BEFORE THE MARYLAND DEPARTMENT OF THE ENVIRONMENT

CONSTELLATION ENERGY GENERATION, LLC 1310 Point Street Baltimore, MD 21231	FERC Project No. P-405 MDE WSA Application No. 17-WQC-02

SUPPLEMENTAL SUBMISSION OF CONSTELLATION ENERGY GENERATION, LLC IN SUPPORT OF PETITION FOR RECONSIDERATION AND ADMINISTRATIVE APPEAL

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EXECUTIVE SUMMARY

Constellation Energy Generation, LLC, successor to Exelon Generation Company, LLC, provides this supplemental submission in support of its petition for reconsideration of MDE's 2018 water quality certification for the Conowingo Hydroelectric Project under § 401 of the Clean Water Act. Along with numerous other benefits, Conowingo is a vital part of Maryland's clean energy infrastructure, providing Maryland's largest source of renewable energy and avoiding 867,000 metric tons of greenhouse gas emissions every year.

MDE's 2018 certification imposed far more than $8.0 billion in compliance costs on Conowingo, rendering the facility uneconomic and unable to operate on those terms. Constellation asked MDE to reconsider the certification based on both factual and legal grounds, as MDE's regulations allow. Constellation also challenged the 2018 certification in federal and state court and at FERC. A Maryland court directed the parties to mediation, and Constellation and MDE negotiated a comprehensive settlement. Under the settlement, Constellation agreed to incur a total of more than $200 million in costs, including obligations to make significant changes to Conowingo's operations and to make more than $60 million in payments to Maryland to support Chesapeake Bay restoration efforts; Constellation also agreed to withdraw all challenges to Maryland's right to obtain these benefits. MDE heralded the settlement as "a comprehensive, holistic approach that will accelerate environmental improvements related to the Conowingo Project and improve water quality and aquatic habitat in the Susquehanna River and Chesapeake Bay."[1]

FERC accepted the settlement and issued a new license for Conowingo. A court vacated the license on appeal, without addressing the merits of the settlement or its impact on water quality,

[1] Citations are provided in the body of the submission.

on the narrow ground that the way Maryland had structured the settlement—involving a waiver of Maryland's right to issue a certification, *after* Maryland had already done so—did not comport with certain text in § 401 of the Clean Water Act. As a result, MDE has now resumed review of petitions asking it to reconsider the 2018 certification.

In the reconsideration process, the issue is not whether Maryland is bound by its settlement with Constellation, but rather whether the certification should be reconsidered and revised under § 401 of the CWA and Maryland's administrative procedures act, and whether certain provisions of the settlement agreement satisfy those legal standards. In this supplemental submission, Constellation addresses four major points:

(1) MDE should reconsider and remove the 2018 certification's nutrient reduction obligations (which alone would cost more than $8.0 billion) for multiple reasons, including the Chesapeake Bay Program's May 2023 Report and Governor Moore's recently announced new strategy (based on that report) for cleaning up the Chesapeake Bay;

(2) MDE should not impose an unprecedented dredging obligation on Conowingo, given that there remains no scientific evidence that dredging would be either beneficial to the Bay or feasible;

(3) MDE must take into account Conowingo's very significant benefits in avoiding greenhouse gas emissions and mitigating climate change, which have direct impacts on water quality in the Bay, and are appropriately key priorities for Maryland and the Moore Administration; and

(4) MDE should reconsider and revise other aspects of the 2018 certification—involving Conowingo's flow regime, fish passage facilities, trash and debris responsibilities, and other operations—because the associated provisions of Maryland's settlement with Constellation, *on the merits*, provide reasonable assurance that Conowingo's operations will not violate Maryland's water quality standards.

Constellation summarizes here the key support for each of these points.

I. Maryland Should Eliminate the Nutrient Reduction Obligation on Conowingo.

The nutrient reduction obligation of the 2018 certification is inappropriate for four principal reasons.

A. MDE Lacks Legal Authority to Require Conowingo to Remove Nutrients Introduced by Other Parties Throughout the Susquehanna River Watershed.

It is clear where the nutrients at issue in the 2018 certification come from: MDE itself sponsored a major 2016 report that found that "[t]he Susquehanna River watershed, not the Conowingo Dam and its reservoir, is the principal source of adverse pollutant impacts on the upper Chesapeake Bay water quality and aquatic life." EPA, which administers the Clean Water Act, has made clear that a State's § 401 certification conditions "must be directly related to impacts to water quality requirements from the project proponent's activity, and not water quality concerns caused by other entities." A federal judge, hearing Constellation's challenge to the 2018 certification, remarked to Maryland's counsel, "I read the opening of your brief and I wanted to say oh come on Maryland. Be serious with me, be serious." The judge emphasized, "if the pollutants come from elsewhere, I'm just astonished that Maryland thinks that [Constellation] should pay for everybody else's pollution." Significantly, Constellation has reviewed *roughly four hundred* published § 401 certifications issued by states for FERC hydropower projects over the past two decades, and there is not a *single* example obligating a project to remove upstream nutrients from flowing river water for the purpose of addressing water quality impacts beyond the project's boundaries, as Maryland does in the 2018 certification.

B. The Amount of Nutrient Reduction Required by the 2018 Certification Resulted from an Irrelevant Calculation, Which Is Out of Step with Maryland's Current Climate Focus.

Since its construction in 1928, Conowingo Dam has indisputably *benefited* the water quality of the Bay by *trapping* nitrogen and phosphorus flowing in the river that otherwise would have wound up in the Bay—a benefit Conowingo had no obligation to provide. When setting Bay cleanup goals in 2010, with a deadline to achieve those goals by 2025, EPA estimated that Conowingo's beneficial trapping capacity would continue through 2025, significantly *reducing* the

obligations EPA placed on Bay jurisdictions in 2010 to reduce the amount of nutrients coming from those jurisdictions and entering the Bay.

Unfortunately, EPA's 2010 assessment was wrong; because of the large amount of nutrient-laden sediments flooding its reservoir from upstream, Conowingo Reservoir was unable to maintain its expected beneficial trapping capacity through 2025. In 2017, EPA calculated that, as a result of the Reservoir's reduced beneficial trapping capacity, an additional 6.0 million pounds of nitrogen and 0.26 million pounds of phosphorus needed to be removed from the Susquehanna River watershed each year. These are the precise amounts MDE's 2018 certification imposed on *Constellation* to remove. There is neither a logical nor a legal basis for imposing an $8.0 billion *obligation* on Conowingo simply because its beneficial trapping capacity—which Conowingo had no obligation to provide in the first place—was less than EPA had estimated in 2010.

Moreover, after Maryland issued 2018 certification, the three states of the Susquehanna River watershed—Pennsylvania, Maryland and New York—have accepted the obligation to take actions to remove the very same 6.0 million pounds of nitrogen and 0.26 million pounds of phosphorus from entering the river each year, further eliminating any basis for imposing that obligation on Conowingo. EPA has stated its expectation that virtually all of these reductions will be made by Pennsylvania, which is where the bulk of the nutrients originate. As Governor Hogan stated in 2019, it is incumbent upon "upstream states, such as Pennsylvania, to take responsibility for pollution that pours into the Chesapeake Bay." Maryland's 2020 lawsuit against EPA contending that EPA was not properly enforcing the obligations of Pennsylvania and others to adequately reduce nutrient pollution at its source further underscores this point. It would be a huge step backwards for Maryland to revert to the unfounded and false view that it is Conowingo that is the cause of dissolved oxygen problems in the Bay. In so doing, Maryland would once again

shift the focus away from Pennsylvania and other sources of pollution, where it belongs. Pennsylvania has little stake in the Bay, but it is the overwhelming source of the Bay's nutrient problem.

Focusing on EPA's nutrient reduction targets for the Bay also is inconsistent with recent scientific evidence and Governor Moore's new strategy for addressing the Bay's water quality problems. In a May 2023 report, scientists with the Chesapeake Bay Program's Scientific Technical Advisory Committee concluded that "achieving pollutant reduction and water quality improvements is proving more challenging than expected" and that "modeling and monitoring evidence indicates that current efforts to reduce nutrient loads will not meet the [EPA] targets." The report emphasized that a major reason is climate change, which "is producing increases in water temperature and changing precipitation patterns that confound efforts to achieve water quality goals." As a result, the report recommends a shift in strategy away from simply "reducing pollutants to achieve ... measurable criteria" to a focus on actually improving aquatic habitats for living resources in shallower areas of the Bay. In a major address on July 20, 2023, Governor Moore embraced this change in strategy, providing further reason not to force the closure of Maryland's largest source of renewable energy by obligating it to remove upstream pollution.

C. Recent Studies Have Documented and Explained that Conowingo "Scour" Events Are *Not* a Material Contributor to Water Quality Deficits in the Bay.

In the 2018 certification, MDE claimed—without any support—that material "scoured" from Conowingo Reservoir during large storm events has had adverse consequences for the Bay. Scientific studies, however, establish that this assertion is not correct. In particular, in a significant 2019 study assessing the effects of Conowingo Dam on the Bay, the University of Maryland Center for Environmental Science reported that "model simulations of scour events within Conowingo Reservoir have only shown marginal impacts on dissolved oxygen" levels in the Bay. The study

explains several reasons for this, including that: (1) nutrients released by scour are actually a small percentage of the total amount of nutrients flushed from the watershed during a large storm; (2) nutrients become less "bioreactive" while being trapped in the Reservoir, and therefore less harmful in terms of depleting oxygen levels when ultimately released into the Bay; and (3) nutrients in scour material are attached to sediment that settles and is efficiently retained in the upper Bay instead of reaching the deep channels of the Bay, where dissolved oxygen levels are low. The 2019 UMCES study, and numerous other studies discussed in this submission, show that scour impacts from Conowingo are minimal and short-lived. Nevertheless, in its settlement with Maryland, Constellation has agreed to pay more than $60 million to Maryland to support Bay restoration efforts (for problems Conowingo did not cause), with virtually all of the money targeted to support for the "living resources" at the heart of Governor Moore's new Bay restoration strategy. Maryland should preserve the benefit of these payments.

D. The Nutrient Reduction Obligation in the 2018 Certification Was in Effect Only a *Financial* Obligation on Constellation, Which Is Impermissible Under the Clean Water Act.

The only realistic way Constellation can comply with the nutrient obligations in the 2018 certification is through payment of the certification's "in lieu of" fee of $172 million per year—an amount that would force Conowingo to shut down. Indeed, this was what MDE *expected* when it issued the 2018 certification; then-MDE Secretary Ben Grumbles testified in 2019 that the 2018 certification would allow "the Commonwealth of Pennsylvania to step up its game, in part with [Constellation] dollars, to reduce the runoff upstream." There is no legal basis in § 401 for imposing a condition on a federal licensee to pay money so that another state government may "step up its game ... to reduce the runoff upstream." The text of § 401 allows a State to impose *effluent limitations*, *other limitations*, and *monitoring requirements* in a § 401 certification; courts have made clear that § 401 does *not* authorize a State to impose monetary obligations or penalties.

II. Maryland Should Not Impose a Dredging Obligation on Conowingo.

In the 2018 certification, MDE suggested that Conowingo should have conducted "routine dredging" to "maintain any trapping function." There is no basis for this statement. Dredging would have been beyond the scope of Conowingo's permitted operations. Neither FERC's license, Maryland's original § 401 certification, nor any other permit issued by Maryland for Conowingo required or authorized Conowingo to conduct "routine dredging" of the Reservoir to "maintain any trapping function." Numerous federal and state permits would have been required for any such dredging to occur. In short, Conowingo was under no *obligation* to conduct such dredging, and it had no *authority* to do so.

There also is no basis for MDE to impose a dredging obligation on Conowingo going forward. Legally, it is not permissible to impose a new water quality obligation on the grounds that a previously unrequired benefit has diminished. In addition, MDE's own 2016 report concluded that "[e]valuation of a range of dredging alternatives [of the reservoirs behind the dams on the Susquehanna River] did not yield any management strategies that could ... provide meaningful, long-term Chesapeake Bay water quality benefits" and that "Chesapeake Bay water quality benefits are minimal and short-lived, and the costs are high." MDE and the other sponsor of the report—the U.S. Army Corps of Engineers—thus failed to identify any beneficial and feasible dredging option for Conowingo Reservoir in 2016, and the same remains true today, now seven years later. MDE's recent "Pilot Study" concerning dredging (which involved an extremely small and non-representative segment of the Reservoir) has not yet adequately established that dredging is *economically* feasible (in that there are permissible and cost-effective ways to dispose of the dredged material). Even more significant, the Pilot Study has not made any attempt to analyze whether dredging is even *beneficial* to the Bay. There are numerous issues, including whether dredging activity may *increase* the delivery of nutrients to the Bay and whether the

dredged material may contain toxins. Significantly, to this day EPA has not approved dredging as a permissible "best management practice" that may be used by states to generate nutrient reduction credits towards EPA's Bay reduction targets. There is simply no factual, scientific, or legal basis to require Conowingo to dredge the Reservoir for nutrients that flow into it from upstream sources. As studies consistently have found, the proper way to address the buildup of nutrients in the Reservoir and the Bay is to curb the amount of nutrients entering the watershed at their source.

III. MDE Must Consider Conowingo's Very Significant Benefits in Avoiding Greenhouse Gas Emissions and Mitigating Climate Change, Which Have Direct Impacts on Water Quality in the Bay.

The 2018 certification is silent regarding Conowingo's significant impacts in avoiding greenhouse gas emissions and mitigating climate change. Conowingo is by far Maryland's largest source of renewable energy—enough to power 165,000 homes. Conowingo avoids 867,000 metric tons of greenhouse gas emissions every year, roughly the annual benefit to taking 190,000 cars off the road. On reconsideration, MDE must address its oversight in failing to consider these important environmental benefits. Addressing climate change is not only one of Maryland's most important priorities, but the consequences of climate change have direct, measurable, and very detrimental impacts on the water quality of the Bay.

Maryland is well aware of this connection. Wetter conditions on land due to climate change lead to more nutrient-laden runoff to the Bay. In addition, increased water temperatures coupled with increased runoff exacerbates dissolved oxygen problems in the water. In connection with EPA's Bay cleanup program—which has focused on decreasing the amount of nutrients delivered to the Bay—Maryland has recognized that these consequences of climate change "will lead to a net degradation of water quality, which will necessitate additional nutrient reductions." Indeed, specifically because of climate change, Maryland may need to reduce nitrogen pollution from the State by an *additional* five million pounds/year and phosphorus pollution by 600,000 pounds/year.

By 2035, climate change may raise the nitrogen reduction target to an additional 10 million pounds/year. As noted above, the recent May 2023 report of the Chesapeake Bay Program scientists notes the futility of chasing nutrient targets alone, in part because "higher water temperatures offset roughly 6–34% of the water quality improvement from [nitrogen] reductions."

Governor Moore has committed to eliminate Maryland's reliance on fossil fuels by 2035. Conowingo's attributes as a large source of clean, dispatchable power in central Maryland is particularly important to supporting this energy transition. Generators like Conowingo are essential to enabling polluting generators within the region to retire without jeopardizing grid reliability. Conowingo also operates without any cost to or subsidy from Maryland. The same is not true for new large-scale renewable developments, whether on land or offshore, which often have faced significant challenges and require substantial state support at an already challenging time. To combat climate change—with its direct and substantial impacts on water quality—MDE must consider Conowingo's critical and cost-effective role as part of Maryland's clean energy infrastructure.

IV. MDE Should Reconsider and Revise the 2018 Certification in Light of the Substantial Changes Constellation Has Agreed to Make to Conowingo's Operations.

Since the issuance of the 2018 certification, Constellation has entered a settlement with Maryland in which it agreed to make material changes to Conowingo's operations. These changes will improve aquatic habitats and address a range of water quality issues. In light of these changes—involving matters such as the Project's flow regime, fish and eel passage over the Dam, trash and debris removal, handling of invasive species, and other issues—MDE should reconsider and revise corresponding provisions in the 2018 certification. Constellation establishes in this submission that the changed conditions in the settlement provide reasonable assurance that Conowingo's operations will not violate Maryland's water quality standards.

V. Conclusion.

Constellation recently chose to locate its headquarters in Baltimore, and it is the only Baltimore-based corporation on the most recent Fortune 500 list. It is one of the largest companies in Maryland. Constellation and its 2300 Maryland-based employees share the concern that all Marylanders have for the Chesapeake Bay, the State's greatest natural resource.

Constellation is willing to be part of a solution for the Chesapeake Bay. Its settlement conditions with Maryland, if evaluated fairly and on the merits, go far beyond what is required under § 401 of the Clean Water Act to provide reasonable assurance that Conowingo's operations will satisfy Maryland's water quality standards. Constellation is eager to partner with Maryland to address these and other environmental issues. But singling out Conowingo for something that responsible parties and environmental groups have recognized is a much broader, entire watershed problem—and putting Maryland's largest source of renewable energy at risk—will do nothing to advance Maryland's energy and environmental goals, and is inconsistent with both the law and the evidence relevant to this proceeding.

INTRODUCTION

Pursuant to Assistant Secretary James' June 1, 2023 correspondence, Constellation Energy Generation, LLC ("Constellation") offers this submission to the Maryland Department of the Environment ("MDE") concerning its reconsideration of the 2018 Clean Water Act ("CWA") § 401 water quality certification ("2018 Certification") for the Conowingo Hydroelectric Project ("Conowingo" or "Project").[2] Constellation incorporates herein its earlier submissions, including its Protective Petition for Reconsideration and Administrative Appeal of the 2018 Certification ("Conowingo 2018 Petition"), oral argument on October 19, 2018, and the first supplement to the Conowingo 2018 Petition dated November 2, 2018.

FACTUAL BACKGROUND

To provide context for the materials that follow, Constellation provides a brief and updated factual background concerning Conowingo, the 2018 Certification, and MDE's resumed reconsideration process of the 2018 Certification.

A. Conowingo.

Constellation, formerly known as Exelon Generation Company, LLC, owns and operates Conowingo, which is located on the Susquehanna River in Maryland, about ten miles upstream of where the river meets the Chesapeake Bay. Before reaching the Bay, the Susquehanna flows for nearly 450 miles through New York, Pennsylvania and Maryland, draining a watershed of approximately 27,500 square miles. Conowingo is authorized to generate up to 570.15 megawatts of electricity, enough to power 165,000 homes.

[2] Constellation submits this 2023 Conowingo Supplemental Petition without waiving any right that it has under the settlement agreement it previously entered with Maryland under the mediation program of the Maryland Court of Special Appeals, and without waiving its rights to present further evidence and additional arguments at a subsequent contested case hearing, per the sequence of proceedings set forth in the COMAR.

Conowingo was constructed in 1928 and operates under a license issued by the Federal Energy Regulatory Commission ("FERC").[3] Maryland issued a § 401 water quality certification for Conowingo in 1975, and has since issued numerous National Pollutant Discharge Elimination System ("NPDES") permits.[4] In its 1975 certification, the State determined that in order "to insure that the operation of the facility will comply with appropriate requirements of State law," Conowingo simply had to "operate[] at all times in such a manner as to conform to the requirements contained in" its NPDES permit.[5] At no point in Conowingo's nearly 100-year history has any government entity required Conowingo to: (1) dredge the reservoir created by Conowingo Dam ("Conowingo Reservoir" or "Reservoir") to remove upstream sediment and nutrients that flow into the Reservoir; (2) "maintain" the Reservoir so that it remains free of upstream sediment and nutrients; or (3) remove upstream sediment and nutrients from the water that flows through Conowingo Dam ("Dam").

The Project is Maryland's largest source of renewable carbon-free energy, producing more than 45 percent of Maryland's renewable energy. Conowingo avoids 867,000 metric tons of greenhouse gas ("GHG") emissions every year. As the Maryland Energy Administration ("MEA") put it in a letter to a committee of the General Assembly: "MEA supports the continued operation

[3] One of the purposes of the Federal Power Act, which created the agency that would ultimately become FERC, is to expand and support the utilization of hydroelectric power in the United States.

[4] Maryland first issued a § 401 certification for Conowingo in 1975. *See* Maryland Water Resources Administration, Section 401 Certification for Conowingo (Feb. 7, 1975) (Ex. 1). State Permit No. 75-DP-0491 was an NPDES permit, authorizing discharges from the Conowingo Project. Maryland has continuously renewed State Permit No. 75-DP-0491, and issued the most recent renewal in 2021. *See* MDE Discharge Permit No. 19-DP-0491 (Ex. 2).

[5] Ex. 1 (1975 Certification) at 2.

of the Conowingo Hydroelectric Generating Station because it provides large quantities of emissions-free electricity that is both scalable and extremely reliable."[6]

Conowingo provides additional benefits to the State of Maryland. The Reservoir provides cooling water for other power plants and is a backup source of drinking water for Baltimore and other cities. The 14-mile-long Reservoir is used heavily for recreation, including fishing, boating, hiking, swimming, and bird watching.

Conowingo has long served to *protect* the water quality of the Chesapeake Bay by *blocking* a significant portion of the harmful nutrient pollution that is discharged into the Susquehanna River through its watershed. Nutrient pollution discharged into the Susquehanna River watershed has contributed to aquatic "dead zones" in two deep channel zones of the central Chesapeake Bay (far from Conowingo), and the presence of the Project has *reduced* the amount of nutrient pollution that discharges to the Bay downstream.

As one scientific study reported: "Since construction of Conowingo Dam in 1929 through 2012, approximately 470 million tons of sediment was transported down the Susquehanna River into the lower Susquehanna River reservoir system, approximately 280 million tons were trapped, and approximately 190 million tons were transported to Chesapeake Bay."[7] A recent 2019 peer-reviewed paper by a team of five scientists from the University of Maryland Center for Environmental Studies ("UMCES") concluded that "[s]edimentation rates in the upper Bay [the portion closest to the mouth of the Susquehanna River] … decreased after 1930" due to factors

[6] *See* Maryland Energy Administration, Letter of Information re SB0540/HB0427 (Feb. 24, 2021) (Ex. 3).

[7] Michael J. Langland, *Sediment Transport and Capacity Change in Three Reservoirs, Lower Susquehanna River Basin, Pennsylvania and Maryland, 1900–2012* at 1 (2015) (Ex. 4, "Langland 2015").

including "construction of [the] Conowingo Dam."[8] The UMCES scientists referred to Conowingo's long history as "a nutrient and sediment sink" and "an unintended watershed [best management practice]."[9] Among many similar reports, EPA concluded that "[t]rapping of pollutants by the Conowingo reservoir over the past 80 years has … benefited the water quality of the [] Bay" and has "benefited the Bay jurisdictions … by lessening [pollutant] load reduction responsibilities…."[10]

B. Nutrient Pollution in the Chesapeake Bay.

The Chesapeake Bay is unique in that it is affected by pollution from seven jurisdictions—Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia, and the District of Columbia. Over the past four decades, the Bay states, Congress, and EPA have established and developed a special "Chesapeake Bay Program" for the Bay.[11] Congress charged the EPA administrator with "achiev[ing] and maintain[ing]" "nutrient goals … for the quantity of nitrogen and phosphorus entering the Chesapeake Bay" and "water quality requirements necessary to restore living resources in the Chesapeake Bay ecosystem."[12]

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[8] Cindy M. Palinkas, et al., *Influences of a River Dam on Delivery and Fate of Sediments and Particulate Nutrients to the Adjacent Estuary: Case Study of Conowingo Dam and Chesapeake Bay*, 42 ESTUARIES AND COASTS 2072, 2075, 2091 (2019) (Ex. 5, "2019 UMCES Study").

[9] *Id.*

[10] *See* EPA, Evaluation of the Final Conowingo Watershed Implementation Plan, Enclosure at 1 (Jan. 24, 2022) (Ex. 6, "EPA Conowingo WIP Evaluation").

[11] 33 U.S.C. § 1267.

[12] *Id.* §§ 1267(g)(1)(A), (B).

Pursuant to requirements elsewhere in the CWA,[13] in 2010, EPA established a "Total Maximum Daily Load" or "TMDL" to address nutrient pollution in the Bay (the "Bay TMDL").[14] EPA determined that reaching its water quality goals for the Bay by 2025 would require significant reductions in discharges of nitrogen, phosphorus, and suspended sediment. EPA allocated those reductions among the Bay jurisdictions. In turn, the Bay jurisdictions became obligated to implement the Bay TMDL through phased-in "Watershed Implementation Plans" or "WIPs."[15] The Bay TMDL set several intermediate checkpoints, including a goal of achieving 60 percent of all pollutant reductions by 2017—roughly the midpoint between 2010 and 2025.

The Bay TMDL expressly addressed the impacts of Conowingo on the Bay's water quality. Although, as stated above, Conowingo had historically blocked a significant portion of the nutrient pollution in the Susquehanna River from reaching the Bay, the Bay TMDL recognized that Conowingo's beneficial trapping function would decline as the Reservoir filled with greater amounts of sediment. In 2010, when EPA issued the Bay TMDL and allocated the full amount of the required nutrient reductions on the seven Bay jurisdictions, EPA evaluated that Conowingo would likely maintain its "trapping" capacity through 2025, when the TMDL targets were to be reached. EPA provided a contingency, however: "If future monitoring shows that trapping efficiencies [at Conowingo] are reduced, Pennsylvania, New York, and Maryland's respective 2-

[13] *See generally id.* § 1313(d).

[14] A "Total Maximum Daily Load" is a "pollution diet" designed to identify necessary reductions of pollutant loads so that a waterway can meet applicable water quality standards. *See id.* § 1313(d)(1)(C).

[15] *Id.* § 1313(e).

year milestone delivered loads could be adjusted accordingly."[16] These potential adjustments, EPA explained, would "ensure that each jurisdiction is meeting its obligations."[17]

EPA conducted a mid-course assessment in 2017 to review progress towards meeting nutrient and sediment load goals and to apply updated modeling. This assessment showed that the Conowingo Reservoir had reached "dynamic equilibrium"—meaning it was no longer trapping nutrients and sediment over the long term, contrary to EPA's earlier assumption.[18] EPA determined that as a result of Conowingo's reduced trapping capacity, to meet the 2025 TMDL water quality improvement goals, the Bay states would have to remove an additional 6.0 million pounds of nitrogen and 260,000 pounds of phosphorous. The Chesapeake Bay Program constituents agreed to address this additional reduction in a separate Conowingo Watershed Implementation Plan ("Conowingo WIP"), which was published in July 2021.[19]

C. The 2018 Certification and MDE's Resumed Reconsideration Process.

With its then-existing FERC license expiring in 2014, Conowingo commenced a relicensing process at FERC in 2009. Conowingo, FERC staff, and other interested parties conducted voluminous environmental studies—including assessments of Conowingo's impacts on sediment transport, the bathymetry of the Reservoir, the Project's flow regime, and the Project's impact on fish and eels, and other studies. Conowingo reached a comprehensive settlement with the Department of the Interior ("DOI") Fish and Wildlife Service ("FWS") regarding the terms of

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[16] U.S. Environmental Protection Agency, Chesapeake Bay Total Maximum Daily Load for Nitrogen, Phosphorous and Sediment, at 10–8 (Dec. 29, 2010), https://www.epa.gov/chesapeake-bay-tmdl/chesapeake-bay-tmdl-document ("TMDL").

