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JODY L. HOLTON, AICP
EXECUTIVE DIRECTOR

April 5, 2024
Ms. Kimberly Bose
Federal Energy Regulatory Commission (FERC)
888 First Street, NE
Washington, DC 20246

RE: Norristown Dam Hydroelectric Project
Initial Consultation Document Exemption Application

Dear Secretary Bose,

Montgomery County is pursuing a <10 MW Exemption from FERC for development of a small hydroelectric project which is proposed to be located at the Norristown Dam located on the Schuylkill River in Montgomery County, Pennsylvania. According to 18 CFR § 4.38, enclosed are the public and non-public versions of the Initial Consultation Document (ICD) for filing. The public version excludes exhibits F and G, as these contain Critical Energy Infrastructure Information (CEII).

In parallel with this filing, we are sending the ICD to the parties on the service list for Pennsylvania and publishing notice of the filing and the availability of the ICD in a newspaper that serves the area where the dam is located.

Please do not hesitate to contact Steve Amaral (samaral@verdantas.com or 508-829-6000 ext. 6415) who represents our consultant for this project, with any questions or concerns regarding the application submission.

Sincerely,

Signature

Jon Leshar
Environmental Planning Assistant Manager
Montgomery County Pennsylvania
P.O. Box 311
Norristown, PA 19404-0311
610-278-3773

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JODY L. HOLTON, AICP
EXECUTIVE DIRECTOR

Norristown Dam Hydroelectric Project

Initial Consultation Document

Submitted To:

The Federal Energy Regulatory Commission (FERC)

Submitted by:

Montgomery County Pennsylvania

April 2024





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1.0 Introductory Statement

The Norristown Dam has been identified by the United States Department of Energy's Oak Ridge National Laboratory as an existing unpowered dam with small hydropower development potential. Hydropower is considered one of the most cost-effective renewable energies and, after assessing the feasibility of hydropower at the site, Montgomery County, the owner of the Norristown Dam, has decided to pursue an exemption from licensing for the installation and operation of hydroelectric generating facilities at the dam.

Montgomery County applies to the Federal Energy Regulatory Commission (FERC) for an exemption from licensing under the Federal Power Act for a small hydroelectric power project at the Norristown Dam, that will have an installed capacity of 10 megawatts or less. Pursuant to section 30 of the Federal Power Act, 16 U.S.C. § 823 (2006), exemption from all of Part I of the Federal Power Act is requested.

The location of the project is:

State or Territory:	Pennsylvania
County:	Montgomery
Township or nearby town:	Norristown and Bridgeport
Stream or nearby body of water:	Schuylkill River

2.0 Applicant Information, Project Ownership, Federal Land, and Fees

2.1 Applicant Information

The exact name and business address of the applicant is:

Montgomery County
Montgomery County Courthouse
P.O. Box 311
Norristown, PA 19404-0311

The exact name and business address of each person authorized to act as agent for the applicant(s) in this initial consultation document is:

Jon Leshner
Environmental Planning Assistant Manager
Montgomery County Pennsylvania
P.O. Box 311
Norristown, PA 19404-0311
610-278-3773

The applicant, Montgomery County, is a jurisdiction incorporated under the laws of Pennsylvania.

Acting Agent:

Alden Research Laboratory (A Verdantas Company)
30 Shrewsbury Street
Holden, MA 01520



2.2 Evidence of Applicant Ownership

Montgomery County has all of the real property interests in the lands necessary to develop and operate the project. Specifically, Montgomery County has full ownership of the properties required to develop and operate the project. Exhibit G in Section **Error! Reference source not found.** of this document includes an ownership boundary line and Appendix B contains documentary evidence of the applicant's interest in the lands, as required by 18 C.F.R. § 4.31(b)(2).

2.3 Federal Lands

The Norristown Dam Project will not be located on federal lands.

2.4 Statement of Fees Required to Develop Section 30(C) Conditions

The required fees for development of Section 30(C) conditions have not yet been determined.

3.0 License Process Plan and Schedule

The submission of this Initial Consultation Document (ICD) will begin the process for filing an exemption application to FERC for the Norristown Dam Project. According to 18 CFR § 4.38, stakeholders, resource agencies, and members of the public will have an opportunity to be educated about the proposed project as well as comment on the ICD before preparation and submittal of the exemption application. Montgomery County will hold a joint agency and public meeting at a date between 30 and 60 days after the submittal of the ICD. A notice of a public meeting will be published in a local paper two weeks prior to the joint meeting. A site visit will also be scheduled for the same day as the public meeting.

A tentative schedule for the exemption application process for the Norristown Dam Project is provided in Figure 3-1.

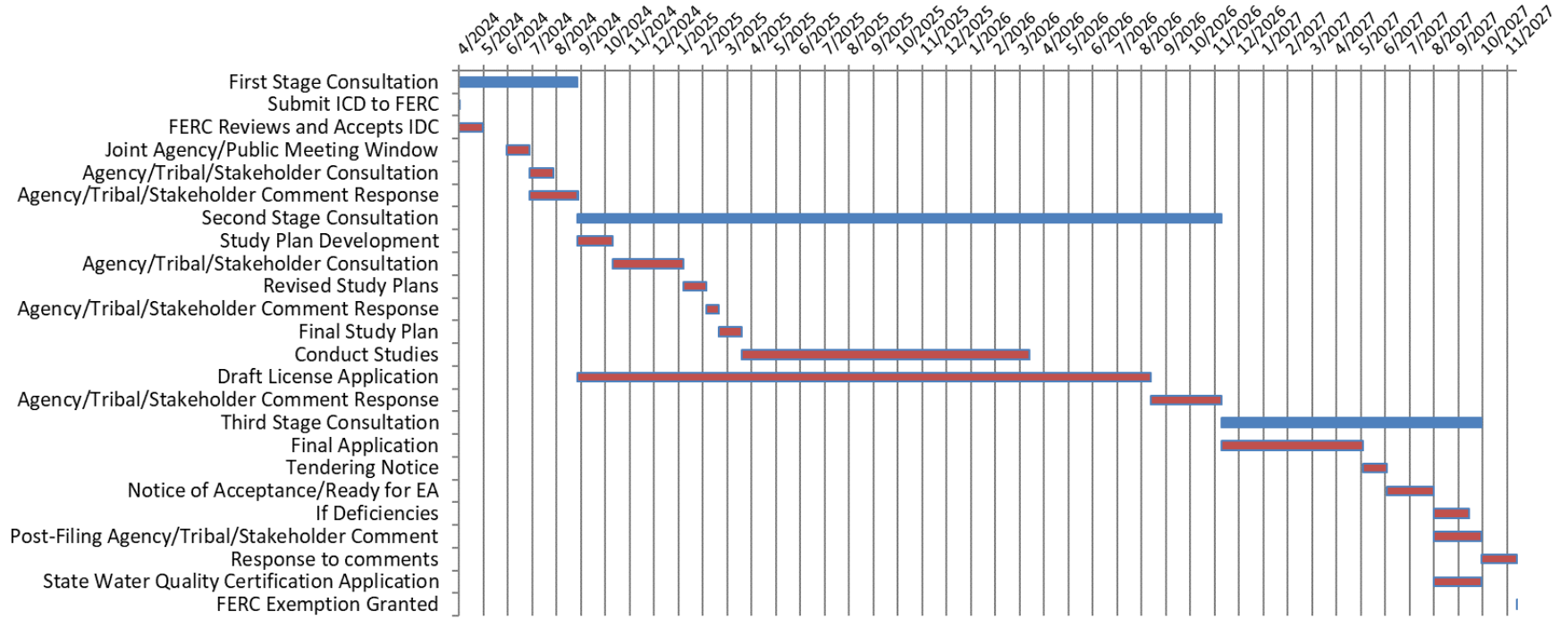


Figure 3-1. Exemption License Application Schedule for Norristown Dam



4.0 Exhibit A: Project Location, Facilities, and Operations

4.1 Existing Project Description

The Norristown Dam (also known as the Swede Street Dam) is located approximately 15 miles northwest of Philadelphia, Pennsylvania, spanning the Schuylkill River between the municipality of Norristown and the borough of Bridgeport, Pennsylvania (Figure 4-1, Figure 4-2). It is located 24.2 miles upstream of the confluence of the Schuylkill River with the Delaware River and approximately 15.5 miles upstream of the first dam on the Schuylkill (Fairmount Dam) and 8.6 miles from the second dam (Flat Rock Dam). It was originally constructed as a timber crib dam along with an adjacent canal and lock in the early 1800s to support a shipping route along the Schuylkill River. The canal and lock were located on the Bridgeport side of the site but have since been abandoned, removed, and filled. The concrete-capped dam is 869 ft long, 12 ft high, and set in a wide V shape approximately north to south across the river. The dam terminates at a stone masonry abutment on the north end (Norristown side) and at a fish ladder structure on the south end (Bridgeport side). The fish ladder was installed in the mid-2000s at the south abutment of the dam to provide upstream passage of migratory fish species. There are no other outlets or gates located on or adjacent to the dam; however, Pennsylvania American Water has an intake located in the impoundment. A public recreational area and parking lot are adjacent to the dam on the south side to allow public access to the waterway and for viewing the dam and the fish ladder.

The proposed Project boundary includes the impoundment, which is approximately 0.98 square miles and extends 7.5 miles upstream to where Pawlings Road crosses over the river (Exhibit G).



Figure 4-1. Norristown Dam location map



Figure 4-2. Norristown Dam area map



4.2 Flow Duration Curves

The following graphs (Figure 4-3 through Figure 4-14) provide monthly flow duration curves for the Schuylkill River at the Norristown Dam. The curves were created using historic daily mean flow data collected at the USGS gage located in the Norristown Dam impoundment.

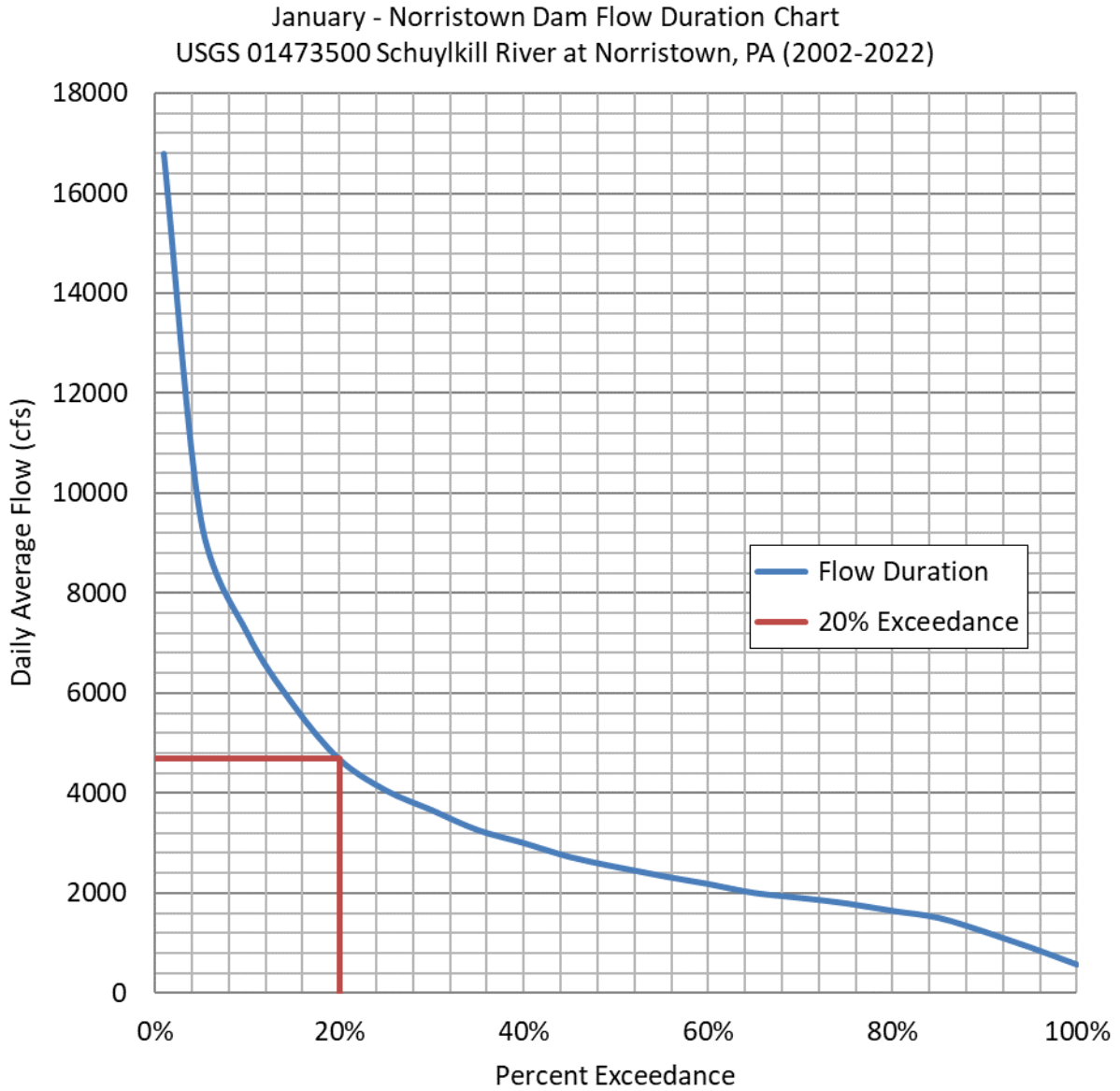


Figure 4-3. January flow duration curve



February - Norristown Dam Flow Duration Chart
USGS 01473500 Schuylkill River at Norristown, PA (2002-2022)

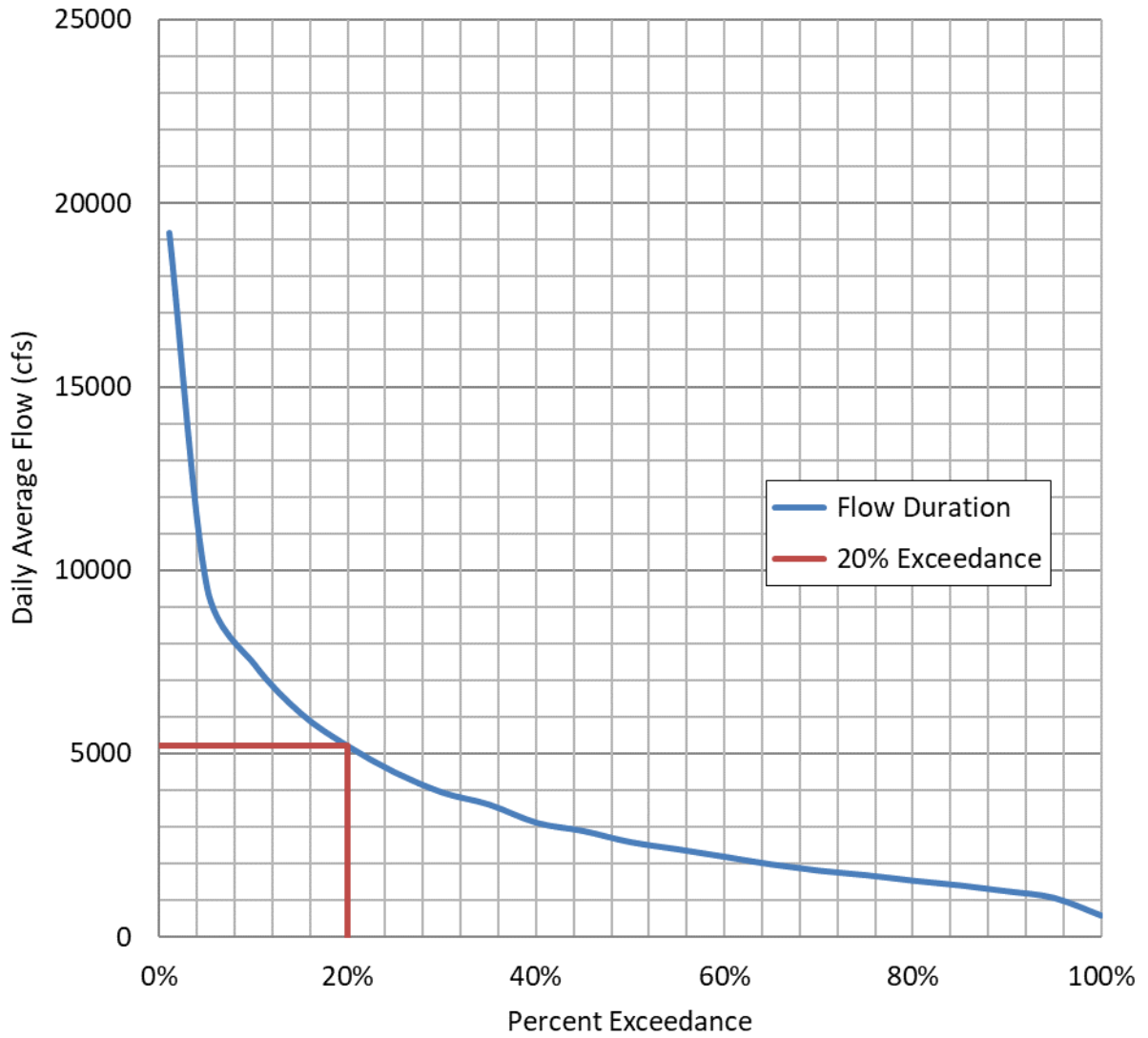


Figure 4-4. February flow duration curve



March - Norristown Dam Flow Duration Chart
USGS 01473500 Schuylkill River at Norristown, PA (2002-2022)

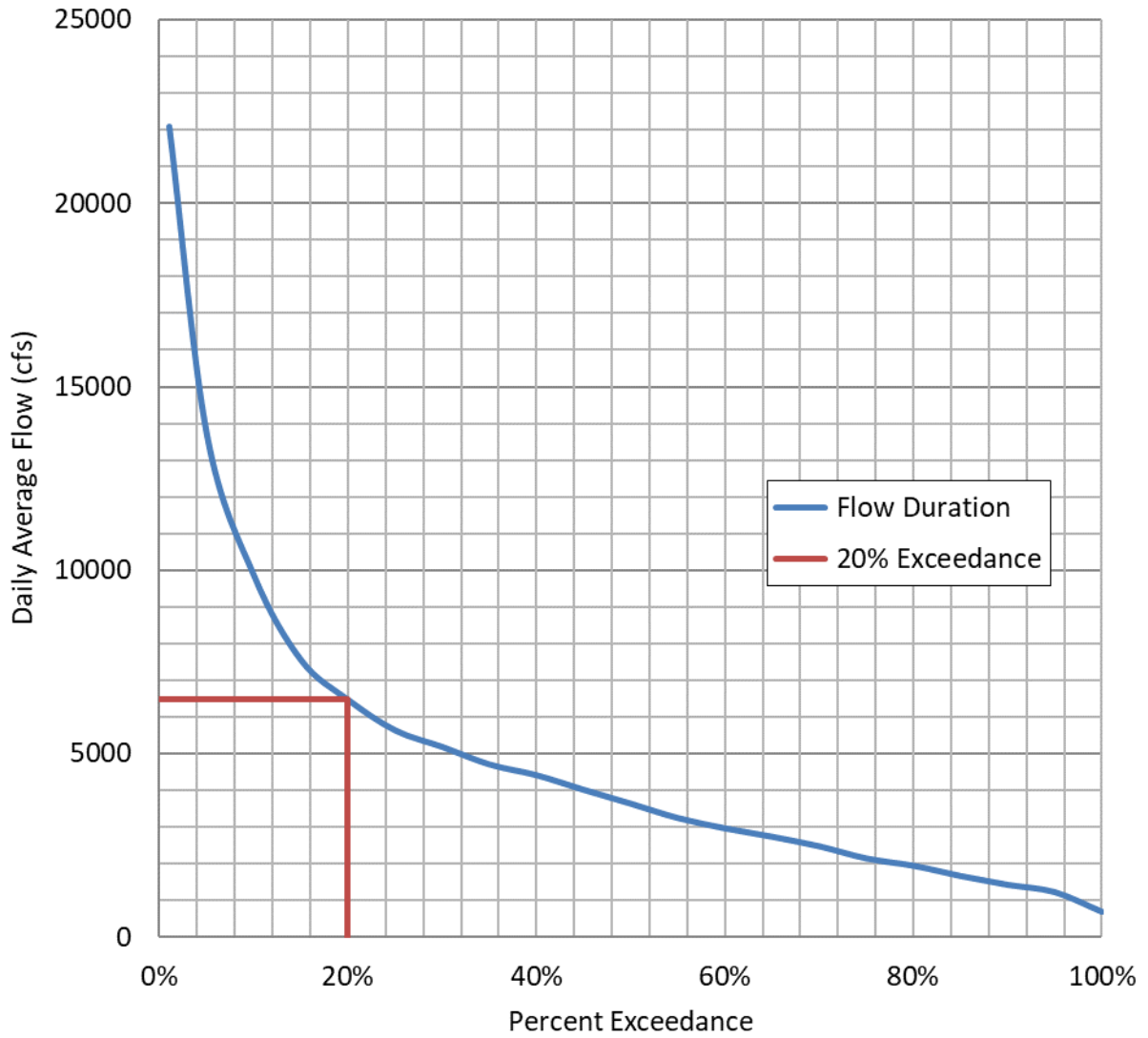


Figure 4-5. March flow duration curve



April - Norristown Dam Flow Duration Chart
USGS 01473500 Schuylkill River at Norristown, PA (2002-2022)

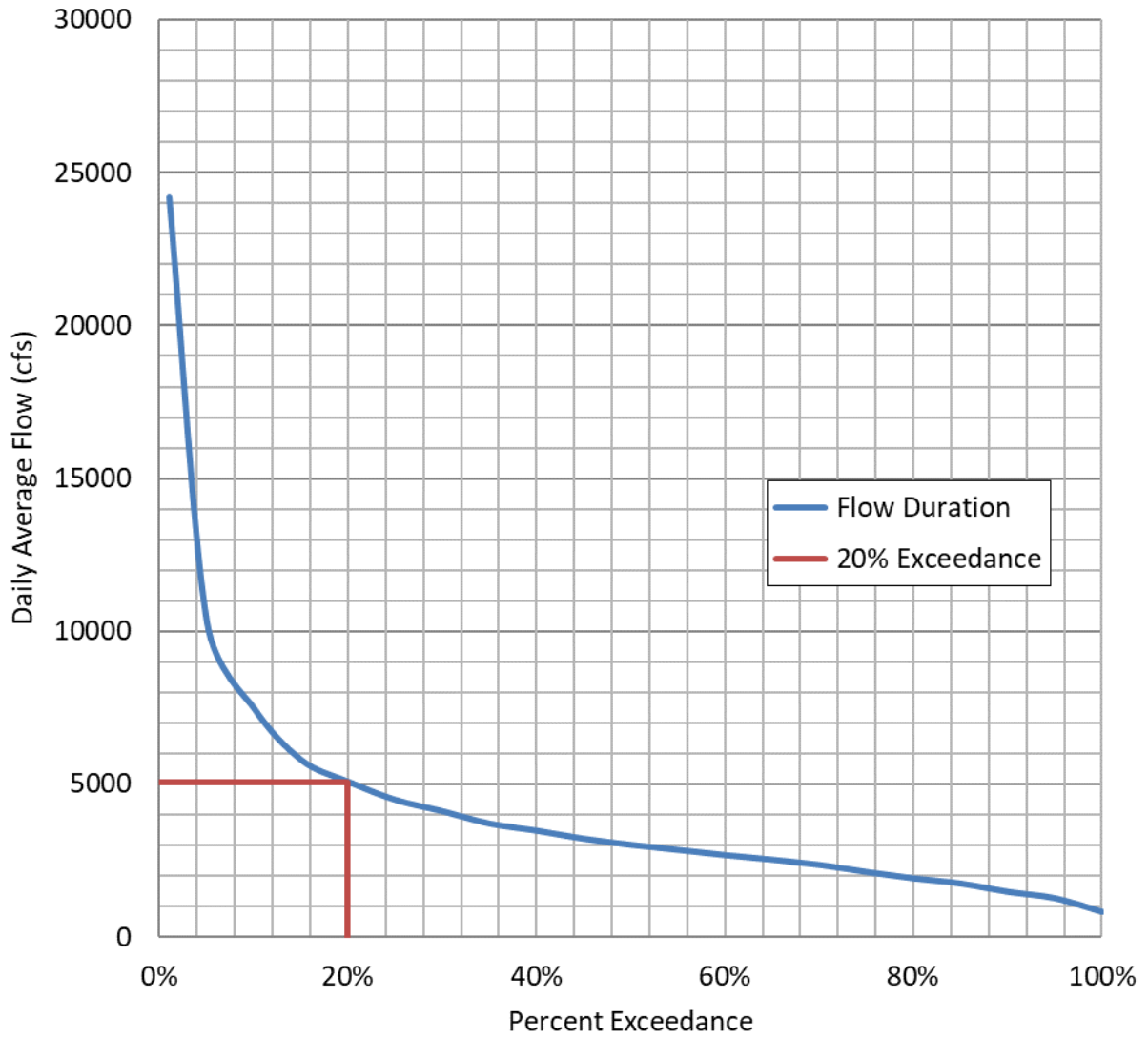


Figure 4-6. April flow duration curve



May - Norristown Dam Flow Duration Chart
USGS 01473500 Schuylkill River at Norristown, PA (2002-2022)

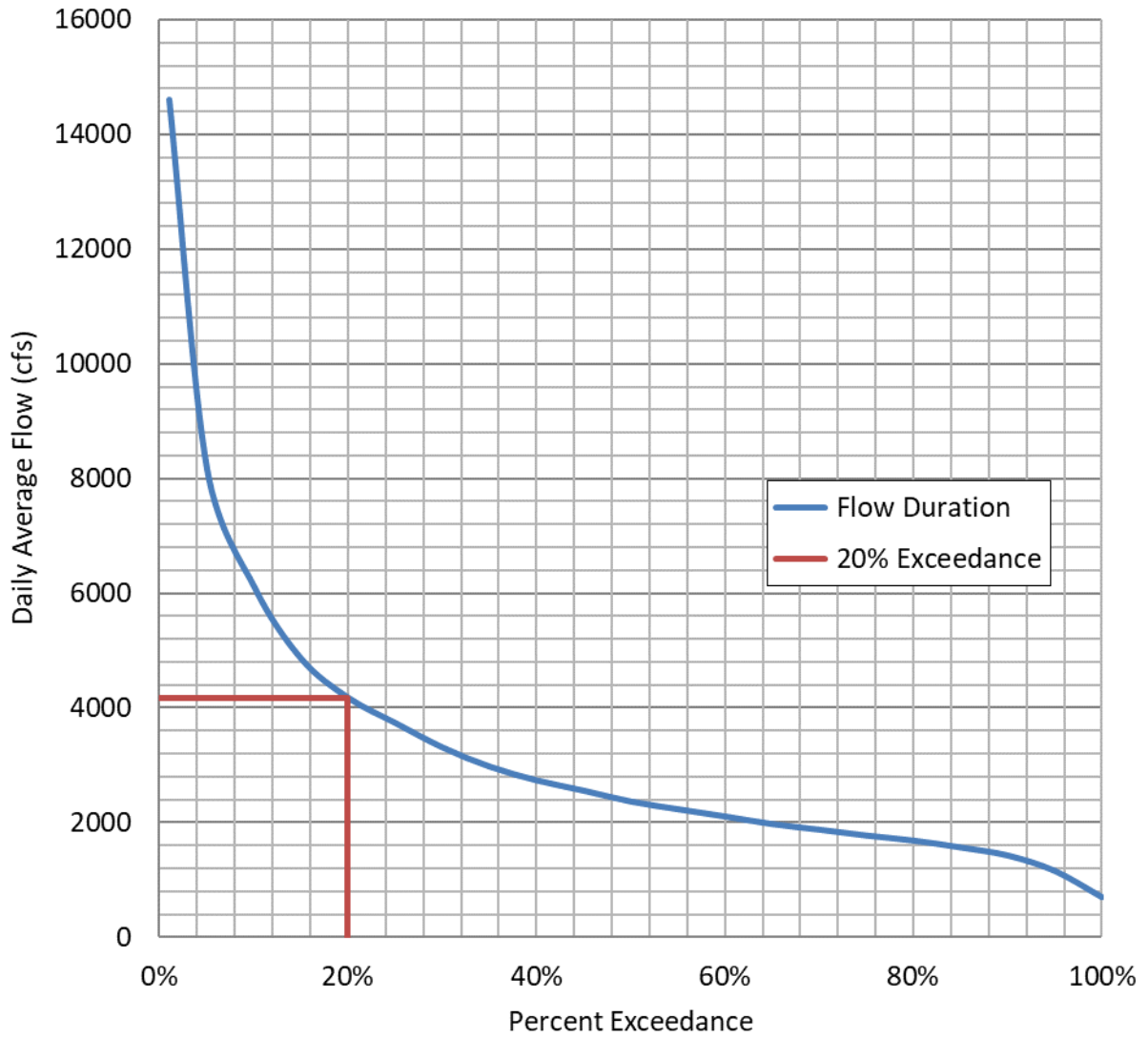


Figure 4-7. May flow duration curve



June - Norristown Dam Flow Duration Chart
USGS 01473500 Schuylkill River at Norristown, PA (2002-2022)

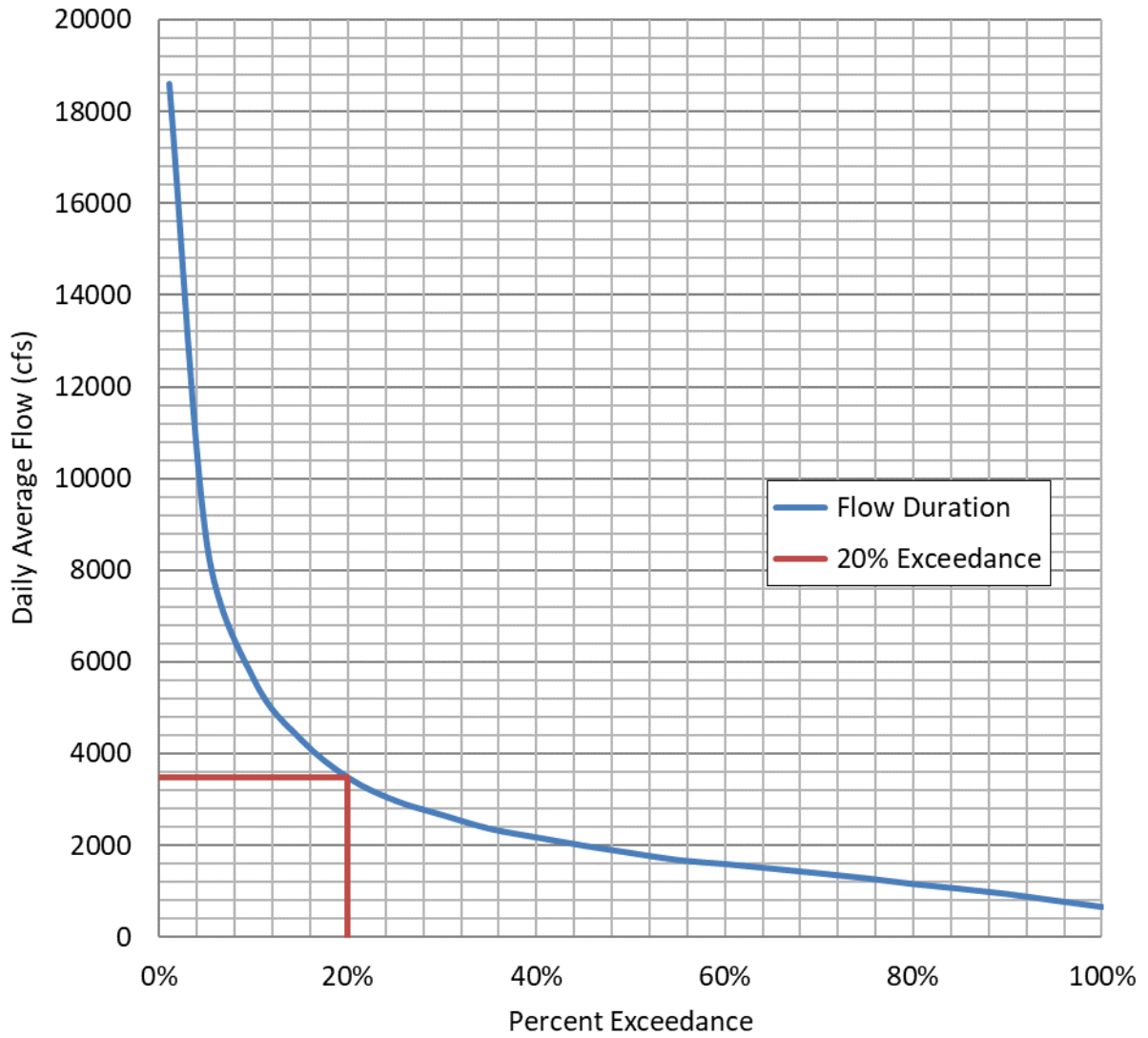


Figure 4-8. June flow duration curve



July - Norristown Dam Flow Duration Chart
USGS 01473500 Schuylkill River at Norristown, PA (2002-2022)

