

February 2, 2021

The Honorable Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
ATTN: OEP/DHAC
888 First Street, NE
Washington, DC 20426

RE: York Haven Hydroelectric Project (FERC No. 1888-036)
Article 401(b) – 2020 Fish Passage Operating Report

Dear Secretary Bose:

In accordance with Article 401(b) of the Project license, the Pennsylvania Department of Environmental Protection (Pennsylvania DEP) Water Quality Certification (WQC), and the U.S. Fish and Wildlife Service (FWS) fishway prescription, York Haven Power Company, LLC (York Haven) has enclosed the 2020 Fish Passage Operating Report (Report) for Commission review. The Report must be filed with the Commission annually by March 1, or within 30 days of the annual meeting, whichever is sooner. The Report must document Agency consultation.

York Haven distributed the 2020 draft Report to PADEP, USFWS, and other agencies, for review and comment on December 22, 2020. PADEP and USFWS provided written comments on the draft Report to YHPC via emails dated January 14, 2021 and January 15, 2021, respectively. YHPC hosted a virtual meeting with PADEP, USFWS, and other agencies, on January 20, 2021 to review and discuss the Report. The enclosed Report incorporates and responds to Agency comments. Documentation of Agency consultation is appended to the Report.

If you have questions or need additional information, please contact me at (804) 739-0654 or via email jody.smet@eaglecreekre.com.

Sincerely,



Jody J. Smet, AICP
VP Regulatory Affairs
York Haven Power Company, LLC
Eagle Creek Renewable Energy

Enclosure

CC: PADEP
USFWS

**SUMMARY OF UPSTREAM AND DOWNSTREAM
FISH PASSAGE AT THE
YORK HAVEN HYDROELECTRIC PROJECT
IN 2020**

Prepared For:

**York Haven Power Company
Middletown, Pennsylvania 17057**

Prepared By:

**Kleinschmidt Associates
Strasburg, Pennsylvania 17579**

January 2021

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EXECUTIVE SUMMARY

The East Channel Fishway was opened on 29 March allowing volitional upstream passage. Shad passage at the lower river fish lifts this spring was the lowest recorded since the three lower Susquehanna River fish lifts were placed in service in 1997. Based on a request from the Resource Agencies, the lower River fish lifts were shut down to stop the passage of Northern Snakehead, an invasive species. Prior to their shutdown some 485, 28 and 1 shad were passed at Conowingo, Holtwood and Safe Harbor, respectively in 2020. Since only one shad was passed at Safe Harbor, the East Channel Fishway was not staffed during the spring spawning run for the third consecutive spawning season since it was placed in service in 2000.

Volitional upstream passage ended on 21 December when the Fishway was closed for the year. During volitional passage, the South fixed wheel gate was closed, and the North fixed wheel gate and ladder were set to deliver a minimum flow of 400 cfs into the East Channel. River flows from 29 March to 21 December varied from 3,250 cfs to 232,000 cfs (Figure 4). River flows were less than or equal to Station hydraulic capacity (17,000 cfs) from 16 June to 14 November, a 152-day period.

Downstream passage of adult American shad occurred from 1 May to 30 June. The forebay Sluice Gate was opened as required (~370 cfs) for two hours, Monday through Friday, throughout May and June as river flows exceeded the Stations hydraulic capacity. Since only one American Shad was passed upstream of Safe Harbor, no physical observations of post-spawned adult American shad were noted by Station personnel.

In accordance with the Projects FERC License and 401 Water Quality Certification, the Sluice Gate was generally left opened daily from 1 October to 30 November to provide downstream passage of juvenile shad. The Sluice Gate was open 80% to 85% of the two-month period. Generally, the Sluice Gate was closed from 0700 hrs to 1400 hrs during the week and the and the Gate was left open from 1400 hrs of Friday until 0700 hrs on Monday.

During the JASPP, river flow was lower than normal and varied from 17,300 cfs to 3,570 cfs (Figure 5). Flows during the entire two-month period only exceeded the hydraulic capacity (17,000 cfs) of the Station on 15 November. In contrast, 20-year average flow values (2000 to 2019) varied from 47,738 cfs to 17,739 cfs and always exceeded the hydraulic capacity of the Station. Average daily water temperature during the fall downstream migration period (1 October to 30 November) varied over 22 degrees and ranged from a high of 66.6°F on 23 October to a low of 43.7°F on 25 November.

1.0 INTRODUCTION

In 1993, York Haven Power Company (YHPC), the licensees of the Safe Harbor and Holtwood Projects, the U.S. Department of the Interior represented by the Fish and Wildlife Service (“USFWS”), the Susquehanna River Basin Commission (“SRBC”), the states of Maryland and Pennsylvania and their involved agencies – Maryland Department of Natural Resources (“MDNR”), Pennsylvania Fish and Boat Commission (“PFBC”) and Pennsylvania Department of Environmental Resources (“PADEP”), and two other parties signed the Susquehanna River Fish Passage Settlement Agreement.

This agreement established for each project a Fish Passage Technical Advisory Committee (“FPTAC”) comprised of representatives of the affected licensee, USFWS, PFBC and MDNR. Each FPTAC is responsible for reviewing and monitoring the maintenance and operation of the fish passage facilities at the respective project, preparing an annual report, and recommending studies and/or modifications to improve upstream and downstream passage. Cube Hydro Partners, LLC and YHPC personnel hosted a conference call with the York Haven FPTAC on February 7th, 2020 to review the 2019 Annual Fish Passage Report and discuss 2020 Fishway operation.