[17] *Id*.

[18] *Id.*, App'x T at T-4.

[19] Chesapeake Bay Program, Conowingo Watershed Implementation Plan, at 1 (July 31, 2021), https://d18lev1ok5leia.cloudfront.net/chesapeakebay/documents/final_cwip.pdf.

DOI's "Fishway Prescription," which is required by the Federal Power Act. Under the terms of the DOI settlement, Conowingo agreed to spend approximately $300 million to improve the Project's fish lifts and construct new eel ramps. Conowingo also agreed to "trap and transport" fish upstream—not merely past Conowingo, but past three other upstream hydroelectric projects as well—to ensure that a higher percentage of fish successfully reach spawning grounds.

To obtain a new FERC license, Conowingo was required to seek a new § 401 certification from Maryland. Conowingo applied for the new certification in 2014. MDE responded to Conowingo's application by declaring that it needed an additional three-year sediment transport study (beyond its own Lower Susquehanna River Watershed Assessment ("LSRWA"), already then in draft form) before ruling on the application. Conowingo responded that its application was complete and no further study was needed, but ultimately agreed to withdraw and resubmit its application in 2015, 2016, and 2017. MDE then issued the 2018 Certification.

The 2018 Certification bears no resemblance to Maryland's 1975 § 401 certification for Conowingo or to *any* other § 401 certification issued by any State for any hydroelectric project in the past 20 years. Among other unique provisions, Maryland seeks in the 2018 Certification to require Conowingo to "annually reduce the amount of nitrogen included in the Project's discharges by six million (6,000,000) pounds and the amount of phosphorus in the Project's discharges by two hundred sixty thousand (260,000) pounds."[20] Other than trace amounts, *none* of this nitrogen and phosphorus is introduced into the water by Conowingo; it all originates upstream in the Susquehanna River watershed and would flow into the Chesapeake Bay if the dam were not present. Constellation has attempted to survey *every* § 401 certification issued by a State for a FERC hydropower project since the beginning of 2003, and it has not identified a *single* § 401

[20] 2018 Certification, § 7(D)(ii).

certification in which a State has imposed a similar obligation on a hydropower operator to remove *upstream* nutrients from flowing river water for the purpose of improving water quality, as Maryland does in the 2018 Certification.[21] Constellation has also surveyed more than 500 water quality certifications that MDE has issued to authorize a range of types of activities over more than twenty years, and none impose dredging for nutrient reduction.[22]

Within 30 days, Constellation's predecessor filed with MDE a Protective Petition for Reconsideration and Administrative Appeal of the 2018 Certification ("2018 Conowingo Petition"); it also challenged the 2018 Certification in both federal and state court.[23] Later, it further contended at FERC that Maryland had waited too long to issue the 2018 Certification and, as a result, had waived its right to issue a § 401 certification *before* it issued the 2018 Certification (the "*Hoopa Valley*" challenge). At an early hearing in federal court, the judge remarked: "I read the opening of your brief and I wanted to say oh come on Maryland. Be serious with me, be serious."[24] The judge emphasized: "[I]f the pollutants come from elsewhere, I'm just astonished that Maryland thinks that Exelon should pay for everybody else's pollution."[25]

In connection with the state court litigation, Maryland and Constellation agreed to participate in a court-run mediation program. The mediator assisted the parties in reaching a comprehensive settlement, under which Constellation agreed: (1) to make significant changes in

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[21] A list of the surveyed § 401 certifications is attached as Ex. 27.

[22] A list of the surveyed MDE certifications is attached as Ex. 28.

[23] A petition for reconsideration of the 2018 Certification was also filed by certain Riverkeeper parties with MDE ("2018 Riverkeepers Petition"). MDE had already received and had an opportunity to consider both petitions, and associated oral argument in October 2018, before MDE agreed to the substantive terms of the settlement, discussed *infra*.

[24] *Exelon Generation Co., LLC*, *v. Grumbles*, Civ. No. 18-1224, Transcript of Hearing, at 29 (D.D.C. Feb. 28, 2019) (Ex. 7, "2019 Hearing Tr.").

[25] *Id.* at 41.

the way Conowingo operates (reducing the revenues Conowingo can earn); (2) to make millions of dollars in payments to Maryland—specifically, $63.55 million over the life of Conowingo's new license (with provisions for inflation adjustments)—to improve water quality in the Chesapeake Bay; and (3) to dismiss its federal court, state court, and *Hoopa Valley* challenges to the 2018 Certification.[26] In exchange, Maryland agreed to withdraw the 2018 Certification and to waive any right to issue a § 401 certification. After soliciting comments from all interested parties, FERC accepted the settlement—including the significant changes in the way Conowingo would operate—and incorporated the changed operating conditions into a new license for the Project.

Several Riverkeeper parties appealed FERC's issuance of the new license. On December 20, 2022, a federal appellate court ruled that the text of § 401 does not allow a State to waive a § 401 certification *after* issuing one, and after more than one year has passed since the § 401 application was submitted.[27] Because Constellation had withdrawn its timeliness challenge as part of the settlement, the court did not address whether Maryland already had waived *before* it issued the 2018 Certification.[28] The court also did not address the merits of Constellation's other challenges to the 2018 Certification (including the issues raised in the 2018 Conowingo Petition), or whether the changes Constellation had agreed to make in the way Conowingo operates would satisfy Maryland's water quality standards.[29] The court vacated FERC's issuance of the new

[26] *See Conowingo Hydroelectric Project*, FERC Docket No. P-405-106 and -121, Joint Offer of Settlement and Explanatory Statement of Exelon Generation Company, LLC and the Maryland Department of the Environment (Oct. 29, 2019) (Ex. 8, "Conowingo Settlement").

[27] *Waterkeepers Chesapeake v. FERC*, 56 F.4th 45, 49 (D.C. Cir. 2022).

[28] *See id*., 56 F.4th 45.

[29] *See id*.

license, stating that this would allow the resumption of administrative and judicial review of the 2018 Certification.[30]

On June 1, 2023, MDE sent a letter to Constellation and Riverkeepers indicating that MDE intended to resume administrative reconsideration of the 2018 Certification, and inviting the Parties to make supplemental submissions in support of their respective petitions by August 1, 2023. On June 9, 2023, Constellation filed a letter in this docket notifying MDE that it considers the conditions reflected in its settlement with Maryland to be new, updated, or relevant information to the § 401 certification that MDE should consider.

STATUTORY AND LEGAL BACKGROUND

To place the supplemental information in context, Constellation provides a brief and updated overview of the applicable legal standard.

Section 401(a) of the CWA requires "[a]ny applicant for a Federal license or permit to conduct any activity ... which may result in any discharge into the navigable waters" to obtain a *certification* from the State in which the discharge originates "that any such discharge will comply" with applicable provisions of the CWA and state law, such as state water quality standards.[31] The CWA defines the term "discharge" to include the "discharge of a pollutant" or "pollutants," such as nitrogen or phosphorus.[32] The CWA further provides that a "discharge of a pollutant" is "any *addition* of any pollutant to navigable waters from any point source."[33] Under CWA § 401, a State

[30] *Id.* at 50.

[31] 33 U.S.C. § 1341(a)(1).

[32] *Id.* § 1362(16).

[33] *Id.* § 1362(12)(A) (emphasis added).

may *grant* a certification, either with or without conditions, *deny* a certification, or *waive* its power to grant or deny.[34]

Section 401 is specific regarding the type of conditions a State may impose in a § 401 certification. Section 401(d) provides that "[a]ny certification provided under this section shall set forth *any effluent limitations* and *other limitations*, and *monitoring requirements* necessary to assure that any applicant for a Federal license or permit will comply" with applicable provisions of the CWA and state law.[35] Any such "effluent limitations," "other limitations," or "monitoring requirements" set forth in a § 401 certification "shall become a condition of any Federal license or permit subject to the provisions of this section."[36]

The text of § 401(a) is thus focused on the *activity* of the *applicant* seeking a federal license or permit. And the State may impose conditions under § 401(d) only if "necessary to assure that any *applicant*" for a federal license or permit "will comply" with the applicable law.[37] In *PUD No. 1 of Jefferson County v. Washington Department of Ecology*, the Supreme Court confirmed that "[t]he text refers to the compliance of the *applicant*" and that § 401(d) authorizes "conditions and limitations on the *activity*" of the applicant.[38]

EPA regulations underscore this point. In 2020, EPA updated its regulations regarding § 401 certifications and emphasized that "[t]he scope of a Clean Water Act section 401 certification is limited to assuring that discharge from a Federally licensed or permitted activity will comply

[34] *Id*., §§ 1341(d), 1362(12)(A).

[35] *Id*. § 1341(d).

[36] *Id*.

[37] *Id*. (emphasis added).

[38] *PUD No. 1 of Jefferson Cnty. v. Wash. Dep't of Ecology* 511 U.S. 700, 711-712 (1994) (emphasis added).

with water quality requirements"[39] and that "[a]ny action by the certifying authority to grant, grant with conditions, or deny a certification request must be within the scope of certification."[40] The regulations further require that "[a]ny grant of certification with conditions shall be in writing and shall for each condition include, at a minimum … (i) [a] statement explaining why the condition is necessary to assure that the discharge from the proposed project will comply with water quality requirements; and (ii) [a] citation to federal, state, or tribal law that authorizes the condition."[41]

In the final rule promulgating these regulations, EPA explained that "a certifying authority's review and action under section 401 *must be limited to water quality impacts from the proposed federally licensed or permitted project*."[42] Accordingly, EPA confirmed that "effects caused by the presence of pollutants in a discharge *that are not attributable to the discharge from a federally licensed facility*" would "generally … be beyond the scope of certification as articulated in the final rule."[43] Indeed, EPA noted that some commenters requested EPA to clarify "that

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[39] 40 C.F.R. § 121.3.

[40] *Id*. § 121.7(a).

[41] *Id*. § 121.7(d)(1). In 2022, EPA proposed revisions to the existing 2020 regulations. EPA proposes to amend this rule to require that a conditional certification include "[a] statement explaining why each of the included conditions is necessary to assure that the activity as a whole will comply with water quality requirements." *See Clean Water Act Section 401 Water Quality Certification Improvement Rule*, 87 Fed. Reg. 35,318, 35,378 (June 9, 2022) ("EPA 2022 Proposal").

[42] *Clean Water Act Section 401 Certification Rule*, 85 Fed. Reg. 42,210, 42,232 (July 13, 2020) ("EPA 2020 Rule") (emphasis added); *see also id.* at 42,256 (explaining that any condition imposed by a certifying authority "must be necessary to assure that the discharge from a proposed federally licensed or permitted project will comply with water quality requirements"). EPA's proposed revisions to the existing 2020 regulations continue to make clear that the focus remains on whether the activities *of the federal applicant itself* will cause violations of water quality standards, with numerous passages in the 2022 Proposal emphasizing that § 401 addresses the potential "effects" or "impacts" of a project's activities on water quality. *See*, *e.g.*, EPA 2022 Proposal, 87 Fed. Reg. at 35,342, 35,345, 35,348. This is consistent with Supreme Court precedent interpreting the scope of § 401. *See PUD No. 1*, 511 U.S. 700.

[43] EPA 2022 Rule at 42,253 (emphasis added).

certification conditions must be directly related to impacts to water quality requirements from the project proponent's activity, and not water quality concerns caused by other entities."[44] EPA responded that it "agrees with these comments that certification conditions must be directly related to water quality impacts from the proposed project," and only declined to add specific text on this point in the final rule on the grounds that doing so would be "redundant."[45]

This important limit in the scope of § 401 is reinforced by MDE's own regulations, which provide, with respect to § 401 certifications, that "[i]f the Department determines *the proposed activities* will not *cause* a violation of applicable State water quality standards, the Department shall issue the water quality certification."[46] Maryland's own regulations thus confirm that a § 401 certification is properly limited to the water quality effects *caused* by the *proposed activities of the applicant* for a § 401 certification.

Rulings from federal and state courts repeatedly underscore the same point, holding that § 401 certifications must be based on changes in water quality *caused* by the activities of the applicant.[47] Thus, where water already was impaired by discharges from other sources, the Supreme Court held in *Arkansas v. Oklahoma* that § 401 does *not* automatically "prohibit any

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[44] *Id*. at 42,257.

[45] *Id*. EPA further noted that "EPA is also aware of certification conditions that purport to require project proponents to address pollutants that are not discharged from the construction or operation of a federally licensed or permitted project," and it stressed that "certification conditions must be necessary to assure that the discharge from a proposed federally licensed or permitted project will comply with water quality requirements, because this is the extent of authority provided in section 401." *Id.*

[46] COMAR § 26.08.02.10(E)(1) (emphasis added).

[47] *See also* Debra L. Donahue, *The Untapped Power of Clean Water Act Section 401*, 23 ECOLOGY L.Q. 201, 213, 253–57 & nn.296–308 (1996) (Ex. 9) (citing cases and documenting appropriate § 401 conditions for hydroelectric facilities, including conditions designed to implement anti-degradation regulations, streamflow and fish-protection requirements, and conditions designed to mitigate a project's impacts on erosion, vegetation, and grading).

[additional] discharges of effluent that would reach waters already in violation of existing water quality standards."[48] Recently, the Fourth Circuit highlighted that issuance of a § 401 certification depends on whether the *activity of the applicant* will comply with applicable water quality standards, and it held that a denial of a § 401 certification must be grounded on the *applicant's* "impacts to water."[49] Numerous other decisions illustrate that the propriety of a § 401(d) condition depends on whether the condition addresses the *applicant's* direct effect on, and compliance with, water quality standards.[50] Where a § 401(d) condition is not based on a direct "nexus" between a licensee's own activity and water quality violations, courts have invalidated the condition.[51]

One such example is the recent decision of the New York Appellate Division in *Niagara Mohawk Power Corp. v. New York State Department of Environmental Conservation*, which struck down conditions that would have required a permittee "to discover and eliminate any net increase in designated invasive plants at the project sites for five years after construction had ended, irrespective of whether that increase was in any way attributable to petitioner or its construction activities."[52] The court held that "such a requirement is quintessentially irrational and arbitrary."[53]

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[48] *Arkansas v. Oklahoma*, 503 U.S. 91, 107 (1992); *see id.* at 108 (explaining that nothing in the CWA "mandates a complete ban on discharges into a waterway that is in violation of [water quality] standards").

[49] *Mountain Valley Pipeline, LLC v. N. Carolina Dep't of Env't Quality*, 990 F.3d 818, 823, 831 (4th Cir. 2021).

[50] *See*, *e.g.*, *Del. Riverkeeper Network v. Secretary of the Penn. Dep't of Envtl. Prot*., 833 F.3d 360, 386 (3d Cir. 2016*)*; *In re 401 Water Quality Certification*, 822 N.W.2d 676, 678, 689 (Minn. Ct. App. 2012); *Port of Oswego Auth. v. Grannis*, 897 N.Y.S.2d 736, 738-39 (N.Y. App. Div. 3d Dep't 2010).

[51] *See supra* note 50.

[52] *Niagara Mohawk Power Corp. v. N.Y. State Dep't of Envtl. Conservation*, 150 N.Y.S.3d 197, 197 (N.Y. 2021).

[53] *Id.* at 1470.; *see also id.* at 1469 (agreeing with permittee's argument that "the specific invasive-species mitigation conditions in the subject permits were arbitrary and capricious because they

Similarly, in *Port of Seattle v. Pollution Control Hearings Board*, the court overturned a streamflow condition that would have "required that the Port do more than offset the impact of the [project being licensed]."[54]

These regulatory interpretations and judicial decisions are consistent with the CWA's general statutory scheme. The CWA's regulatory provisions limit the *introduction* of pollutants into navigable waters; they do not generally compel the *removal* of pollutants already present. In accordance with this principle, the Fourth Circuit agreed in *Appalachian Power Co. v. Train* that "EPA has no jurisdiction under the Act to require removal of any pollutants which enter a plant through its intake stream."[55] Similarly, in *American Iron & Steel Institute v. EPA*, the court held that EPA could not impose effluent limitations without adjusting them for pollution already present in the water, because otherwise the party subject to the limitations "would be forced to clean up water that had already been polluted by other companies."[56] Likewise as reported in *Potomac Riverkeeper, Inc. v. MDE*, MDE explained to the reviewing court that a facility was responsible only for nitrogen loading "that is being added to the receiving waters and not the concentrations of nutrients that are already present in the river water intake."[57] And, a federal court held that EPA

made [permittee] responsible for controlling invasive-species growth that it had no role in causing").

[54] *Port of Seattle v. Pollution Control Hearings Board*, 90 P.3d 659, 681 (Wash. 2004), *see also Comm. Power Co. v. Dep't of Nat. Res*., 2000 WL 33521869 at *2 (Mich. Ct. App. Mar. 21, 2000) (per curiam) (rejecting fish study requirement because the condition "was not imposing a requirement that [the agency] knew would be necessary to protect fish in the river"); 17 A.L.R. Fed. 2d 309 §§ 19, 21, 23, 26 (cataloging conditions held to be inappropriate).

[55] *Appalachian Power Co. v. Train*, 545 F.2d 1351, 1377 (4th Cir. 1976).

[56] *Am. Iron & Steel Institute v. EPA*, 526 F.2d 1027, 1056 (3d Cir. 1975).

[57] *Potomac Riverkeeper, Inc. v. MDE*, 238 Md. App. 174, 195 (2018).

acted unlawfully because, instead of setting a maximum daily amount of trash that could *enter* a river, EPA set a minimum amount of trash to be *removed*.[58]

The lesson of these cases is that MDE cannot impose onerous conditions relating to the "discharge of pollutants" (*i.e.*, nitrogen and phosphorous) already present in the waterway under the guise of regulating Conowingo's "discharge" of water. Conowingo cannot lawfully be held responsible under the CWA for these nutrients because the Project's operation does not result in "any addition of any pollutant to navigable waters"[59]—nor is the obligation "necessary to assure that any *applicant* for a Federal license or permit will comply" with applicable provisions of the CWA and state law.[60]

Under Maryland's Administrative Procedure Act, an agency decision is reversable, among other reasons, if it: exceeds the agency's statutory authority or jurisdiction; it is affected by an error of law; it "is unsupported by competent, material, and substantial evidence in light of the entire record as submitted … or it is arbitrary or capricious."[61] Maryland generally follows the federal arbitrary or capricious standard and considers several factors in determining whether an agency's actions are arbitrary or capricious, including whether:

> (1) there is a rational connection between the facts found and the choice made; (2) the decision was based on a consideration of the relevant factors; (3) there has been clear error of judgment; (4) the agency relied on factors which Congress has not intended it to consider; (5) the agency has entirely failed to consider an important aspect of the problem; (6) there is an explanation for a decision that runs counter to

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[58] *Natural Res. Defense Council, Inc. v. EPA*, 301 F. Supp. 3d 133 (D.D.C. 2018).

[59] 33 U.S.C. § 1362(12) (emphasis added); *see also Los Angeles Cnty. Flood Control Dist. v. Natural Res. Defense Council*, 568 U.S. 78, 82 (2013) ("[N]o pollutants are 'added' to a water body when water is merely transferred between different portions of that water body"); *id.* at 83 ("[N]o discharge of pollutants occurs when water … simply flows from one portion of the water body to another.").

[60] 33 U.S.C. § 1341(a)(1)(d).

[61] Md. Code (2021 Repl. Vol.), § 10-222(h)(3) of the State Government Article ("SG").

> the evidence; and (7) the decision is so implausible that it could not be ascribed to a difference in view or the product of agency expertise.[62]

The Maryland Supreme Court has further explained that "[a]n administrative agency decision may be deemed 'arbitrary or capricious' if it is contrary to or inconsistent with an enabling statute's language or policy goals or if it is irrationally inconsistent with previous agency decisions."

Maryland must evaluate the pending petitions for reconsideration, including the supplemental information set forth herein, against these clear legal standards.

SUPPLEMENTAL INFORMATION

I. MDE Should Reconsider and Remove the Required Nutrient Reductions in the 2018 Certification for Several Additional Reasons Beyond Those Set Forth in the 2018 Conowingo Petition.

In this supplemental submission, Constellation incorporates in full the arguments and information set forth in the 2018 Conowingo Petition. The passage of time provides further reasons, however, why MDE should reconsider and remove the nutrient-reduction obligation in the 2018 Certification. In particular:

(1) Legal authority following the 2018 Certification continues to make clear that MDE lacks authority under § 401 to impose a condition on Conowingo to *remove* nutrients from the water flowing through the Project that were introduced by *other* parties throughout the Susquehanna River watershed.

(2) Recent EPA pronouncements confirm that the nutrient reductions required by the 2018 Certification resulted from a calculation of a reduced *benefit* of what Conowingo had been expected to provide by *blocking* other parties' pollution. Section 401 does not allow an obligation to be imposed because of a reduced, unrequired *benefit*. Moreover, the same nutrient reduction has now been assumed by Maryland, New York, and Pennsylvania through the 2021 Conowingo WIP, and Governor Moore has specifically embraced a new strategy less focused exclusively on nutrient reductions.

(3) Even if Conowingo were held responsible for any *increased* effects of nutrients that are "scoured" from Conowingo Reservoir, recent studies—in particular a detailed 2019 study from UMCES—have documented and explained that Conowingo scour events

[62] *Montgomery Park, LLC v. Md. Dep't of Gen. Servs.*, 482 Md. 706, 728 & n.9 (2023).

are *not* a material contributor to deficits in dissolved oxygen ("DO") in the deep channel zones of the Chesapeake Bay.

(4) The nutrient reduction obligation in the 2018 Certification was, in effect, only a *financial* obligation imposed on Conowingo, which is unlawful under § 401(d).

Each of these legal, evidentiary, and scientific defects is addressed in turn below.

A. Legal Authority Continues to Underscore that MDE Lacks Authority Under § 401 to Impose a Condition on Conowingo to *Remove* Nutrients Introduced by *Other* Parties Throughout the Watershed.

The legal standard set forth and updated above, however, continues to make clear that MDE lacks authority under § 401 to impose an obligation on Conowingo to remove nutrients that are introduced by other parties throughout the Susquehanna River watershed. Any decision that ignores this limitation and exceeds MDE's statutory authority and jurisdiction will not stand under Maryland's Administrative Procedure Act.[63] MDE does not contend in the 2018 Certification that the "activities" of the "applicant" introduce nutrients into the water. The nutrients at issue are introduced by other parties upstream of Conowingo and are already present in the water flowing through the Project.[64] Indeed, most of the nitrogen (and some of the phosphorus) is *dissolved* in the water.[65] Some of these nutrients are blocked by the Dam for a time—which is indisputably beneficial to the Bay—before eventually flowing through the Project. In all cases, however, the addition of the nutrients to the Susquehanna River and Bay is not caused by Conowingo, and the nutrients would flow into the Bay whether Conowingo existed or not.

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[63] Md. Code, SG § 10-222(h)(3).

[64] A 2021 study of Susquehanna River loads identified that Pennsylvania and New York, respectively, were responsible for 87 percent and 12 percent—or a total of 99 percent—of the nitrogen loads, and 84 percent and 14 percent—or a total of 98 percent—of the phosphorus loads, in the river. *See* Chesapeake Bay Program, Public Report, 2021 Loads Report (Ex. 10) (calculated using edge of tide figures).

[65] *See*, *e.g.*, Qian Zhang et al., *Data Associated with Decadal-Scale Export of Nitrogen, Phosphorus, and Sediment from the Susquehanna River Basin, USA: Analysis and Synthesis of Temporal and Spatial Patterns*, File A3 (2016) (Ex. 12, "Zhang et al. Data Archive").

For several reasons set forth in the legal standard above, MDE lacks authority under § 401 to require Conowingo to *remove* nutrients introduced by others. The text of § 401, as underscored by MDE's own regulations and EPA regulations, confirm that MDE must focus on the activities and water quality impacts of the *applicant* (Conowingo) and not on impacts caused by other parties. Consistent with the statutory text and court decisions, EPA has expressly agreed that "certification conditions must be directly related to impacts to water quality requirements from the project proponent's activity, *and not water quality concerns caused by other entities*."[66] MDE must show that Conowingo is the *cause* of harm to the Bay, that the Bay is not already impaired by *other* causes, and that there is a *nexus* between Conowingo's activities and the harm MDE is seeking to remedy. As the 2018 *Natural Resources Defense Council* case and other cases consistently have held, MDE's focus on regulating pollutants must be on preventing the *entry* of pollution into the water, not setting amounts of existing pollution to be *removed*.[67]

Significantly, as stated at the outset, Constellation conducted a survey of *nearly four hundred* § 401 certifications issued by states for a FERC hydropower project over the past two decades, and did not identify a *single* § 401 certification in which a State has imposed a similar obligation on a hydropower operator to remove upstream pollution from flowing river water, as Maryland does in the 2018 Certification.[68] The survey includes every such § 401 certification for a FERC hydropower project issued in the years since MDE issued the 2018 Certification.

Constellation challenged the nutrient reduction obligation in federal court. Although it dismissed the case based on its settlement with Maryland before the court reached the merits of

[66] EPA 2020 Rule, at 42,257 (emphasis added).

[67] *Natural Res. Defense Council, Inc. v. EPA*, 301 F. Supp. 3d 133 (D.D.C. 2018).

[68] A list of the surveyed § 401 certifications is attached as Ex. 27.

the challenge, as noted above, the federal judge expressed a strong reaction in opposition to her perception that "Maryland thinks that Exelon should pay for everybody else's pollution."[69]

In testimony after the 2018 Certification issued, then-MDE Secretary Ben Grumbles acknowledged that the real focus of the certification is not activities of Conowingo, but rather helping "the Commonwealth of Pennsylvania to step up its game, in part with [Constellation] dollars, to reduce runoff upstream."[70] There is no legal basis in § 401 for imposing a condition on an applicant for a federal license to pay money so that a state government may "step up its game ... to reduce the runoff upstream." *See also infra*, at Section 1.D.

Based on this supplemental information, as well as the reasons set forth in the 2018 Conowingo Petition, MDE should reconsider and remove the nutrient reduction obligation in § 7(D) of the 2018 Certification.