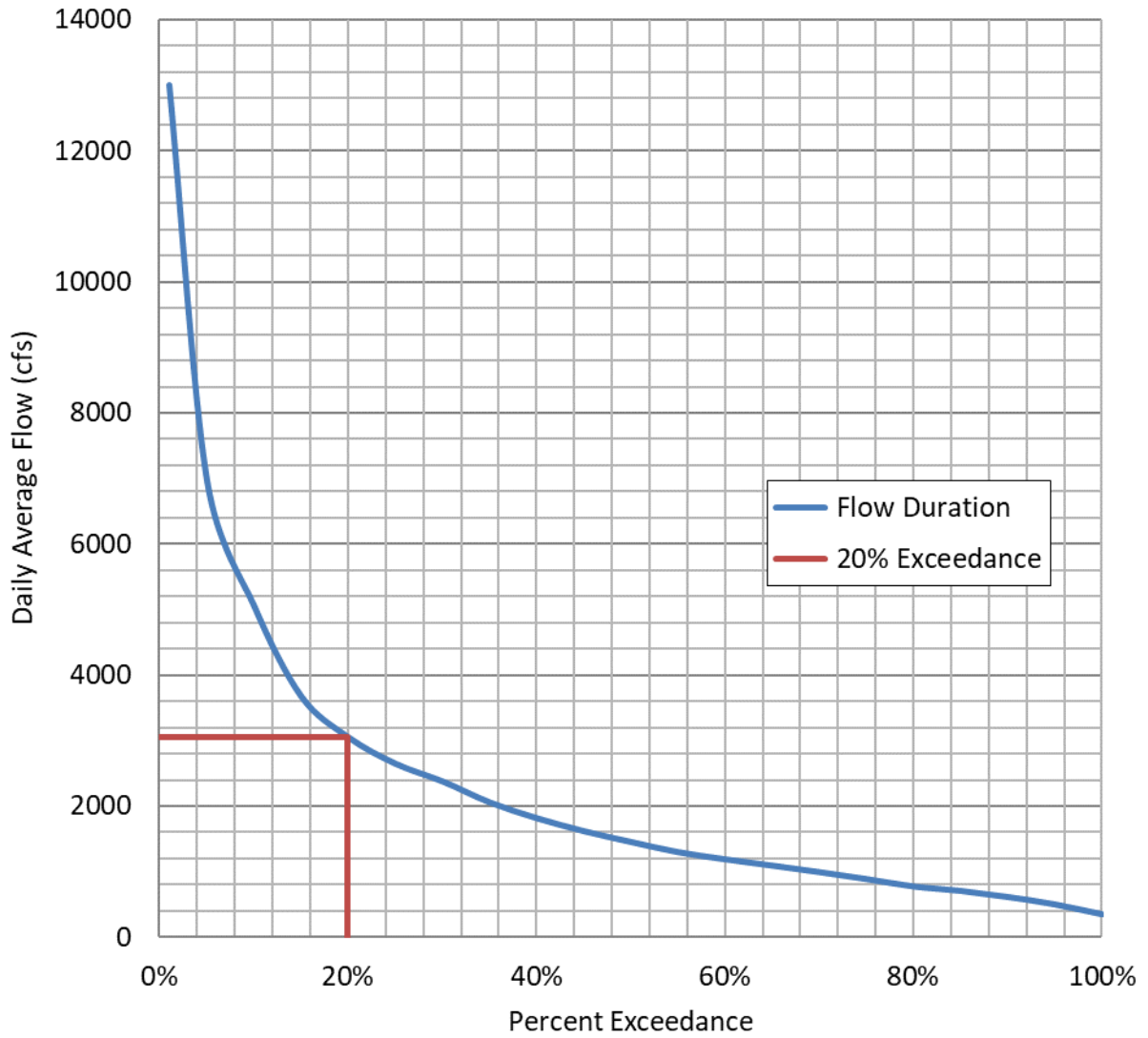


Figure 4-9. July flow duration curve

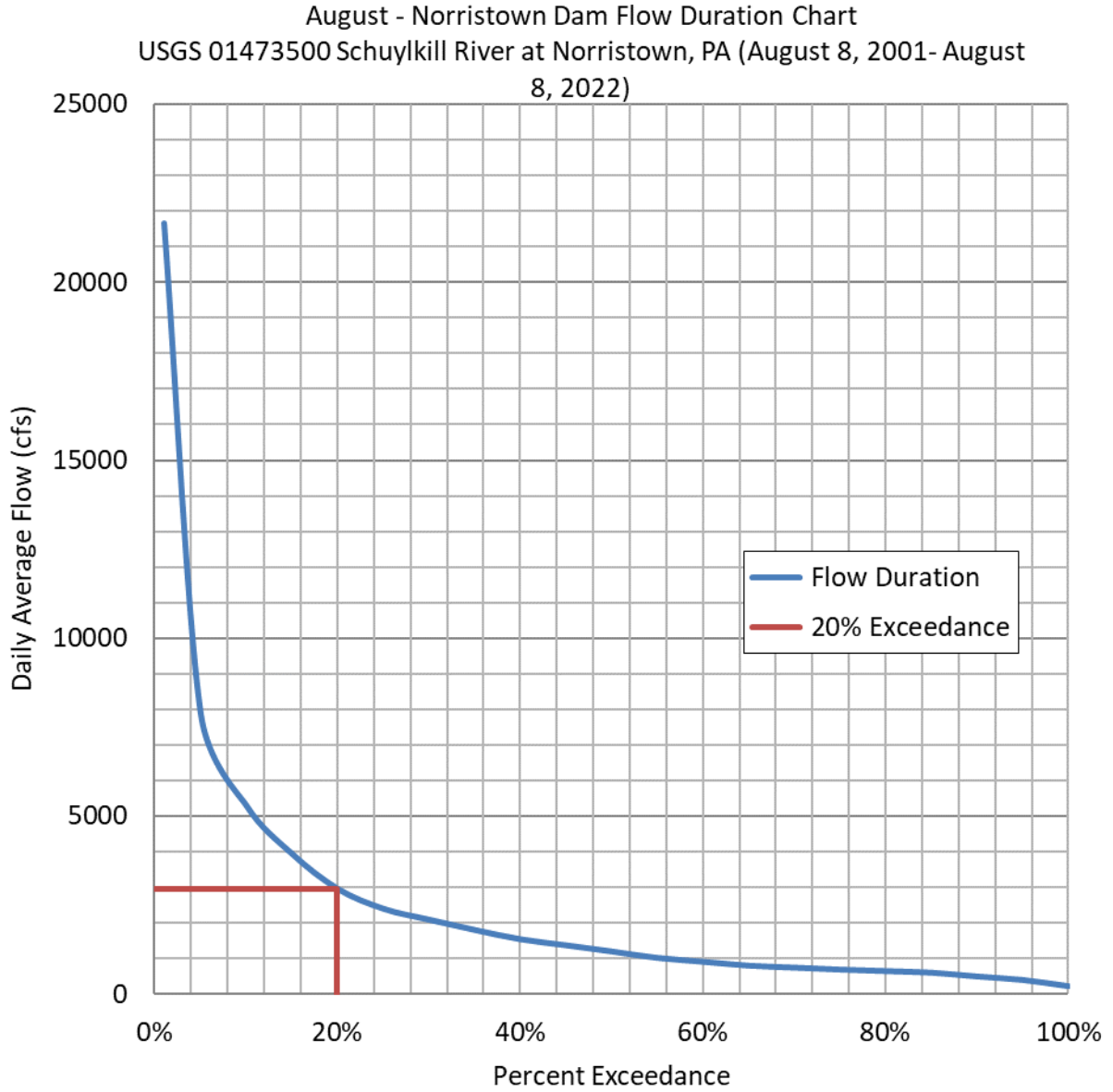


Figure 4-10. August flow duration curve



September - Norristown Dam Flow Duration Chart
USGS 01473500 Schuylkill River at Norristown, PA (2001-2021)

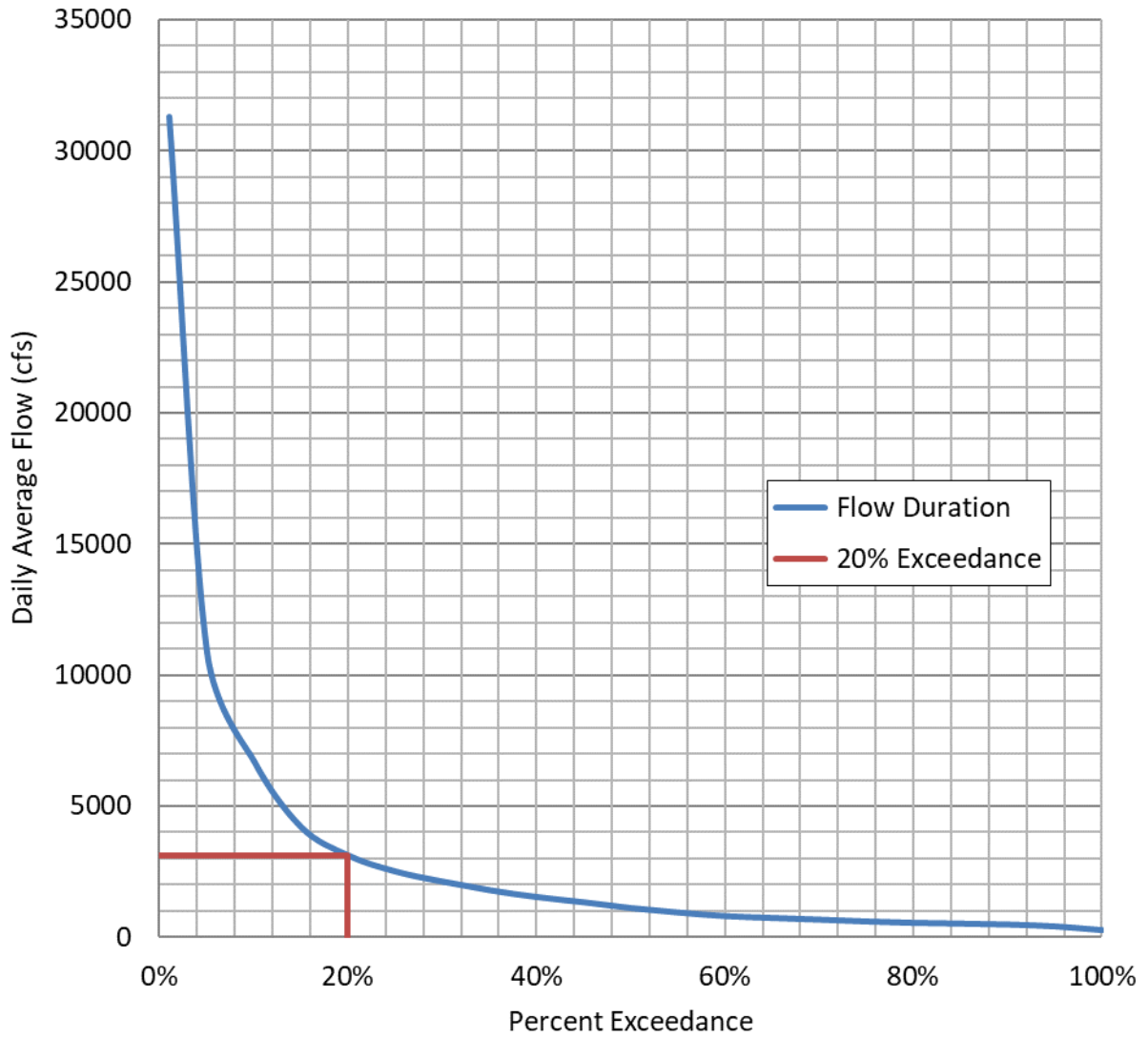


Figure 4-11. September flow duration curve



October - Norristown Dam Flow Duration Chart
USGS 01473500 Schuylkill River at Norristown, PA (2001-2021)

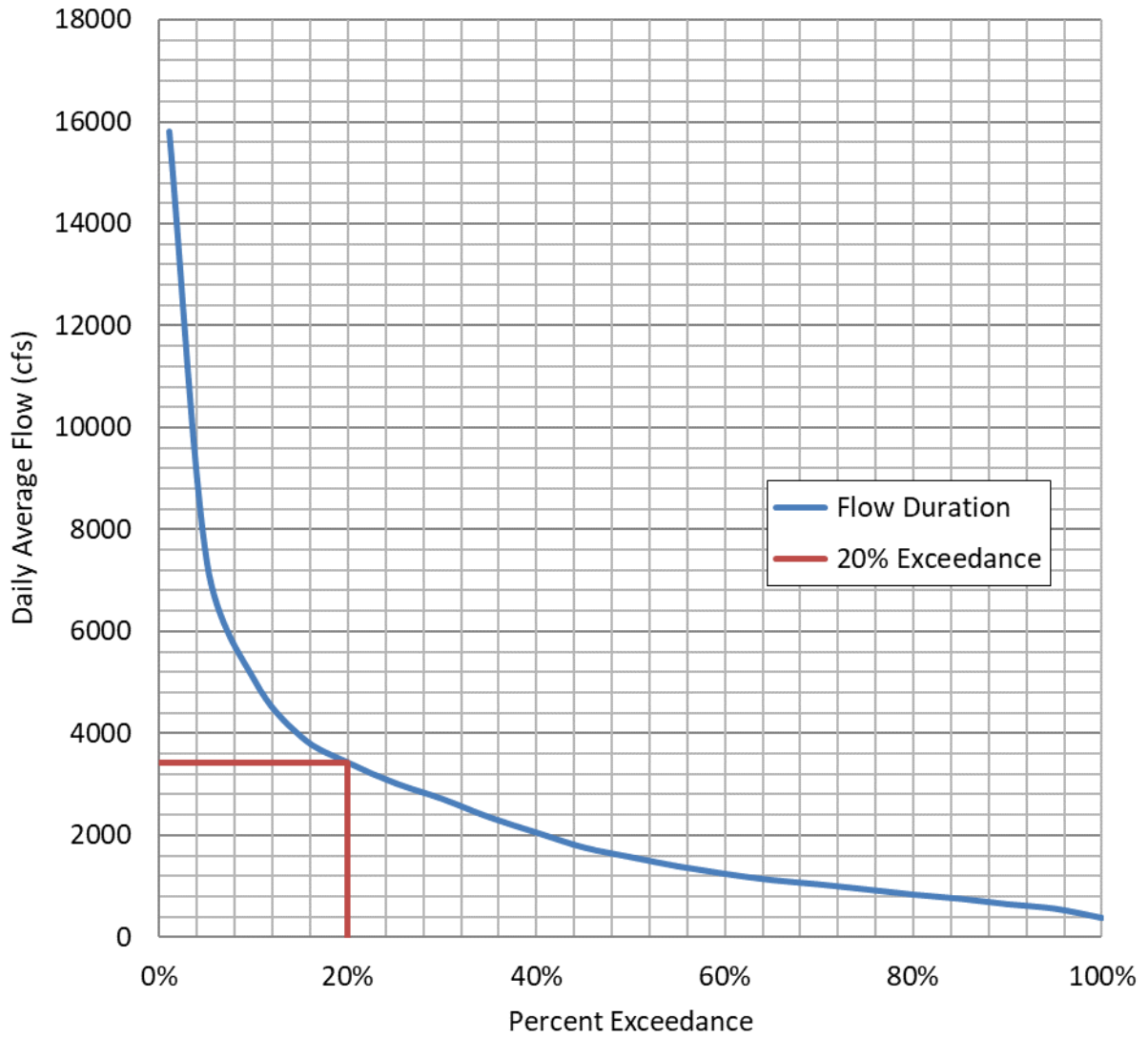


Figure 4-12. October flow duration curve



November - Norristown Dam Flow Duration Chart
USGS 01473500 Schuylkill River at Norristown, PA (2001-2021)

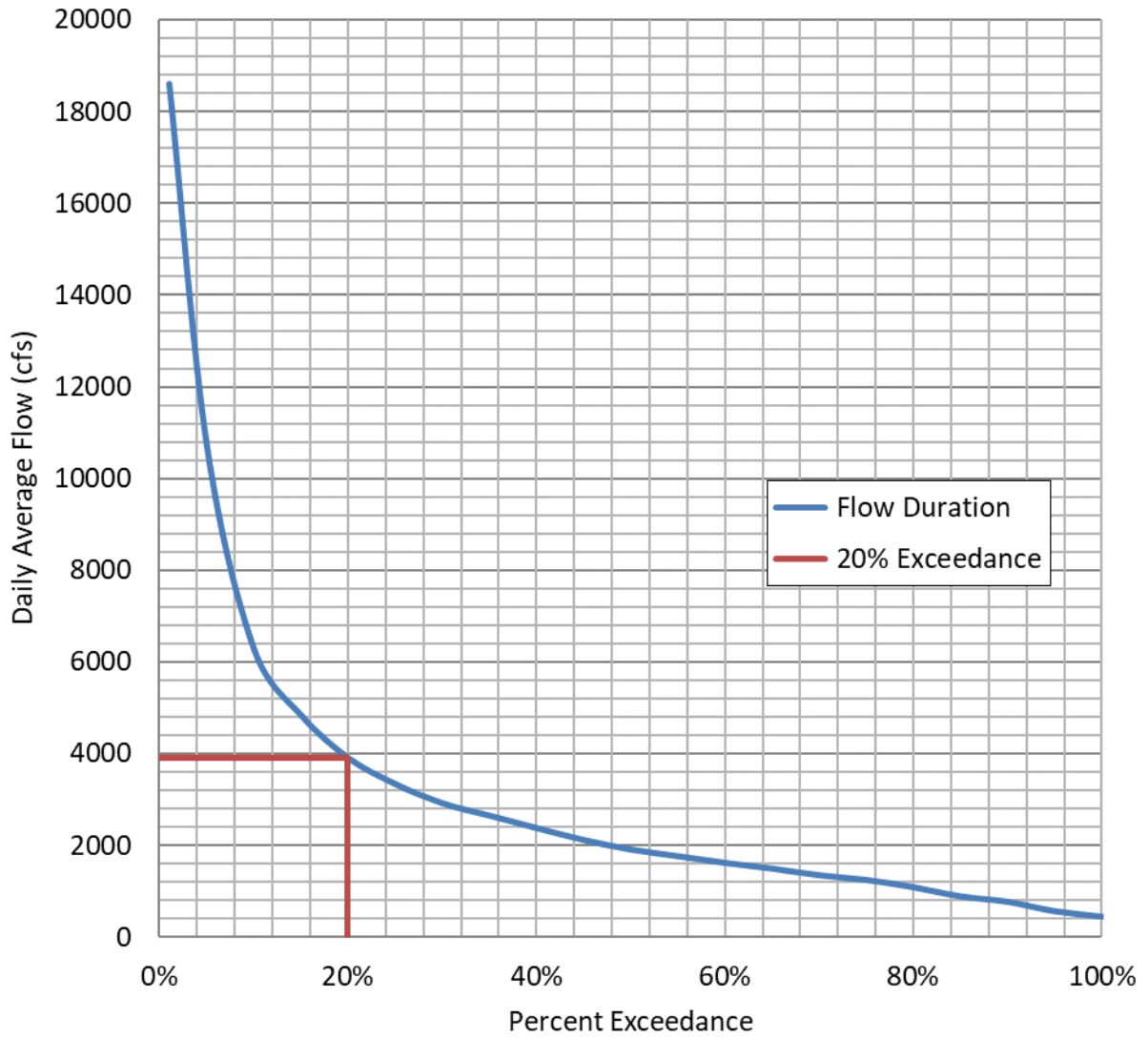


Figure 4-13. November flow duration curve

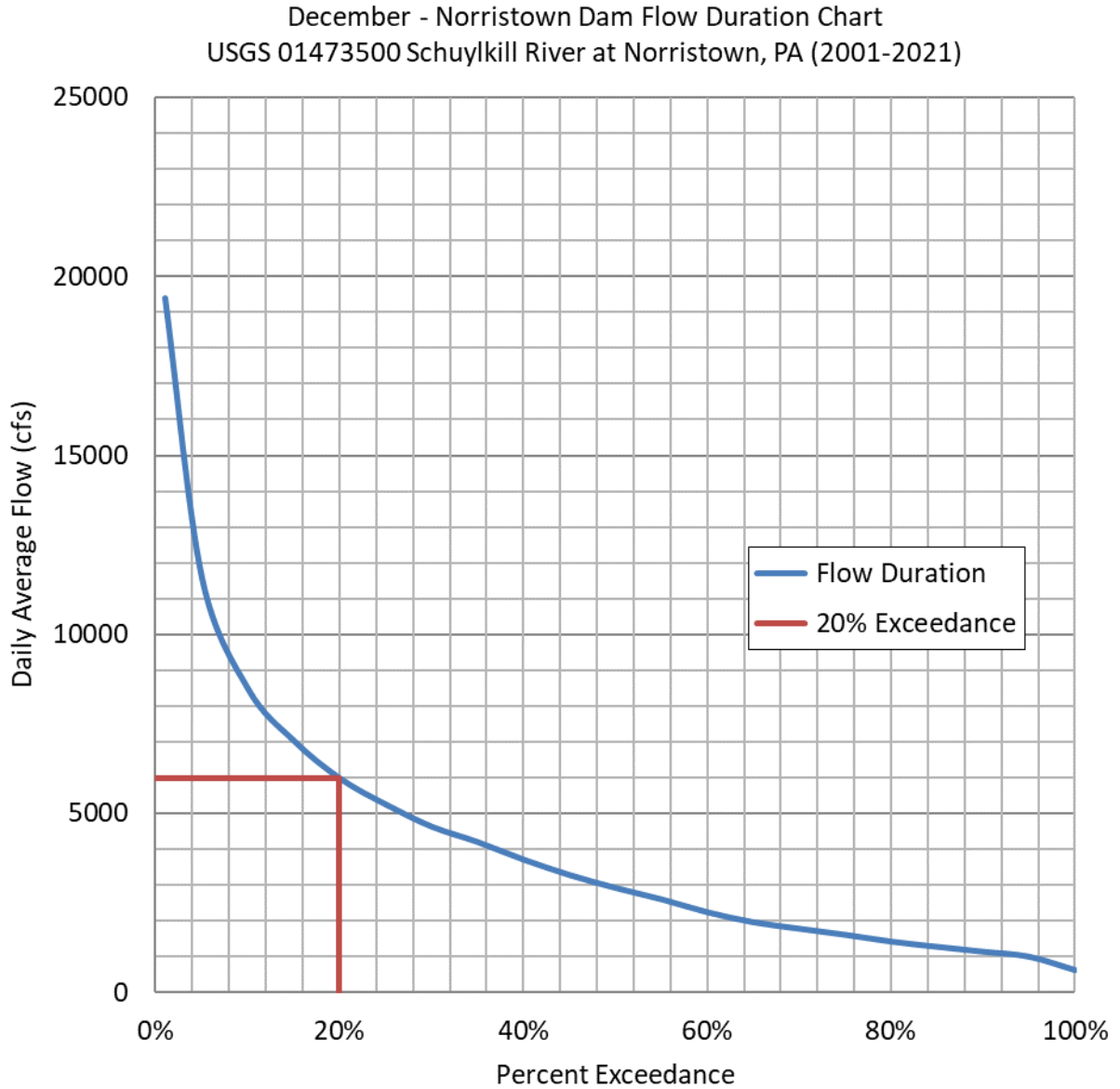


Figure 4-14. December flow duration curve

4.3 Proposed Project Description

General Description

The primary features of the proposed project include:

- Four mini-bulb type turbine-generators,
- In-river concrete and steel structure with four bays,
- Trashracks,
- Trash rake,
- Shutoff gate at each turbine,



- Flashboards above each turbine,
- Upstream and downstream stop log slots and stop logs,
- Rolling gantry crane,
- Catwalks and work decks,
- Steel tracks and supports for the rolling gantry crane,
- Controls,
- Controls enclosure,
- Transformer,
- Interconnection,
- Fish ladder entrance extension, and
- Surface skimmer for downstream fish passage.

The proposed project will be located on the right bank of the river abutting the existing fish ladder, as shown in Figure 4-15 and Figure 4-16. The project will include a reinforced concrete and steel structure replacing approximately 100 feet of the existing dam and extending about 120 feet from the upstream to downstream extents. The structure will include four turbine generators, each located in its own bay separated by concrete walls. Each bay will include angled trash racks and upstream and downstream stop log slots where stop logs may be placed to isolate the bay for maintenance (see section view in Figure 4-17). The turbine-generators will be self-contained, fully submersible, and regulated by shutoff gates located between the unit and the draft tube. The area above the turbines and between the dividing walls is designed to be overtopped, when necessary, with a crest elevation one foot below the crest of the dam. This will compensate for the spill capacity lost due to the dividing walls and other in-river structures as needed for FEMA no-rise certification. The one-foot differential is preliminary and will be finalized using computer modeling at the 100-year FEMA flood elevation. Under normal operating (non-flood) flow conditions, the flashboards, and gate where needed, will stay in place and any flow not used for generation will pass over the spillway or through the fish ladder. A powerhouse for the proposed design is not required and, therefore, is not being proposed. Electrical controls will be housed in a weatherproof enclosure, placed adjacent to the existing fish ladder and the existing parking area. The top of each concrete wall will match the elevation of the retaining wall on the inland side of the fish ladder, which is about the 10-year flood elevation. Catwalks and work decks will span from the parking area over the fish ladder and over each bay. Tracks for the gantry crane and trash rake supports will be integrated into the work decks or span in a similar way. The entire project will be designed to be overtopped during extreme flood conditions. A single transformer will be installed on the south shore above the 500-year flood elevation, and an interconnection will be made with the local utility. The existing fish ladder entrance will be extended to the downstream extents of the in-river hydropower structure. A surface skimmer gate will be incorporated into the southernmost turbine bay to provide downstream fish passage. The skimmer gate will have a minimum depth of 18 inches and minimum width of three feet to meet USFWS downstream fish passage guidelines.

Generating Equipment

The project will include four identical mini-bulb type turbine generators placed horizontally, as shown in Figure 4-17. The turbine units will have fixed-blade unregulated propeller-type runners. Each runner connects directly to a permanent magnet generator enclosed in the bulb at the forward end of the unit. The units are water-cooled, requiring no oil and low maintenance as compared to other available turbine-generators of a similar size and design. The self-contained nature of the units eliminates the need for a powerhouse and reduces civil structure requirements. Table 4-1 provides a summary of key turbine characteristics. Each unit will have a nameplate generating capacity of about 291 kW and a flow capacity of 507 cfs. A weatherproof enclosure placed



adjacent to the fish ladder retaining wall will house the turbine controls. This structure will be about the size of a small storage container.

Table 4-1. Summary of proposed turbine characteristics

Feature	Value
Turbine Type	Bulb-type fixed blade
Number of turbines	4
Runner diameter	5.6 ft
Single unit nameplate generating capacity	291 kW
Single unit maximum flow capacity	507 cfs
Combined nameplate generating capacity	1,164 kW
Combined maximum flow capacity	2,028 cfs
Annual energy estimate	7,300 MWhr

Interconnection

At this stage in design, it has been assumed that the local electrical grid can support the power generated at the site. There is a local service at the site and pole mounted lighting in the parking area. It has been assumed the poles on Water Street leading to the site will support an interconnection and a single transformer will service the project. An in-dept power study will be included in the next phase of design.

Changes to Existing Dam

The Norristown Dam has undergone numerous changes since its original construction. The two most significant modifications were the concrete capping and sheet pile reinforcement which occurred in 1993-1994 and the construction of the fish ladder in 2007-2008. Changes to the existing dam related to the proposed hydropower development will be limited to the demolition and removal of an approximately 100-ft section of dam abutting the fish ladder.

Fish Passage Consideration

The provision of a fish ladder was a condition of PECO's sale of the dam to Montgomery County and construction of it was completed in 2008. A visual inspection of the fish ladder in 2022 showed the structure to be in good condition, and it has been assumed that only routine maintenance will be required. The proposed hydropower structure was located to avoid interfering with the fishway exit and auxiliary water intake. The fishway entrance would be extended about 40 feet downstream, as shown in Figure 4-16.

Downstream fish passage would be accomplished by installing a 3-foot-wide by 18-inch-deep surface skimmer gate located in the turbine bay closest to the fish ladder. The placement of the turbines and the skimmer gate adjacent to the fish ladder is anticipated to improve migrating fish's ability to locate the fishway entrance.