2.0 YORK HAVEN FISHWAY OPERATIONS

The installation and operation of the Fishway are part of a cooperative private, state and federal effort to restore American Shad (*Alosa sapidissima*) and other migratory fish to the Susquehanna River. In 1997, YHPC and the resource agencies reached a new settlement agreement to revise the type and location of the York Haven fish passage facility. The Fishway is located in Dauphin County, PA at the Three Mile Island end of the East Channel Dam at the York Haven Hydroelectric Project (FERC No. 1888). The Fishway was placed in service by YHPC in April 2000. Upstream and downstream Fishway operation is provided for in the Projects FERC License (FERC, 2015) and the Pennsylvania Department of Environmental Protection Water Quality Certification (PA DEP, 2014) issued on December 22, 2015 and 19 August 2014, respectively.

Fishway operation coincides with a springtime minimum flow release. As part of the 1997 agreement and in accordance with its new License and Water Quality Certification, YHP agreed to maintain a spill of up to 4,000 cfs over the Main Dam and a minimum release of approximately 2,000 cfs in the East Channel during spring Fishway operation. River flow in excess of spring minimum flow requirements and station capacity is spilled over the Main and East Channel Dams.

2.1 Project Operation

The hydroelectric station located in York Haven, PA built in 1904, is situated on the River (river mile 55) in Dauphin and York counties, Pennsylvania (Figure 1). It is the fourth upstream hydroelectric dam on the River. The Project is a 20 unit run-of-river facility capable of producing approximately 19 MW and has an estimated hydraulic capacity of 17,000 cfs. It includes two dams that impound approximately 5 miles of the River forming Lake Frederic. The Main Dam is approximately 5,000-ft long, with a maximum height of 17-ft. The East Channel Dam is approximately 925-ft long with a maximum height of 9-ft. When River flow exceeds station hydraulic capacity (55% of the year), water is spilled over the two dams. During the spring spawning season, river flows in excess of spring minimum flow requirements were spilled over the Main and East Channel dams.

2.2 Fishway Design, Maintenance and Operation

2.2.1 Fishway Design

Fishway design incorporated numerous criteria established by the USFWS and the other resource agencies. The Fishway has an operating limit of 150,000 cfs River flow (East Channel flow limit of approximately 22,000 cfs). The Fishway includes two sections; a “weir cut” and a vertical notch fish ladder. Figure 2 provides the general arrangement of the Fishway. A detailed description of the Fishway and its major components is located in 2000 and 2001 summary reports (Kleinschmidt 2000 & 2002). Volitional passage at the Fishway is to begin on or about the 1st of April conditions permitting. Daily operation is scheduled to begin 4 days after the Safe Harbor lift passes 1,000 American shad.

2.2.2 Fishway Maintenance

Per the York Haven Fishway Operation Procedure (YHPC, LLC and Kleinschmidt, 2019) preparation and maintenance of the Fishway began in early March. The Fishway was inspected and repairs undertaken which enabled the Fishway to open on 29 March. Major repairs undertaken and completed in 2020 included the replacement of the Fishway exit gate operator.

Resident fish passage operation is scheduled to end on 15 December or when the average daily water temperature is ≤ 40 degrees Fahrenheit for three consecutive days. Thus, in the beginning of December, YHPC contacted its supplemental labor contractor and developed a plan and schedule to close the Fishway. While the Fishway is closed, it is inspected, and minor repairs are completed. Due to an impending Nor’easter combined with the potential for 12 inches of snow, closure of the Fishway was completed on 21 December.

Based on inspections by YHPC maintenance personnel, the Project is planning to replace the entrance gate actuator and install a Worthington Tuff Boom debris barrier at the Fishway exit in 2021.

2.2.3 Fishway Operation

In 2020, lower River fish passage operations and Passage of American Shad in the River were affected by COVID 19 and the collection and passage of Northern Snakeheads. Due to COVID 19, operation of the Conowingo East lift was delayed until 12 May. From 12 to 15 May, the Conowingo East Lift collected (35) and passed (21) Northern Snakeheads before operations were canceled for the season at the request of the Resource Agencies. Lift operations at Holtwood and Safe Harbor were also canceled on 15 May. While fish passage operations were limited this spring in 2020, lower River fish passage operations and Passage of American Shad in the River were affected by COVID 19 and the collection and passage of Northern Snakeheads. Due to COVID 19, operation of the Conowingo East lift was delayed until 12 May. From 12 to 15 May, the Conowingo East Lift collected (35) and passed (21) Northern Snakeheads before operations were canceled for the season at the request of the Resource Agencies. Lift operations at Holtwood and Safe Harbor were also canceled on 15 May. While fish passage operations were limited this spring, a total of 485, 28 and 1 American Shad were passed at Conowingo, Holtwood and Safe Harbor, respectively in 2020 (Table 1).

Fishway preparations began in early March and volitional passage (un-staffed) began on 29 March. Since just 1 American Shad was passed at Safe Harbor this spring, the Fishway was not staffed this year. From 29 March through 27 May daily River flows, measured at the USGS Harrisburg Gage (01570500), exceeded 30,000 cfs resulting in flows spilled over the Main and East Channel Dams (Figure 3) that exceeded springtime minimum flow requirements of 4,000 cfs and 2,000 cfs at the Main and East Channel Dams, respectively.

Water temperature¹ was collected in the East Channel Fishway at 60-minute intervals from 29 March to 30 June and 1 October to 30 November with an Onset Hobo Water Temperature Pro v2 Data Logger (U22-001) that has a ± 0.2 °C accuracy. The monitor was suspended approximately 4 ft above the bottom (Elev. 274.63 ft) of the Fishway exit flume opposite the counting window on the east side of the exit flume (Figure 2). Average daily water temperature during the spring (Figure 3) increased over 34.7 degrees and ranged from a 47.7°F on 29 March to a high of 82.4°F on 22 June.

The Fishway provided volitional passage through 21 December when the Fishway was closed for the year. During volitional passage, the South fixed wheel gate was closed, and the North fixed wheel gate and ladder were set to deliver a minimum flow of 400 cfs into the East Channel. River flows from 29 March to 21 December varied from 232,000 cfs to 3,250 cfs. (Figure 4). During this period, River flows were less than or equal to station hydraulic capacity (17,000 cfs) on 174 days and exceeded the upper Fishway operation criteria (150,000 cfs) on 3 days from 1 May to 3 May.

