NPDES Permit No. IL0005037
Notice No. KPM:21051701.docx

Public Notice Beginning Date: **August 30, 2023**

Public Notice Ending Date: **September 28, 2023**

National Pollutant Discharge Elimination System (NPDES)
Permit Program

Draft Reissued NPDES Permit to Discharge into Waters of the State

Public Notice/Fact Sheet Issued By:

Illinois Environmental Protection Agency
Bureau of Water
Division of Water Pollution Control
Permit Section
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276
217/782-0610

Iowa Department of Natural Resources
Environmental Services Division
NPDES Section
Henry A. Wallace Building
900 East Grand Avenue
Des Moines, Iowa 50319

Name and Address of Discharger:

Constellation Energy Generation, LLC
4300 Winfield Road
Warrenville, Illinois 60555

Name and Address of Facility:

Constellation Energy Generation, LLC
Quad Cities Generating Station
22710 206th Avenue North
Cordova, Illinois 61242
(Rock Island County)

The Illinois Environmental Protection Agency (IEPA) has made a tentative determination to issue a NPDES permit to discharge into the waters of the state and has prepared a draft permit and associated fact sheet for the above named discharger. The Public Notice period will begin and end on the dates indicated in the heading of this Public Notice/Fact Sheet. The last day comments will be received will be on the Public Notice period ending date unless a commentor demonstrating the need for additional time requests an extension to this comment period and the request is granted by the IEPA. Interested persons are invited to submit written comments on the draft permit to the IEPA at the above address. Commentors shall provide his or her name and address and the nature of the issues proposed to be raised and the evidence proposed to be presented with regards to those issues. Commentors may include a request for public hearing. Persons submitting comments and/or requests for public hearing shall also send a copy of such comments or requests to the permit applicant. The NPDES permit and notice number(s) must appear on each comment page.

The application, engineer's review notes including load limit calculations, Public Notice/Fact Sheet, draft permit, comments received, and other documents are available for inspection and may be copied at the IEPA between 9:30 a.m. and 3:30 p.m. Monday through Friday when scheduled by the interested person.

If written comments or requests indicate a significant degree of public interest in the draft permit, the permitting authority may, at its discretion, hold a public hearing. Public notice will be given 45 days before any public hearing. Response to comments will be provided when the final permit is issued. For further information, please call Keegan MacDonna at 217/782-0610.

The applicant is engaged in the operation of Quad Cities Generation Station which is an existing nuclear fueled steam electric generating facility (SIC 4911). The facility consists of two boiling water nuclear reactors, each producing 2,957 MW power for a total Station output of 5,914 MW. Quad Cities Station withdraws water from the Mississippi River for condenser cooling and various service water uses. Plant operation results in an average discharge of 1085 MGD of open cycle diffusers from outfall 001/002, 0.054 MGD of wastewater treatment plant from internal outfall B01, and 0.056 MGD of radwaste treatment system blowdown from internal outfall A02. The facility previously discharged 0.005 MGD of sanitary waste treatment plant from outfall 003, but the sanitary waste treatment plant has closed and outfall 003 has been removed from the permit.

Application is made for existing discharges which are located in Rock Island County, Illinois. The following information identifies the discharge point, receiving stream and stream classifications:

Outfall	Receiving Stream	Latitude		Longitude		Stream Classification	Integrity Rating
001/002	Mississippi River	41° 43' 30"	North	90° 18' 45"	West	General Use	Not Rated

To assist you further in identifying the location of the discharge please see the attached map.

The stream segment, M-02, receiving the discharge from outfalls 001/002 is on the 2020/2022 303(d) list of impaired waters and is not a biologically significant stream on the 2008 Illinois Department of Natural Resources Publication – *Integrating Multiple Taxa in a Biological Stream Rating System*.

The following parameters have been identified as the pollutants causing impairment:

Potential Cause:	Designated Use:
Mercury and Polychlorinated Biphenyls	Fish Consumption, Aquatic Life, Public and Food Processing Water Supplies, Primary Contact Recreation, Secondary Contact, and Aesthetic Quality
Fecal Coliform	Primary Contact Use

Iowa IDNR classifies the Mississippi River as A1, B(WW-1) HH and Class C at the Davenport drinking water intake. The designations have been adopted in Iowa's state rule described in the rule referenced document of Surface Water Classification effective on December 2, 2010. Below you will find a list of the stream segments on the 2012 Iowa impaired waters listed 303(d) list applicable to the facility's discharge location.

Segment	Impaired Use	Pollutant	Year Impaired	TMDL Priority	Location Description
IA 03-SKM-0010_1	Aquatic Life	Aluminum	2006	Low	IA/MO line to confluence with Sugar Creek In S23 T67N R5W Lee County
		Cadmium	2010	Low	
	Drinking Water	Arsenic	2004	Low	
IA 01-NEM-0010_2	Aquatic Life	Aluminum	2006	Low	From Burlington water supply intake (Des Moines County) to confluence with Iowa Road (S36 T74N R2W Louisa County)
		Cadmium	2010	Low	
	Drinking Water	Arsenic	2006	Low	
IA 02-ICM-0010_2	Aquatic Life	Aluminum	2006	Low	From Lock and Dam 15 at Davenport (Scott County) to Lock and Dam 14 at Le Claire (Scott County) (= Pool 15) (Davenport water supply intake is located near river mile 484)
		Cadmium	2010	Low	
	Drinking Water	Arsenic	2004	Low	

The discharges from the facility shall be monitored and limited at all times as follows:

	LOAD LIMITS lbs/day DAF (DMF)			CONCENTRATION LIMITS mg/l		
PARAMETER	30 DAY AVERAGE	DAILY MAXIMUM	REGULATION	30 DAY AVERAGE	DAILY MAXIMUM	REGULATION
Outfall 001/002:						
Flow (MGD)						
pH				6 – 9 s.u.		35 IAC 304.125
Temperature						35 IAC 302.211, 35 IAC 303.331, 35 IAC 106, and 316(a) CWA
Total Residual Chlorine / Total Residual Oxidant					0.038*	40 CFR 125.3 and 35 IAC 302.208
Zinc (Total)				Monitor Only		
PFAS**				Report**		

	LOAD LIMITS lbs/day DAF (DMF)			CONCENTRATION LIMITS mg/l		
PARAMETER	30 DAY AVERAGE	DAILY MAXIMUM	REGULATION	30 DAY AVERAGE	DAILY MAXIMUM	REGULATION
Outfall B01:						
Flow (MGD)						
Total Suspended Solids	19	39	35 IAC 304.124	15	30	35 IAC 304.124
Oil and Grease	19	26	40 CFR 423(b)(3)	15	20	40 CFR 423(b)(3)
Outfall: A02						
Flow (MGD)						
Total Suspended Solids				15	30	35 IAC 304.124
Oil and Grease				15	20	40 CFR 423(b)(3)
Boron				Monitor only		

*See Special Condition 26.
**See page 8 of the Fact Sheet and Special Conditions 24 and 25 for details.

Outfall 003, which previously discharged treated wastewater from the Sanitary Waste Treatment Plant on-site has been removed from the permit, because the Sanitary Waste Treatment plant has been closed since June 2016.

Load Limit Calculations:

Outfall B01 load limit calculations for the following pollutant parameters were based on a design maximum flow of 0.155 MGD and using the formula of maximum flow (MGD) X concentration limit (mg/l) X 8.35 = the average or maximum load limit (lbs/day): Total Suspended Solids and Oil/Grease.

The following explain the conditions of the proposed permit:

The Special Conditions clarify flow monitoring and reporting, pH, monitoring location, TRC sampling requirements, monitoring Outfall 001 via Outfall 002, no effect on outcome of court case No. 2208-71 (U.S. District Court), 316(a) Alternate Thermal Effluent Limits, PCBs, complexed metal bearing wastestreams, additives, affirmative defense of upset, oil/water separators, discharge monitoring report submission, stormwater (BAT/BCT), boron monitoring, Crib House Floor Drain Sump discharge routing, 316(b) requirements, water quality standards, class K operator, 316(a) continuation requirements, re-opener, modified traveling screen and fish return system construction schedule, PFAS monitoring requirements, PFAS BMP requirements, and TRC compliance schedule.

