL, UOLS, NUS, SC, SE, LED) Monthly bill (Rate TL at 800 kWh per month)	$0.01	$0.35	$0.46

Q. WHAT RETURN ON EQUITY IS DUKE ENERGY KENTUCKY REQUESTING IN THIS PROCEEDING?

A. Duke Energy Kentucky is proposing to use the 9.725 percent Return on Equity (ROE) that was recently established by the Commission in the Company's electric base rate case as part of the Commission's April 13, 2018 Order in Case No. 2017-00321. As this rate was recently established and was supported by a full cost of equity analysis, the Company believes it is reasonable to continue using this ROE.

III. CONCLUSION

Q. WAS ATTACHMENT SEL-1 PREPARED BY YOU AND UNDER YOUR DIRECTION AND CONTROL?

A. Yes.

Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?

A. Yes.

VERIFICATION

STATE OF OHIO)
) **SS:**
COUNTY OF HAMILTON)

The undersigned, Sarah E. Lawler, Director of Rates & Regulatory Planning, being duly sworn, deposes and says that she has personal knowledge of the matters set forth in the foregoing testimony and that it is true and correct to the best of her knowledge, information and belief.

Sarah E. Lawler, Affiant

Subscribed and sworn to before me by Sarah E. Lawler on this 15th day of June, 2018.

NOTARY PUBLIC

ADELE M. FRISCH
Notary Public, State of Ohio
My Commission Expires 01-05-2019

My Commission Expires: 1/5/2019

Duke Energy Kentucky, Inc.
Estimated Revenue Requirement for Rider ESM - Landfill Cell 2

Line No.		Source	Environmental Compliance Plans 2018	2019	2020
1	Eligible Environmental Compliance Plant (Gross Plant)	Page 2	$ -		$ 23,324,212
2	Eligible Environmental Compliance CWIP Excluding AFUDC	Page 2	$748,838	$ 20,678,823	$ -
3	Subtotal	(1) + (2)	$ 748,838	$ 20,678,823	$ 23,324,212
4	Deductions:				
5	Accumulated Depreciation on Eligible Environmental Compliance Plant	Page 2	$ -	$ -	$388,737
6	Accumulated Deferred Income Taxes on Eligible Environmental Compliance Plant	Page 2	-	-	$10,204
7	Accumulated Deferred Investment Tax Credits (ITC) on Eligible Environmental Compliance Plant		-	-	-
8	Subtotal	(5) + (6) + (7)	$ -	$ -	$ 398,941
9	Environmental Compliance Rate Base	(3) - (8)	$ 748,838	$ 20,678,823	$ 22,925,271
10	Pretax Rate of Return (ROR)	ES Form 1.20 [1]	8.446%	8.446%	8.446%
11	Return on the Environmental Compliance Rate Base (RORB)	(9) x (10)	$ 63,247	$ 1,746,533	$ 1,936,268
12	Environmental Operating Expenses (OE)				
13	Monthly Depreciation Expense	Page 2	$ -	$ -	$388,737
14	Monthly Taxes Other Than Income Taxes	(3) * 1.4274%	10,689	295,170	332,930
15	Subtotal	(13) + (14)	$ 10,689	$ 295,170	$ 721,667
16	Sub-Total E(m)	(11) + (15)	$ 73,936	$ 2,041,703	$ 2,657,935
17	Jurisdictional Allocation as of April 30, 2018	ES Form 1.10 [1]	96.62%	96.62%	96.62%
18	Jurisdictional E(m)	(16) x (17)	$ 71,437	$ 1,972,693	$ 2,568,097
	Allocation of Estimated Annual Revenue Requirement [1]				
19	Estimated Annual Revenue Requirement		$ 71,437	$ 1,972,693	$ 2,568,097
20	Residential	41.19%	$ 29,425	$ 812,552	$ 1,057,799
21	Non-Residential	58.81%	$ 42,012	$ 1,160,141	$ 1,510,298
	Total Revenues for the twelve months ended April 30, 2018	ES Form 3.00 [1]	$ 307,816,935	$ 307,816,935	$ 307,816,935
22	Residential	ES Form 3.00 [1]	$ 126,777,213	$ 126,777,213	$ 126,777,213
23	Non-Residential	ES Form 3.00 [1]	$ 181,039,722	$ 181,039,722	$ 181,039,722
	Estimated Percentage Increase				
24	Residential	(20) / (22)	0.0232%	0.6409%	0.8344%
25	Non-Residential	(21 / (23)	0.0232%	0.6408%	0.8342%

[1] From Expense Month April ESM filing.