B. The Nutrient Reductions Required by the 2018 Certification Resulted from a Calculation of a Reduced *Benefit* of What Conowingo Had Been Expected to Provide by *Blocking* Other Parties' Pollution, and § 401 Does Not Allow an Obligation to be Imposed Because of a Reduced, Unrequired *Benefit*.

1. There Is No Logical Basis for MDE to Impose the TMDL Mid-Point Reductions on Conowingo, and It Would Be Arbitrary and Capricious for MDE to Do So Based on the Reduction of a Historical Benefit Conowingo Has Provided.

The 2018 Certification imposes a very specific nutrient reduction obligation on Conowingo: "[T]he Licensee shall annually reduce the amount of nitrogen included in the Project's discharges by six million (6,000,000) pounds and the amount of phosphorus in the

[69] Ex. 7 (2019 Hearing Tr.) at 41.

[70] *See* Md. General Assembly, Testimony of Secretary Grumbles to the Senate Public Safety, Transportation, and Environment Subcommittee, Chesapeake Bay Overview, at 1:05:00 (excerpt at 3:58) (Jan. 24, 2019) (Ex. 13, "Grumbles 2019 Testimony" Exerpt), https://mgaleg.maryland.gov/mgawebsite/Committees/Media/false?cmte=pst&clip=PST_1_24_2019_meeting_1&ys=2019rs.

Project's discharges by two hundred sixty thousand (260,000) pounds."[71] There can be no dispute regarding what these numbers *represent*. As EPA recently explained in its January 2022 formal comments on the Conowingo WIP:

> When the Chesapeake Bay Total Maximum Daily Load (Bay TMDL) was established in 2010, it was estimated that the reservoir behind the Conowingo Dam would be trapping sediment and associated nutrients through 2025. The trapping of pollutants by the Conowingo reservoir over the past 80 years has not only benefitted the water quality of the Chesapeake Bay, but it has also benefitted the Bay jurisdictions to varying degrees by lessening load reduction responsibilities under the Bay TMDL – i.e., had the reservoir reached trapping capacity prior to the Bay TMDL being established, the Bay jurisdictions would have had a greater lift to meet their respective Bay TMDL allocations. However, studies conducted over the last several years have demonstrated that the reservoir has reached dynamic equilibrium (i.e., the reservoir is near full capacity and is no longer trapping pollutants). The CBP partnership estimates that an additional reduction of 6 million pounds of nitrogen and 0.26 million pounds of phosphorus is needed to mitigate the water quality impacts of Conowingo Dam infill. This additional reduction must be addressed to attain applicable state water quality standards in the Chesapeake Bay.[72]

These amounts—6.0 million pounds of nitrogen and 0.26 million pounds of phosphorus—are the *precise* amounts MDE required Conowingo to "reduce ... in the Project's discharges" in the 2018 Certification.

It is important to step back and break down EPA's 2022 statement above into its component parts, each of which is significant (and not disputed). *First*, EPA refers to the "trapping of pollutants by the Conowingo reservoir over the past 80 years," which has "benefitted the water quality of the Chesapeake Bay."[73] This *beneficial* effect of Conowingo on water quality has been widely recognized. As stated above, one scientific study estimated that from the time of Conowingo's construction through 2012, approximately 280 million tons of sediment—out of a

[71] 2018 Certification, § 7(D)(ii).

[72] *See* Ex. 6 (EPA Conowingo WIP Evaluation), Enclosure at 1.

[73] *Id.*

total of approximately 470 million tons transported down the Susquehanna River, or roughly 60% of the total—was trapped by the dams on the river and prevented from reaching the Chesapeake Bay.[74] Conowingo has been described as "a nutrient and sediment sink" and "an unintended watershed [best management practice]."[75] In 2016, the Bay Journal described Conowingo as "the Chesapeake Bay's biggest friend" and emphasized that "without the dam, more nutrients and water-clouding sediment would have poured into the Bay for most of the past century. Algae blooms would have been more intense, and oxygen-starved dead zones would have been even larger."[76] Conowingo had no obligation to provide this benefit; as the 2019 UMCES Study reported, it was an "unintended" consequence of the Project.

Second, EPA's 2022 statement emphasizes not only that Conowingo has benefited the water quality of the Bay, "but it has also benefitted the Bay jurisdictions" by "lessening load reduction responsibilities under the Bay TMDL."[77] And EPA explains exactly how. When the 2010 Bay TMDL was established by EPA, "it was estimated that the reservoir behind the Conowingo Dam would be trapping sediment and associated nutrients through 2025," which was the date when the Bay TMDL targets were to be reached.[78] However, later studies "demonstrated that the reservoir has reached dynamic equilibrium (i.e., the reservoir is near full capacity and is no longer trapping pollutants)" *prior* to 2025, or earlier than had been expected.[79] In other words, the 2010 Bay

[74] *See* Ex. 4 (Langland 2015) at 1.

[75] *See* Ex. 5 (2019 UMCES Study) at 2075, 2091.

[76] Karl Blankenship, Conowingo's, Bay's Mutual Relationship Finally Ran Its Course, Bay Journal (Dec. 8, 2016), https://www.bayjournal.com/news/energy/conowingo-s-bay-s-mutual-relationship-finally-ran-its-course/article_97a8fc4f-83f2-567f-801c-c53c396834d4.html.

[77] Ex. 6 (EPA Conowingo WIP Evaluation), Enclosure at 1.

[78] *Id.*

[79] *Id.*

TMDL estimated Conowingo's future beneficial "trapping capacity" incorrectly. And EPA is clear in its 2022 statement what *would* have happened if the loss of Conowingo's beneficial trapping capacity had been modeled correctly and known in 2010: "[H]ad the reservoir reached trapping capacity prior to the Bay TMDL being established, the Bay jurisdictions would have had a greater lift to meet their respective Bay TMDL allocations."[80] In other words, the "additional reduction of 6.0 million pounds of nitrogen and 0.26 million pounds of phosphorus" would have been allocated to the Bay jurisdictions in the original 2010 Bay TMDL (and not Constellation), along with the other nutrient reductions the Bay TMDL required the jurisdictions to achieve.[81] The equivalent nutrient reduction obligation in the 2018 Certification thus (1) results from a faulty assumption in the 2010 Bay TMDL, and (2) results from a reduction in the estimate of Conowingo's beneficial trapping capacity, which Conowingo had no obligation to provide in the first place.

There is no legal basis for requiring one party to "trap" or "block" the pollution of another party. Nothing in § 401 authorizes Maryland to penalize Conowingo because of a modeling error in the 2010 Bay TMDL, or because Conowingo is trapping less of other parties' pollution than was originally expected when the Bay TMDL was established. Nothing in FERC's license, Maryland's previous § 401 certification, or Maryland's NPDES permits for Conowingo required the Project to trap the amount of nutrients that was expected when the Bay TMDL was established, nor could those documents legally have done so.

Significantly, since MDE issued the 2018 Certification, the necessary additional reduction of six million pounds of nitrogen and 0.26 million pounds of phosphorus now *has* been allocated

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[80] *Id.*

[81] *Id.* As stated above, the additional nitrogen and phosphorus reductions required as a result of the Conowingo modeling error is about 3% of the total Bay TMDL reductions.

to the three Susquehanna River watershed states—Pennsylvania, Maryland, and New York—in the Conowingo WIP, which was finalized in July 2021. Specifically, the Conowingo WIP provides that "[t]he obligation for mitigating the pollution loads attributed to the Conowingo Dam *rests with the Bay jurisdictions with the budgetary assistance of the federal government*."[82] Similarly, with regard to the Conowingo WIP, EPA has stated its expectations as follows:[83]

> The Conowingo nutrient assignments to the Susquehanna jurisdictions will be those as reflected in the final PSC-approved [Conowingo WIP].

Summary of Load Reductions (Millions of Pounds) in Primary CWIP Strategy

Jurisdiction	Nitrogen Load Reduction	Phosphorus Load Reduction	Sediment Load Reduction
Maryland	0.18	0.003	8
New York	0.08	-0.013	-3
Pennsylvania	6.41	0.153	172
Total	**6.67**	**0.143**	**177**

Thus, what MDE—without any lawful basis under § 401, or any logical basis resulting from the reduction of a benefit provided by Conowingo—imposed on Conowingo in the 2018 Certification now has been properly assumed by the Susquehanna River jurisdictions in the Conowingo WIP (primarily Pennsylvania, the source of most of the pollution). For this reason too, MDE should reconsider the 2018 Certification and remove the "Required Nutrient Reductions" of § 7(D).

This conclusion regarding the Conowingo WIP is not changed by the fact that the 2018 Certification provided that "the Licensee may credit against its Required Nutrient Reduction obligation the nitrogen and/or phosphorus reductions that are actually achieved by the Bay

[82] Conowingo WIP at 29 (emphasis added). Constellation disputes the suggestion that pollution loads may be considered as "attributed to the Conowingo Dam." *Id.* As explained above, the additional loads result solely from a reduction in the Dam's expected beneficial trapping capacity.

[83] *See* EPA, EPA Expectations: Implementation of the Conowingo Watershed Implementation Plan's Phased Approach, Draft—For Partnership Input, at 2 (Jan. 26, 2023) (Ex. 14).

Jurisdictions" in the Conowingo WIP.[84] There was no valid reason to impose those nutrient reductions on Conowingo in the first place, and Conowingo cannot be forced to accept them in the hopes that, at some potential undefined point in the future, the relevant Bay jurisdictions might "actually achieve[]"[85] nitrogen and phosphorus reductions through the Conowingo WIP.

By imposing nutrient-reduction requirements based on Conowingo's lower-than-anticipated trapping capacity, the 2018 Certification exceeds MDE's authority under § 401 and constitutes arbitrary and capricious agency action.[86] For these reasons, MDE should reconsider the 2018 Certification and remove the "Required Nutrient Reductions" of § 7(D).

2. MDE's Imposition of the Mid-Point TMDL Reductions on Conowingo Is Inconsistent with Its Strategy to Control Pollution at Its Sources.

MDE's nutrient-reduction requirement also is not consistent with the State's strategy of holding polluters accountable for their pollution. It is not seriously disputed where the pollution in the Susquehanna River—and the associated harm to water quality in the Bay—comes from. As far back as 2012, Dr. Beth McGee, then-senior scientist with the Chesapeake Bay Foundation, described Conowingo as a "red herring" and explained in a statement: "Local tributary creeks and rivers to the Chesapeake Bay are polluted almost entirely by local sources of pollution. In addition, no matter what happens at the Conowingo we'll still have a major pollution problem in the main stem of the Bay."[87]

This statement is consistent with finding after finding concerning the source of the Bay's nutrient problem. To quote just a few:

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[84] 2018 Certification, § 7(D)(iii).

[85] *Id.*

[86] *See* Md. Code, SG § 10-222(h)(3).

[87] Press Statement, Chesapeake Bay Foundation, *Conowingo Is A Red Herring; Local Pollution Comes From Local Sources* (Nov. 2, 2012) (Ex. 15).

FERC Final Environmental Impact Statement (FEIS): "Because it is a watershed-wide issue, we find no justification at this time for requiring Exelon to implement measures such as dredging to help control sediment and nutrient loading in the Bay, which would occur in the long term whether or not Conowingo dam was in place."[88]

MDE's own (with the US Army Corps) Lower Susquehanna River Watershed Assessment (LSRWA): "The Susquehanna River watershed, not the Conowingo Dam and its reservoir, is the principal source of adverse pollutant impacts on the upper Chesapeake Bay water quality and aquatic life."[89]

Bay TMDL: "The Susquehanna River basin, draining parts of New York, Pennsylvania, and Maryland, is estimated to be responsible for almost half of the nitrogen loads delivered to the Bay (46 percent)."[90] Focusing on the *source* of the nutrients, the Bay TMDL allocated nitrogen and phosphorous reductions for the Susquehanna Basin as follows:

State	Nitrogen	Phosphorous	Sediment
MD	1.09	.05	62.84
NY	8.77	0.57	292.96
PA	68.90	2.49	1,741.17
Total	**78.76**	**3.11**	**2,096.97**
Loads stated in millions of pounds.			

Since issuing the 2018 Certification, Maryland has taken a different and appropriate approach with regard to the nutrient pollution that is harming the Bay. In a 2019 press release, Governor Hogan echoed the call for upstream states, such as Pennsylvania, to take responsibility for pollution that pours into the Chesapeake Bay.[91] And in 2020, Maryland—along with other States and environmental groups—brought suit against EPA, contending that EPA was not properly enforcing the obligations of Pennsylvania and New York to adequately reduce nutrient pollution

[88] FERC, Office of Energy Projects, *Final Multi-Project Environmental Impact Statement for Hydropower Licenses: Susquehanna River Hydroelectric Projects* at 139 (Mar. 11, 2015) ("FEIS"), https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20150311-4005&optimized=false.

[89] LSRWA at 158.

[90] 2010 TMDL at 4-2.

[91] Josh Kurtz, "Hogan Rips Pa. on Chesapeake Bay Cleanup," Md. Matters (August 29, 2019), https://www.marylandmatters.org/2019/08/29/hogan-rips-pa-on-chesapeake-bay-cleanup/.

at its sources within those States.[92] In its complaint, Maryland alleged that without more effective EPA enforcement of the Bay TMDL, Pennsylvania and New York would "continue to discharge excessive pollution into the Bay and its tributaries … lead[ing] to exceedances of federal and state water quality standards beyond 2025, harm[ing] fish and other aquatic resources, and eliminat[ing] or curtail[ing] recreational opportunities for the millions who visit the Bay each year."[93]

It would be a huge step backwards for Maryland to revert to the unfounded and false view that it is Conowingo—and the supposed deep pockets of its owner—that is the cause of dissolved oxygen problems in the Bay. Such a conclusion is not supported by substantial evidence, and, in fact, is contradicted by Maryland's actions and Maryland's own statements. And in so doing, Maryland would once again shift the focus away from Pennsylvania, where the focus belongs. Pennsylvania has little stake in the Chesapeake Bay, but it is the overwhelming source of the nutrient pollution delivered to the Bay through the Susquehanna River. As it did with its EPA lawsuit, Maryland should keep the focus on Pennsylvania, where true mitigation of nutrient pollution can occur. As discussed below, the evidence establishes that there is no basis in the environmental science of the Bay to attribute to Conowingo the harm caused by Pennsylvania.

3. MDE's Imposition of the TMDL Mid-Point Reductions Is Inconsistent with Maryland's New Bay-Restoration Strategy.

More broadly, the nutrient-reduction requirements in the 2018 Certification are inconsistent with the Chesapeake Bay Program's Scientific and Technical Advisory Committee's 2023 research and recommendations for Bay restoration—endorsed by Governor Moore—which have shifted the

[92] *State of Maryland v. EPA*, Civ. No. 20-2530, Dkt. 1, Complaint (D.D.C. Sept. 10, 2020).

[93] *Id.* at ¶ 59; *see also id.* at ¶ 66 ("EPA's failure to require New York's and Pennsylvania's compliance with the Bay Agreement's 2025 pollution-reduction goals will perpetuate the harms caused by excessive nutrient and sediment pollution to the Chesapeake Bay.").

focus from quantitative nutrient-reduction goals towards actual improvements to aquatic habitats and better outcomes for living resources.

In May 2023, the Scientific and Technical Advisory Committee released its report, *Achieving Water Quality Goals in the Chesapeake Bay: A Comprehensive Evaluation of System Response* ("CESR Report").[94] The CESR Report observed that "achieving pollutant reduction and water quality improvements is proving more challenging than expected."[95] The report explained that "modeling and monitoring evidence indicates that current efforts to reduce nutrient loads will not meet the TMDL targets" and that "ambient water quality monitoring program indicates that estuary water quality has been slow to respond to realized nutrient and sediment reductions in many regions of the Bay."[96] The CESR Report highlights climate change as a key cause: "Climate change is producing increases in water temperature and changing precipitation patterns that confound efforts to achieve water quality goals."[97] For example, despite modest gains in nutrient control, dissolved oxygen levels have not responded accordingly, particularly in the deep water and deep channel habitats, because "higher water temperatures offset roughly 6–34% of the water quality improvement from N reductions."[98]

In view of these developments, the CESR Report recommends a shift in strategy away from simply "reducing pollutants to achieve the measurable criteria (e.g., DO)" to "improv[ing] living

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[94] Chesapeake Bay Program, Scientific and Technical Advisory Committee, *Achieving Water Quality Goals in the Chesapeake Bay: A Comprehensive Evaluation of System Response* (May 2023), https://www.chesapeake.org/stac/wp-content/uploads/2023/05/CESR-Final-update.pdf.

[95] *Id.* at v.

[96] *Id.* at iv.

[97] *Id.* at viii; *see also id.* at 39 ("Climate change poses an array of challenges to meeting the Bay TMDL.").

[98] *Id.* at vii-viii.

resources…."[99] Namely, the CESR Report proposes focusing on DO improvements in shallow water habitats that "support both nursery habitat and forage fish" to "generate larger living resource responses than similar levels of water quality improvement in deeper water habitats."[100] The CESR Report concludes that by replacing the one-size-fits-all TMDL and WQS frameworks with tiered requirements that prioritize implementation, such as in shallow water habitats, policymakers could accelerate results and reach better outcomes.[101]

Notably, the CESR Report does not identify Conowingo either as a polluter or potential opportunity to improve water quality, aquatic habitats, or living resources. Indeed, Conowingo is hardly mentioned. Rather, the CESR Report acknowledges—consistent with all preceding literature—that "[a]griculture is the largest remaining source of nutrient loads to the Bay, and urban nonpoint sources are the fastest growing."[102]

In July 2023, Governor Moore accepted the CESR Report's recommendations and announced a "New Chesapeake and Atlantic Coastal Bays Improvement Strategy."[103] The Governor's office states that "Maryland will focus water quality improvement projects in specific areas with the most potential to improve wildlife habitat and populations…."[104]

The CESR Report and Maryland's new strategy for restoring the Bay simply confirm the arbitrariness of requiring Conowingo annually to remove 6.0 million pounds of nitrogen and 0.26

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[99] *Id.* at 80.

[100] *Id.* at 82.

[101] *Id.* at 83-84.

[102] *Id.* at v.

[103] State of Maryland, Office of the Governor, Governor Moore Announces New Chesapeake and Atlantic Coastal Bays Improvement Strategy (July 21, 2023), https://governor.maryland.gov/news/press/pages/governor-moore-announces-new-chesapeake-and-atlantic-coastal-bays-improvement-strategy.aspx.

[104] *Id.*

million pounds of phosphorous from the Susquehanna River. The Report acknowledges Conowingo Reservoir's reduced benefit (infill) as one of several reasons that the TMDL targets needed adjustment, but the report in no way implicates Conowingo as a source of pollution or solution to improving water quality. If anything, the CESR Report questions the metrics-focused approach to Bay restoration that was used to establish the nutrient-reduction goals in the first place because of the limited benefits for aquatic habitats and living resources. MDE should not impose burdensome and legally untenable requirements on Conowingo that are not even in line with the State's current Bay restoration priorities. That is particularly so given that Conowingo—with its 570 MW of renewable, dispatchable generation—is a key tool in Maryland's fight against climate change.

C. Studies Following the 2018 Certification Confirm that MDE Cannot Justify the Nutrient Reduction Requirements by Relying on Incremental Discharges from Scour Events.

Riverkeepers and others claim that "scour" is a discharge of the Conowingo Project that causes a grave impairment of the water quality of the Chesapeake Bay. But the claim of harm is rife with scientific errors. The scientific evidence—including recent studies—shows that the Project's benefits to the Bay have exceeded any harms and that the concerns regarding scour are inaccurate or greatly exaggerated.

Critics of Conowingo overstate the amount of nutrients entering the Bay due to scour from the Reservoir, as compared to other sources, and ignore that the "scoured" pollutants originally entered the waters from upstream. And they also confuse key distinctions—not only between sediment and nutrients, but also between dissolved nutrients and particulate nutrients, and between particulate nutrients that are "bioavailable" and those that are biologically "inert" due to long residence periods and transformations within the reservoir.

The 2018 Certification does not discuss or address *any* of the actual science concerning the effects of Conowingo scour events. Indeed, MDE provides no support for any of its "findings" in the 2018 Certification, or for the specific values imposed in any of the conditions in the Certification. Here are the facts, first as summarized in the key 2019 UMCES Study, and then as presented more comprehensively through a brief overview of the broad body of studies and literature, much of which has focused directly on Conowingo and its effects on the Bay.

1. The 2019 UMCES Study Found that the Biogeochemical Impacts of Increased Amounts of Conowingo Scour Are Limited in Time and Space for Several Reasons.

The 2019 UMCES Study (attached as Exhibit 5)—captioned "Influences of a River Dam on Delivery and Fate of Sediments and Particulate Nutrients to the Adjacent Estuary: Case Study of Conowingo Dam and Chesapeake Bay"—focused directly and expressly on Conowingo and its effects,[105] noting that "[r]ecent attention has been focused on the potential impacts on Chesapeake Bay of elevated particulate N [nitrogen] and P [phosphorus] inputs associated with more frequent scour events within the Conowingo Reservoir."[106] Significantly, after conducting an extensive review, the UMCES scientists conclude: "Our synthesis suggests that the potential biogeochemical impacts of these elevated inputs are limited in time and space for several reasons."[107] The reasons are explained at length in the report.

Initially, the study found that "model analyses of reservoir sediments suggest that a substantial scour event (top 5 cm of the entire reservoir) would contribute 20% of P loads in a TS

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[105] The paper's authors were supported by grants from Maryland Sea Grant (from the National Oceanic and Atmospheric Administration, U.S. Department of Commerce); the Grayce B. Kerr Fund; and Exelon through MDNR. Ex. 5 (2019 UMCES Study) at 2091.

[106] *Id.* at 2090.

[107] *Id*.

[Tropical Storm] Lee-like storm and only 6% of N loads."[108] In other words, even when a significant amount of scour occurs, as may occur during the largest storms, the amount of nitrogen and phosphorus delivered to the Bay from Conowingo Reservoir is small compared to the amount of nutrients flushed by the storm from elsewhere in the watershed.

In addition, the study determined that "[t]he scoured particulate N and P loads that do enter the Chesapeake Bay are also highly refractory."[109] Critically, what this means is that the scoured material transformed during the time that it was trapped in the Reservoir, becoming less bioreactive and therefore less harmful in terms of depleting oxygen from the water. In other words, the presence of the Dam has provided a benefit by trapping bioreactive (harmful) nutrients and transforming them to less bioreactive forms over long time periods before being released to the Bay during scour events.

The 2019 UMCES study also explained other reasons why the Conowingo scour had limited impacts. Specifically, "particulate forms of N and P that enter Chesapeake Bay are efficiently retained in the upper Bay, especially near the Susquehanna River mouth, due to high sinking rates or trapping within the [estuary turbidity maximum]."[110] In other words, most scoured material is heavy and sinks quickly in the upper Bay near the River mouth, and does not even reach the deep channel zones of the Bay where DO rates are low and water quality is impaired. As the 2019 UMCES Study explained: "Our finding that delivered particles coarsen and associated settling speeds increase as flow rates increase further amplifies upper Bay sediment trapping."[111]

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[108] *Id*.

[109] *Id*.

[110] *Id*. "Estuarine turbidity maximum" is the dominant driver of sediment transport dynamics in the upper Chesapeake Bay

[111] *Id*.

The study continued that the "region where the majority of sediments deposit has typically low rates of sediment-water N and P fluxes," as a result of "high rates of denitrification," "effective phosphorus retention in ... sediments," and "low reactivity of the organic material."[112] And "[f]urthermore, any scoured material that is regenerated in the upper Bay enters a highly enriched water column that is rarely nutrient limited."[113]

Consistent with all of these findings, the study explains that "model simulations of scour events within Conowingo Reservoir *have only shown marginal impacts on dissolved oxygen*."[114] The study repeated these findings in its conclusion, again summarizing that although "sediment loading has ... increased during event flows," nonetheless, "*[t]he potential biogeochemical impacts of these elevated inputs is limited*."[115] Indeed, the study concluded that "the estuary [Chesapeake Bay] is remarkably resilient to storms."[116] Although noting that the Bay "will be negatively influenced by continued infilling of reservoirs and the loss of an unintended watershed [best management practice]," nonetheless, "the scale of the potential impact of elevated particulate nutrient inputs on the mainstem Chesapeake Bay *is likely small* compared to ongoing reductions in dissolved nitrogen and phosphorus in many regions of the watershed."[117]

The 2019 UMCES Study is consistent with a larger body of science, summarized below.

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[112] *Id*.

[113] *Id*.

[114] *Id*. (emphasis added).

[115] *Id*. at 2091 (emphasis added).

[116] *Id*.

[117] *Id*. (emphasis added).

2. Scientific Analysis, Reviewed as a Whole, Shows that Conowingo Is Not the Cause of Oxygen-Deficient Zones in the Bay and that Conowingo Is a Net *Benefit* to the Water Quality of the Bay.

Scientific analysis, taken as a whole and including the recent UMCES study, consistently confirm that Conowingo is not the cause of water quality problems in the Bay, and that Conowingo in fact continues to *benefit* the water quality of the Bay. Constellation provides a brief overview of several key points from that scientific analysis here.

First, as noted above, Conowingo Dam has historically had a positive impact on the Chesapeake Bay's water quality because it blocks pollutants that otherwise would reach the Bay. Over its 90-year history, the Dam has trapped hundreds of millions of tons of sediment that contain nutrients, preventing them from entering the Bay and providing long-term benefits to the Bay's water quality.[118] This fact was significant to the recent UMCES study summarized above.

More recently, due to infilling of sediment originating upstream, the Dam has less trapping capacity, though it still offers continued benefits for downstream water quality, as explained below. From the 1980s through 2013, annual median total nitrogen and total phosphorus exiting from Conowingo was less than or roughly equal to the amounts flowing downriver toward Conowingo from Pennsylvania.[119] This has remained true even in more recent years, as the reservoirs on the Lower Susquehanna River were recognized to be in a state of "dynamic equilibrium."[120] That term

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[118] "Since construction of Conowingo Dam in 1929 through 2012, approximately 470 million tons of sediment was transported down the Susquehanna River into the reservoir system, approximately 280 million tons were trapped, and approximately 190 million tons were transported to Chesapeake Bay." Ex. 4 (Langland 2015) at 1.

[119] *See* Qian Zhang et al., *Long-Term Changes in Sediment and Nutrient Delivery from Conowingo Dam to Chesapeake Bay: Effects of Reservoir Sedimentation*, 50 ENVTL. SCI. & TECH. 1877, 1881 & fig. 3 (2016) (Ex. 16, "Zhang et al. Jan. 2016").