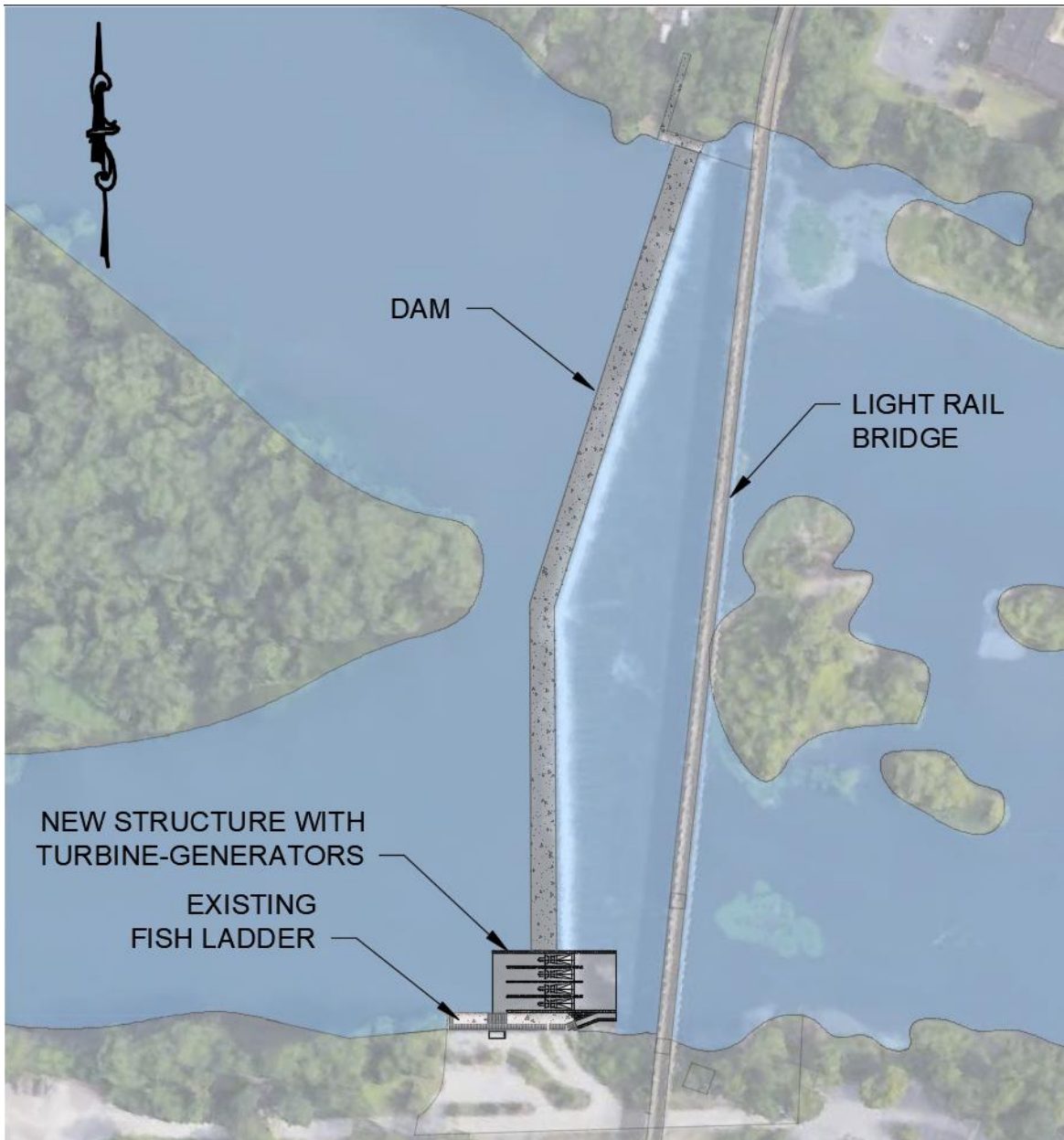


Figure 4-15. Proposed project site plan

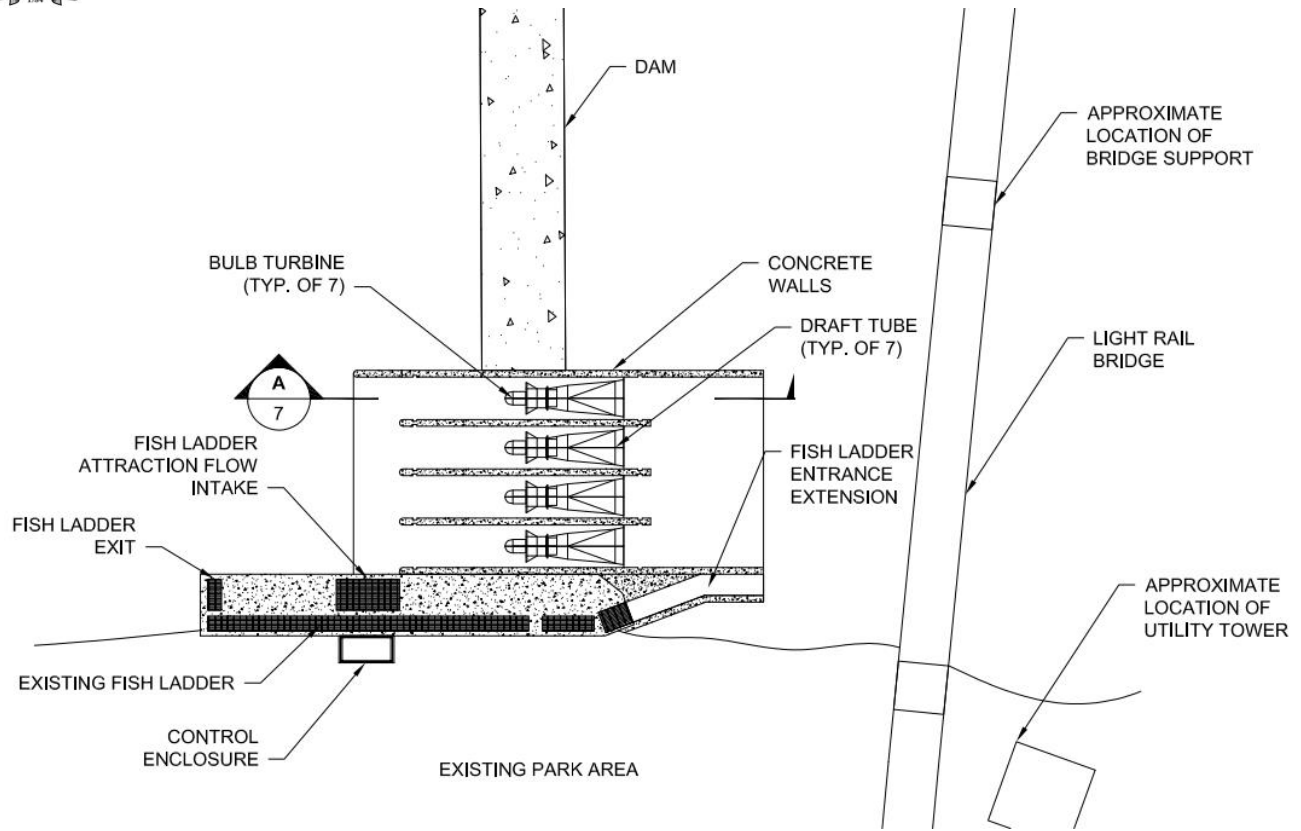


Figure 4-16. Proposed project plan view

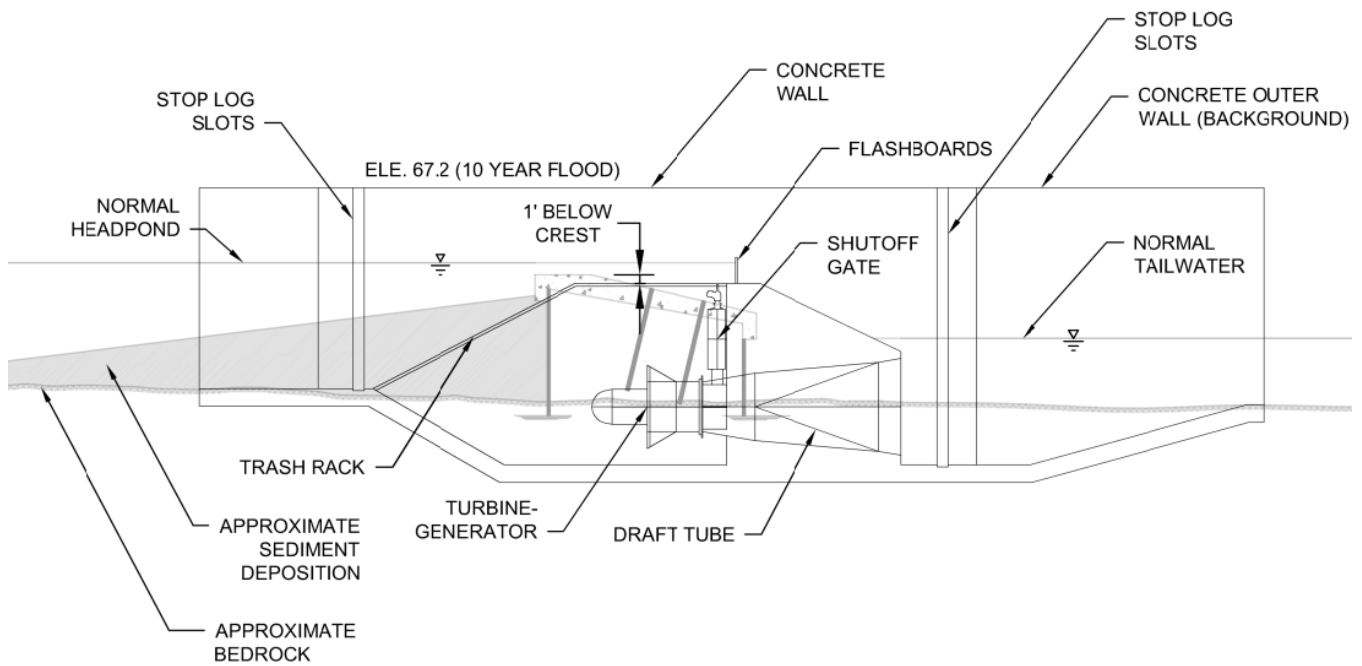


Figure 4-17. Proposed project section view



4.4 Operations Plan

The proposed project will operate in a run-of-river mode. This mode is defined as passing flow downstream of the dam at the same rate as flow entering the impoundment from upstream sources, less any withdrawals from within the impoundment. Flows may be passed over the spillway, through the fish ladder, through the turbine-generators, and over the top of the generators when the flash boards are removed, or the surface gate is open. These will be the only four downstream routes once the project is operational.

The proposed operations will always prioritize spilling water over the crest of the dam for aesthetics, environmental flows, and to maintain the structural integrity of the dam. The Norristown Dam is highly visible from DeKalb Street and the abutting park area; thus, the aesthetics of the spilling dam would be maintained. Although there is no bypass reach included in the proposed design, when the turbines are operating flow will be focused on the southern bank of the river; thus, environmental flows will always spill over the remainder of the dam to maintain the river habitat north of the project. Although the dam was rehabilitated with upstream and downstream sheet piling, a concrete cap, and injected grout, the integrity of the timber crib core would be compromised if allowed to completely dry out; a continuous flow over the top of the dam will avert this issue. It was assumed that two inches of water above the dam crest, requiring an estimated 146 cfs, will be sufficient to submerge the surface of the dam and satisfy these flow requirements. This value may be updated following additional site surveying and hydraulic modeling. In addition, the fish ladder adjacent to the south abutment will be operated from March 15 through June 30 (i.e., same schedule as current operation). The ladder uses 80 cfs for an attraction flow and 5-15 cfs flow in the ladder itself, for a total flow of 85 -115 cfs. These combined required flows will be referred to herein as environmental flow. The environmental flows are the priority in operations and are not considered available for power production. The environmental flow was estimated at 261 cfs with the fish ladder and 146 cfs without. At the current level of design 261 cfs value was used regardless of the season.

The proposed turbine-generators are unregulated, which means they have guide vanes (no wicket gates) and fixed aperture runner blades. The units are controlled by a shutoff gate that is either open or closed. Some flow control is available by adjusting the load on the turbine, but only a minimal reduction (about 10%) may be applied without causing significant loss in efficiency and increasing the chance of damaging cavitation. Thus, at the current level of design each turbine was assumed to operate only at or near design flow. The design flow for each unit about 507 cfs with a combined four-unit total of 2,028 cfs.

Generation will occur when flows exceed the minimum amount for one turbine plus environmental flows. As flows increase, additional units will be operated up to the maximum flows of all units combined. As the turbines are assumed to be either on or off, the additional flow between increments required for the next unit operation will be passed over the spillway. All flows above the combined maximum generation flow will be passed over the spillway. The turbines would shut down when the water surface elevation of the impoundment reaches the 10-year flood elevation of 67.2 feet. Figure 4-18 presents an assumed flow distribution for the proposed project.



Annual - Norristown Dam Flow Duration Chart
USGS 01473500 Schuylkill River at Norristown, PA (2001 - 2022) with
Proposed Flow Distribution for Voith Turbines

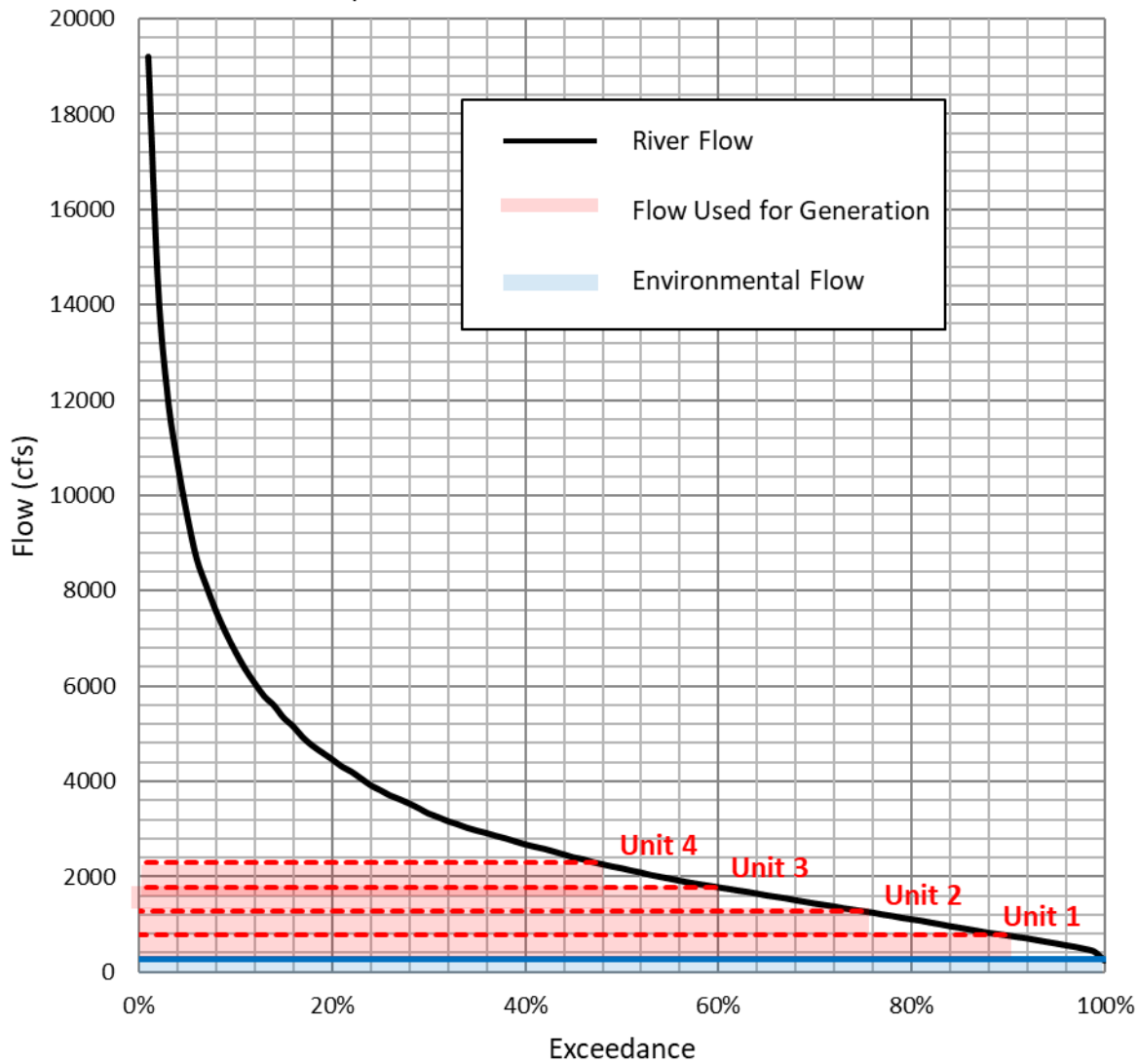


Figure 4-18. Flow duration curve with proposed flow distributions

4.5 Estimation of Annual Generation

Using the site characteristics, historic flows, flow duration curves, and preliminary information from several hydroelectric turbine-generator suppliers, estimates of the annual generation from a hydroelectric generating facility at the Norristown Dam were calculated. Currently, an array of up to four turbine-generators appears feasible. Based on this information, average annual generation is forecast to be 7,300,000 kilowatt-hours per year. As the project design is refined, this estimate will be revised to reflect the most current design and number of turbine-generators, as well as the flows available for generation.



Table 4-2 presents the estimated monthly flow and generation using flow data from the US Geological Survey (USGS) gage on the Schuylkill River for the period 2011-2021 and estimated annual generation from the turbine-generator suppliers.

Table 4-2. Monthly Average Flow and Generation Estimates

	Average Monthly River Flow (cfs)	Percent of Annual Flow (%)	Monthly Generation (MWh)
Jan	3,439	9%	633
Feb	3,678	9%	677
Mar	4,699	12%	865
Apr	4,201	11%	773
May	3,390	9%	624
Jun	2,903	7%	534
Jul	2,246	6%	413
Aug	2,405	6%	443
Sep	2,800	7%	515
Oct	2,586	7%	476
Nov	3,060	8%	563
Dec	4,260	11%	784

4.6 Construction Plan and Schedule

The following is a summary of the construction plan for the proposed Norristown Dam Hydropower Project and a high-level construction schedule.

Access

The site is easily accessible via Water Street and the existing parking area will be used for staging and mobilization including a mobile office, dumpsters, and temporary bathrooms. Access to in-river work area will be designed by the contractor as needed.

Coffer Dams, Dewatering, and Erosion Control

Coffer dams will be required for the duration of the in-river work upstream and downstream of the project. Current bathymetric information is not available at the site, but it's assumed that sand bags or Portadam style



coffer dams will be applicable. Cofferdams and dewatering will be designed by the contractor; however, it has been assumed that work areas will be dewatered by pumps discharging to filter bags placed on shore. Erosion control will be installed surrounding the filter bags, along the access road, and around the staging area as needed.

Following construction, the access roads and cofferdams will be removed, and the disturbed areas will be restored to pre-construction conditions.

Demolition

Approximately 100 feet of the dam abutting the fish ladder will be demolished using excavators and hydraulic breakers as needed. All demolition work will be conducted in dry conditions within the cofferdams. The debris will be trucked off-site for disposal. No other demolition is proposed or anticipated.

Excavation

Once the coffer dams are in place the sediment within the cofferdams will be sampled and analyzed for contaminants. Should analysis reveal contamination, the appropriate Pennsylvania environmental agencies will be consulted for management of such sediments. Sediments upstream and downstream of the dam within the cofferdams will be excavated to the bed rock and removed from the site. Current bathymetry and geotechnical core data are not available, but the sediment is anticipated to be up to 12 feet deep upstream of the dam and minimal immediately downstream. The sediment adjacent to the upstream side of the dam was likely disturbed, and much of it removed, during previous work at the site, with some work as recent as 2008.

As mentioned above, geotechnical data is not currently available, however it is anticipated excavations will extend up to 10 feet into the bed rock, which is reported in the drawings of record to be sandstone. Proximity to the SEPTA light rail bridge supports will prohibit blasting, thus all bedrock excavation will be carried out by hydraulic rock ram or hydraulic splitting, to be determined by the contractor. Excavation spoils will be disposed of offsite. Some excavation may be required or desirable in the tailrace downstream of the SEPTA bridge. If required, this may be completed with shore or trestle-based equipment as determined by the contractor.

Formwork and Concrete Placement

All formwork and concrete will be done in the dry behind the cofferdams. Concrete mixers and pump trucks will place concrete from the river's edge as much as possible, but the sections furthest from shore may require trucks to enter the work area behind the coffer dams. It is assumed that the high-tension electric transmission lines above the work area will prevent the safe use of large cranes. This will be confirmed prior to construction and appropriate precautions employed.

Steelwork

It is assumed that concrete reinforcing rebar, trashracks, catwalks, and supports for the rolling gantry crane will be fabricated off-site, to the extent possible, and placed with boom cranes or the gantry crane as applicable.

Rolling Gantry Crane

The rolling gantry crane will be purchased from a vendor and is not anticipated to require any additional design or fabrication. The rails for the gantry will extend into the parking area a sufficient distance to allow a load, such as a turbine, to be placed between the tracks or under the gantry to then be hoisted and moved into position along the tracks.



Turbine-generators and controls

The turbine-generators will be supplied by a vendor and placed with the rolling gantry crane. The controls will also be supplied by the vendor and installed in the prefabricated enclosure.

Interconnection

To reduce the risk of flood damage, the single transformer will be placed above the 500-year flood elevation. A pole-mounted or buried conduit transmission line would connect the transformer to the local utility, likely on service poles on Water Street.

Commissioning

The vendor will provide commissioning services in conjunction with the applicant.

Fish Passage Considerations

The construction plans in this section assume that maintaining upstream fish passage capabilities will not be required and the fish ladder will remain inoperable during construction. If the fish ladder is required to operate, in-river construction will be scheduled outside of upstream fish passage season, to the extent possible. If the coffer dams must be in place during the upstream fish passage season, upstream of the project a temporary channel traveling along the river bank to the fish ladder exit and auxiliary water supply intake would be constructed, and a temporary trestle bridge would be required to span the channel for access to the work area behind the coffer dam. Similarly, a channel would extend the fish ladder entrance downstream of the coffer dam and another temporary trestle bridge would be used to access the downstream work area.

The spillway provides downstream fish passage at this site, and this will not be significantly impacted by construction.

Schedule

The construction at the Norristown Dam site is estimated to span nearly one year, with in-river work approximately March to October. A conceptual critical path construction schedule may be seen in Figure 4-19.



Conceptual Critical Path Construction Schedule for the Norristown Dam Hydropower Project

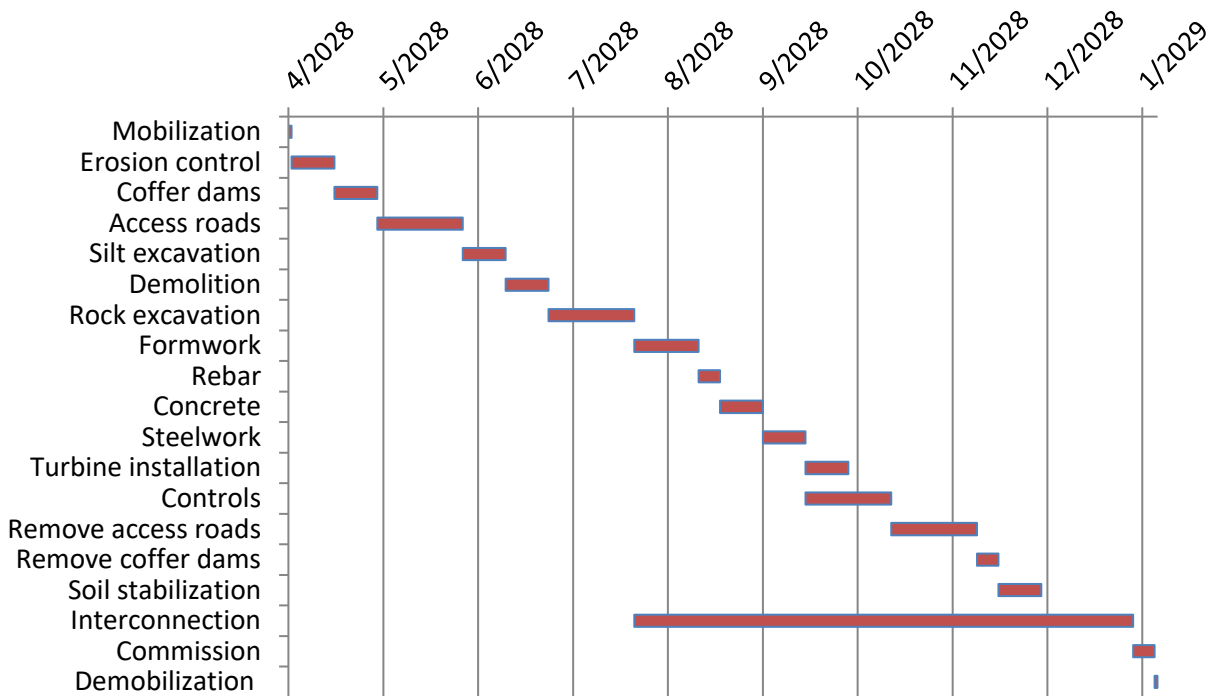


Figure 4-19. Conceptual construction schedule

5.0 Exhibit E: Environmental Resources and Impacts

5.1 Water Resources and Uses

5.1.1 Watershed

The Schuylkill River watershed is about 130 miles long and 25 miles wide with a drainage area of approximately 1,916 square miles (4,962 sq. km). The Schuylkill River travels approximately 130 miles from its headwaters at Tuscarora Springs in Schuylkill County to its mouth at the confluence with the Delaware River in Philadelphia (Figure 5-1). The Schuylkill River is the largest tributary to the Delaware River and the watershed is one of the most densely-populated areas in Pennsylvania. The major tributaries of the Schuylkill River, in order from upstream to downstream, are Mill Creek, West Branch of the Schuylkill River, Little Schuylkill River, Maiden Creek, Tulpehocken Creek, Manatawny Creek, French Creek, Perkiomen Creek, and Wissahickon Creek.

There are seven dams on the mainstem of the Schuylkill River, four of which are on the lower 40 miles of the river. Currently, there is no hydropower at any of the dams on the river. The Norristown Dam is the third dam on



the river located at river mile 24.2 (Figure 5-2). According to the National Inventory of Dams, the Norristown Dam has a maximum storage capacity of 2,355 Acre-ft and drainage area of 1,765 square miles.

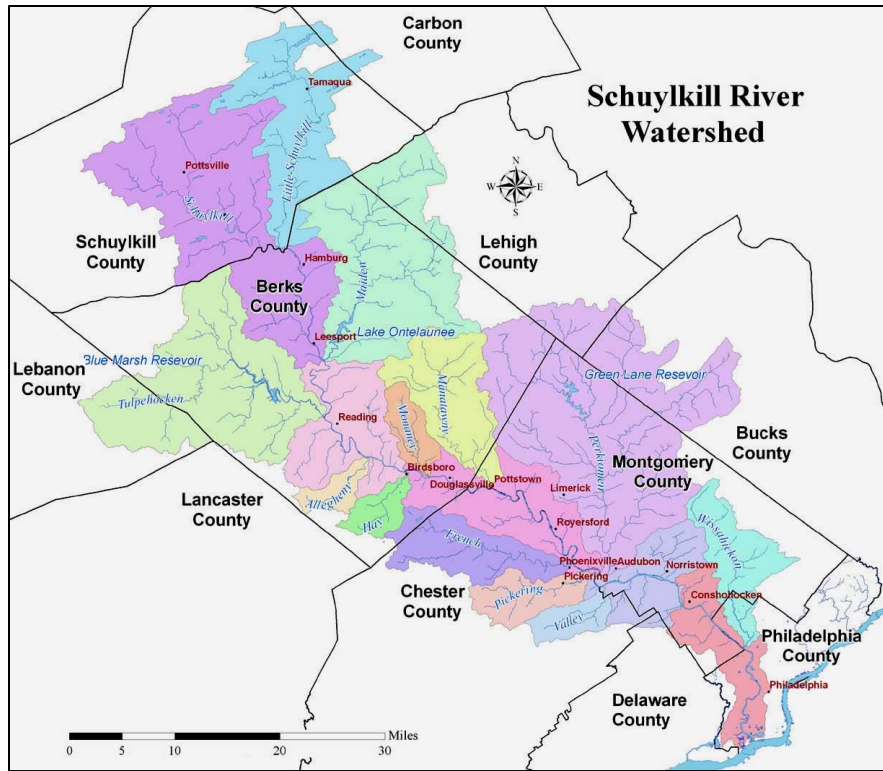


Figure 5-1. Schuylkill River Watershed (Philly H2O 2017)

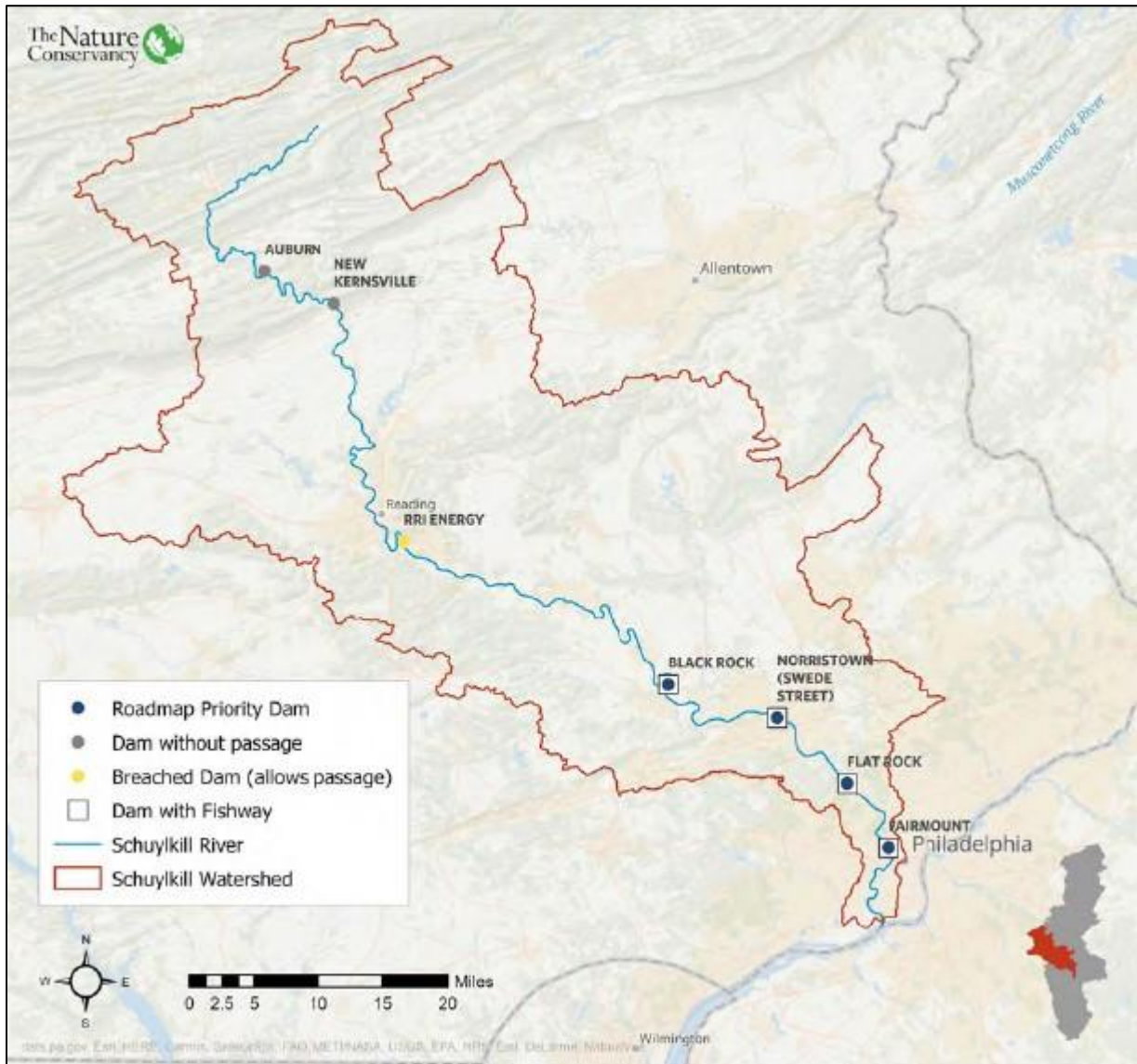


Figure 5-2. Schuylkill River Dams (DeSalvo et al. 2022)

5.1.2 River Flow

River flow data was obtained from the US Geological Service (USGS). The USGS has been measuring flow at gage 01473500 located approximately one mile upstream of the Norristown Dam from 1928 to 1932 and 2002 to 2021. The highest recorded average annual flow was 6,028 cfs in 2018 and the highest maximum flow rate was 60,000 cfs (Figure 5-3). From 2002 to 2021, mean monthly flows ranged from 2,310 to 4,810 with the highest flows occurring December through April (Table 5-1).

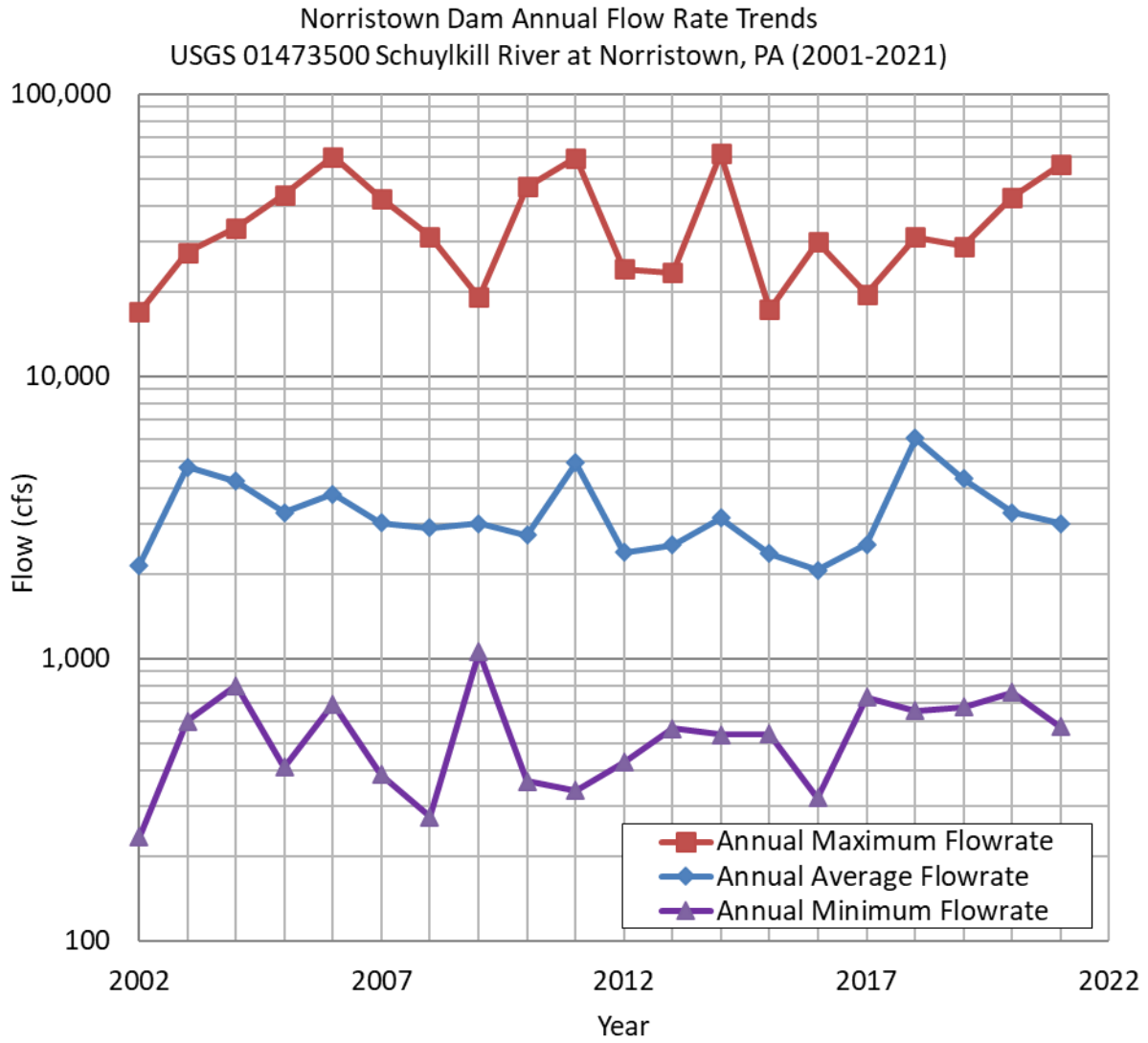


Figure 5-3. Annual flow rate trends



Table 5-1. Mean monthly river flow for Norristown from 2002 through 2021 (USGS gage 01473500)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2002	1,180	1,045	2,213	2,204	3,834	1,625	534	419	729	2,736	3,898	5,195
2003	3,772	3,030	6,980	4,408	2,643	8,885	3,205	3,081	5,241	4,240	4,548	7,066
2004	2,738	4,223	3,414	4,101	2,765	2,208	5,335	5,128	6,514	3,552	4,699	6,440
2005	6,085	3,705	5,066	7,832	1,983	1,216	1,822	801	541	4,403	2,150	4,011
2006	6,072	4,280	1,651	2,282	1,688	7,560	4,369	1,730	3,613	2,980	6,825	2,990
2007	4,665	1,599	7,479	7,786	2,322	1,633	1,129	927	541	1,594	2,111	4,405
2008	2,629	7,153	7,185	2,477	2,686	1,459	1,102	584	1,187	1,189	1,116	6,215
2009	2,264	1,765	1,384	2,798	3,602	3,930	1,915	4,025	2,235	3,401	2,295	6,396
2010	3,414	2,794	7,525	3,550	2,486	1,083	1,225	582	624	4,131	2,006	3,366
2011	1,088	3,748	8,698	6,971	4,441	1,607	707	4,788	11,380	4,193	5,844	6,051
2012	3,800	2,082	1,879	1,567	3,075	2,863	886	1,052	1,647	3,647	2,602	3,460
2013	3,068	3,625	3,270	2,550	2,311	3,580	2,906	2,026	890	1,551	1,195	3,416
2014	4,430	3,661	5,031	5,788	7,555	2,962	1,623	985	706	1,231	1,152	2,733
2015	2,115	1,471	6,708	3,031	1,206	2,574	2,810	1,047	1,120	1,803	1,442	2,817
2016	2,901	8,296	2,611	1,880	2,476	1,056	892	772	648	947	636	
2017	2,589	1,550	3,067	5,274	2,573	2,303	3,702	3,154	2,150	1,529	1,489	1,045
2018	3,091	7,302	5,251	4,143	5,756	3,482	4,204	9,784	7,814	3,997	10,550	7,143
2019	7,463	5,121	6,456	5,197	7,112	4,899	4,539	1,696	954	1,849	3,233	3,379
2020	3,699	3,575	3,203	4,801	3,716	2,218	2,045	5,234	1,277	1,406	2,450	5,833
2021	3,059	3,135	7,054	3,336	2,088	1,962	1,237	1,951	7,903			
Mean Monthly discharge	3,510	3,660	4,810	4,100	3,320	2,960	2,310	2,490	2,890	2,650	3,170	4,550



5.1.3 Flood Frequency

The 2016 FEMA Flood Insurance Study for Montgomery County, Pennsylvania included flood flow estimates, summarized in

Table 5-2.

