ORDER NO. 89805

In the Matter of The Maryland Energy Storage Pilot Program	* * * * * * * *	BEFORE THE PUBLIC SERVICE COMMISSION OF MARYLAND Case No. 9619

Issue Date: April 21, 2021

ORDER ON ENERGY STORAGE PILOT PROPOSALS OF POTOMAC EDISON

1. On April 15, 2020, The Potomac Edison Company ("Potomac Edison") filed an application for two energy storage pilot programs. On November 6, 2020, the Commission denied one of Potomac Edison's programs (the "Little Orleans Proposal") at Potomac Edison's request, and deferred consideration of the other (the "Town Hill Proposal").[1] On February 5, 2021, Potomac Edison filed a replacement pilot proposal (the "Urbana Proposal"), in place of the Little Orleans Proposal.[2]

2. On March 30, 2021, the Commission approved the Town Hill Proposal, with conditions, and stated that a further explanatory order would follow.[3] The Commission now also approves the Urbana Proposal, subject to the conditions discussed below.

[1] Order No. 89664. That Order also approved, with modification, six energy storage projects proposed by Baltimore Gas and Electric Company, Potomac Electric Power Company, and Delmarva Power and Light Company.
[2] Maillog No. 233685.
[3] Maillog No. 234407.

Background

3. In 2019, the Maryland General Assembly amended *Annotated Code of Maryland*, Public Utilities Article ("PUA") § 7-216, requiring the Commission to establish an energy storage pilot program wherein each investor-owned electric utility ("IOU") operating in Maryland would propose two energy storage projects, to be owned and operated under two of four possible frameworks: (1) utility-owned and operated; (2) utility-owned and third party operated; (3) third-party owned and operated; and (4) virtual power plant.

4. On August 23, 2019, the Commission issued Order No. 89240 initiating the Energy Storage Pilot Program (the "Pilot") and also directing the Commission's existing Energy Storage Working Group (the "Working Group") to propose metrics on environmental and clean energy objectives and impacts on the retail energy market, and to propose a list of the types of value streams each project application should consider. On December 31, 2019, the Working Group filed its report on proposed metrics and value streams.[4]

5. On April 15, 2020, Potomac Edison filed an application for two battery energy storage systems ("BESS") projects within its service area (the "Little Orleans" and "Town Hill" Proposals).[5] Also on April 15, 2020, Baltimore Gas and Electric Company, Potomac Electric Power Company, and Delmarva Power & Light Company (collectively, the "Exelon Companies") each filed applications for two BESS within each of their respective service areas.[6]

[4] Maillog No. 228020.
[5] Maillog No. 229737.
[6] Maillog No. 229744 ("Exelon Companies Application").

6. On July 7, 2020, Potomac Edison filed an amended application, withdrawing its Little Orleans proposal and revising its Town Hill proposal based on the stakeholder feedback it had received.[7] Both Commission Staff ("Staff")[8] and the Maryland Office of People's Counsel ("OPC")[9] filed comments to that amended application. The Commission also received general comments from other stakeholders.

7. On July 13, 2020, the Commission held a legislative-style hearing to review the proposals.[10] As part of that hearing, the Commission addressed the six Exelon Companies' projects, but ultimately deferred consideration of the Potomac Edison projects so both projects could be considered together at a later date.[11]

8. On September 15, 2020, Potomac Edison filed a notice asking that the Commission reject its Little Orleans proposal and that it would look to develop another project for consideration by the Commission.[12]

9. On November 6, 2020, the Commission approved, with conditions, the Exelon Companies' projects, addressed the general concerns raised by stakeholders,[13] denied the Little Orleans Proposal, and deferred consideration of the Town Hill Proposal.[14]

10. On February 5, 2021, Potomac Edison filed a replacement pilot proposal (the "Urbana Proposal"), in place of the Little Orleans Proposal.[15] The Commission issued

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[7] Maillog No. 231036 ("PE Amended Application").
[8] Maillog No. 230825, corrected with errata at Maillog No. 231084 ("Staff First Comment").
[9] Maillog No. 230823, corrected with errata at Maillog No. 230837 ("OPC First Comment").
[10] Citations to the transcript from that hearing appear throughout as "Hearing Transcript."
[11] Hearing Transcript at 138-139, 145-146.
[12] Maillog No. 231846.
[13] This Order will not re-examine those issues but will instead focus on project-specific concerns for the two Potomac Edison proposals.
[14] Order No. 89664. Maillog No. 232509, reissued with errata as Maillog No. 232573.
[15] Maillog No. 233685 ("PE Second Application").

