Re: Three Mile Island Alert's Comments on the Supplemental Information to Support TMI-1 2012 NPDES (PA-0009920) Renewal Permit Application.

Submitted by Three Mile Island Alert on June 12, 2025.
Contributors: Eric Epstein, Three Mile Island Alert, LLC., Maureen Milligan, President, Sustainable Futures Communications, LLC, and Bart Ziegler PhD, Samuel Lawrence Foundation.

I. Discussion.

The Supplemental TMI-1 NPDES (PA-0009920) Permit Renewal Application Resubmittal is deficient on its face. The Applicant needs to submit a site-specific study prepared after 2020. The Application is based on conjecture and is overly reliant on Peach Bottom Atomic Power Station ("Peach Bottom") and York Haven Dam.

The name change does not lower the bar on the permitting process. The data obtained from Peach Bottom's most recent Environmental Impact Statement has been rejected by the NRC. Constellation has been mandated to produce a new Environmental Impact Study with data obtained after 2020.

The Clean Water Act 316(b) does not prescribe the Best Technology Available ("BTA") for entrainment; therefore, it must be determined on a site-specific basis. This submittal demonstrates that TMI-1 does not achieve BTA for entrainment. The Application arrives at hypothetical conclusions based on conjecture.

Peach Bottom is not a valid reference point, and neither can it be used as a proxy. It is a boiling water reactor located 48 miles south of TMI, and withdraws water from the Conowingo Pond. The reference comparisons are older and smaller hydroelectric generating stations that are in Lancaster and York Counties located downstream from Three Mile Island. The Holtwood Dam, ("Holtwood"), the Safe Harbor Dam ("Safe Harbor"), and the York Haven Dam ("York Haven") are located in Lancaster and York Counties. The dams are located in proximity to Peach Bottom with the exception of the Safe Harbor dam. The distance between the Conowingo Dam and TMI is 33 miles. (Peach Bottom is 12 from the Conowingo Dam.) The distance between the Holtwood Dam and TMI is 41.1 miles from TMI-1. (The distance from Peach Bottom is 9.6 miles.) The Safe Harbor Dam is 13 mile south of TMI. (Peach Bottom is 20.7 miles from Three Mile Isl\and.)

The original Environmental Impact Statement ("EIS') was conducted in the early 1970s by the NRC's predecessor agency - the Atomic Energy Commission ("AEC"). TMI has been grandfathered into compliance prior to the enactment of the Commonwealth of Pennsylvania's aggressive statutes and regulations. Among the legislation passed were the Radiation Act (1984), Chesapeake Bay Commission Agreement Act (1985), Hazardous Site Cleanup Act (1988), Pennsylvania Environmental Stewardship and Water Protection Act (1999), and Act 129 (2008).

The initial EIS was issued decades prior to the emergence of the Environmental Protection Agency ("EPA") Section 316(b) of the Clean Water Act. The EPA issued regulations on the design and operation of intake structures in order to minimize adverse environmental impacts, and promulgated regulations in 2001, 2003, 2006, and 2014. The requirements are included in the National Pollutant Discharge Elimination System ("NPDES") permit regulations, 40 CFR Parts 122 and 125 (Subparts I, J, and N).

Constellation provided an Executive Summary of the Clean Water Act and the Best Technology Available Executive for 316(b).

> • TMI-1 has a closed-cycle recirculating cooling tower system. Before shutting down, Unit 1 had a gross generating capacity of 885-megawatts ("MW") and the station's design intake flow was 40.4 million gallons per day ("MGD"). TMI-1 first became operational before 2002, therefore, it is an existing facility subject to the final Clean Water Act (CWA) §316(b) rule for existing facilities (the Rule) that became effective on October 14, 2014.The Rule requires that the location, design, construction and capacity of cooling water intake structures ("CWIS") reflect best technology available ("BTA") for minimizing adverse environmental impacts. The Rule applies to existing facilities that are designed to withdraw more than 2 million gallons per day from Waters of the United States, use at least 25 percent of that water exclusively for cooling purposes, and have or require an NPDES permit. As discussed below, TMI-1 utilizes BTA for both impingement mortality and entrainment reduction.
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> ▪ TMI-1 uses closed-cycle cooling technology, which minimizes entrainment through flow reduction. The circulating water flow rate at TMI-1 is 430,000 gpm and the makeup water flow rate is 14,500 gpm. The reduction in cooling water withdrawal rate is 415,500 gpm of 97 percent. If TMI-1 condensers had been once-through cooled, the total water withdrawal rate would have been approximately 443,550 gpm. But because it has a closed-cycle system its total maximum withdrawal rate is 28,050 gpm. The reduction in total water withdrawal rate from utilizing a closed-cycle system is 415,500 gpm or 94 percent.

▪ If TMI-1 were to be classified as a new facility (under Phase 1) or as a new unit at an existing facility (under the 2014 Rule), it would be in compliance with the more stringent requirements stated at 40 CFR §125.84(c) and §125.94(e), respectively. Regulatory compliance requirements applicable to new units or new facilities are more stringent than those applicable to an existing unit or an existing facility. The TMI-1 closed-cycle cooling system would be considered BTA for entrainment at a new unit at an existing facility or for entrainment at a new facility. Therefore, the existing closed-cycle system at TMI-1 may be determined BTA for entrainment.

▪ Statements made by the United States Environmental Protection Agency (USEPA) in the preamble to the 2014 Rule2 and in the Responses to Public Comments3 clarify USEPA's intent for considering closed-cycle cooling as BTA for entrainment. ("TMI Station NPDES Application Update, 2025.")

"Following the separation of Exelon's regulated utility business from its generation and competitive energy business, effective February 2, 2022, CEG was formed to pursue competitive generation and customer- facing energy businesses. CEG notified PADEP of the ownership change in April 2022. In May 2012, prior to the separation, Exelon Corporation (Exelon) submitted a NPDES renewal application more than 180 days prior to the expiration of its 2007 NPDES permit and the PADEP deemed the application administratively complete. Since submission of the original 2012 application, some of the NPDES application information needs and Clean Water Act (CWA) 316(b) requirements have changed. Given the changes at Constellation and the minor changes to the NPDES renewal application, CEG is submitting this application to assist PADEP with its review and permit issuance efforts."

The NPDES has expired and there have been substantial requirement changes that are consequential and significant. The Rule does not prescribe a BTA for entrainment; therefore, it must be determined on a site-specific basis. This submittal demonstrates that TMI-1 does not achieve BTA for entrainment but arrives at a hypothetical conclusion based on conjecture based on a heavy reliance on data from Peach Bottom and York Haven.

The name change does not lower the bar on the permitting process. The NPDES (PA-0009920) Supplemental Renewal Permit Resubmittal is deficient on its face. The Applicant needs to submit a recent site-specific study prepared after 2020. The Rule does not prescribe BTA for entrainment; therefore, it must be determined on a site-specific basis. This submittal demonstrates that TMI-1 does meet BTA for entrainment based on the paucity of data from the Three Mile Island area.

"The Peach Bottom Power Station consists of two General Electric boiling water reactors with three times the capacity of TMI. The Peach Bottom Atomic Power Station, located on the west bank of the Conowingo Pond in York County, Pennsylvania (see Figure I-2), is a two-unit nuclear generating facility that uses water from the Conowingo pond for cooling purposes. The two power units are boiling water reactors capable of generating 1,093 MW each. Both units began commercial operation in 1974. The station does not currently use evaporative cooling towers for cooling needs, but evaporates up to 28 mgd through heat transfer via once-through cooling with water withdrawn from Conowingo pond." (Ibid, 15.)

The Peach Bottom Atomic Power Station ("Peach Bottom") is not a valid reference uclear generating station. It cannot be used as a proxy since it is a boiling water reactor ocated 48 miles south of TMI, and withdraws water from the Conowingo Pond. Peach ottom is comprised of two boiling water reactors designed by General Electric, and has cense extensions of between 20 to 40 years and is fully uprated

Peach Bottom is owned by Constellation Energy and Public Service Enterprise roup. Both entities own 50% of Peach Bottom and Constellation is the site operator. "The wo power units are boiling water reactors capable of generating 1,093 MW each. Both units egan commercial operation in 1974. The station does not currently use evaporative cooling owers for cooling needs, but evaporates up to 28 mgd through heat transfer via once-rough cooling with water withdrawn from Conowingo pond." (Ibid, 15.)

The Supplemental Application is based on conjecture and over reliant on Peach Bottom as a surrogate. The data obtained from Peach Bottom's most recent Environmental Impact Statement has been rejected by the NRC. Constellation has been mandated to produce a new Environmental Impact Study with data obtained after 2020. (1)

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1 "On February 24, 2022, the NRC Commission issued three orders (CLI-22-02, CLI-22-03, and CLI-22-04) and Staff Requirements Memorandum, SECY-21-0066, "Rulemaking Plan for Renewing Nuclear Power Plant Operating Licenses – Environmental Review, that impact the subsequent license renewal of Peach Bottom, Units 2 and 3 and Turkey Point, Units 3. (Please refer to discussion on "Toxics" regarding relationship between TMI and Turkey Point.)

The Opinion reverses the pace and timing of relicensing. ""The completion date and certain environmental review milestone dates remain undetermined for plants who have not received a subsequently renewed license and are under review. The safety review milestones are unaffected. Updates will be posted on their plant-specific as soon as possible." https://www.nrc.gov/reactors/operating/licensing/renewal/subsequent-license-renewal.htm

TMI-1 is a pressurized water reactor ("PWR") where the heat is transferred to water circulating around the uranium fuel in the first of three separate water systems. The water is heated to extremely high temperatures, but doesn't boil because the water is under pressure. The water within the primary system passes over the reactor core to act as a moderator and coolant but does not flow to the turbine. It is contained in a pressurized piping loop. The hot, pressurized water passes through a series of tubes inside the steam generator.

The other reference comparisons are older and smaller hydroelectric generating stations in Lancaster and York Counites located downstream from Three the York Haven Dam ("York Haven") are located in Lancaster and York Counties. The dams are located in proximity to Peach Bottom with the exception of the Safe Harbor dam. The distance between the Conowingo Dam and TMI is 33 miles. (Peach Bottom is 12 from the Conowingo Dam.) The distance between the Holtwood Dam and TMI is 41.1 miles from TMI-1. (The distance from Peach Bottom is 9.6 miles.) The Safe Harbor Dam is 13 mile south of TMI. (Peach Bottom is 20.7 miles from Three Mile Island.)

The Holtwood Dam, also known as the Holtwood Hydroelectric Dam, is a dam on the Susquehanna River in Lancaster County, Pennsylvania. It's the oldest of the three major dams on the lower Susquehanna River and was constructed between 1905 and 1910 by the Pennsylvania Water & Power Company. The dam was originally built as a 55-foot ferry dam and began generating electricity through a powerhouse. The dam and its associated powerhouse are named after two Canadian investors, Sir Herbert Holt and Edward R. Wood, and it produces 252 mw compared to TMI-1 whose capacity 837 mw.

The Safe Harbor Dam opened on December 7, 1931 and is the northern most of the Great Depression Era dams. It is located in Lancaster County, and produces 417 mw of electricity.

York Haven was built 100 years ago, and generates less than 20 megawatts or 2.4% of the capacity of Three Mile Island thus it is not a suitable benchmark. York Haven is located in another county, 2.5 miles north of the southern tip of Three Mile Island. is not a suitable benchmark. The York Haven Dam was built in 1904, and is powered to generate 19.6 megawatts. Cube Hydro Partners purchased the hydroelectric station from York Haven Power in 2015. Cube was a portfolio company of Squared Capital. In 2019, Cube Hydro was purchased from Squared Capital by Ontario Power Generation ("OPG"). The OPG merged Cube Hydro with another company that it acquired in 2018, forming Eagle Creek Renewable Energy. Ontario Power Generation's sole Shareholder - the Government of Ontario.

II. Operating Background.

Three Mile Island Unit 1 ("TMI-1") is a Babcock & Wilcox Pressurized Water Reactor wned and operated by Constellation Energy. TMI-1 came on line in September 1974 at a ost of $400 million which after adjusting for is $2.55 billion in 2018 dollars.

At the time of the accident on March 28, 1979, Three Mile Island-1 was shut down or refueling. The plant was owned by three utilities operating in two states: Metropolitan Edison (50%), Jersey Central Power & Light (25%), and Pennsylvania Electric (25%). The ompanies were organized under the General Public Utilities ('GPU") holding company mbrella. The operator of both plants was Met Ed.