Quad Cities Station utilizes a diffuser-pipe system to distribute its cooling water discharge across the river. The diffuser-pipe system consists of two 16’ diameter pipes buried in the river bed; the north pipe extends approx. 2000’ from the Illinois shoreline, the south pipe extends approx. 1600’ from the Illinois shoreline. Each diffuser pipe is fitted with 20 discharge risers of 36” diameter spaced at 19’ 8” in the deep portion of the river; and 5 discharge risers of 24” diameter spaced at 78’ 8” intervals in the shallow zone of the river.

The dividing line for Illinois and Iowa is recognized as the middle of the main navigable channel of the Mississippi River. At the point of the Mississippi River where the diffuser pipes are buried, the main navigation channel is closest to the Iowa shoreline. Using the center of the main navigation channel as the dividing line, the entire south diffuser pipe lies in Illinois waters. For the north diffuser pipe, all five 24” diffusers are in Illinois waters and two of the twenty 36” risers lie in Illinois waters. Approximately 60% of the water discharged from the station is discharged into Illinois waters and 40% discharged into Iowa waters.

The reissuance of this permit will include the continued approved usage of water treatment additives as identified in the permit application.

The facility does not have any PCB’s on-site. The last identified PCB transformer was removed on April 23, 2012.

Alternative Thermal Effluent Limitations under Clean Water Act, Section 316(a)

On November 23, 1971, the Pollution Control Board adopted the regulation currently found in 35 Ill. Adm. Code 303.331, which establishes more stringent temperature limits than those found in 35 Ill. Adm. Code 302.211(e) for the section of the Mississippi River located between the Wisconsin Border and the Rock River. Quad Cities Nuclear Power Station is located along this section of the Mississippi River, and 35 Ill. Adm. Code 303.331 was adopted in anticipation of the heated effluent specifically from this facility. The thermal effluent limitations included in 35 Ill. Adm. Code 303.331 are as follows:

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
°F	45	45	57	68	78	85	86	86	85	75	65	52

35 Ill. Adm. Code 303.331 also stipulates that the water temperature shall not exceed the above limits during more than 1% of the hours in the 12-month period ending with any month. Additionally, this regulation states that the water temperature shall not exceed the limits by more than 3°F at any time.

The facility conducted a demonstration pursuant to Section 316(a) of the CWA and this was approved by the Illinois Pollution Control Board in Order 14-123, dated September 18, 2014 and by the Iowa Department of Natural Resources by letter dated July 7, 2015, and the previous demonstration for the Quad Cities Nuclear Power Station in accordance with Section 316(a) of the Clean Water Act was approved by IEPA by letter dated July 28, 1981 and by the Iowa Department of Natural Resources (IDNR) by letter dated May 18, 1981. In accordance with 35 Ill. Adm. Code 106.1180, the facility has demonstrated that the nature of the thermal discharge has not changed and the alternative thermal effluent limitation granted by the Board has not caused appreciable harm to a balanced, indigenous population of shellfish, fish, and wildlife in Pool 14 of the Mississippi River. In the facility's renewal application, Constellation Energy Generation (formerly Exelon Generation Company, LLC) requested continuation of alternative thermal effluent limitations as follows:

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
°F	45	45	57	68	78	85	86	86	85	75	65	52

As shown above, the alternative thermal effluent limitations granted by the board did not change the maximum temperature limtis for the facility. However, the facility was granted alternative limits regarding total excursion hours and maximum excursion temperatures. Under the alternative limits, water temperature at representative locations in the main river shall not exceed the maximum limits by 3°F for no more than 219 hours (2.5%) per calendar year, except that during July, August, and September, the temperature standards may be exceeded by up to 5°F for no more than 131.4 hours of the 219 hour annual allotment. Temperatures and both sets of excursion hours shall be reported on the Discharge Monitoring Reports. (Main river temperatures are temperatures of those portions of the river essentially similar to and following the same thermal regime as the temperatures of the main flow of the river.) The maximum temperature rise above natural temperature must not exceed 5°F.

Cooling Water Intake Structure Requirements under Clean Water Act, Section 316(b)

Constellation Energy Generation, LLC's (formerly Exelon Generation Company, LLC) demonstration for the Quad Cities Nuclear Generating Station in accordance with Section 316(b) of the Clean Water Act was approved by IEPA by letter dated July 28, 1981 and by the Iowa Department of Natural Resources by letter dated May 18, 1981. Based on available information, the Agency has determined that the operation of the cooling water intake structure meets the equivalent of Best Technology Available (BTA) in accordance with 40 CFR 125.94(c) and (d), based on information available at the time of permit reissuance.

Intake Structure Description:

The cooling water intake structure at the facility includes an intake canal that is 235 ft. long, 180 ft. wide, and 12 ft. deep. A floating debris boom is located at the entrance to the intake canal on the eastern shore of the Mississippi River. The boom extends 33 in. below the surface of the water and prevents floating debris from entering the canal. The typical water level in the canal at the intake structure is at El. 572.0 ft. (all elevations cited are Mean Sea Level).

Located at the downstream end of the intake canal is the screenhouse structure, the opening of which is 172.5 ft. wide. The screenhouse is divided into six intake bays, 3 bays per unit. At the face of each bay is a trash rack, extending from an invert at El. 552.5 ft. to the top at El. 595.0 ft., to screen out large debris. These racks consist of 5 in. by .5 in. steel bars with 2.5 in. clear spacing between the bars. Curtain walls that extend down to El. 569.0 ft. are located downstream of the trash racks. There are stoplogs between the curtain walls and the trash racks to allow dewatering and isolation of the traveling water screen for maintenance.

Downstream of the trash racks, each bay slips into two screenbays. Each screenbay is equipped with a traveling water screen to keep

fish and debris out of the circulating water system. The traveling screens are 9 ft. downstream of the curtain walls and 45 ft. upstream of the circulating water pumps. Each of the twelve screens (two per intake bay) is 10 ft. wide with 3/8 in. (9.5 mm) mesh. Screens extend from the intake invert of El. 552.5 to above El. 595.

The screen can rotate at two speeds, 2.5 and 10 ft/min, and can be set to rotate manually or automatically. Under automatic operation, the screens will begin to rotate at 2.5 ft/min if a 4 in. pressure differential occurs and at 10 ft/min if a 6 in. differential occurs. When the screens are activated, the spray wash system turns on automatically. Each screen is cleaned via a high pressure spray providing 256 gpm at 100 psi. Illinois does not allow the return of fish or collected debris back to the water body from where it is collected. Therefore, fish and debris are collected in troughs on the front of the screens and washed to a collection basket. From there, fish and debris are trucked to a landfill for disposal.

The service water pumps draw water from the six main bays, while emergency service water pumps draw from the seventh bay that draws its water from one of the Unit 1 bays and one of the Unit 2 bays.

Each circulating water pump is rated at 157,000 gpm @ 36 ft. of head and 236 rpm. With all pumps operating, the total flow is approximately 2253 cfs. The reported velocity at the entrance to the intake canal under plant design flow is approximately 0.9 ft/sec. The calculated velocity is 0.7 ft/sec at the trash racks, 0.8 ft/sec under the curtain wall, and 0.9 ft/sec approaching the screens.
Modification from Original Design:

Operation of the Quad Cities Station commenced in January 1972 operating in open cycle mode from January 1972 until May 1974. Beginning in May 1974, the Station operated in partial open cycle mode with one unit discharging to the spray canal as it was being constructed and the other unit discharged to the river. On May 1, 1975, the spray canal was completed and both units discharged to it (closed cycle cooling) until August 2, 1979 when the NPDES permit was modified to permit partial open cycle cooling when the intake water temperature from the canal exceeded 93°F. The Station operated in this mode until January 1984 when it was permitted to operate in open cycle mode without restrictions other than annually conducting biological monitoring and meeting thermal discharge standards applicable to this reach of the Mississippi River.