Table 5-2. Flood frequency estimates for Norristown, PA

Discharge	Flow (cfs)
10-year flood	62,900
50-year flood	93,700
100-year flood	109,000
500-year flood	146,000

5.1.4 Stormwater

Pennsylvania requires stormwater management plans for each watershed. The Stony Creek/Saw Mill Run watershed feeds into the Schuylkill River directly upstream of Norristown Dam and would therefore most likely affect the storm water flowing passed the project, in addition to flows in the Schuylkill River. This watershed has a management plan in place. In addition, municipalities/counties are required to develop a stormwater program under the MS4 (Municipal Separate Storm Sewer System) to address stormwater discharge from county facilities. Montgomery County is working on developing this program and receiving a permit.

5.1.5 Water Uses

The Schuylkill River is the source of drinking water for residents in several municipalities. There are two drinking water treatment plants (Belmont and Queen Lane) located on the lower Schuylkill River (within the first 12 miles) that are owned and operated by the Philadelphia Water Department. The Schuylkill River supplies water to almost 2 million people. According to the 2006 Schuylkill River Surface Water Protection Plan, over 669 million gallons of water are withdrawn per day from the watershed for uses such as water supply, thermoelectric, industrial, mining, domestic, commercial, livestock, and irrigation. Of that 669 million gallons, 244 million gallons is for drinking water (PWD 2006). According to the Pennsylvania Department of Environmental Protection (PADEP) Water Use Data, in 2021, 242.5 million gallons of surface water per day were withdrawn from the lower Schuylkill River and of that, Montgomery County withdrew 80 million gallons per day with 59 million of that for public water supply.

The PA American Water Company has an intake directly upstream of the Norristown Dam and withdrew approximately 11 million gal per day and discharged on average 0.25 million gal per day in 2022. Of the 11 million gals per day, 34.8% is for domestic use followed by 22.8 for water loss and 19.2 for institutional use (PA DEP electronic discharge monitoring report).

5.1.6 Potential Impacts and Proposed Measures

Because the proposed Project will be operated in a run-of-river mode, it will not alter water levels or flows from what are currently experienced on the Schuylkill River. During periods of lower flows in the river, the majority of the flow will pass through the turbines, concentrating that flow on the south side of the river below the



Norristown Dam. Montgomery County anticipates passing sufficient water over the entire spillway to maintain the wet surface on the spillway, as well as providing flow for the reach immediately below the entire dam length. During periods of the lowest flows (i.e., below the minimum flow of one turbine), all flows will pass over the spillway. No other measures are proposed related to flows.

5.2 Water Quality

5.2.1 Water Quality

Reports from the 1940s state that the river ran black with coal silt and other wastes and that there were no fish at all. At the time, the Schuylkill was regarded as Pennsylvania's dirtiest river. A government sponsored clean-up project was undertaken in the late 1940s and early 1950s which included extensive dredging and the removal of 5 of the original dams on the river. More recently an additional 7 dams were removed between 1999 and 2012 (Towne 2012).

The Schuylkill River has seen significant improvements in important water quality parameters such as dissolved oxygen, ammonia, nitrate, and phosphorous since the 1970s. Schuylkill River nutrient levels (nitrogen and phosphorus) have remained stable or decreased over the past decade due to decreased agricultural runoff within the watershed, along with improved wastewater treatment practices. Dissolved oxygen values have been steadily increasing over the past several decades (PWD 2006). Clean-up efforts may be considered a success as today the river supports a variety of aquatic life and recreational activities and many of the tributaries are designated as high quality.

Based on the Pennsylvania Code Title 25: Chapter 93, the Schuylkill River Critical Use from the mouth to Stony Creek (directly upstream of the Norristown Dam) has been designated as water for warm water fishes (WWF) and migratory fishes (MF). The same designation is given to the impoundment from Stony Creek to Valley Creek. The PA surface water quality criteria and the associated critical uses can be found in



Table 5-3 and Table 5-4.

Under Section 303(d) of the Clean Water Act, states are required to list impaired waters that require a Total Maximum Daily Load (TMDL) to be developed. These waters are classified as a Category 5. While the Schuylkill watershed was classified as a Category 5, it was not put on the list of restoration priorities. However, a TMDL implementation plan was created for the Upper Schuylkill River.



Table 5-3. PA Surface Water Quality Criteria and Critical Uses

Parameter	Symbol	Criteria	Critical Use*
Alkalinity	Alk	Minimum 20 mg/l as CaCO ₃ , except where natural conditions are less. Where discharges are to waters with 20 mg/l or less alkalinity, the discharge should not further reduce the alkalinity of the receiving waters.	CWF, WWF, TSF, MF
Ammonia Nitrogen	Am	<p>In freshwater, the concentration of total ammonia nitrogen (TAN) shall not exceed (more than once in three years on average), the concentration calculated (in milligrams of TAN per liter) by the following:</p> <p>1-hour average Criteria Maximum Concentration (CMC) acute criterion equation:</p> <p>The highest 4-day average within the 30-day averaging period should not be more than 2.5 times the CCC (e.g. 2.5 x 0.2 mg TAN/L at pH 9 and 20°C or 0.5 mg TAN/L) more than once in 3 years on average.</p> <p>The pH and temperature used to derive the appropriate ammonia criteria shall be determined by instream measurements or best estimates, based on reference waters that are representative of the median pH and temperature of the receiving water. Instream measurements for pH and temperature will be gathered using department data collection protocols.</p>	CWF, WWF, TSF, MF
Bacteria	Bac1	<p>(<i>Escherichia coli</i> colony forming units per 100 milliliters (CFU per 100 ml)) During the swimming season (May 1 through September 30), the maximum <i>E. coli</i> level shall be a geometric mean of 126 CFU per 100 ml. The geometric mean for the samples collected in the waterbody should not be greater than 126 CFU per 100 ml in any 30-day interval. There should not be greater than a 10% excursion frequency of 410 CFU per 100 ml for the samples collected in the same 30-day duration interval. (Fecal coliforms/100 ml) For the remainder of the year, the maximum fecal coliform level shall be a geometric mean of 2,000 CFU per 100 ml based on a minimum of five consecutive samples collected on different days during a 30-day period.</p>	WC
Chloride	Ch	Maximum 250 mg/l.	PWS
Color	Col	Maximum 75 units on the platinum-cobalt scale; no other colors perceptible to the human eye.	PWS



Parameter	Symbol	Criteria	Critical Use*
Dissolved Oxygen		The following specific dissolved oxygen criteria recognize the natural process of stratification in lakes, ponds and impoundments. These criteria apply to flowing freshwater and to the epilimnion of a naturally stratified lake, pond or impoundment. The hypolimnion in a naturally stratified lake, pond or impoundment is protected by the narrative water quality criteria in § 93.6 (relating to general water quality criteria). For nonstratified lakes, ponds or impoundments, the dissolved oxygen criteria apply throughout the lake, pond or impoundment to protect the critical uses.	
	DO1	For flowing waters, 7-day average 6.0 mg/l; minimum 5.0 mg/l. For naturally reproducing salmonid early life stages, applied in accordance with subsection (b), 7-day average 9.0 mg/l; minimum 8.0 mg/l. For lakes, ponds and impoundments, minimum 5.0 mg/l.	CWF
	DO2	7-day average 5.5 mg/l; minimum 5.0 mg/l.	WWF
	DO3	For the period February 15 to July 31 of any year, 7-day average 6.0 mg/l; minimum 5.0 mg/l. For the remainder of the year, 7-day average 5.5 mg/l; minimum 5.0 mg/l.	TSF
Fluoride	F	Daily average 2.0 mg/l.	PWS
Iron	Fe1	30-day average 1.5 mg/l as total recoverable.	CWF, WWF, TSF, MF
	Fe2	Maximum 0.3 mg/l as dissolved.	PWS
Manganese	Mn	Maximum 1.0 mg/l, as total recoverable.	PWS
Nitrite plus Nitrate	N	Maximum 10 mg/l as nitrogen.	PWS
Osmotic Pressure	OP	Maximum 50 milliosmoles per kilogram.	CWF, WWF, TSF, MF
pH	pH	From 6.0 to 9.0 inclusive.	CWF, WWF, TSF, MF
Phenolics (except § 307(a)(1) (33) U.S.C.A. § 1317(a)(1)), Priority Pollutants)	Phen	Maximum 0.005 mg/l.	PWS
Sulfate	Sul	Maximum 250 mg/l.	PWS
Temperature		Maximum temperatures in the receiving water body resulting from heated waste sources regulated under Chapters 92a, 96 and other sources where temperature limits are necessary to protect designated and existing uses.	See the following table.
Total Dissolved Solids	TDS	500 mg/l as a monthly average value; maximum 750 mg/l.	PWS



Parameter	Symbol	Criteria	Critical Use*
Total Residual Chlorine	TRC	Four-day average 0.011 mg/l; 1-hour average 0.019 mg/l.	CWF, WWF, TSF, MF

CWF=Cold Water Fishes, WWF=Warm Water Fishes, MF= Migratory Fishes, TSF= Trout Stocking, PWS= Potable Water Supply, WC= Water Contact Sports

Table 5-4. PA Surface Water Temperature Criteria

CRITICAL USE PERIOD	TEMP 1	TEMP 2	TEMP 3
	CWF (°F)	WWF (°F)	TSF (°F)
January 1-31	38	40	40
February 1-29	38	40	40
March 1-31	42	46	46
April 1-15	48	52	52
April 16-30	52	58	58
May 1-15	54	64	64
May 16-31	58	72	68
June 1-15	60	80	70
June 16-30	64	84	72
July 1-31	66	87	74
August 1-15	66	87	80
August 16-30	66	87	87
September 1-15	64	84	84
September 16-30	60	78	78
October 1-15	54	72	72
October 16-31	50	66	66
November 1-15	46	58	58
November 16-30	42	50	50
December 1-31	40	42	42

5.2.2 USGS Water Quality Data

The USGS has a gage (01473500) located on the Schuylkill River approximately 0.6 miles upstream of the Norristown Dam and has been collecting water quality data at this site since 2012. During this time, water temperature has ranged from 0 to 32.1 °C (Figure 5-4), DO ranged from 3.6 to 16.1 mg/L (Figure 5-5) and pH ranged from 7 to 9.6 (Figure 5-6).

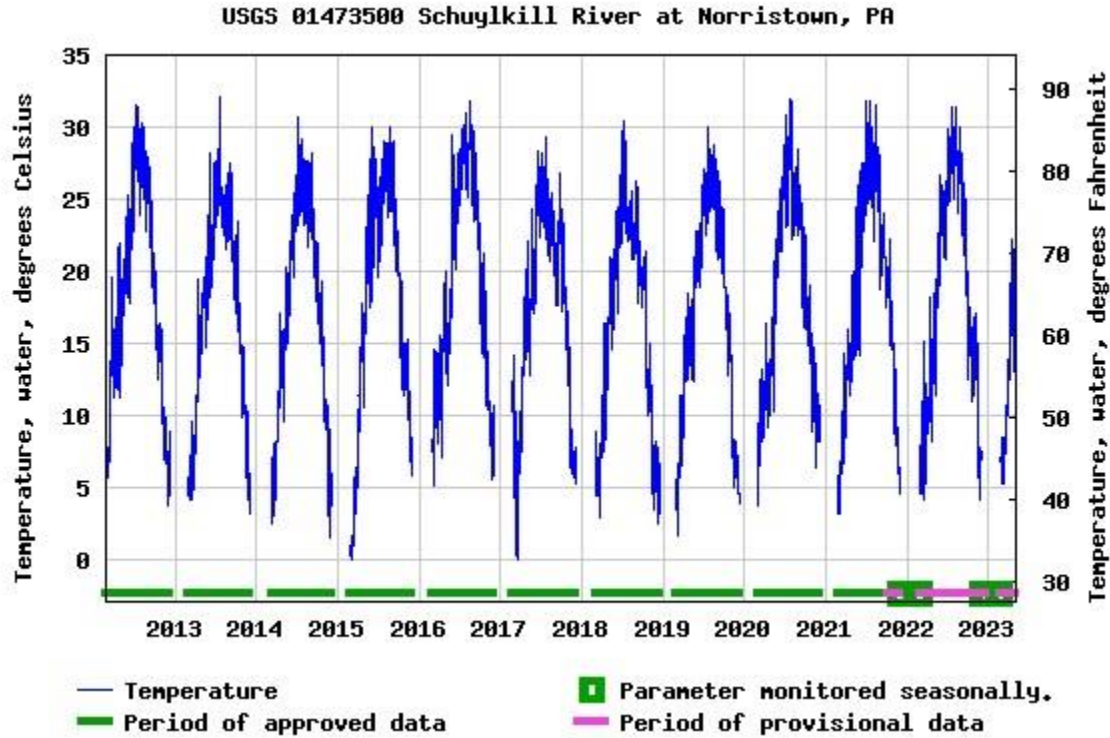


Figure 5-4. Water temperature data from the USGS Schuylkill River gage upstream of Norristown Dam from 2012 to 2023

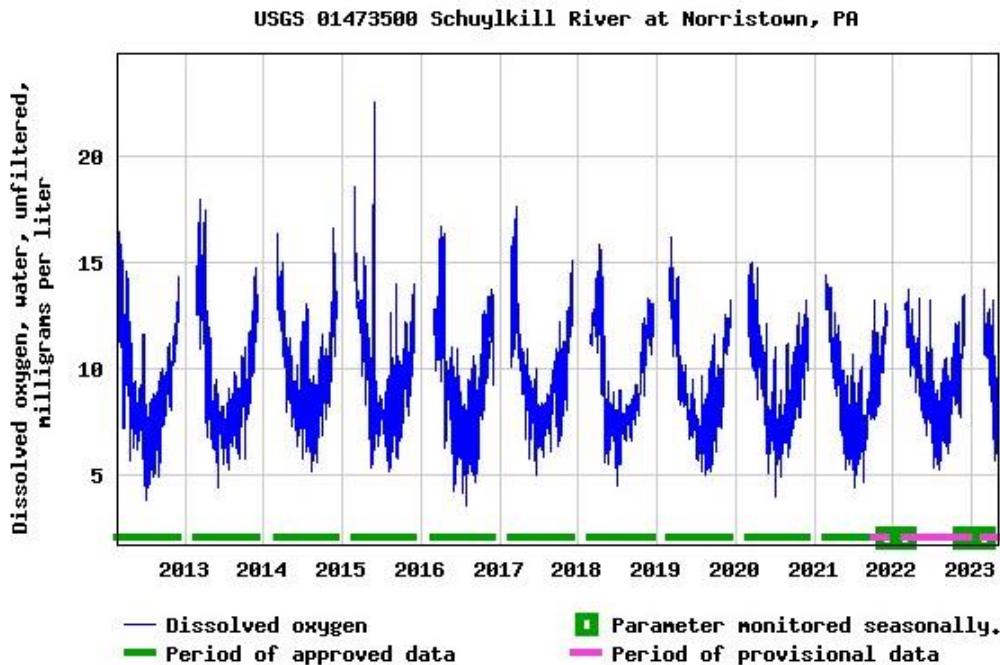


Figure 5-5. Dissolved oxygen data from the USGS Schuylkill River gage upstream of Norristown Dam from 2012 to 2023

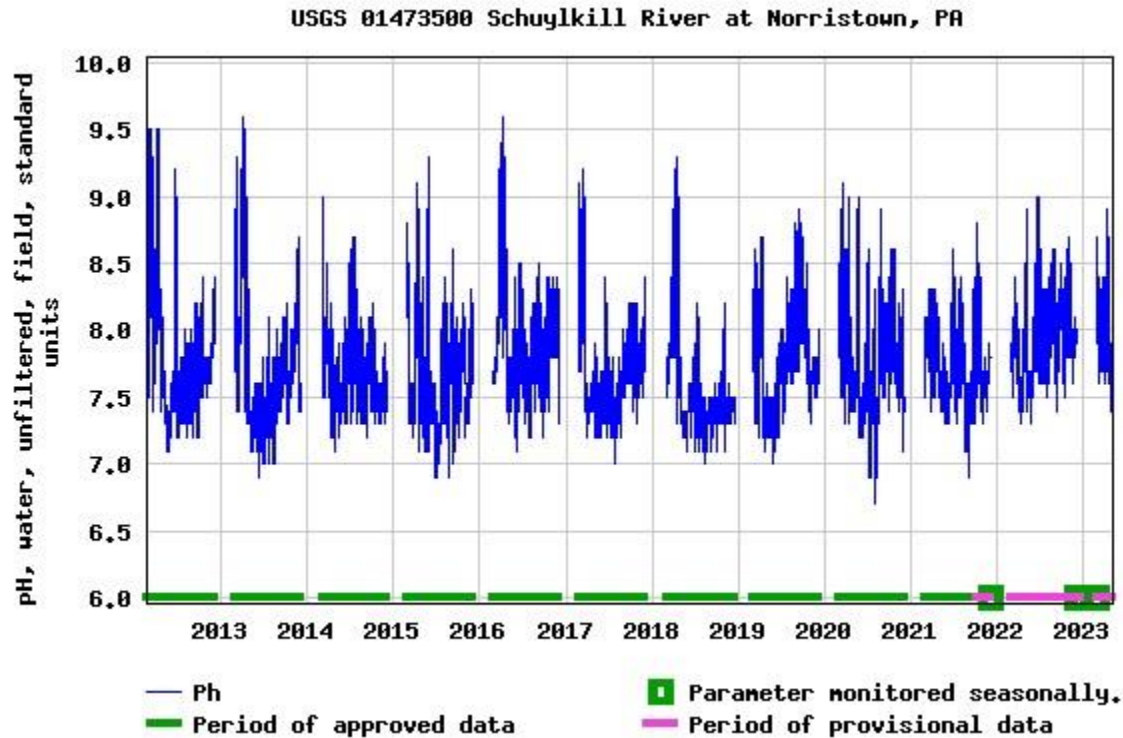


Figure 5-6. pH data from the USGS Schuylkill River gage upstream of Norristown Dam from 2012 to 2023

5.2.3 Potential Impacts and Proposed Measures

As a run-of-river facility, the Project will not alter inflows, outflows, or impoundment surface elevations from what presently occurs. During some flow ranges, more flow will be concentrated towards the south side of the dam where the turbines are proposed to be located. This may affect the wetted areas below the dam. However, downstream constrictions are also likely to affect water levels across the width of the river below the dam. The applicant will pay close attention to the flow distribution in the project area with respect to maintenance of adequate aquatic habitat, water quality, and attraction flows for fish passage while balancing flows required for generation based on the flow requirements determined by the agencies.

5.3 Geology & Soils

5.3.1 Regional Settings

The Schuylkill River flows through four major geological landscape provinces from its headwaters to its mouth; Ridge and Valley, New England, Piedmont, and the Atlantic Coastal Plain. Except for unconsolidated deposits on the Coastal Plain, most aquifers within the Schuylkill River watershed are composed of consolidated rocks (Biesecker et al. 1968).

5.3.2 Bedrock and Surficial Geology

In the Project Area, the Schuylkill River crosses into a section known as the Piedmont Lowland Section of the Piedmont Physiographic Province. According to the PA DNCR Geologic Survey, Montgomery County is made up of the Stockton Formation from the Jurassic and Triassic Eras and consists of mainly arkosic sandstone as well as



red to purplish-red sandstone, shale, siltstone, and mudstone. This region has mixed topography (uplands, hillsides, and valleys) which is developed on residuum, colluvium, and alluvium.

5.3.3 Soils and Sediment Quality

The two main soil types in Montgomery County are Neshaminy-Lehigh-Glenelg and Ungers-Penn-Klinesville (Figure 5-7). These soil types are well drained, consist of slow to rapid runoff, and tend to be found on significant slopes (PWD 2006).

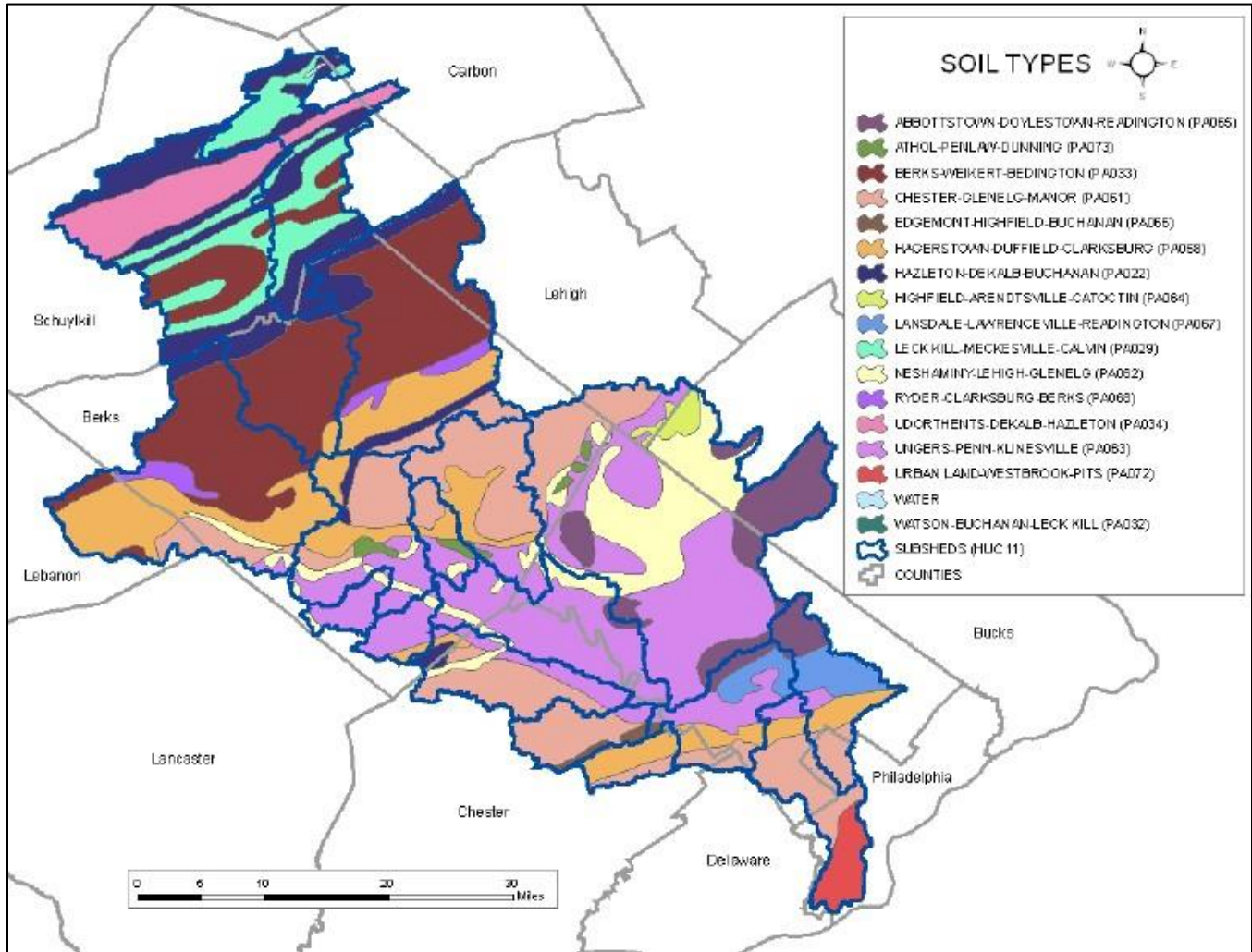


Figure 5-7. Soil Types in the Schuylkill River Watershed (PWD 2006)

5.3.4 Potential Impacts and Proposed Measures

Construction of the project will have no effects on the geology of the area and limited direct impacts on soils and sediment. During construction, sediment in the immediate vicinity of the upstream face of the dam and the proposed intake will be removed and disposed of at an approved upland location. The Applicant is investigating the potential for these sediments to be contaminated and will follow all testing and management requirements



as appropriate. After construction and during operations of the hydropower project, there may be the potential to allow sediments historically that have been retained by the dam to be dispersed downstream. However, such sediments likely pass the dam during higher flows in the absence of the proposed Project.

The Project is proposed to be constructed on the waterward side of the existing fish ladder and the turbine discharge will be designed to direct flow toward the center of the river practically eliminating the potential for shoreline erosion.

5.4 Fish and Aquatic Resources

There are limited data for aquatic resources in the vicinity of the Norristown Dam due to only a few sampling efforts being conducted in the past. Available information is summarized below.

5.4.1 Fish

The Pennsylvania Fish and Boat Commission (PA FBC) conducted a smallmouth bass electro-fishing survey of the Schuylkill River downstream of the Project dam near Bridgeport in 2009. While electrofishing, other game fish species of interest were collected and, in addition to Smallmouth Bass, included Walleye, Channel Catfish, Flathead Catfish, and American Eel (Table 5-5) (PA FBC 2009). In 2012, the PA FBC conducted an American Shad electrofishing survey. Sampling at the Norristown Dam (RM 20.7-24.0) collected nine species including American Shad (Table 5-5)(PA FBC 2012).

Table 5-5. Fish Community Data from Electrofishing Surveys Near the Norristown Dam

Common Name	Scientific Name	2009 Smallmouth Bass Survey (Bridgeport, PA)	2012 American Shad Survey (Norristown Dam)
American Eel	<i>Anguilla rostrata</i>	X	X
American Shad	<i>Alosa sapidissima</i>		X
Channel Catfish	<i>Ictalurus punctatus</i>		X
Flathead Catfish	<i>Pylodictis olivaris</i>		X
Gizzard Shad	<i>Dorosoma cepedianum</i>		X
Rock Bass	<i>Ambloplites rupestris</i>	X	
Redbreast Sunfish	<i>Lepomis auritus</i>	X	
Green Sunfish	<i>Lepomis cyanellus</i>	X	X
Bluegill	<i>Lepomis macrochirus</i>	X	
Smallmouth Bass	<i>Micropterus dolomieu</i>	X	X
Largemouth Bass	<i>Micropterus salmoides</i>	X	
Tessellated Darter	<i>Etheostoma olmstedii</i>	X	
Spotfin Shiner	<i>Cyprinella spiloptera</i>		X
Quillback Carpsucker	<i>Carpionodes cyprinus</i>		X
White Sucker	<i>Catostomus commersonii</i>	X	

5.4.2 Benthos

While there have been some macroinvertebrate studies conducted in the Schuylkill River Basin, these studies were mostly conducted in the tributaries to the mainstem and to determine water quality and health of that particular stream or reach. One mainstem site was sampled upstream of Norristown Dam near Eagleville, PA in



2015. There were 16 taxa identified and the condition of the river at this site was categorized as poor (PA DEP 2021).

Most recently, the Stroud Water Research Center conducted an 11-year study (1996-2007) looking at the macroinvertebrate community at 19 different sites on multiple tributaries of the Schuylkill River. The closest site to Norristown Dam was in Valley Creek, approximately 6.5 miles upstream, which had an average Macroinvertebrate Aggregated Index for Stream (MAIS) of Fair (Jackson 2009).

5.4.3 Freshwater Mussels

According to the PA FBC, there are eight species of freshwater mussels found in the Schuylkill River. However, no information was located to determine if they are present in the vicinity of the Norristown Dam. These include one federally and state endangered species (Dwarf Wedgemussel) and one species of concern (Tidewater Mucket) (Table 5-6).

Table 5-6. Freshwater Mussels in the Schuylkill River (PA FBC 2018)

Common Name	Scientific Name
Alewite Floater	<i>Anodonta implicata</i>
Brook Floater	<i>Alasmidonta varicosa</i>
Creeper	<i>Strophitus undulatus</i>
Dwarf Wedgemussel	<i>Alasmidonta heterodon</i>
Eastern Floater	<i>Pyganodon cataracta</i>
Green Floater	<i>Lasmigona subviridis</i>
Tidewater Mucket	<i>Leptodea ochracea</i>
Triangle Floater	<i>Alasmidonta undulata</i>

5.4.4 Aquatic Nuisance Species

Aquatic nuisance species or invasive species are usually defined as non-native species that are or can cause harm to the environment. Helping to prevent the spread of these species is of great importance. Aquatic invasive species in Montgomery County consist of 17 invasive plants, 3 invertebrates, 3 fish, and 2 turtle species (

Table 5-7).

5.4.5 Potential Impacts and Proposed Measures

Development of the project may have impacts on the efficiency of the existing upstream passage facility and cause migratory delays. Fish passage will be assessed and modifications to the existing facility or development of additional facilities will be implemented as required to maintain or improve fish passage at Norristown Dam. In addition, impingement on the intake racks and turbine entrainment of migratory and resident species may occur. The Applicant will conduct a study to assess the magnitude and significance of fish impingement and entrainment on populations in the Schuylkill River. If necessary, modifications to the intakes will be undertaken to reduce potential impacts of turbine entrainment on affected fish populations.

**Table 5-7. Aquatic Invasive Species in Montgomery County (PA SeaGrant 2015)**

Type	Common Name	Scientific Name
Plants	Brazilian Elodea	<i>Egeria densa</i>
	Curly-leaf Pondweed	<i>Potamogeton crispus</i>
	Eurasian Watermilfoil	<i>Myriophyllum spicatum</i>
	Narrowleaf Cattails	<i>Typha angustifolia</i>
	Hybrid Cattails	<i>Typhax glauca</i>
	Water Chestnut	<i>Trapa natans</i>
	Yellow Iris	<i>Iris pseudacorus</i>
	Common Privet	<i>Ligustrum vulgare</i>
	Common Reed	<i>Phragmites australis</i>
	Exotic Bush Honeysuckles	<i>Lonicera sp.</i>
	Japanese Hop	<i>Humulus japonicus</i>
	Japanese Knotweed	<i>Fallopia japonica</i>
	Japanese Stilt Grass	<i>Microstegium vimineum</i>
	Lesser Celandine	<i>Ficaria verna</i>
	Oriental Bittersweet	<i>Celastrus orbiculatus</i>
Purple Loosestrife	<i>Lythrum salicaria</i>	
Reed Canary Grass	<i>Phalaris arundinacea</i>	
Invertebrates	Asian Clam	<i>Coricula fluminea</i>
	Chinese Mystery Snail	<i>Cipangopaludina chinensis malleata</i>
	Red Swamp Crayfish	<i>Procambarus clarkii</i>
Fish	Common Carp	<i>Cyprinus carpio</i>
	Flathead Catfish	<i>Pylodictis olivaris</i>
	Grass Carp	<i>Ctenopharyngodon idella</i>
Turtles	Red-eared Slider	<i>Trachemys scripta elegans</i>
	Yellow-bellied Slider	<i>Trachemys scripta scripta</i>

5.5 Fish Passage

5.5.1 Description

The Norristown Dam is the fourth dam on the Schuylkill River; all four dams have upstream fish passage facilities. The existing fish ladder was constructed at the Norristown Dam in 1994 as part of restoration efforts for American Shad (*Alosa sapidissima*) and other Alosines, including Blueback Herring (*Alosa aestivalis*) and Alewife (*Alosa pseudoharengus*), as well as Striped Bass (*Morone saxatilis*), to the Schuylkill River. Prior to transferring the Norristown Dam to the County, PECO designed and installed a Denil fishway with a viewing window for observations on the south (right) bank of the river (Figure 5-8).