3.0 DOWNSTREAM FISH PASSAGE

The Projects recently issued FERC license and new Water Quality Certification provide for downstream passage of adult and juvenile shad. Downstream passage of adult American Shad is expected to occur from 1 May to 30 June while downstream passage of juvenile American Shad is to occur from 1 October through 30 November.

3.1 Adult Passage

When River flows exceed the sum of Project Hydraulic Capacity, and required flows through the East Channel and required flows (if any) over the Main Dam, the Project, according to its FERC License and 401 Water Quality Certification, the Station is to open and spill water via the forebay Sluice Gate (~370 cfs) to the extent practicable for a period of one to two hours during the morning on weekdays, subject to Project personnel availability and access requirements for operations and maintenance purposes. Spilling may be provided in connection with opening of the forebay Sluice Gate for purposes of passing debris.

As the Fishway was operated to allow volitional upstream fish passage, the forebay Sluice Gate was opened as required (~370 cfs) for two hours, Monday through Friday, throughout May and June as river flows exceeded the Stations hydraulic capacity (Figure 3). Since just one American Shad was passed at Safe Harbor, no physical observations of post-spawned adult American shad were noted by Station personnel.

3.2 Juvenile Passage

During the juvenile American Shad Passage Period (JASPP), 1 October to 30 November, the Project is to operate its turbines in the following order. Depending on available River flow, Units 1-6 (Propeller/Kaplan units) may be operated without restriction up to available River flow. Unit 14 (larger single Francis unit) may be operated if river flow exceeds capacity of Units 1 to 6; Units 7 to 13 and 15 to 20 (double Francis units) may be operated in ascending order if river flow exceeds capacity of Units 1-6 and 14. During the downstream juvenile passage period, the Station is to open and spill water via the Forebay Sluice Gate (~370 cfs) between the hours of 5 PM to 11 PM EST. If during the downstream passage period, River flow exceeds the sum of Project hydraulic capacity, required flows through the East Channel and required flows over the Main Dam (if any), the Project is also to open and spill water via the Forebay Sluice Gate to the

¹ Water temperature data to be provided upon request as an Excel file.

extent practicable for one to two hours during the morning, subject to Project access requirements for operations and maintenance purposes.

In accordance with the Projects FERC License and 401 Water Quality Certification, the Sluice Gate was generally left opened daily from 1 October to 30 November to provide downstream passage of juvenile American Shad. The Sluice Gate was open 80% to 85% of the two-month period. The sluice gate was normally closed from 0700 hrs to 1400 hrs Monday through Friday and was left open from 1400 hrs Friday until 0700 hrs on Monday.

During the JASPP, river flow was lower than normal due as a result of drought conditions that was experienced in much of the River Basin this year and varied from 17,300 cfs to 3,570 cfs (Figure 5). Flows during the entire two-month period only exceeded the hydraulic capacity (17,000 cfs) of the Station on 15 November. In contrast, 20-year average flow values (2000 to 2019) varied from 47,738 cfs to 17,739 cfs and always exceeded the hydraulic capacity of the Station. Average daily water temperature (measured at the Fishway) during the fall downstream migration period (1 October to 30 November) varied over 22 degrees and ranged from a high of 66.6°F on 23 October to a low of 43.7°F on 25 November.

4.0 LITERATURE CITED

- Commonwealth of Pennsylvania Department of Environmental Protection. August 19, 2014, Water Quality Certification for the York Haven Hydroelectric Project and Related Mitigation, DEP File NO. –EA67-023: York Haven Power Company, LLC, 65 pp.
- Federal Energy Regulatory Commission, December 15, 2015. Order Issuing New License for York Haven Power Company, LLC. 135 pp.
- Kleinschmidt. 2000. Summary of operation at the York Haven Fishway in 2000. Prepared for York Haven Power Company, GPU Energy by Kleinschmidt, Strasburg, Pennsylvania. 21 pp.
- Kleinschmidt. 2002. Summary of operation at the York Haven Fishway in 2001. Prepared for York Haven Power Company, GPU Energy/FirstEnergy by Kleinschmidt, Strasburg, Pennsylvania. 21 pp.
- York Haven Power Company, LLC and Kleinschmidt. April 2019. Fishway Operation Plan. Prepared for York Haven Hydroelectric Project, York Haven, Pennsylvania. 128 pp.

TABLE

Table 1. American Shad Passage and the "Perceived Effectiveness" of Fish Passage Facilities at the Four Mainstem Susquehanna River Hydroelectric Projects, 1997 to 2020

Year	Conowingo (RM 10)	Holtwood (RM 24)	Safe Harbor (RM 31)		York Haven (RM 55.6)			
	Number Passed	Number Passed	% of Conowingo	Number Passed	% of Holtwood	Number Passed	% of Safe Harbor	% of Conowingo
1997	90,971	28,063	30.8%	20,828	74.2%			
1998	39,904	8,235	20.6%	6,054	73.5%			
1999	69,712	34,702	49.8%	34,150	98.4%			
2000	153,546	29,421	19.2%	21,079	71.6%	4,687	22.2%	3.1%
2001	193,574	109,976	56.8%	89,816	81.7%	16,200	18.0%	8.4%
2002	108,001	17,522	16.2%	11,705	66.8%	1,555	13.3%	1.4%
2003	125,135	25,254	20.2%	16,646	65.9%	2,536	15.2%	2.0%
2004	109,360	3,428	3.1%	2,109	61.5%	219	10.4%	0.2%
2005	68,926	34,189	49.6%	25,425	74.4%	1,772	7.0%	2.6%
2006	56,899	35,968	63.2%	24,929	69.3%	1,913	7.7%	3.4%
2007	25,464	10,338	40.6%	7,215	69.8%	192	2.7%	0.8%
2008	19,914	2,795	14.0%	1,252	44.8%	21	1.7%	0.1%
2009	29,272	10,896	37.2%	7,994	73.4%	402	5.0%	1.4%
2010	37,757	16,472	43.6%	12,706	77.1%	907	7.1%	2.4%
2011	20,571	21	0.1%	8	38.1%	0	0.0%	0.0%
2012	22,143	4,238	19.1%	3,089	72.9%	224	7.3%	1.0%
2013	12,733	2,503	19.7%	1,927	77.0%	202	10.5%	1.6%
2014	10,425	2,589	24.8%	1,336	51.6%	8	0.6%	0.1%
2015	8,341	5,286	63.4%	3,896	73.7%	43	1.1%	0.5%
2016	14,276	6,718	47.1%	4,242	63.1%	178	4.2%	1.2%
2017	16,248	3,169	19.5%	2,007	63.3%	62	3.1%	0.4%
2018*	6,992	1,458	20.9%	661	45.3%	*	*	*
2019*	4,787	570	11.9%	316	55.4%	*	*	*
2020**	485	28	5.8%	1	3.6%	*	*	*
AVG			31.4%		68.7%		7.6%	1.7%
	1,245,436	393,839		299,391		31,121		