Agency Discussion on Entrainment:

The Applicant has characterized rates of entrainment at QCGS in multiple years (1984, 1985, and 2017). Concerning entrainment sampling at the facility in 2017, a total of 4,778 organisms—encompassing 4,776 finfish distributed among 21 distinct taxa and two mollusks from one distinct taxon—were collected at Unit 1 and 2 intakes. Fingernail Clams comprised less than 1% of the total entrainment collection, with finfish at over 99.9%. A small number of fish eggs (252) collected, primarily in June, were considered nonviable (unfertilized or dead/decaying) and not contributive to future fish populations. The total number of fish collected in entrainment samples was 4,524, excluding nonviable eggs (see Table 9-1 of the Applicant's (r)(9) submittal report). Post yolk-sac and yolk-sac larvae finfish life stages comprised 86% and 10%, respectively, of the total organisms collected, whereas only juvenile Fingernail Clams were collected. Carps and minnows and carpsuckers larvae dominated the finfish, followed by Gizzard Shad, Yellow Perch, and Freshwater Drum. Only one species of mollusk, the Fingernail Clam, was found. No endangered or threatened species were collected. The projected number of fish and Fingernail Clams that would be entrained annually at Units 1 and 2 under the full flow scenario at QCGS is estimated to be 442,270,296. This total is comprised of 442,063,629 finfish and 206,667 Fingernail Clams. A review of diel densities of all taxa indicates densities were highest at night; late-night densities were identified as carpsucker yolk-sac larvae and carp and minnow post yolk-sac larvae. Densities of the post yolk-sac finfish life stage, which made up 86% of the total collected, did not vary greatly across the diel sampling periods, aside from the peak value in the night period. For yolk-sac larvae finfish life stage (10% of the total collected), daylight densities were highest followed by pre-dawn and night. Average densities for all taxa and life stages by month were also reviewed for seasonal and spatial trends. Fingernail Clams were collected in June only and at low densities.

Overall, the entrainment composition collected in 2017 is comparable to entrainment data collected in previous years (the 1970s and 1980s). The finfish component of the current study was consistent with the Hazelton Environmental Sciences, Inc. 1971-78 study, conducted at the QCGS on Pool 14, with cyprinids (carps and minnows), carp, and Freshwater Drum being the most abundant taxa collected. Freshwater Drum eggs were predominant in the 1970s, comprising 66 to 98% of all eggs collected from 1975 to 1978, whereas Freshwater Drum eggs comprised 100% of all eggs collected during the current study. The 2017 entrainment sampling results are also consistent with findings of the 1984-1985 Quad Cities Studies in which the majority (81%) of the eggs collected were Freshwater Drum, and the 1985 Study, in which cyprinids represented some of the most abundant larvae collected. The seasonal pattern of peak density of finfish was similar for all studies, with the highest densities occurring in late spring to summer (May, June, and July), a reflection of the similar species compositions. Comparisons of mollusk collections were not made, as the species were not assessed as part of the previous studies. The entrainment data collected in 2017 pairs well with earlier entrainment studies at the QCGS and the Quad Cities Long-Term Monitoring Program conducted since the early 1970s. There has been no discernable change in species composition or any significant alteration to the BIC in Pool 14 due to QCGS operations in the last five decades. The Applicant provided brief life history summaries for the most abundant taxa in the entrainment samples (Cyprinidae—Carps and Minnows; Carpsuckers—Carpiodes spp.; Yellow Perch; Freshwater Drum; and Gizzard Shad).

The Applicant has complied with the requirements of CFR 122.21(r)(4), (r)(7), and (r)(9) based on the information provided, including justification to make a site-specific BTA determination for entrainment. The potential "take" of relevant listed T&E species in the glochidia stage is possible through impingement of fish hosts (e.g., Freshwater Drum, Channel Catfish, and Bluegill—see Table 4-1 and 4-2 of the Applicant's (r)(4) submittal). However, the facility's further consultation with IDNR and USFWS, at Illinois EPA's recommendation, and both Agencies' response, dated March 10, 2022, suggest that such a form of "taking" is unlikely and difficult to quantify with the best science available. Consequent to that determination, the Applicant's ITA obtainment efforts, and commitment to Illinois EPA to meet BTA standards for impingement mortality through modified traveling screens and fish return within the next five (5) years, a minimal threat to the identified T&E mussel species from fish host impingement and glochidia take is envisaged from the facility's current operations.

The proposed determination for entrainment must be based on consideration of the following factors pursuant to 40 CFR 125.98(f)(2):

(i) Numbers and types of organisms entrained, including, specifically, the numbers and species (or lowest taxonomic classification possible) of Federally-listed, threatened and endangered species, and designated critical habitat (e.g., prey base);

Agency Consideration: The numbers and types of organisms entrained were evaluated by the Agency's Water Quality Standards Unit, and it was determined that there has been no discernable change in species composition or any significant alteration of wildlife in Pool 14 due to QCGS operations in the last five decades. Discussion of these organisms can be found in the last two paragraphs of page 5 and the first paragraph of page 6 of this Fact Sheet.

(ii) Impact of changes in particulate emissions or other pollutants associated with entrainment technologies;

Agency Consideration: The entrainment technology utilized at this facility has no impact on particulate emissions and has no effect on pollutants discharged under the NPDES Permit.

(iii) Land availability inasmuch as it relates to the feasibility of entrainment technology;

Agency Consideration: The intake structure that houses the entrainment technology used at the facility is large, due to the large volume of intake water required for plant operations. See pages 4 and 5 of this Fact Sheet for information about the dimensions of the intake structure. It is not feasible to implement entrainment technology that would utilize less space, as it would affect the intake's volumetric flow rate.

(iv) Remaining useful plant life;

Agency Consideration: The two units that generate electricity at QCGS have operating licenses from the U.S. Nuclear Regulatory Commission that do not expire until December 14, 2032 (License Nos. DPR-29 and DPR-30). Additionally, there is the potential that the facility may seek extension of these licenses within the next few years to further extend useful plant life.

(v) Quantified and qualitative social benefits and costs of available entrainment technologies when such information on both benefits and costs is of sufficient rigor to make a decision.

Agency Consideration: Replacement of the existing 3/8 in. (9.5 mm) coarse-mesh screens with 0.75 mm fine-mesh modified-Ristroph screens and a fish return system is deemed impractical due to the potential safety and reliability impacts resulting from increased through-screen velocity, reduction in operating margin of circulating pumps during low water level conditions, increased operations burden, and additional maintenance due to fouling and clogging. The use of fine-mesh screens would reduce production foregone by 21.1%, while introducing the safety concerns previously mentioned. A primary problem with fine-mesh technologies is conversion of entrainment gains into impingement losses, thereby providing little benefit to the actual fish, the fisheries community, and the public in the form of social costs. The facility's Entrainment Benefits Reduction Study found that conversion to fine-mesh screens would save $145,114 in social costs per year, which is outweighed by the value of energy production lost.

The proposed determination for entrainment may be based on consideration of the following factors pursuant to 40 CFR 125.98(f)(3):

(i) Entrainment impacts on the waterbody;

Agency Consideration: The facility's intake flow from the Mississippi River is approximately 2,253 cfs (1,212 MGD), with a discharge back to the river of approximately (1,085 MGD). Based on these values, approximately 127 million gallons of water are consumed by the facility per day and not returned to the river. The river itself has a 7Q10 flow of 13,760 cfs (7,405 MGD), so the facility consumes approximately 1.7 percent of the river's flow volume during 7Q10 conditions. This percentage is lower during average flow conditions in the Mississippi River. Use of an alternate entrainment technology would not impact the amount of cooling water necessary to operate the facility, so there is no impact on the Mississippi River itself that is caused directly by the entrainment technology used.

(ii) Thermal discharge impacts;

Agency Consideration: The entrainment technology used at the facility has no impact on the facility's thermal discharge, since the entrainment technology allows for intake cooling water flow rates sufficient to achieve adequate cooling to meet thermal effluent limits already established in the NPDES Permit.

(iii) Credit for reductions in flow associated with the retirement of units occurring within the ten years preceding October 14, 2014;

Agency Consideration: No units have been retired at this facility.

(iv) Impacts on the reliability of energy delivery within the immediate area;
Agency Consideration: The entrainment technology used at the facility allows for continuous water intake at flow rates necessary to operate the reactors and provide reliable energy delivery to the community.

(v) Impacts on water consumption; and

Agency Consideration: The entrainment technology used has no impact on the volume of water required for operation of the facility.

(vi) Availability of process water, gray water, waste water, reclaimed water, or other waters of appropriate quantity and quality for reuse as cooling water.