TMI-1's structures are located on the northern most section of Three Mile Island. The principal structures of TMI-1 include the reactor building, turbine generator building, uel handling building, the TMI-1 intake pump and screenhouse structure and the TMI-1 'LEX Storage Facility (formerly the TMI-2 intake pump and screenhouse structure), two atural draft cooling towers, circulating waste pump hoses, waste storage and handling uildings, long-term steam generator storage building, pump hoses, independent spent fuel torage installation ("ISFSI)", desilting basin, and administrative buildings.

Three Mile Island Unit-1 has experienced numerous ownership changes, was shut own from 1979 to 1985, operated from 1985 to 2019, relicensed in 2009, and was shut own again in 2019 after failing to compete in the marketplace.

On July 17, 1998 Amer Gen Energy ("Amer Gen") announced that it reached an greement with General Public Utilities ("GPU") to purchase TMI-1 for $100 million. The roposed sale included $23 million for the reactor, and $77 million, payable over five years, or the nuclear fuel. The sale confirmed the Company's position that the aging plant had educed value.

On December 20, 1999 TMI-1's license was transferred from GPU Nuclear to Amer Gen.

On September 5, 2002 PECO announced that it was putting its share of Amer Gen p for sale. British Energy was bankrupt, and owned the other 50% of TMI-1. The sale emonstrated the Company's claim of the reduced value of the plant at the Bureau of ssessment and Appeals in Dauphin County.

On September 11, 2003 Florida Power & Light announced a sales agreement to buy ritish Energy's 50% share of TMI- 1. (Please refer to the discussion under "Chemicals" on . 22)

On December 23, 2003 British Energy sold 50% of its share of TMI-1 to its partner, PECO, which was Exelon's predecessor for its nuclear power plants, including TMI-1, Oyster Creek and Clinton, to Exelon.

From 2015 through 2018 TMI failed to sell the power it generated at the PJM auction.

On May 30, 2017 TMI-1's owner, Exelon, announced plans to close the plant by September 2019. Constellation complained they couldn't compete in the market place. They were right. TMI-1 lost $300 million over eight years, and the free market closed the plant in 2019.

Three Mile Island Nuclear Station Unit 1 ceased operations on September 26, 2019.

Three Mile Island's permit to withdraw water expired in 2019. The case came before the Susquehanna River Basin Commission ("SRBC"). The SRBC's Order on December 15, 2022 means that TMI-1 no longer has access to enough water to operate a nuclear power plant. Water use at TMI is complicated by the fact that ownership is split between two separate licenses – Constellation and TMI-2 Solutions.

Exelon no longer owns nor operates Three Mile Island Unit-1. On February 24, 2021, Exelon Corporation announced that it intended to transfer 100% ownership of its subsidiary, Exelon Generation, LLC to a newly-created subsidiary that will then be spun-off, becoming Exelon Generation's new ultimate parent company. As a result of this transaction (the "Generation Spin Transaction"), Exelon Generation and its subsidiaries are now owned by Constellation.

Microsoft reportedly entered into an agreement with Constellation to buy all the electricity the 835-megawatt TMI Unit 1 would generate over 20 years.

The NRC said it "understands that Constellation Energy and TMI-2 Energy Solutions will continue to coordinate and review activities associated with TMI -1 restart through operations and TMI-2 decommissioning to determine if there will be potential impacts to their respective activities. NRC will also review these activities." The determination has not occurred, the NRC has no documents to review, and there is no formal agreement between the parties.

In the absence of impingement and entrainment data from Three Mile Island, the closed-cycle cooling system would not be considered BTA for entrainment and impingement.

III. Regional factors north of Three Mile Island.

A. Harrisburg is ten miles north of Three Mile Island.

The City of Harrisburg suffers from poverty with a median household income of roughly $32,000 and is largely comprised of communities of color, with over 75% of the population identifying as black, Hispanic, Latino or Asian. These residents and those who swim, fish, and otherwise recreate in these waters deserve a cleaner Susquehanna River free from raw sewage and unsafe bacteria levels that can cause illness or death.

The combined sewer overflow and discharges of sewage from Harrisburg's antiquated combined sewer and stormwater system are still impacting local water quality. In August 2023 a federal court accepted the modified partial consent decree that has new deadlines for plans to achieve compliance with the Clean Water Act. By December 2024, Capital Region Water must file a new Long Term Control Plan that will go into effect to eliminate combined sewer overflows into the Susquehanna River. (Source: Lower Susquehanna Riverkeeper Association.)

"The City of Harrisburg and Capital Region Water entered into a settlement agreement with the U.S. Environmental Protection Agency ("EPA") and the Pennsylvania Department of Environmental Protection ("DEP") to address Clean Water Act violations related to combined sewer overflows and polluted stormwater discharges. This settlement, filed in federal court, addresses issues with Harrisburg's combined sewer system, which frequently discharges raw sewage, industrial waste, and polluted stormwater into the Susquehanna River and Paxton Creek. The settlement does not impose civil penalties on the City due to its financial situation, but it requires Capital Region Water to take steps to improve the operation and maintenance of Harrisburg's wastewater system and implement long-term control plans." (Environmental Protection Agency, February 11, 2015).

B. The Harrisburg International Airport is located four miles north of Three Mile Island.

"In 1983, trichloroethylene ("TCE") and other volatile organic compounds ("VOCs") were discovered in six of the ten groundwater supply wells operated at the Harrisburg International Airport ("HIA") facility, then owned by Pennsylvania Department of Transportation ("Penn DOT"). In 1984, the Pennsylvania Department of Environmental Protection ("DEP") removed sludge and liquids in a waste collection building on the site, began closure of the fire training pits, and removed all contaminated materials from the location. The same year, the United States Air Force removed some waste drums from the Mead Heights area."

"In 1987, the EPA issued a Record of Decision ("ROD") documenting the selection of an interim remedy for the HIA water supply system consisting of the construction of a central treatment plant in conjunction with continued groundwater monitoring. These cleanup activities were implemented by the potentially responsible parties ("PRPs") and were considered an interim response pending supplemental investigation of the remainder of the site. Construction of the groundwater treatment system was completed in 1987 and is currently operational."

"Five disposal areas were identified as potential sources of groundwater contamination at the site and were investigated during the Remedial Investigation and Feasibility Study ("RI/FS") from 1988 through 1990. In December 1990, the Environmental Protection Agency issued a second ROD documenting the selection of the permanent remedy consisting of continued operation of the groundwater treatment system, land-use restrictions, and groundwater monitoring."

"In April 1992, EPA issued an Explanation of Significant Differences ("ESD") in response to Pennsylvania Department of Environmental Protection's concerns regarding the relationship between soil and groundwater contamination at the site. The ESD redesignated the 1990 ROD as an interim ROD and required additional investigations and studies to characterize soil and groundwater. The ESD also modified the existing institutional controls. Following the completion of an additional investigation and feasibility study, EPA issued a final l controls were sufficient to protect human health and the environment."

"In October 2023, EPA issued a second that modifies the Selected Remedy by changing the treatment system from the existing air stripper water treatment system to a Granular Activated Carbon ("GAC") water treatment system. This upgrade is to treat the groundwater for non-site related contaminants to standards set forth by the PA DEP Safe Drinking Water Program ("SDWP"). The system upgrade, financed by the current owner and operator, will still be protective of and effectively treat site-related contamination." (Source: Environmental Protection Agency.")

C. Wastewater infiltration located within ½ mile of public water supply

Middletown meets the criteria for an environmental justice community under Pennsylvania's definition, based on factors such as potential poverty levels and/or minority population, as well as its history of environmental challenges like flooding.

The Wastewater Treatment facility is located at 60 W Emaus St, Middletown, and its located within half a mile of Three Mile Island. Three Mile Island will be discharging within ½ mile from "environmental justice community." (Please refer to discussion under "Chemicals.")

Environmental Justice communities on the Susquehanna River face a disproportionate burden of environmental hazards, particularly along the Harrisburg-to-Steelton corridor. These communities, often redlined in the past, are now struggling with the impacts of climate change, including extreme floods and heat. These areas are experiencing the negative consequences of pollution from sources like urban runoff and combined sewer overflows. The release of additional toxics into an Environmental Justice communities is an unhealthy development.

The Environmental Justice scale does not account for mixed waste or highly radioactive wastes stored on Three Mile Island, and the flood risk appears to ignore the history of the Susquehanna River. The basin has experienced large-scale floods about every 15-20 years. "The Susquehanna basin is one of the nation's most flood-prone areas. Additionally, the main stem Susquehanna River is more prone to ice jams and subsequent flooding than any other river east of the Rocky Mountains." (Susquehanna River Basin Commission).

D. Weather.

Extreme weather events occur with more frequency including Tropical Storm Lee in 2011. Droughts have become more common in the Susquehanna River Basin

Earthquakes.

Pennsylvania hosts three of the 10 plants most vulnerable to damage from an earthquake — more than any other state.

In June, 2019 a 3.4 magnitude earthquake just north of Harrisburg occurred in June 2019. The epicenter was near Mifflintown.

Three Mile Island Generating Station in Londonderry Township said the 5.8 magnitude earthquake registered in Pennsylvania on August 23, 2011.

Lancaster County is known for the highest number of recorded earthquakes in the state, with 26 between 1752 and 2000. (The southern tip of TMI is located in northern Lancaster County.)

Floods.

Extreme weather events occur with more frequency for example, Tropical Storm Lee in 2011. Additionally, droughts have become more common in the Susquehanna River Basin.

The Susquehanna River Basin is flood prone. “Since record-keeping began 200 years ago, the Susquehanna River has proven one of the most flood-prone watersheds in the nation. The watershed encompasses 27,510 square miles and extends from New York to Pennsylvania to the Chesapeake Bay in Maryland – where nearly 4 million people live…Of the 1,400 communities in the river basin, 1,160 have residents who live in flood-prone areas.” (7th Annual Susquehanna River Symposium, Bucknell University, October 12-13, 2012).

“The Susquehanna River has a long and often turbulent history of flooding, with some of the most significant events occurring in the late 1800s and 1900s. The river has experienced major floods in years like 1865, 1889, 1894, 1936, 1972, 1996, and 2004. These floods have been caused by various factors, including heavy rainfall, snowmelt, and even the remnants of hurricanes.” (Susquehanna River Basin Commission.)

In September, 1975 heavy rains from Tropical Storm Eloise soaked the region with a record - for the date - 6.29 inches or rainfall, and continued to fall, saturating the Harrisburg area with 2.80. The old record the 1902 flood was eclipsed by record of 1.55 inches. The Susquehanna River crested at - at 23.8 feet - 6.8 feet above flood stage. The damage was not as bad as Agnes, but it was significant. The damage – at the time- was estimated at more than $150 million.

Hurricane Agnes in June, 1972 caused widespread and devastating flooding across the Susquehanna River basin and other areas, resulting in over $3.1 billion in damage and 122 deaths. The storm's impact extended to 12 states, with the majority of damage occurring in Pennsylvania.

Water shortage.

Water shortages on the Lower Susquehanna reached critical levels in the summer of 2002. For the month of August 2002, 66 of 67 Pennsylvania counties had below normal precipitation. On August 9th, 2002, Governor Schweiker extended the drought emergency for 14 counties across Southcentral and Southeast Pennsylvania. Precipitation deficits at or exceeding 10.0 inches were recorded in several counties, included Dauphin County. The greatest deficit of 14.6 inches was in Lancaster County, and departures from normal precipitation range included 0.0 inches in York County. Peach Bottom is located in Lancaster and York Counties while Three Mile Island is situated in Dauphin and Lancaster Counties. (Pennsylvania Department of Environmental Protection, Drought Report and Drought Conditions Summary, August-September, 2002).

Ten years later in April 2012, the Susquehanna River reached record seasonal lows matching drought conditions of 1910 and 1946. U.S. Geological Survey analysis showed stream flows at hydrological emergency levels in 42 of the state's 67 counties. Another 10 counties were at warning levels, and another 12 at watch level. The SRBC began issuing temporary orders to cease water withdrawals in February, 2012.

The Lower Susquehanna River is impacted by abnormal weather conditions. "…periods of drought or extended periods of low flow can adversely affect the ability of the dam to meet minimum flow and summertime pond level minimums. In addition, due to high ambient and water temperatures and low flow, maintaining the minimum dissolved oxygen requirement is also challenging. These situations can further be compounded if the flows coming into the pond as measured at the Marietta gage do not equal the flow outfalls. This not only affects the dam, but also the water supply companies and Peach Bottom Atomic Power Station due to the loss of pond level. Additionally, recreational boating and marina operation becomes severely hampered due to low water levels." ("Conowingo Pond Management Plan," Publication No. 242, June 2006, p. 71.)