* Due to limited shad passage at the lower 3 Susquehanna River fish lifts, the York Haven Fishway was not manned.

** Lower River Fish Lifts shutdown to prevent the passage of the Northern Snakehead, per Resource Agency Request.

FIGURES

Figure 1. General Layout of the York Haven Hydroelectric Project Showing the Location of the Fishway

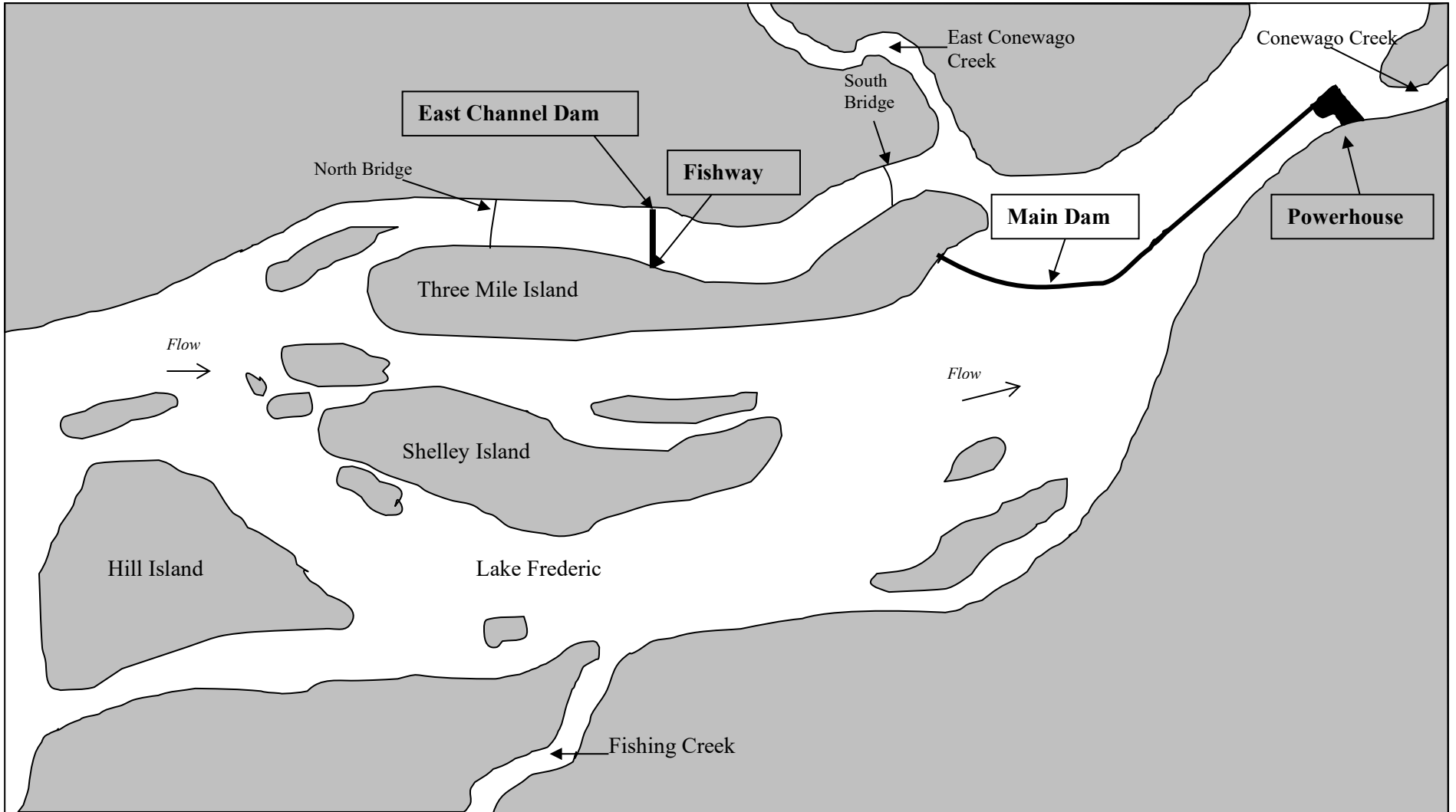


Figure 2. General Arrangement - York Haven Fishway

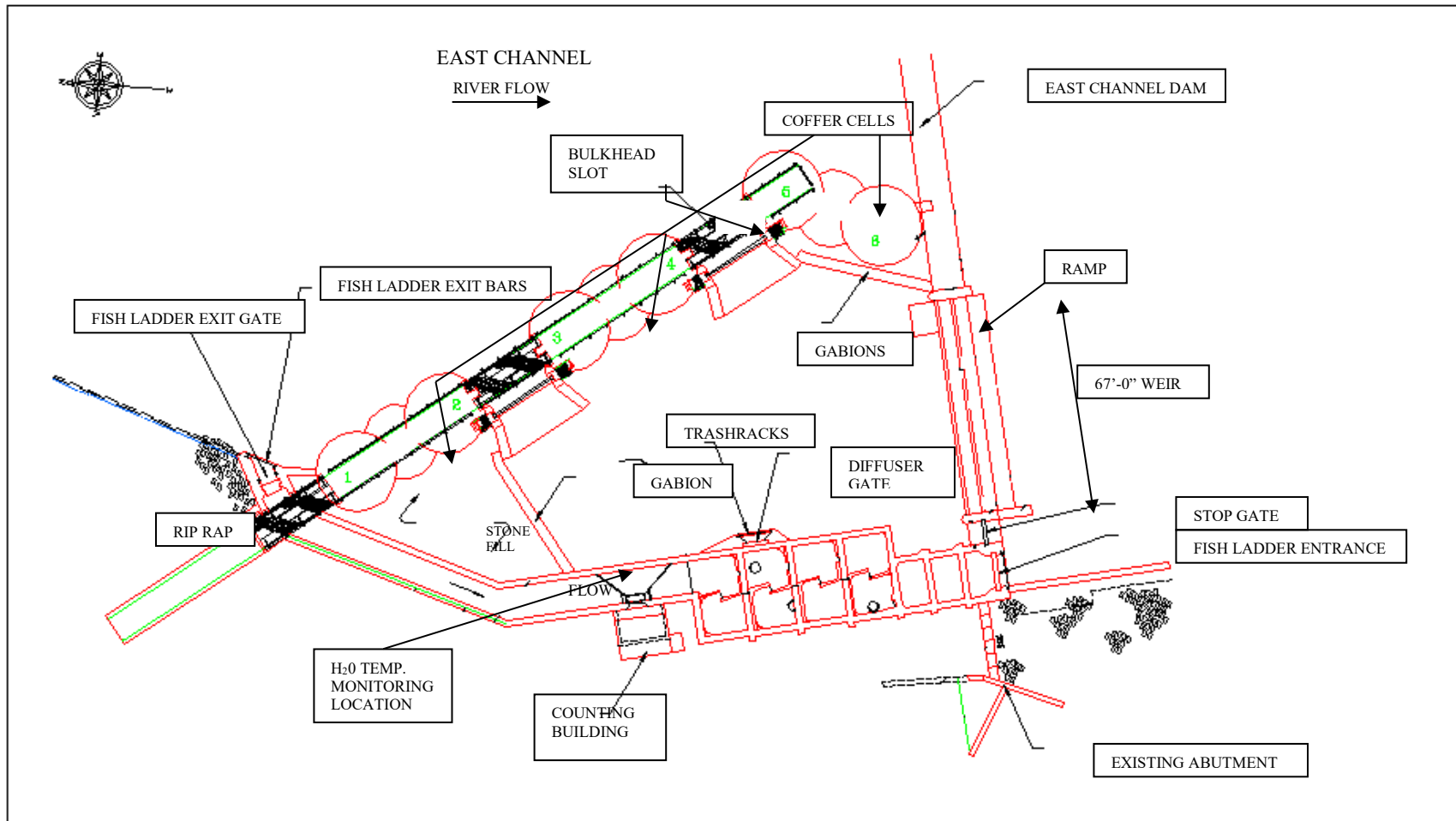


Figure 3. Plot of River Flow (x 1000 cfs) at the USGS Harrisburg Station (#01570500) and Water Temperature (F) at the York Haven Hydroelectric Project in Spring 2020 and 20-year Average Flow Values (2000-2019)