Agency Consideration: Given the large water intake volume required to operate the facility (approx. 1 million gallons per minute), there is no alternative source of water that the facility could feasibly use to meet cooling needs. As discussed on page 5 of this Fact Sheet, closed cycle-cooling is not feasible at this facility.

Based on the information provided by the facility, the Agency has determined that operation of the cooling water intake structure meets BTA for entrainment.

Proposed Modification to Intake Structure for 316(b) Compliance:

Constellation has chosen installation of modified traveling screens and a fish return system as the impingement mortality compliance alternative at Quad Cities Station, pursuant to 40 CFR 125.94(c)(5), to maintain compliance with Section 316(b) of the Clean Water Act. Constellation submitted a proposed planning and construction timeline to the Agency for modified screens and fish return system on October 3, 2022. The proposed timeline has been incorporated into the permit as Special Condition 22, with a quarterly reporting requirement to keep the Agency updated on the status of the project. Following commencement of operation of the proposed modified traveling screens and fish return system, the facility must complete an impingement technology performance optimization study pursuant to 40 CFR 122.21(r)(6)(i). The study must encompass two years of biological data collection and must include a complete description of the modified traveling screens and associated equipment, including the fish return system. Additionally, the study is also subject to the following requirements:

1. Collecting data no less frequently than monthly;
2. Biological data collection representative of the impingement and the impingement mortality at the intakes subject to this provision;
3. A taxonomic identification to the lowest taxon possible of all organisms collected;
4. The method in which naturally moribund organisms are identified and taken into account;
5. The method in which mortality due to holding times is taken into account;
6. If the facility entraps fish or shellfish, a count of entrapment, as defined at 40 CFR 125.92(j), as impingement mortality; and
7. The percent impingement mortality reflecting optimized operation of the modified traveling screen and all supporting calculations.

Consultation with the U.S. Fish and Wildlife Service:

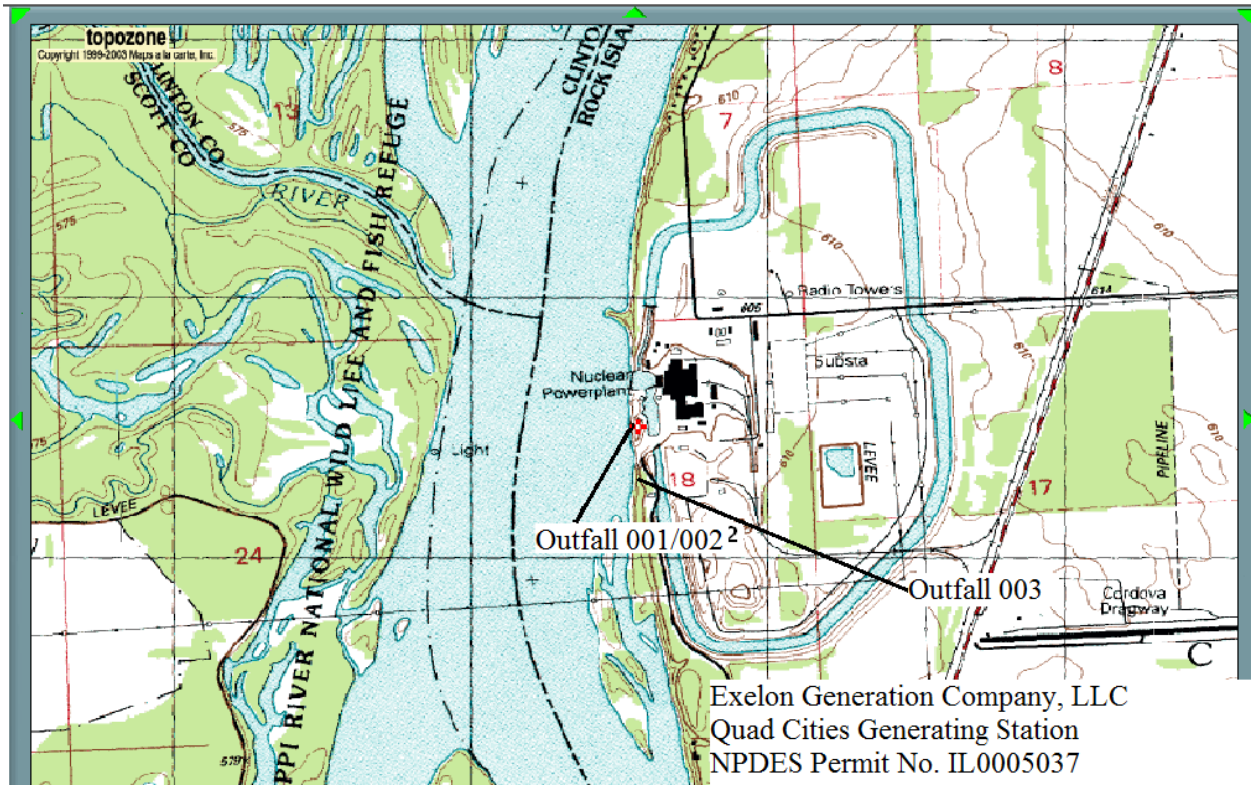
The Agency consulted with the IL-IA Ecological Services Field Office of the U.S. Fish and Wildlife Service on July 25, 2022 regarding operation of the cooling water intake structure at Quad Cities Station, pursuant to the requirements of 40 CFR 125.98(h). A copy of the permit renewal application and all supplemental materials was provided to U.S. FWS at that time, along with a copy of the draft Public

Notice/Fact Sheet and Draft NPDES Permit for 60-day review. They were also informed that the facility was planning to install traveling screens and a fish return system to the intake structure to be compliant with 316(b) impingement regulations. The Agency was contacted by U.S. FWS by email on December 15, 2022 regarding the findings of the review. In the email, U.S. FWS stated that their review showed that impacts to mussels within the vicinity of the intake are unlikely and that they do not have concerns with the proposed modifications to the intake structure in regards to federally threatened or endangered species.

PFAS Reduction Initiative Monitoring and Best Management Practices

The Agency has begun implementation of a PFAS Reduction Initiative to address concerns of PFAS contamination in Waters of the State. Under this initiative, new requirements have been implemented for facilities classified as major industrial facilities under the NPDES Permit program, as well as facilities with SIC codes for industrial activities known to be associated with the use of PFAS. Facilities subject to the PFAS Reduction Initiative will have new semiannual sampling requirements for PFAS compounds and will be required to develop Best Management Practices (BMPs) for minimization of PFAS. As a major facility, Quad Cities Generating Station is subject to the requirements of the PFAS Reduction Initiative.

A semiannual PFAS monitoring requirement has been added to the draft NPDES Permit for Outfalls 001/002. The parameters for the monitoring requirement are detailed in the new Special Condition 24, including a table of PFAS compounds for which the facility must analyze wastewater samples from the outfalls. Requirements for the facility to develop BMPs have been added to the draft permit in the new Special Condition 25.



Outfall 003, shown on the map above, has been removed from the permit.

NPDES Permit No. IL0005037

Illinois Environmental Protection Agency
Division of Water Pollution Control
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

Iowa Department of Natural Resources
NPDES Section
Henry A. Wallace Building
900 East Grand Avenue
Des Moines, Iowa 50319

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

Reissued (NPDES) Permit

Expiration Date:

Issue Date:
Effective Date:

Name and Address of Permittee:

Constellation Energy Generation, LLC
4300 Winfield Road
Warrenville, Illinois 60555

Facility Name and Address:

Constellation Energy Generation, LLC
Quad Cities Generating Station
22710 206th Avenue North
Cordova, Illinois 61242
(Rock Island County)

Discharge Number and Name:	
001/002	Open Cycle Diffusers
B01	Wastewater Treatment System
A02	Radwaste Treatment System Blowdown

Receiving Waters:

Mississippi River

In compliance with the provisions of the Illinois Environmental Protection Act, Title 35 of Ill. Adm. Code, Subtitle C and/or Subtitle D, Chapter 1, the Iowa Code Section 455B.174 and rule 567-64.3 of the Iowa Administrative Code, and the Clean Water Act (CWA), the above-named permittee is hereby authorized to discharge at the above location to the above-named receiving stream in accordance with the standard conditions and attachments herein.

Permittee is not authorized to discharge after the above expiration date. In order to receive authorization to discharge beyond the expiration date, the permittee shall submit the proper application as required by the Illinois Environmental Protection Agency (IEPA) not later than 180 days prior to the expiration date.