Consumptive water users in the summer of 2002, except Peach Bottom, did not "conserve" water until the plant was forced to close to address a massive fish kill. On August 30, 2002, high differential pressures on the circulating water intake screens forced the manual shut down of Peach Bottom. "The problem was caused by a sudden surge in the amount of fish (Gizzard Shad) that entered the intake canal and clogged the screens. Unit 3 power was returned to 100 percent following cleaning of the circulating water screens and restarting of the 3'A' circulating water pump." (Nuclear Regulatory Commission, IR-50-277/02-05; 50-278/02- 05). Five years later in the summer of 2007, Peach Bottom-2 & 3 were detected returning water to the Susquehanna River at temperatures in excess of 110 degrees.

Communities and ecosystems that depend on limited water resources are adversely affected by "normal operating conditions" at nuclear stations. The Conowingo Pond also plays a critical role in Peach Bottom's water intake. Declining pond levels threaten Peach Bottom's cooling water intake, recreational use of the Conowingo pond, shore habitat levels, and downstream flows. As drought conditions continue, the operators continue to generate hydroelectricity as much as possible using the water available to them, but it becomes a secondary concern. The primary concern becomes the depletion of storage in the pond and safeguarding the ability of the pond to continue to make adequate releases during low flow events of extended duration." ("Conowingo Pond Management Plan," Publication No. 242 June 2006 p. 21.)

The Conowingo pond provides a mixed warm water recreational fishery for large mouth and small mouth bass, channel catfish, white crappie, bluegill, and to lesser degrees, striped bass, walleye and carp. The most abundant fish in the Conowingo pond is the gizzard shad. Bass fishing tournaments are commonplace during the open season. Steep, wooded slopes and railroad postings limit shoreline and boat access. The heated effluent from Peach Bottom Atomic Power Station attracts game fish during the winter and extends the open-water fishing season. ("Conowingo Pond Management Plan," Publication No. 242, June 2006, p. 13).

Water use and water consumption - as well as water supply and water chemistry - have direct and indirect relationships with safety related components, plant cooling, and are intimately connected to the health and safety of the Susquehanna River and the regional community.

On April 2, 2024, the US Government Accountability Office ("GAO") publicly released an extensive report, "Nuclear Power Plants Should Take Actions to Fully Consider the Potential Effects of Climate Change" (GAO-24-106326. The report thoroughly examined how climate change is expected to adversely affect nuclear power plants, and what actions the Nuclear Regulatory Commission has taken to address the risks to nuclear power plants. The GAO conducted extensive interviews with officials from the Department of Energy, the National Oceanic and Atmospheric Administration, and the Nuclear Regulatory Commissions. The GAO recommended that the NRC needed to do more than look at the reactor operation impacts on climate change: NRC needs to begin analyzing the adverse impacts climate change has on nuclear power plant operations.

IV. Re: Supplemental Information to Support TMI-1 2012 NPDES. (PA-0009920) Renewal Permit Applications.

The Supplemental TMI-1 NPDES (PA-0009920) Permit Renewal Application Resubmittal is deficient on its face. The Applicant needs to submit a recent site-specific study prepared after 2020. The data in the Supplemental NPDES submitted on March 7, 2025 is based on conjecture, speculation linked to extrapolation, and over reliant on Peach Bottom and York Haven Dam as surrogates. The data obtained from Peach Bottom's most recent Environmental Impact Statement has been rejected by the NRC. Constellation has been mandated to produce a new Environmental Impact Study with data obtained after 2020 for the relicensing of Peach Bottom Atomic Power Station ("PBAPS" or "Peach Bottom.").

The Rule does not prescribe BTA for entrainment; therefore, it must be determined on a site-specific basis. This submittal demonstrates that TMI-1 does not achieve BTA for entrainment but arrives at a hypothetical conclusion based on conjecture based on a heavy reliance on data from Peach Bottom and York Haven.

The other reference comparisons are older and smaller hydroelectric generating stations located downstream from Three Mile Island in Lancaster and York Counties. The Holtwood Dam, ("Holtwood"), the Safe Harbor Dam ("Safe Harbor"), and York Haven Dam ("York Haven") are located in Lancaster and York Counties. The dams are located in proximity to Peach Bottom with the exception of the Safe Harbor dam. The distance between the Conowingo Dam and TMI is 33 miles. (Peach Bottom is 12 from the Conowingo Dam.) The distance between the Holtwood Dam and TMI is 41.1 miles from TMI-1. (The distance from Peach Bottom is 9.6 miles.) The Safe Harbor Dam is 13 mile south of TMI. (Peach Bottom is 20.7 miles from Three Mile Island.)

The Holtwood Dam, also known as the Holtwood Hydroelectric Dam, is a dam on the Susquehanna River in Lancaster County, Pennsylvania. It's the oldest of the three major dams on the lower Susquehanna River and was constructed between 1905 and 1910 by the Pennsylvania Water & Power Company. The dam was originally built as a 55-foot ferry dam and began generating electricity through a powerhouse. The dam and its associated powerhouse are named after two Canadian investors, Sir Herbert Holt and Edward R. Wood, and it produces 252 mw compared to that of TMI-1 which has a capacity of 837 mw.

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York Haven Dam, built 100 years ago, generates less than 20 megawatts or% of the capacity of Three Mile Island. York Haven is located in another county, 2 miles north of the southern tip of Three Mile Island so it is not a suitable benchmark. The York Haven Dam was built in 1904, and is powered to generate 19.6 megawatts. Cube Hydro Partners purchased the hydroelectric station from York Haven Power in 2015. Cube was a portfolio company of Squared Capital. In 2019, Cube Hydro was purchased from Squared Capital by Ontario Power Generation ("OPG") The OPG merged Cube Hydro with another company that it acquired in 2018, forming Eagle Creek Renewable Energy. Ontario Power Generation's sole Shareholder - the Government of Ontario.

V. Renewal Permit Applications: Proposed Comments and Suggestions.

The NPDES Permit.

The current limited operations at the site are continuing under an administratively extended NPDES permit since a renewal application was initially submitted in 2012.

On January 15, 2025, Constellation submitted Supplemental Information to Support TMI-1 2012 NPDES (PA-0009920) Renewal to DEP—which was comprised of the two attachments included with this email. In response, DEP requested that Constellation submit an entire updated application package because a significant amount of time has elapsed since the original renewal application in 2012. This supplement includes the following:

"The 2012 NPDES Application Cross Reference Table lists the key elements of the 2024 application, and where in the 2012 application that information may be found. CWA 316(b) Information is extrapolated from other reference proxies. The current Module5 was not a part of the NPDES renewal application in 2012. Constellation (then Exelon) submitted a completed Module 5 in September, 2015."

"The attached Module 5 includes updates since 2015. Constellation is providing a narrative of TMI-1 utilizing Best Technology Available consistent with the 2014 CWA 316(b) rule for impingement mortality and entrainment compliance."

Use of some of the chemicals and additives started before 2007, before PA DEP implemented the current Toxics Management Spreadsheet or published the Approved List of Chemical Additives. As such, some of the chemicals used at TMI-1 are not on PA DEP's Approved List of Chemical Additives. Some others are on the list, but their allowable usage has not been established using Water Quality Based Effluent Limits ("WQBEL"). Constellation is therefore submitting two sets of forms:

a. New Chemical Additives Request Forms for chemicals previously approved for use at TMI-1 but not on PA DEP's Approved List of Chemicals.

b. Chemical Additives Usage Forms – for chemicals previously approved for use at TMI-1 and on PA DEP's Approved List of Chemical Additives, but whose usages have not been established with WQBEL calculations.

2024 to 2012 NPDES Application Information Cross Reference.

Table 1 Information Cross Reference 2012 NPDES Application and 2024 Industrial NPDES Permit Application (3800-PM-WFSR0008)

Chemical additives begin on p.20. Also, refer to discussion pollutants from pp. 64-68.

The following information was not required in the 2012 application: Report whether the facility is operated by operator(s) certified in compliance with the Water and Wastewater Systems Operators Certification Act (63 P.S. §§ 1001-1015.1)
(Re: Supplemental Information to Support TMI-1 2012 NPDES (PA0009920) Renewal Permit Application January 16, 2025.)

TMI-Alert's comments.

The original Environmental the Impact Statement ("EIS') was conducted in the early 1970s by the NRC's predecessor agency - the Atomic Energy Commission ("AEC"). TMI had been grandfathered into compliance prior to the enactment of the Commonwealth of Pennsylvania's aggressive statutes and regulations. Among the legislation passed were the Radiation Act (1984), Chesapeake Bay Commission Agreement Act (1985), Hazardous Site Cleanup Act (1988), Pennsylvania Environmental Stewardship and Water Protection Act (1999) and Act 129 (2008).

The initial EIS was issued decades prior to the emergence of the Environmental Protection Agency ("EPA") Section 316(b) of the Clean Water Act. EPA issued regulations on the design and operation of intake structures in order to minimize adverse environmental impacts, and promulgated regulations in 2001, 2003, 2006 and 2014. The requirements are included in the National Pollutant Discharge Elimination System ("NPDES") permit regulations, 40 CFR Parts 122 and 125 (Subparts I, J, and N).

The Clean Water Act ("CWA"), Section 401, Water Quality Certification ("WQC") on pp. 18-20, p. 90, p. 331, p. 406, p. 422, p.433, p. 443, p. 452, and p. 471.

MI-Alert's comment.

"The final rule became effective on September 11, 2020 or one year after Three Mile Island Unit-1 shut down. The license modification and transfer at Three Mile Island Unit-1 should include a documented waiver or other documentation from the Certifying Authority - either the Department of Environmental Protection ("DEP") or the Susquehanna River Basin Commission ("SRBC") stating that Section 401 Certification does/does not apply to the changes in license conditions at Three Mile Island."

"The rule was modified to address deficiencies in the nuclear oversight and regulatory omissions. The revised CWA rule specifically provides for state oversight as a safety valve to prevent pollution.

This rule was advertised, discussed, and publicized in full public view. Moreover, the EPA actively engaged with the Pennsylvania regulators regarding the rule modification prior to the rule becoming effective on September 11, 2020. The rule was designed to protect citizens who live and work around nuclear power plants from radioactive discharges. The Environmental Protection Agency intended to insulate local residents from the previous negligence of nuclear licensees and regulatory bodies."

The Federal Energy Regulatory Commission, the U.S. Army Corps of Engineers, and the Nuclear Regulatory Commission are partners with the Susquehanna River Basin Commission, and they all reviewed 316 (b). The Corps, which is a member of the SRBC, plays a pivotal role regarding water resource allocation at nuclear plants.

Pennsylvania established a certification protocol to ensure pollution does not become a routine feature of water use. In June 1980, the Susquehanna Valley Alliance filed a Complaint and Injunction with the Middle District Court in Harrisburg, Pennsylvania against the Nuclear Regulatory Commission and Metropolitan Edison. The injunction sought to prevent the owner and operator of Three Mile Island from dumping 700,000 gallons of radioactive water into the Susquehanna River

This supplement includes the following.

1. 2. And 3. The 2024 NPDES Application to 2012 NPDES Application Cross Reference Table – This table lists the key elements of the 2024 application and where in the 2012 application that information may be found.

TMI-Alert's comments.

Please provide an updated table completed post-2020.

"CWA 316(b) Information – The current Module 5 was not a part of the NPDES renewal application in 2012. Constellation (then Exelon) submitted a completed Module 5 in September 2015. The attached Module 5 includes updates since 2015. Constellation is providing a narrative of TMI-1 utilizing Best Technology Available consistent with the 2014 CWA 316(b) rule for impingement mortality and entrainment compliance."

TMI-Alert's comments: The Clean Water Act ("CWA"), Section 401, Water Quality Certification ("WQC").

The final rule became effective on September 11, 2020 or one year after Three Mile Island Unit-1 shut down. TMI-1's narrative is inherently flawed, and based on hydroelectric plants in Lancaster and York Counties. The Peach Bottom Atomic Power Station ("Peach Bottom") is a Boiling Water Reactor in York County. TMI is located in Dauphin County, and is a Pressurized Water Reactor ("PWR"). Peach Bottom is cooled with water from the Conowingo Pond, and TMI is cooled with water from the Susquehanna River.

Remedies.