Figure 5-8. Norristown Dam fishway entrance

Between 2002 and 2011, the Philadelphia Water Department (PWD) maintained a robust monitoring program on the Schuylkill River, quantifying the resurgence of key migratory species including American Shad, assessing the relative health and abundance of both resident and migratory fish, and evaluating the success of restoration activities with fish passage counts at the Fairmount Dam Fishway. The 2010 fish passage season at the Fairmount Fishway was a record-breaking year, with 2,521 American Shad ascending the fishway. This number was the highest recorded and more than seven times greater than passage numbers prior to the renovations in 2008. From 2011 to 2016, there was an estimate of 1,500 shad passing the dam. However, only 624 passed in 2018 (DeSalvo et al. 2022). At the Fairmount Dam, about 96% of the shad returning to spawn are of hatchery origin.

In addition to monitoring American Shad passage, fish counts of all species that pass through the Fairmount fishway are conducted. In 2005, a total of 8,003 fish passed the dam and in 2006 the total increased to 16,839. While 30 different species have been observed using the fishway, the majority were Channel Catfish, Common Carp, Quillback, and White Sucker (Table 5-8)



Table 5-8. Fairmount Dam fishway counts (Perillo and Butler 2009)

Common Name	Scientific Name	2005	2006
American Eel	<i>Anguilla rostrata</i>	70	34
American Shad	<i>Alosa sapidissima</i>	41	345
Bluegill	<i>Lepomis macrochirus</i>	147	276
Brown Trout	<i>Salmo trutta</i>	7	5
Bullhead Catfish	<i>Ameirus nebulosus</i>	-	2
Channel Catfish	<i>Ictalurus punctatus</i>	1,663	3,421
Common Carp	<i>Cyprinus carpio</i>	1,197	2,215
Flathead Catfish	<i>Pylodictis olivaris</i>	43	466
Gizzard Shad	<i>Dorosoma cepedianum</i>	553	2,899
Grass Carp	<i>Ctenopharyngdon idella</i>	-	1
Hickory Shad	<i>Alosa mediocris</i>	-	9
Hybrid Striped Bass	<i>Morone saxatilis chrysops</i>	16	48
Hybrid Trout		8	40
Largemouth Bass	<i>Micropterus salmoides</i>	10	42
Minnnow		7	-
Pumpkinseed	<i>Lepomis gibbosus</i>	7	1
Quillback	<i>Carpoides cyprinus</i>	2,042	2,631
Rainbow Trout	<i>Oncorhynchus mykiss</i>	13	16
Redbreast Sunfish	<i>Lepomis aurius</i>	3	4
River Herring	<i>Alosa sp.</i>	5	7
Rock Bass	<i>Ambloplites rupestris</i>	1	-
Smallmouth Bass	<i>Micropterus dolomieu</i>	124	1,225
Statinfin Shiner	<i>Cyprinella analostana</i>	2	-
Striped Bass	<i>Morone saxatilis</i>	127	61
Sunfish	<i>Lepomis sp.</i>	10	2
Trout		1	-
Walleye	<i>Sander vireus</i>	33	84
White Catfish	<i>Ameirus catus</i>	1	6
White Perch	<i>Morone americana</i>	105	112
White Sucker	<i>Catostomus commersoni</i>	1,767	2,887
Total		8,003	16,839

5.5.2 Potential Impacts and Proposed Measures

Installation of hydroelectric power generation at the Norristown Dam has the potential to affect the existing fish passage facility through modification of attraction flow conditions as well as introducing a potential source of mortality during downstream migrations. The Applicant will study the siting and configuration of the Project intake and discharge as they relate to the performance of the existing fish passage system and the overall protection of fish. Modifications to maintain or improve the effectiveness of the fish passage system will be analyzed for implementation.



5.6 Wildlife and Botanical Resources

5.6.1 Description

The Schuylkill River watershed is mainly located in the Northern Piedmont ecoregion with the immediate Project area being in the Triassic lowlands subregion. Terrain in the Northern Piedmont ecoregion is intermediate between the mountains to the northwest and the flatter coastal plain to the southeast, with rolling hills, irregular plains, and open valleys dominating the region.

Prior to European settlement, native vegetation of the Northern Piedmont ecoregion consisted mainly of Appalachian oak and hickory forests with associated species including chestnut, yellow-poplar, ash, walnut, and elm (McNab and Avers 1994). Presently, most of the forests in this broader region have been cleared and the composition of the remaining forests has been greatly changed, with red maple-mixed hardwoods and hemlock-mixed hardwoods dominating (Zimmerman et al. 2012). Eastern American Chestnut has been virtually eliminated by the Chestnut blight, and American Elm numbers greatly reduced. Eastern redcedar (*Juniperus virginiana*) is abundant on abandoned farmland and other cleared areas. Currently, most of the Triassic lowlands subregion is used for either agriculture or residential development. The Project lies within the Piedmont ecoregion of Pennsylvania (Figure 5-9).

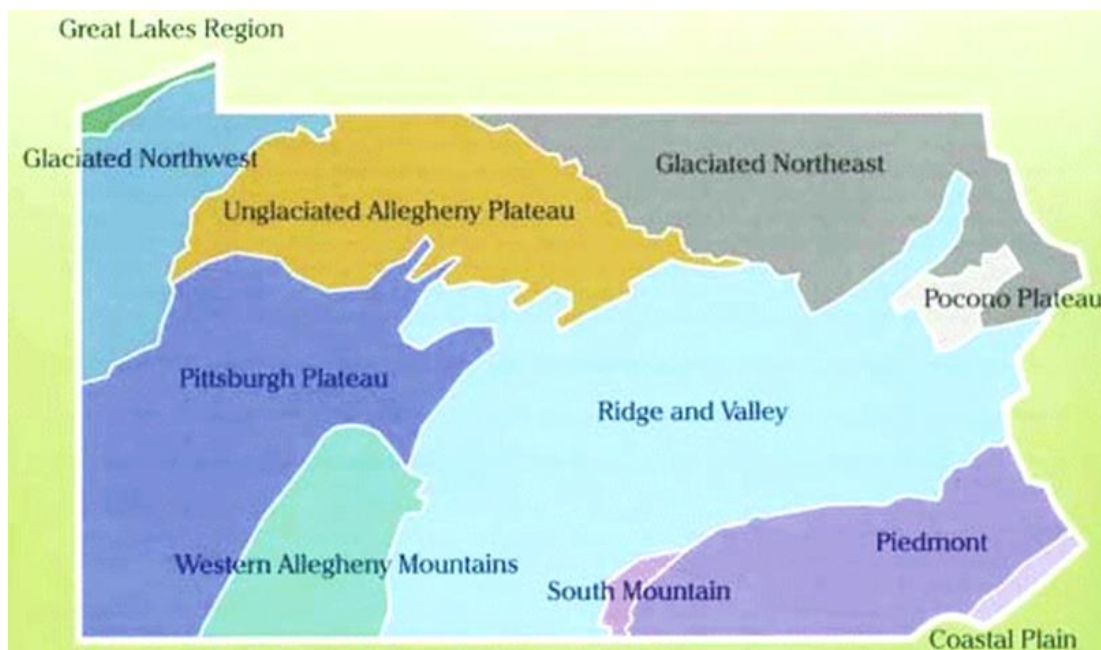


Figure 5-9. Ecoregions of Pennsylvania (PA DCNR 2023a)

Development of the Schuylkill River corridor in the vicinity of the Project has resulted in the replacement of native forest cover with a residential and industrial built environment with predominantly low- and high-density urban areas. Botanical resources and wildlife in the immediate Project area are anticipated to be typical of those found in disturbed urban environments.



5.6.2 Botanical Resources

Pennsylvania maintains a Natural Areas Inventory (NAI) of sites of statewide and local significance, designated as Conservation Landscapes, where the presence of species of special concern and/or exemplary natural communities have been documented. Further finer scale designations of Natural Heritage Areas (NHAs) are identified as areas that support rare plants or animals, exemplary ecological communities, and Pennsylvania’s native species biodiversity. The upstream end of the Project boundary (Exhibit G) encompasses the downstream end of the Middle Schuylkill River Conservation Landscape (Rhoads and Block 2007). This downstream end of the Conservation Landscape has been designated as the Schuylkill River-Port Providence National Heritage Area (NHA), which is delineated around the stretch of the river from Phoenixville downstream through Valley Forge National Historical Park to Port Indian (Figure 5-10). This area has been highly developed, with a narrow strip of riparian forest remaining along the floodplain.

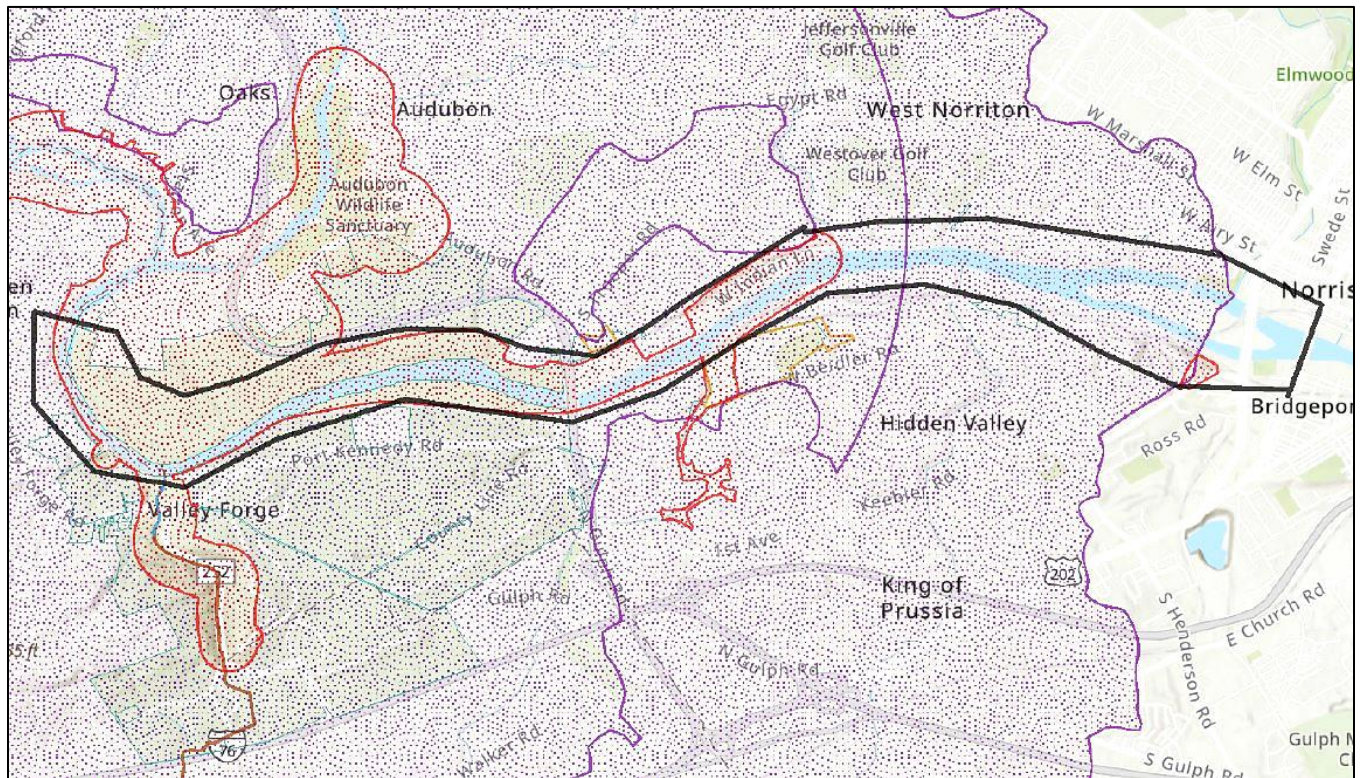


Figure 5-10. Core habitat (red border and stipple) and supporting landscapes (purple border and stipple) in the Schuylkill River-Port Providence and Barbados Overlook National Heritage Areas (PA DCNR 2023). The black border is the Project Boundary

Terrestrial upland vegetation communities in Valley Forge National Historical Park include dry oak forest, tulip tree-oak forest, Black (Sweet) Birch talus slope, Northeastern modified successional forest, conifer and broad-leaf tree plantations, and grasslands (Rhoads and Block 2007). Dominating species in dry oak, tulip tree forest and Black (Sweet) Birch talus slope habitats are Chestnut Oak (*Quercus montana*), usually occurring with a mix of Black Oak (*Quercus velutina*), Scarlet Oak (*Quercus coccinea*), and White Oak (*Quercus alba*); Red Maple (*Acer rubrum*), and Tuliptree (*Liriodendron tulipifera*), Black Gum (*Nyssa sylvatica*), and Black (Sweet) Birch (*Betula lenta*). Other tree species include Sassafras (*Sassafras albidum*), Pignut Hickory (*Carya glabra*), Pitch Pine (*Pinus rigida*), Virginia Pine (*Pinus virginiana*), and Eastern White Pine (*Pinus strobus*). Common shrub species include Mountain Laurel (*Kalmia latifolia*), Black Huckleberry (*Gaylussacia baccata*), Lowbush Blueberry (*Vaccinium*



pallidum), Low Sweet Blueberry (*Vaccinium angustifolium*), Maple-leaved Viburnum (*Viburnum acerifolium*), Sweet Fern, (*Comptonia perigrina*), Flowering Dogwood (*Cornus florida*), Witch Hazel (*Hamamelis virginiana*) and Spicebush (*Lindera benzoin*) (Zimmerman et al. 2012). Grassland communities in Valley Forge National Historical Park are predominately made up of Glomerate Sedge (*Carex aggregata*) (Rhoads and Block 2007).

Terrestrial vegetation species of concern within the Schuylkill River-Port Providence NHA include Spreading Rockcress (*Arabis patens*) and Wild Kidney Bean (*Phaseolus polystachios*), which the Pennsylvania Natural Heritage program has listed as 'imperiled'. Currently, no legal status exists for these species, but they are under review for future listing as threatened or endangered (PNHP 2013).

Further downstream, in Bridgeport, PA, the Barbados Overlook has been designated as an NHA (Figure 5-10) due to a small population of a tree species of concern that occurs hillside along aspen and oaks (PA DCNR 2023). Currently, this tree species of concern is not named by the request of the jurisdictional agency responsible for its protection.

The immediate area surrounding the Project is a mixture of low- and high-density urban and residential areas and industry (Figure 5-16), and does not contain core habitat or supporting landscapes for ecological communities (Figure 5-10). There are presently no data on terrestrial vegetation abundance and diversity specifically in Norristown and Bridgeport regions of the Schuylkill River, but the terrestrial community type that usually occurs on highly disturbed sites or in small woodlots in an agricultural or suburban matrix is black locust forest, where Black Locust (*Robinia pseudoacacia*) is usually the dominant tree. Other characteristic species include Sweet Birch (*Betula lenta*), Red Maple (*Acer rubrum*), Sassafras (*Sassafras albidum*), various oaks (*Quercus* spp.), or Wild Black Cherry (*Prunus serotina*). Poison Ivy (*Toxicodendron radicans*) is commonly abundant in disturbed sites. Invasive species typically predominate in disturbed areas, with characteristic species including Norway Maple (*Acer platanoides*) Japanese Honeysuckle (*Lonicera japonica*), Japanese Knotwood (*Fallopia japonica*), Tree-of-heaven (*Ailanthus altissima*), Morrow's Honeysuckle (*Lonicera morrowii*), Japanese Barberry (*Berberis thunbergii*), Garlic Mustard (*Alliaria petiolate*), Mile-a-minute (*Persicaria perfoliata*), Stilt Grass (*Microstegium vimineum*), Kentucky Bluegrass (*Poa pratensis*), Orchard Grass (*Dactylis glomerata*), and Velvet Grass (*Holcus lanatus*) (Zimmerman et al. 2012).

5.6.3 Wildlife

As with changes in the native vegetation, human impacts on the river corridor including in the Project area, have affected the presence and abundance of animal species. Animals which are expected to occur in the vicinity of the Project are those that have become habituated to human presence and activities. More reclusive species are not expected to occur due to the historic and ongoing modifications in the immediate area of the dam. No specific wildlife inventories have been conducted in the Project area, however, monitoring and sightings in Montgomery County and nearby parks provide a list of fauna that could be expected to be found in the area.

5.6.3.1 Amphibians and Reptiles

Amphibians and reptiles found in Montgomery County (PARS 2023) and Valley Forge National Historical Park (NHP) (Rhoads and Block 2007) are listed in Table 5-9. Montgomery County records encompass monitoring and sightings from the 1930s until present. Surveys at Valley Forge NHP were conducted in 1999-2002 and 2006 and 2007.



Table 5-9. Amphibians and reptiles found in Montgomery County and Valley Forge National Historical Park (NHP)

Type	Common Name	Scientific Name	Montgomery County	Valley Forge NHP
Salamanders	Eastern Long-tailed Salamander	<i>Eurycea longicauda</i>	X	X
	Eastern Red-backed Salamander	<i>Plethodon cinereus</i>	X	X
	Four-toed Salamander	<i>Hemidactylium scutatum</i>	X	
	Northern Dusky Salamander	<i>Desmognathus fuscus</i>	X	X
	Northern Red Salamander	<i>Pseudotriton ruber</i>	X	X
	Northern Slimy Salamander	<i>Plethodon glutinosus</i>	X	X
	Northern Two-lined Salamander	<i>Eurycea bislineata</i>	X	X
	Red-spotted Newt	<i>Notophthalmus viridescens</i>	X	X
	Spotted Salamander	<i>Ambystoma maculatum</i>	X	
Frogs and Toads	American Bullfrog	<i>Lithobates catesbeianus</i>	X	X
	Eastern American Toad	<i>Anaxyrus americanus</i>	X	X
	Fowler's Toad	<i>Anaxyrus fowleri</i>	X	X
	Gray Treefrog	<i>Hyla versicolor</i>	X	X
	Green Frog	<i>Lithobates clamitans</i>	X	X
	Pickerel Frog	<i>Lithobates palustris</i>	X	X
	Spring Peeper	<i>Pseudacris crucifer</i>	X	X
	Unknown Gray Treefrog	<i>Hyla Unknown/Complex</i>	X	
	Wood Frog	<i>Lithobates sylvaticus</i>	X	X
Turtles	Diamondback Terrapin	<i>Malaclemys terrapin</i>	X	
	Eastern Box Turtle	<i>Terrapene carolina</i>	X	X
	Eastern Musk Turtle	<i>Sternotherus odoratus</i>	X	X
	Eastern Painted Turtle	<i>Chrysemys picta picta</i>	X	X
	Eastern Spiny Softshell	<i>Apalone spinifera</i>	X	X
	Northern Map Turtle	<i>Graptemys geographica</i>	X	X
	Northern Red-bellied Cooter	<i>Pseudemys rubriventris</i>	X	X
	Painted Turtle	<i>Chrysemys picta</i>	X	
	Pond Slider	<i>Trachemys scripta</i>	X	
	Red-eared Slider	<i>Trachemys scripta elegans</i>	X	X
	River Cooter	<i>Pseudemys concinna</i>	X	
	Snapping Turtle	<i>Chelydra serpentina</i>	X	X
	Spotted Turtle	<i>Clemmys guttata</i>	X	
	Wood Turtle	<i>Glyptemys insculpta</i>	X	
	Yellow-bellied Slider	<i>Trachemys scripta scripta</i>	X	
Snakes	Eastern Gartersnake	<i>Thamnophis sirtalis</i>	X	X
	Eastern Milksnake	<i>Lampropeltis triangulum</i>	X	X
	Eastern Ratsnake	<i>Pantherophis alleghaniensis</i>	X	
	Northern Black Racer	<i>Coluber constrictor</i>	X	X
	Northern Brownsnake	<i>Storeria dekayi</i>	X	X
	Northern Copperhead	<i>Agkistrodon contortrix</i>	X	X
	Northern Ring-necked Snake	<i>Diadophis punctatus</i>	X	X



Type	Common Name	Scientific Name	Montgomery County	Valley Forge NHP
	Northern Watersnake	<i>Nerodia sipedon</i>	X	X
	Queensnake	<i>Regina septemvittata</i>	X	X
Lizards	Eastern Fence Lizard	<i>Sceloporus undulatus</i>	X	
	Italian Wall Lizard	<i>Podarcis sicula</i>	X	
	Mediterranean House Geckos	<i>Hemidactylus turcicus</i>	X	

5.6.3.2 Birds

Pennsylvania developed the first statewide Important Bird Area (IBA) program in the country. A group of scientific advisors known as the Ornithological Technical Committee has identified over 80 IBA sites encompassing over two million acres of Pennsylvania's public and private land. These areas include migratory staging areas, winter roost sites and prime breeding areas for songbirds, wading birds, and other species. There are no IBAs located within the Project boundary or outside the immediate area of the Project boundary. Bird species found in Norristown Farm Park, located approximately five miles away from the Project site, are listed in Table 5-10.

Table 5-10. Bird species sighted in Norristown Farm Park (eBird 2023, iNaturalist 2023)

Common Name	Scientific Name
American Crow	<i>Corvus brachyrhynchos</i>
American Goldfinch	<i>Spinus tristis</i>
American Pipit	<i>Anthus rubescens</i>
American Redstart	<i>Setophaga ruticilla</i>
American Robin	<i>Turdus migratorius</i>
American Tree Sparrow	<i>Spizelloides arborea</i>
Baltimore Oriole	<i>Icterus galbula</i>
Barn Swallow	<i>Hirundo rustica</i>
Black Vulture	<i>Coragyps atratus</i>
Blue Jay	<i>Cyanocitta cristata</i>
Blue-gray Gnatcatcher	<i>Poliophtila caerulea</i>
Bobolink	<i>Dolichonyx oryzivorus</i>
Brown-headed Cowbird	<i>Molothrus ater</i>
Bufflehead	<i>Bucephala albeola</i>
Canada Goose	<i>Branta canadensis</i>
Carolina Chickadee	<i>Poecile carolinensis</i>
Carolina Wren	<i>Thryothorus ludovicianus</i>
Cedar Waxwing	<i>Bombycilla cedrorum</i>
Chimney Swift	<i>Chaetura pelagica</i>
Chipping Sparrow	<i>Spizella passerina</i>
Common Grackle	<i>Quiscalus quiscula</i>
Common Loon	<i>Gavia immer</i>
Common Merganser	<i>Mergus merganser</i>



Common Name	Scientific Name
Common Nighthawk	<i>Chordeiles minor</i>
Common Yellowthroat	<i>Geothlypis trichas</i>
Dark-eyed Junco	<i>Junco hyemalis</i>
Double-crested Cormorant	<i>Phalacrocorax auritus</i>
Downy Woodpecker	<i>Dryobates pubescens</i>
Eastern Bluebird	<i>Sialia sialis</i>
Eastern Phoebe	<i>Sayornis phoebe</i>
Eastern Towhee	<i>Pipilo erythrophthalmus</i>
European Starling	<i>Sturnus vulgaris</i>
Field Sparrow	<i>Spizella pusilla</i>
Fish Crow	<i>Corvus ossifragus</i>
Golden-crowned Kinglet	<i>Regulus satrapa</i>
Gray Catbird	<i>Dumetella carolinensis</i>
Great Blue Heron	<i>Ardea herodias</i>
Green-winged Teal	<i>Anas carolinensis</i>
Hooded Merganser	<i>Lophodytes cucullatus</i>
Horned Lark	<i>Eremophila alpestris</i>
House Finch	<i>Haemorhous mexicanus</i>
House Sparrow	<i>Passer domesticus</i>
House Wren	<i>Troglodytes aedon</i>
Indigo Bunting	<i>Passerina cyanea</i>
Killdeer	<i>Charadrius vociferus</i>
Least Sandpiper	<i>Calidris minutilla</i>
Magnolia Warbler	<i>Setophaga magnolia</i>
Mallard	<i>Anas platyrhynchos</i>
Mourning Dove	<i>Zenaida macroura</i>
Northern Cardinal	<i>Cardinalis cardinalis</i>
Northern Flicker	<i>Colaptes auratus</i>
Northern Mockingbird	<i>Mimus polyglottos</i>
Northern Pintail	<i>Anas acuta</i>
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>
Osprey	<i>Pandion haliaetus</i>
Palm Warbler	<i>Setophaga palmarum</i>
Pectoral Sandpiper	<i>Calidris melanotos</i>
Pine Siskin	<i>Spinus pinus</i>
Purple Finch	<i>Haemorhous purpureus</i>
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>
Red-shouldered Hawk	<i>Buteo lineatus</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
Red-winged Blackbird	<i>Agelaius phoeniceus</i>
Ring-billed Gull	<i>Larus delawarensis</i>



Common Name	Scientific Name
Ring-necked Duck	<i>Aythya collaris</i>
Rock pigeon	<i>Columba livia</i>
Ruby-crowned Kinglet	<i>Regulus calendula</i>
Rusty Blackbird	<i>Euphagus carolinus</i>
Savannah Sparrow	<i>Passerculus sandwichensis</i>
Snow Goose	<i>Anser caerulescens</i>
Solitary Sandpiper	<i>Tringa solitaria</i>
Song Sparrow	<i>Melospiza melodia</i>
Swamp Sparrow	<i>Melospiza georgiana</i>
Tree Swallow	<i>Tachycineta bicolor</i>
Tufted Titmouse	<i>Baeolophus bicolor</i>
Turkey Vulture	<i>Cathartes aura</i>
Warbling Vireo	<i>Vireo gilvus</i>
White-breasted Nuthatch	<i>Sitta carolinensis</i>
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>
White-throated Sparrow	<i>Zonotrichia albicollis</i>
Willow Flycatcher	<i>Empidonax traillii</i>
Wilson's Snipe	<i>Gallinago delicata</i>
Wood Duck	<i>Aix sponsa</i>
Wood Thrush	<i>Hylocichla mustelina</i>
Yellow Warbler	<i>Setophaga petechia</i>
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>
Yellow-rumped Warbler	<i>Setophaga coronata</i>

5.6.3.3 Mammals

The Pennsylvania Important Mammal Areas (IMA) project was initiated in 2001 to promote the conservation of mammals by identifying sites or regions that include habitats critical to their survival, and to educate the public about mammals and their needs. The IMA project is patterned after the Important Bird Areas Project described previously. There are no IMAs located within the Project boundary or outside the immediate area of the Project boundary. Mammalian species found in Montgomery County are listed in Table 5-11 below. Mammals in the immediate Project area are anticipated to be typical of those found in disturbed urban environments, including native species such as the Raccoon, Virginia Opossum, Gray Squirrel, White-tailed Deer, and coyotes, and invasive species including the House Mouse and Norwegian Rat.

Table 5-11. Mammalian species found in Montgomery County, PA (PGC 2015).

Family	Common Name	Scientific Name
Dogs & Foxes - Canidae	Coyote	<i>Canis latrans</i>
	Gray Fox	<i>Urocyon cinereoargenteus</i>
	Red Fox	<i>Vulpes vulpes</i>
Beavers - Castoridae	North American Beaver	<i>Castor canadensis</i>
	White-tailed Deer	<i>Odocoileus virginianus</i>



Family	Common Name	Scientific Name
	Meadow Vole	<i>Microtus pennsylvanicus</i>
	Woodland Vole	<i>Microtus pinetorum</i>
	Southern Red-backed Vole	<i>Myodes gapperi</i>
	Common Muskrat	<i>Ondatra zibethicus</i>
	White-footed Mouse	<i>Peromyscus leucopus</i>
	Deer Mouse	<i>Peromyscus maniculatus</i>
New World Opossums - Didelphidae	Virginia Opossum	<i>Didelphis virginiana</i>
Jumping Mice - Dipodidae	Woodland Jumping Mouse	<i>Napaeozapus insignis</i>
	Meadow Jumping Mouse	<i>Zapus hudsonius</i>
New World Porcupines - Erethizontidae	North American Porcupine	<i>Erethizon dorsatum</i>
Cats - Felidae	Domestic Cat	<i>Felis catus</i>
	Bobcat	<i>Lynx rufus</i>
Hares and Rabbits-Leporidae	Eastern Cottontail	<i>Sylvilagus floridanus</i>
Skunks - Mephitidae	Striped Skunk	<i>Mephitis mephitis</i>
	Eastern Spotted Skunk	<i>Spilogale putorius</i>
Old World Rats & Mice - Muridae	House Mouse	<i>Mus musculus</i>
	Norway Rat	<i>Rattus norvegicus</i>
	Ermine	<i>Mustela erminea</i>
	Long-tailed Weasel	<i>Mustela frenata</i>
	American Mink	<i>Neovison vison</i>
Raccoons - Procyonidae	Raccoon	<i>Procyon lotor</i>
Squirrels - Sciuridae	Southern Flying Squirrel	<i>Glaucomys volans</i>
	Woodchuck	<i>Marmota monax</i>
	Gray Squirrel	<i>Sciurus carolinensis</i>
	Eastern Fox Squirrel	<i>Sciurus niger</i>
	Eastern Chipmunk	<i>Tamias striatus</i>
	Red Squirrel	<i>Tamiasciurus hudsonicus</i>
Shrews - Soricidae	Northern Short-tailed Shrew	<i>Blarina brevicauda</i>
	North American Least Shrew	<i>Cryptotis parva</i>
	Masked Shrew	<i>Sorex cinereus</i>
	Smoky Shrew	<i>Sorex fumeus</i>
	American Pygmy Shrew	<i>Sorex hoyi</i>
Moles - Talpidae	Star-nosed Mole	<i>Condylura cristata</i>
	Hairy-tailed Mole	<i>Parascalops breweri</i>
	Eastern Mole	<i>Scalopus aquaticus</i>
Bears - Ursidae	American Black Bear	<i>Ursus americanus</i>
Plain-Nosed Bats - Vespertilionidae	Big Brown Bat	<i>Eptesicus fuscus</i>
	Eastern Red Bat	<i>Lasiurus borealis</i>



Family	Common Name	Scientific Name
	Hoary Bat	<i>Lasiurus cinereus</i>
	Little Brown Myotis	<i>Myotis lucifugus</i>
	Northern Myotis	<i>Myotis septentrionalis</i>
	Evening Bat	<i>Nycticeius humeralis</i>
	Tricolored Bat	<i>Perimyotis subflavus</i>

5.6.4 Potential Impacts and Proposed Measures

There is potential for the disturbance of wildlife during construction maintenance activities at the project. Typical maintenance activities include periodic inspections, cleaning of the trash racks, and manipulation of gates. The frequency of these activities range from daily to quarterly and may temporarily displace wildlife which are expected to return once the activity ceases.

While the upstream portion of the Project boundary falls in the Schuylkill River-Port Providence NHA, construction and maintenance activities at the Project site are not expected to have an impact to the NHA designation. Similarly, Barbados Overlook NHA is located just west of the Schuylkill River Boat House Park an upland area that is not expected to be affected by construction and maintenance activities at the Project site. During construction, any non-native plants that are disturbed will be removed and disposed of in manner and place where they will not re-establish themselves.