Darin E. LeCrone, P.E.
Manager, Permit Section
Division of Water Pollution Control

Wendy Hieb
Iowa Department of Natural Resources
NPDES Section
Environmental Services Division

DEL:KPM:21051701.docx

NPDES Permit No. IL0005037

Effluent Limitations and Monitoring

1. From the effective date of this permit until the expiration date, the effluent of the following discharges shall be monitored and limited at all times as follows:

	LOAD LIMITS lbs/day DAF (DMF)		CONCENTRATION LIMITS mg/l			
PARAMETER	30 DAY AVERAGE	DAILY MAXIMUM	30 DAY AVERAGE	DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall 001/002 – Open Cycle Diffusers* (Average Flow = 1085 MGD) The discharge consists of: 1. Main Condenser Cooling Water 2. House Service Water 3. Radwaste Treatment System Blowdown (Outfall A02) 4. Wastewater Treatment Plant (Outfall B01) 5. House Service Water Strainer Backwash 6. Intake Screen Backwash 7. Units 1 and 2 Oil/Water Separators (stormwater) 8. Fish Culture Facilities 9. Crib House Floor Drain Sump**						
Flow (MGD)	See Special Condition 1.				Daily	24-Hour Total
pH	See Special Condition 2.				1/Month	Grab
Temperature***	See Special Condition 7.				Daily	Continuous
Total Residual Chlorine / Total Residual Oxidant	See Special Condition 4.			0.038****	1/Month	Grab
Zinc (Total)*****			Monitor Only		1/Quarter	Grab
PFAS******	See Special Conditions 24 and 25.		Monitor Only		******	******

* - Outfall 001/002 consists of two open cycle diffusers which are side by side and discharge equally into the Mississippi River. See Special Condition 5.
** - This sub-waste stream is an alternative routing from Outfall B01. See Special Condition 16.
*** - Daily grab samples for Temperature are allowed when the Continuous Temperature Recorder is inoperable.
**** - See Special Condition 26.
***** - Quarterly sampling for zinc shall only be done when using the zinc-phosphate corrosion inhibitor.
****** - See Special Conditions 24 and 25.

NPDES Permit No. IL0005037

Effluent Limitations and Monitoring

1. From the effective date of this permit until the expiration date, the effluent of the following discharges shall be monitored and limited at all times as follows:

	LOAD LIMITS lbs/day DAF (DMF)		CONCENTRATION LIMITS mg/l			
PARAMETER	30 DAY AVERAGE	DAILY MAXIMUM	30 DAY AVERAGE	DAILY MAXIMUM	SAMPLE FREQUENCY	SAMPLE TYPE
Outfall B01 – Wastewater Treatment System* (DMF = 0.155 MGD)						
The discharge consists of:** 1. Crib House Floor Drain 2. Auxiliary Boiler Blowdown 3. Roof and Floor Drains 4. Portable Demineralizer Rinse Water						
Flow (MGD)	See Special Condition 1.				1/Month	24-Hour Total
Total Suspended Solids	19	39	15	30	1/Month	24-Hour Composite
Oil and Grease	19	26	15	20	1/Month	Grab

* - Wastewater treatment system effluent is routed through an oil/water separator prior to discharge.
** - The listed contributory waste stream all pass through an oil/water separator (Units ½ oil/water separator) prior to entering the wastewater treatment plant. The crib house floor drain sump water may be discharged directly to Outfalls 001/002 as an alternative route. See Special Condition 16.

Outfall A02 - Radwaste Treatment System Blowdown* (Average Flow = 0.056 MGD)						
The discharge consists of: 1. Laundry Wastewater 2. Floor Drains 3. Equipment Drains 4. Reactor Water 5. Filter Backwash from Reactor Cleanup 6. Filter Backwash from Condensate Demineralizers 7. Laboratory Wastewater 8. Groundwater						
Flow (MGD)	See Special Condition 1.				Daily	24-Hour Total
Total Suspended Solids			15	30	1/Month	Grab
Oil and Grease			15	20	2/Year	Grab
Boron	See Special Condition 15.		Monitor Only		1/Discharge Event**	Grab

* - The Permittee shall comply with the Nuclear Regulatory Commission, Title 10, regulations for discharge and monitoring of radioactive wastewater discharges. Wastewater is generally batch treated and recycled. Therefore the daily average discharge rate from Outfall A02 does not reflect influent flow rates.
** - When discharging sodium pentaborate.

Special Conditions

SPECIAL CONDITION 1. Flow shall be measured in units of Million Gallons per Day (MGD) and reported as a monthly average and a daily maximum on the Discharge Monitoring Report.

SPECIAL CONDITION 2. The pH shall be in the range 6.0 to 9.0. The monthly minimum and monthly maximum values shall be reported on the DMR form.

SPECIAL CONDITION 3. Samples taken in compliance with the effluent monitoring requirements shall be taken at a point representative of the discharge, but prior to entry into the receiving stream.

SPECIAL CONDITION 4. All samples for Total Residual Chlorine shall be analyzed by an applicable method contained in 40 CFR 136, equivalent in accuracy to low-level amperometric titration or other methods found in Standard Methods for Examination of Water and Wastewater, current edition. Any analytical variability of the method used shall be considered when determining the accuracy and precision of the results.

SPECIAL CONDITION 5. Compliance with discharge limitations for Outfall 001 shall be determined by representative sampling of Outfall 002. Due to the configuration of the discharge bay, which is immediately upstream of the two open cycle diffusers, the effluent from the discharge bay flows into the two open cycle diffuser pipes, which equally release the discharge into the Mississippi River.

SPECIAL CONDITION 6. Nothing in this permit affects or abrogates the responsibilities or commitments of the Permittee herein as set forth in the agreement entered into by the Permittee in the consolidated cases of Izaak Walton League of America, et. al. v. Schlesinger, No. 2208-71 and People of the State of Illinois, et. al. v. United States Atomic Energy Commission, No. 2208-71 (U.S. District Court, District of Columbia).

SPECIAL CONDITION 7. Constellation Energy Generation, LLC's demonstration for the Quad Cities Nuclear Generating Station in accordance with Section 316(a) of the CWA was approved by the Illinois Pollution Control Board in Order 14-123, dated September 18, 2014 and by the Iowa Department of Natural Resources by letter dated July 7, 2015, and the previous demonstration for the Quad Cities Nuclear Power Station in accordance with Section 316(a) of the Clean Water Act was approved by IEPA by letter dated July 28, 1981 and by the Iowa Department of Natural Resources by letter dated May 18, 1981, which resulted in the following thermal limitation.

Discharge of wastewater from this facility must not alone or in combination with other sources cause the receiving stream to violate the following thermal limitations at the edge of the mixing zone:

A. Maximum temperature rise above natural temperature must not exceed 5°F.

B. Water temperature at representative locations in the main river shall not exceed the maximum limits in the following table by 3°F for no more than 219 hours (2.5%) per calendar year, except that during July, August, and September, the temperature standards may be exceeded by up to 5°F for no more than 131.4 hours of the 219 hour annual allotment. Temperatures and both sets of excursion hours shall be reported on the Discharge Monitoring Reports. (Main river temperatures are temperatures of those portions of the river essentially similar to and following the same thermal regime as the temperatures of the main flow of the river.)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
°F	45	45	57	68	78	85	86	86	85	75	65	52

C. The area of diffusion of an effluent in the receiving water is a mixing zone, and that mixing zone shall not extend:

   i. Over more than 25 percent of the cross sectional area or volume of flow in the Mississippi River when river flow is 16,400 cubic feet per second or more, nor more than 34 percent of the cross sectional area or volume of flow in the Mississippi River when the river flow is less than 16,400 cubic feet per second.

   ii. More than 26 acres of the Mississippi River.

D. The permittee must assess the impact on aquatic life when the Station uses more than 219 excursion hours in any twelve-month period. The permittee must conduct this study the first time that more than 219 excursion hours are used in a twelve-month period. The results of this study must be made available to Illinois EPA, Illinois DNR, and Iowa DNR when the permittee applies for renewal of its NPDES permit.