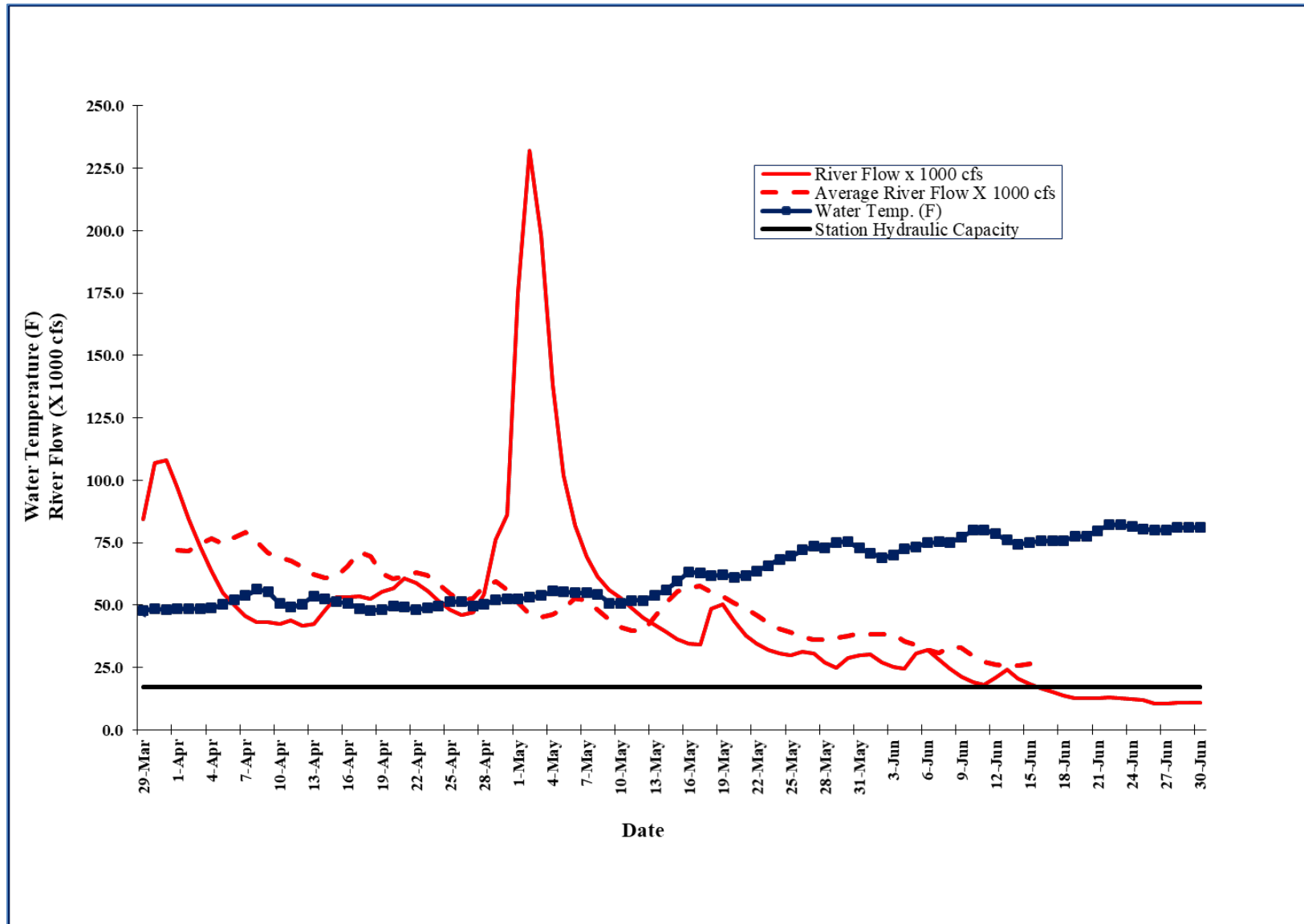


Figure 4. Plot of River Flow (x 1000 cfs) at the USGS Harrisburg Station (#01570500) on the