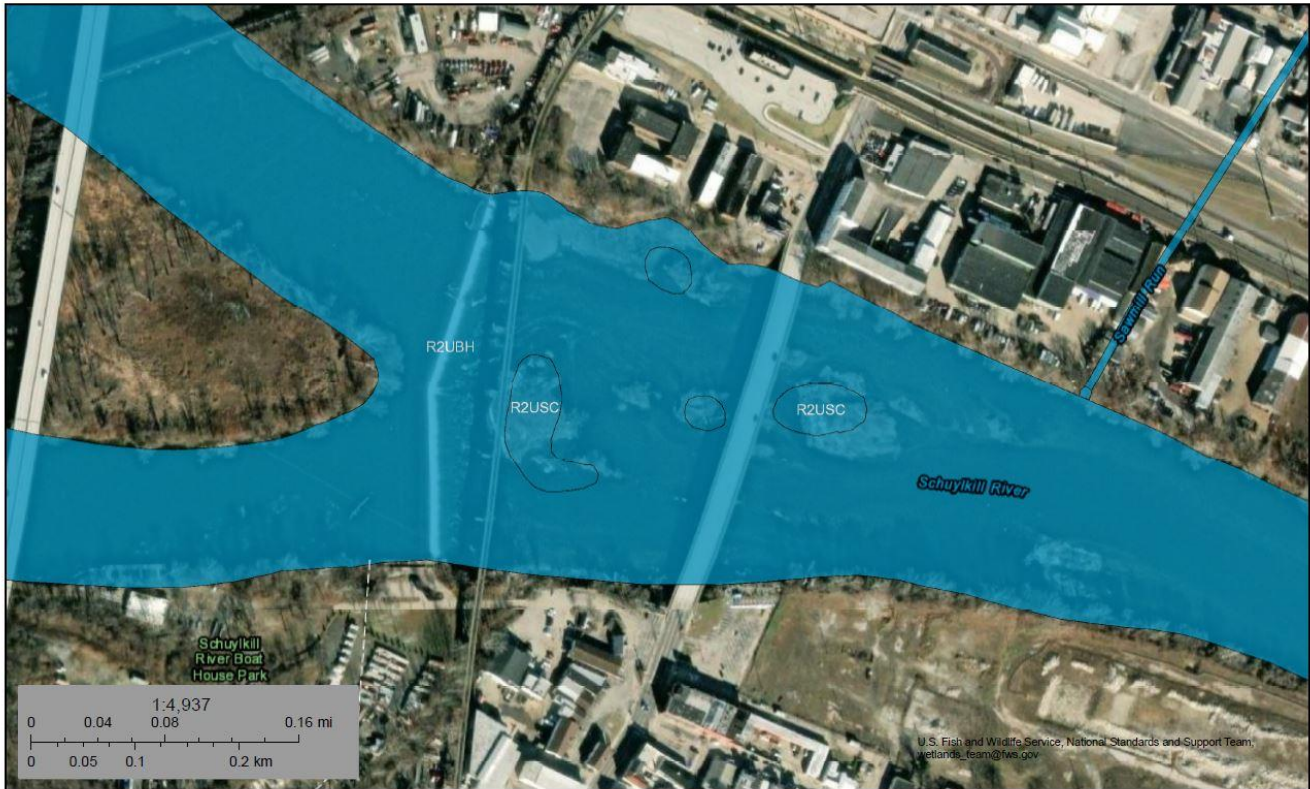
The Applicant has utilized the PA Conservation Tool and Natural Heritage Tool to formulate a list of federal and state listed species. The US Fish and Wildlife Service (USFWS) and PA DEP will be consulted to confirm this list and provide any other additional information. If any listed species or critical habitats are identified, which may be affected by the construction or operation of the Project, the respective agencies will be consulted for appropriate avoidance and/or mitigative measures.

5.7 Wetlands, Floodplains, and Riparian Resources

5.7.1 Wetlands



No specific wetland inventories have been conducted in the Project area. The U.S. Fish and Wildlife Service National Wetlands Inventory (NWI) mapper (USFWS 2023) was used to identify jurisdictional wetlands and obtain a general map of the distributions of wetlands near the Project location (Figure 5-11). Riverine wetlands in the Project area identified by NWI mapping are classified according to the Cowardin et al. (1979) classification system. Wetlands mapped near the project location include:



- R2UBH – riverine lower perennial, unconsolidated bottom, permanently flooded
- R2USC – riverine lower perennial, unconsolidated shore, seasonally flooded



February 22, 2023

Wetlands

-  Estuarine and Marine Deepwater
-  Estuarine and Marine Wetland

-  Freshwater Emergent Wetland
-  Freshwater Forested/Shrub Wetland
-  Freshwater Pond

-  Lake
-  Other
-  Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Figure 5-11. Wetland classification near the Norristown Dam. R2USC classified wetlands are delineated by black borders in the Schuylkill River (USFWS 2023)

The Schuylkill River is mapped as riverine (R) habitat classification R2UBH and includes all wetlands and deepwater habitats contained within a channel (USFWS 2023). The designation ‘2’ refers to Lower Perennial - low gradient character of the reach, with no tidal influence and some water flow all year, except during years with extreme drought. ‘UB’ refers to Unconsolidated Bottom, and ‘H’ refers to Permanently Flooded water regime where water covers the substrate throughout the year (USFWS 2023). R2USC are classified Riverine (R) and Lower Perennial (2) as above. The designation US refers to Unconsolidated Shore, which includes all wetland habitats having unconsolidated substrates with less than 75% areal cover of stones, boulders or bedrock; and less than 30 percent areal cover of vegetation. Landforms such as beaches, bars, and flats are included in this designation. ‘C’ refers to Seasonally Flooded, where surface water is present for extended periods especially early in the growing season but is absent by the end of the growing season in most years (USFWS 2023).

R2USC wetlands comprise 1.78 acres in the project area (Figure 5-11). These wetlands are likely characteristic of periodically exposed shoreline communities, which are found on all orders of streams, and in a wide variety of riverine settings including island heads, bars, spits, low terraces, and riverbanks. Species composition of the community varies depending upon the available seed bank, surrounding vegetation, type of substrate, and



NOTES TO USERS

This map is for use in determining the National Flood Insurance Program. It does not constitute a warranty or any other form of insurance. The user should consult the Flood Insurance Study (FIS) for more information on the National Flood Insurance Program. The user should also consult the Flood Insurance Study (FIS) for more information on the National Flood Insurance Program. The user should also consult the Flood Insurance Study (FIS) for more information on the National Flood Insurance Program.

Coastal Area Flood Hazard Areas shown on this map were derived from the National Flood Insurance Study (NFIS) for the Atlantic and Gulf of Mexico Coasts. The user should consult the NFIS for more information on the National Flood Insurance Program. The user should also consult the Flood Insurance Study (FIS) for more information on the National Flood Insurance Program.

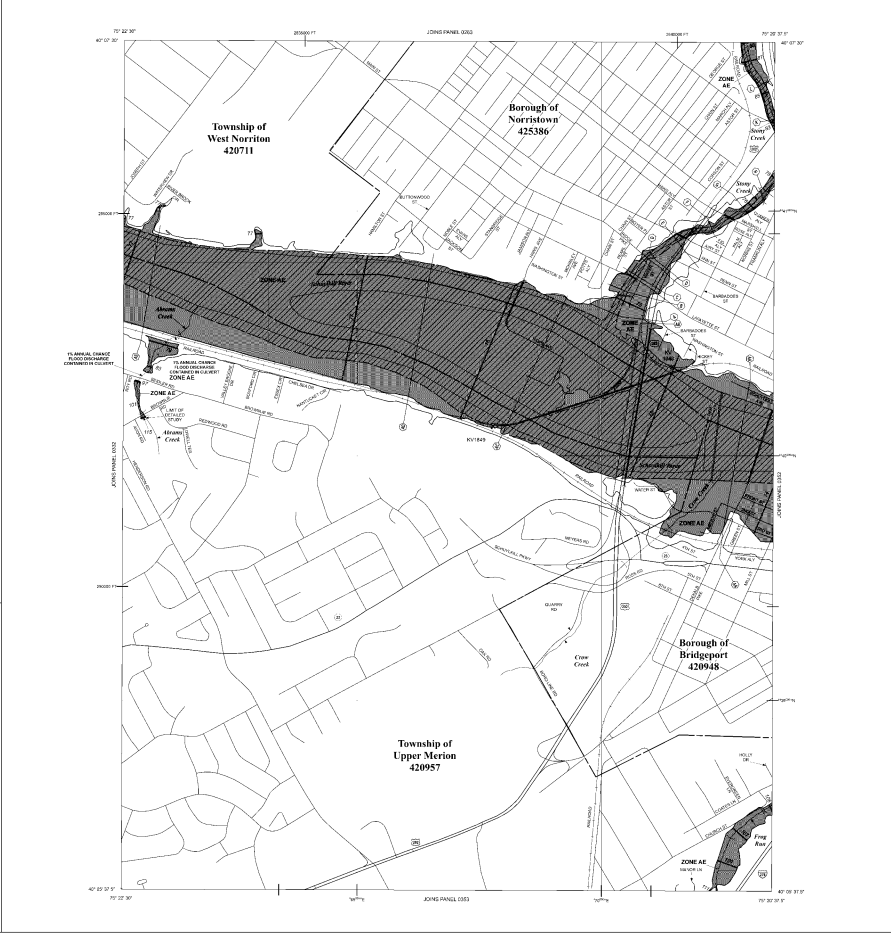
Other Flood Hazard Areas shown on this map were derived from the National Flood Insurance Study (NFIS) for the Atlantic and Gulf of Mexico Coasts. The user should consult the NFIS for more information on the National Flood Insurance Program. The user should also consult the Flood Insurance Study (FIS) for more information on the National Flood Insurance Program.

Map Scale: 1" = 1000'

Map Number: 4201FC0316

Map Revised: MARCH 2, 2016

Federal Emergency Management Agency



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHA) SUBJECT TO INSURANCE UNDER THE NATIONAL FLOOD INSURANCE PROGRAM (NFIP)

Zone A Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Zone B Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Zone C Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Zone D Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Zone E Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Zone F Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Zone G Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Zone H Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Zone I Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Zone J Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Zone K Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Zone L Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Zone M Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Zone N Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Zone O Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Zone P Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Zone Q Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Zone R Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Zone S Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Zone T Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Zone U Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Zone V Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Zone W Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Zone X Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Zone Y Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Zone Z Special Flood Hazard Area (SFHA) - 1% Annual Chance Flood

Other Flood Hazard Areas

Coastal Area Flood Hazard Areas

Map Scale: 1" = 1000'

Map Number: 4201FC0316

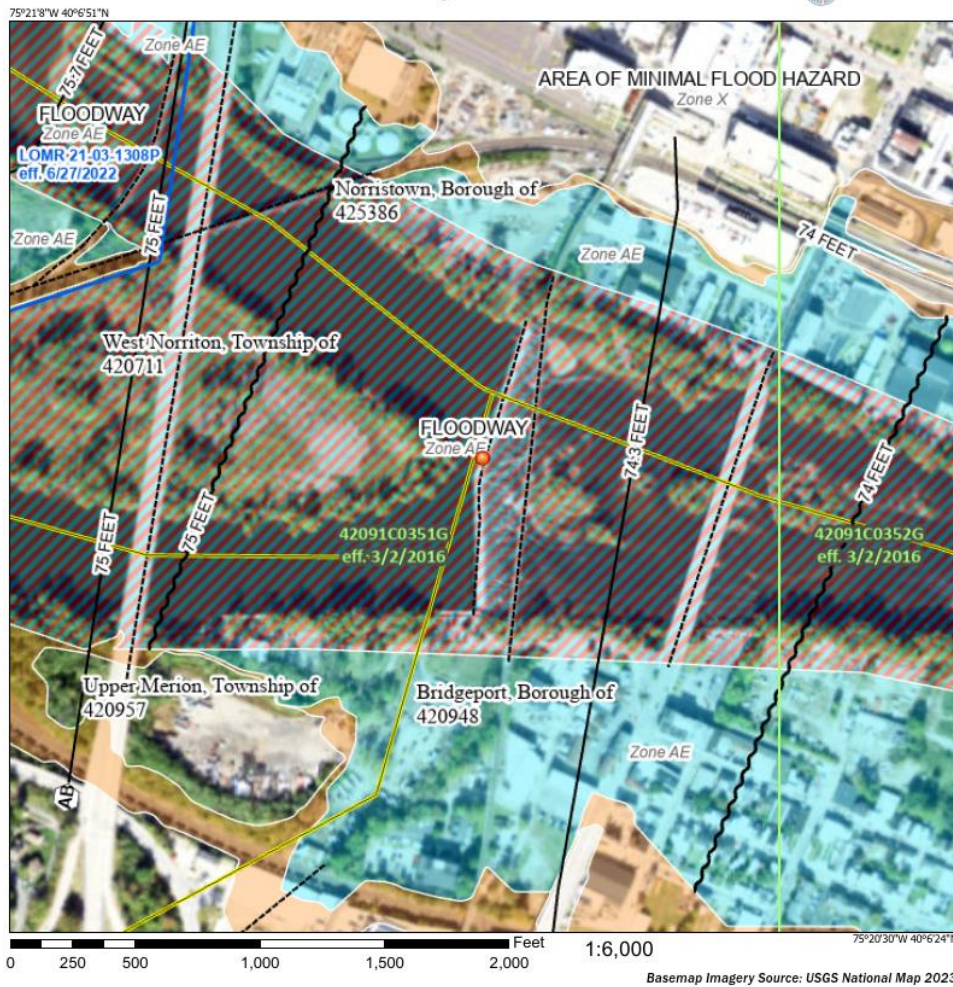
Map Revised: MARCH 2, 2016

Federal Emergency Management Agency

Figure 5-13. FEMA map near the Norristown Dam



National Flood Hazard Layer FIRMette



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) Zone A, X, AE, AO
- With BFE or Depth Zone AE, AO, AH, VE, AR
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
- Future Conditions 1% Annual Chance Flood Hazard Zone X
- Area with Reduced Flood Risk due to Levee. See Notes. Zone X
- Area with Flood Risk due to Levee Zone D

OTHER AREAS

- NO SCREEN Area of Minimal Flood Hazard Zone X
- Effective LOMRs
- Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

- 20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
- 17.5 Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS

- Digital Data Available
- No Digital Data Available
- Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

Figure 5-14. FEMA's National Flood Hazard Layer (NFHL) Viewer at the Norristown Dam

5.7.3 Riparian

The riparian habitat, usually defined as a vegetative buffer, includes the area adjacent to the Schuylkill River. While there are presently no data on riparian vegetation abundance and diversity specifically in Norristown and Bridgeport regions of the Schuylkill River, riparian communities have been mapped at Valley Forge National Historical Park which is in the upstream region of the Project boundary. Riparian communities in Valley Forge National Historical Park include Sycamore – Green Ash floodplain forest and Silver Maple floodplain forest. These forests are dominated by Green Ash (*Fraxinus pennsylvanica*), Black Walnut (*Juglans nigra*), Sycamore (*Platanus occidentalis*), and Silver Maple (*Acer saccharinum*). Typical canopy associates include Sugar Maple (*Acer saccharum*) on smaller tributaries, Silver Maple (*Acer saccharinum*), and River Birch (*Betula nigra*) (Zimmerman et al. 2012)

In these types of habitats shrubs may include Silky Dogwood (*Cornus amomum*), Gray Dogwood (*Cornus racemosa*), Poison-ivy (*Toxicodendron radicans*), Spicebush (*Lindera benzoin*), Elderberry (*Sambucus canadensis*), and Arrow-wood (*Viburnum recognitum*). Herbs include Ostrich Fern (*Matteuccia struthiopteris*), Jewelweed (*Impatiens capensis*), Pale Jewelweed (*Impatiens pallida*), Turk’s-cap Lily (*Lilium superbum*), Clearweed (*Pilea pumila*), Rice Cutgrass (*Leersia oryzoides*), Sensitive Fern (*Onoclea sensibilis*), Jack-in-the-pulpit (*Arisaema*



triphillum), Green-dragon (*Arisaema dracontium*), Stout Woodreed (*Cinna arundinacea*), False Nettle (*Boehmeria cylindrica*), Common Blue Violet (*Viola sororia*), and Jumpseed (*Persicaria virginianum*). Commonly occurring invasive plant species are Multiflora Rose (*Rosa multiflora*), Morrow's Honeysuckle (*Lonicera morrowii*), Common Privet (*Ligustrum vulgare*), Japanese Barberry (*Berberis thunbergii*), Japanese Stiltgrass (*Microstegium vimineum*), Japanese Knotweed (*Fallopia japonica*), and Garlic-mustard (*Alliaria petiolata*) (Zimmerman et al. 2012).

Riparian vegetation described above is likely to be present to a lesser extent in the immediate Project area due to high residential and urban development.

5.7.4 Potential Impacts and Proposed Measures

During construction, the work area will be isolated from the river. However, the area that is isolated is not expected to have any appreciable effect on the capacity of the spillway to pass flows. The Project will operate in a run-of-river mode, such that outflows equal inflows minus withdrawals in near real time thus impoundment levels will not be altered from the pre-construction levels or ranges. The Project will not change flow volumes or the timing of flows. The Project will modify the distribution of flows over the spillway, concentrating a portion of the flows near the south side of the river where the turbines will be installed. The present design of the Project employs submersible turbine-generator units and does not include a powerhouse. Once in operation, there is not expected to be any change in flow capacity of the Norristown Dam. This will be further investigated as the engineering design proceeds. During flood flows where the net head is too low for generation, or where flood flows are exceedingly high, the units will be shut down and all flows will pass over the spillway and turbine bays.

5.8 Rare, Threatened and Endangered Species

5.8.1 RTE Species

Based on the PA Conservation tool, sixty-nine species of rare, threatened, or endangered species have ranges that include Montgomery County, PA. Of those 69 species, two species of bats, - the Northern Long-eared Bat (*Myotis septentrionalis*) and Indiana Bat (*Myotis sodalis*), and the Bog Turtle (*Glyptemys muhlenbergii*) were determined to be potentially located in the project area (



Table 5-12). Based on a US Fish and Wildlife IPaC analysis, the critical habitat for these species does not seem to be located within the project boundary. During construction of the existing fish passage, the Bog Turtle was identified as having potential habitat in the Project area. A field survey was completed in 2004 which indicated that the area did not have habitat characteristics to support this species. An updated review will be conducted to provide a current evaluation of any potential or identified habitat.



Table 5-12. Rare (R), Threatened (T), and Endangered (E) Species in Montgomery County (PA Natural Heritage Program).

Type	Common Name	Scientific Name	Federal Status	State Status	Potentially in Project Area
Plant	Balsam Poplar	<i>Populus balsamifera</i>		E	
	Beach Plum	<i>Prunus maritima</i>		E	
	Bicknell's Sedge	<i>Carex bicknellii</i>		E	
	Blue-curls	<i>Trichostema setaceum</i>		E	
	Blunt Manna-grass	<i>Glyceria obtusa</i>		E	
	Brook Lobelia	<i>Lobelia kalmii</i>		E	
	Bugleweed	<i>Lycopus rubellus</i>		E	
	Bushy Cinquefoil	<i>Potentilla paradoxa</i>		E	
	Bushy St. John's-wort	<i>Hypericum densiflorum</i>		T	
	Butterfly-pea	<i>Clitoria mariana</i>		E	
	Cattail Sedge	<i>Carex typhina</i>		E	
	Cross-leaved Milkwort	<i>Polygala cruciata</i>		E	
	Downy Willow-herb	<i>Epilobium strictum</i>		R	
	Eared False-foxglove	<i>Agalinis auriculata</i>		E	
	Ellisia	<i>Ellisia nyctelea</i>		T	
	Fassett Jeweled Shooting-Star	<i>Primula fassettii</i>		T	
	Few Flowered Nutrush	<i>Scleria pauciflora</i>		T	
	Forked Rush	<i>Juncus dichotomus</i>		E	
	Glade Spurge	<i>Euphorbia purpurea</i>		E	
	Grass-leaved Goldenrod	<i>Euthamia caroliniana</i>		T	
	Grooved Yellow Flax	<i>Linum sulcatum</i>		E	
	Hooded Ladies'-tresses	<i>Spiranthes romanzoffiana</i>		E	
	Horrible Thistle	<i>Cirsium horridulum</i>		E	
	Indian Wild Rice	<i>Zizania aquatica</i>		R	
	Matted Spike-rush	<i>Eleocharis intermedia</i>		T	
	Missouri Rock-cress	<i>Borodinia missouriensis</i>		E	
	Narrow-leaved White-topped Aster	<i>Sericocarpus linifolius</i>		E	
	New York Aster	<i>Symphotrichum novi-belgii</i>		T	
	Nodding Pogonia	<i>Triphora trianthophora</i>		E	
	Oblique Milkvine	<i>Matelea obliqua</i>		E	
	Plain Ragwort	<i>Packera anonyma</i>		R	
	Possum-haw	<i>Viburnum nudum</i>		E	
	Prickly-pear Cactus	<i>Opuntia humifusa</i>		R	
	Reflexed Flatsedge	<i>Cyperus refractus</i>		E	
	Sand Blackberry	<i>Rubus cuneifolius</i>		E	
	Sandplain Wild Flax	<i>Linum intercursum</i>		E	
	Schweinitz's Flatsedge	<i>Cyperus schweinitzii</i>		R	



Type	Common Name	Scientific Name	Federal Status	State Status	Potentially in Project Area
	Scirpus-like Rush	<i>Juncus scirpoides</i>		E	
	Slender Blue Iris	<i>Iris prismatica</i>		E	
	Slender Cotton-grass	<i>Eriophorum gracile</i>		E	
	Slender Sea-oats	<i>Chasmanthium laxum</i>		E	
	Small-whorled Pogonia	<i>Isotria medeoloides</i>	T	E	
	Smith's Bulrush	<i>Schoenoplectiella smithii</i>		E	
	Southern Bog Clubmoss	<i>Lycopodiella appressa</i>		T	
	Southern Red Oak	<i>Quercus falcata</i>		E	
	Spring Ladies'-tresses	<i>Spiranthes vernalis</i>		E	
	Stagger-bush	<i>Lyonia mariana</i>		E	
	Sterile Sedge	<i>Carex sterilis</i>		T	
	Sweet Bay Magnolia	<i>Magnolia virginiana</i>		T	
	Tawny Ironweed	<i>Vernonia glauca</i>		E	
	Tooth-cup	<i>Rotala ramosior</i>		R	
	Torrey's Mountain-mint	<i>Pycnanthemum torreyi</i>		E	
	Tufted Buttercup	<i>Ranunculus fascicularis</i>		E	
	Twig Rush	<i>Cladium mariscoides</i>		E	
	Umbrella Flatsedge	<i>Cyperus diandrus</i>		E	
	White Milkweed	<i>Asclepias variegata</i>		E	
	Willow Oak	<i>Quercus phellos</i>		E	
Bats	Indiana Bat	<i>Myotis sodalis</i>		E	X
	Northern Long-eared Bat	<i>Myotis septentrionalis</i>	T	E	X
Birds	Long-eared Owl	<i>Asio otus</i>		T	
	Upland Sandpiper	<i>Bartramia longicauda</i>		E	
	Yellow-crowned Night-heron	<i>Nyctanassa violacea</i>		E	
Fish	Ironcolor Shiner	<i>Notropis chalybaeus</i>		E	
Frogs	Eastern Cricket Frog	<i>Acris crepitans</i>		E	
	New Jersey Chorus Frog	<i>Pseudacris kalmi</i>		E	
Mussel	Dwarf Wedgemussel	<i>Alasmidonta heterodon</i>	E	E	
Turtles	Bog Turtle	<i>Glyptemys muhlenbergii</i>	T	E	X
	Northern Red-bellied Cooter	<i>Pseudemys rubriventris</i>		T	
	Southeastern Mud Turtle	<i>Kinosternon subrubrum subrubrum</i>		E	

5.8.2 Potential Impacts and Proposed Measures

As required, the Applicant will consult with the US Fish and Wildlife Service, the PA DEP, and the PA Natural Heritage Program to further evaluate the potential for protected species to occur within the Project construction area. Given the limited area where construction will occur and that this site has been disturbed multiple times in the past, there is little to no potential for effects from the Project on the Long-eared Bat or Indiana Bat.



Based on the previous assessment of the potential for the Bog Turtle to be present within the Project construction site, pre-construction surveys will be conducted. Any turtles will be relocated to suitable habitat on the Schuylkill River far enough to prevent them from re-entering the site. Any permits that are required will be obtained in advance and trained personnel will handle any specimens. These measures will be compiled in a Bog Turtle Construction Management Plan which will be submitted to the respective environmental agencies and FERC for review and approval.

If any listed species are located during construction, the respective agencies will be consulted and best management practices employed to mitigate any unintended adverse effects to these species.

Project operations are not expected to have any effects on Bog Turtles. Water flows and elevations are not expected to be altered by Project operations. In the unlikely event that a turtle is recovered from Project structures, in vegetative debris on the trash racks, for example, they will be relocated to the nearest suitable habitat.

5.9 Recreation and Land Use

5.9.1 Recreation

The Schuylkill River Trail is a multi-use trail in Southeastern Pennsylvania which is projected to be approximately 120 miles in length. There are currently over 75 miles complete in sections, including a 30-plus mile stretch from Philadelphia to Parkerford (Figure 5-15) on the north side of the river. In addition to the walking trail, the Schuylkill River water trail offers multiple public access areas for paddling, motorboats, water skiers, and rowers. There are canoe/kayak launches upstream (Upper Merion Boathouse) and downstream of the dam (Falls View Drive/Water St.) on the Bridgeport side of the river. Several rowing and boating clubs are known to use the impoundment above the Norristown Dam on a regular basis.

Along Falls View Drive/Water St. adjacent to the dam on the Bridgeport side of the Schuylkill River is a linear town park called Rotondo Riverfront Park, which is operated by the Borough of Bridgeport Parks and Recreation Department. The park is 2.4 acres and includes vehicle parking, an overlook of the dam and fish ladder, an interpretive kiosk, a flower/pollinator garden, and the previously described launch.

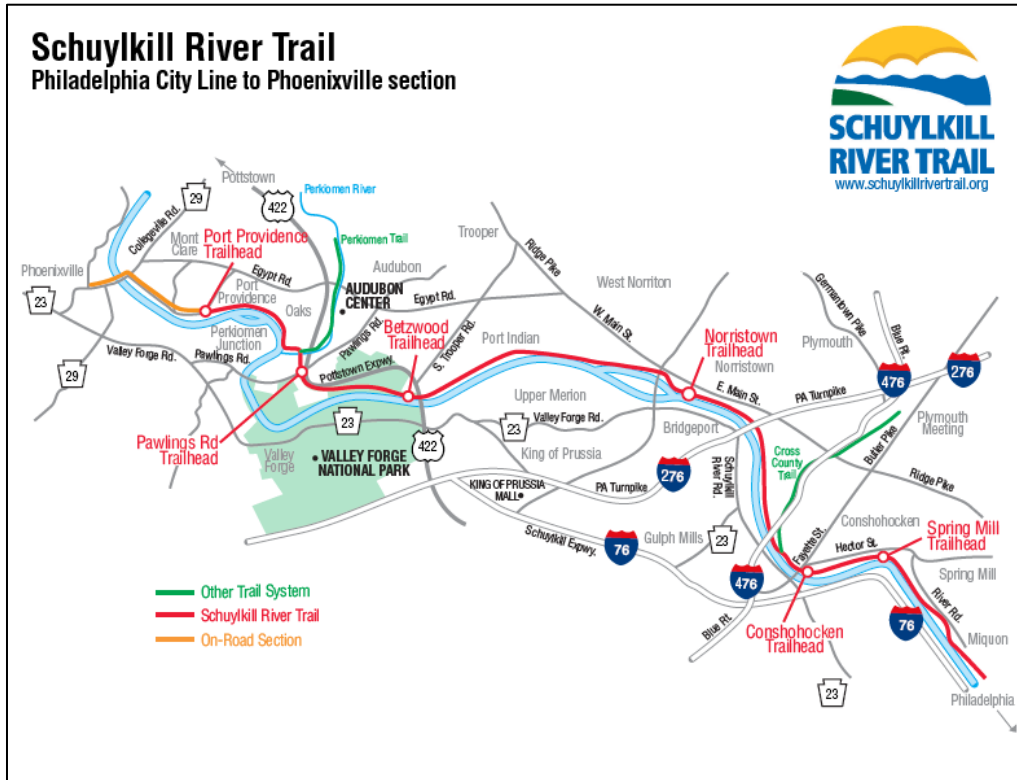


Figure 5-15. Schuylkill River trail map (Schuylkill River Trail 2017)

5.9.2 Land Use

According to the Norristown and Bridgeport Zoning maps, both sides of the river in the vicinity of the project are zoned as mixed use/downtown riverfront. These designations include the use as open space, housing, recreational facilities, commercial/industrial space and/or parking. Based on the land use map found in the 2015 Montgomery County Comprehensive Plan, the areas adjacent to the proposed Project mostly encompass industrial and wooded land use classifications (Figure 5-16). Construction for the Project will take place on the Bridgeport side of the river. Here, the Project is surrounded by two local parks: Rotondo Riverfront Park and Upper Merion Boathouse Park.

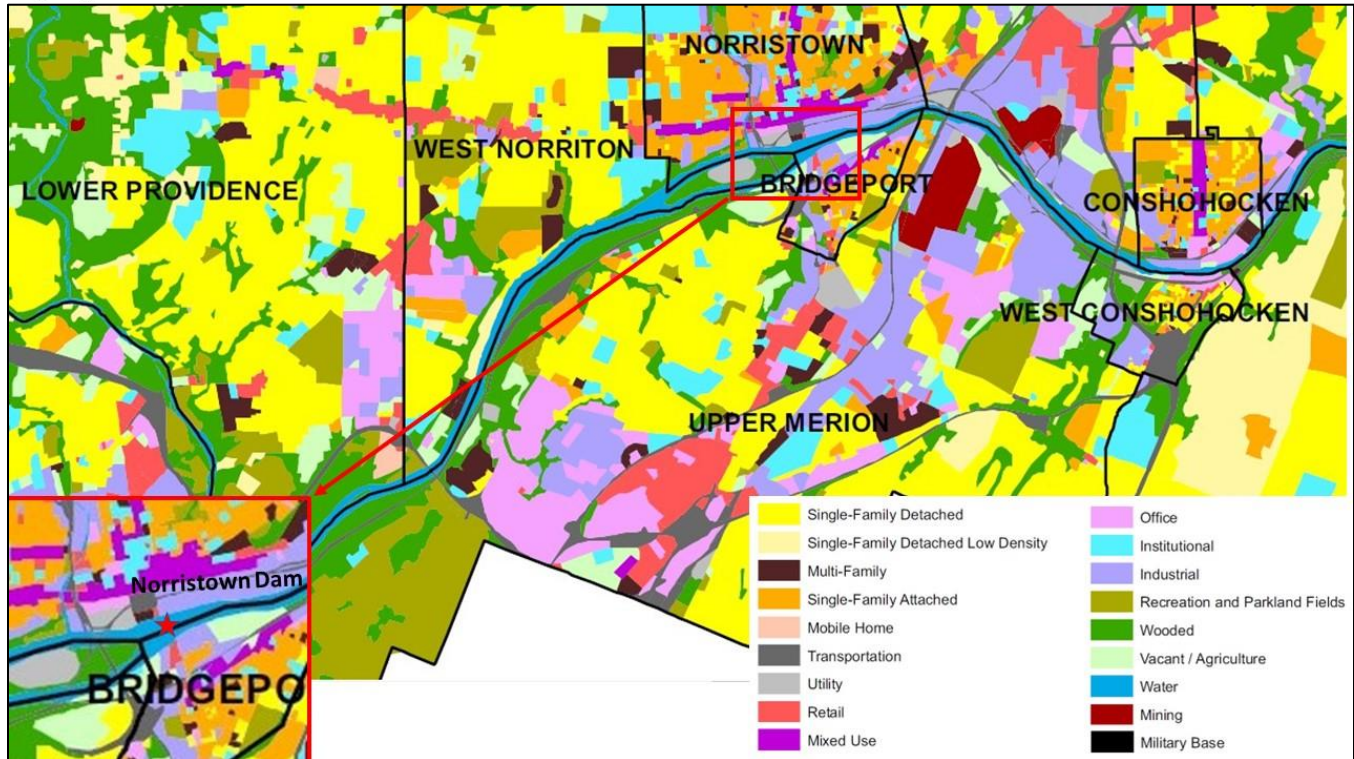


Figure 5-16. 2015 Lower Montgomery County Land Use Map (MCPC 2015)

5.9.3 Potential Impacts and Proposed Measures

The Project construction area will be confined to the Bridgeport, PA end of the Norristown Dam. No effects from Project construction or operation are anticipated at the north end of the dam where the Schuylkill River Trail is located. The Applicant will coordinate safety and security of the public during construction with the Borough of Bridgeport and with Upper Merion. While construction is underway, it is expected that the work site will be isolated with security fencing and appropriate signs. In addition, floating exclusion barriers may be placed in the river outside of the construction area to caution boaters and other river users and prevent their entry into the construction area. Portions of the Rotondo River front Park and possibly the Upper Merion Boathouse Park may be temporarily closed during the construction period for public safety. Immediately downstream of the dam on the Bridgeport side is a popular shoreline fishing area. This area will likely be closed during construction. For some periods of construction, the Falls View Drive/Water St. launch will also be closed. The Applicant does not intend to provide alternate recreation resources while these facilities are unavailable. All closures and restrictions will be for only the periods of time necessary for the construction of the Project and will be re-opened as soon as it is practical and safe to do so.