notice and received stakeholder comments regarding the Urbana Proposal from Staff[16] and OPC.[17]

11. On March 24, 2021, the Commission held a legislative-style hearing to consider Potomac Edison's applications. Also at the hearing, Potomac Edison stated that it had no objections to the general conditions[18] set by the Commission in its November 6, 2020 approval of the six energy storage projects proposed by the Exelon Companies.

12. On March 30, 2021, the Commission approved the Town Hill Proposal, subject (where applicable) to the general conditions included in Order No. 89664 and also contingent on the final contract between Potomac Edison and Convergent (the project developer with whom Potomac Edison is partnering on the Town Hill project) being consistent with the representations made by Convergent at the March 24 hearing, discussed below. In that Order, the Commission stated that a subsequent order addressing the Town Hill and Urbana Proposals in greater detail, and potentially including further modifications beyond those contained in that Order, would follow.

1. Proposed Energy Storage Project #1: Potomac Edison's Town Hill Proposal

13. Potomac Edison's first proposed project is a third-party owned and operated BESS located on the Town Hill circuit and located at 35702 National Pike in Little

[16] Maillog No. 234272 ("Staff Second Comment").
[17] Maillog No. 234273 ("OPC Second Comment").
[18] Order No. 89664 addressed nine general topics (contingency projections; PJM market participation; recovery of operating and maintenance (O&M) costs; cost allocation; emissions management and tracking; decommissioning, safety, and fire prevention; data collection metrics; proposals to extend the pilot; and utility compliance with state and local laws) applicable to all projects.

Orleans, Maryland.[19] The Town Hill Proposal calls for a BESS capable of 1.75 MW and 8.4 MWh.[20]

14. The primary goal of the Town Hill Proposal is to enhance reliability, with the secondary benefit of providing Potomac Edison with experience in engineering and operating storage assets as a reliability solution.[21] The Town Hill circuit is located in a rural area and has suffered from challenging tree-related reliability issues, and tree trimming measures are not expected to be sufficient to fully improve reliability across the circuit. In order to improve reliability, the Town Hill Proposal is a battery solution that offers islanding capability, to provide power to customers within the circuit in the event of loss of power at the Hancock substation or a fault on the line. The Proposal is offered as an alternative to building a connection to another circuit, for which Potomac Edison has developed two alternative plans, the costs of which are estimated at $1.9 and $2.06 million.[22]

15. Under the provisional agreement with Convergent, Potomac Edison has the ability to reserve the system (and charge it to full capacity) for up to 20 days during each calendar year, which Potomac Edison expects to be sufficient to cover all high-risk days based on historical weather and outages.[23] In the event of an outage on a day not identified as high-risk, the system will still operate to isolate and restore service to affected customers, but potentially with less than full capacity.

[19] PE Amended Application at 4.
[20] *Id*. at 4-5.
[21] *Id*. at 5.
[22] *Id*. at 6-7.
[23] *Id*. at 7-8.

16. Although the project is expected to participate in PJM wholesale markets, any revenues will not accrue directly to Potomac Edison or its customers, but they will serve to lower the annual contract price.[24] All market risk remains with the contractor, Convergent.

17. Potomac Edison estimates a total cost of the project of $5.55 million over a 10-year period.[25] Potomac Edison also foresees that the project will produce quantifiable benefits equal to approximately $3.5 million, based on the metrics developed by the PC44 energy storage working group.[26]

18. Potomac Edison proposes to establish a regulatory asset for all pilot costs incurred, including all operating and maintenance ("O&M") expenses, a return on any Potomac Edison capital investment (at the authorized rate of return, based on a 15-year depreciable life for energy storage facilities and the Commission-approved rate for other facilities), and related property taxes.[27] Potomac Edison proposes that the regulatory asset will be incorporated into its rate base in the company's next base rate proceeding, and thereafter earn a return at the authorized rate of return.[28] Potomac Edison proposes that the amortization period for the regulatory asset will be five years.[29]

a. Staff Comment

19. Staff disagrees with certain of Potomac Edison's estimates of the value of the Town Hill Proposal, such as the value of deferred distribution investments, avoided outage benefits, and the inclusion as a benefit of the difference in value between the cost