A license modification at Three Mile Island Unit-1 should include a documented waiver or other documentation from the Certifying Authority - either the Department of Environmental Protection ("DEP") or the Susquehanna River Basin Commission, ("SRBC") stating that Section 401 Certification does/does not apply to the changes in license conditions at Three Mile Island.

The rule was modified to address deficiencies in the nuclear oversight and regulatory omissions. The revised CWA rule specifically provides for state oversight as a safety valve to prevent pollution. This rule was advertised, discussed, and publicized in full public view. Moreover, the EPA actively engaged with the Pennsylvania regulators regarding the rule modification prior to the rule becoming effective on September 11, 2020. The rule was designed to protect citizens who live and work around nuclear power plants from radioactive discharges. The Environmental Protection Agency intended to insulate local residents from the previous negligence of nuclear licensees and regulatory bodies.

Chemicals.

"The NPDES Application expands the 2012 NPDES Application Cross Reference Table. This table lists the key elements of the 2024 application, and where in the 2012 application that information may be found. CWA 316(b) Information, the current Module 5 was not a part of the NPDES renewal application in 2012. Constellation (then Exelon) submitted a completed Module 5 in September 2015."

"The attached Module 5 includes updates since 2015. Constellation is providing a narrative of TMI-1 utilizing Best Technology Available consistent with the 2014 CWA 316(b) rule for impingement mortality and entrainment compliance."

"All chemicals and additives used atTMI-1 have been approved by PA DEP (in a prior permit or by letter). Use of some of the chemicals and additives started before 2007, before PA DEP implemented the current Toxics Management Spreadsheet or published the Approved List of Chemical Additives. As such, some of the chemicals used at TMI-1 are not on PA DEP's Approved List of Chemical Additives. Some others are on the list, but their allowable usage has not been established using Water Quality Based Effluent Limits ("WQBEL"). Constellation is therefore submitting two sets of forms."

a. New Chemical Additives Request Forms – for chemicals previously approved for use at TMI-1 but not on PA DEP's Approved List of Chemical Additives.

b. Chemical Additives Usage Forms for chemicals previously approved for use at TMI-1 and on PA DEP's Approved List of Chemical Additives, but whose usages have not been established with WQBEL calculations.

TMI-Alert's comments.

The TMI chemical inventory in the attachments were reviewed for this "permit renewal application submittal to discharge industrial waste water" into ground water within ½ mile of a public water supply. The discharging is also within ½ mile from "environmental justice community."

"After reviewing measurements, most chemicals are simply not detectable after the dilution. Dilution happens readily with 500,000 gallons per minute, and drainage over 25,000 square miles."

• Sanitary waste, miscellaneous waste, industrial waste treatment system, chlorinator "floor drain" is continuous (24hr/7days weekly).

• Stormwater, industrial filter waste, secondary neutralizer tank, will be batch release intermittently. Biocides of 600 gal/day, "neutralizing agent" of 15,000 gal/day, Brominated biocide of 35 gal/day, Sulfuric acid 500 gal/day, are diluted enormously.

• Discharging within ½ mile from "environmental justice community," assumedly poor neighborhood

- 6.1 Waste water discharge
- 15.0 Waste water infiltration within ½ mile of public water supply
- 19.0 Treatment, storage, reuse, disposal waste.
- 25.0 Radiation source!
- P.23. Hypersperse MDC714?
- 10 gal/day Aluminum sulfate (Al neurotoxicant).
- Biocides Nalco 77352NA, HI50M, and 3D TRASAR 3DT198??
- P. 24/40 ControBRAM CB70 – biocide, 10, 820 allowable rate calculated; 35 gal/day.
- NALCO HI50M biocide 600 gal /day. (Biocide.)

• Cooling water intake structure – drainage is over 25,000 square miles.

• Hydrochloric acids are dangerous and fatal to fish. It can be lethal at concentrations as low as 25 mg/L. The toxicity stems from its low pH, which disrupts the delicate balance of the aquatic environment and can cause significant stress and damage to fish.
date.

• Hydrazine and biocides like Control Brom and NALCO are hazardous for human consumption.

• There 17 unapproved chemical additives, and seven without submission dates ("Renewal Permit Application, January 15, 2025, pp. 5-6.)

• The sampling protocol appears to be problematic, and contingent on frequency, and may miss spikes in releases.

• Perfluorooctanesulfonic acid ("PFBS").

• Perfluorobutanesulfonic acid ("PFBS").

•Hexafluoropropyline oxide ("HFPO-DA").

Perfluorooctanoic acid and perfluorooctanesulfonic acid ("PFOS)" are man-made chemicals that are part of a larger class of chemicals called per- and polyfluoroalkyl substances ("PFAS".) Perflorooctane sulfonic acid (Perfluorooctane Sulfonates, are persistent chemicals linked to various health challenges. Exposure has been associated with decreased immune response, thyroid dysfunction, changes in liver enzymes, and increased cholesterol levels. Some studies also suggest links between PFOA/PFOS and certain cancers, like kidney and testicular cancer.

The U.S. Environmental Protection Agency ("EPA") is issuing a lifetime drinking water health advisory (HA) for PFOS of 0.07 micrograms per liter (µg/L) based on a reference dose (RfD) derived from a developmental toxicity study in rats; the critical effect was decreased pup body weight following exposure during gestation and lactation. PFOS is known to be transmitted to the fetus in cord blood and to the newborn in breast milk. This lifetime HA is based on the latest health effects information for noncancer and cancer effects for PFOS as described in EPA's 2016 *Health Effects Support Document for Perfluorooctane Sulfonate (PFOS*), which was revised Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS), (EPA, May 2012.)

Perfluorooctanoic acid ("PFOA"), also known as C8, is a synthetic chemical used in various industrial and consumer products due to its ability to resist heat, water, oil, grease, and stains. PFOA is part of the per- and polyfluoroalkyl substances (PFAS) group, which are lab-made chemicals that don't easily break down. PFOA has been linked to various health effects and is a concern due to its persistence in the environment. PFOA is known for its persistence in the environment and its resistance to typical environmental degradation processes, leading to its accumulation in soil, water, and even air.

Perfluorooctanoic acid and perfluorooctanesulfonic acid ("PFOS)" are man-made chemicals that are part of a larger class of chemicals called per- and polyfluoroalkyl substances ("PFAS".) Perflorooctane sulfonic acid ("Perfluorooctane Sulfonate (PFOS), are persistent chemicals linked to various health challenges. Exposure has been associated with decreased immune response, thyroid dysfunction, changes in liver enzymes, and increased cholesterol levels. Some studies also suggest links between PFOA/PFOS and certain cancers, like kidney and testicular cancer.

Constellation's chemical inventory needs to comport with the Water Quality-Based Effluent Limitations.

Clean Water Act.

"Section 303(d) of the Clean Water Act ("CWA") establishes a process for states to identify waters within their boundaries where implementing technology-based controls is inadequate to achieve water quality standards. States establish a priority ranking of these waters and, for the priority waters, develop total maximum daily loads (TMDLs). A TMDL identifies the amount of a specific pollutant or property of a pollutant, from point, nonpoint, and natural background sources, including a margin of safety, that may be discharged to a water body and still ensure that the water body attains water quality standards. The allocations of pollutant loadings to point sources are called waste load allocations."

Remedies.

Constellation needs to conduct site-specific studies. Effluent limits in NPDES permits must be consistent with the assumptions used to derive the waste load allocations. Also, in the absence of a TMDL, permitting authorities still must assess the need for effluent limits based on water quality standards and, where necessary, develop appropriate waste load allocations and effluent limits. This analysis could be done for an entire watershed or separately for each individual discharge.

Entrainment: Best Technology Available.

Use of Closed-Cycle Cooling.

TMI-Alert's comments.

This statement does not account for the SRBC's policy on dry cooling. In 2024 the Susquehanna River Basin Commission instituted a new policy for new and existing facilities. Constellation must provide a dry cooling study.

(d) Project sponsors proposing new or significantly modified power generation.

The TMI-1 closed-cycle cooling system would not be considered BTA for entrainment at a new unit at an existing facility or for entrainment at a new facility. Therefore, the existing closed-cycle system at TMI-1 may not be determined to be BTA for entrainment, and must comport with the dry cooling policy of the Susquehanna River Basin Commission.

The Susquehanna Basin Commission adopted the addition of paragraph (d) to § 801.12 related to electric power generation facilities. This new paragraph memorializes and elevates the Use of Dry Cooling Technology for Power Generation and Other Facilities, Commission Resolution Number 2015-02 (Dry Cooling Resolution). The Dry Cooling Resolution has been instrumental in reducing the water consumption of new power plants in the basin. The Commission recognizes that an increasing number of power generation facilities, most recently combined cycle natural gas-powered plants, are utilizing dry cooling technology to reduce the environmental footprint in the basin, and are demonstrating overall efficiencies in operations that are equivalent to wet cooling processes. Dry cooling technology significantly reduces the water demand of such facilities and provides increased flexibility in siting facilities in proximity to fuel sources and electrical transmission lines. Use of dry cooling technology reduces impacts to aquatic ecosystems through the reduction of thermal impacts associated with large industrial volume discharges. The proposal would require consideration of dry cooling technologies for any new or significantly modified power generation facilities and an alternatives analysis to continue the consideration of water conservation technologies in an industry that is the largest consumptive user of water in the basin."

"If TMI-1 were to be classified as a new facility (under Phase 1) or as a new unit at an existing facility (under the 2014 Rule), it would be in compliance with the more stringent requirements stated at 40 CFR §125.84(c) and §125.94(e), respectively. Regulatory compliance requirements applicable to new units or new facilities are more stringent than those applicable to an existing unit or an existing facility. The TMI-1 closed-cycle cooling system would be considered BTA for entrainment at a new unit at an existing facility or for entrainment at a new facility. Therefore, the existing closed-cycle system at TMI-1 has not been determined to meet the BTA for entrainment."

TMI-Alert's comments.

The Rule does not prescribe BTA for entrainment; therefore, it must be determined on a site-specific basis. This submittal demonstrates that TMI-1 does not achieve BTA for entrainment but arrives at hypothetical conclusions based on a heavy reliance on data from Peach Bottom and York Haven.

The proxy plant is Peach Bottom. In the absence of site-specific studies, the reference plant is inadequate at a new facility. The TMI-1 closed-cycle cooling system would not be considered BTA for entrainment at a new unit at an existing facility or for entrainment.

Therefore, the existing closed-cycle system at TMI-1 is not BTA for entrainment, and must comport with the dry cooling policy of the Susquehanna River Basin Commission.

TMI Alert's additional comments. Constellation should conduct a site-specific analysis at Three Mile Island.

Constellation's dependence on data from Peach Bottom is fatal. The data is based on conjecture and speculation, and cannot be used as a surrogate. Peach Bottom is tethered to the Generic Environmental Impact Statement as prescribed by the NRC. The proposed Environmental Impact Statement for TMI-1's reference reactor has been voided. The data obtained from Peach Bottom's most recent Environmental Impact Statement has been rejected by the NRC. Constellation has been mandated to produce a new Environmental Impact Study with data obtained after 2020.

"On February 24, 2022, the NRC Commission issued three orders (CLI-22-02, CLI-22-03, and CLI-22-04) and Staff Requirements Memorandum, SECY-21-0066, "Rulemaking Plan for Renewing Nuclear Power Plant Operating Licenses – Environmental Review," that impact the subsequent license renewal of the following plants." North Anna, Units 1 and 2; Oconee Units, 1, 2, and 3; Peach Bottom, Units 3; Point Beach, Units 1 and 2; St. Lucie, Units, 1 and 2, and Turkey Point, Units 3 and 4."

2 Turkey Point is connected to Peach Bottom by virtue of the NRC rejection of their license extensions, and order for a site-specific Environmental Impact Statement. Turkey Point has experienced chronic water pollution. Florida and Power & Light also owned Three Mile Island Unit-1.

Florida Power & Light has operated the Turkey Point's twin nuclear reactors since 1972. giant e of super salty water has been located underneath the Turkey Point power plant for years, polluting the surrounding groundwater along the coast of south Miami-Dade County. FP&L has been on a ten-year timeline to clean up the pollution. At the halfway point, it's now clear that FP&L is not going to make that deadline.

The plume had spread far outside the boundaries of Turkey Point. It spread westward, toward South Florida's drinking water supply. The salty plume never got close enough to compromise any municipal freshwater wells, but it posed a potential continuing risk.