E. The following data shall be collected and recorded:

   1. Weekly determination of the river flow rate (daily when the river flows fall below 23,000 cfs).

   2. Daily determination of the ambient river temperature (at or upstream of station intakes).

3. Daily recording of station discharge rate.

4. Daily continuous recording of the temperature of the station discharge.

5. Daily determination of station load.

6. As deemed necessary according to the above data, daily determination of the cross-sectional average temperature at the 500 foot downstream cross-section in the river.

F. Compliance with the thermal limitations of Special Condition 7 shall be demonstrated as follows:

1. When river flow is 21,000 cfs or greater and the ambient river temperature is 5°F or more lower than the monthly limiting temperatures, the temperature monitoring curve[1] establishes that the permittee is in compliance for all power generation levels;

2. When the river flow is less than 21,000 cfs and/or the ambient river temperature is within 5° F of the monthly limiting temperatures, the permittee shall demonstrate compliance using either:

   a. Plant load, river flow, ambient river temperature, and the temperature monitoring curve, or

   b. Field measurement[2] of the river cross-sectional average temperature taken 500 feet downstream of the diffusers.

In the event that compliance monitoring shows that the permittee has exceeded the monthly limiting temperature, the number of hours of such exceedance shall be reported on the permittee's Discharge Monitoring Report.

[1] The temperature monitoring curve identified as figure 2 in the December 2000 "Revised Temperature Monitoring Curve for Quad Cities Nuclear Generating Station".

[2] When conditions such as ice formation render the Mississippi River inaccessible to marine activity, the Permittee may demonstrate compliance with the thermal limitations of Special Condition 7 by using the most recent field measurement data collected at a river flow equal to or less than the flow for which field measurement data cannot be collected. The most recent field measurement data shall be normalized to the power production level for the day when the river was inaccessible.

G. The permittee shall notify within twenty-four hours via phone call and email Iowa DNR when excursion hours are utilized; provide daily email updates to Iowa DNR while excursion hours are utilized that include excursion hours utilized and intake, receiving water, discharge, and mixing zone water temperatures; notify Iowa DNR when normal conditions return; and submit documentation summarizing the emails to Iowa DNR within 30 days after normal conditions return. The Iowa DNR points of contact for conditions G – J will be:

Scott Gritters
Bellevue Fisheries Station
24143 Hwy 52
Bellevue, IA 52031
Phone #: 563-872-4976
Email: scott.gritters@dnr.iowa.gov

Ryan Hupfeld
Bellevue Fisheries Station
24143 Hwy 52
Bellevue, IA 52031
Phone #: 563-872-4976
Email: ryan.hupfeld@dnr.iowa.gov

H. During the months of July, August, and September if greater than 87.6 excursion hours (1% excursion hours) are utilized, the permittee will, in addition to the requirements of Condition (G) above, visually inspect intake and discharge areas at least three times daily to assess any mortality to fish and other aquatic life. If mortality to fish and other aquatic life is observed, the fish kill investigation plan and procedures previously developed will be utilized to estimate any losses to aquatic resources.

I. The permittee shall immediately notify Illinois EPA, Iowa DNR, and Illinois DNR of any unusual conditions via phone call and email, including mortality to fish or other aquatic life; immediately take action to remedy the problem; investigate and document the cause and seriousness of the unusual conditions while providing updates to Illinois EPA and Iowa DNR as changes occur until normal conditions return; notify the Iowa DNR when normal conditions return; and submit the documentation to Illinois EPA, Illinois DNR, and Iowa DNR within 30 days after normal conditions return.

J. In the event adverse environmental impacts due to thermal conditions resulting from thermal effluent are detected, the permittee shall develop and implement a response and recovery plan to address any adverse environmental impacts, including loss and damage to aquatic life. The plan shall be made available to Illinois EPA, Illinois DNR, and Iowa DNR upon request.

SPECIAL CONDITION 8. There shall be no discharge of polychlorinated biphenyl compounds from any discharge.

SPECIAL CONDITION 9. There shall be no discharge of complexed metal bearing wastestreams and associated rinses from chemical metal cleaning, unless this permit has been modified to include the new discharge.

SPECIAL CONDITION 10. This permit authorizes the use of water treatment additives that were requested as part of this renewal. The use of any new additives, or change in those previously approved by the Agencies, or if the permittee increases the feed rate or quantity of the additives used beyond what has been approved by the Agencies, the permittee shall request a modification of this permit in accordance with the Standard Condition - Attachment H.

The permittee shall submit to the Agencies on a yearly basis a report summarizing their efforts with water treatment suppliers to find a suitable alternative to phosphorus based additives.

SPECIAL CONDITION 11. A permittee who wishes to establish the affirmative defense of upset as defined in 40 CFR 122.41(n) shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: An upset occurred and that the permittee can identify the cause(s) of the upset; the permitted facility was at the time being properly operated; the permittee submitted notice of the upset as required in standard condition 12 of this permit; and the permittee complied with any remedial measures required in standard condition 4 of this permit.

SPECIAL CONDITION 12. Discharge is allowed from the Unit 1 oil/water separator and the Unit 2 oil/water separator in accordance with the Spill Prevention Control and Countermeasure Plan (SPCC). If an applicable effluent standard or water quality related effluent limitation is promulgated under Section 301 and 302 of the Clean Water Act (CWA) and that effluent or water quality standard or limitation is more stringent than any effluent or water quality limitations in this permit, or controls a pollutant not limited in this NPDES Permit, the Agencies shall revise or modify the permit in accordance with the promulgated standard and shall notify the permittee.

SPECIAL CONDITION 13. The Permittee shall record monitoring results on Discharge Monitoring Report (DMR) electronic forms using one such form for each outfall each month.

In the event that an outfall does not discharge during a monthly reporting period, the DMR Form shall be submitted with no discharge indicated.

The Permittee is required to submit electronic DMRs (NetDMRs) instead of mailing paper DMRs to the IEPA unless a waiver has been granted by the Agency. More information, including registration information for the NetDMR program, can be obtained on the IEPA website, https://www2.illinois.gov/epa/topics/water-quality/surface-water/netdmr/Pages/quick-answer-guide.aspx.

The completed Discharge Monitoring Report forms shall be submitted to IEPA no later than the 28th day of the following month, unless otherwise specified by the permitting authority.

Permittees that have been granted a waiver shall mail Discharge Monitoring Reports with an original signature to the IEPA at the following address:

Illinois Environmental Protection Agency
Division of Water Pollution Control
Attention: Compliance Assurance Section, Mail Code # 19
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

SPECIAL CONDITION 14. The Agency has determined that the effluent limitations in this permit constitute BAT/BCT for storm water which is treated in the existing treatment facilities for purposes of this permit reissuance, and no pollution prevention plan will be required for such storm water. In addition to the chemical specific monitoring required elsewhere in this permit, the permittee shall conduct an annual inspection of the facility site to identify areas contributing to a storm water discharge associated with industrial activity, and determine whether any facility modifications have occurred which result in previously-treated storm water discharges no longer receiving treatment. If any such discharges are identified the permittee shall request a modification of this permit within 30 days after the inspection. Records of the annual inspection shall be retained by the permittee for the term of this permit and be made available to the Agency on request.

SPECIAL CONDITION 15. The permittee shall monitor for boron during periods when Sodium Pentaborate is discharged as a result of tank testing and connection drainage from components in the radwaste treatment system. The effluent boron concentration in the subject discharge shall not cause the receiving stream to exceed the water quality standards in Section 302 of 35 Ill. Adm. Code, Chapter 1, Subtitle C. This permit may be modified to include effluent limitations or requirements which are consistent with applicable laws, regulations, or judicial orders. The Agency will public notice the permit modification.

SPECIAL CONDITION 16. Crib House Floor Drain Sump shall only be routed to the Outfall 001/002 Open Cycle Diffusers during periods when increased pump seal cooling water leakage is significant enough so as to overload the wastewater treatment plant or during maintenance activities. Alternate routing of this discharge shall not take place in lieu of proper maintenance and operation of the circulating pumps.