Duke Energy Kentucky, Inc.
Estimated Revenue Requirement for Rider ESM - Landfill Cell 2 (Assumptions and Details of Calculations)

Project	Annual Spend (Capital) 2018	2019	2020	2021	2022	2023	2024	2025
Landfill Cell 2 Construction	$748,838	$19,929,985	$2,645,389	$0	$0	$0	$0	$0
Cumulative Gross Plant	748,838	20,678,823	23,324,212	23,324,212	23,324,212	23,324,212	23,324,212	23,324,212
Depreciation Expense	-	-	388,737	583,105	583,105	583,105	583,105	583,105
Accumulated Depreciation	$0	$0	($388,737)	($971,842)	($1,554,947)	($2,138,053)	($2,721,158)	($3,304,263)
Accumulated Deferred Income Tax	$0	$0	($10,204)	($68,002)	($119,040)	($163,563)	($201,817)	($234,047)

Capital in service May 1, 2020

	Book Life	Tax Life
Landfill Cell 2 Construction	40.0	40.0

		40 Yr MACRS	Tax Depreciation 2018 Capital	2019 Capital	2020 Capital	2021 Capital	2022 Capital	Total Tax Depr	Book Depreciation	ADIT
2018								-	-	-
2019								-	-	-
2020	1	1.9%			437,329			437,329	388,737	10,204
2021	2	3.7%			858,331	-		858,331	583,105	68,002
2022	3	3.5%			826,144	-	-	826,144	583,105	119,040
2023	4	3.4%			795,122	-	-	795,122	583,105	163,563
2024	5	3.3%			765,267	-	-	765,267	583,105	201,817
2025	6	3.2%			736,579	-	-	736,579	583,105	234,047
2026	7	3.0%			709,056	-	-	709,056	583,105	260,496
2027	8	2.9%			682,466	-	-	682,466	583,105	281,362
2028	9	2.8%			656,810	-	-	656,810	583,105	296,840
2029	10	2.7%			632,086	-	-	632,086	583,105	307,126
2030	11	2.6%			608,529	-	-	608,529	583,105	312,465
2031	12	2.5%			585,671	-	-	585,671	583,105	313,004
2032	13	2.4%			563,746	-	-	563,746	583,105	308,939
2033	14	2.3%			542,521	-	-	542,521	583,105	300,416
2034	15	2.3%			525,494	-	-	525,494	583,105	288,318
2035	16	2.3%			525,494	-	-	525,494	583,105	276,219
2036	17	2.3%			525,494	-	-	525,494	583,105	264,121
2037	18	2.3%			525,494		-	525,494	583,105	252,023
2038	19	2.3%			525,494			525,494	583,105	239,925
2039	20	2.3%			525,494			525,494	583,105	227,826
2040	21	2.3%			525,494			525,494	583,105	215,728
2041	22	2.3%			525,494			525,494	583,105	203,630
2042	23	2.3%			525,494			525,494	583,105	191,531
2043	24	2.3%			525,494			525,494	583,105	179,433
2044	25	2.3%			525,494			525,494	583,105	167,335
2045	26	2.3%			525,494			525,494	583,105	155,237
2046	27	2.3%			525,494			525,494	583,105	143,138
2047	28	2.3%			525,494			525,494	583,105	131,040
2048	29	2.3%			525,494			525,494	583,105	118,942
2049	30	2.3%			525,494			525,494	583,105	106,844
2050	31	2.3%			525,494			525,494	583,105	94,745
2051	32	2.3%			525,494			525,494	583,105	82,647
2052	33	2.3%			525,261			525,261	583,105	70,500
2053	34	2.3%			525,494			525,494	583,105	58,401
2054	35	2.3%			525,261			525,261	583,105	46,254
2055	36	2.3%			525,494			525,494	583,105	34,156
2056	37	2.3%			525,261			525,261	583,105	22,009
2057	38	2.3%			525,494			525,494	583,105	9,910
2058	39	2.3%			525,261			525,261	583,105	(2,237)
2059	40	2.3%			525,494			525,494	583,105	(14,335)
2060	41	1.1%			262,631			262,631	194,368	(0)
								23,324,212	23,324,212	