[24] *Id*. at 8.
[25] *Id*. at 10.
[26] *Id*.
[27] *Id*. at 12-14; PE Second Application at 14.
[28] PE Amended Application at 15.
[29] *Id*. at 15; PE Second Application at 14.

of the storage asset and the depreciated value at year 10.[30] Staff assumes in its analysis that the entire cost of the storage unit will be amortized over 15 years and collected from customers.[31]

20. Staff also questions Potomac Edison's estimates of emissions reductions, though it withholds judgment and states that the storage's usage profile will ultimately determine any actual emissions increase or reduction.[32]

21. Staff estimates a total cost of the Town Hill Proposal of approximately $3.6 million[33] and finds a likely range of the ratio of benefits-to-costs for the Town Hill Proposal of 0.28 - 0.45.[34]

22. Staff recommends that, given the low benefit-to-cost ratio, the Commission could choose to reject the project, but also notes that the Commission could approve the project to study islanding and to improve the reliability within the affected feeder.[35]

23. Staff does not oppose Potomac Edison's cost recovery proposal but recommends an amortization period of 15 years and requests that each project in the regulatory asset be tracked separately for investments, expenses, and savings associated with the specific project.[36]

24. Staff argues that Potomac Edison's application does not justify the storage project operations that would enable the benefit streams claimed.[37] Staff recommends that the

[30] Staff First Comment at 21-22.
[31] *Id*. at 22.
[32] *Id*. at 25.
[33] *Id*. at 53.
[34] *Id*. at 22.
[35] *Id*.
[36] *Id*. at 73.
[37] *Id*. at 83.

Commission require Potomac Edison to submit plans for how it will claim peak energy and capacity benefits.

25. Staff recommends that the Commission require Potomac Edison and Convergent to agree that Potomac Edison can reserve the project for 30 days more than originally proposed.[38] At the March 24, 2021 hearing, a representative of Convergent stated that its intention is to make the facility available to Potomac Edison for 50 days each year, which Staff agreed to.

b. OPC Comment

26. OPC argues that Potomac Edison made errors in its quantification of benefits. First, OPC states that, contrary to the recommendations of the Working Group, Potomac Edison does not use the values for peak versus non-peak energy used in the analysis of EmPOWER Maryland programs, instead using one-year of PJM locational marginal pricing data to support an "unreasonably high" peak price and an "unreasonably low" off-peak price.[39] Second, OPC states that Potomac Edison erroneously includes deferral value in its benefits calculation even though Potomac Edison has not determined when the traditional deferred projects would have begun, and OPC further states that Potomac Edison's deferral value calculation is flawed because it does not use the net-present value of the deferred projects' full revenue requirements.[40] Third, OPC states that Potomac Edison uses a low peak shaving value of $1.5/kW-month to perform its peak shaving value calculation, resulting in undervaluing the peak shaving benefit, and also fails to

[38] Staff Second Comment at 5-6.
[39] OPC First Comment at 2.
[40] *Id*. at 2.

take the present value of the stream of annual peak shaving values.[41] Fourth, OPC states that Potomac Edison makes an error in calculating PJM reserve market revenues.[42]

27. OPC also argues that Potomac Edison overstates the qualitative benefits of the Town Hill Proposal.[43] OPC criticizes Potomac Edison's claimed kW hosting capacity and notes that Potomac Edison anticipates only a "relatively minor" amount of solar installed on the circuit over the next 10 years.[44] OPC also criticizes Potomac Edison's claimed benefits from frequency regulation, voltage support, and hosting capacity, stating that Potomac Edison provides no commitment from either it or its third-party vendor to provide such benefits.[45]

28. OPC also argues that Potomac Edison makes errors in its assessment of the environmental impact of the Proposal.[46] OPC states that Potomac Edison did not follow the Working Group's recommended methodology when it calculated the amount of CO_2 the Proposal will displace, resulting in a substantial inflation of benefits.[47]