[120] *See* Lew Linker et al., *Results of Latest Phase 6 Conowingo Analysis*, at 6 (Sept. 13, 2017) (Ex. 17, "Linker et al.") ("Conowingo is nearing dynamic equilibrium, which has reduced its ability to

refers to the stage when a reservoir's sediment outflows over a long period (such as a decade or more) are roughly equal to sediment inflows.[121]

Second, other than a trivial amount of runoff from Project lands immediately adjacent to the River, the Conowingo Project itself produces zero sediment, zero nitrogen, and zero phosphorus.[122] Over time, roughly the same amount of each of those pollutants would flow into the Reservoir and out of it with or without the Dam. The reason large amounts of nutrients and sediment are entering the Chesapeake Bay from the lower Susquehanna River is because they are being loaded into the River upstream in Pennsylvania and, to a lesser extent, New York. The more nutrients loaded into the River in the upstream States, the more will eventually enter the Bay.[123]

Third, the argument that the Conowingo Dam harms the Bay by altering the *timing* of the nutrients' delivery to the Bay—the only manner in which the Project could have an effect—lacks support in sound science because it ignores some significant distinctions. One key distinction is between particulate nutrients and dissolved nutrients. Particulate nutrients are the focus of the "scour" theory. But the bulk of nutrients that pass the Dam, including the vast majority of the nitrogen and much of the phosphorus, are *dissolved* in the river water.[124] These dissolved nutrients

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trap sediment and nutrients."); *id.* at 15 (showing dynamic-equilibrium transport factors just below 1.00, meaning that input barely exceeds output).

[121] *See* U.S. Army Corps of Engineers & Md. Dep't of the Env't., *Lower Susquehanna River Watershed Assessment, Maryland and Pennsylvania*, at ES-3 (May 2015), https://dnr.maryland.gov/waters/bay/Documents/LSRWA/Reports/LSRWAFinalMain20160307.pdf ("LSRWA").

[122] *See* Lee Currey, *Conowingo Dam Infill: How Much, Who, How, and By When*, *in* Chesapeake Bay 2017 Midpoint Assessment—Policy Issues for Partnership Decisions at 346 (Dec. 4–5, 2017), (Ex. 18, "Currey 2017 Presentation").

[123] Addressing Conowingo, Dr. William Ball, director of the Chesapeake Research Consortium, has stated that "[t]he most effective approach has always been to better manage upstream sources." David McFadden, *Experts Warn of "Dead Zone" in Chesapeake Bay from Pollution*, Associated Press (July 6, 2019), https://apnews.com/fcc685b8e1f048eea5edd0e606493cf5.

[124] *See* Ex. 12 (Zhang et al. Data Archive); Ex. 16 (Zhang et al. Jan. 2016) at 1877.

freely flow with the water, through the Dam's turbines or over its crest gates (when they are open). The Conowingo Dam slows the River's flow, which in turn increases "denitrification," the escape of dissolved nitrogen into the air.[125] So, the amount of dissolved nitrogen flowing away from the Dam and toward the Bay is usually *less* than the amount flowing toward the Dam from Pennsylvania.[126] Thus, the Dam's impact on the amount of dissolved nitrogen transported downstream is helpful, or at worst neutral, not harmful.

Fourth, this net decrease in dissolved nitrogen is important because of another key distinction that critics of Conowingo ignore: the difference between "bioavailable" nutrients and "biologically inert" nutrients. Dissolved forms of nitrogen and phosphorus are the most immediately bioavailable forms for algal consumption, which is what ultimately triggers decreased dissolved-oxygen levels in the central Bay.[127] So, generally, the Dam actually *reduces* the supply of the very nutrients that have the most significant harmful impacts on water quality in the Bay—the dissolved nutrients. This is one of the reasons why the LSRWA study conducted jointly by the U.S. Army Corps of Engineers and MDE found that the Bay's dissolved-oxygen level is "uniformly higher" with the Dam and Reservoir in place than it would be without them.[128]

Fifth, all of this remains true both before and after the Dam reaches "dynamic equilibrium," and both in normal years and in years with massive floods or storms, like Hurricane Ivan in 2004 or Tropical Storm Lee in 2011. Of course, in a year like 2004 or 2011, there is more runoff

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[125] *See* Qian Zhang et al., *Decadal-Scale Export of Nitrogen, Phosphorus, and Sediment from the Susquehanna River Basin, USA: Analysis and Synthesis of Temporal and Spatial Patterns*, 563–564 SCI. OF THE TOTAL ENVIRONMENT 1016, 1027 (2016) (Ex. 11).

[126] *See* Ex. 12 (Zhang et al. Data Archive); Ex. 16 (Zhang et al. Jan. 2016) at 1879, 1881.

[127] *See* Ex. 18 (Currey 2017 Presentation) at 346; Qian Zhang et al., *Long-Term Seasonal Trends of Nitrogen, Phosphorous, and Suspended Load from the Non-Tidal Susquehanna River Basin to Chesapeake Bay*, 452–453 SCIENCE OF THE TOTAL ENVIRONMENT 208, 217 (2013) (Ex. 19).

[128] LSRWA, Appendix C at 53 & figure 6-42.

throughout the entire Susquehanna River basin, so more water and more dissolved nutrients enter the river and flow down to the Reservoir.[129] But it is still true, even in a storm-heavy year, that the amount of dissolved nutrients leaving the Reservoir (and heading toward the Bay) is similar to or less than the amount entering the Reservoir (again due to denitrification).[130] So, year in and year out, the Dam is, at worst, neutral for dissolved phosphorus and is either neutral or positively helpful to the Bay for dissolved nitrogen. And, to reiterate, most of the nutrients passing through the Dam, including the vast majority of nitrogen, are dissolved.

Sixth, as to particulate (non-dissolved) nutrients, Riverkeepers and others again ignore the key distinction between bioavailable and biologically inert particulate nutrients. As explained above, it is the bioavailable nutrients that contribute significantly to algae blooms in the central Bay, which in turn suppress the dissolved-oxygen level there. Yet the particulate nutrients that rest on the bottom of the Conowingo Reservoir and get scoured only during large storm events are relatively inert.[131] Scour of this relatively inert particulate nitrogen has a negligible impact on the Bay's water quality because it is not bioavailable for algal consumption.[132] This is one of several reasons why the narrative about the dangers of scour during large storm events is misguided.

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[129] *See* Ex. 12 (Zhang et al. Data Archive), SRB_load_estimates_output, MAR_DN_Annual_estimates.csv (Susquehanna River at Marietta) and CONE_DN_Annual_estimates.csv (Conestoga River), "load(true), kg/day") (showing that 2004 and 2011 had high amounts of dissolved nitrogen).

[130] *See id.* (showing similar or lesser amounts of dissolved nitrogen exiting Conowingo, compared to the amounts entering the lower Susquehanna from Marietta and Conestoga). This finding uses the same method used by Zhang et al. (Ex. 16) at 1879 to account for nutrient loading from the small land area between Marietta and Conowingo.

[131] *See* 2019 UMCES Study at 2081 (explaining that G3 material is relatively inert, compared with G1 or G2); Ex. 17 (Linker et al.) at 14 (showing that the transport of G3 material predominates over that of G1 and G2 material during high-flow, or scour, events).

[132] *See* Jeffrey Cornwell, J. Michael Owens, Hamlet Perez & Zoe Vulgaropulos, *The Impact of Conowingo Particulates on the Chesapeake Bay: Assessing the Biogeochemistry of Nitrogen and Phosphorus in Reservoirs and the Chesapeake Bay* at 79 (2017) (Ex. 20, "Cornwell et al.").

Seventh, on the relatively rare days when the Dam's crest gates are open and flows are high enough to "scour" the Reservoir bottom, as noted above, the team of UMCES scientists found that "the potential biogeochemical impacts of these elevated inputs are limited in time and space for several reasons."[133] As summarized above, the first reason is that an overwhelming majority of the pollutant loads during a major storm, even one like 2011's Tropical Storm Lee, comes directly from runoff and other sources, and has nothing to do with the scouring of the Reservoir bottom.[134] The second (and related) reason the impact on the Bay is limited is that "[t]he scoured particulate N and P loads that do enter the Chesapeake Bay are also highly refractory."[135] The third reason is that the particulate nitrogen and phosphorus scoured from the Reservoir bottom sink quickly and thus usually do not travel far into the Bay.[136] Thus, they do not even reach the central Bay, which is where the low dissolved-oxygen levels are found. The fourth reason why scour has only a limited impact is that the low-salinity Bay water near the Susquehanna River mouth generally has low levels of nitrogen and phosphorus exchange from sediment to water.[137] In combination, these four reasons explain why "scour events within Conowingo Reservoir have only shown marginal impacts on dissolved oxygen" in the Bay.[138]

Eighth, even when major storm events do transport sediment past the Upper Bay and into the saltier (mesohaline) mid-Bay region, there are typically long time lags between such events, and the magnitude of sediment delivery to the mid-Bay is relatively small, minimizing potential

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[133] Ex. 5 (2019 UMCES Study) at 2090.

[134] *Id.*

[135] *Id.*; *see also id.* at 2080–81, 2086–87.

[136] *Id.* at 2090; *see also id.* at 2076, 2091.

[137] *Id.* at 2090.

[138] *Id.* (citation omitted).

impacts to water quality.[139] Even 2011's Tropical Storm Lee, the region's second largest storm in a half century, deposited only about one cm of sediment in the mesohaline region of the Bay.[140] The UMCES team highlighted that submerged aquatic vegetation beds mostly withstood Tropical Storm Lee and that the Bay's water quality improved "[i]n the years following" the storm.[141]

Ninth, given this body of scientific findings, it is not surprising that the best available data show no historical correlation between the timing of "scour"-inducing storms at Conowingo and depressed dissolved-oxygen levels in the central Bay.[142] This is consistent with studies of sediment cores from the Reservoir, which concluded that any extra input of phosphorus and nitrogen from scour events would have only "minimal" impacts on the Chesapeake Bay.[143]

Published computer-modeling studies have reached a similar conclusion. For example, a study in the *Journal of Environmental Quality* found that a Conowingo scour event would generate only "marginal impacts" in the Bay, which would be "small relative to the normal intra- and inter-annual variations in … DO observed in the bay."[144] Specifically, the study found that a scour event would likely produce an average decline in bottom-water dissolved-oxygen levels of about 0.1

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[139] *See id.*

[140] *Id.*; *see also id.* at 2074.

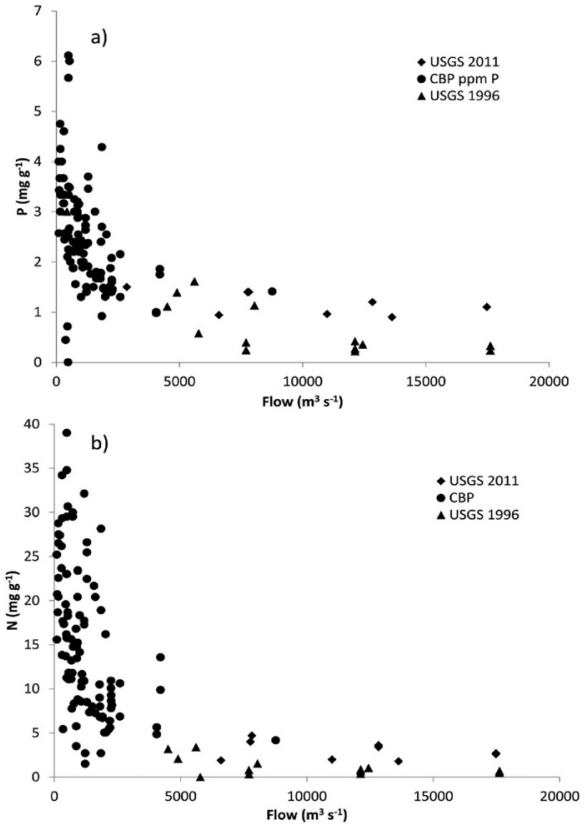
[141] *Id.* at 2090.

[142] *See* Jeremy M. Testa et al., *Season-Specific Trends and Linkages of Nitrogen and Oxygen Cycles in Chesapeake Bay*, Limnology and Oceanography 1, 8 fig. 5 & box 5 (2018) (showing August–September bottom-layer dissolved oxygen for the central Bay, 1985–2013) (Ex. 21); Aaron J. Bever et al., *Combining Observations and Numerical Model Results to Improve Estimates of Hypoxic Volume within the Chesapeake Bay, USA*, 118 J. OF GEOPHYSICAL RESEARCH: OCEANS 4924, 4941 & fig. 14 (2013) (showing data-interpolated hypoxic volumes and duration of hypoxia, 1984–2012) (Ex. 22); Ex. 4 (Langland 2015) at 11 & table 4 (showing scour events occurred in February 1984, March 1986, April 1993, January 1996, September 2004, June 2006, March 2011, and September 2011).

[143] *See* Ex. 20 (Cornwell et al.) at 79.

[144] Carl F. Cerco & Mark R. Noel, *Impact of Reservoir Sediment Scour on Water Quality in a Downstream Estuary*, 45 JO. ENVTL. QUALITY 894, 904 (2016) (Ex. 23, "Cerco & Noel").

grams per cubic meter; by contrast, within a typical year, that same number vacillates by about 8 to 12 grams per cubic meter in the central Bay, roughly 100 times as much as the impact of a scour event.[145] Hence, the projected impact from a scour event on dissolved-oxygen levels is so small it could hardly be observed in a typical data scatterplot.[146]



Tenth and finally, by definition, any storm that is large enough to cause significant "scour," like Hurricane Ivan or Tropical Storm Lee, will remove a sizeable layer from the Reservoir bottom,

[145] *See id.*; *see also* Chesapeake Bay Program Data Hub, *available at* https://www.chesapeakebay.net/what/data (Chesapeake Bay Program Water Quality Database (1984–present), querying data for Water Quality Data, 1987–2023, Program: TWQM—Tidal Water Quality Monitoring Program, Project: MAIN—Tidal Mainstem Water Quality Monitoring Project, Geographical Attribute: Monitoring Station, Attribute: CB4.4—Northeast of Cove Point; Mid-Channel; Parameter: Dissolved Oxygen in mg/L; review data for Layer = B ('Bottom')) (showing dissolved-oxygen levels fluctuate at this location between 0 and 12 mg/L).

[146] *See* Ex. 23 (Cerco & Noel) Fig. 3.

which in turn will, for a time, increase the Reservoir's capacity to trap sediment and nutrients flowing down from Pennsylvania.[147] So, ironically, at least in the short- to medium-term, a scour event has the offsetting *benefit* of restoring part of the Reservoir's storage or trapping capacity.[148]

Again, contrary to the picture that others attempt to paint, the scientific evidence shows that scour events have little to no effect on the Bay's health. As the computer modeling that the Army Corps of Engineers and MDE relied on in their LSRWA report confirmed, at all times except after very large storm events that do not occur in most years,[149] the Dam continues to provide water-quality benefits to the central Bay, including *increased* DO.[150] Likewise, as noted above, the UMCES team of scientists summarized their findings by calling the Bay "remarkably resilient to storms."[151] As Professor Cindy Palinkas, the UMCES study's lead author, put it, the Chesapeake Bay "can handle the occasional big input of sediment."[152] While major storm events can have a short-term impact, in the long run the Bay and its biogeochemistry remain resilient, even as the Conowingo Reservoir's trapping capacity has decreased.[153]

MDE did not discuss any of these scientific assessments in the 2018 Certification. Based on this information, culminating in the 2019 UMCES Study, Constellation requests that MDE

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[147] *See* Ex. 4 (Langland 2015) at 4; Michael J. Langland, *Bathymetry and Sediment-Storage Capacity Change in Three Reservoirs on the Lower Susquehanna River, 1996–2008*, USGS Scientific Investigations Report 2009-5110, at 19 (2009) (Ex. 24, "Langland 2009").

[148] *See* Ex. 4 (Langland 2015) at 4; Ex. 24 (Langland 2009) at 19.

[149] *See* Ex. 4 (Langland 2015) at 11, table 5.

[150] *See* LSRWA, Appendix C figs. 6-42, 6-43.

[151] Ex. 5 (2019 UMCES Study) at 2091.

[152] University of Maryland Center for Environmental Science, *UMCES Scientists Complete Study on Conowingo Dam and Impact on Chesapeake Bay* 1 (Nov. 11, 2019), https://www.umces.edu/news/umces-scientists-complete-study-conowingo-dam-and-impact-chesapeake-bay (quoting the study's lead author, Professor Cindy Palinkas).

[153] Ex. 5 (2019 UMCES Study) at 2091.

reconsider the 2018 Certification and remove the required nutrient reductions of § 7(D) in their entirety.

3. Although There Is Neither a Legal nor a Science-Based Rationale to Impose a Nutrient Reduction Obligation on Conowingo, Constellation Nonetheless Has Agreed to Make Tens of Millions of Dollars of Payments to Maryland to Help Mitigate the Effects of Nutrient Pollution.

Constellation has shown above that there is neither a legal nor a scientific basis to impose a nutrient reduction obligation on Conowingo. Nevertheless, Constellation has agreed to make a total of more than $63 million in payments to Maryland over the course of a new 50-year license for Conowingo (to be escalated with inflation), specifically to help mitigate the effects of nutrient pollution. The amounts are intended to be used for things such as: mussel restoration projects; resiliency projects (such as submerged aquatic vegetation restoration, aquaculture, clam and oyster restoration, and living shoreline creation); mitigation of the impact of high-flow events that may result in scour of sediment impounded behind the Dam (including restoration of submerged aquatic vegetation or other resiliency projects, or trash and debris cleanup); other projects that will have benefits to water quality (including agricultural practices that will decrease nutrient loading, such as cover crops and forest buffers); research and projects related to eels and eel passage; study of the feasibility of dredge material disposal options; and other things. Constellation also has agreed to donate land to MDE for a mussel hatchery. These actions go beyond what is required of Constellation under the CWA but provide additional assurance that Conowingo's activities will comply with state water quality standards. They are also in accord with Maryland's strategy—based on the CESR Report—of focusing on the measures with the greatest impacts for aquatic habitats and living resources.

D. The Required Nutrient Reductions in the 2018 Certification Are Also Impermissible Under § 401(d) Because They Impose a Purely Financial Obligation on Conowingo.

1. The Required Nutrient Reductions Are Feasible Only as a Financial Obligation on Conowingo.

The 2018 Certification requires the Project to provide—no later than December 31, 2019, which was only 20 months after MDE issued the certification—a "nutrient corrective action plan" to MDE for its review and approval.[154] Although the 2018 Certification provides that the plan "may propose any combination of corrective action strategies," it identifies three:[155]

(a) "Payment of an in-lieu fee annually at $17.00 per pound of nitrogen and $270.00 per pound of phosphorus in accordance with payment instructions provided by MDE" (with these dollar amounts adjusted annually for inflation);

(b) "Installation of best management practices and/or ecosystem restoration actions (e.g., restoration of buffers, land conservation, stream and wetland restorations, re-forestation, and/or freshwater mussel and oyster restoration)"; and/or

(c) "Dredging the Reservoir, subject to Licensee obtaining all necessary Authorizations for such dredging."

Of these alternatives, only option (a) is feasible, payment of the identified "in-lieu fee."

Option (b)—the "installation" of "best management practices" and/or "ecosystem restoration actions"—is infeasible because Conowingo's Project lands are minimal and there is nothing Conowingo can do on those lands to achieve the significant amount of nutrient reductions required by the 2018 Certification. At most, a negligible amount of nutrients originate on Project lands. MDE cannot seriously contend—and the 2018 Certification makes no attempt to demonstrate—that Constellation, on its own, has the power to conduct "installation" of things like "restoration of buffers," "land conservation," "stream and wetland restorations," or "re-

[154] *See* 2018 Certification, § 7(D)(iv).

[155] *Id.*

forestation." Constellation certainly could *pay* for such actions by other parties on *their* lands, but it could not undertake these actions on its own, sufficient to remove the significant amount of nutrient reductions identified in the 2018 Certification. Even with regard to "freshwater mussel and oyster restoration," the 2018 Certification itself declares at § 6(E) that "[t]he Reservoir lacks suitable habitat for freshwater mussels," so even there Conowingo could not conduct such restoration activities on its own. The 2018 Certification does not explain how Constellation could implement "best management practices and/or ecosystem restoration actions" across the Susquehanna watershed to achieve the Certification's required nutrient obligations. This option is not feasible—and a § 401 condition that effectively requires the applicant "to do something impossible … is quintessentially irrational and arbitrary."[156]

Option (c), "dredging the Reservoir" is also neither realistic nor feasible. Constellation is legally barred from conducting such activity on its own and, as the 2018 Certification acknowledges, would require numerous government approvals. And it is not just a matter of applying for approvals: To this day, five years after MDE issued the 2018 Certification, the most in-depth evaluations to date recommend against dredging as neither a cost-effective nor significantly beneficial option. *See infra*, Part II. If the potential benefits and feasibility of any significant amount of dredging were re-assessed, it will take years, if ever, to complete the necessary studies to determine whether dredging the Reservoir is feasible and beneficial.

There is a further disconnect with MDE's dredging alternative. The 2018 Certification requires the Project to "annually reduce the amount of nitrogen included in the Project's discharges by six million (6,000,000) pounds."[157] However, it is firmly established that virtually all of the

[156] *See Niagara Mohawk Power Corp. v. New York State Dep't of Env't Conservation*, 195 A.D.3d 1468, 1470 (N.Y. 2021).

[157] 2018 Certification, § 7(D)(ii).

nitrogen discharged (by others) into the Susquehanna watershed is *dissolved* in the water when it reaches Conowingo and is not trapped by the Dam or captured in the Reservoir. It is not clear that *any* amount of dredging of the Reservoir, even at potentially astronomical costs, would "annually reduce the amount of nitrogen included in the Project's discharges by six million … pounds."

That leaves only MDE's *first* option, "payment of an in-lieu fee." Even without inflation, that option would require Constellation to pay more than $172 million per year—or more than $8.0 billion over the life of its FERC license—"in accordance with payment instructions provided by MDE." Under the 2018 Certification, Conowingo simply must pay this amount annually; how the money would be spent would be entirely up to MDE. The obligation is not only impermissible—as shown below—under § 401(d), but it would force the closure of Conowingo and its carbon-free generation. The $172 million annual payment far exceeds the value of the Project as an operating asset; Conowingo cannot operate under the conditions MDE imposed.[158]

2. MDE Secretary Grumbles Acknowledged that the Required Nutrient Reductions Were *Expected* to Be a Financial Burden and Not an Operational Condition on Conowingo.

As set forth above, MDE Secretary Grumbles testified that the 2018 Certification would help "the Commonwealth of Pennsylvania to step up its game, *in part with [Constellation] dollars*, to reduce the runoff upstream."[159] It is clear that MDE expected the nutrient reduction obligation to be a purely *financial* obligation on Conowingo, and nothing else.

[158] In comparison to the $172 million annual payment Maryland required in the 2018 Certification, Riverkeepers asserted on appeal that Conowingo's annual revenues range between $115 and $121 million.

[159] *See* Ex. 13 (Grumbles 2019 Testimony) at 1:05:00 (emphasis added).

3. A Purely Financial Obligation Is Not a Lawful Condition Under § 401.

The 2018 Certification effectively imposes an obligation on Conowingo to pay MDE in excess of $172 million per year—or more than $8.0 billion over the term of the federal license—for Maryland to spend as it pleases, at least in theory, to support nutrient reduction throughout the Susquehanna watershed. The money would not be used to change *Conowingo's* operations in any way; at best, it would change the practices of farmers or the condition of lands having nothing to do with the federal permit at issue. Nothing in § 401 authorizes a state to impose such an obligation on a federal permittee.

As set forth above, § 401(a) of the CWA requires a federal permittee whose operations "may result in any discharge into the navigable waters" to obtain a *certification* from the State in which the discharge originates "that any such discharge will comply" with applicable provisions of the Clean Water Act.[160] Critically, § 401(d) allows a State to *condition* such a certification, but *not* in the way Maryland did in the 2018 Certification. Section 401(d) provides that "[a]ny certification provided under this section shall set forth *any effluent limitations and other limitations*, and *monitoring requirements* necessary to assure that any applicant for a Federal license or permit will comply" with applicable effluent limitations, other limitations in the CWA, and any appropriate requirements of state law (such as state water quality standards).[161] By its express terms, § 401(d) allows a State to impose *effluent limitations*, *other limitations*, and *monitoring requirements* in a § 401 certification. Section 401(d) does not authorize a State simply

[160] 33 U.S.C. § 1341(a)(1)(a).

[161] *Id.* § 1341(d) (emphasis added).

to require a federal permittee to pay it money, or otherwise impose a purely financial obligation upon a federal permittee.[162]

This plain text limitation is further supported by the way in which a § 401 certification operates. Again, the text of § 401 provides that when a State imposes conditions in a § 401 certification, such obligations "shall become a condition of any Federal license or permit subject to the provisions of this section."[163] Thus, § 401 water quality certifications, although *issued* by a State, become in fact a condition of the *federal* license at issue and are enforced by the *federal* agency issuing the license. FERC has made clear that § 401 does not authorize a State to include in a § 401 certification a separate *state* enforcement mechanism. In *Consumers Power Co.*, Michigan included in a § 401 certification "a process for the Michigan DNR to require Consumers Power to pay it for failure to comply with the water quality limitations set forth in the certification."[164] As FERC explained, however, in doing so Michigan exceeded its authority under § 401: "Pursuant to section 401(d) of the CWA, the State may include in a section 401 certification *conditions relating to water quality*. Nothing in the CWA authorizes the state to engraft a state enforcement scheme onto a federal license. Accordingly, Condition 8 exceeds the scope of section 401 and will not be made a part of the license."[165]

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[162] Accordingly, EPA explained in its 2020 rulemaking on § 401 certification rules that "[u]sing the certification process to yield … payments from project proponents that are unrelated to water quality impacts from the proposed federally licensed or permitted project is inconsistent with the authority provided by Congress." EPA 2020 Rule, 85 Fed. Reg. at 42,257. The 2022 notice proposing updates to EPA's regulations agreed that "one-time and recurring payments to state agencies for improvements or enhancements that are unrelated to the proposed federally licensed or permitted project … would generally be beyond the scope of section 401." EPA 2022 Proposal, 87 Fed. Reg. at 35,343.

[163] 33 U.S.C. § 1341(d).

[164] *Consumers Power Co.*, 68 FERC ¶ 61,077, 61,374 (1994),

[165] *Id*. (emphasis added).