SPECIAL CONDITION 17. Constellation Energy Generation, LLC's demonstration for the Quad Cities Nuclear Generating Station in accordance with Section 316(b) of the Clean Water Act was approved by IEPA by letter dated July 28, 1981 and by the Iowa Department of Natural Resources by letter dated May 18, 1981. Based on available information, the Agency has determined that the operation of the cooling water intake structure meets the equivalent of Best Technology Available (BTA) in accordance with the provisions of 40 CFR 125.94(c) and (d), based on information available at the time of permit reissuance. The determination was based, in part, on the facility's proposal to install a modified traveling screen system and fish return system on the cooling water intake system, pursuant to the requirements of 40 CFR 125.94(c)(5). Additionally, based on these conclusions the following actions by the permittee are required:

A. The permittee shall monitor fish impingement year-round. Each year's data shall be tabulated and compared to historical fish impingement data for the same period with the results submitted to IEPA Compliance Assurance Section and Iowa Department of Natural Resources by July 28, each year.

Iowa Department of Natural Resources
Attn. Fisheries Management Biologist
Bellevue Research Station
24143 Hwy 52
Bellevue, Iowa 52031

B. The permittee shall perform a visual or remote inspection of the intake structure once per week during the period when the intake structure is in operation, to ensure that impingement technologies are maintained and operated to function as designed. The permittee shall maintain a log of the inspections to be submitted to IEPA and Iowa DNR along with the annual impingement data each year as outlined in Section A of this condition.

C. The permittee shall submit an annual certification statement signed by the responsible corporate officer as defined in 40 CFR 122.22, pursuant to the requirements of 40 CFR 125.97(c). The certification statement shall be submitted to IEPA and Iowa DNR along with the annual impingement data each year as outlined in Section A of this condition.

D. The permittee shall maintain all records supporting IEPA's Determination of BTA for Entrainment under 40 CFR 125.98(f) or (g) until such time as IEPA revises the Determination of BTA for Entrainment in this permit, pursuant to 40 CFR 125.97(f).

E. Entrainment Monitoring and Remote Monitoring

1. The permittee shall collect monthly samples over a 24-hour period to determine entrainment rates during the primary period of reproduction, larval recruitment and peak abundance for each species identified in the Entrainment Characterization Study submitted to the Agency on March 6, 2017. For the purpose of this permit, the primary period for reproduction, larval recruitment and peak abundance will be the months of April through June.

2. Remote monitoring shall be utilized year-round as part of an operation and maintenance program to ensure that the cooling water intake structure screens are functioning as designed. The remote monitoring shall consist of monitoring the flow of water from the intake bays through the modified traveling screens on a continuous basis. Remote monitoring can also include alarm systems on the head loss measuring device for the screens.

3. Entrainment monitoring and remote monitoring required under this condition shall begin following commencement of operation of the modified traveling screens and fish return system.

4. In the event that the intake structure does not operate, no monitoring is required. This shall be identified in the annual report required under Part F of this Special Condition.

F. Entrainment Reporting

The permittee shall prepare a report on an annual basis and submit the report by February 28th of the following year, for all cooling water intake structure monitoring required under Part E of this condition, occurring during the previous calendar year, to the address identified in Special Condition 13 and to Iowa DNR. The report is due the first year after modified traveling screens and fish return system commences operation. The facility shall notify the Agency in writing after operation of the screens and fish return system commences. The report should contain the following information:

1. The results of biological monitoring for entrainment sampling shall be tabulated by species for each sampling event and compared to historical entrainment data for the same period.

2. The permittee shall identify the results of the remote monitoring. Flow monitoring shall be tabulated on a daily basis for each month for the flow of water from the intake bays through the modified traveling screens. A daily average flow for each month shall be provided. Additional remote monitoring shall be noted as deemed necessary.

3. The permittee shall include the dates when the intake structure was not operational.

Nothing in this permit authorizes take for the purposes of a facility's compliance with the Endangered Species Act.

This special condition does not relieve the permittee of the responsibility of complying with any other laws, regulations, or judicial orders issued pursuant to Section 316(b) of the Clean Water Act.

SPECIAL CONDITION 18. The effluent, alone or in combination with other sources, shall not cause a violation of any applicable water quality standard outlined in 35 Ill. Adm. Code 302.

SPECIAL CONDITION 19. The use or operation of this facility shall be by or under the supervision of a Certified Class K operator.

SPECIAL CONDITION 20. If the permittee intends to request the continuation of the 316(a) alternative thermal limits in its next reissued NPDES permit, the permittee shall submit the information necessary to comply with 35 Ill. Adm. Code 106.1180 as part of the application for renewal of this permit.

SPECIAL CONDITION 21. If an applicable effluent standard or limitation is promulgated under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the Clean Water Act and that effluent standard or limitation is more stringent than any effluent limitation in the permit or controls a pollutant not limited in the NPDES Permit, the Agency shall revise or modify the permit in accordance with the more stringent standard or prohibition and shall so notify the permittee.

SPECIAL CONDITION 22. To achieve compliance with the impingement mortality standards of Section 316(b) of the Clean Water Act, Constellation Energy Generation, LLC has proposed the installation of modified traveling screens and a fish return system at Quad Cities Generating Station pursuant to 40 CFR 125.94(c)(5). Planning and construction of the proposed systems shall take place based on the following proposed schedule:

Construction Schedule

Item	Completion Date
1. Provide a schedule of activities for the design and installation of the modified traveling screens	Within 90 days of effective date of this permit
2. Provide information regarding the selected screen type, manufacturer, and any significant construction activities required for modified screen system installation	Within 18 months of effective date of this permit
3. Provide a description of the fish return system, including the proposed return location from the system	Within 24 months of effective date of this permit
4. Provide a detailed schedule for modified traveling screen and fish return system installation	Within 36 months of effective date of this permit
5. Begin a 24-month impingement technology performance optimization study pursuant to the requirements of 40 CFR 122.21(r)(6)(i)	Within 120 days of commencement of operation of the modified traveling screen system and fish return system

Quarterly status reports of the construction project shall be submitted to the Agency at the address listed under Special Condition 13 until the modified traveling screen system and fish return system are both operational. A report containing the results of the impingement technology performance optimization study shall also be submitted to the Agency at the same address.

SPECIAL CONDITION 23. After the initial submission of the 40 CFR 122.21(r) permit application studies after October 14, 2014, the owner or operator of a facility may, in subsequent permit applications, request to reduce the information required, if conditions at

the facility and in the waterbody remain substantially unchanged since the previous application so long as the relevant previously submitted information remains representative of current source water, intake structure, cooling water system, and operating conditions. Any habitat designated as critical or species listed as threatened or endangered after issuance of the current permit whose range of habitat or designated critical habit includes waters where a facility intake is located constitutes potential for a substantial change that must be addressed by the owner/operator in subsequent permit applications, unless the facility received an exemption pursuant to 16 U.S.C. 1536(o) or a permit pursuant to 16 U.S.C. 1539(a) or there is no reasonable expectation of take. The owner or operator of a facility must submit its request for reduced cooling water intake structure and waterbody application information to IEPA and Iowa DNR at least two years and six months prior to the expiration of its NPDES permit. The owner or operator's request must identify each element in 40 CFR 122.21(r) that it determines has not substantially changed since the previous permit application and the basis for the determination. IEPA and Iowa DNR have the discretion to accept or reject any part of the request.

SPECIAL CONDITION 24.

1) PFAS Sample Frequency and Type of Sample.

Sampling Point	Sample Frequency	Sample Type	Report
Effluent	Quarterly**	Grab	ng/L

** Quarterly sampling – Testing done during the first quarter (January – March) must be reported on the April Electronic Discharge Monitoring Report (NetDMR), testing done in the second quarter (April – June) must be reported on the July NetDMR, testing done in the third quarter (July – September) must be reported on the October NetDMR, and testing done in the fourth quarter (October – December) must be reported on the January NetDMR.

2) Test results must be reported in nanograms per liter (ng/L) as a daily maximum concentration.

3) Monitoring for Per- and polyfluoroalkyl Substances (PFAS) shall be performed using USEPA 3rd draft test method 1633 or subsequent draft test method. Upon USEPA's final approval and incorporation under 40 CFR 136, the approved method shall be used for PFAS testing.

4) The Minimum Level (ML) of Detection identified in paragraph 5) of this Special Condition is based on the USEPA's 3rd Draft Method 1633, dated December 2022. The permittee shall use these minimum levels of detection until they are replaced by subsequent draft methods, or a final method is defined under 40 CFR 136. At that time of update the permittee shall use the revised minimum level of detection values as part of this permit.