The "hypersaline plume" has migrated off site along with ammonia, phosphors and tritium all leaching into the bay. Miami-Dade County is now pushing the utility to change up its plan of attack on what is known as a "hypersaline plume" produced by the sprawling network of cooling canals created to cool the reactors but undetected for decades. ("Miami Waterkeeper," June 5, 2025.

TMI-Alert's suggestions:

TMI-1 should provide site-specific supporting data and information that the existing closed-cycle system at TMI-1 qualifies as the BTA for entrainment. The preamble to the 2014 Rule and in the Responses to Public Comments clarifies EPA's intent for considering closed-cycle cooling as BTA for entrainment. "Although this rule leaves the BTA entrainment determination to the Director, with the possible BTA decisions ranging from no additional controls to closed-cycle recirculating systems plus additional proceeding, will determine that facilities with properly operated closed-cycle recirculating systems do not require additional entrainment reduction control measures."

TMI-1's closed-cycle cooling system would not be considered BTA for entrainment at a new unit at an existing facility or for entrainment at a new facility. The Rule does not prescribe BTA for entrainment; therefore, it must be determined on a site-specific basis. This submittal demonstrates that TMI-1 does not achieve BTA for entrainment, but arrives at a hypothetical conclusion based on conjecture based on a heavy reliance on data from Peach Bottom and York Haven. The applicant's statements are incomplete. Please provide Three Mile Unit-1's current classification. Please provide the basis and supporting "site-specific data" requested by the EPA.

In February, 2022 the agency reversed a decision the agency made in 2019 to allow the Turkey Point nuclear plant in Florida to continue operating for another 20 years. The agency also rescinded its approval of a license extension for the Peach Bottom nuclear plant in Pennsylvania, an extension that was granted in 2020.

TMI Nuclear Station's NPDES Application Updates: January, 2025.

'The now-remanded Phase 2 rule provided exemption for facilities that withdrew less than 5 percent of the mean annual flow of the source waterbody. When TMI-1 design intake rate of 28,050 gpm ("40.4 MGD") is compared with the Susquehanna River flow rate from October 2004- September 2024, TMI-1 withdrawal rate is approximately 0.16 percent of the mean annual flow ("cfs").

"TMI-1 water withdrawal rate (make-up water, service water, and screen wash water) is less than 5 percent of the source waterbody flow. Considering the regulatory precedent with new facilities and new units, and uncontested provisions in the now remanded Phase 2 rule, use of closed-cycle cooling is BTA for entrainment compliance. As such, TMI-1 is BTA for entrainment."

Summary.

"Overall, impingement mortality and entrainment at the facility have been reduced to the maximum extent practicable; water withdrawal by TMI-1 is not expected to impact federally or state- protected species or their designated critical habitats. Constellation Energy therefore respectfully submits that TMI-1 is BTA for both impingement mortality and entrainment, and that no additional control measures to reduce impingement or entrainment mortality are warranted."

TMI-Alert's comments.

Constellation's conclusion is based on the reliance of one data point without considering other factors EPA weighs. "As Normandeau points out, the lowest river flows, and highest proportion of river withdrawn through the CWISs, occurs in August and September when the density of eggs and larvae is relatively low. At the same time, EPA's determination that entrainment of millions of eggs and larvae annually is an adverse environmental impact is not predicated on the fraction of the river withdrawn."

"… EPA has interpreted "minimize" to mean "reduce to the smallest amount, extent, or degree reasonably possible" in the context of § 316(b). 40 C.F.R. The Final Rule, at 40 C.F.R. § 125.98(f) (2) and (3), sets out a list of factors that the permitting authority must or may consider in establishing site- specific entrainment controls, which essentially provides a framework for determining whether a particular level of reduction is reasonable. *See also* AR-618 at 232-33.

> "Impingement and entrainment determinations are to be based on more than one data point. The de minimis designation is to be used sparingly. "Recall also that the *de minimis* provision is within a permitting authority's discretion to invoke in a particular instance and is not automatically applied in any case. Water Intake Structure withdraw less than 5% of mean annual flow. Again, if percentage of MAF were a threshold for concluding that the effects of the intake are *de minimis*, then most of the facilities subject to the Final Rule would be *de minimis*. Clearly this was not the intent, as EPA plainly states that it expects the *de minimis* provision to be "rarely used." AR-1697 at 25 n.4, 42 ("The final rule provides flexibility for the Director to decide not to require impingement controls where rates of impingement *are exceptionally low* as to be de minimis.") (emphasis added), ("EPA did not establish any metrics for what qualifies as 'exceptionally low' impingement rates, as the Agency intends for the *de minimis* provision to be infrequently used"); *see also* 40 CFR § 125.94(c)(11)

("*In limited circumstances*, rates of impingement may be so low at a facility that additional impingement controls may not be justified.") (emphasis added); AR-1718 at 12-3 ("EPA intends hat this provision would not be utilized often"). For all of these reasons, EPA does not find persuasive PSNH's comments justifying a *de minimis* finding based on the comparison of AIF and MAF at Merrimack Station.

"For the above reasons, EPA does not agree that impingement at Merrimack Station is *de minimis*. (3)

This flow figure does not occur in isolation, and the DEP needs to review TMI-1's application based on the multiple factors identified above by the EPA. flow rate needs to be recomputed to account for the TMI-1's proxy generating stations on the Lower Susquehanna River.

Constellation's study does not account for the coal-gas fired plant across from TMI. Three Mile Island's neighbor, Brunner Island contains three units with dual fuel switching capabilities allowing it to operate using coal or natural gas. The plant opened in 1961, and the combined capacity of the three units is 1,546 megawatts. Brunner Island is twice the size of TMI-1, and is set to cease burning coal by the end of 2028. The plant withdraws from the Susquehanna and later discharges up to 795 million gallons of once-through condenser cooling water each day [to the maximum] maximum extent practicable…"

Water use at Three Mile Island is regulated by the Susquehanna River Basin Commission ("the Commission" or "SRBC"). Three Mile Island Unit-1 was shut down in September of 2019, and its permission for water use expired in October of 2021. Since the core melt accident at Three Mile Island Unit-2 ("TMI-2"), that reactor has been permanently shut down. TMI-1 was approved to withdraw up to 100 million gallons per day (mgd) from the Susquehanna River and have a consumptive use of up to 19.200 mgd for electric generation processes.

TMI-1's preferred comparison plants on the Susquehanna River. Peach Bottom withdrawals 1.3 billion gallons per day. TMI-1 is heavily reliant on Peach Bottom comparisons, and cannot selectively exclude data that does not comport with Constellation's pre-conceived narrative,

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3 III. CWA § 316(b) Cooling Water Intake Structure Cooling," Page III-47 of III-22 and Page III-40 227-228, 2020.)

Peach Bottom and Three Mile Island require substantial amounts of water from the Susquehanna, and impact the river through their chemical and chlorine discharges, thermal pollution, and water withdrawals, leading to concerns about overall river's health, especially during periods of low flow. (4)

Based on the SRBC's Order on December 15, 2022, TMI-1 no longer has access to enough water to operate a nuclear power plant. Unit 2 has no rights to withdraw water. In addition, TMI-2 has no water infrastructure or intakes, and would have to construct a water line or install storage tanks for a water supply. Water use at Three Mile Island is complicated by the fact that ownership is split between two separate licenses.

Re: Pre-Existing Generic Fundings.1.2.2 Environmental Review.

"In December 1996, the staff revised the environmental protection regulations in 10 CFR Part 51 to facilitate environmental reviews for license renewal. The staff prepared a "Generic Environmental Impact Statemen for License Renewal of Nuclear Plants" (NUREG-1437) to document its evaluation of the possible environmental impacts associated with renewing licenses of nuclear power plants. For certain types of environmental impacts, the GEIS establishes generic findings that are applicable to all nuclear power plants. These generic findings are identified as Category 1 issues in 10 CFR Part 51, Subpart A, Appendix B."

"Pursuant to 10 CFR 51.53(c)(3)(i), an applicant for license renewal may incorporate these generic findings in its environmental report. Analyses of environmental impacts of license renewal that must be evaluated on a plant-specific basis are identified as Category 2 issues in 10 CFR Part 51, Subpart A, Appendix B. Such analyses must be included in an environmental report in accordance with 10 CFR 51.53(c)(3)(ii).

"…water withdrawal by TMI-1 is not expected to impact federally or state-protected species or their designated critical habitats. Constellation Energy therefore respectfully submits that TMI-1 is BTA for both impingement mortality and entrainment, and that no amount…"

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4 The full credit of 800 cfs for uncontrolled leakage was allowed under this scenario, but only when the elevation of the Conowingo pond dropped below a pre-defined critical stage (104.5 feet, Conowingo datum) due to extreme low flow conditions. That stage was selected because it is a reasonable indication of conditions at which continued operations at Peach Bottom and Muddy Run loses sustainability. Above that stage, no consideration was given for estimated leakage. Below that stage, the dam could count all 800 cfs of estimated leakage toward meeting the FERC-required minimum release. As in scenario No. 2, the credit for leakage was never available in April, May, or June, regardless of the pond elevation, out of concern for fish migration. (Ibid, p. 45.)

"Pursuant to 10 CFR 51.53(c)(3)(i), an applicant for license renewal may incorporate these generic findings in its environmental report. Analyses of environmental impacts of license renewal that must be evaluated on a plant-specific basis are identified as Category 2 issues in 10 CFR Part 51, Subpart A, Appendix B. Such analyses must be included in an environmental report in accordance with 10 CFR 51.53(c)(3)(ii).

"…water withdrawal by TMI-1 is not expected to impact federally or state-protected species or their designated critical habitats. Constellation Energy therefore respectfully submits that TMI-1 is BTA for both impingement mortality and entrainment, and that no amount…"

ΓMIA's comments.

There is no site-specific data or evidence to support the Constellation's conclusions. Please provide a dedicated study and recent as well as supporting evidence.

The data obtained from Peach Bottom's most recent Environmental Impact Statement has been rejected by the NRC. Constellation has been mandated to produce a new Environmental Impact Study. (5)

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5 "The U.S. Nuclear Regulatory Commission staff will prepare a supplement to NUREG–1437, 'Generic Environmental Impact Statement for License Renewal of Nuclear Plants," Supplement 10, Second Renewal, Regarding Subsequent License Renewal for Peach Bottom Atomic Power Station Units 2 and 3,' dated January 2020 (the final supplemental environmental impact statement ("SEIS') in order to complete its evaluation of the environmental impacts of the subsequent license renewal of Renewed Facility Operating License Nos. DPR–44 and DPR–56 for Peach Bottom Atomic Power Station (Peach Bottom), Units 2 and 3, respectively. The supplement will address new information since the issuance of the final SEIS. A draft of the supplement will be issued for public comment. (January 27, 2025.)"

"The U.S. Nuclear Regulatory Commission staff is issuing for public comment, 'Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 10, Second Renewal, Regarding Subsequent License Renewal for Peach Bottom Atomic Power Station Units 2 and 3, Supplement 1, Draft Report for Comment (NUREG-1437).' The draft supplement updates NUREG-1437, Supplement 10, Second Renewal, Final Report issued in January 2020. The supplement includes the NRC staff's evaluation of the environmental impacts of Peach Bottom subsequent license renewal including new information obtained since issuance of the 2020 report. (Nuclear Regulatory Commission May 22, 2025)."

Configuration of the Cooling Water Intakes.

Pages, 6 – 8.

TMI-Alert's comments:

Fish kills have been well documented. A former southern Lancaster County worker at the Peach Bottom nuclear plant said he was "sickened" by the large numbers of sport fish he saw sucked out of the Susquehanna. "When the water comes in, fish would swim in through tunnels and swim into wire baskets," said the man who lives in southern Lancaster County and asked that his name not be used. "There were hundreds and hundreds of fish killed each day. Stripers and bass and walleye and gizzard shad and all kinds of fish. It took a forklift to carry them out. "Every species in the river comes in there when they turn those big intakes on."

TMI has a similar system for disposing of the fish and other organisms that make it through the intake maze. "If they get that far, they're not going back," said Pete Ressler, a spokesman for TMI owner Exelon Nuclear. "They are dumped into a container and disposed of." ("Lancaster Intelligencer Journal," January 15, 2005)

Page 8. "…following the decommissioning of the Unit 2 reactor."

TMI-Alert's comments*:*

TMI-2 is not decommissioned.