Susquehanna River, 29 March to 21 December 2020

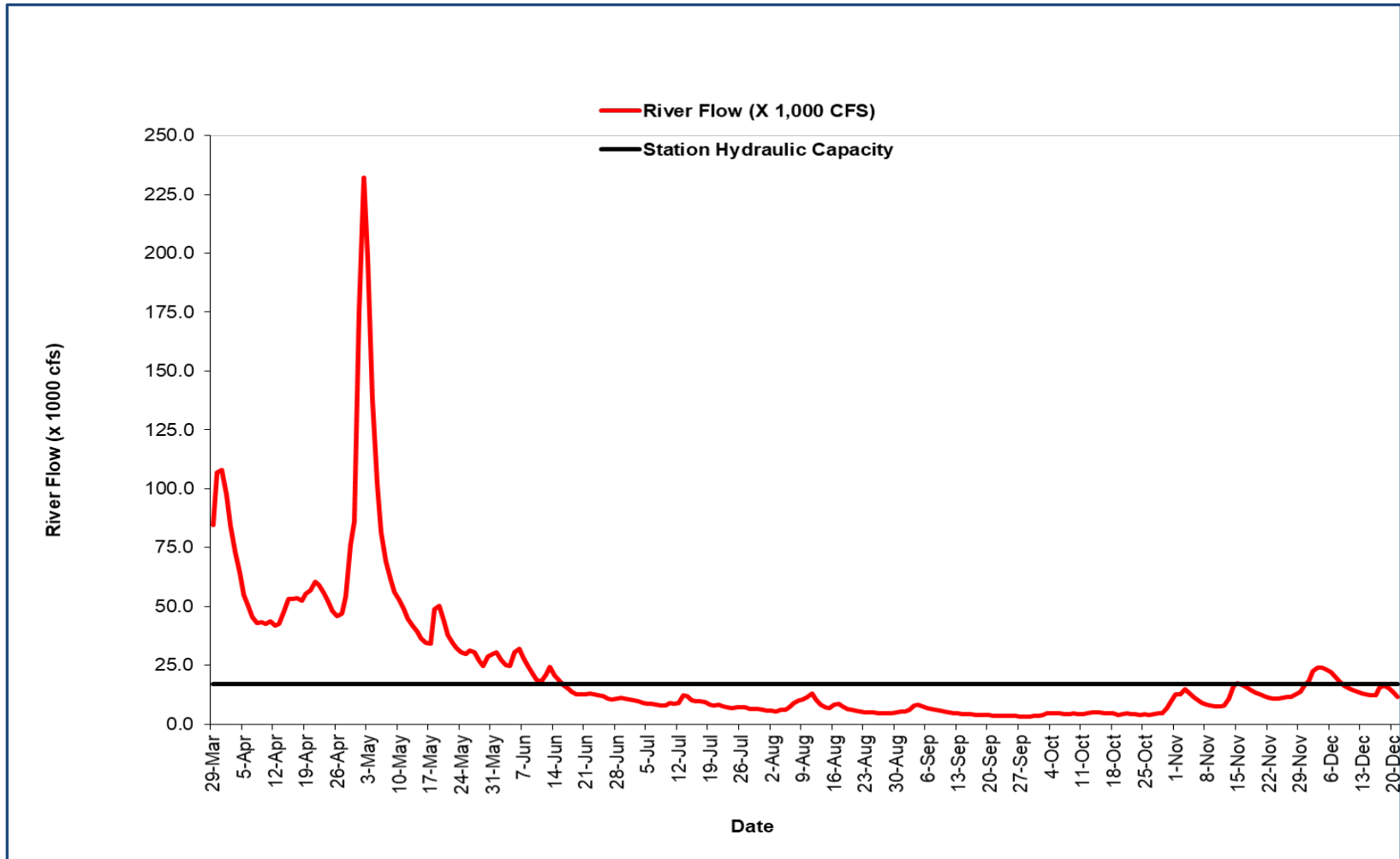
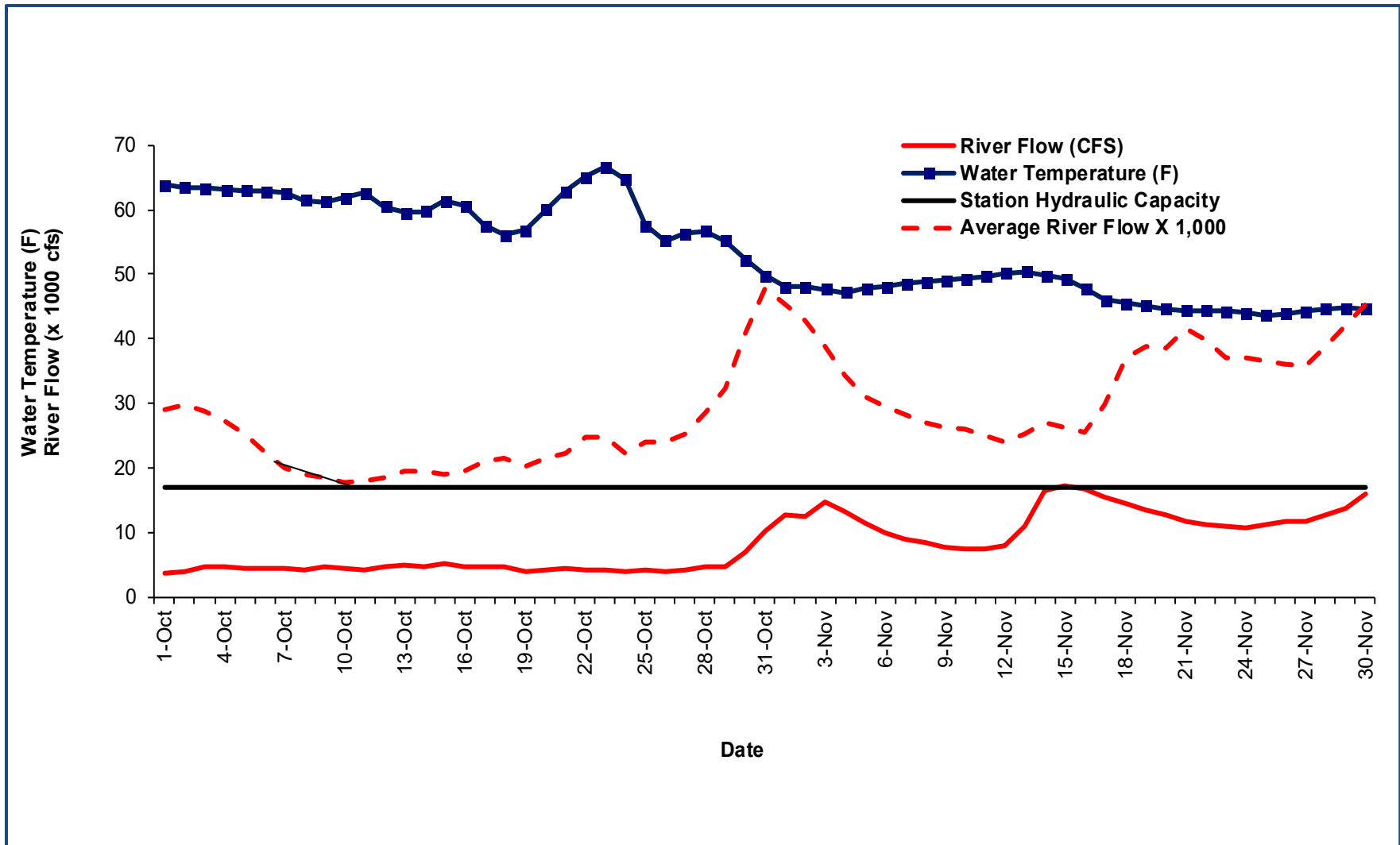