If Maryland's requirement that Conowingo pay MDE in excess of $172 million annually was included in Conowingo's FERC license, it would be FERC's obligation to enforce that financial obligation in the license. But such an obligation amounts to monetary damages, and the Federal Power Act does not authorize FERC to impose a damages obligation on a permittee.[166]

In *South Carolina Public Service Authority v. FERC*, the court distinguished FERC's authority "to ensure that a project is safe before licensing, or relicensing, it" and a FERC order requiring a permittee to pay compensation for harms caused by the permittee.[167] FERC argued that by requiring a licensee to pay compensation for damages it has caused, FERC had "simply condition[ed] a license with safety measures" in furtherance of its statutory authority to protect life, health and property.[168] But the D.C. Circuit emphasized that "'compensation' bears little resemblance to 'protection' as those terms are used in ordinary language or in statutes regulating various hazards."[169] The court ruled that "[u]nlike a requirement that a licensee take a measure to prevent a loss from occurring, such as installing an alarm system or rebuilding a dam, the compensation condition does not contribute in any way to the protection of property."[170]

The same is true of the "payment of an in-lieu fee" annual financial obligation in the 2018 Certification. It is not a condition that changes or limits the way Conowingo operates the Project, as the imposition of "effluent limitations," "other limitations," or "monitoring requirements"

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[166] *See*, *e.g.*, *Ohio Power Co.*, 71 FERC ¶ 61,092, 61,313 (1995) ("[I]t is well established that the Commission has no authority to adjudicate claims for, or require payment of, damages"); *Settlements in Hydropower Licensing Proceedings under Part I of the Federal Power Act*, 116 FERC ¶ 61,270, 62,085 (2006) ("[T]he Commission is precluded by law from assessing damages, so any condition that would do so would be unenforceable").

[167] *S. Carolina Pub. Serv. Auth. v. FERC*, 850 F.2d 788, 792 (D.C. Cir. 1988).

[168] *Id.*

[169] *Id*.

[170] *Id*.

would do. It is simply a form of compensation, which is not permissible under either the Federal Power Act or § 401(d) of the CWA.

Obviously, permissible conditions in a § 401 certification may be expensive to implement. But, again, FERC has recognized the difference between a permissible expense and an impermissible financial obligation. In *Ohio Power*, FERC recognized that "[v]irtually all protection, mitigation, and enhancement measures come at a cost, be it in terms of equipment that is installed, generation that is foregone, or land that is acquired and dedicated to resource protection."[171] And FERC has ruled that where "it is infeasible to avoid or minimize the project's impact on fish," it may require "a level of expenditures to develop compensatory mitigation of fishery resources for the unavoidable fish losses."[172] But at the same time, FERC has made clear: "What compensation does *not* mean is that the licensee must pay—to a state agency, for example—a sum reflecting a monetary value for each fish destroyed by the project."[173]

The 2018 Certification seeks to impose in Conowingo's federal license an obligation "that the licensee must pay—to a state agency, for example—a sum reflecting a monetary value" that MDE has ascribed to identified amounts of nitrogen and phosphorus. For the reasons set forth above, Maryland had no authority under § 401 to *impose* such an obligation, and FERC would have no authority under the FPA to *enforce* such a condition in Conowingo's license. Maryland should reconsider § 7(C) of the 2018 Certification and remove the obligation that Conowingo remove significant amounts of nitrogen and phosphorus from the Susquehanna River that are introduced into the watershed by *other* parties and ultimately may pass through the Project.

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[171] *Ohio Power Co.*, 71 FERC at 61,312.

[172] *Id*.

[173] *Id*. at 61,313.

II. MDE Should Not Impose a Dredging Obligation on Conowingo.

In the 2018 Certification, Maryland suggested, without any support, that Conowingo should have been performing "routine dredging" to "maintain any trapping function" and that such dredging would lessen the supposedly harmful effects of scour.[174] There is no basis in precedent, law, or fact for this suggestion. In any revised § 401 certification, MDE should not impose a dredging obligation on Conowingo.

A. Conowingo Did Not Have Any Legal Obligation in the Past to Dredge the Reservoir to Maintain a "Trapping" Capacity or to Offset the Effects of Pollutants Discharged into the Watershed by Others.

MDE's 2018 Certification implies that a failure by Conowingo to conduct "routine dredging" in the past provides a basis for imposing "corrective action strategies," including dredging, in the future.[175] Conowingo had no previous obligation—and indeed no previous authorization—to conduct "routine dredging" to "maintain [a] trapping function" of the Reservoir. Dredging would have been beyond the scope of Conowingo's permitted operations. Neither FERC's license, Maryland's previous 1975 § 401 certification, nor any other permit issued by Maryland for Conowingo either required or authorized Conowingo to conduct such dredging, and numerous federal and state permits would have been required for any such dredging to occur.[176] In short, Conowingo had no *obligation* to conduct such dredging, and had no *authority* to do so.

For the reasons set forth above,[177] MDE had no legal authority to require Conowingo to conduct such dredging in the past. There is no legal authority or precedent for requiring a party to

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[174] *See* 2018 Certification, § 6(G). With regard to the actual effects of material scoured from Conowingo Reservoir, *see supra* at Section I(C).

[175] *See* 2018 Certification, §§ 6(G), 7(D)(iv)(c).

[176] The need for such authorizations is acknowledged in § 7(D)(iv)(c) of the 2018 Certification.

[177] *See supra*, at Statutory and Legal Background; Section I(A).

expend significant sums to "trap" or "block" harmful nutrient pollution introduced into a watershed by other parties. For decades, Conowingo has performed a beneficial trapping function, but it had no legal obligation to do so. And, as explained above, Conowingo also could not have been required to dredge the Reservoir to avoid impacts when other parties' nutrient pollution is "scoured" from the Reservoir in elevated flow events.[178] The overriding point, however, is that Conowingo cannot be faulted—and obligations cannot be imposed on account of that fault—for failing to do something that it was neither obligated nor authorized to do.

The fact that Maryland did not (and could not) impose a "routine dredging" obligation on Conowingo to "maintain [a] trapping function" for other parties' nutrient pollution is not unique. Constellation has reviewed more than 500 other water quality certifications issued by MDE, and it has found not a single Maryland water quality certification that imposes an obligation to remove nutrient pollution caused by others.[179] Other Maryland water quality certifications at times address and *approve* dredging, but only for another purpose, such as to improve navigational access or provide for operational capacity.[180] And in such instances, rather than *requiring* dredging, MDE's certifications have merely considered and addressed the *potential adverse impacts from dredging*.[181] That is because, as addressed *infra* Section II, dredging itself has the potential to

[178] *See supra*, at Section I(C).

[179] This is supported by Maryland Water Quality Certifications posted online by MDE for the years 2019 through 2023, https://mde.maryland.gov/programs/Water/WetlandsandWaterways/Pages/WQC.aspx, and those provided pursuant to the Public Information Act for the period from 1995 through May 17, 2018 (Ex. 28).

[180] *E.g.*, *id.* 09-WL-0159 at 7; 09-WL-0197 at 7; 09-WL-0784 at 4; 10-WL-0049 at 1; 10-WL-0501 at 7; 10-WL-0576 at 7; 06-WQC-1653 at 1-3; 08-WL-1352 at 6.

[181] *E.g.*, *id.* 09-WL-0159 at 7-8; 09-WL-0197 at 7-8; 09-WL-0784 at 5-6; 10-WL-0049 at 1-3; 10-WL-0501 at 7-9; 10-WL-0576 at 7-9; 06-WQC-1653 at 4-8; 08-WL-1352 at 6-7.

create significant harmful effects. But an affirmative obligation to dredge as a nutrient reduction attainment tool has not been required under Maryland's prior water quality certifications.

Not only did Conowingo not have an *obligation* to dredge, but it was *prohibited* from doing so without multiple state and federal permits; Conowingo was not free to conduct "routine dredging" on its own. Dredging is far from a "routine" activity. Multiple permits were required to conduct even a small dredging pilot dredging project of Conowingo Reservoir, discussed *infra* Section II.[182] The Maryland Environmental Service that contracted for Pilot Study had to apply for a Non-Tidal Wetland License, a CWA § 404 dredging permit from the U.S. Army Corps of Engineers, and a § 401 water quality certification. In addition, Conowingo had to submit a "Non-Project Specific Use Application" from FERC because the dredging project was outside the scope of Conowingo's existing FERC license.[183] Even the 2018 Certification recognized that Conowingo lacked authorization to dredge by qualifying that any dredging undertaken to achieve the certification's nutrient reduction requirements would be "subject to Licensee obtaining all necessary Authorizations for such dredging" and that "[t]his Certification does not authorize any work to occur in waters of the State, including any dredging."[184]

For these reasons, there is no basis for faulting Conowingo for failing to conduct "routine dredging" to "maintain [a] trapping function,"[185] and no obligation may be imposed on Conowingo

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[182] *See infra* at Section II(B)(2).

[183] *See* Joint Federal/State Application for the Alteration of any Floodplain, Waterway, Tidal or Nontidal Wetland In Maryland Joint Application (May 8, 2018) (Ex. 25, "Joint Application"). In contrast to this out of scope activity, limited dredging of marina facilities to support recreational access is directly related to project activities required by the Federal Power Act, which requires that recreational activities be considered and included in a federal hydropower project. *See al*so Summary of Questions Received During the April 1, 2020 Conowingo Dredging Pilot Project Public Webinar.

[184] 2018 Certification, §§ 7(D)(iv)(c), 7(Q)(ii).

[185] *Id.* § 6(G).

as a result of any such fault. The 2018 Certification should be reconsidered and revised to remove such contentions and obligations.

B. MDE Should Not Require Dredging in Any Revised Certification for Conowingo.

For multiple reasons, there is no legitimate basis for MDE to impose a going-forward dredging obligation on Conowingo in any revised § 401 certification. Again, as set forth above, MDE lacks legal authority to require Conowingo to take corrective actions to reduce the harms of nutrient pollution caused by other parties or to maintain a capacity to "trap" upstream pollution introduced by others; in addition, Conowingo already mitigates the harmful effects of upstream pollution by causing nutrients held in the Reservoir to become less bioreactive, and Conowingo itself does not cause any material additive harm when upstream nutrients are scoured from the Reservoir during high flow events.[186] There are additional reasons why there is no legitimate basis to impose a going-forward dredging obligation on Conowingo in any revised § 401 certification.

1. Dredging Is Not, and Has Never Been, a Recognized Best Management Practice.

EPA's Chesapeake Bay Program has not approved dredging as a Best Management Practice ("BMP") to reduce sediment and nutrient loadings to the Bay as part of the CWIP.[187] Because it is not an established BMP, states cannot get any nutrient reduction credit under the CWIP for performing dredging.[188] EPA has made clear that states may only include Chesapeake Bay Program partnership-approved BMPs in their Watershed Implementation Plans, and that dredging

[186] *See supra* at Sections I(A), I(C).

[187] *See* Ex. 6 (EPA Conowingo WIP Evaluation), Enclosure at 5 (recognizing the interest of some jurisdictions to utilize the Chesapeake Bay Program (CBP) partnership's expert panel processes to determine whether dredging is a viable BMP, and that only CBP partnership-approved BMPs may be included in the CWIP).

[188] *Id.*

is not at present a viable BMP—despite some jurisdictions' interest to study it further.[189] Neither Maryland nor the Chesapeake Bay Program has completed studies that could be used to support dredging becoming a BMP.[190]

Indeed, dredging faces significant obstacles before it could ever be approved as a BMP. As MDE itself found in the LSRWA, dredging is an impractical solution, the high costs of which cannot be justified by water-quality benefits, which likely would be both minimal and short-lived.[191] After evaluating a range of dredging volumes and approaches, the LSRWA concluded:

> Any dredging alternative comes with *very high costs with relatively small benefits* observed. The long-term reality of dredging is that large volumes of sediment are depositing annually. Therefore, the net removal of sediment out of the system is minimal because part of the dredging operation would simply be "keeping up" with sediment deposition; therefore, apparent benefits would also be reduced.[192]

With the continued deposition of sediments, even the modeled minimal benefits were largely illusory. Similarly, in 2015, FERC summarized that "operational changes at Conowingo would not address the sediment transport issue, and ... dredging of Conowingo Pond would be cost prohibitive and ineffective."[193] The consensus then was that reducing upstream nutrients was the

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[189] *See id.*

[190] A Chesapeake Bay Program work group may at some point further assess whether dredging could become an approved BMP, but the initial stages are yet to be completed. A scope of future modeling is not yet finalized. *See* Conowingo WIP Update to Chesapeake Bay Program Principals' Steering Committee, at 9 (July 2023) (Ex. 26). Future modeling is speculative and unavailable.

[191] *See* LSRWA at 143 (noting that "[e]valuation of a range of dredging alternatives [of the reservoirs behind the dams on the Susquehanna River] did not yield any management strategies that could ... provide meaningful, long-term Chesapeake Bay water quality benefits" and "Chesapeake Bay water quality benefits [brought by dredging] are minimal and short-lived, and the costs are high.")

[192] LSRWA at 143 (emphasis added).

[193] FEIS at 139 (discussing the LSRWA and that there is no justification for requiring Conowingo to dredge "to help control sediment and nutrient loading the Bay, which would occur in the long term whether or not Conowingo dam was in place").

most effective way to improve Bay water quality.[194] After those 2015 conclusions, scientists have determined that the benefits of dredging are likely to be even *less* that previously hypothesized.[195]

MDE has had nearly a decade to study dredging further since publishing the LSRWA and it has not uncovered persuasive evidence to support an obligation to dredge. As a result, there is no scientific or evidentiary basis for imposing a dredging obligation at this time.[196] Dredging simply is not, has never been, and likely may never become an approved BMP under the Chesapeake Bay Program.[197] Dredging is complex and has its own risks and impacts to human health (such as safety, noise, and nuisance) and the environment (such as disturbance of habitat, resuspension of sediment and pollutants,[198] and waste management and disposal issues significant enough that Maryland pursued a Pilot Study to explore whether some dredge spoils might be

[194] *See* LSRWA at 163("Strategies focused on reducing nutrients, as opposed to sediments, are likely more effective [than dredging] at addressing impacts to Chesapeake Bay water quality and aquatic life.").

[195] *See* Ex. 5 (2019 UMCES Study) (dispelling the idea that dredging should be employed to reduce the severity of scour events by explaining why scour events have a limited impact on the Bay).

[196] *See* Ex. 26 (Conowingo WIP July 2023 Update) at 9 (noting that the scope of future modeling is not yet finalized).

[197] The approved and pursued CWIP strategies, meanwhile, are targeting pollution at the source. *See* Ex. 6 (EPA Conowingo WIP Evaluation).

[198] Some of the pollutants present in Conowingo sediment from upstream sources include substances above project screening levels for residential soils, such as arsenic, manganese, thallium and certain semi-volatile organic compounds which the Reuse Study suggests may not present an issue for beneficial reuse of dredge spoils (the issue that the Reuse Study focused on), but the Reuse Study did not evaluate whether these or other constituents detected would present an aquatic environmental issue in connection with resuspension during any potential large scale dredging. Northgate Environmental Management, Inc., Conowingo Sediment Characterization and Innovative Reuse and Beneficial Use Pilot Project, *Innovative Reuse and Beneficial Use Evaluation and Demonstration Project Report*, pp. 5, 6 (Dec. 5, 2022) ("Reuse Study"), https://mde.maryland.gov/programs/marylander/Documents/IRBU%20Report.pdf.

beneficially reused rather than disposed[199]). There is no sound basis in science or established practice for MDE to impose a dredging requirement moving forward.

2. Maryland's Pilot Study Does Not Support a Dredging Requirement.

Although Maryland commissioned a recent Pilot Study focused on one aspect of dredging—the potential beneficial reuse of dredge spoils—the study does not address the fundamental question of whether the dredging itself is more beneficial than harmful, and therefore whether it should be performed in the first place. Because the Pilot Study is new, however, Constellation addresses it briefly.

Maryland's Pilot Study had two parts: an Innovative Reuse and Beneficial Use Evaluation and Demonstration Project (December 5, 2022) ("Reuse Study") and a Sediment Characterization Study Report (May 28, 2021). The Reuse Study's focus was to assess the suitability of dredged material for potential beneficial or innovative end-use.[200] Another Reuse Study goal was to provide data to support future predictive modeling.[201] However the Reuse Study does not determine the effects of dredging and whether dredging would significantly benefit water quality in the Chesapeake Bay.

On the question of asserted benefits from dredging, the Reuse Study applies a simple two-point linear "calculator" to roughly estimate, at a screening level, the nutrient load reductions resulting from removing a given volume of sediment. Yet the calculator does not even attempt to consider an array of factors necessary for accuracy of dredging impacts, and is of limited use. As the Reuse Study concedes, rather than relying on its two-data point calculator, "[m]ore

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[199] *See* LSRWA at 122-23 (identifying costs drivers and considerations of material placement); Reuse Study.

[200] Reuse Study at 2.

[201] *Id.*

sophisticated modeling will be necessary to produce more accurate estimates of the effect of dredging."[202] Thus, the Reuse Study does not inform multiple important questions of whether dredging is beneficial in terms of its impacts on downstream water quality, and, if so, how much dredging would be required to realize benefits, where, and whether the benefits are significant enough to justify the disadvantages of dredging. As a result, there is no substantial evidence to justify the imposition of a dredging obligation on Conowingo, which could cost tens or hundreds of millions of dollars or more.

The Reuse Study also does not determine whether dredging is even feasible at any meaningful scale. Maryland sought, in its Request For Proposal ("Pilot Study RFP"), a *scalable* project to evaluate potential reuse of dredge spoils. The Pilot Study RFP requested dredging of the modest volume of 25,000 cubic yards of sediment (for comparison, this is less than 1 percent of the volume of dredging three million cubic yards, a volume that the Reuse Study uses as one point of reference).[203] Ultimately, however, the pilot project dredged only a small fraction of that volume, only 1,000 cubic yards.[204]

A further limitation of the Reuse Study is its failure to perform its assessment on dredge materials that are representative of the Maryland portion of the Conowingo Reservoir as a whole. The Pilot Study only dredged in a location with non-representative sandy characteristics, selected as follows:

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[202] *Id.* at 37.

[203] *Id.* at 43.

[204] Reuse Study at ES 2. *See al*so Summary of Questions Received During the April 1, 2020 Conowingo Dredging Pilot Project Public Webinar at Q 24 and Q 25, https://mde.maryland.gov/programs/Marylander/Documents/2020-4-1-Conowingo-Dredging-Pilot-Project-Public-Webinar-QA.pdf ("The awarded contractor chose a much smaller staging area for the reduced dredging volume (now 1,000 cubic yards) that had less environmental and logistical concerns" and capped bids also influenced the reduced size of the project).

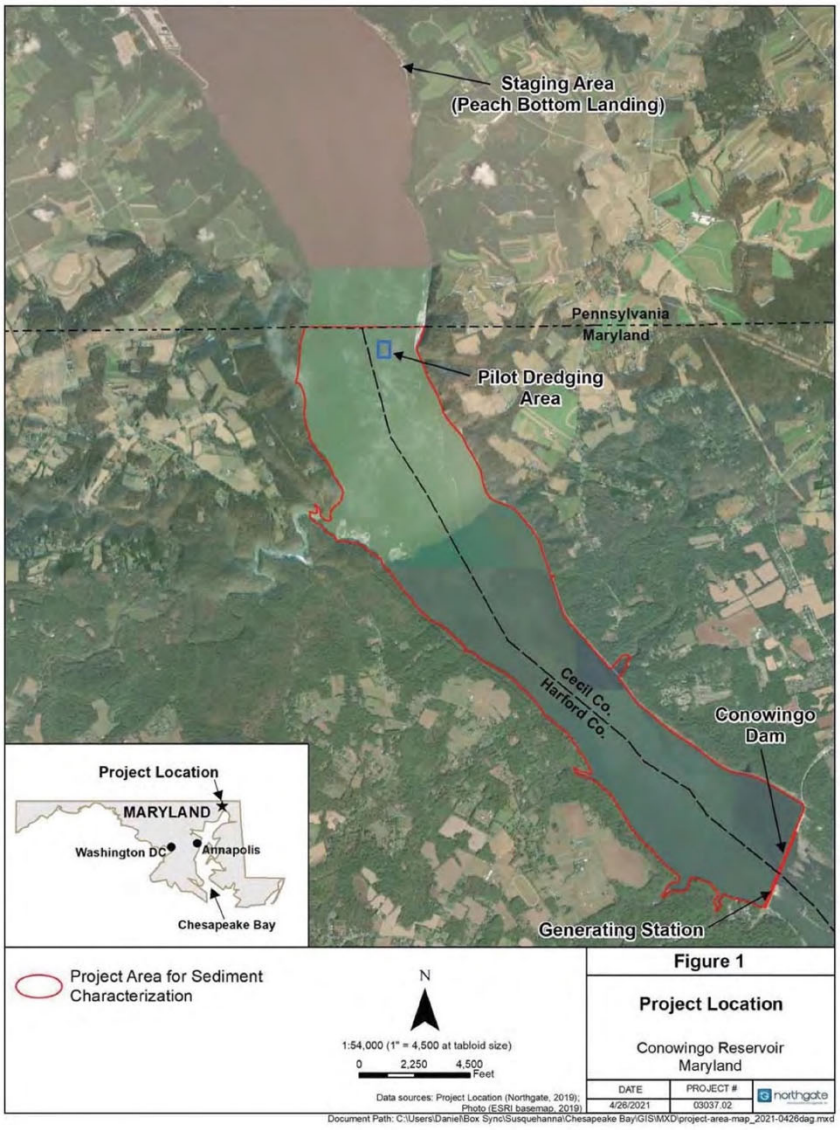
> Because one of the goals of the Conowingo Pilot Project is to beneficially reuse or innovatively use the dredged material within the State of Maryland, initial site selection for the dredging area *focused on identifying a site with predominantly sandy dredged material that could be readily dewatered and processed for innovative reuse and/or beneficial use*. The entire extent of the Reservoir located within the State of Maryland was initially reviewed for identification of potential dredging areas. . . . Once preliminary field investigations indicated one target area that met the project criteria, sediment sampling was conducted in the area that had the greatest proportion of sandy material.[205]

The initial site selected for the dredging[206] generally matches the dredging location for the final Reuse Study, far from the Dam (near the Pennsylvania line) where dredge spoils were sandy. Thus, the Reuse Study assessed the potential for beneficial reuse of *sandy* soils and did not evaluate beneficial reuse of representative samples of dredge spoils throughout the pond. The Reuse Study's multiple weaknesses greatly limit the legitimacy and value of an already-limited study.[207] The single, non-representative Pilot Study area is shown in the following diagram:

[205] Ex. 25 (Joint Application), Attach. 3: Alternative Site Analysis (emphasis added). The analysis further noted that the dredging area selected for the project is approximately five acres in size and located approximately five miles north of the Conowingo Dam, in the eastern portion of the Conowingo Reservoir, generally consistent with the final Pilot Study dredging location.

[206] *Id.* at A3-3 (figure 1).

[207] Notably, Conowingo offered timely input to MDE and identified a number of the above weaknesses back in 2018. *See* Comment Letter to W. Seiger, Chief Waterway Construction Division, MDE, from C. Hicks, Manager Regulatory and Licensing, Hydro (June 18, 2018) (Ex. 29). Additionally, Conowingo noted deficiencies in scalability given the non-representative location of the Reuse Study; MES chose a dredging location in a predominantly sandy area, as sand could "be readily dewatered and processed." *Id.* at 3 and nn.11 & 12. Conowingo cautioned that the pilot project "would not even demonstrate the feasibility of a similar size operation in a location that is more representative of the majority of the Maryland part of Conowingo Pond." *Id.* at 8. The same critiques hold true today, after the study has been completed.



The Sediment Characterization Study part of the Pilot Study only sought to provide data regarding the sediments dredged—in terms of thickness, volume, grain size, chemical composition, and distribution of coal layers—for use to support the evaluation of potential sediment reuse options.[208] Like the Reuse Study, modeling or any assessment of sediment

[208] Northgate Environmental Management, Inc., Conowingo Sediment Characterization and Innovative Reuse and Beneficial Use Pilot Project, *Sediment Characterization Study Report* (May 28, 2021), https://mde.maryland.gov/programs/marylander/Documents/Final%20Sediment%20Characterization%20Report.pdf ("Characterization Study").

transport was beyond the scope of the Sediment Characterization Study,[209] although its data might potentially be used to support future modeling, if performed, of dredging impacts to nutrient and sediment transport.[210] But even if the data may support future modeling, there are limitations as to its usefulness. For example, the Sediment Characterization Study omits any indication that it pursued an important dilution process as part of its methodology.[211]

These are just some of the flaws and inadequacies in the two reports of the Pilot Study. The critical point remains that there is no substantial evidence to justify the imposition of a going-forward dredging obligation on Conowingo in any revised § 401 certification.

III. MDE Should Reconsider the 2018 Certification and Consider Conowingo's Beneficial Impacts on GHG Reductions and Climate Change.

A. Conowingo Provides Extensive Benefits in Terms of Reductions of GHG Emissions and Mitigation of Climate Change.

MDE should reconsider the 2018 Certification and recognize the extensive benefits that Conowingo provides in terms of reductions of GHG emissions and climate change mitigation in lieu of issuing a certification that would shut Conowingo down. Conowingo is Maryland's largest source of renewable energy, generating 45 percent of the State's overall renewable energy. The carbon-free energy generated by Conowingo can power 165,000 homes. Overall, Conowingo avoids 867,000 metric tons of greenhouse gas emissions—the annual carbon-reduction equivalent of taking approximately 190,000 cars off the road.

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[209] *Id.* at ES-3.

[210] *Id.* at ES-1.

[211] The missing procedure is described in a 2017 paper entitled *The Impact of Conowingo Particulates on the Chesapeake Bay: Assessing the Biogeochemistry of Nitrogen and Phosphorus in Reservoirs and the Chesapeake Bay*, Ex. 20 (Cornwell et al.). The Sediment Characterization Study references the above paper, but does not perform its recommended analysis.

MDE should consider the importance of Conowingo's positive climate impacts because GHG reductions are critical to the health and well-being of Maryland and a key legislative and policy goal of the State. Because of climate change, Maryland is set to face extreme drought, storms, flooding, forest fires, and coastal erosion.[212] Marylanders are at risk of more heat-related stress and increased spread of vector-borne diseases.[213] Maryland is already experiencing warmer winters and summers, wetter autumns and springs, and drier summers.[214] The Chesapeake Bay does not escape these effects. Climate change is already affecting the fisheries in the Bay by damaging habitats, increasing the salinity in fresh areas through sea level rise, forcing migration to cooler waters, lowering the salinity in brackish areas through flooding, and increasing water temperature, which decreases DO levels.[215]

B. GHG Reductions Are Critical to the Health and Well-Being of Maryland and Key Legislative and Policy Goals of the State.