5) If sampling results for PFAS are consistently below the minimum level (ML) of detection for two consecutive years using USEPA's latest draft method 1633, or the final test method 1633 once incorporated into 40 CFR 136, the permittee may request a reduction in testing frequency or the elimination of testing.

6) Specific PFAS constituents that must be analyzed for are listed in the following table:

Target Analyte Name	**Abbreviation**	**CAS Number**	**STORET**	**Minimum Level (ML) of Detection Aqueous (ng/L)**
Perfluoroalkyl carboxylic acids				
Perfluorobutanoic acid	PFBA	375-22-4	51522	2.0
Perfluoropentanoic acid	PFPeA	2706-90-3	51623	2.0
Perfluorohexanoic acid	PFHxA	307-24-4	51624	2.0
Perfluoroheptanoic acid	PFHpA	375-85-9	51625	2.0
Perfluorooctanoic acid	PFOA	335-67-1	51521	2.0
Perfluorononanoic acid	PFNA	375-95-1	51626	2.0
Perfluorodecanoic acid	PFDA	335-76-2	51627	2.0
Perfluoroundecanoic acid	PFUnA	2058-94-8	51628	2.0
Perfluorododecanoic acid	PFDoA	307-55-1	51629	2.0
Perfluorotridecanoic acid	PFTrDA	72629-94-8	51630	2.0

Perfluorotetradecanoic acid	PFTeDA	376-06-7	51631	2.0
Perfluoroalkyl sulfonic acids				
Acid Forms				
Perfluorobutanesulfonic acid	PFBS	375-73-5	52602	2.0
Perfluoropentansulfonic acid	PFPeS	2706-91-4	52610	2.0
Perfluorohexanesulfonic acid	PFHxS	355-46-4	52605	2.0
Perfluoroheptanesulfonic acid	PFHpS	375-92-8	52604	2.0
Perfluorooctanesulfonic acid	PFOS	1763-23-1	52606	2.0
Perfluorononanesulfonic acid	PFNS	68259-12-1	52611	2.0
Perfluorodecanesulfonic acid	PFDS	335-77-3	52603	2.0
Perfluorododecanesulfonic acid	PFDoS	79780-39-5	52632	2.0
Fluorotelomer sulfonic acids				
1H,1H, 2H, 2H-Perfluorohexane sulfonic acid	4:2FTS	757124-72-4	52605	5.0
1H,1H, 2H, 2H-Perfluorooctane sulfonic acid	6:2FTS	27619-97-2	62606	10
1H,1H, 2H, 2H-Perfluorodecane sulfonic acid	8:2FTS	39108-34-4	52603	10
Perfluorooctane sulfonamides				
Perfluorooctanesulfonamide	PFOSA	754-91-6	51525	2.0
N-methyl perfluorooctanesulfonamide	NMeFOSA	31506-32-8	52641	2.0
N-ethyl perfluorooctanesulfonamide	NEtFOSA	4151-50-2	52642	2.0
Perfluorooctane sulfonamidoacetic acids				
N-methyl perfluorooctanesulfonamidoacetic acid	NMeFOSAA	2355-31-9	51644	2.0
N-ethyl perfluorooctanesulfonamidoacetic acid	NEtFOSAA	2991-50-6	51643	2.0
Perfluorooctane sulfonamide ethanols				
N-methyl perfluorooctanesulfonamidoethanol	NMeFOSE	24448-09-7	51642	10
N-ethyl perfluorooctanesulfonamidoethanol	NEtFOSE	1691-99-2	51641	20
Per- and Polyfluoroether carboxylic acids				
Hexafluoropropylene oxide dimer acid	HFPO-DA	13252-13-6	52612	5.0
4,8-Dioxa-3H-perfluorononanoic acid	ADONA	919005-14-4	52636	5.0
Perfluoro-3-methoxypropanoic acid	PFMPA	377-73-1	PF002	2.0
Perfluoro-4-methoxybutanoic acid	PFMBA	863090-89-5	PF006	2.0
Nonafluoro-3,6-dioxaheptanoic acid	NFDHA	151772-58-6	52626	5.0
Ether sulfonic acids				
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	9Cl-PF3ONS	756426-58-1	PF003	5.0
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	763051-92-9	PF004	5.0
Perfluoro(2-ethoxyethane)sulfonic acid	PFEESA	113507-82-7	52629	2.0
Fluorotelomer carboxylic acids				
3-Perfluoropropyl propanoic acid	3:3FTCA	356-02-5	PF001	10
2H,2H,3H,3H-Perfluorooctanoic acid	5:3FTCA	914637-49-3	PF007	20
3-Perfluoroheptyl propanoic acid	7:3FTCA	812-70-4	PF005	20

SPECIAL CONDITION 25. PFAS Minimization Program

1) PFAS Reduction Initiative:

   a) Within 6 months from the effective date of the permit the Permittee shall develop and implement a PFAS reduction initiative. The reduction initiative must include Best Management Practices (BMPs).

   b) Best Management Practices (BMPs) must include an evaluation based on product substitution, reduction, or elimination of PFAS in discharges as detected by method 1633. When developing a BMP, the following should be considered, at a minimum:

      i) Evaluation of the potential for the industrial facility to use products containing PFAS or have knowledge or suspect wastewater being discharged under the NPDES permit to contain PFAS.

      ii) Evaluation of Pollution prevention/source reduction opportunities which may include:

         (1) Product elimination or substitution when a reasonable alternative to using PFAS is available in the industrial process,

         (2) Accidental discharge minimization by optimizing operations and good housekeeping practices,

         (3) Equipment decontamination or replacement (such as in metal finishing facilities) where PFAS products have historically been used to prevent discharge of legacy PFAS following the implementation of product substitution.

   c) BMP's for PFAS must be reevaluated in accordance with paragraph 1 b) of this Special Condition and updated on an annual basis. The reevaluated BMP's must include any updates made since the previous BMP was submitted.

   d) The Permittee is required to submit a PFAS reduction report annually to the Illinois Environmental Protection Agency at the address indicated under paragraph 2) of this Special Condition, with the first report due 12 months from the permit effective date. Subsequent annual reports shall be due 12 months following the previous report's due date.
   PFAS reduction reports must include the following information:

      i) The name, address, and NPDES permit number of the Permittee,

      ii) The current BMP for the facility. Reevaluated BMPs must also include all updates made since the previous BMP was submitted.

2) The Permittee shall submit the PFAS reduction reports identified under section 1) of this Special Condition electronically or in writing to the one of the following addresses:

   a) EPA.PrmtSpecCondtns@Illinois.gov, or

   b) Illinois Environmental Protection Agency
   Bureau of Water
   Compliance Assurance Section
   Mail Code #19
   1021 North Grand Avenue East
   Post Office Box 19276
   Springfield, Illinois 62794-9276

SPECIAL CONDITION 26. Compliance Schedule for Residual Chlorine Effluent Limitations

Compliance is required with the 0.038 mg/L daily maximum TRC/TRO effluent limit two years from the effective date of this Permit. From the effective date of this Permit until two years after the effective date of this Permit, the 0.05 mg/L daily maximum TRC/TRO effluent limit applies.

The Permittee shall achieve compliance with the final effluent limitations as specified in this Permit for Outfall 001/002 in accordance with the following compliance schedule:

Compliance Schedule

Item	Completion Date
1. Submit an interim progress report to the Agency	Within 6 months of effective date of this permit
2. Procure necessary equipment and submit a status report to the Agency	Within 12 months of effective date of this permit
3. Submit a status report to the Agency	Within 18 months of effective date of this permit
4. Achieve compliance with 0.038 mg/L TRC/TRO limit	Within 24 months of effective date of this permit

This Permit may be modified, with Public Notice, to include revised compliance dates set out in this Permit.

In addition, the IEPA may initiate a modification of the compliance schedule set out in this Permit at any time, to include other dates which are necessary to carry out the provisions of the Illinois Environmental Protection Act, the Federal Clean Water Act or regulations promulgated under those Acts. Public Notice of such modification and opportunity for public hearing shall be provided.

Reporting

The Permittee shall submit reports electronically to EPA.PrmtSpecCondtns@illinois.gov with “IL0005037 Special Condition 26” as the subject of the email no later than fourteen (14) days following the completion dates indicated for each lettered item in the compliance schedule, indicating, a) the date the item was completed, or b) that the item was not completed.