Figure 5. Plot of River Flow (cfs) at the USGS Harrisburg Station (#01570500) & Water Temperature (F) at the York Haven Power Station, 1 October to 30 November 2020 & 20-Year Average Flow Values (2000-2019)



AGENCY CONSULTATION

Jody Smet

From: Jody Smet
Sent: Tuesday, December 22, 2020 11:58 AM
To: Eyler, Sheila; Miller, Jeremy; Eberts, Ron; Tryniewski, Joshua; Henning, Aaron; Newhard, Joshua; Shawn Seaman -DNR-; Chris Frese; Scott Ault; Wendy Bley; Jose Zayas
Cc: McCorkle, Richard; Kevin Nebiolo; Tom O'Connor
Subject: York Haven Annual Fish Passage Operating Report (2020)
Attachments: 2020_YH Draft Final Report_ 12-22-2020.pdf

Good Morning All,

The York Haven FERC License and WQ Certification require YHPC to prepare an annual Fish Passage Operating Report and meet with Agency members of York Haven's Fish Passage Technical Advisory Committee (FPTAC) to review the report. Attached for your review is a copy of the 2020 York Haven Annual Fish Passage Report. Please provide any comments you may have within 30 days (or by January 21, 2021).

I will be reaching out soon (early January) to coordinate a MS Teams meeting to discuss the report. Knowing that upstream and downstream fish passage at York Haven were reviewed during the Susquehanna River Anadromous Fish Restoration Committee (SRAFR) meeting held on 8 December, I expect this call will be brief. Please feel free to forward the report on to anyone in your agencies that I may have inadvertently omitted.

Happy holidays!

Jody J. Smet, AICP | Vice President Regulatory Affairs
Eagle Creek Renewable Energy

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**SUMMARY OF UPSTREAM AND DOWNSTREAM
FISH PASSAGE AT THE
YORK HAVEN HYDROELECTRIC PROJECT
IN 2020**

Prepared For:

**York Haven Power Company
Middletown, Pennsylvania 17057**

Prepared By:

**Kleinschmidt Associates
Strasburg, Pennsylvania 17579**

December 2020

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The East Channel Fishway was opened on 29 March allowing volitional upstream passage. Shad passage at the lower river fish lifts this spring was the lowest recorded since the three lower Susquehanna River fish lifts were placed in service in 1997. Based on a request from the Resource Agencies, the lower River fish lifts were shut down to stop the passage of Northern Snakehead, an invasive species. Prior to their shutdown some 485, 28 and 1 shad were passed at Conowingo, Holtwood and Safe Harbor, respectively in 2020. Since only one shad was passed at Safe Harbor, the East Channel Fishway was not staffed during the spring spawning run for the third consecutive spawning season since it was placed in service in 2000.