Conowingo is important for Maryland to reach its ambitious climate change goals and limit the worst of these devastating effects. In passing the Climate Solutions Now Act of 2022, the Maryland General Assembly required the State to adopt a comprehensive plan to reduce statewide GHG emissions.[216] Maryland's goals include a 60 percent reduction in GHG emissions by 2031,

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[212] *See* Maryland Dep't of Natural Resources, *Climate Resilience Home*, https://dnr.maryland.gov/climateresilience/Pages/default.aspx.

[213] *Id.*

[214] *See* Maryland Dep't of Natural Resources, *Climate Change in Maryland*, https://dnr.maryland.gov/climateresilience/Pages/about_climatechange.aspx.

[215] *See* Nat'l Oceanic & Atmospheric Administration, NOAA Fisheries, *Climate Change Is Already Affecting Chesapeake Bay Fisheries* (Sept. 16, 2021), https://www.fisheries.noaa.gov/feature-story/climate-change-already-affecting-chesapeake-bay-fisheries.

[216] *See* Climate Solutions Now Act of 2022, Md. Gen. Assembly, https://mgaleg.maryland.gov/mgawebsite/Legislation/Details/sb0528?ys=2022RS.

and net-zero emissions by 2045.[217] The Moore Administration has equally ambitious goals. During his campaign, Governor Moore recognized the grave financial harms that climate change has caused and will cause in Maryland, including $10 billion in damage over the last decade alone.[218] Governor Moore set a goal of 100 percent clean energy generation in the state by 2035 while reducing burdens on the grid.[219] Since taking office, Governor Moore has followed through on his campaign commitment by joining the U.S. Climate Alliance, committing to achieve the goals of the Paris Agreement by reducing greenhouse gas emissions by 26-28 percent by 2025, and accelerating policies to reduce greenhouse gas emissions among other promises.[220] The MEA has strongly supported Conowingo's role in meeting Maryland's climate goals, stating that "MEA supports the continued operation of the Conowingo Hydroelectric Generating Station because it provides large quantities of emissions-free electricity that is both scalable and extremely reliable."[221]

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[217] Maryland Dep't of the Environment, *New Analysis Gives Options for Meeting Maryland's Climate Goals* (June 30, 2023), https://news.maryland.gov/mde/2023/06/30/new-analysis-gives-options-for-meeting-marylands-climate-goals/.

[218] Moore Miller for Maryland, *Maryland's Climate, Our Economic Future*, https://wesmoore.com/issues/climate/.

[219] Moore Miller for Maryland, *Maryland's Climate, Our Economic Future: Building a Cleaner, More Prosperous Maryland*, https://wesmoore.com/wp-content/uploads/2022/05/Wes-Moore-For-Maryland-Climate-Plan.pdf.

[220] Executive Office of the Governor, *Maryland Joins U.S. Climate Alliance, Governor Wes Moore Affirms Support to Combating Climate Change* (Jan. 30, 2023), https://governor.maryland.gov/news/press/pages/Maryland-Joins-U.S.-Climate-Alliance-Governor-Wes-Moore-Affirms-Support-to-Combating-Climate-Change.aspx.

[221] Ex. 3 (MEA Ltr. re SB0540).

C. Conowingo's Beneficial Impacts on the Climate Have a Direct Effect on the Water Quality of the Chesapeake Bay.

MDE's analysis of Conowingo is incomplete without considering the Plant's benefits for fighting climate change, and the effect of those positive impacts on DO levels in the Bay. Climate change is not only becoming a barrier to improving Bay water quality, it is actively harming the Bay ecosystem. It thus follows that Conowingo's benefits to fighting climate change are directly relevant to its overall *net* effect on water quality. That is especially true given that Maryland is obligated to address climate change broadly and its effects on the Bay TMDL.

Climate change influences the chemical state and reactions that lead to DO decreases in the Bay.[222] Wetter conditions and more intense storms on land lead to more nutrient-laden runoff to the Bay.[223] While sea level rise is predicted to dilute some of that runoff, increased temperatures coupled with increased runoff are expected to exacerbate DO concerns.[224] Maryland has recognized that those factors "will lead to a net degradation of water quality, which will necessitate additional nutrient reductions."[225] Due to climate change, the Bay states would have to reduce watershed-wide nitrogen pollution by 5 million pounds/year and phosphorus pollution by 600,000 pounds/year to meet 2025 TMDL goals.[226] By 2035, climate change raises that nitrogen reduction target to an additional 10 million pounds/year.[227] Because of climate change's very real and

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[222] Maryland Dep't of the Environment, Climate Change Addendum to Maryland's Phase III Watershed Implementation Plan, at A-2 (Jan. 2022), https://mde.maryland.gov/programs/water/TMDL/TMDLImplementation/Documents/Phase-III-WIP-Report/MD_Climate_Change_Addendum_2022.pdf.

[223] *Id.*

[224] *Id.*

[225] *Id.*

[226] *Id.* at A-2 - A-3.

[227] *Id.* at A-3.

staggering negative impacts on water quality, Maryland is committed (as of 2020) to reduce an additional 1.142 million pounds/year of nitrogen pollution and an additional 111,000 pounds/year of phosphorus pollution.[228]

MDE must consider Conowingo's characteristics as a non-emitting, dispatchable generator, and therefore, a key tool in the fight against climate change. Maryland's regional grid operator, PJM Interconnection, L.L.C. ("PJM"), reported that in 2022, plants within the region emitted a weighted average of 811 pounds of CO_2 per hour per megawatt.[229] Conowingo's 570 MW of generation are non-emitting. Thus, by generating, Conowingo avoids roughly 867,000 metric tons of greenhouse gas emissions annually from entering the air.

Conowingo's attributes as a large source of clean, dispatchable power in central Maryland is particularly important to supporting the energy transition. At a macro level, because of a mismatch between retirements of polluting plants and the deployment of new clean generators, which are taking longer than expected to bring online, "[f]or the first time in recent history," PJM may see its ability to serve customers during peak days become less certain.[230] Resources like Conowingo are essential to enabling polluting generators within PJM to retire without jeopardizing grid reliability while additional clean capacity is deployed.

More locally, Conowingo can help alleviate the environmental harm associated with the specific challenges of retiring fossil-fuel plants in Maryland. For example, although Talen Energy

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[228] *Id.*

[229] PJM Interconnection, L.L.C., 2018–2022 CO_2, SO_2 and NO_X Emission Rates, at 3 (Apr. 27, 2023), https://www.pjm.com/-/media/library/reports-notices/special-reports/2023/2022-emissions-report.ashx.

[230] *See, e.g.*, PJM Interconnection, L.L.C., Energy Transition in PJM: Resource Retirements, Replacements & Risks at 3 (Feb. 24, 2023), https://www.pjm.com/-/media/library/reports-notices/special-reports/2023/energy-transition-in-pjm-resource-retirements-replacements-and-risks.ashx.

announced a plan to retire the 1,282 MW Brandon Shores coal plant in Anne Arundel County in 2025, PJM determined that doing would result in multiple reliability violations, which may necessitate keeping the plant online.[231] This is consistent with a 2020 report that PJM delivered to the House of Delegates, concluding that the retirement of Maryland's then-six remaining coal plants would "impose infrastructure overloads to seven existing transmission facilities in the region."[232] While these polluting plants remain connected to the grid, Conowingo provides a clean and reliable alternative for PJM to power central Maryland.

Conowingo's features are all the more important based on the way PJM accredits electric capacity. Under its existing capacity auction rules, PJM values each megawatt of hydroelectric facilities, like Conowingo, nearly at face value—94 percent. By contrast, PJM values each megawatt for solar and wind facilities at only 10-50 percent.[233] Put simply, to achieve the same capacity value as a hydroelectric plant, other renewable technologies must install between double and ten times the nameplate capacity. Natural gas and coal plants do not currently face such an

[231] PJM Interconnection, L.L.C., Transmission Expansion Advisory Committee, Generation Deactivation Notification Update (July 11, 2023), https://www.pjm.com/-/media/committees-groups/committees/teac/2023/20230711/20230711-item-02---generation-deactivation-notification-update.ashx.

[232] PJM Interconnection, L.L.C., Report to Maryland House of Delegates Environment and Transportation Committee, at 2 (Mar. 5, 2020), https://www.pjm.com/-/media/library/reports-notices/special-reports/2020/20200305-pjm-requested-reliability-analysis-response-md-house-environment-transportation-committee.ashx.

[233] PJM Interconnection, L.L.C., Updated ELCC Class Ratings for the 2025/26 BRA reflecting FERC Order accepting PJM's ELCC CIR proposal (Docket No. ER23-1067-000) (May 15, 2023), https://www.pjm.com/-/media/planning/res-adeq/elcc/updated-elcc-class-ratings-for-the-2025-bra.ashx.

automatic discount.[234] This directly affects the investments signals for new capacity in PJM and the likelihood that the region will be able to replace the clean energy provided by Conowingo.

Finally, it is notable that Conowingo also operates without any cost to, or subsidy from, the State. The same is not true for new large-scale renewable developments, whether on land or offshore, which often have faced significant challenges and require substantial financial support.

In short, Conowingo is a powerful weapon in the fight against climate change. MDE must reconsider the 2018 Certification and take into account Conowingo's beneficial environmental attributes and their effect on water quality.

IV. MDE Should Reconsider and Revise the 2018 Certification in Light of Changes Constellation Has Agreed to Make in Conowingo's Operations.

Since the issuance of the 2018 Certification, Constellation has reached an agreement with Maryland to change in material respects numerous aspects of Conowingo's operations from what Conowingo was proposing in connection with its application for a Water Quality Certification. MDE heralded this agreement as "a comprehensive, holistic approach that will accelerate environmental improvements related to the Conowingo Project and improve water quality and aquatic habitat in the Susquehanna River and Chesapeake Bay."[235] MDE should reconsider the 2018 Certification to evaluate whether Conowingo's agreed-to revised operations provide reasonable assurance that the discharges from the Project will comply with state water quality standards. Constellation demonstrates below that several conditions in the 2018 Certification should be reconsidered and revised in light of Conowingo's agreed revised operations.

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[234] PJM is considering accreditation reform proposals, including those that would impose accreditation requirements on conventional generators, but no plan has been adopted within PJM, nor has any submission been made to FERC. These proposals continue to recognize the superior reliability benefits of hydroelectric generation.

[235] Reply Comments of the Maryland Department of the Environment, In Re Exelon Generation Company, LLC, Docket Nos. P-405-106, P-405-121, at 1 (FERC Jan. 31, 2020).

A. Flow Regime.

1. The 2018 Certification Contains Conditions Regarding Conowingo's Operational Flow Regime that Should Be Reconsidered and Revised in Light of Conowingo's Agreed Revised Operations.

Section 7(C) of the 2018 Certification contains conditions regarding Conowingo's Operational Flow Regime. Specifically, the 2018 Certification provides that Conowingo shall operate the Project in accordance with a "Minimum Flow Regime" beginning on September 1, 2018 and ending on December 31, 2028.[236] In addition, the 2018 Certification provides that Conowingo shall operate the Project in accordance with a "Year 10 Flow Regime" starting on January 1, 2029.[237] MDE imposed further specific conditions regarding Conowingo's flow regime throughout the subsections of § 7(C). For the reasons that follow, MDE should reconsider *all* aspects of § 7(C) of the 2018 Certification.

2. Constellation Has Agreed with Maryland to Change the Project's Operational Flow Regime, and MDE Should Revise the 2018 Certification to Impose as a Condition this Agreed New Flow Regime.

Constellation has agreed with Maryland to operate the Project in accordance with the following flow regime, which in certain instances exceeds protections in the 2018 Certification:

(a) Conowingo shall operate the Project in accordance with the following operational flow regime until the third (3rd) anniversary of the effective date of the New License.

Date	Minimum Flow
September 15 - March 31	3,500 cfs or natural inflow, whichever is less
April 1-30	10,000 cfs or natural inflow, whichever is less
May 1 - June 15	7,500 cfs or natural inflow, whichever is less
June 16 - September 14	5,000 cfs or natural inflow, whichever is less

[236] 2018 Certification, § 7(C)(i). The 2018 Certification becomes operative only if and when included in a New License for the Project issued by FERC.

[237] *Id.* § 7(C)(ii).

(b) Conowingo shall operate the Project in accordance with the following operational flow regime beginning on the third (3rd) anniversary of the effective date of the New License:

Date	Minimum Flow	Down Ramping Rate	Upramping Rate	Maximum Flow
January 1-31	4,000 cfs or natural inflow, whichever is less	Up to 12,000 cfs/hour if Conowingo Discharge is less than 30,000 cfs	None	None
February 1-28	4,000 cfs or natural inflow, whichever is less	Up to 12,000 cfs/hour if Conowingo Discharge is less than 30,000 cfs	None	None
March 1-15	13,100 cfs or natural inflow, whichever is less	Up to 12,000 cfs/hour if Conowingo Discharge is less than 30,000 cfs	Up to 40,000 cfs/hour	None
March 16-31	18,200 cfs or natural inflow, whichever is less	Up to 12,000 cfs/hour if Conowingo Discharge is less than 30,000 cfs	Up to 40,000 cfs/hour	None
April 1-30	18,200 cfs or natural inflow, whichever is less	Up to 12,000 cfs/hour if Conowingo Discharge is less than 30,000 cfs	Up to 40,000 cfs/hour	None
May 1-31	18,200 cfs or natural inflow, whichever is less	Up to 12,000 cfs/hour if Conowingo Discharge is less than 30,000 cfs	Up to 40,000 cfs/hour	75,000 cfs
June 1-15	10,000 cfs or natural inflow, whichever is less	Up to 12,000 cfs/hour if Conowingo Discharge is less than 30,000 cfs	Up to 40,000 cfs/hour	75,000 cfs
June 16-30	7,500 cfs or natural inflow, whichever is less	Up to 12,000 cfs/hour if Conowingo Discharge is less than 30,000 cfs	Up to 40,000 cfs/hour	75,000 cfs
July 1-31	5,500 cfs or natural inflow, whichever is less	Up to 12,000 cfs/hour if Conowingo Discharge is less than 30,000 cfs	Up to 40,000 cfs/hour	79,000 cfs
August 1-31	4,000 cfs or natural inflow, whichever is less	Up to 12,000 cfs/hour if Conowingo Discharge is less than 30,000 cfs	Up to 40,000 cfs/hour	79,000 cfs
September 1-30	4,000 cfs or natural inflow, whichever is less	Up to 12,000 cfs/hour if Conowingo Discharge is less than 30,000 cfs	Up to 40,000 cfs/hour	79,000 cfs
October 1-31	4,000 cfs or natural inflow, whichever is less	Up to 12,000 cfs/hour if Conowingo Discharge is less than 30,000 cfs	Up to 40,000 cfs/hour	None
November 1-30	4,000 cfs or natural inflow, whichever is less	Up to 12,000 cfs/hour if Conowingo Discharge is less than 30,000 cfs	None	None
December 1-31	4,000 cfs or natural inflow, whichever is less	Up to 12,000 cfs/hour if Conowingo Discharge is less than 30,000 cfs	None	None

(c) Natural inflow will be measured at the Marietta U.S. Geological Survey gage (No. 01576000). If, upon issuance by FERC of a new license for the Holtwood Hydroelectric Project (Project No. 1881), there is a provision for reported hourly-flow releases at the Holtwood Hydroelectric Project such that the licensee can readily identify inflow conditions, the minimum flows at the Conowingo Dam shall be based on the minimum flows prescribed above or inflow as measured at Holtwood, whichever is less.

(d) Maximum flow restrictions shall only apply when the flow measured at the Marietta U.S. Geological Survey gage (No. 01576000) is less than 86,000 cfs.

(e) If compliance with the prescribed flows would cause the Project or any of its affiliates to violate or breach any law, any applicable license, permit, approval, consent, exemption or authorization from a federal, state, or local governmental authority, including the Nuclear Regulatory Commission license for the Peach Bottom Atomic Power Station, the FERC license for the Muddy Run Project (FERC Project No. 2355), any agreement with the City of Baltimore or other governmental entity, or any tariff or other requirement of the PJM Interconnection Regional Transmission Organization or their assigns, Conowingo may deviate from the prescribed flows to the least degree necessary in order to avoid such violation or breach.

(f) If compliance with the prescribed flows would cause the Project or any of its affiliates to violate any agreement in effect as of September 1, 2019 with the Chester Water Authority, Old Dominion Electric Cooperative, or the York Energy Center, Conowingo may deviate from the prescribed flows to the least degree necessary in order to avoid such violation or breach.

(g) If compliance with the prescribed flows would cause or exacerbate flooding or a similar public safety hazard, Conowingo may deviate from the prescribed flows to the least degree necessary in order to avoid such flooding or public safety hazard.

(h) Within one week of any authorized or unauthorized deviation from the prescribed flows, Conowingo will file with FERC a written report detailing the events that necessitated the deviation, describing the actual flows provided during the deviation period, the duration of the deviation period, and any observed adverse impacts to aquatic life (*e.g.*, fish kills, additional observed delays in migratory fish reaching the fishlifts, etc.).

(i) Not including the authorized deviations in sections (e), (f), and (g) above, Conowingo shall have the flexibility to deviate from the upramping, downramping and maximum flow restrictions according to the following limits during each month:

- January, February: eight (8) total permitted hours of deviation/month
- March, April, May, and that portion of June during which the EFL is in operation: no deviations allowed

- June after East Fish Lift operation has ceased: eight (8) total permitted hours of deviation/month of which no more than fifty (50) percent will be allocated to downramping and upramping
- July, August: twenty-six (26) total permitted hours of deviation/month of which no more than fifty (50) percent will be allocated to downramping and upramping
- September: thirty-two (32) total permitted hours of deviation/month of which no more than fifty (50) percent will be allocated to downramping and upramping
- October: fourteen (14) total permitted hours of deviation/month
- November, December: eight (8) total permitted hours of deviation/month

When Conowingo deviates from the downramping or upramping restrictions of the operational flow regime, the amount of time applied against the limits set forth above shall be two (2) hours per event, regardless of the actual amount of time it takes licensee to complete the actual downramping or upramping event. Conowingo will maintain complete and accurate records of all permitted deviations that occur pursuant to this section and shall report such deviations to FERC.

3. The 2018 Certification Should Be Reconsidered and Revised Because Conowingo's Agreed New Flow Regime Provides Reasonable Assurance that the Project's Discharge Will Comply with All Numeric and Narrative Criteria of Maryland's Water Quality Standards.

As MDE declared in the 2018 Certification, the discharge from the Project—which is determined in part by the Project's flow regime—impacts water quality in the river below the Dam and in the Bay.[238] The water quality criteria applicable to these waters include both "numeric" and "narrative" criteria. The applicable criteria are set forth in COMAR § 26.08.02.03 and its subdivisions. As demonstrated below, Conowingo's agreed new flow regime ("ANFR") fully satisfies all numeric and narrative criteria of Maryland's water quality standards and should be adopted by MDE in a revised § 401 certification.

At the outset, Conowingo's flow regime has limited impact on the numeric water quality criteria. As set forth in the 2018 Certification, the mainstem of the Susquehanna River from

[238] 2018 Certification, § 5(B).

Conowingo Dam to the confluence with the Bay has been designated as a "Class II-P" water.[239] The Chesapeake Bay has several designated uses,[240] § 5(B)(ii), which renders the Bay a "Class II" water.[241] The numeric water quality criteria for Class II water and Class II-P water are set forth in COMAR § 26.08.02.03-3(C) and (C-1), respectively, and are essentially the same.[242] These numeric water quality criteria concern matters such as bacteriological criteria, water temperature, pH, turbidity, color, toxic substance criteria, DO criteria, water clarity criteria, chlorophyll-a concentrations, and application of certain effluent limitations—all of which are generally not affected by the components of a hydroelectric project's flow regime (*i.e.*, the volume of minimum flows or maximum flows, or the rate of upramping or downramping).

The Project's flow regime could potentially impact only two of these numeric criteria—DO and temperature. As discussed in the FERC Final Environmental Impact Statement, the Project properly addressed a specific DO issue involving the Project's turbines:

> Because the Conowingo generating units withdraw water from the bottom of the reservoir, DO levels in the project discharge have been similar to levels at depth (40 to 70-foot depths) in the pond. During low-flow, high-temperature periods in the summer, when reservoir bottom DO levels approached anoxic conditions, DO levels in the tailrace were historically as low as 2 mg/L. However, from 1989 to 1991, Exelon installed aeration (turbine venting) on all the Francis units (Units 1 through 7). Prior to installation of aeration, in some years, hourly DO levels were less than 5 mg/L up to 40 percent of the time. Following installation of aeration, hourly DO readings were less than 5 mg/L only 0.03 percent of the time (from 1989 to 2007), and no readings were less than 4.3 mg/L. Exelon also installed aerating turbine runners in two Francis units in 2005 and 2008, further enhancing its ability to provide additional aeration in the tailrace.[243]

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[239] *Id.* § 5(B)(i).

[240] *Id.*

[241] COMAR § 26.08.02.02-1.

[242] *See* COMAR § 26.08.02.03-3(C-1)(1).

[243] FEIS at 108.

With regard to temperature, the FEIS summarized that "[w]ater temperature in the tailrace closely reflects the temperatures in the pond, with similar seasonal trends and minimum and maximum levels."[244] Significantly, in its discussion of "operational flow regime impacts" in the 2018 Certification, MDE did not identify any issue with regard to impacts of the Project's flow regime on any numeric water quality criteria.[245]

The applicable narrative criteria of Maryland's water quality standards are set forth in COMAR § 26.08.02.03(B), which provides that "waters of this State may not be *polluted* by" various substances or conditions that "[i]nterfere directly or indirectly with designated uses."[246] As written, however, none of the identified substances or conditions is implicated by Conowingo's flow regime. Specifically, (B)(1) applies to waters polluted by "[s]ubstances attributable to sewage, industrial waste, or other waste that will settle to form sludge deposits"; (B)(2) applies to waters polluted by "[a]ny material, including floating debris, oil, grease, scum, sludge, and other floating materials attributable to sewage, industrial waste, or other waste"; (B)(3) applies to waters polluted by "[h]igh temperature or corrosive substances attributable to sewage, industrial waste, or other waste"; (B)(4) applies to waters polluted by "[a]cute toxicity from any discharge outside the mixing zone established under Regulation .05 of this chapter"; and (B)(5) applies to waters polluted by "[t]oxic substances attributable to sewage, industrial waste, or other waste."[247] None of these conditions or any resulting narrative criterion is implicated by any discharges from Conowingo. Moreover, the ANFR specifically *enhances* Conowingo's impact on downstream

[244] *Id*.

[245] *See* 2018 Certification, § 7(C).

[246] COMAR § 26.08.02.03(B)(1)-(5) (emphasis added).

[247] COMAR § 26.08.02.03(B).

water quality in multiple respects as a result of the agreed flow regime's increased minimum flows, new maximum flows, and new upramping and downramping restrictions.

For these reasons, the ANFR will not cause a violation of any of Maryland's water quality criteria, and MDE should reconsider and revise the 2018 Certification to require Conowingo to adhere to the ANFR. In addition, however, as shown below, even if the ANFR is evaluated further in terms of its impacts on aquatic habitat, fish migration and stranding, and submerged aquatic vegetation (SAV), the ANFR adequately protects any potentially implicated water quality standard.

4. The ANFR Retains Important Changes from the 2018 Certification, and Adequately Addresses Aquatic Habitat, Fish Stranding, and SAV, While Removing Unnecessary Restrictions that Unreasonably Impair Conowingo's Ability to Generate Carbon-Free Electricity.

a. The ANFR Retains Important Changes from the 2018 Certification.

In Conowingo's relicensing proceedings, The Nature Conservancy ("TNC") was most actively involved in proposing changes to Conowingo's operational flow regime. In the 2018 Certification, MDE largely mirrored, in the "Year 10 Flow Regime" applicable for years 10 through 50 of the New License, TNC's proposed flow regime changes. While the ANFR does not adopt the TNC proposal or the "Year 10 Flow Regime" outright, it does two things. First, it adopts the *elements* of those flow regimes by increasing minimum flows, limiting the rate of ramping, and restricting Conowingo's maximum generation flows—and indeed, at times even exceeding the protections in the 2018 Certification. The table below illustrates this, showing the overlapping elements of the Year 10 Flow Regime in the 2018 Certification and the ANFR. Second, the ANFR provides the same *types* of resource benefits as the 2018 Certification: It enhances the growth of submerged aquatic vegetation (SAV), reduces fish stranding, increases aquatic habitat, protects at-risk species, and facilitates fish passage. Thus, while the ANFR does not mirror the 2018

Certification in all ways, it adopts the same framework and provides many of the same ecological benefits.

TABLE 1

Period	2018 Certification, Year 10 Regime				Agreed Flow Regime			FERC FEIS		
	Min Flow	Max Gen	Minimum Down-ramping	Maximum Up-ramping	Min Flow[248]	Max Gen[249]	Minimum Down-ramping[250]	Maximum Up-ramping	Min Flow	Max Gen
Jan 1-31	11,000	none	20,000	40,000	4,000	86,000	12,000	None	3,500	86,000
Feb 1-29	12,500	none	20,000	40,000	4,000	86,000	12,000	None	3,500	86,000
Mar 1-15	24,000/ 30,000	none	20,000	40,000	13,100	86,000	12,000	40,000	3,500	86,000
Mar 16-31					18,200	86,000				
Apr 1-30	29,000/ 35,000	none	20,000	40,000	18,200	86,000	12,000	40,000	10,000	86,000
May 1-31	17,500/ 25,500	65,000	20,000	40,000	18,200	75,000	12,000	40,000	7,500	86,000
Jun 1-15	10,000/ 14,000	65,000	20,000	40,000	10,000	75,000	12,000	40,000	7,500	86,000
Jun 16-30					7,500	75,000			5,000	86,000
Jul 1-31	5,500/ 8,500	65,000	10,000/ 20,000	40,000	5,500	79,000	12,000	40,000	5,000	86,000
Aug 1-31	4,500/ 6,000	65,000	20,000	40,000	4,000	79,000	12,000	40,000	5,000	86,000
Sep 1-14	3,500/ 5,500	65,000	20,000	40,000	4,000	79,000	12,000	40,000	5,000	86,000
Sep 15-30									3.500	86,000
Oct 1-31	4,500/ 6,000	none	20,000	40,000	4,000	86,000	12,000	40,000	3,500	86,000
Nov 1-30	6,000/ 11,000	none	20,000	40,000	4,000	86,000	12,000	None	3,500	86,000
Dec 1-31	11,000	none	20,000	40,000	4,000	86,000	12,000	None	3,500	86,000

The ANFR provides a level of mitigation and enhancement that far exceeds Conowingo's previous operations—under a § 401 certification previously issued by Maryland—or what was identified as necessary for environmental protection in FERC's FEIS. For example, with the exception of the period between August 1 and September 14, all the required minimum flows in the ANFR are higher than those determined to be necessary for environmental protection in

[248] Lesser of this value or natural inflows.