TMI-1 closed on September 20, 2019. The following year Energy Solutions bought TMI-2 from First Energy in December, 2020. TMI-2 was removed from Post-Defueling Monitoring Storage in 2023, despite objections from TMI-Alert that the DTF was underfunded, and the cleanup plan was based on undocumented speculation. The completion of decommissioning of TMI-2 is scheduled for 2037, and Site Restoration is projected to be achieved by 2054 so that the damaged reactor would be placed in Post-Defueling Monitored Storage until the end of operations at TMI-1 in 2034. The plan was to decommission TMI-1 and TMI-2 at the same time.

18. TMIA's comments, (p.9)

"Identify all data requested by 40 CFR 122.21(r)(4)(ii) through (vi) that are not available and efforts made to identify sources of the data."

"Source water baseline biological characterization data were compiled from three main sources to prepare this report. The rationale for their inclusion is explained below. Ecological studies of the Susquehanna River near TMI-1 performed by RMC (1988, 1989, 1990, and 1991). Although these data are over 20 years old, they represent the most site-specific information available. More recent data available from nearby areas of the Susquehanna River were compared to assess if major changes have occurred in the waterbody. Since no substantial change in the fish population is evident, the historical site-specific data are likely still representative. Aquatic ecology studies of York Haven Pool performed in support of Susquehanna River Hydroelectric Projects licensing (FERC 2014), include the York Haven Hydroelectric Project FERC relicensing (FERC 2012) and fish passage studies at the York Haven Hydroelectric plant (Kleinschmidt Associates, 2022 and 2023). These studies provide more recent information) even if they are not site-specific."

Studies include.

• A 2007 angler survey from Fabridam at Sunbury, PA, to the Holtwood Dam at Holtwood, PA. Survey data collected for the "lower Susquehanna River geological strata" include Lake Frederic (Smucker et al. 2009).

• Fish passage data through the East Channel fishway during spring operations from 2000 through 2012 (FERC 2012).

• Mussel survey data conducted by York Haven Power Company, LLC (YHPC 2011) near the York Haven Dam in 2010. Upstream and Downstream Fish Passage study at the York Haven Hydroelectric Project (Kleinschmidt Associates, 2022 and 2023).

A literature search is not a valid substitute for a timely, dedicated study. The studies are over twenty-years old. There is no proof to substantiate the claim that data studies from different locations "are likely still representative."

"Impingement and entrainment studies performed at Peach Bottom Atomic Power Station (PBAPS), which is a nuclear power generating facility located on a downstream impoundment of the Susquehanna River (Normandeau and URS 2008; Normandeau 2013) Review of these studies focused on data collected in Lake Frederic or relative to passage of fish into Lake Frederic from Lake Clarke and found a somewhat similar species list as that prepared by RMC (1988, 1989, 1990, and 1991). Therefore, use of data from these nearby studies is representative of conditions at TMI-1. Cursory review of fishery data from the downstream areas suggests that the composition of the fish population is also similar. generating facility located on a downstream impoundment of the Susquehanna River (Normandeau and URS 2008; Normandeau 2013). In the absence of impingement or entrainment data for TMI-1, results of recent impingement or entrainment performed at PBAPS are useful to provide a list of species that could potentially be affected by TMI-1's cooling water system intake with some exceptions due to the three dams located between the two power stations (see Section 4.2 for further explanation). Few site- specific studies have been performed for TMI-1 because the station uses cooling towers which are part of closed-cycle recirculating systems as defined in 40 CFR 125.83."

"As explained above, a literature search was performed for additional information, particularly on reproduction and early life stages, to supplement the Susquehanna River aquatic studies. Impingement and entrainment data from a power station downstream of TMI-1 on the Susquehanna River were also used to augment the limited site-specific data available, References provided in Attachment E."

TMI-Alert's comments.

A literature search is not a valid substitute for a timely, dedicated study. The studies are over twenty-years old. There is no proof to substantiate the claim that data studies from different locations "are likely still representative."

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"Source water baseline biological characterization data were compiled from three main sources to prepare this report. The rationale for their inclusion is explained below. Ecological studies of the Susquehanna River near TMI-1 performed by RMC (1988, 1989, 1990, and 1991). Although these data are over 20 years old, they represent the most site-specific information available. More recent data available from nearby areas of the Susquehanna River were compared to assess if major changes have occurred in the waterbody. Since no substantial change in the fish population is evident, the historical site-specific data are likely still representative. Aquatic ecology studies of York Haven Pool performed in support of Susquehanna River Hydroelectric Projects licensing (FERC 2014), include the York Haven Hydroelectric Project FERC relicensing (FERC 2012) and fish passage studies at the York Haven Hydroelectric plant (Kleinschmidt Associates, 2022 and 2023). These studies provide more recent information) even if they are not site-specific."

TMI-Alert's comments.

The reference points are south of TMI.

Studies include.

• A 2007 angler survey from Fabridam at Sunbury, PA, to the Holtwood Dam at Holtwood, PA. Survey data collected for the "lower Susquehanna River geological strata" include Lake Frederic (Smucker et al. 2009).

• Fish passage data through the East Channel fishway during spring operations from 2000 through 2012 (FERC 2012).

• Mussel survey data conducted by York Haven Power Company, LLC (YHPC 2011) near the York Haven Dam in 2010.Upstream and Downstream Fish Passage study at the York Haven Hydroelectric Project (Kleinschmidt Associates, 2022 and 2023).

References.

FERC (Federal Energy Regulatory Commission). 2000. Environmental and Public Use Inspection Report. York Haven. Submitted
April 28, 2000.

FERC (Federal Energy Regulatory Commission). 2012. York Haven Hydroelectric Project, FERC Project No. 1888, Final License Application, Volume I, August 2012.

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Normandeau Associates Inc. and URS Corporation (Normandeau and URS). 2008. Detailed Characterization of the Aquatic Resources and Impingement Mortality at the Peach Bottom Atomic Power Station for Peach Bottom Atomic Power Station. Prepared for Exelon. October, 2008.

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TMI Alert's comments:

In the absence of impingement and entrainment data from Three Mile Island Unit-1, Constellation's referenced Peach Bottom twice, Susquehanna River Hydroelectric Projects was referenced twice, and York Haven was referenced four times. These are not suitable "augmented" comparisons in the absence of a site-specific study.

18. Identify all data requested by 40 CFR 122.21(r)(4)(ii) through (vi) that are not available and efforts made to identify sources. of the data. (Page, 9.)

"Source water baseline biological characterization data were compiled from three main sources to prepare this report. The rationale for their inclusion is explained below. Ecological studies of the Susquehanna River near TMI-1 performed by RMC (1988, 1989,1990, and 1991). Although these data are old, they represent the most site-specific information available. More recent data available from nearby areas of the Susquehanna River were compared to assess if major changes have occurred in the water body. Since no substantial change in the fish population is evident, the historical site-specific data are likely still representative. Aquatic ecology studies of York Haven Pool performed in support of Susquehanna River Hydroelectric Projects licensing (FERC 2014), include the York Haven Hydroelectric Project FERC relicensing (FERC 2012) and fish passage studies at the York Haven Hydroelectric plant (Kleinschmidt Associates, 2022 and 2023). These studies provide more recent information) even if they are not site-specific."

TMIA's comments:

A literature search is not a valid substitute for a timely, dedicated study. The studies are over twenty-years old. There is no proof to substantiate the claim that data studies from different locations "are likely still representative."

Source materials, page, 9.

• A 2007 angler survey from Fabridam at Sunbury, PA, to the Holtwood Dam at Holtwood, PA. Survey data collected for the "lower Susquehanna River geological strata" include Lake Frederic (Smucker et al. 2009).

• Fish passage data through the East Channel fishway during spring operations from 2000 through 2012 (FERC 2012).

• Mussel survey data conducted by York Haven Power Company, LLC (YHPC 2011) near the York Haven Dam in 2010. Upstream and Downstream Fish Passage study at the York Haven Hydroelectric Project (Kleinschmidt Associates, 2022 and 2023).

Review of these studies focused on data collected in Lake Frederic or relative to passage of fish into Lake Frederic from Lake Clarke and found a somewhat similar species list as that prepared by RMC (1988, 1989, 1990, and 1991). Therefore, use of data from these nearby studies is representative of conditions at TMI-1. Cursory review of fishery data from the downstream areas suggests that the composition of the fish population is also similar.

TMI-Alert's comments:

A "cursory review" is not a site-specific study, the Holtwood Dam is not a nuclear power plant, and Sunbury is not located on the lower Susquehanna River. Please note that Lake Fredric also includes Brunner Island and the York Haven Dam. The only references relating to TMI are from 1976 and 1981. The other two references relate to hydro facilities. Please provide more timely, site-specific reports. Theare additional incongruent reference points at the Peach Bottom Atomic Power Station and York Haven Dam.

The Holtwood Dam, also known as the Holtwood Hydroelectric Dam, is a located on the Susquehanna River in Lancaster County, Pennsylvania. It's the oldest of the three major dams on the lower Susquehanna River and was constructed between 1905 and 1910 by the Pennsylvania Water & Power Company. The dam was originally built as a 55-foot ferry dam and began generating electricity through a powerhouse. The dam and its associated powerhouse are named after two Canadian investors, Sir Herbert Holt and Edward R. Wood. liter

"The Peach Bottom Power Station consists of two General Electric boiling water reactors with three times the capacity of TMI. The Peach Bottom Atomic Power Station, located on the west bank of the Conowingo Pond in York County, Pennsylvania (see Figure I-2), is a two-unit nuclear generating facility that uses water from the Conowingo pond for cooling purposes. The two power units are boiling water reactors capable of generating 1,093 MW each. Both units began commercial operation in 1974. The station does not currently use evaporative cooling towers for cooling needs, but evaporates up to 28 mgd through heat transfer via once-through cooling with water withdrawn from Conowingo pond." (Ibid, 15.)

18. TMIA's comments.

"Identify all data requested by 40 CFR 122.21(r)(4)(ii) through (vi) that are not available and efforts made to identify sources of the data."

Speculation is not empirical or verifiable science.

Constellation is making a case based on "cursory suggestions," literature searches," and extrapolations from dissimilar plants with varying capacities and differing water cooling structures.

In the absence of impingement and entrainment data from Three Mile Island Unit-1, the NPDES Application must be rejected. Peach Bottom was used as a reference point from 2008 and 2013. Peach Bottom was reference once, the Susquehanna River Hydroelectric Projects were referenced twice, and York Haven was referenced four times. These are not suitable "augmented" comparisons in the absence of a site-specific study

Page 10. TMI-Alert's comments.

The term "may" which has been used four times should be replaced by "shall."

19. TMI-Alert's comments.

The reference points are from an EIS for Hydropower Licenses, and TMI study from 2007

p. 20 Proxy.

TMI-Alert's comments: Re: Peach Bottom withdrawals the Conowingo Pond.

Peach Bottom is allowed to withdraw up to 2.2 billion gallons of river water a day from the Conowingo, and not replace — mainly from evaporation — up to 35.5 million gallons daily. The power plant draws water from Conowingo Pond, an 8,500-acre reservoir formed by the Conowingo Dam on the Susquehanna River. Most of the reservoir is in southern Lancaster and York counties. The plant needs more water because it has been given permission from the Nuclear Regulatory Commission to increase power production at its two York County reactors by 12 percent.

Susquehanna River Boaters Association opposed the application in a letter to the Federal Energy Regulatory Commission ("FERC"). They argued that "allowing them access to increase their water usage will absolutely impact our environment and the accessibility for boaters and emergency rescue crews." The group said it has concerns despite Exelon agreeing to lessen the temperature of heated water before being poured back into the Susquehanna by running it through cooling towers in summer months.

The and Fish and Wildlife Service also submitted comments to the Federal Energy Regulatory Commission relating to Peach Bottom The federal agency said it had a "great concern" about how heated water discharged at the nuclear plant would affect migrating American shad, which the agency is trying to restore in the Susquehanna. (6)

A closed-cycle recirculating system where water is used again after cooling, rather than being placed back in the river. Less water would be withdrawn under such a system. The agency said Peach Bottom should be made to consider such a system — which is more expensive. Less water would be withdrawn under such a system. ("Lancaster News," September 25, 2015.) (Please refer to the discussion under Dry Cooling on pp. 25 -27.)