While the Project is under construction, it is expected that there will be noise and visual impacts, typical of this type of construction. No explosive blasting will occur. Construction activities will occur only during daylight working hours, unless additional hours are required. If longer hours are required for Project construction activities, the Applicant will inform the borough and minimize the length of time and duration of additional hours that are necessary. These effects will be temporary and will cease when construction is complete.



After construction, the view of the Norristown Dam will have changed. The south end of the dam will house up to four turbine-generators, concrete bay walls, trash racks, and hoisting equipment. On the shore, a small enclosure will be erected to house the equipment controls, switchgear, and security equipment. Appropriate ownership information and emergency contact information will be posted so that it is visible by the public. It is anticipated that the existing interpretive kiosk will be expanded, or a second kiosk developed to explain the construction, operation, and benefits of the hydropower project.

During operation, there will be minimal noise from the Project, typically a humming sound from the transformer(s), and periodic noises as equipment on the dam and in the enclosure operate. Removal of trash and vegetative debris from the trash racks will occur as needed but will likely be performed at least several times per week. Hoisting activities to lower or raise gates or remove equipment will occur very infrequently. Floating boater safety booms and warning signs will be deployed during the open water season to alert boaters to the water currents around the Project. Additional caution signs will be installed at the launch downstream of the dam on the Bridgeport side to also alert shoreline fishers.

Montgomery County will be engaged with the municipal officials, recreationists, and other public on the effects of the Project construction and operation throughout this FERC process, construction, and the life of this Project. There will be many opportunities for the public to obtain information and understand the effects of the Project on public use and recreation near this site and the measures to avoid or minimize those effects.

5.10 Cultural and Historic Resources

5.10.1 Cultural Resources

The Schuylkill River Valley is a designated National Heritage Area and managed by the Schuylkill River Greenway Association (Figure 5-17). This designation recognizes the national significance of the contribution of the Schuylkill River Valley to the nation's political, cultural and industrial development. The purpose of the congressional designation is to enable local communities to conserve their heritage while continuing to pursue economic opportunities, and to conserve, interpret and develop the natural, historical, cultural and recreational resources related to the industrial and cultural heritage of the area.



Figure 5-17. Schuylkill River National Heritage Area (Schuylkillriver.org)



5.10.2 Historical Background and Resources

The Norristown Dam is the 29th of the original 32 dams of the historic Schuylkill Navigation System. This 108-mile system of dams, pools, canals, and locks was built by hand beginning in 1816 to promote commerce and for waterpower. The Norristown Dam was one of the first to be completed (in 1819). Hundreds of mills and other factories sprang up along the new canals, as coal transported from the mountains fueled the Industrial Revolution in this region. To the knowledge of the owner, there has never been any hydropower at this site.

5.10.3 Potential Impacts and Proposed Measures

The historic canal and lockage facilities which were located on the south side of the Norristown Dam were completely removed prior to and during the construction of the fish ladder in the early 2000s. Similarly, the original dam at this location was a timber crib dam. Over time, the dam has been repaired and rebuilt, most recently prior to the transfer of ownership of the dam from PECO to Montgomery County in the mid-1990s. The present dam is now a concrete-capped structure with driven steel sheet piles on the upstream and downstream faces. A construction access road was installed along the upstream face of the dam from the Bridgeport shoreline and, subsequently, removed. The south end of the dam and abutment were modified to accommodate the fish ladder. The shoreline on the south side of the river adjacent to the dam has also been disturbed many times, most notably during the 1993 dam concrete and sheet pile reinforcement, and again during the construction of the fish ladder. No impacts to cultural or historic resources from Project construction or operation are anticipated.

5.11 Socioeconomic Resources

5.11.1 Description

According to the 2022 census data, Montgomery County has a population of 860,578. Of the population that is 16 years or older, 68.4% were in the civilian work force with a per capita income of \$53,343. The largest industries in the county are Healthcare and social assistance, professional, scientific and technical services, and manufacturing. The project encompasses both Norristown and Bridgeport Boroughs. Bridgeport has a population of 5,019 with 78% of those over 16 years old in the civilian workforce. Norristown has a population of 35,829 with 70.6% of those over 16 years old in the civilian workforce (US Census, 2022). The Norristown comprehensive plan's goals are to invest in the redevelopment of the riverfront and downtown areas, improve transportation and attract new businesses (MCPC 2009). The focus of the Bridgeport Comprehensive 2040 plan is to improve transportation, update infrastructure, protect natural features and increase open spaces and parks. Part of the plan, Bridgeport wants to implement 100% renewable energy (BBCP 2021).

As more state and local governments develop comprehensive energy plans, the adoption of energy efficiency and renewable energy technologies has become a focal point of many planning processes. The U.S. Department of Energy (DOE) and the National Renewable Energy Laboratory (NREL) have designed a tool to help address the challenge of energy planning and support state and local governments and stakeholders, and the residents they serve. The State and Local Planning for Energy (SLOPE) tool allows users to research energy potential and projection data at the state, county, and city-levels to better understand energy planning opportunities.

SLOPE indicates that hydropower has the fourth largest renewable energy generation potential for Pennsylvania (Figure 5-18). Technical generation potential reflects an upper bound of generation based on resource availability and quality, system performance, and environmental and land-use constraints, not market conditions. Hydropower generation potential reflects new stream reach and non-powered dam development projects as well as upgrades to existing hydropower facilities.

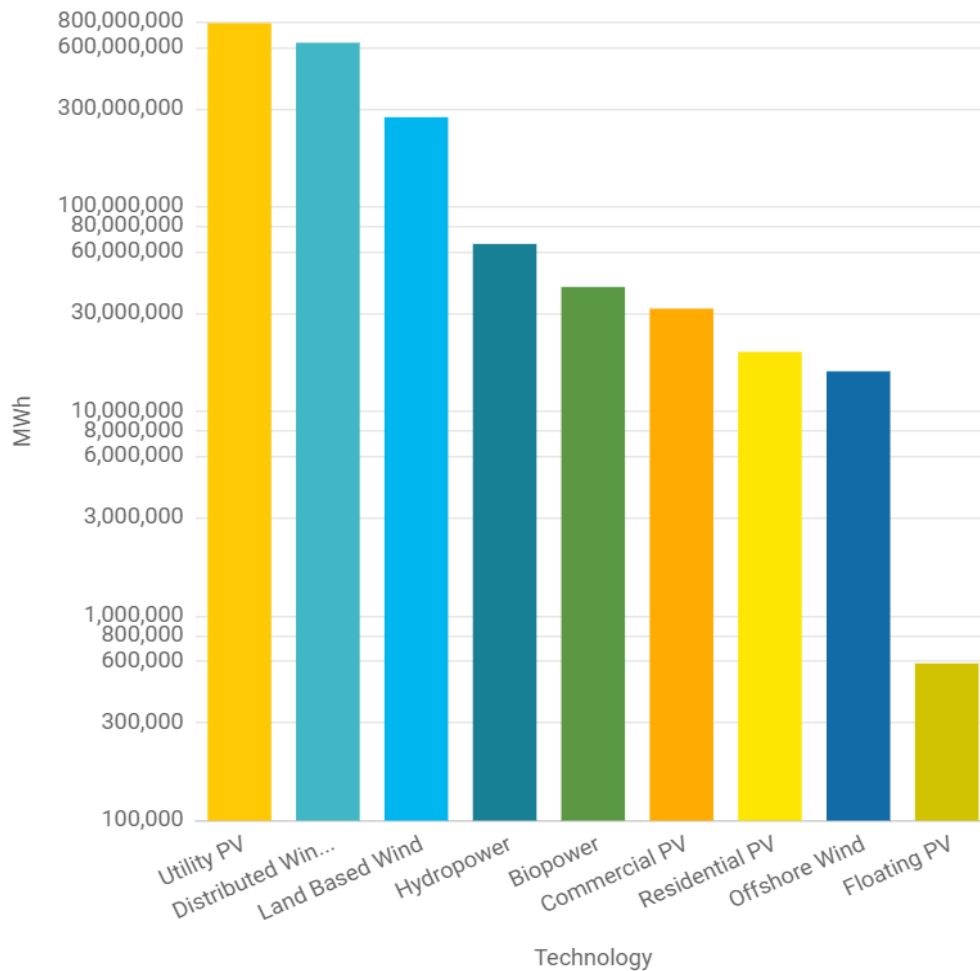


Figure 5-18. Annual technical generation potential of multiple technologies in the state of Pennsylvania (SLOPE 2022a)

When considering socioeconomic factors, it is prudent to investigate energy sectors that will have the biggest impact on reducing costs and emissions, while providing secure sources of energy. SLOPE indicates that despite consuming approximately 31% and 54% more natural gas than electricity (Figure 5-19), the cities of Norristown and Bridgeport spend approximately \$2 million and \$20 million more, respectively, on electricity than natural gas (Figure 5-20). Therefore, focusing on electricity efficiency measures such as the Norristown Dam hydropower project, has great potential to achieve substantial cost savings for residents and businesses.

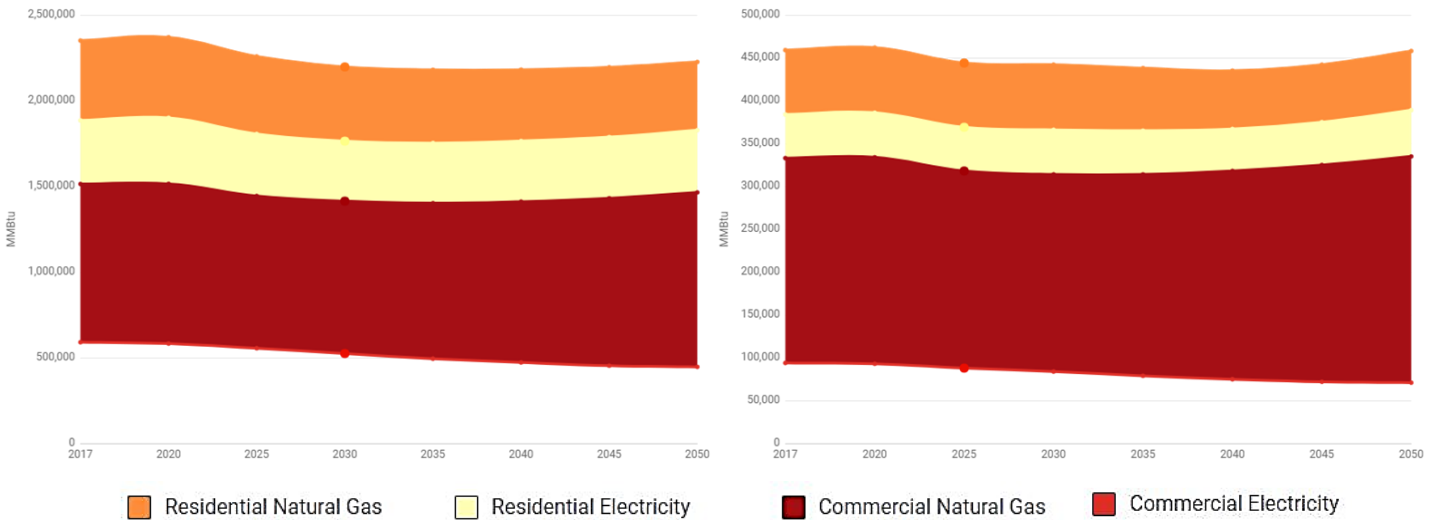


Figure 5-19. Projected electricity and natural gas consumption (MMBtu) for residential and commercial sectors in Norristown (left) and Bridgeport (right) using baseline 2016 and historic per household and establishment energy estimates (SLOPE 2022c).

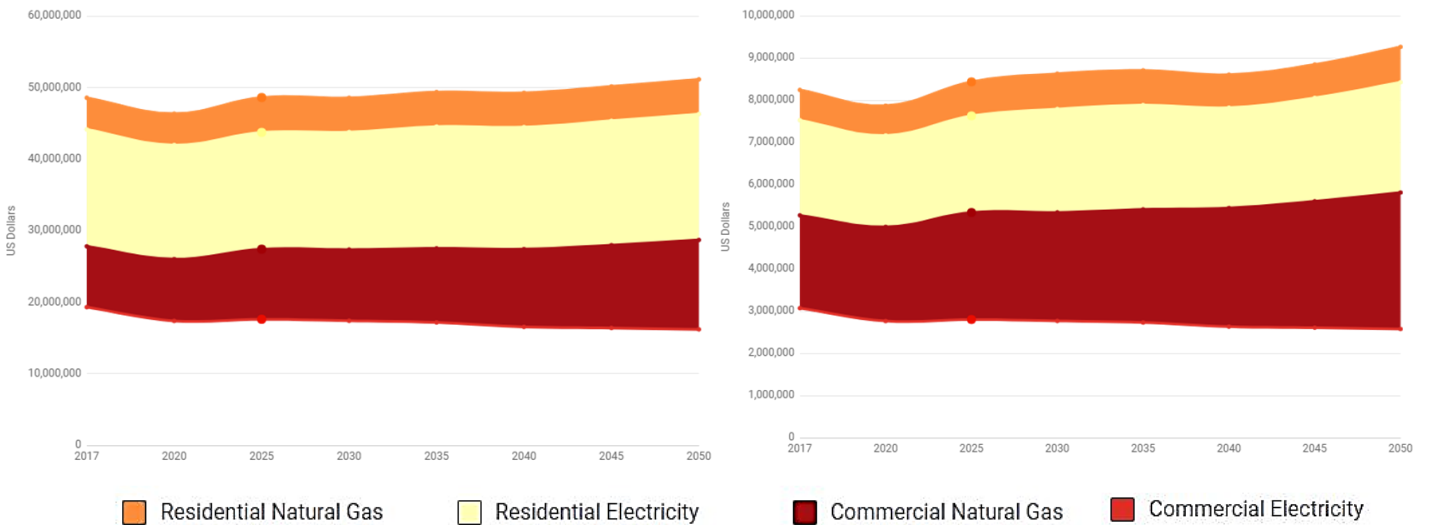


Figure 5-20. Projected electricity and natural gas expenditures (US Dollars) for residential and commercial sectors in Norristown (left) and Bridgeport (right) using baseline 2016 and historic per household and establishment energy estimates (SLOPE 2022d).

Investigating social vulnerability can aid state and local governments, utilities, and stakeholders to make decisions on energy goals and program planning, particularly for low and moderate-income households. Social vulnerability is the susceptibility of social groups to the adverse impacts of natural hazards, including disproportionate death, injury, loss, or disruption of livelihood. The CDC’s Social Vulnerability Index (SVI) indicates the relative vulnerability of every U.S. census tract. SVI ranks the tracts on 15 social factors, including unemployment, minority status, and disability, and further groups them into four related index themes - Socioeconomic Status (below poverty, unemployed, income, high school diploma); Household Composition &



Disability (Aged 65 or older, 17 or younger, single parent households, disabilities); Minority Status & Language (Minority, speaks English ‘less than well’); and Housing Type & Transportation (Multi-unit structures, mobile homes, crowding, group quarters, no vehicle). Each census tract receives a ranking for each of the four indexes as well as an overall ranking. Percentage scores range from 0 (lowest vulnerability) to 100 (highest vulnerability). Norristown, Bridgeport, and surrounding census tracts (Figure 5-21) rank relatively high in overall social vulnerability as well as all four related indexes, with socioeconomic vulnerability ranging from 36 – 91% (SLOPE 2022e).

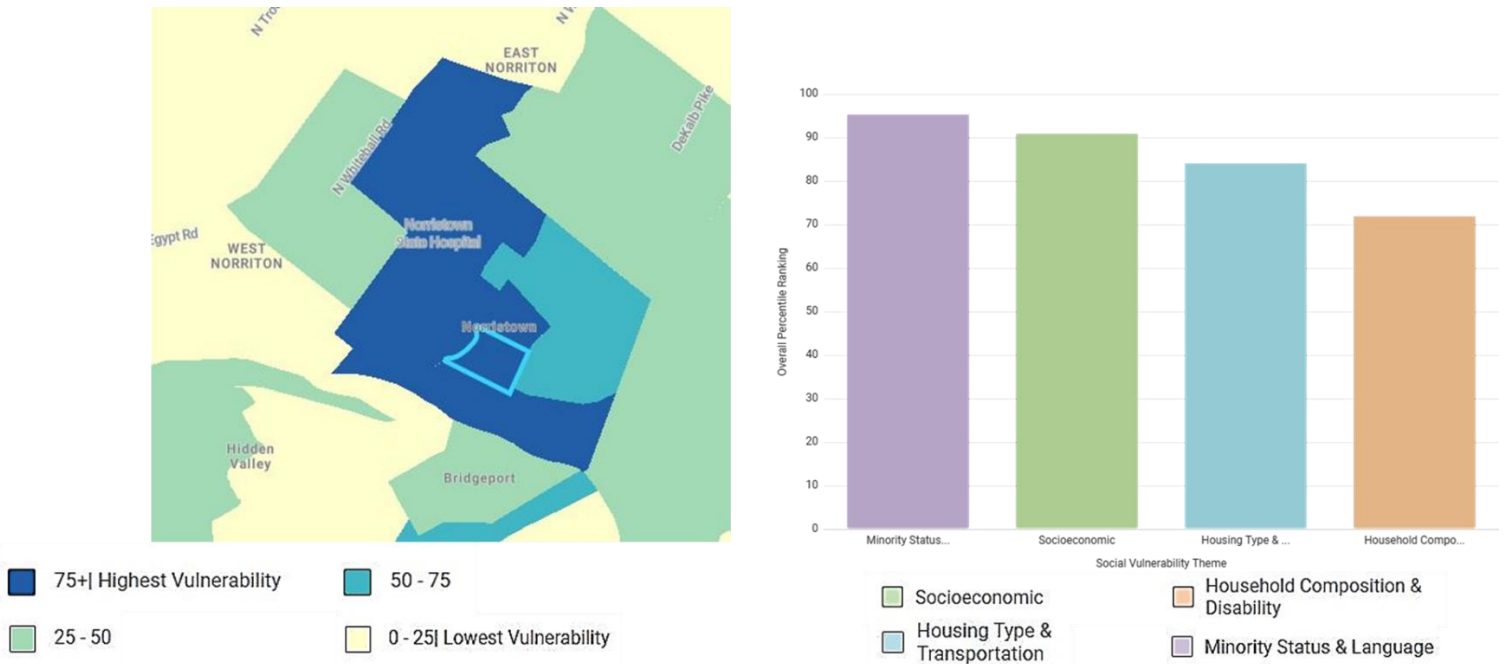


Figure 5-21. Overall social vulnerability of Norristown and surrounding census tracts (left) and grouped indices of social vulnerability for one selected census tract in the Norristown area (right) (SLOPE 2022e)

Energy burden is the percentage of annual household income spent on energy costs, and energy bills that consume more than 6% of a single household’s income constitute a high energy burden. Energy burdens remain a persistent national challenge, and areas with high socioeconomic vulnerability may be particularly susceptible to high energy burdens (Drehobl et al. 2020). Mapping energy burden across Montgomery County for low to moderate income households, defined as households that earn 0-80% of the Area Median Income (AMI), illustrates that the majority of census tracts have average energy burdens ranging from 4-12%. Energy burden in census tracts in the Norristown/Bridgeport area range from 5-9% (Figure 5-22), indicating that, low to moderate income households fall in the average to high energy burden category. Clean energy investments—such as energy efficiency, weatherization, and renewable energy—can provide a long-term, high-impact solution to lowering energy burdens. Weatherization and energy efficiency can be combined with renewable energy investments and/or electrification strategies that reduce energy bills for additional impact. Cities and states can incorporate energy burden goals into strategies and plans to create local policies and programs to achieve more equitable energy outcomes for their communities (Drehobl et al. 2020). Models of renewable technologies that



are most cost-effective over time indicate that hydropower is projected to have the lowest levelized cost of energy (LCOE) for Montgomery County for the next 30 years (Figure 5-23).

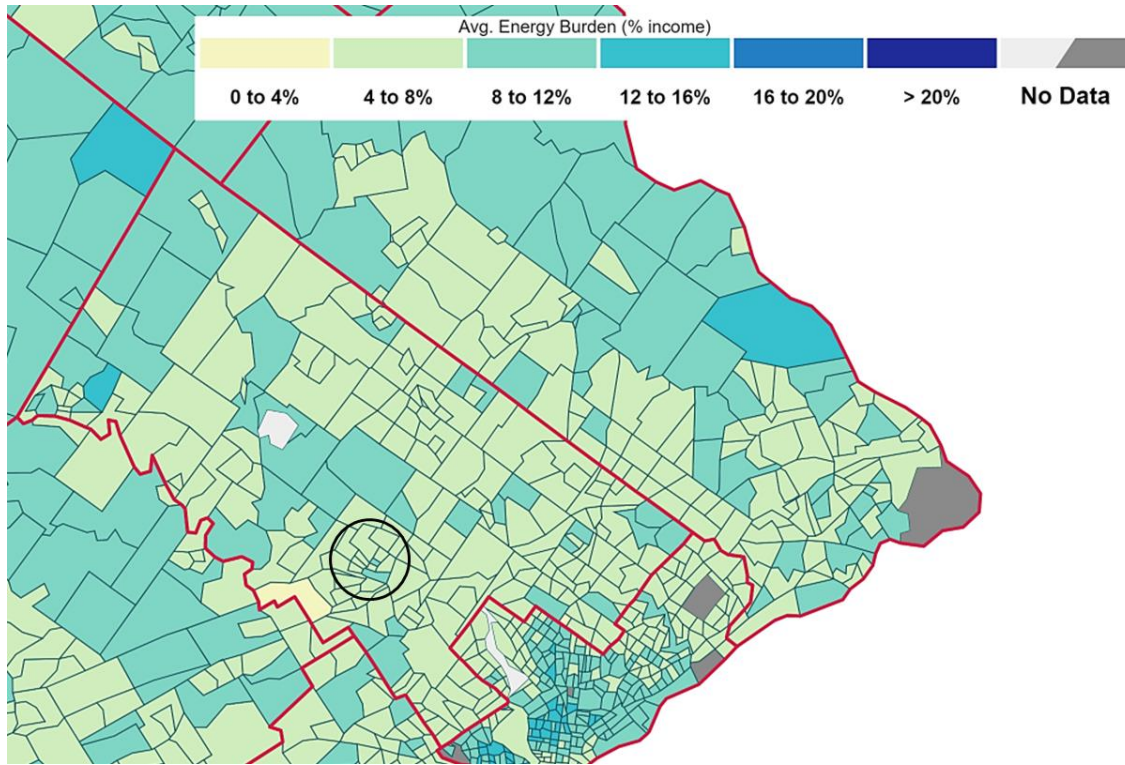


Figure 5-22. Average energy burden as a percent of income for low to moderate income households for census tracts in Montgomery County, PA. The black circle indicates census tracts in the surrounding Norristown/Bridgeport area (LEAD 2022)

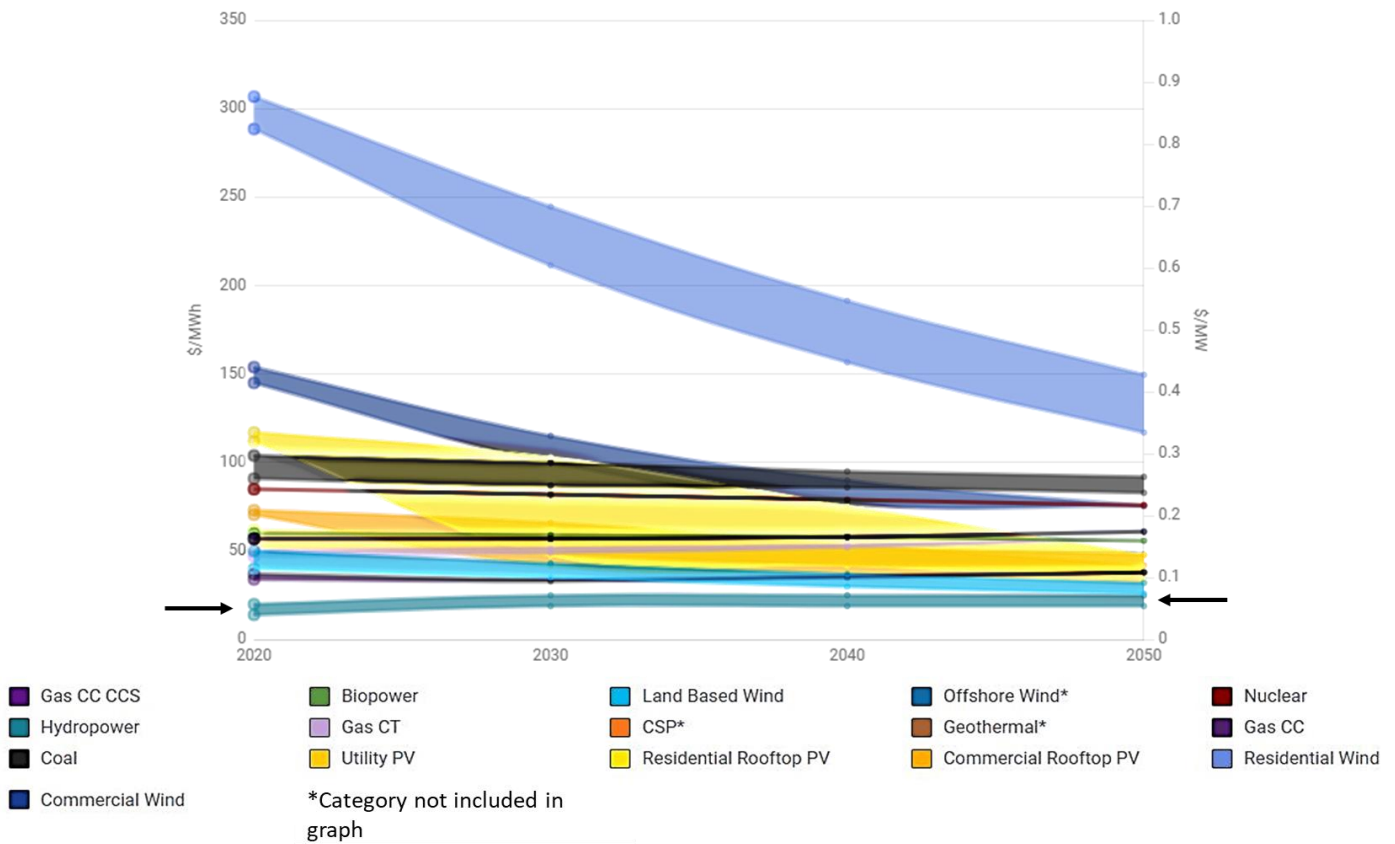


Figure 5-23. Projected Levelized Cost of Energy (LCOE) by technology for Montgomery County. Black arrows on the graph indicate hydropower data in comparison to other renewable technologies (SLOPE 2022f).

5.11.2 Potential Impacts and Proposed Measures

The Norristown hydroelectric power project will produce renewable electricity from the county-owned dam. This revenue source can be used to offset the potential liability of dam ownership and future repairs. Montgomery County is also investigating using the electricity produced at the dam to power its new county courthouse, also offsetting the cost of electricity purchased from the local utility. Both of these actions reduce the costs of Montgomery County, savings which flow to all citizens of the county.

The Project will be constructed by one or more contractors through the county’s public purchasing process. Local contractors are likely to participate in this construction project, providing local economic benefits. Those contractors may also need additional labor resources and may employ local citizens.

Operation of the Project will likely be done by existing County employees and, as such, will not increase permanent employment in the County.



5.12 Aesthetic Resources

The Norristown Dam itself and the water flowing over it provide aesthetic resources to the public using the local parks, walking along the river, and boating on the river. It is a part of the local community character for that portion that is within view of the dam. There is no known formal aesthetic designation for the dam.

On the north shore of the Schuylkill River adjacent to the Norristown Dam there is vacant brownfield land with scattered early successional vegetation and other commercial and industrial structures. On the south side of the river, the dam blends in with the Rotondo Riverfront Park.

Immediately upstream of the dam lies Barbadoes Island, which formerly hosted a PECO thermal generation facility. Barbadoes Island is not part of the Project. The island is believed to be under private ownership. The downstream portion of the island is mostly vegetated. There are no known publicly accessible vantage points or observation points on the island that would include views of the dam.

Potential Impacts and Proposed Measures

The proposed design of the hydroelectric power project has considered the visual impacts of the new facilities. As presently configured, the Project does not include a conventional powerhouse, reducing the extent of change to the dam. The turbine-generators will be submersible and a majority of the structure will be underwater and out of the view of the public. Other than occasional inspections and maintenance, activity at the Project will be minimal.

A small equipment enclosure will be located in the south shore. The overall size, height, and color of this structure will be designed to blend with surrounding structures and minimize its visibility. The Borough of Bridgewater will be consulted on the location and appearance of this enclosure.

5.13 Tribal Resources

No federally or state recognized tribes in the State of Pennsylvania have been identified and, therefore, none occur in the project vicinity. However, there are six tribes with ancestral claims to the region. These include the Absentee-Shawnee Tribe of Indians of Oklahoma, Delaware Nations, Oklahoma, Delaware Tribe of Indians, Eastern Shawnee Tribe of Oklahoma, Saint Regis Mohawk Tribe, and the Shawnee Tribe.

As an integral part of the FERC evaluation process, FERC and/or the Applicant will contact potentially affected tribes and invite them to participate in this process.

5.13.1 Potential Impacts and Proposed Measures

The licensee is unaware of any Native American tribal lands, cultural sites, or interests that the project may affect. Based on responses from contacted tribes and an archeological assessment of the Project construction site, the sensitivity of the site for archeological resources will be determined. If required, an unanticipated cultural and archeological resource management plan will be developed to address the process for discovering and managing any such artifacts or remains during the Project construction.