[249] Restriction applies only when the flow at the Marietta gauge is at or less than 86,000 cfs.

[250] If Conowingo discharge is less than 30,000 cfs.

FERC's FEIS. For the reasons stated above, and given the resource benefits described below, the ANFR provides reasonable assurance that the discharge from the Project will comply with state water quality standards and should be adopted by MDE in a revised § 401 certification.

b. The Minimum Flows in the ANFR Enhance Aquatic Habitat.

During the FERC licensing proceedings, Conowingo conducted a study, designated as Study 3.16, *Instream Flow Habitat Below Conowingo Dam*, to assess the effects of Project operations on habitat for fish and invertebrates. The study evaluated the Project's impact on different life stages of American shad, striped bass, shortnose sturgeon, smallmouth bass, several taxa of aquatic insects (mayflies, stoneflies, caddisflies), and freshwater mussels. The study used the "River2D" model to simulate hydraulic conditions in the reach extending from Conowingo Dam to the downstream end of Spencer Island (where tidal effects begin).

Using the results of this study, the FERC FEIS determined that certain flows may improve habitat for some species and life stages, while those same flows would reduce habitat for other species and life stages.[251] Selection of a flow regime requires balancing among the several target species and life stages to determine which life stage is most important for each time interval, as well as consideration of the effects of a flow regime on project power production.

Using Study 3.16 and the analysis in the FERC FEIS, it is appropriate to focus the instream flow evaluation on the spring migration and spawning period for American shad, river herring, and hickory shad. Each of these species uses the river downstream of Conowingo Dam for spawning,[252] and juveniles of these species, as well as gizzard shad, likely provide a seasonal

[251] *See* FEIS at 152.

[252] *See* Normandeau Assocs., Inc. & Gomez and Sullivan Engineers, P.C., *Final Study Report Downstream Fish Passage Effectiveness Assessment* (RSP 3.2) (Aug. 2022), https://azdev.exeloncorp.com/locations/Documents/ConowingoDocuments2012_2.zip.

source of forage for migratory striped bass. Enhancing flows during the spring season has the potential to provide increases in the production of these anadromous species without constraining project operation in other seasons, including the summer and winter seasons when there are peaks in the demand for power for cooling and heating.

Given these considerations, the enhanced flow measures in the ANFR appropriately provide for increased flows during key periods. Under the ANFR, Conowingo's minimum flow releases would range from 4,000 cubic feet per second (cfs) during the period from August through February, to 18,200 cfs in April and May, beginning in Year 4 of the New License.

Applying the analytical framework in the FERC FEIS to these minimum flow measures demonstrates that the ANFR is as protective as the 2018 Certification. To analyze flows, the FEIS utilized habitat models, developed by Constellation as part of the licensing study process, to evaluate the relationship between aquatic habitat (as measured by weighted usable area or "WUA") and flow.[253] Constellation has duplicated the analysis in the FERC FEIS and compares below the results for the 2018 Certification flows, the ANFR flows, and the FEIS-recommended flows:

TABLE 2

Month	Flow Range (cfs)				
	70% MWUA (All Species)	**70% MWUA (Key Species)**	**2018 Certification Flows**	**ANFR Flows**	**FEIS Flows**
Jan 1- 31	2,000 to 86,000	21,450 to 86,000	11,000 to 86,000	4,000 to 86,000	3,500 to 86,000
Feb 1-29	2,000 to 86,000	21,450 to 86,000	12,500 to 86,000	4,000 to 86,000	3,500 to 86,000
Mar 1-15	2,000 to 86,000	21,450 to 86,000	30,000/24,000 to 65,000	13,100 to 86,000	3,500 to 86,000
Mar 16-31	2,000 to 86,000	21,450 to 86,000		18,200 to 86,000	3,500 to 86,000
Apr 1-30	2,000 to 86,000	13,861 to 86,000	35,000/29,000 to 65,000	18,200 to 86,000	10,000 to 86,000

[253] *See* FEIS at 155–61.

May 1-31	2,000 to 86,000	7,744[254] to 86,000	25,000/17,500 to 65,000	18,200 to 75,000	7,500 to 86,000
Jun 1-15	2,000 to 86,000	7,744[254] to 86,000	14,000/10,000 to 65,000	10,000 to 75,000	7,500 to 86,000
Jun 16-30	2,000 to 86,000	7,744[254] to 86,000		7,500 to 75,000	5,000 to 86,000
Jul 1- 31	2,000 to 86,000	2,000 to 86,000	8,500/5,500 to 65,000	5,500 to 79,000	5,000 to 86,000
Aug 1-31	2,000 to 86,000	2,000 to 86,000	6,000/4,500 to 65,000	4,000 to 79,000	5,000 to 86,000
Sep 1-14	2,000 to 86,000	2,000 to 86,000	5,500/3,500 to 65,000	4,000 to 79,000	5,000 to 86,000
Sep 15-30	2,000 to 86,000	2,000 to 86,000		4,000 to 79,000	3,500 to 86,000
Oct 1- 31	2,000 to 86,000	2,000 to 86,000	6,000 to 86,000	4,000 to 86,000	3,500 to 86,000
Nov 1-30	2,000 to 86,000	2,000 to 86,000	11,000 to 86,000	4,000 to 86,000	3,500 to 86,000
Dec 1-31	2,000 to 86,000	7,961 to 86,000	11,000 to 86,000	4,000 to 86,000	3,500 to 86,000

When analyzing the relationship between flows and aquatic habitat, and focusing on a performance metric of 70 percent of maximum WUA, the ANFR meets this metric for all key species, except for the period December to March and the second half of June, all of which falls outside of the key Spring period.[255] As noted in the FEIS, the period December to March only impacts adult striped bass, which the FEIS concludes are unlikely even to be present in the Susquehanna River during this period because of their preference for warmer temperatures found along the coastal areas of Virginia and North Carolina.[256] With regard to the second half of June, the ANFR of 7,500 cfs falls just short of achieving 70 percent of maximum.

[254] Table 3-22 of the FEIS shows this value as 13,861; however, the FEIS appears to have omitted the American Shad Fry when compiling these values.

[255] However, in each of these periods, the ANFR remains higher than those found necessary for environmental protection in the FERC FEIS.

[256] *See id.* at 156.

Given the benefits of the ANFR for habitat downstream of Conowingo Dam, MDE should find that the ANFR provides reasonable assurance that the discharge from the Project will comply with state water quality standards, and it should revise the 2018 Certification to adopt the ANFR.[257]

c. The ANFR Also Enhances Submerged Aquatic Vegetation.

As described in the FEIS, submerged aquatic vegetation ("SAV") downstream of Conowingo Dam is limited to areas that have finer-grained substrate or are protected from high water velocities associated with high river flows.[258] Specifically, "[t]he highest concentrations of SAV are in the lower part of the river closer to the mouth of the river, where river levels are influenced by tidal flow from the Chesapeake Bay and velocities tend to be lower."[259] Portions of the river closest to Conowingo Dam have a steeper gradient, a substrate of primarily bedrock and boulder, and—consequently—little SAV.

Accordingly, "SAV distribution downstream of the dam is more influenced by existing substrate conditions and natural high flow events, which have the potential to scour and redistribute finer-grained substrate, than by normal day-to-day project operation."[260] While normal peaking operations may result in discharges as high as 86,000 cfs (although USGS flow records indicate normal peaking operations seldom exceed a maximum discharge of 80,000 cfs and are often less than 70,000 cfs during the summer months), those typical peaking flows have less of an effect on scouring and substrate redistribution than typical annual high-flow events.[261] For example,

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[257] *See* Gomez and Sullivan Engineers, P.C., Effects of Flows on Aquatic Resources Downstream of Conowingo Dam (July 26, 2023) (Ex. 30).

[258] *See* FEIS at 148.

[259] *Id.*

[260] *Id.*

[261] *See id.*

monthly ten-percent (10%) exceedance flows are greater than 80,000 cfs in six months of the year (December through May), while maximum recorded flows representing natural high-flow events exceed 200,000 cfs in all months of the year, reaching the range of 400,000 to 600,000 cfs in three months (*see* Table 3-6 of FEIS). These natural high-flow events are magnitudes greater than normal Project discharges. As a result, they have a greater effect on scour and substrate redistribution, and therefore affect the distribution of substrate suitable for SAV growth.

Despite the limiting geomorphic and natural high flow conditions, which are not determined by Project operations, Constellation nevertheless has agreed to provide substantial funding to MDE for SAV restoration and related projects. Specifically, Constellation agreed to pay MDE $2.5 million in the first three years following issuance of a New License, and $250,000 per year (with adjustments for inflation) for the remainder of the license term—or a total of $14,250,000—that MDE indicated it intends to use to implement resiliency projects in the River and the Bay such as SAV restoration, aquaculture, clam and oyster restoration, and living shoreline creation. Consistent with Maryland's renewed focus on improving aquatic habitats, these projects can be designed for implementation where they are sustainable and provide lasting benefits to the River and the Bay. Because impacts to SAV are not Project-related impacts, and Constellation has agreed to provide funding to MDE for SAV restoration projects in any event, MDE should find that the ANFR provides reasonable assurance that the discharge from the Project will comply with state water quality standards, and it should revise the 2018 Certification to adopt the ANFR.

d. The ANFR Also Addresses Fish Migration and Stranding.

Constellation's relicensing studies found little evidence of a relationship between operational flow releases and the ability of fish migrating upstream to find and enter Conowingo's East and West Fish Lifts. Nevertheless, a reduction in the frequency and magnitude of flow fluctuations, as provided in the ANFR, may improve fish passage efficiency. The results of radio

telemetry studies conducted in 2010 and 2012 indicate that many American shad that migrated upstream to the tailrace area subsequently returned downriver within a few hours or days.[262] While this type of movement has been observed on other rivers unaffected by fluctuating flow releases from hydroelectric projects, it is possible that some of these migratory fish would remain in the tailrace area for a longer period of time if the magnitude of operational flow changes is reduced during the migration season. As a consequence, it may be easier for migratory fish to find and enter one of the fish lifts. In addition, as part of its redesign of the applicable fish lifts, Constellation is designing zone of passage structures to provide hydraulic conditions in the tailrace that facilitate shad and herring passage by enhancing their ability to find the fish lift entrances; the adaptive management provisions also allow for the modification of Project operations to meet fish passage efficiency criteria, if needed.

FERC concluded in the Final EIS that, although some stranding of fish was observed, there was no evidence of substantial stranding downstream of Conowingo Dam and there is little justification for requiring specific measures to prevent stranding below the Dam.[263] However, the ANFR nevertheless includes year-round down-ramping restrictions when the Project discharge is less than 30,000 cfs. Maps of the areas downstream of Conowingo Dam show that at a Project discharge of 28,000 cfs, there is generally good connectivity and sufficient depth for egress (1-2+

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[262] *See* Normandeau Assocs., Inc. & Gomez and Sullivan Engineers, P.C., *Upstream Fish Passage Effectiveness Study* (RSP 3.5) (Feb. 2011), https://azdev.exeloncorp.com/locations/Documents/ConowingoDocuments2011_5.zip; Normandeau Assocs., Inc. & Gomez and Sullivan Engineers, P.C., *Final Study Report Estimation Of Survival Of Juvenile American Shad Passed Through Francis Turbines* (RSP 3.2) (Aug. 2022), https://azdev.exeloncorp.com/locations/Documents/ConowingoDocuments2012_2.zip.

[263] *See* FEIS at 150-51; Normandeau Assocs., Inc. & Gomez and Sullivan Engineers, P.C., *Estimation of Survival of Adult American Shad Passed Through Francis and Kaplan Turbines* (RSP 3.5) (Aug. 2012), https://azdev.exeloncorp.com/locations/Documents/ConowingoDocuments2012_2.zip.

feet) among areas that eventually become stranding pools, along with potential corridors connecting the pools to deeper areas of the river channel. Fish would have the potential to move around freely throughout the area and would not be considered stranded. At a Project discharge of 20,000 cfs, there would be poorer connectivity among potential stranding pools and from the pools to the deeper areas of the river channel due to a shallower depth (depth < 1 foot) and narrow potential routes of egress. As indicated by this analysis, the primary stranding issue begins when flows decline from 28,000 cfs to 20,000 cfs. Therefore, the proposed implementation of down-ramping rate restrictions at discharges less than 30,000 cfs is an appropriate mitigation measure to limit the potential effects of stranding by slowing water level reductions, which would allow time for fish to react to the increasingly shallow waters and find egress to deeper waters. For this reason, too, the ANFR will provide additional benefits to aquatic species.

e. For All These Reasons, MDE Should Adopt the ANFR in a Revised § 401 Certification for the Project.

As set forth above, the ANFR will not impair the water quality criteria identified by MDE in the 2018 Certification, while providing substantial resource benefits. In proceedings before FERC, the federal FWS, the Susquehanna River Basin Commission (SRBC), and the Pennsylvania Department of Environmental Protection all supported adoption of the ANFR. SRBC commented: "The Commission acknowledges and finds beneficial that the proposed changes to the flow regime that will occur after the third year of the facility's new license are an improvement over the conditions contained in the expiring license. Increased minimum flows and restrictions on ramping and maximum flows that target the spring fish migratory season should reduce adverse impacts to downstream aquatic communities."[264] MDE should find that the ANFR provides

[264] *Conowingo Hydroelectric Project*, FERC Docket No. P-405-106 and -111, Comments of the Susquehanna River Basin Commission on Joint Offer of Settlement, at 1 (Jan. 17, 2020).

reasonable assurance that the discharge from the Project will comply with state water quality standards, and MDE should incorporate the ANFR, without modification, into a revised § 401 certification for the Project.

B. Fish And Eel Passage.

Constellation also petitions MDE to reconsider the 2018 Certification and to revise its provisions relating to fish and eel passage.[265] The detailed provisions of Conowingo's comprehensive settlement with DOI, as augmented further by additional changes that Constellation has agreed with Maryland to make regarding fish and eel passage, are fully adequate to provide reasonable assurance that Conowingo's activities will not violate Maryland's water quality standards.

1. Conowingo's Historic and Comprehensive Settlement with DOI Provides Very Significant Enhancements to Facilitate Fish and Eel Passage, and Is Itself Sufficient to Satisfy Water Quality Standards.

Conowingo reached an historic and, in several respects, unprecedented settlement with DOI regarding the terms of DOI's Fishways Prescription, required under the FPA. In the resulting Offer of Settlement filed at FERC, Constellation explained that the facility and operational changes it had agreed to make regarding fish and eel passage had a total nominal cost ranging from $155 to $339 million over the term of the license, depending on which measures proved to be required under the settlement and when those measures were implemented.[266] At the time of the settlement, Wendi Weber, Northeast Regional Director for FWS, publicly stated that "[t]his [settlement] is a

[265] *See* 2018 Certification, §§ 7(B)(i)-(iv).

[266] *See Conowingo Hydroelectric Project*, FERC Docket No. P-405-106, Offer of Settlement and Explanatory Statement at 10 (May 12, 2016) ("Conowingo 2016 Settlement").

victory for everyone who lives or recreates on the Susquehanna River and the Chesapeake Bay."[267] Ms. Weber continued: "The agreement honors the science-based recommendations developed by the federal and state agencies that manage these resources. Along with upgrades at two upstream dams, we believe hydropower dams should no longer be the most limiting factor for shad on the East Coast's biggest river."[268] Significantly, both MDE and the Maryland Department of Natural Resources ("MDNR") had an opportunity to object to the settlement as in some way deficient—and other parties did file comments regarding the Offer of Settlement at FERC—but neither MDE nor MDNR filed any objections or comments.

As explained in the Offer of Settlement, the DOI settlement provides measurable and immediate benefits to the American eel, river herring, and American shad populations of the Susquehanna River, and ensures that any future impediments to fish passage will be addressed through the implementation of additional mitigation and enhancement measures. Specifically, with regard to Conowingo's fish passage facilities, the Offer of Settlement explained that Conowingo currently operates two fish lifts. The West Fish Lift ("WFL") was completed in 1972 and originally operated as part of a trap and transport facility. The East Fish Lift ("EFL") was constructed in 1991 to allow for direct passage of fish to Conowingo Pond and interim trap and transport operations until upstream fish passage facilities were constructed at the remaining upstream dams. The trap and transport program was terminated once construction of the fish passage facility at York Haven was completed in 2000. The WFL operated for specific experiments

[267] *See* Exelon Corp., Landmark Agreement with Exelon, U.S. Fish and Wildlife Service uses Cutting-edge Science to Drive Fishes' Return to Susquehanna River (Apr. 15, 2016), https://www.exeloncorp.com/newsroom/landmark-agreement-with-exelon-u-s-fish-and-wildlife-service.

[268] *Id.*

conducted for resource agencies (e.g., induced spawning, transport to specific tributaries). The EFL operated solely as a tailwater to headpond fish lift.

Under the terms of the DOI Settlement, Conowingo has agreed to implement substantial improvements to the existing fish passage facilities within three years of license issuance ("Initial Construction Items"). The Initial Construction Items include:

- Modifying the EFL to provide 900 cubic feet per second ("cfs") of attraction flow.
- Replacing the current 3,300-gallon hopper at the EFL with two 6,500- gallon hoppers.
- Reducing cycle time at each hopper at the EFL to be able to lift fish four times per hour.
- Completing modifications to the EFL structure to allow for trapping and sorting fish at the EFL facility and transporting them to the western side of the dam to a truck for transport upstream.
- Modifying the WFL to facilitate trap and transport.
- Constructing and maintaining structures, implementing measures, and/or operating the Project to provide American shad and river herring a zone of passage to the fish passage facilities.
- Evaluating potential trapping locations for American eel on the east side of Conowingo Dam including Octoraro Creek starting in May of the first calendar year after license issuance or immediately if license issuance occurs during the upstream American eel migration period.

In addition to these Initial Construction Items, Conowingo agreed to commence trap and transport of American shad and river herring from Conowingo to above the York Haven Hydroelectric Project beginning the first fish passage season after license issuance.[269] Conowingo also committed to trap and transport American eels at the west side of Conowingo Dam.

Conowingo also agreed in the DOI settlement that, five years after issuance of the new license, it will commence a three-year "Initial Efficiency Test" of fish passage at the Project. The Initial Efficiency Test will measure the passage efficiency of the improved facilities. If the

[269] Conowingo has agreed to annually trap and transport up to 80 percent of the run, up to a maximum of 100,000 fish for each species.

facilities achieve an 85 percent upstream passage efficiency for adult American shad, Conowingo will continue to operate the facilities without further modification. Conowingo will then conduct two-year "Periodic Efficiency Tests" every five years to ensure that the Project maintains an upstream passage efficiency of 85 percent for adult American shad throughout the term of the new license.

If the Project does not achieve an upstream passage efficiency of 85 percent after the Initial Efficiency Test or any Periodic Efficiency Test, Conowingo is required under the DOI settlement to implement measures to improve passage efficiency at the Project. Constellation and DOI agreed on a tiered list of potential measures, which are designed to address fish passage impediments associated with attraction flow and capacity limitations. The degree of the shortfall from the 85 percent passage efficiency target determines the scope of the additional mitigation and enhancement measures that will be required. As set forth in the DOI settlement, these additional mitigation measures range from the implementation of preferential turbine operating schemes to the construction of a new WFL.

In addition, in the first fish passage season after Conowingo implements any measure or measures to improve passage effectiveness, Conowingo agreed to commence a three-year Post-Modification Efficiency Test. The Post-Modification Efficiency Test will measure the passage efficiency of the improved facilities. If the Project achieves an upstream passage efficiency of 85 percent for American shad, Constellation will continue to operate the facilities without modification and will return to conducting two-year Periodic Efficiency Tests every five years. Again, if any Periodic Efficiency Test demonstrates that the Project is not achieving an 85 percent passage efficiency, Conowingo will implement a measure or measure(s) from the tiered list of

options, to be followed by a Post-Modification Efficiency Test. This cycle of testing and modifying, as necessary, will continue throughout the term of the license.

The DOI settlement also includes substantial adaptive management plans for the anticipated restoration of American shad and river herring throughout the term of the license. This fishway prescription incorporates a fish passage efficiency target and measures to assess fish passage efficiency throughout the term of the license in order to test for future conditions that would require corrective actions contained in this prescription. This fishway prescription includes measures providing for an ultimate fishway capacity of up to 18 million pounds per season (four 6,500-gallon hoppers with separate holding pools). Moreover, if this amount proves insufficient, the DOI has reserved authority through the settlement to address this issue at a later date if fishway capacity appears to be a limiting factor to population restoration.

Other significant enhancements to fish and eel passage—including a Fishway Operation and Maintenance Plan, and a Fishway Effectiveness Monitoring Plan—are described in the Offer of Settlement regarding the DOI settlement.[270] The DOI settlement was a landmark settlement in numerous respects. The codification of passage efficiency criteria was very rare at the time of the settlement and the level of efficiency (85 percent) the Project is striving to achieve for upstream passage is extremely high for hydroelectric projects on the East Coast. The adaptive management measures to deal with contingencies for both the need for potential increased capacity for fish passage, as well as the improved efficiency in fish passage, gave all parties certainty in what was required over the life of the license. Up until that point, most fish passage settlements had an initial "build out" requirement and then "study" requirements, without any real or committed plan as to what was required should study results not meet expectations. The DOI settlement was also

[270] *See* Conowingo 2016 Settlement at 6-10.

unprecedented in requiring a "trap and transport" aspect in which Conowingo would trap fish at its facility (both eels and shad) and transport them upstream of three other dams to their spawning grounds. Conowingo had no responsibility for the passage of fish and eels above *other* upstream dams owned by other parties. This was particularly important for getting fish and eels past the Holtwood facility, which has been a known bottleneck, for shad, due to low passage efficiency, for years.

For these reasons, the DOI settlement itself provides adequate assurance that Conowingo's activities will not violate any of Maryland's water quality criteria. As set forth above, Constellation has not identified an applicable provision of the COMAR, but any water quality criteria applicable to fish and eel passage would be, at most, narrative and subjective. As described below, however, Conowingo has agreed with Maryland to go even *further* than is required by the DOI settlement.

2. Conowingo Has Agreed to Further Fish and Eel Passage Enhancements with Maryland, Which Provide Further Assurance that Conowingo's Activities Will Comply with Water Quality Standards.

In addition to the DOI settlement, Constellation has agreed to other significant fish and eel passage enhancements in its settlement with Maryland.

Regarding fish passage, as described above, Constellation agreed in the DOI settlement to modify the Project's EFL to provide an attraction flow of 900 cubic feet per second. However, in order to best optimize fish passage at the EFL, Constellation has agreed with Maryland to make modifications to the EFL to achieve the greatest possible balance of increased attraction flow (up to 900 cfs) and improved internal hydraulic performance. These modifications will be developed in consultation with, and subject to approval by, both MDE and USFWS, in addition to FERC. In fact, the design work has already been done, and MDE has agreed to a lower flow. Maintaining the language from the 2018 Certification would merely delay the modifications to the EFL, in derogation of a change that MDE itself sought in the settlement.

Regarding eel passage, Constellation likewise agreed to significant additional enhancements in the settlement with Maryland, beyond the requirements of the DOI settlement. The American Eel is a catadromous fish species that migrate to the Sargasso Sea to spawn. American Eel serve as hosts to the larval stage of several freshwater mussels, allowing for the dispersion of mussels to upstream areas. These mussel species in turn provide important ecosystem services, including filtration and transformation of sediment and nutrient pollution. Very few juvenile eels (elvers) are passed upstream of the Project, because fish lifts are generally not effective at passing elvers. As a result, Constellation has agreed with Maryland to take a variety of actions to improve eel passage at the Project, including the following:

1. Constellation agreed to develop an "Eel Passage and Restoration Plan" (which it now has done) that would: (a) provide for modification of the EFL to accommodate a temporary eel trapping facility in the EFL stilling basin (the "Temporary Eel Trapping Facility"); (b) contain details regarding the operation and maintenance of all existing and proposed eel fishways at the Project, including continued use of the EFL for eel passage after shad and herring season has ended; and (c) establish attraction flow speed and volume, slopes of ramps, matting, and methods to reduce predation.

2. Constellation agreed to consult at least annually with MDE to review eel passage efficiency at the EFL. In addition, it agreed that after it has operated the Temporary Eel Trapping Facility for ten years, if MDE determines, in consultation with an Eel Passage Advisory Group, that the Temporary Eel Trapping Facility has been successful, Constellation will design, install, and operate a permanent eel trapping facility at the EFL (subject to a limitation in the agreement, such that Constellation only must maintain either the EFL ramp or the Octoraro trap, but not both).

3. Constellation agreed to maintain the upstream eel trap-and-transport program required by the DOI settlement through 2035. The company also agreed to conduct trap-and-transport operations in accordance with certain parameters that are intended to minimize eel mortality.

There are three key differences between the DOI and MDE settlements:

First, Constellation will operate eel fishways on the west side of the Conowingo Dam from May 1 to when Fall mean daily river temperature below the Conowingo Dam is ten degrees Celsius or less for three (3) consecutive days. In practice, this means Conowingo will operate the west side eel fishways until mid-to-late November. In contrast, the DOI settlement only requires the west side eel fishway to operate until September 15 of each year.

Second, Constellation has agreed to operate an upstream eel passage trap and truck program through 2035. The DOI prescription only requires the trap and truck program to operate through 2030, at which time it is contemplated that volitional passage would be implemented. Conowingo thus has agreed to extend trap and truck operations, and delay volitional passage, for five years.

Third, Constellation has agreed to operate a temporary eel facility at the EFL for 10 years. If, subject to certain defined metrics that Constellation has agreed with Maryland, data demonstrates that the location of the temporary eel facility is productive, then the eel trapping facility at the EFL will become permanent (subject to the limitation identified above). Further details are set forth in the agreement with Maryland.

These enhancements further ensure that Conowingo's activities will not violate any of Maryland's water quality criteria—which again are at most, with regard to fish and eel passage, narrative and subjective. Indeed, it would not make sense for MDE to jettison specific changes and enhancements that it negotiated with Constellation in the settlement, particularly with regard to elements of the fish and eel passage program that Constellation, MDE, and FWS have been

implementing. As a result, Constellation petitions that MDE reconsider the fish and eel passage requirements of § 7(B)(i)-(iv) of the 2018 Certification, and instead impose obligations that are consistent with the provisions of the DOI settlement and Constellation's subsequent further agreement with the State of Maryland.