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6 "The agency said it has concerns despite Exelon agreeing to lessen the temperature of heated water before being poured back into the Susquehanna by running it through cooling towers in summer

TMI Alert's response:

Constellation should conduct a site-specific study for Three Mile Island. The dams are invalid reference points, and are located in proximity to Peach Bottom with the exception of the Safe Harbor Dam. This passage is misleading. The distance between the Conowingo Dam and TMI is 33 miles. (Peach Bottom is 12 from the Conowingo Dam.) The distance between the Holtwood Dam and TMI is 41.1 miles from TMI-1. (The distance from Peach Bottom is 9.6 miles.) The Safe Harbor Dam is 13 mile south of TMI. (Peach Bottom is 20.7 miles from Three Mile Island. None of the dams are "between" each other.

"Fish kills have become an acceptable part of nuclear generation at Peach Bottom. Millions of fish (game and consumable), fish eggs, shellfish and other organisms are sucked out of the Lower Susquehanna River and killed by nuclear power plants annually. It is hard to know just what the impact on fisheries is, because cool water intakes have been under the radar screen compared to some types of pollution, said Pennsylvania Fish and Boat Commission aquatics resources chief Leroy Young." (Ad Crable, "Intelligencer Journal," January 15, 2005).

“A former Peach Bottom nuclear plant employee said he was "sickened" by the large numbers of sport fish he saw sucked out of the Susquehanna. "When the water comes in, fish would swim in through tunnels and swim into wire baskets," said a man who lives in southern Lancaster County and who asked that his name not be used. "There were hundreds and hundreds of fish killed each day. Stripers and bass and walleye and gizzard shad and all kinds of fish. It took a forklift to carry them out. (“Intelligencer Journal,” January 15, 2005).

The heated effluent from Peach Bottom Atomic Power Station attracts game fish during the winter and extends the open-water fishing season. On August 30, 2002, a Unit-3, “power was reduced to approximately 90% prior to shut down the 3 ‘A’ recirculating water pump because of high differential pressures on the circulating water intake screens. The high differential pressures were caused by a sudden surge in the amount of fish (Gizzard Shad) that entered the intake canal and clogged the screens. Unit 3 power was returned to 100 percent following cleaning of the circulating water screens and restating of the 3’A’ circulating water pump.” (Inspection Report, #50-277/02-05; 50-278/02-05. (Nuclear Regulatory Commission.)

Page 10.

TMI-Alert’s comments.

Peach Bottom’s results are from Normandeau in 2013. References are limited to Peach Bottom and York Haven. (7)

Remedy:

More comprehensive testing can be conducted by “The Academy of Natural Sciences, Parrick Center for Environmental Research.” Please refer to the Susquehanna Electric Steam Station’s, “Safety Net Program/”

https://pubmed.ncbi.nlm.nih.gov/17293693/

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7 A plant built 100 years ago, generating less than 20 megawatts, and located in another county is not a suitable benchmark. The York Haven Dam was built in 1904, and is powered to generate 19.6 megawatts. Cube Hydro Partners purchased the hydroelectric station from York Haven Power in 2015. Cube was a portfolio company of Squared Capital. In 2019, Cube Hydro was purchased from Squared Capital by Ontario Power Generation. (“OPG”) The OPG merged Cube Hydro with another company that it acquired in 2018, forming Eagle Creek Renewable Energy. Ontario Power Generation's sole Shareholder - the Government of Ontario.

20. Identify the species and life stages that would be most susceptible to impingement and entrainment.

"Susceptibility to impingement or entrainment is dependent on a number of biotic and abiotic factors, as shown in Attachment E. Table 4-5. Site-specific studies have not been performed for TMI-1 to assess these factors. Nor have any impingement or entrainment characterization studies been conducted at the station. However, Peach Bottom Atomic Power Station (PBAPS) is a nuclear power generating facility subject to the 316(b) Rule, and is located 48 miles downstream from TMI-1 near the Conowingo Dam (Normandeau 2007). Much like TMI-1, PBAPS withdraws from an impoundment of the Lower Susquehanna River, and may impinge or entrain similar aquatic biota as TMI-1. One exception may be the presence of more migratory species near PBAPS due o its' proximity to the Chesapeake Bay. An impingement characterization study was conducted at PBAPS between August 2005 and November 2006 (Normandeau and URS 2008) and entrainment characterization was performed from March 8 through September 27, 2012 (Normandeau 2013). Although PBAPS has a once-through cooling water system, the impingement and entrainment occurring at its traveling water screens can provide a proxy to assess the species most susceptible to impingement and entrainment at TMI-1. See Attachment E Tables 4-6 and 4-7 for a list of species impinged and entrained at PBAPS."

"Gizzard shad was the most impinged species at PBAPS and likely to be impinged at TMI-1. In the Susquehanna River, gizzard shad populations have increased over time particularly since 2000 (FERC, 2014). The numbers of gizzard shad to pass through the York Haven Dam in 2013 (106,395) was the third highest since the opening of the fish passage in 2000 (FERC, 2014). Peak impingement at PBAPS was observed during the fall (Normandeau and URS, 2008). Young-of-year clupeids (including shad, alewife, and herring) migrate downstream in the fall (FERC. 2014) and peak impingement may be attributed to the movement of these smaller individuals."

"Available data indicate that gizzard shad is the most common fragile species to be found near the TMI-1 intake." (p.20)

"Channel catfish and bluegill, both common species found in the York Haven Pool, were the next most common species collected at PBAPS. Impingement events of channel catfish and bluegill may be attributed to high river flow, as King et al. (2010) found river flow is statistically significant to the impingement of channel catfish and bluegill at multiple facilities on the Ohio River. While survey data (RMC 1988, 1989, 1990, 1991) indicated cyprinids such as spottail shiner, spotfin shiner, and mimic shiner were abundant in the York Haven Pool near TMI-1 in 1990, high abundance does not necessarily indicate high rates of impingement (King et al. 2010). At PBAPS, cyprinids were not often impinged. Comely shiner, spotfin shiner, and spottail shiner only accounted for 0.12 percent of impingement at PBAPS (Normandeau and URS 2008).

TMI-Alert's comments.

Constellation has not provided impingement or entrainment rates at TMI even though the title to the passage was, "20. Identify the species and life stages that would be most susceptible to impingement and entrainment."

Constellation undermined their "minimal impact" argument.

> "The species most likely to have eggs entrained are broadcast spawners with semi-adhesive, non-demersal eggs (Normandeau 2013), such ascyprinids. Periods of high-water flow may cause significant disturbance and wash away larvae and eggs leading to entrainment of species not normally entrained. Availability of spawning habitat near the intake also affects entrainment rates at PBAPS (Normandeau 2013). No information on spawning habitat near TMI-1's intake was found."

The term "likely" needs to be supplanted with real and testable data, and conjecture relating to the correlation of "abundance" and "high rates of impingement" need to be documented and proven.

York Haven is not an appropriate proxy.

A plant built 100 years ago, generating less than 20 megawatts, and located in another county is not a suitable benchmark. The York Haven Dam was built in 1904, and is powered to generate 19.6 megawatts. Cube Hydro Partners purchased the hydroelectric station from York Haven Power in 2015. Cube was a portfolio company of Squared Capital. In 2019, Cube Hydro was purchased from Squared Capital by Ontario Power Generation. ("OPG") The OPG merged Cube Hydro with another company that it acquired in 2018, forming Eagle Creek Renewable Energy. Ontario Power Generation's sole Shareholder - the Government of Ontario.

20. References, (Page, 7.)

TMI-Alert's comments.

None of the reference points are in Dauphin County. They are located in York County. TMI-1 should produce a current and site-specific study.

Constellation needs to conduct site specific studies. The fourteen reference points included studies from Delaware, Florida, the Great Lakes, the Ohio River, a proposed hydroelectric plant, and the four studies at TMI were between 1987-1991, and one took place 18 years ago in 2007.

The Normandeau 2013 study found: "No information on spawning habitat near TMI-1's intake was found. Constellation will also need to undertake a spawning study.

The term "likely" needs to be supplanted with real and testable data, and conjecture relating to the correlation of "abundance" and "high rates of impingement" needs to be documented and proven.

22. Report data representative of the seasonal and daily activities of biological organisms in the vicinity of the CWISs.

TMIA's responses.

Re: Striped bass. A debate is not a conclusion.

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Re: "Gizzard shad is considered an open water species, usually residing at or near the surface year-round (Miller 1960). During spring spawning events, adults travel upstream through the York Haven fish passage into the York Haven Pool near TMI-1 (FERC 2014). A total of 106,395 individuals utilized the fish passage at York Haven in 2013 (FERC 2014). Juveniles tend to congregate in shallow water near shore mid-summer (Miller 1960). Populations tend to peak from late summer to early fall due to the inclusion of young-of-year (Miller 1960). Young-of-year shad illustrate schooling behavior, but begin to disperse in the fall (Miller 1960). Schooling behavior tends to cease after the shad reach 1 year old (Miller 1960.)

TMI-Alert's comments.

This analysis is based on a study from 1960, and observations at York Haven.

Blowdown System, p. 12.

The Blowdown System is provided to control the dissolved solids concentration in the circulating water. Approximately 0.5 to 1.2 percent of the total circulating water is let off continually as blowdown to control the solids build-up and to minimize scale formation in the system. Solids concentrations in the circulating cooling tower water are maintained between two and five times the river concentrations. Blowdown is measured in the flow and radiation monitor box, and discharged to the Susquehanna River. Based on flow records from January 2010 to December 2013, the average and maximum discharge rates to the river are 13,132 GPM (18.9 MGD) and 32,014 GPM (46.1 MGD), respectively.

TMI-Alert's comments.

Blowdown from the steam generators contains impurities that are removed by a demineralizer system before being recycled back into the feedwater system. Temperatures range from 527 to 608 degrees Fahrenheit, but it is unclear if TMI monitors for thermal pollution. This process helps to maintain water chemistry and prevent corrosion in the secondary loop. Hydrazine is used to prevent corrosion.

"Susceptibility to impingement or entrainment is dependent on a number of biotic and abiotic factors, as shown in Attachment E: Table 4-5. Site-specific studies have not been performed for TMI-1 to assess these factors. Nor have any impingement or entrainment characterization studies been conducted at the station."

"However, Peach Bottom Atomic Power Station (PBAPS) is a nuclear power generating facility subject to the 316(b) Rule, and is located 48 miles downstream from TMI-1 near the Conowingo Dam (Normandeau 2007). Much like TMI-1, PBAPS withdraws from an impoundment of the Lower Susquehanna River, and may impinge or entrain similar aquatic biota as TMI-1. One exception may be the presence of more migratory species near PBAPS due to its' proximity to the Chesapeake Bay. An impingement characterization study was conducted at PBAPS between August 2005 and November 2006 (Normandeau and URS 2008) and entrainment characterization was performed from March 8 through September 27, 2012 (Normandeau 2013). Although PBAPS has a once-through cooling water system, the impingement and entrainment occurring at its traveling water screens can provide a proxy to assess the species most susceptible to impingement and entrainment at TMI-1. See Attachment E Tables 4-6 and 4-7 for a list of species impinged and entrained at PBAPS."

TMIA's comments.

Peach Bottom is not Three Miles Island. A site-specific study is required especially regarding the impingement of gizzard shad at Three Mile Island. "Available data indicate that gizzard shad is the most common fragile species to be found near the TMI-1 intake."

21. Identify and evaluate the primary period of reproduction, larval recruitment, and period of peak abundance for relevant taxation.

22. Report data representative of the seasonal and daily activities of biological organisms in the vicinity of the CWISs.

"…Abundance of data representing seasonality are available for the York Haven Pool of the Susquehanna River from collections made from 1978 through 1990 using seines and electrofishing. Seasonal and diel variability in ichthyoplankton populations can be assessed by using entrainment data from PBAPS as a proxy. These data are summarized below and augmented with general seasonality and diel information from the literature."

TMI-Alert's Comments.

There is a paucity of data from TMI.

22. Report data representative of the seasonal and daily activities of biological organisms in the vicinity of the CWISs.

"Descriptions of migratory species are provided below to fulfill the requirement to discuss data representative of the seasonal activities of biological organisms in the vicinity of the CWIS. These species are not currently abundant in Lake Frederic and therefore not likely to be impinged at the CWIS.

TMIA's comments.

"The preferred flow is debated, as some authors state spawning area suitability increases with increased flow, while others argue that sustained minimum flows are necessary for suitable spawning. Those observed passing through the York Haven fish ladder may have been post spawning individuals, possibly chasing forage species, remaining in the Susquehanna."

TMIA's response.

The response is a "check the box" formality without any support data.

A debate is not a conclusion.

Page 14. Endangered species.

Page 16. Blowdown assessment.

TMI-Alert's Comments.

There is an absence of any discussion on the temperatures of the water.