6.0 References

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APPENDIX A Distribution List

Appendix Table 1: Agency and tribal distribution list

Agency/Town/Tribe	Title	Address 1	Address 2	City	State	Zip
Town						
Norristown Planning Office	Director of Planning and Municipal Development	252 E Airy St	2nd Floor	Norristown	PA	19401
Municipal Administrator's Office	Municipal Administrator	252 E Airy St		Norristown	PA	19401
Montgomery Planning Commission	Executive Director	425 Swede St	Suite 201	Norristown	PA	19401
Bridgeport Administrator's Office	Borough Manager and Secretary	63 W. Fourth St		Bridgeport	PA	19405
Agency						
Federal Emergency Management Agency	Regional 3 Administrator	615 Chestnut Street	6th Floor	Philadelphia	PA	19106-4404
National Park Service	Regional Director	1234 Market St	20th Floor	Philadelphia	PA	19107
Pennsylvania Historical and Museum Commission	Bureau Director	400 North St		Harrisburg	PA	17120
U.S. Army Corps of Engineers (Philadelphia District)	Public affairs officer	100 Penn Square East		Philadelphia	PA	19107-3390
PA Environmental Protection Agency	Regional Administrator	1600JFK Blvd		Philadelphia	PA	19103-2029
U.S. Fish and Wildlife Service (PA region)	Biologist for Conservation Planning Assistance	315 South Allen Street	Suite 322	State College	PA	16801-4850
PA Department of Environmental Protection	Southeast Regional Director	2 E Main St		Norristown	PA	19401



Agency/Town/Tribe	Title	Address 1	Address 2	City	State	Zip
PA Fish and Boat Commission	Attn: Department of Environmental Services	595 East Rolling Dr		Bellefont	PA	16823
NMFS/NOAA Greater Atlantic Region	Mid-Atlantic Council and Ecosystems Branch Chief	55 Great Republic Dr		Gloucester	MA	1930
Office of the Attorney General	Attorney General	1600 Strawberry Square		Harrisburg	PA	17120
Office of the Governor	Governor	508 Main Capitol Bld	Rm 225	Harrisburg	PA	17120
Tribe						
Absentee-Shawnee Tribe of Indians of Oklahoma	Devon Frazier	2025 S. Gordon cooper Drive		Shawnee	OK	74801
Delaware Nations, Oklahoma	Eric Thompson-Paden	31064 State Highway 281	PO Box 825	Anadarko	OK	73005
Delaware Tribe of Indians	Susan Bachor	126 University Circle	Stroud Hall, Rm 437	East Stoudsburg	PA	18301
Eastern Shawnee Tribe of Oklahoma	Paul Barton	70500 E. 128 Rd		Wynadotte	OK	74370
Saint Regis Mohawk Tribe	Darren Bonaparte	71 Margaret Terrance Memorial Way	Community Bld	Akwesasne	NY	13655
Shawnee Tribe	Tonya Tipton	29 South Highway 69a	PO Box 189	Miami	OK	74355



Appendix Table 2. Abuffers list

Parcel ID	Owner	Address 1	City/State	Zip Code
430002089001	UNITED STATES OF AMERICA	1849 C ST NW	WASHINGTON DC	20240
430015067001	UNITED STATES OF AMERICA	1849 C ST NW	WASHINGTON DC	20240
020000784006	BRIDGEPORT BOROUGH	PO BOX 148	BRIDGEPORT PA	19405
580015988001	212 WOOD STREET LLC	3201 POTSHOP RD	EAST NORRITON PA	19403
430002173007	UNITED STATES OF AMERICA	201 14TH ST SW 4TH FL	WASHINGTON DC	20250-0001
430005917007	UNITED STATES OF AMERICA	1849 C ST NW	WASHINGTON DC	20240
430012946007	UNITED STATES OF AMERICA	1849 C ST NW	WASHINGTON DC	20240
430010567001	MONTGOMERY COUNTY	P O BOX 311	NORRISTOWN PA	19404-0311
430010675001	UNITED STATES OF AMERICA	1849 C ST NW	WASHINGTON DC	20240
430005449007	MONTGOMERY COUNTY	P O BOX 311	NORRISTOWN PA	19404
430005446001	MONTGOMERY COUNTY	P O BOX 311	NORRISTOWN PA	19404
430002092007	UNITED STATES OF AMERICA	CUSTOM HOUSE 502	PHILADELPHIA PA	19106
430002095004	UNITED STATES OF AMERICA	1849 C ST NW	WASHINGTON DC	20240
430013912004	UNITED STATES OF AMERICA	1849 C ST NW	WASHINGTON DC	20240
430005893004	UNITED STATES OF AMERICA	1849 C ST NW	WASHINGTON DC	20240
430013930004	UNITED STATES OF AMERICA	1849 C ST NW	WASHINGTON DC	20240
430005452004	MONTGOMERY COUNTY	PO BOX 311	NORRISTOWN PA	19404
130033296009	PECO	2301 MARKET ST	PHILADELPHIA PA	19103
130033308006	PECO	2301 MARKET ST	PHILADELPHIA PA	19103
130033284003	KARP MICHAEL SOLE OWNER OF	1062 E LANCASTER AVE ST APT 30-B	ROSEMONT PA	19010
020000776005	106 DEKALB INC	100 VALLEY CREEK RD	PLYMOUTH MEETING PA	19462
130009852008	JAR INVESTMENTS INC	1800 DEKALB ST	NORRISTOWN PA	19401
580016003013	UPPER MERION TOWNSHIP	175 W VALLEY FORGE RD	KING OF PRUSSIA PA	19406
130015804005	MUNICIPALITY OF NORRISTOWN	235 E AIRY ST	NORRISTOWN PA	19401
580016013003	HUGHES R P LAND DEV INC	144 BROWN ST	PITTSTON PA	18640
130038016005	PECO	2301 MARKET ST	PHILADELPHIA PA	19103
130038020001	NGP PROPERTIES LLC	1 NOBLE ST	NORRISTOWN PA	19401
580016003004	PECO	2301 MARKEKT ST N3-3	PHILADELPHIA PA	19103
130016252007	MUNICIPALITY OF NORRISTOWN	235 E AIRY ST	NORRISTOWN PA	19401



Parcel ID	Owner	Address 1	City/State	Zip Code
130003696017	NORRISTOWN WATER CO	196 W JOHNSON HWY	NORRISTOWN PA	19401
580015991007	UPPER MERION TOWNSHIP	175 W VALLEY FORGE RD	KING OF PRUSSIA PA	19406
580016057004	UNITED STATES OF AMERICA	1849 C ST NW	WASHINGTON DC	20240
580016060001	COMMONWEALTH OF PENNSYLVANIA	PO BOX 8476	HARRISBURG PA	17105-8476
580016066004	PHILADELPHIA & READING RAILROAD COMPANY	51 N 12TH ST	PHILADELPHIA PA	19107
580016027007	UPPER MERION TOWNSHIP	175 W VALLEY FORGE RD	KING OF PRUSSIA PA	19406
580016036007	UNITED STATES OF AMERICA	1849 C ST NW	WASHINGTON DC	20240
630003502008	MITCHELL FREDDIE L II	40 W INDIAN LN	NORRISTOWN PA	19403
630003496005	LEBERMAN HELEN P	37 W INDIAN LN	NORRISTOWN PA	19401
630003499002	MAUGER PAMELA LEE	39 W INDIAN LN	NORRISTOWN PA	19403
630003505005	KITTREDGE KEVIN & KERRIE	41 W INDIAN LN	NORRISTOWN PA	19403-3510
630003514005	CONROY ELLEN DAVIS & THOMAS J	312 PLUSH MILL RD	WALLINGFORD PA	19086
630003544002	BLANEY JAMES R III	63 W INDIAN LN	NORRISTOWN PA	19403
630003556008	SANTANGELO MARK	1436 E LAMPLIGHTER LN	NORTH WALES PA	19454
630003595005	DEGERONIMI MAURIZIO & JUDITH L	84 W INDIAN LN	NORRISTOWN PA	19403
630008202087	FPACP4 VALLEY FORGE LLC	2082 MICHELSON DR STE 400	IRVINE CA	92612
630003538008	RUCKS BARRY ARTHUR	60 W INDIAN LN	NORRISTOWN PA	19403
630000235008	BARBADOS 83 LLC	2620 EGYPT RD	NORRISTOWN PA	19403
630003559005	SMITH EDWARD R II & DEBORAH L	67 1/2 W INDIAN LN	NORRISTOWN PA	19403
630003565008	YOUNG TAMEKA	383 HIGHGATE DR	AMBLER PA	19002
630003571002	ARENA THOMAS R & MARY L	71 W INDIAN LN	NORRISTOWN PA	19403
630003577005	LENTZ GEORGE M & NEWELL STEPHANIE	75 W INDIAN LN	NORRISTOWN PA	19403
630003586005	LIPTON GLENN & JILL	16 PATTERDALE PL	DOWNINGTOWN PA	19335
630003589002	LAROCCA ROBERTA A & RICHARD E TRUST	PO BOX 614	EAGLEVILLE PA	19408
630003594006	RAINSFORD EDWARD T & KAREN D	82 W INDIAN LN	NORRISTOWN PA	19403
630003598002	VALLEY FORGE CENTER ASSOCIATES	201 KING OF PRUSSIA RD STE 501	RADNOR PA	19087
630003610008	WELSH JEFFREY M	100 W INDIAN LN	NORRISTOWN PA	19403
630000235008	BARBADOS 83 LLC	2620 EGYPT RD	NORRISTOWN PA	19403
630008202033	FISHBURNE STREET LLC	PO BOX 3418	GREENVILLE SC	29602



Parcel ID	Owner	Address 1	City/State	Zip Code
630003370005	HUSTON CURT C & SUSAN K	42 E INDIAN LN	NORRISTOWN PA	19403
630003379005	STROUSE BRUCE	38 E INDIAN LN	NORRISTOWN PA	19403
630003382002	LYNCH AMY KATHERINE & NESBITT JEFFREY A	94 BROOKMEAD	WAYNE PA	19087
630003400002	KAUFMAN RICHARD D & VICKI D	28 E INDIAN LN	NORRISTOWN PA	19403
630003385008	BRENNAN DENNIS M & SUSAN J	36 E INDIAN LN	NORRISTOWN PA	19403
630003397005	BARTELT RUTH W	30 E INDIAN LN	NORRISTOWN PA	19403
630003409002	GOWDER JAMES A	18 E INDIAN LN	NORRISTOWN PA	19403
630003430008	WEST NORRITON TOWNSHIP	1630 W MARSHALL ST	JEFFERSONVILLE PA	19403
630003403008	ZIMMERMAN ROBERT JR & BRENDA	26 E INDIAN LN	NORRISTOWN PA	19403
630003415005	CAUSAK BRIAN	16 E INDIAN LN	NORRISTOWN PA	19403
630003427002	WATTERS LEROY J III & LYNN MARIE	1 E INDIAN LN	NORRISTOWN PA	19403
630003439008	WHITE JEFFREY	4 W INDIAN LN	NORRISTOWN PA	19403
630003448008	MUHAMMAD JOHN IBN & REID AJA	530 S PROVIDENCE RD	WALLINGFORD PA	19086
630003457008	FROST LILA ROSALIE	1409 GERTRUDE AVE	PHOENIXVILLE PA	19460
630003463002	HILL JEFFREY C	12 W INDIAN LN	NORRISTOWN PA	19403
630003472002	BOSTOCK PETER DAVID & KATJA SUSANNE	16 W INDIAN LN	NORRISTOWN PA	19403
630003484008	MALPASS WILLIAM R	21 W INDIAN LN	NORRISTOWN PA	19403
630003487005	SIGGELKOW NICOLAJ & WATSON DEBORAH	2421 SOUTH ST	PHILADELPHIA PA	19146
630003523005	GEHRET ALLAN K & H VIRGINIA	1450 W MAIN ST	NORRISTOWN PA	19403
630003475008	PECO	2301 MARKET ST	PHILADELPHIA PA	19103
630003478005	BEERY DANIEL & IFFLAND SABRINA	19 W INDIAN LN	NORRISTOWN PA	19403
630003490002	SOWA MATTHEW R & VELDMAN HENDRIKA D	30 W INDIAN LN	NORRISTOWN PA	19403
630003541005	BLANEY JAMES R III	63 W INDIAN LN	NORRISTOWN PA	19403
630003562002	WILSON WILLIAM S & SHERRIE L	68 W INDIAN LN	EAGLEVILLE PA	19403
630003547008	MCGREGOR TIMOTHY TERRENCE &	65 W INDIAN LN	NORRISTOWN PA	19403
630003550005	DOUGHERTY WILLIAM	66 W INDIAN LN	NORRISTOWN PA	19403
630003568005	WELCH SEAN M & SUSAN	70 W INDIAN LN	NORRISTOWN PA	19403
630003574008	GERSTENFELD MEGAN L & DUTY JOHN III	73 W INDIAN LN	NORRISTOWN PA	19403
630003580002	BAILEY ROBERT & SCHASBERGER BRITTA	76 W INDIAN LN	NORRISTOWN PA	19403



Parcel ID	Owner	Address 1	City/State	Zip Code
630003592008	LAST MILE HOLDINGS LLC	152 MATHERS RD STE 201	AMBLER PA	19002
630003583008	DONAHUE KRISTA M & CHARLES V	77 W INDIAN LN	NORRISTOWN PA	19403
630000235008	BARBADOS 83 LLC	2620 EGYPT RD	NORRISTOWN PA	19403
630008202078	RIVERVIEW LANDING LLC	PO BOX 769	GLADWYNE PA	19035
630006331005	UNITED STATES OF AMERICA	1849 C ST NW	WASHINGTON DC	20240
630003388005	MILLER DIANE PARENTE & MATTHEW T	35 E INDIAN LN	NORRISTOWN PA	19403
630003406005	COMMERCIAL CLUB	22 E INDIAN LN	NORRISTOWN PA	19403
630003418002	NORRISTOWN BOAT CLUB INC	PO BOX 24	GWYNEDD VALLEY PA	19437
630003424005	KEELER C B & DIANE L	826 SIMMONS RD	SELLERSVILLE PA	18960
630003421008	KEELER C BRIAN & DIANE L	826 SIMMONS RD	SELLERSVILLE PA	18960
630003445002	WITLIN JOHN J JR & MISCANNON JODI G	6 W INDIAN LN	NORRISTOWN PA	19403
630003451005	ROBERTS JONATHAN BREWSTER &	8 W INDIAN LN	NORRISTOWN PA	19403
630003466008	BOWDEN CHARLES W IV	13 W INDIAN LN	NORRISTOWN PA	19403-3510
630003487014	LAWRENCE STEPHEN R & MELISSA	3428 CAMDEN DR	LEWISVILLE TX	75028
630003494007	GIVNISH KARA LEA	33 W INDIAN LN	EAGLEVILLE PA	19403
630003391002	BESTOSO DONALD M & ELIZABETH	34 E INDIAN LN	JEFFERSONVILLE PA	19403
630003394008	SEITZ GARY & LEA	10 STEVENS CT	LAFAYETTE HILL PA	19444
630003412008	CAUSAK BRIAN	16 E INDIAN LN	JEFFERSONVILLE PA	19403
630003433005	ULLBERG JEFFREY P	2 W INDIAN LN	NORRISTOWN PA	19403
630003436002	RICKERT CLETUS C & CYNTHIA F	3 W INDIAN LN	NORRISTOWN PA	19401
630003442005	BAKER WILLIAM J SR & MARGARET M	5 W INDIAN LN	NORRISTOWN PA	19403
630003454002	ROBERTS JONATHAN	9 W INDIAN LN	NORRISTOWN PA	19403
630003460005	GREENSPAN CYRIL J	11 W INDIAN LN	NORRISTOWN PA	19403
630003481002	WALKER TODD E	63 E BROAD ST	HATFIELD PA	19440
630003493008	HUGANIR JOHN L	1107 N TROOPER RD	EAGLEVILLE PA	19403
630003535002	CROWLEY JOHN	56 W INDIAN LN	NORRISTOWN PA	19403
630003526002	SIEDZIKOWSKI HENRY F & MARY RITA D	50 W INDIAN LN	EAGLEVILLE PA	19403
630003511008	SALER LOUISE & WOOD SHARON	42 W INDIAN LN	NORRISTOWN PA	19403
430002197001	UNITED STATES OF AMERICA	201 14TH ST 4TH FL	WASHINGTON DC	20250-0001



Parcel ID	Owner	Address 1	City/State	Zip Code
580015988001	212 WOOD STREET LLC	3201 POTSHOP RD	EAST NORRITON PA	19403
130019828004	MORAN WILLIAM J JR TRUSTEE	1123 KRIEBEL MILL RD	COLLEGEVILLE PA	19426
580015997001	EASTERN REAL ESTATE COMPANY	PO BOX 8499	PHILADELPHIA PA	19101
130019166009	PECO	2301 MARKET ST	PHILADELPHIA PA	19103
130003780005	NORRISTOWN WATER CO	196 W JOHNSON HWY	NORRISTOWN PA	19403
580016018007	READING COMPANY	PO BOX 8499	PHILADELPHIA PA	19101
430002089001	UNITED STATES OF AMERICA	1849 C ST NW	WASHINGTON DC	20240
580015997001	EASTERN REAL ESTATE COMPANY	PO BOX 8499	PHILADELPHIA PA	19101
580016024001	PHILADELPHIA & READING RAILROAD COMPANY	51 N 12TH ST	PHILADELPHIA PA	19107
580016009007	CONRAIL	PO BOX 8499	PHILADELPHIA PA	19101
430005437001	MONTGOMERY COUNTY	P O BOX 311	NORRISTOWN PA	19404
430005434004	MONTGOMERY COUNTY	P O BOX 311	NORRISTOWN PA	19404
580016054007	UNITED STATES OF AMERICA	1849 C ST NW	WASHINGTON DC	20240
580016039004	UNITED STATES OF AMERICA	1849 C ST NW	WASHINGTON DC	20240
580012340004	UPPER MERION TOWNSHIP	175 W VALLEY FORGE RD	KING OF PRUSSIA PA	19406
580016021004	PHILADELPHIA & READING RAILROAD COMPANY	51 N 12TH ST	PHILADELPHIA PA	19107
630003604005	MARSH BETSY A	97 W INDIAN LN	NORRISTOWN PA	19403
630003601008	93 WEST LP	948 TENNIS AVE	AMBLER PA	19002
630003373002	BAKALOV BOJIDAR &	40 E INDIAN LN	NORRISTOWN PA	19403
630003376008	MILNES MARK R	39 E INDIAN LN	NORRISTOWN PA	19403
130033292004	PECO	2301 MARKET ST	PHILADELPHIA PA	19103
130003780014	NORRISTOWN WATER CO	196 W JOHNSON HWY	NORRISTOWN PA	19403
2707 0004000	PENNSYLVANIA LINES LLC	THREE COMMERCIAL PL-TAXATION-BOX 209	NORFOLK VA	23510
2707 0005000	UNITED STATES OF AMERICA	USA	WASHINGTON DC	20240
2706 0117000	PENNSYLVANIA LINES LLC	THREE COMMERCIAL PL-TAXATION-BOX 209	NORFOLK VA	23510
2706 0014000	RSK PROPERTIES LLC	1310 EGYPT RD	PHOENIXVILLE PA	19460
2706 0116000	DELAWARE VALLEY PROPERTIES II LLC	PO BOX 2987	VALLEY FORGE PA	19482
2706 0013000	VALLEY FORGE SEWER	333 PAWLING RD	PHOENIXVILLE PA	19460



APPENDIX B Property Rights/Deeds

THIS INDENTURE, made this *14th* day of *July* A.D. 1955, between the COMMONWEALTH OF PENNSYLVANIA, acting by and through the Water and Power Resources Board of the Department of Forests and Waters (hereinafter referred to as the Grantor), and PHILADELPHIA ELECTRIC COMPANY, a Pennsylvania Corporation, (hereinafter referred to as the Grantee):

WHEREAS, the Commonwealth of Pennsylvania, acting by and through the Water and Power Resources Board, by two deeds dated April 1, 1947 and recorded in the office for the Recording of Deeds in and for Chester County, in Deed Book No. H-22, Page 231, and Deed Book No. H-22, Page 230, and also recorded in the Recorder of Deeds office in and for Montgomery County in Volume 1823, Page 551, and Volume 1823, Page 508, pursuant to the Act of June 4, 1945, P. L. 1383, and amendments thereto, acquired for use in connection with the Schuylkill River Desilting Project, the major portions of the lands, tenements, hereditaments, and canals with their major appurtenances, comprising the original system of the canals and navigation works of the President, Managers, and Company of the Schuylkill Navigation Company, and located in Philadelphia, Montgomery, Chester, Berks and Schuylkill Counties, Pennsylvania; and

WHEREAS, the Act of June 27, 1947, P. L. 1042, amending Section 7 of the aforesaid Act of June 4, 1945, P. L. 1383, authorizes the Water and Power Resources Board of the Department of Forests and Waters, with the approval of the Governor, to sell any property, real, personal or mixed, acquired in the name of the Commonwealth under the provisions of said Act of June 4, 1945, and not needed for the purposes of said Act; and

WHEREAS, the Water and Power Resources Board, at a

regular meeting thereof, on January 12, 1955, a full quorum being present, did by resolution duly passed (1) declare that the property hereinafter described was not needed for the purpose of the Schuylkill River Desilting Project, and (2) accept the offer of Sixty Thousand (\$60,000.00) Dollars from the PHILADELPHIA ELECTRIC COMPANY for the purchase of said property and (3) authorize the Chairman of the Board to execute, acknowledge and deliver its deed for the said property for the said sum;

NOW THEREFORE WITNESSETH, that the said Grantor, for and in consideration of the sum of Sixty Thousand (\$60,000.00) Dollars lawful money of the United States of America, to it well and truly paid by the Grantee at and before the sealing and delivery of these presents, the receipt whereof is hereby acknowledged, has remise, released and quit-claimed, and by these presents does remise, release and quit-claim unto the Grantee, its successors and assigns forever:

ALL THOSE CERTAIN tracts or parcels of property, to wit,

PARCEL NUMBER 1
BLACK ROCK DAM

SITUATE across the Schuylkill River above Phoenixville in Chester County and above Mont Clare in Montgomery County, Commonwealth of Pennsylvania, now the property of the Commonwealth of Pennsylvania, and known as Black Rock Dam, bounded and described according to a survey made by the Department of Forests and Waters, July 12, 1954, Drawing No. BRD/1, attached hereto and marked Exhibit "A",

BEGINNING at a point on the inside face of the Right abutment located on the West side of the Schuylkill River, said abutment containing U.S.E.D. Monument No. 30 located approximately 18 feet, 4 inches from the upper face of the masonry abutment. Said abutment also adjacent to the Inlet of the Phoenix Branch and included in the former Schuylkill Canal property conveyed to the Central Iron and Steel Company as shown on Drawing #18, Section #PB-1, dated January 24, 1949. Thence crossing the Schuylkill River including the Wood Crib Rock filled Dam for a distance of 378 feet more or less, to the left masonry abutment located on the East side of the Schuylkill River.

Including also the left abutment extending from the River edge to the right or west edge of the Oaks Reach of the Schuylkill Canal. Does not include any portion of the Oaks Reach of the Schuylkill Canal.

BEING a part of the same premises which the Reading Company and Schuylkill Navigation Company granted and conveyed unto the Commonwealth of Pennsylvania in their deeds dated April 1, 1947, and recorded in the Recorder of Deeds Office in and for Chester County in Deed Book #H-22, page 231 and Deed Book #H-22, page 230

and also recorded in the Recorder of Deeds Office in and for Montgomery County in Volume No. 1823, page 551 and Volume No. 1823, page 508, respectively.

PARCEL NUMBER 2
NORRISTOWN DAM

SITUATE across the Schuylkill River with abutments in the Boroughs of Bridgeport and Norristown, County of Montgomery, Commonwealth of Pennsylvania, now the property of the Commonwealth of Pennsylvania, and known as the Norristown Dam, bounded and described according to the survey made by the Department of Forests and Waters, July 20, 1954, Drawing No. NO/D1, attached hereto and marked Exhibit "B" and

BEGINNING at a point in the Dam, said point being located 30 feet, more or less, from the North face of the South abutment located on the Right bank of the Schuylkill River. Said abutment located in the former Schuylkill Canal Property conveyed to the Philadelphia Electric Company as shown on Drawing #25, Section #N-1, dated September 7, 1949, U.S.E.D. Monument #15 is located between the abutment and former Canal Locks #64 of the former adjacent Canal.

Thence crossing the Schuylkill River including the Wood Crib Rock filled Dam for a distance of ~~689.4~~ feet, more or less, to the left masonry abutment located on the North side of the Schuyl-

kill River. Including also the Left abutment, located adjacent to the property of the Philadelphia Electric Company and the edge of the left bank of the Schuylkill River.

BEING a part of the same premises which the Reading Company and the Schuylkill Navigation Company granted and conveyed unto the Commonwealth of Pennsylvania in their deed dated April 1, 1947, and recorded in the Recorder of Deeds Office in and for Montgomery County in Volume No. 1823, page 551 and Volume No. 1823, page 508, respectively.

EXCEPTING, and reserving unto the said Grantor, and its assigns, the full and free right and liberty at all times hereafter to a supply of water from Black Rock Pool as required to maintain the normal level of water without decrease in flow in Oaks Reach of the Schuylkill Canal.

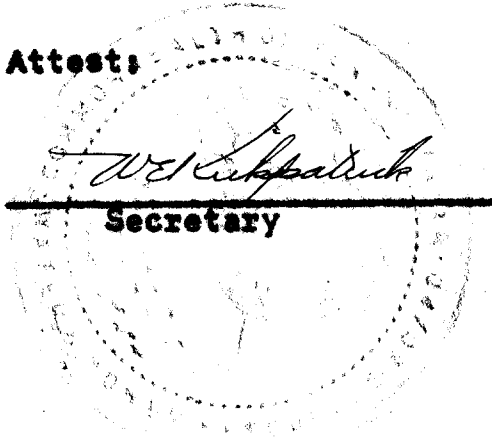
TOGETHER with all and singular the tenements, hereditaments and appurtenances thereunto belonging, or in any wise appertaining, and the reversions, remainders, rents, issues and profits thereof. AND ALSO all the estate, right, title, interest, property, claim and demand whatsoever, as well in law as in equity, of the Grantor, of, in or to the above described premises, and every part and parcel thereof, with the appurtenances.

TO HAVE AND TO HOLD all and singular the above mentioned

and described premises, together with appurtenances, unto the said Grantee, its heirs and assigns forever.

IN WITNESS WHEREOF, the said Water and Power Resources Board of the Department of Forests and Waters, acting for the Commonwealth of Pennsylvania, has caused this Indenture to be signed by its Chairman, Maurice K. Goddard, attested by its Secretary, E. Kirkpatrick, and affixed thereunto the seal of said Board, and approved by the Governor of the Commonwealth of Pennsylvania, all in accordance with the provisions of the Act of the General Assembly of the Commonwealth of Pennsylvania, approved June 4, 1945, P.L. 1383, as amended, dated the day and year first above written.

Attest:



Secretary

WATER AND POWER RESOURCES BOARD

By Maurice K. Goddard
Chairman

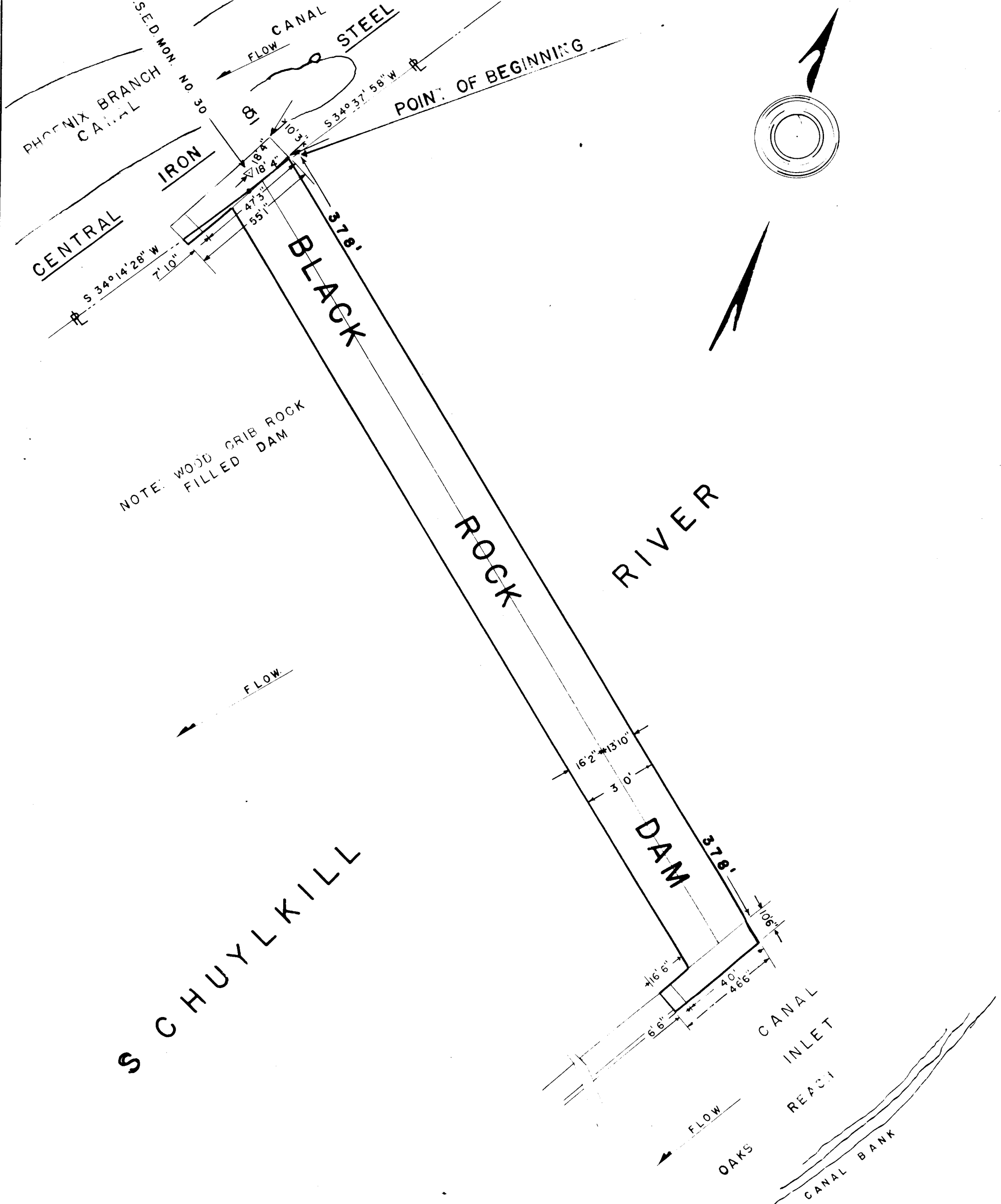
28

Approved:

Richard B. Golden
Attorney General

Approved:

George M. Lusk
Governor



NOTE: WOOD CRIB ROCK FILLED DAM

REVISED JULY 7, 1955

COMMONWEALTH OF PENNSYLVANIA
 DEPARTMENT OF FORESTS & WATERS
WATER & POWER RESOURCES BOARD
 HARRISBURG, PENNSYLVANIA

EXHIBIT "A"
BLACK ROCK DAM

BORO OF PHOENIXVILLE CHESTER COUNTY, PENNA

DRAWN BY S.E.B. TRACED BY S.E.B. CHECKED BY J.R.S.	FIELD OFFICE <i>NORRISTOWN, PENNA</i> SUBMITTED BY <i>[Signature]</i> ENGINEER IN CHARGE	DATE 7-12-54	SCALE 1" = 40'	SECT. NO. PHOENIX	DRWG NO. BRD / 1
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STATE TAX
AFFIDAVIT
FILED

002946

9/8/98

REALTY TRANS TAX PAID
STATE
LOCAL
PEN

QUITCLAIM DEED

1.50
15.00
25

97 FEB 24 AM 11:31

THIS QUITCLAIM DEED made the 1st day of December 1998 BETWEEN PECO ENERGY COMPANY (the "Donor"), and COUNTY OF MONTGOMERY (the "Donee").

WITNESSETH, that in consideration of the sum of ONE DOLLAR (\$1.00) paid by the Donee to the Donor, the receipt whereof is hereby acknowledged, Donor renounces, releases and quitsclaims to Donee, its successors and assigns, all of the right, title and interest of Donor of, in and to the following:

ALL THAT CERTAIN "NORRISTOWN DAM" situate across the Schuylkill River with abutments in the Boroughs of Bridgeport and Norristown, County of Montgomery, Commonwealth of Pennsylvania, bounded and described according to the survey made by the Department of Forests and Waters, dated July 20, 1954, Drawing No. NO/D1, attached hereto and marked Exhibit "A" and

BEGINNING at a point in the Dam, said point being located 30 feet, more or less, from the North face of the South abutment located on the Right bank of the Schuylkill River. Said abutment located in the former Schuylkill Canal Property conveyed to the Philadelphia Electric Company as shown on Drawing #25, Section #N-1, dated September 7, 1949, U.S.E.D. Monument #15 is located between the abutment and former Canal Locks #64 of the former adjacent Canal. Thence crossing the Schuylkill River including the existing Dam for a distance of 699.4 feet, more or less, to the left masonry abutment located on the North side of the Schuylkill River. Including also the Left abutment, located adjacent to the property of the Philadelphia Electric Company and the edge of the left bank of the Schuylkill River.

BEING part of the same premises (Parcel No. 2) which the COMMONWEALTH OF PENNSYLVANIA by indenture dated July 14, 1955 and recorded in the Office for Recording of Deeds, &c., in and for the County of Montgomery, aforesaid in Deed Book E 28, Page 394, &c., renounced, released and quit claimed unto PHILADELPHIA ELECTRIC COMPANY (now known as PECO ENERGY COMPANY).

TOGETHER with all and singular the improvements, and appurtenances belonging thereto and all the estate, right, title, interest, property, claim and demand whatsoever of the Donor, in law, equity, or otherwise of, in, and to the same and every part thereof (collectively with the premises described above the "Property").

085177PG2436

INTER-DEPARTMENT CORRESPONDENCE

TO	RECORDER OF DEEDS	DATE	2/14/97
FROM	Board of Assessment		
SUBJECT	Title of Document - Quick Claim Deed - Naxxistown Dam		

Please index this document
by name only.

08517762437 Paul G. Baird

UNDER and SUBJECT to existing easements and restrictions of record or which a survey or personal inspection might reveal; and to ordinances, rules and regulations of governmental or regulatory bodies;

PROVIDED that said Property be used for providing public boating, fishing and related recreational activities for public purposes.

TO HAVE AND TO HOLD the Property, unto the Donee, its successors and assigns, to and for the only proper use and benefit of the Donee, its successors and assigns forever.

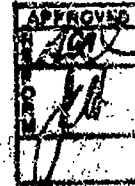
EXECUTED the day and year first above written.

ATTEST:

Johnnie H. Smith
Secretary

PECO ENERGY COMPANY

BY: *J. [Signature]*
Manager, Real Estate Division



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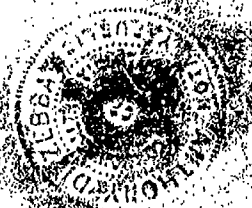
COMMONWEALTH OF PENNSYLVANIA:
COUNTY OF DELAWARE : SS.

On this, the 4th day of December 1984, before me, a Notary Public, the undersigned officer, personally appeared M. A. Williams, who acknowledged himself to be Manager, Real Estate Division, and that he as such Manager, being authorized to do so, executed the foregoing instrument for the purposes therein contained, by signing the name of the corporation by himself as Manager, Real Estate Division.

In Witness Whereof, I hereunto set my hand official seal.

Anthony F. Zabus
Notary Public

Notary Seal
Anthony F. Zabus, Notary Public
Springfield Twp., Delaware County
My Commission Expires June 21, 1987
1987-06-21, Pennsylvania Association of Notaries



File No. PE 1185-1

AJC/m

Address of Grantee:
County of ~~Delaware~~
PA 19404-0311