29. OPC estimates that the Town Hill Proposal will have a benefit-to-costs ratio of either 0.273 (if deferral values are not considered, which OPC recommends) or 0.65 (if deferral values are considered).[48] OPC also questioned the educational value of the Town Hill Proposal for Potomac Edison, given that it will be third-party owned and operated.[49]

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[41] *Id*. at 2-3.
[42] *Id*. at 3. "PJM" refers to PJM Interconnection, LLC, which is the Federal Energy Regulatory Commission (FERC)-regulated Regional Transmission Operator in which energy is delivered and transmitted throughout Maryland and surrounding states.
[43] OPC First Comment at 3.
[44] *Id*.
[45] *Id*.
[46] *Id*.
[47] *Id*.
[48] *Id*.
[49] *Id*.

30. Ultimately, OPC recommends that the Commission reject the Town Hill Proposal.[50]

2. Proposed Energy Storage Project #2: Potomac Edison's Urbana Proposal

31. Potomac Edison's second proposed project is a utility-owned and operated 0.5 MW BESS, to be sited at the same location as an EV DC Fast Charging ("DCFC") station at the Urbana Park & Ride parking lot, owned by the Maryland Department of Transportation.[51] The DCFC station would also be owned and operated by Potomac Edison, under the electric vehicle charging pilot approved in Case No. 9478. The BESS would provide 1,000 kWh during a two-hour discharge period, providing approximately eight hours of uninterrupted DCFC EV charging at a charging rate of 125 kW, and require 4.8 hours to charge to full capacity.[52]

32. Potomac Edison states that it selected the Urbana project, in part, to help address the lack of information available regarding the interplay between DCFC and BESS, including the availability of public EV charging during a distribution outage via islanding capability.[53] Potomac Edison also intends to use the BESS for demand management, frequency regulation, and energy arbitrage (via PJM markets), and revenues earned will offset the overall costs of the BESS.[54]

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[50] OPC First Comment at 3-4.

[51] PE Second Application at 2, 6. At the time of application, Potomac Edison was actively working to finalize a formal agreement with the Maryland Department of Transportation to use space at the Urbana Park & Ride.

[52] PE Second Application at 5.

[53] *Id*. at 3-4.

[54] *Id*. at 3, 9.

33. Potomac Edison estimates the cost of the Urbana Proposal at approximately $1.1 million for capital costs and another $1 million of O&M costs through December 2036, including a 25% contingency.[55]

34. Potomac Edison estimates quantifiable benefits of $305,626, including: air emissions reductions; public health adverse-impact reductions; peak shaving; EV charging payments; energy arbitrage; PJM markets; and reliability.[56] Potomac Edison also estimates that the project will produce unquantifiable benefits that "should more than outweigh the program costs."[57]

35. Potomac Edison estimates that the project will be operational no later than the end of February 2022.[58]

a. Staff Comment

36. Staff raises several concerns with Potomac Edison's valuation of certain benefit streams. Staff disagrees with Potomac Edison's valuation of the benefit stream from EV charger payments, which Staff feels is double counted as avoided peak and avoided peak energy benefits.[59] Staff also recommends excluding public health benefits because it is concerned the assumptions may not readily translate into the analysis at this time.[60] With those benefit streams removed, Staff finds that the Urbana Project has a benefit-to-cost ratio of less than 0.1.[61] Staff also modified Potomac Edison's analysis to reflect a capacity degradation rate of two percent and a higher starting capacity value, and to

[55] *Id*. at 6, 10.
[56] *Id*. at 11-12.
[57] *Id*. at 12.
[58] *Id*. at 7.
[59] Staff Second Comment at 3, 7.
[60] *Id*. at 3.
[61] *Id*.

reflect an assumed operating life of 15 years.[62] Staff also adjusted its analysis based on concerns with Potomac Edison's estimates of emissions reductions for the Urbana Proposal, which Staff found inconsistent with the operations of the frequency regulation market.[63] Staff also adjusted the analysis to reflect losses due to round trip efficiency.[64]

37. Staff also notes what it argues are differences in how Potomac Edison valued PJM market revenues in its Town Hill and Urbana Proposals, which Staff submits have a material impact on the cost effectiveness of the Urbana Proposal.[65] Staff states that if the Urbana Proposal was supported by comparable PJM market revenue projections to those in the Town Hill Proposal, then the Urbana Proposal might be similar in cost effectiveness to the other energy storage projects already approved by the Commission in this case.[66]