C. Trash and Debris.

Prior to issuing the 2018 Certification—including in its previous § 401 certification issued in 1975—MDE had imposed *no* obligation on Conowingo to remove *any* trash and debris carried by the Susquehanna River into the Reservoir. Conowingo itself does not introduce any material amount of trash and debris into the water, and there is no dispute that if Conowingo did not exist, all of the trash and debris in the river would continue to flow downstream from Pennsylvania and New York. In the 2018 Certification, however, MDE imposed a condition that Conowingo "shall ... remove floating and water surface trash and debris ... at least weekly" and that during such trash and debris removal events, Conowingo "shall remove *all* visible trash and debris."[271]

In its settlement with Constellation, Maryland agreed to modify those requirements, and Constellation in turn agreed to perform substantial measures to remove trash and debris it did not introduce into the water, far beyond what Conowingo had been doing previously. Specifically, Constellation agreed to:

(a) remove as much floating and water surface trash and debris that accumulates in the Reservoir behind Conowingo Dam as is reasonably practicable, but in any event no less than fifty (50) loads nor more than four hundred fifty (450) loads of trash and debris per year, where a "load" consists of the maximum volume of trash and debris that can be safely transported in a standard twenty (20) yard dumpster;

(b) additional, specified measures in response to any complaint relating to accumulated trash and debris at the Project's facilities interfering with recreational uses in the Reservoir;

[271] 2018 Certification, § 7(F)(i) (emphasis added).

(c) sponsor at least two annual community-based cleanups of the Reservoir, tributaries upstream of the Project that feed the Reservoir, and the Susquehanna River and tributaries downstream of the Project; and

(d) additional, specified measures after any storm event that results in trash and debris blocking water supply intakes in the Susquehanna River downstream of Conowingo Dam.[272]

For the reasons stated in the 2018 Conowingo Petition, and based also on the new information described above concerning what Constellation has agreed to do in its settlement with Maryland, MDE should reconsider the 2018 Certification. Constellation does not object to MDE incorporating these provisions into a revised § 401 certification consistent with the terms of the settlement. The measures set forth in the settlement are sufficient to provide reasonable assurance that the Project's activities will not violate any of Maryland's applicable water quality standards. The measures detailed above that Constellation has agreed to perform (including in particular the core obligation *to remove as much trash and debris that accumulates in the Reservoir behind the Dam as is reasonably practicable*) go far beyond what MDE legally could require Conowingo to do, particularly given that: (1) all of the trash and debris at issue is introduced into the river upstream and independent of Conowingo and is not caused by[273] and has nothing to do with the "activity" of Conowingo; (2) during a storm event when amounts of trash and debris may be swept over or through the Dam, there is no basis to find that all or necessarily even most of the trash and debris had been trapped and accumulated by the Dam; and (3) even during a significant storm event, the Dam will continue to trap much of the trash and debris and *prevent* it from flowing

[272] *See* Ex. 8 (Conowingo Settlement), Attachment A (Proposed License Articles, provisions relating to Trash and Debris) at 8.

[273] *See* COMAR § 26.08.02.10(E)(1). Maryland's own regulations confirm that a § 401 certification is properly limited to the water quality effects caused by the proposed activities of the applicant for a § 401 certification.

further downstream.[274] Thus, Constellation respectfully petitions MDE to reconsider the trash and debris provisions of § 7(F) of the 2018 Certification and issue a revised § 401 certification that imposes the obligations Constellation has agreed to perform in its settlement with Maryland.

D. Invasive Species.

It is beyond dispute that the Dam makes it significantly more difficult for invasive species of fish to swim upstream beyond the Dam. The existence of invasive species in the river is certainly not a function of the Project or a by-product of its activities in any way. To the extent the Project has *any* impact on invasive species, it is only to retard their otherwise inevitable movement in a beneficial way. Nonetheless, in § 7(B)(i)(c) and Attachment #3 of the 2018 Certification, MDE imposed on Conowingo a detailed "Invasive Species Mitigation Plan."

Efforts to block the flow and expansion of invasive species are complex. In its settlement with Maryland, Constellation agreed to assist Maryland's efforts to block the flow and expansion of invasive species, with detailed provisions that Constellation agreed could be included in a new FERC license for Conowingo.[275] FWS had comments on these provisions and requested changes. Both Maryland and Constellation agreed to the changes requested by FWS. Ultimately, FERC included the settlement's Invasive Species Mitigation provisions in the new license for the Project, with the changes requested by FWS.

Conowingo has been working closely with MDE and MDNR on the capture and disposition of invasive fish that attempt to use the Project's fish lifts to get around the Dam. Conowingo

[274] *See Natural Resources Defense Council, Inc. v. EPA*, 301 F. Supp. 3d 133, (D.D.C. March 30, 2018) (finding EPA action to be arbitrary, capricious, and not in accordance with law because, instead of setting a maximum daily amount of trash that could enter a river, EPA set a minimum amount of trash that must be removed).

[275] *See* Ex. 8 (Settlement Agreement) at Exhibit A (Proposed License Articles, provisions relating to Invasive Species Mitigation), p. 7.

expends very significant resources on this effort, none of which can be said to be required by Maryland's water quality standards. Again, *nothing that* the Project does exacerbates an *existing* problem presented by invasive species, which exists wholly independent of Conowingo. Constellation will continue to work with MDE and MDNR, as it has been doing, to address the problem presented by invasive species. For all the reasons set forth above, MDE should reconsider the Invasive Species Mitigation Plan in § 7(B)(i)(c) and Attachment #3 of the 2018 Certification, and issue a revised § 401 certification that imposes the obligations Constellation has agreed to perform in its settlement with Maryland, as modified at the request of FWS.

E. Plans and Other Provisions.

As described below, there are a variety of plans included in the 2018 Certification that were either included in Constellation's settlement with Maryland or, in one case, subject to other state requirements. In addition, some requirements in the 2018 Certification were not part of the settlement, often because other provisions of the settlement provided adequate protections for the resource in question. In most cases, Constellation has either initiated or completed tasks associated with these plans consistent with the settlement. Constellation respectfully petitions MDE to reconsider the 2018 Certification and revise it so that the following plan provisions remain in line with the terms of the settlement and also reflect the current status of each plan and provision.

1. 643 Monitoring Plan.

The NPDES permit issued by MDE for the Project, effective December 1, 2021,[276] requires that continuous sampling of DO occur from May 1 through October 31 of each year. The permit requires that if, for any reason, Conowingo does not comply or will be unable to comply with daily minimum DO standards (or other effluent limitations), it is responsible for notifying the Inspection

[276] Ex. 2 (Discharge Permit 19-DP-0491).

and Compliance Program by telephone within 24 hours. Additionally, within five calendar days, Conowingo is to notify MDE in writing with a description of non-complying discharge and impacts, including a description of cause, duration, corrective actions taken, and other information related to the non-compliance event.

Conowingo has continuously monitored DO at Station 643 for years and developed annual reports to provide FERC and MDE with a summary of the previous year's DO monitoring at the Project. Constellation has submitted reports for the 2021 and 2022 monitoring periods (May 1 through October 31, annually) to FERC and MDE. During the 2021 and 2022 monitoring periods there were no instances where DO was less than the applicable 5.0 mg/L standard.

Constellation petitions that MDE issue a revised § 401 certification that is consistent with the NPDES permit requirements and that reflects the status of the monitoring program.

2. Fish Kill Monitoring Plan.

The Fish Kill Monitoring Plan included in the Constellation settlement with Maryland is consistent with the requirements of the 2018 Certification. The Fish Kill Monitoring Plan has been developed in consultation with FWS, MDE, MDNR, and the Pennsylvania Fish and Boat Commission ("PAFBC"), and it was approved by FERC on June 22, 2022.

In 2022, there were *zero* Fish Kill Events at the Project within the geographic extent of the Fish Kill Notification Plan. As a result, there were zero Fish Kill Reconnaissance Surveys performed and zero potential Fish Kill Events investigated. Constellation developed a brief letter report on the activities performed as part of implementing the Fish Kill Notification Plan during 2022, which was submitted to MDE on March 31, 2023.

Constellation petitions that MDE issue a revised § 401 certification that reflects the current status of the Fish Kill Monitoring Plan.

3. Chlorophyll-A Levels in the Reservoir.

As required by its settlement with Maryland, Constellation developed a monitoring plan "designed to determine with a high level of statistical confidence whether chlorophyll-a [water quality standards] are exceeded in the Maryland portion of the Reservoir between May 1 and September 30 in any particular year."[277] Following consultation with MDE, Constellation finalized the Chlorophyll-a Monitoring Plan in November 2021.

A total of ten sampling events occurred during the 2022 sampling period and Chlorophyll-a sample results ranged from 0.87 µg/L to 15.46 µg/L, with an average of 8.83 µg/L and a median of 9.31 µg/L. There was one occurrence of the 30-day moving average exceeding the applicable standard of 10.0 µg/L (a mean concentration of 10.45 µg/L was calculated for all results over the July 5 to August 2, 2022, period). The 90th percentile of all results during the monitoring period was 12.68 µg/L (well below the standard of no more than 30 µg/L). A report was submitted to MDE on December 22, 2022. The second year of sampling is being performed in 2023.

Constellation has proposed to MDE to amend the Chlorophyll-a Monitoring Plan following the completion of the 2022 monitoring effort. In 2022, the analytical methodology to determine Chlorophyll-a deviated from what was specified in the monitoring plan.[278] To retain consistency through the remainder of the three-year monitoring program, Constellation proposed, at MDE's

[277] Ex. 8 (Conowingo Settlement) at 8.

[278] Analytical testing of Chlorophyll-a was performed using the fluorometric method (EPA 445.0, SM10200H.3) instead of the spectrophotometric method (EPA 446.0, SM10200H). The fluorometric method is the University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory (CBL) default method for analyzing Chlorophyll-a in water and sediment of fresh, estuarine, and coastal areas, as it provides slightly more sensitivity than the spectrophotometric method. All sample preservation procedures, extraction methods, and holding times are identical between the fluorometric and spectrophotometric methods. Additionally, the measuring and reporting of Chlorophyll-a done by CBL is comparable between both methods.

direction, to continue performing chlorophyll-a analysis using the same method in 2023 and 2024. The revised Chlorophyll-a Monitoring Plan was submitted to MDE on March 27, 2023.

Constellation's settlement with Maryland deviates from the 2018 Certification in that it does not require either a Chlorophyll-a reduction plan or reimbursement to the City of Baltimore for additional treatment costs resulting from elevated Chlorophyll-a. As shown by the results to date, such requirements are moot given the results obtained. Moreover, because Chlorophyll-a is an indicator of nutrient pollution and Constellation is subject to nutrient loading predominantly from upstream sources, Constellation should not be required—for the reasons set forth above—to develop a nutrient reduction plan for pollution it does not cause. Further, the relationship between the City of Baltimore and Constellation for the use of water from Conowingo Pond is a contractual relationship between the two parties and is not properly addressed in a § 401 certification.

Constellation respectfully petitions that MDE reconsider the 2018 Certification and issue a revised certification that reflects the current status of the Chlorophyll-a sampling program without any requirement for either a Chlorophyll-a reduction plan or potential payments to the City of Baltimore.

4. PCB Levels in Fish Tissue.

There are no requirements in Constellation's settlement with Maryland related to Project operations and PCBs. Additionally, the settlement provides that notwithstanding its "Adaptive Management" provision, MDE will not petition FERC to impose any additional requirements related to PCBs or Chlorophyll-a associated with pollution originating from sources outside of the Project. The existence of potential PCBs in the sediment, like Chlorophyll-a, is not pollution caused by the Project. Constellation respectfully petitions that MDE reconsider the 2018 Certification and issue a revised certification that has no provisions regarding PCBs.

5. Shoreline Management Plan.

A Shoreline Management Plan ("SMP") for the Project was developed in consultation with MDE and approved by FERC on January 19, 2022.

The SMP was updated to include: (a) a provision for reviewing and updating the plan every 10 years, beginning in 2030; (b) a requirement to consult with the MDE prior to filing the 10-year SMP updates; (c) a requirement that, prior to filing an application for a non-Project use of Project land or making any modifications to shoreline vegetation, the Project must assess and consult with MDE regarding any impacts on water quality; and (d) a requirement that the Project must consult with MDE regarding any proposed modification to an existing use of Project lands where such use may affect any sensitive aquatic resource identified by the Project in the "sensitive resources overlays" included in the SMP. The SMP is consistent with the 2018 Certification. MDE should reconsider and revise the § 401 certification to reflect the content and status of the current SMP.

6. Bog Turtle Management Plan.

The Bog Turtle Protection Plan was developed in consultation with FWS, MDE, MDNR, and PAFBC, and approved by FERC on September 7, 2022. The plan contains a summary of regulations that apply to the management of bog turtles and their habitat within the Conowingo Project boundary, a description of historic and current records of bog turtles and their habitat within the Conowingo Project boundary, and measures that Constellation will implement to avoid negatively impacting bog turtles and their habitat.

Within the Conowingo Project boundary, no historical records of bog turtles have been identified by Constellation, MDE, MDNR, or PAFBC, and no other sightings of bog turtles have been reported to Constellation. Potential bog turtle habitat within the Conowingo Project boundary have not been identified. No actions or avoidance measures have been implemented under the Bog Turtle Protection Plan. The Bog Turtle Protection Plan is consistent with the 2018

Certification. MDE should reconsider and revise the § 401 certification to reflect the content and status of the current Bog Turtle Protection Plan.

7. Map Turtle Plan.

The Northern Map Turtle Protection Plan was developed in consultation with MDE, MDNR, and PAFBC, and approved by FERC on May 23, 2022. The plan summarizes existing information regarding the status of the Northern Map Turtle populations within the Conowingo Project boundary, considers potential Project-related effects on Northern Map Turtle nesting, basking, and hibernating, and lays out methods for population monitoring, habitat studies, and nest management and protection measures including monitoring. The Northern Map Turtle Protection Plan is consistent with the 2018 Certification. MDE should reconsider and revise the § 401 certification to reflect the content and status of the current Northern Map Turtle Protection Plan.

8. Waterfowl Nesting Protection Plan.

The Waterfowl Nesting Protection Plan was developed in consultation with FWS, MDE, MDNR, and PAFBC, and approved by FERC on May 6, 2022. The plan specifies Constellation's approach to identifying potential waterfowl nesting areas and methods to investigate specific Project-related effects on these areas. The plan also includes Constellation's approach to verify which nesting waterfowl species, as well as black-crowned night-heron, are affected by the Project, if any, and examples of potential mitigation measures Constellation may implement to minimize potential impacts on waterfowl or black-crowned night-heron nesting habitat, if they were to occur. The Waterfowl Nesting Protection Plan is consistent with the 2018 Certification. MDE should reconsider and revise the § 401 certification to reflect the content and status of the current Waterfowl Nesting Protection Plan.

9. Monitoring Stream Flows in the Tailrace.

In accordance with its settlement with Maryland, Constellation has conducted a study regarding the feasibility of redesigning, installing, and maintaining best available real-time flow telemetry at the United States Geological Survey flow gage in the project tailrace (No. 01578310). Under the now-vacated FERC license, the Tailrace Gage Feasibility Study was due to be filed with FERC by March 2023. In February 2023, Constellation requested an extension with MDE for an additional year to work with USGS to obtain data. MDE has not responded to date. The execution of the feasibility study for tailrace stream gaging is consistent with the 2018 Certification. MDE should reconsider and revise the § 401 certification to reflect the content and status of the current study process.

10. Sturgeon Protection.

In accordance with Article 418 of the now-vacated FERC license, Constellation initiated a Sturgeon Awareness Program for staff, contractors, and the public at the Project. Constellation has additionally submitted letter reports to FERC, MDE, and MDNR on the number of sturgeon reported in each calendar year. In both 2021 and 2022, Constellation and its contractors observed zero Atlantic and shortnose sturgeon at the Conowingo Dam.

In addition, in January 2018, Constellation developed a draft Biological Assessment ("BA") to further evaluate the effects of the Project on shortnose and Atlantic sturgeon, as requested by the National Marine Fisheries Service. The BA includes a Sturgeon Handling Plan that specifies the procedures for the handling, documenting, and reporting of any shortnose or Atlantic sturgeon that may be incidentally collected by the Conowingo fish lifts or recovered from stranding in temporary pools.

MDE should reconsider and revise the § 401 certification to reflect the content and status of the Sturgeon Awareness Program contemplated by Article 418 of the vacated FERC license, as well as the Sturgeon Handling Plan in the draft BA.

11. Habitat Improvement Projects.

The 2018 Certification required Conowingo to develop a plan for implementing habitat improvement projects ("HIPs") in the Susquehanna River extending approximately 4.5 miles downstream of the Dam, to the island complex that includes Robert and Spencer Islands. The 2018 Certification identified a total of nine HIP locations targeting improvements for fish (shad, herring, shortnose sturgeon, and smallmouth bass), freshwater mussels, aquatic vegetation, and macroinvertebrates. Out of the nine locations identified for the potential development of HIPs under the 2018 Certification, only two (the mouth of Octoraro Creek and Rowland Island) are within the 2021 FERC Project boundary.

HIPs are typically required in FERC licenses where flow regimes cannot be implemented to achieve habitat goals. As part of its settlement with Constellation, MDE has chosen to implement flow regimes that substantially improve the aquatic habitat over existing conditions, *see supra* at Section IV(E), and thus obviate the need for the HIPs. Constellation respectfully petitions that MDE reconsider the 2018 Certification and eliminate the requirement for implementing HIPs, in light of the agreed new flow regime that Constellation has negotiated with Maryland.

12. Lower River Fisheries Survey.

The 2018 Certification required Conowingo to develop a lower river fish protection plan, the crux of which requires: (a) monitoring by Constellation of the fish populations of the tributaries of the Susquehanna River and the lower riffle habitats of Deer Creek, Octoraro Creek, Broad Creek, and Conowingo Creek during spring, summer, and fall every five years; (b) monitoring of

those habitats by electrofishing (conventional and trawl), snorkeling, and/or seine surveys (or otherwise as approved by MDNR); and (c) sampling technique(s) targeting darter and logperch for each sampling event in riverine habitat. Specifically, the surveys were meant to target the Maryland darter, a federally endangered species, and the Chesapeake logperch, a state threatened species. These requirements were not part of Maryland's settlement with Constellation.

Constellation performed targeted fishery surveys for the Maryland darter as part of the Project relicensing and did not identify the presence of this species in the Susquehanna River or two of its tributaries (Deer and Octoraro creeks). However, as part of that study, the Chesapeake logperch was the second most abundant darter species recorded, with 1,886 collected, accounting for 21 percent of the total number of darters recorded.

Constellation respectfully petitions that MDE reconsider the 2018 Certification and remove the lower river fisheries survey requirements on the grounds that (a) the 2018 Certification requires Conowingo to collect basic resource inventory information outside of the Project boundary or zone of influence of Project operations; and (b) Constellation collected information, as part of the FERC relicensing, adequate for environmental review under the National Environmental Policy Act.

13. Spillway Modifications/Fish Stranding Minimization.

The 2018 Certification requires that, no later than September 1, 2019, the Project shall submit to MDE for approval a plan for modifying the spillway tailrace and/or modifying operational flow practices at the Project to reduce the numbers of rare, threatened, or endangered fish species stranded by Project operations (the "Stranding Minimization Plan"). This requirement was not part of Maryland's settlement with Constellation. Because Constellation has agreed to a new flow regime that includes down-ramping requirements designed to minimize stranding, Constellation respectfully petitions that MDE reconsider the 2018 Certification and remove the requirement for this plan.

V. Under Established Maryland Law, Riverkeepers Lack Standing to Challenge the 2018 Certification.

Constellation has previously raised the issue that, under established Maryland law, Riverkeepers lack standing to *appeal* the 2018 Certification under COMAR § 26.08.02.10(F)(4).[279] MDE has never ruled on that issue.

Maryland's standing law—which is distinct from federal standing law[280]—has the same requirements today as it did in 2018.[281] Constellation welcomes input concerning MDE's § 401 decision from all parties, and MDE has reopened the public comment process for anyone wishing to provide such input. MDE can certainly consider the viewpoints of Riverkeepers in connection with that public comment process. But as Constellation previously demonstrated, under Maryland law regarding organizational standing, and as previously applied by MDE in analogous situations, Riverkeepers lack standing to *appeal* the 2018 Certification, either in this reconsideration process or any subsequent contested case hearing or judicial review proceeding.[282]

CONCLUSION

Constellation respectfully requests that MDE consider this submission and the supplemental materials provided herewith, and grant reconsideration of the 2018 Certification as requested.

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[279] *See* Letter from Pamela D. Marks to Michael T. Pedone, Senior Policy Advisor, MDE, at 2-3 (Sept. 6, 2018); Exelon General Company, LLC's Renewed Request to Dismiss Appeal of Stewards of the Lower Susquehanna, d/b/a Lower Susquehanna Riverkeeper Association, and Waterkeepers Chesapeake for Lack of Standing (Nov. 2, 2018).

[280] *See id.*

[281] *See*, *e.g.*, *Paula v. Mayor and City Council of Baltimore*, 253 Md. App. 556, 581 (2022); *Green v. Comm'n on Judicial Disabilities*, 247 Md. App. 591 (2020).

[282] *See id.* As Constellation previously demonstrated, Maryland's standing requirements are distinct from the rules governing participation in the relicensing proceedings at FERC and the ability of a party to appeal FERC's issuance of a federal license.

Respectfully submitted,

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BEFORE THE MARYLAND DEPARTMENT OF THE ENVIRONMENT

CONSTELLATION ENERGY GENERATION, LLC 1310 Point Street Baltimore, MD 21231	FERC Project No. P-405 MDE WSA Application No. 17-WQC-02

EXHIBIT LIST

No.	Full Description
1	Maryland Water Resources Administration, Section 401 Certification for Conowingo (Feb. 7, 1975)
2	Maryland Dep't of the Environment, State Discharge Permit No. 19DP0491, NPDES Permit No. MD0002518 (Oct. 18, 2021)
3	Maryland Energy Administration, Letter of Information re SB0540/HB0427 (Feb. 24, 2021)
4	Michael J. Langland, Sediment Transport and Capacity Change in Three Reservoirs, Lower Susquehanna River Basin, Pennsylvania and Maryland, 1900–2012 (2015)
5	Cindy M. Palinkas, et al., Influences of a River Dam on Delivery and Fate of Sediments and Particulate Nutrients to the Adjacent Estuary: Case Study of Conowingo Dam and Chesapeake Bay, 42 ESTUARIES AND COASTS 2072 (2019)
6	EPA, Evaluation of the Final Conowingo Watershed Implementation Plan, Enclosure at 1 (Jan. 24, 2022)
7	Exelon Generation Co., LLC, v. Grumbles, Civ. No. 18-1224, Transcript of Hearing (D.D.C. Feb. 28, 2019)
8	Conowingo Hydroelectric Project, FERC Docket No. P-405-106 and -121, Joint Offer of Settlement and Explanatory Statement of Exelon Generation Company, LLC and the Maryland Department of the Environment (Oct. 29, 2019)
9	Debra L. Donahue, The Untapped Power of Clean Water Act Section 401, 23 ECOLOGY L.Q. 201 (1996)
10	Chesapeake Bay Program, Public Report, 2021 Loads Report
11	Qian Zhang et al., Decadal-Scale Export of Nitrogen, Phosphorus, and Sediment from the Susquehanna River Basin, USA: Analysis and Synthesis of Temporal and Spatial Patterns, 563– 564 SCI. OF THE TOTAL ENVIRONMENT 1016 (2016)
12	Qian Zhang et al., Data Associated with Decadal-Scale Export of Nitrogen, Phosphorus, and Sediment from the Susquehanna River Basin, USA: Analysis and Synthesis of Temporal and Spatial Patterns (2016).
13	Md. General Assembly, Testimony of Secretary Grumbles to the Senate Public Safety, Transportation, and Environment Subcommittee, Chesapeake Bay Overview (Jan. 24, 2019) (excerpt)

14	EPA, EPA Expectations: Implementation of the Conowingo Watershed Implementation Plan's Phased Approach, Draft—For Partnership Input (Jan. 26, 2023)
15	Press Statement, Chesapeake Bay Foundation, Conowingo Is A Red Herring; Local Pollution Comes From Local Sources (Nov. 2, 2012)
16	Qian Zhang et al., Long-Term Changes in Sediment and Nutrient Delivery from Conowingo Dam to Chesapeake Bay: Effects of Reservoir Sedimentation, 50 Envtl. Sci. & Tech. 1877 (2016)
17	Lew Linker et al., Results of Latest Phase 6 Conowingo Analysis (Sept. 13, 2017)
18	Lee Currey, Conowingo Dam Infill: How Much, Who, How, and By When, in Chesapeake Bay 2017 Midpoint Assessment—Policy Issues for Partnership Decisions (Dec. 4–5, 2017)
19	Qian Zhang et al., Long-Term Seasonal Trends of Nitrogen, Phosphorous, and Suspended Load from the Non-Tidal Susquehanna River Basin to Chesapeake Bay, 452–453 Science of the Total Environment 208 (2013)
20	Jeffrey Cornwell, J. Michael Owens, Hamlet Perez & Zoe Vulgaropulos, The Impact of Conowingo Particulates on the Chesapeake Bay: Assessing the Biogeochemistry of Nitrogen and Phosphorus in Reservoirs and the Chesapeake Bay (2017)
21	Jeremy M. Testa et al., Season-Specific Trends and Linkages of Nitrogen and Oxygen Cycles in Chesapeake Bay, Limnology and Oceanography (2018)
22	Aaron J. Bever et al., Combining Observations and Numerical Model Results to Improve Estimates of Hypoxic Volume within the Chesapeake Bay, USA, 118 J. OF GEOPHYSICAL RESEARCH: OCEANS (2013)
23	Carl F. Cerco & Mark R. Noel, Impact of Reservoir Sediment Scour on Water Quality in a Downstream Estuary, 45 Jo. Envtl. Quality 894 (2016)
24	Michael J. Langland, Bathymetry and Sediment-Storage Capacity Change in Three Reservoirs on the Lower Susquehanna River, 1996–2008, USGS Scientific Investigations Report 2009-5110 (2009)
25	Joint Federal/State Application for the Alteration of any Floodplain, Waterway, Tidal or Nontidal Wetland In Maryland Joint Application (May 8, 2018)
26	Conowingo WIP Update to Chesapeake Bay Program Principals' Steering Committee (July 2023)
27	Surveyed § 401 Certifications
28	Surveyed MDE Water Quality Certifications
29	Comment Letter to W. Seiger, Chief Waterway Construction Division, MDE, from A. Danucalov, FERC License Compliance Manager, Exelon Generation (June 18, 2018).
30	Gomez and Sullivan Engineers, P.C., Effects of Flows on Aquatic Resources Downstream of Conowingo Dam (July 26, 2023)