"Three out of every four gallons of withdrawn evaporate water (consumptive use water) that will be initially drawn from the Susquehanna River will be returned to the river as blow down with four times more concentration of pollutants and minerals than when that water was withdrawn. In addition to concentrating contaminants and minerals that already existed in the river, the blow down contains biocides and algaecides used within the cooling towers to prevent them from becoming clogged with mold and mildew. Along with chemical contamination and highly concentrated minerals, the dirty blowdown water will be approximately 20 degrees hotter than the river water to which it is being returned." (8)

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8 Expert Witness Report of Arnold Gundersen, Re: Bell Bend Nuclear Power Plant Application for Groundwater Withdrawal Application for Consumptive Use, BNP-2009-073, Susquehanna River Basin Commission, January 5, 2010.

Page 17. Streamflow: SRBC"? Streamflow is based on Susquehanna River flow at the USGS Gage Station 01570500, Susquehanna River at Harrisburg, PA.

TMI-Alert's Comments.

The Susquehanna River between Harrisburg and Three Mile Island contains two dams, an incinerator, Steelton which is an Environmental Community Justice, wastewater treatment facility, and Swatara Creek merges with the river at Royalton. TMI will be discharging within ½ mile from "Environmental Justice" community.

Water of Pennsylvania.

Pages 44-45. Potential impacts. ("PDMI.")

The title to the beds of public waters is held in trust by the Commonwealth of Pennsylvania for the benefit of the public. In case of rivers and streams, the Commonwealth's ownership extends to ordinary low water mark, and the adjacent riparian landowner owns above the high-water mark.

p. 45 Game Commission: Meeting.

Valid for two years.

Pages. 49-51. TMI and York Haven water periods (Miller, 1960).

"Likely" and "tend" are not empirical terms.

In regards to diel activity, electrofishing results in the Platte River, Iowa, indicated higher numbers of gizzard shad at night during the summer and fall. (Yu and Peters 2003). This likely indicates that gizzard shad tend to reside higher in the water column at night. Gizzard shad spawning activity also only occurs during nighttime (Miller ,1960). The preferred flow is debated, as some authors state spawning area suitability increases with increased flow, while others argue that sustained minimum flows are necessary for suitable spawning. Those observed passing through the York Haven fish ladder may have been post spawning individuals, possibly chasing forage species, remaining in the Susquehanna until the early fall, when they return to the Chesapeake Bay or Atlantic Ocean. In data from 2000-2013 (excluding 2011 due to construction), an average of approximately eight striped bass per year have been recorded utilizing the fish passage at York Haven, (FERC 2014).

"American eel (SRAFRC 2010) – American eel reside within the Susquehanna River for most of its life, and migrate to the Sargasso Sea in the fall. Juvenile eels (elvers) migrate upstream between March and October, possibly continuing their upstream migration until they reach their sexual maturity. They are active at night and have the ability to crawl over low dams, and even travel over moist land."

"Gizzard shad – Gizzard shad is considered an open water species, usually residing at or near the surface year-round (Miller, 1960). During spring spawning events, adults travel upstream through the York Haven fish passage into the York Haven Pool near TMI-1 (FERC,2014). A total of 106,395 individuals utilized the fish passage at York Haven in 2013 (FERC, 2014). Juveniles tend to congregate in shallow water near shore mid-summer (Miller, 1960). Populations tend to peak from late summer to early fall due to the inclusion of young-of-year (Miller, 1960). Young-of-year shad illustrate schooling behavior, but begin to disperse in the fall (Miller 1960). Schooling behavior tends cease after the shad reach 1 year old (Miller 1960). et al. (2010) describes gizzard shad as an open water, pelagic species demonstrating a negative rheotaxic response to flow and sensitivity to low temperatures and drastic changes in water temperatures."

TMI Alert's comments.

A debate is not a conclusion, and Iowa is not Pennsylvania.

Supporting Tables, Figures and References for §122.21(r)(4)

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Wang, J.C.S and Kernehan, R.J. 1979. Fishes of the Delaware Estuaries: A Guide to Early Histories Life. EA Communications, Towson, MD. 1979.

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York Haven Power Company, LLC (YHPC). 2011. Assessment of Aquatic Resources in the Susquehanna River below the York Haven Project Dams Study Report, York Haven Hydroelectric Project, FERC Project No. 1888. *Cited in*: FERC (2012) as YHPC 2011c.

YHPC. 2012. York Haven Hydroelectric Project FERC Project No. 1888, Final License Application.

TMI Alert's comments:

There is only one reference that took place at TMI in 1994. There is a reference from Delaware (1979), Maryland (1979), six references from Ohio in 2006. Two references were from the York Haven Dam in 2011 and 2012.

Environment Emergency Response Plan. ("EERP").

Exelon Reference EN-TM-406-0001, Revision 5, Preparedness, Prevention, and Contingency (PPC) Plan for the Management and Prevention of Pollutant Releases to the Environment, August 2023

TMI-Alert's comments. It does seem odd that "this Plan is not intended to address the emergency response to incidents involving radioactive materials." (Last paragraph of first page before 1.1 starts) I assume that's because that's available in an entirely different document somewhere else?

Executive Summary.

2. Description of Facility.

TMI-Alert's comments.

The description provides data about the location but doesn't say how high above sea-level the island is. (First paragraph)

(Third paragraph) Use of term "minimized" in the last sentence is too general.

TMI-Alerts comments.

2.1: "Mixed waste spills" – not defined but may be defined in Hazardous Materials Off-Site Emergency Response Plan.

2.1 Same paragraph that starts with mixed waste spills last sentence – talks about "cooperative efforts of both the community and industrial planners in response to a hazardous material emergency at the facility.

TMIA's comments.

The Plan does not identify what agencies are involved and whether they rely on volunteers.

2.2 Material and Waste Inventory.

TMI-Alert's comments.

2nd paragraph.

"Under this program, required SDS are maintained onsite and available to all station employees." Where are they available?

TMIA. 4th paragraph.

"Residual and hazardous waste generation is tracked onsite by use of labels. The term labile is vague. How visible? Waterproof?

2.3 Pollution Incident History.

TMI-Alert's comments. "EERP will be updated periodically" -vague, any minimum time for updates? Station procedures require weekly inspections of station waste in the accumulation building (4.1.1.2) so maybe its covered?

And further Appendix E doesn't mention the need to track the resolution of the problem, not just how to prevent a recurrence.

3. Description of How Plan is Implemented by Organization.

TMI-Alert's comments. 1st paragraph "…training appropriate to their level of responsibility". That's fine but doesn't give examples or say anything else about what the training entails/how long it is/how often conducted etc.?

3.1 Organizational Structure of Facility for Implementation.

TMI-Alert's comments.

Last paragraph –Even though this is referring to on-site, doesn't mention any scenarios where local officials and downstream water users are to be notified.

3.2 List of Emergency Coordinators.

TMI-Alert's Comments.

Should be more specific of how these folks are notified when they are not required to have someone there 24/7. Some positions require 24/7, others are normal work hours so protocols should be spelled out if those folks are needed onsite.

4. Spill/Leak Prevention and Response.

TMI-Alert's comments.

4.1 2nd paragraph – Do you think 1 copy of the EDMS in the control room is enough if their on-line system is unavailable

What does the training of oil handlers consist of? Are all oil handlers trained?

4.1.1. Sources of Potential Spills/Leaks

TMI-Alert's comments.

Doesn't explain where appropriate employees can access these industry standards and doesn't articulate the pipe testing frequency or assessment process.

4.1.1.2 Other Above Group Oil Story Containers etc.

TMI-Alert's comments.

Equipment – "…station transformers will be visually inspected at an annual frequency." Doesn't seem very rigorous since "visually inspected" could mean anything especially since frequency is only yearly. Further, "significant liquid spills" is not defined nor does it address smaller spills in detail. No mention of how and when the dikes were last inspected (although there is some information as part of the NPDES permit so it may be covered there).

South TMI – Yard TMI-Alert's comments.

Drainage and Support Buildings.

No mention of what guidance they use to determine "sound soil erosion and sediment pollution control practices".

In the next section on 4.2 Material Compatibility they are more specific when it comes to having a "comprehensive chemical control program" so why not have the same for soil erosion and sediment pollution?

Also under 4.2 I would recommend river monitoring at the dike sight.

4.3 Inspection and Monitory Program.

TMI-Alert's comments.

Under paragraph that starts "other unregulated tanks" why can't they use sensing devices such as alarms etc. to detect bulk material storage containers instead of "periodically" simply visually testing?

4.6 Security.

TMI-Alert's comments.

Stand-alone sentence "adequate lighting". Vague.
Also do all essential service areas have diesel back up?

4.8 Employee Training Program.

TMI-Alert's comments.

5th paragraph "station personnel that respond to hazardous material spills are trained to the appropriate level in accordance with the applicable Constellation and Station Training procedures"

Not included here but may be in full document.

5.1 Countermeasures Undertaken by Facility.

TMI-Alert's comments.

1st paragraph – do they have a contractor in mind or when will they have an outside contractor for spill clean-up?

5.3 Internal and External Communications and Alarm Systems.

TMI-Alert's comments.

6th bullet on off-site warning system has no details except to reference the Emergency Plan

5.4 Evacuation Plan for Installation Personnel.

TMI-Alert's comments.

"Periodic drills" - vague.

5.5 Emergency Equipment Available for Response.

TMI-Alert's comments.

Paragraph number 2 and 3 – no mention of how often routine maintenance takes place

TMI-Alert's comments.

6.1 Arrangement with Local Emergency Response Agencies

TMI-Alert's comments.

Details are in the TMI Emergency Plan but not in this summary on training and contact verification updates.

6.2.2. Hazardous Waste Emergency Incent Reporting.

TMI-Alert's comments.

2. DEP should verify following an emergency incident.
The scale of the impacted area should be reported and some form of public notification may be needed.

6.2.3 Same as above. Notification of public and especially downstream users.

6.2.5 Who decides (Governor? PEMA) if public is notified?

6.2.6 NPDES Permit Requirement.

TMI-Alert's comments.

1. "If reasonably possible" downstream users must be notified. Need to have updated contacts and efficient system to contact them. Go beyond "reasonably possible." Someone should be available who can contact them. And under the bullet points: add a reliable company contact number or point person should be listed and shared with downstream users.

6.2.7 Federal SPCC Requirement.

TMI-Alert's comments.

Definition for "regional administrator". Point person should be available.

7. Stormwater Management Practices.

TMI-Alert's comments.

2nd paragraph Define "**routinely inspected"** of culvert areas.

3rd paragraph Is NGET training for **all** station staff?

4th paragraphDefine **"periodic** NPDES program.

7.4 Compliance Evaluations and Record Keeping.

TMI-Alert's comments.

NPDES stormwater compliance required inspections "at least annually."

Does Constellation simply meet the minimum NPDES requirement?
Last paragraph says NPDES Permit allow for an annual inspection in lieu of monitoring. Monitoring is better. Will Constellation conduct monitoring?

VI. Conclusion.

The Supplemental TMI-1 NPDES (PA-0009920) Permit Renewal Application Resubmittal is deficient on its face. The Applicant needs to submit a site-specific study prepared after 2020. There is no empirical or site-specific data available, therefore, the Supplemental NPDES is inconsistent with the 2014 CWA 316(b) rule for impingement mortality and entrainment compliance."

The Application is based on conjecture, dated material, and hypothetical observations from gas, coal and hydroelectric generating stations south of Three Mile Island. The NPDES is over reliant on the Peach Bottom Atomic Power Station as a baseline and reference plant. Peach Bottom is a boiling water reactor located 48 miles south of TMI. All the reference plants are located outside of Dauphin Count, and in many instances the studies are dated and conducted out of state.

The data obtained from Peach Bottom's most recent Environmental Impact Statement has been rejected by the NRC. Constellation has been mandated to produce an updated site-specific Environmental Impact Study with data obtained after 2020.

The Clean Water Act 316(b) does not prescribe the Best Technology Available ("BTA") for entrainment; therefore, it must be determined on a site-specific basis. This submittal demonstrates that TMI-1 does not achieve BTA for entrainment, but arrives at a hypothetical conclusion based on conjecture, and overly reliant on data from Peach Bottom and York Haven.

There is no proof that Module 5 demonstrated that Three Mie Island Unit-1's updates since 2015 serve as the Best Technology Available. Constellation is providing a narrative of TMI-1 utilizing Best Technology Available consistent with the 2014 CWA 316(b) rule for impingement mortality and entrainment compliance."