38. Staff also states that the current reliability metrics indicate that the Urbana Proposal may provide limited reliability and resiliency benefits today, though they could improve if the State moves toward greater use of electric vehicles.[67] Staff also notes that the Urbana Proposal does not defer any distribution upgrades.[68]

39. If the Commission approves the Urbana Proposal, Staff recommends that the Commission should require Potomac Edison to document in its annual report how storage operations were optimized between market and EV charging usage.[69] Staff also

[62] *Id*. at 10.
[63] *Id*. at 11-12.
[64] *Id*. at 11.
[65] *Id*. at 7, 22-24.
[66] *Id*. Comment at 9.
[67] *Id*. at 8-9.
[68] *Id*. at 14.
[69] *Id*. at 6.

recommends that the study parameters for the pilot should be constructed to appropriately measure the impact on benefits of increasing use of electric vehicles. Staff also recommends that Potomac Edison either submit a revised PJM market revenue study for the Urbana project or confirm they continue to support its PJM market revenue analysis.[70]

40. Staff also advocates adopting a recommendation from the Joint Exelon Utilities Emissions tracking proposal, filed February 1, 2021,[71] that proposed to track emissions for losses due to round trip losses when a storage unit is participating in the regulation market.[72] Staff proposes to add this to the tracking of public health benefits.

41. Staff states that the Urbana project would provide lessons learned regarding the ability of EV charging and BESS to interact and offer uninterrupted EV charging, peak shaving, and energy cost savings, while minimizing the impacts of EV charging demand spikes on the local distribution system infrastructure.[73]

b. OPC Comment

42. OPC states that it has significant concerns with the low benefit-to-cost ratio of the Urbana Proposal.[74] After several adjustments, discussed below, OPC calculates the present value benefit-to-cost ratio as 0.07.[75] OPC states that the low benefit-to-cost ratio casts doubt on whether the project is in the ratepayer interest.[76]

[70] *Id*. at 9.
[71] Maillog No. 233601.
[72] Staff Second Comment at 12.
[73] *Id*. at 31.
[74] OPC Second Comment at 2, 6-7.
[75] *Id*. at 10.
[76] *Id*. at 7.

43. OPC also questions whether the project will achieve its goal of peak-shaving the total EV charging demand, noting that on-peak charging at Potomac Edison's other EV charging stations only took place during 11 to 13 percent of days.[77]

44. OPC estimates that the Urbana Proposal will, as a result of round-trip efficiency losses, result in a substantial increase in carbon dioxide emissions which OPC estimates at 1.1 tons of increased carbon dioxide emissions in the first year of operation.[78] OPC submits that Potomac Edison improperly claims emissions benefits during periods when the project is participating in PJM's RegD market, during which OPC states the project will likely result in increased emissions.[79]

45. Like Staff, OPC also challenges Potomac Edison's inclusion of EV charger payments as a benefit.[80] OPC states that there would be no new charging at the EV chargers caused by the BESS, so this project would not create new revenue, though it raises questions of rate impacts as to how payments from charging flow back to customers.

46. OPC also questions the value of the learning opportunities claimed by Potomac Edison for the Urbana Proposal, stating that Potomac Edison has not established that it will be possible for commercial DC fast charging operators to replicate this business model, particularly regarding its participation in PJM wholesale market services.[81]

[77] *Id*. at 9.
[78] *Id*. at 2-6.
[79] *Id*. at 6.
[80] *Id*. at 9.
[81] *Id*. at 2.

47. OPC acknowledges that the Urbana project will provide learning opportunities but otherwise states that Potomac Edison has failed to establish any additional qualitative benefits.[82]

48. Based on these concerns, OPC recommends that the Commission reject the Urbana Proposal.[83]

Commission Decision

49. PUA § 7-216(h)(ii) provides that the "Commission shall approve, approve with modifications, or reject an application submitted under subsection (d) of this section after: (1) receiving comments from the Maryland Energy Administration, the Office of People's Counsel, and other stakeholders and holding a hearing; (2) considering the projected costs and benefits of the projects proposed for inclusion in the Pilot program; and (3) determining whether the project is in the public and ratepayer interest."

50. The Commission has received the required stakeholder comments and held public hearings on July 13, 2020 and March 24, 2021. The Commission has also considered the competing arguments on the costs and benefits of the individual project proposals. Based on the considerations required under PUA § 7-216, the Commission finds that the two Potomac Edison projects are in the public and ratepayer interest and are approved, subject to the conditions below.[84]

51. The Commission notes, as in the concerns raised by some stakeholders, that these two projects might not be immediately cost-effective, although the value of some benefits remains unquantified.

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[82] *Id*. at 10-11.
[83] *Id*. at 2.
[84] Chairman Stanek and Commissioner Herman Dissent with respect to the approval of the Urbana Proposal. Their partial dissent is appended to this Order.

52. As the Commission also noted in approving the six Exelon projects, this pilot program's value to both ratepayers and the public will come primarily from the lessons learned by utilities, stakeholders, and the Commission, and which will later be relied on in making future investment decisions. Toward that end, the Commission notes that, while the approved Exelon projects already satisfy all four ownership models anticipated by PUA § 7-216, the Potomac Edison projects appear well conceived to produce valuable additional data and experience which will form the foundation for the next phase of utility-scale energy storage in Maryland.

53. The Commission also notes that the Urbana project, although not cost effective, will be part of an EV charger system along a major thoroughfare and will help test a new model for handling distribution demand requirements for EV charging. Although OPC has expressed skepticism about the replicability of that model, the Commission is tasked with maintaining the reliability of the electricity distribution grid during the State's transition – as part of its effort to meet the State's greenhouse gas reduction initiatives – to the use of non-gasoline-powered vehicles, and the Commission is less skeptical than OPC about the possibility for future collaboration between developers of EV charging stations and the utilities that will be called on to adapt to meet the associated increases in grid demand.[85]

[85] *See Md. Code Ann.*, Environment Article, § 2-1201, *et seq. See also* Commission Order No. 88997, Case No. 9478, granting in part the petition of the Electric Vehicle Work Group for implementation of a statewide electric vehicle portfolio.

54. In its November 6, 2020 Order approving the Exelon projects, the Commission also addressed common issues,[86] some of which resulted in the Commission setting conditions for project approval for each of the Exelon projects. Potomac Edison has agreed to those conditions, and the Commission finds that they remain appropriate and, where applicable, shall continue for the projects approved in this Order. Some of those conditions required the utility to make filings by specific dates. For both projects approved in this Order, the applicable filings shall be made with the Commission by August 1, 2021.

IT IS THEREFORE, this 21st day of April, in the year of Two Thousand Twenty-One, by the Public Service Commission of Maryland,

ORDERED: The energy storage Pilot projects proposed by the Potomac Edison Company are approved, subject to the conditions contained in this order and Order 89664.

/s/ Jason M. Stanek

/s/ Michael T. Richard

/s/ Anthony J. O'Donnell

/s/ Odogwu Obi Linton

/s/ Mindy L. Herman
Commissioners

[86] (1) Contingency funding; (2) PJM market participation; (3) recovery of O&M costs for third-party owned projects; (4) cost allocation; (5) emissions management and tracking; (6) decommissioning, safety, and fire protection; (7) data collection metrics; (8) extension of the pilot; and (9) compliance with state and local requirements.

Partial Dissent of Chairman Jason M. Stanek and Commissioner Mindy L. Herman

We dissent from the majority with respect to its approval of Potomac Edison's proposal to develop a 500 kW storage project at a park-and-ride location in Urbana, Maryland. While the utility deserves credit for developing an innovative proposal to pair and co-locate a lithium-ion battery with an electric vehicle DC fast charger, the potential benefits, when compared against the costs, is concerning. Although there is no requirement for a battery storage proposal to be cost effective under this pilot program, it appears unlikely that the costs to develop, operate, and maintain the project will be offset by the projected benefit streams, some of which are admittedly unquantifiable. Moreover, there is evidence that emissions may be increased, not decreased, by the installation of the battery. While there will undoubtedly be learning opportunities that come from this project, especially as electric vehicles begin to replace combustion engine vehicles in the coming years, at this time, with a projected cost-effectiveness ratio at or near zero, we do not find that spending several million dollars in ratepayer funds to develop this project is in the public interest.

/s/ Jason M. Stanek
Chairman

/s/ Mindy L. Herman
Commissioner