Volitional upstream passage ended on 21 December when the Fishway was closed for the year. During volitional passage, the South fixed wheel gate was closed, and the North fixed wheel gate and ladder were set to deliver a minimum flow of 400 cfs into the East Channel. River flows from 29 March to 21 December varied from 3,250 cfs to 232,000 cfs (Figure 4). River flows were less than or equal to Station hydraulic capacity (17,000 cfs) from 16 June to 14 November, a 152-day period.

Downstream passage of adult American shad occurred from 1 May to 30 June. The forebay Sluice Gate was opened as required (~370 cfs) for two hours, Monday through Friday, throughout May and June as river flows exceeded the Stations hydraulic capacity. Since only one American Shad was passed upstream of Safe Harbor, no physical observations of post-spawned adult American shad were noted by Station personnel.

In accordance with the Projects FERC License and 401 Water Quality Certification, the Sluice Gate was generally left opened daily from 1 October to 30 November to provide downstream passage of juvenile shad. The Sluice Gate was open 80% to 85% of the two-month period. Generally, the Sluice Gate was closed from 0700 hrs to 1400 hrs during the week and the and the Gate was left open from 1400 hrs of Friday until 0700 hrs on Monday.

During the JASPP, river flow was lower than normal and varied from 17,300 cfs to 3,570 cfs (Figure 5). Flows during the entire two-month period only exceeded the hydraulic capacity (17,000 cfs) of the Station on 15 November. In contrast, 20-year average flow values (2000 to 2019) varied from 47,738 cfs to 17,739 cfs and always exceeded the hydraulic capacity of the Station. Average daily water temperature during the fall downstream migration period (1 October to 30 November) varied over 22 degrees and ranged from a high of 66.6°F on 23 October to a low of 43.7°F on 25 November.

1.0 INTRODUCTION

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2.0 YORK HAVEN FISHWAY OPERATIONS

The installation and operation of the Fishway are part of a cooperative private, state and federal effort to restore American Shad (*Alosa sapidissima*) and other migratory fish to the Susquehanna River. In 1997, YHPC and the resource agencies reached a new settlement agreement to revise the type and location of the York Haven fish passage facility. The Fishway is located in Dauphin County, PA at the Three Mile Island end of the East Channel Dam at the York Haven Hydroelectric Project (FERC No. 1888). The Fishway was placed in service by YHPC in April 2000. Upstream and downstream Fishway operation is provided for in the Projects FERC License (FERC, 2015) and the Pennsylvania Department of Environmental Protection Water Quality Certification (PA DEP, 2014) issued on December 15, 2015 and 19 August 2014, respectively.

Fishway operation coincides with a springtime minimum flow release. As part of the 1997 agreement and in accordance with its new License and Water Quality Certification, YHP agreed to maintain a spill of up to 4,000 cfs over the Main Dam and a minimum release of approximately 2,000 cfs in the East Channel during spring Fishway operation. River flow in excess of spring minimum flow requirements and station capacity is spilled over the Main and East Channel Dams.

2.1 Project Operation

The hydroelectric station located in York Haven, PA built in 1904, is situated on the River (river mile 55) in Dauphin and York counties, Pennsylvania (Figure 1). It is the fourth upstream hydroelectric dam on the River. The Project is a 20 unit run-of-river facility capable of producing approximately 19 MW and has an estimated hydraulic capacity of 17,000 cfs. It includes two dams that impound approximately 5 miles of the River forming Lake Frederic. The Main Dam is approximately 5,000-ft long, with a maximum height of 17-ft. The East Channel Dam is approximately 925-ft long with a maximum height of 9-ft. When River flow exceeds station hydraulic capacity (55% of the year), water is spilled over the two dams. During the spring spawning season, river flows in excess of spring minimum flow requirements were spilled over the Main and East Channel dams.

2.2 Fishway Design, Maintenance and Operation

2.2.1 Fishway Design

Fishway design incorporated numerous criteria established by the USFWS and the other resource agencies. The Fishway has an operating limit of 150,000 cfs River flow (East Channel flow limit of approximately 22,000 cfs). The Fishway includes two sections; a “weir cut” and a vertical notch fish ladder. Figure 2 provides the general arrangement of the Fishway. A detailed description of the Fishway and its major components is located in 2000 and 2001 summary reports (Kleinschmidt 2000 & 2002). Volitional passage at the Fishway is to begin on or about the 1st of April conditions permitting. Daily operation is scheduled to begin 4 days after the Safe Harbor lift passes 1,000 American shad.

2.2.2 Fishway Maintenance

Per the York Haven Fishway Operation Procedure (YHPC, LLC and Kleinschmidt, 2019) preparation and maintenance of the Fishway began in early March. The Fishway was inspected and repairs undertaken which enabled the Fishway to open on 29 March. Major repairs undertaken and completed in 2020 included the replacement of the Fishway exit gate operator.

Resident fish passage operation is scheduled to end on 15 December or when the average daily water temperature is ≤ 40 degrees Fahrenheit for three consecutive days. Thus, in the beginning of December, YHPC contacted its supplemental labor contractor and developed a plan and schedule to close the Fishway. While the Fishway is closed, it is inspected, and minor repairs are completed. Due to an impending Nor’easter combined with the potential for 12 inches of snow, closure of the Fishway was completed on 21 December.

Based on inspections by YHPC maintenance personnel, the Project is planning to replace the entrance gate actuator and install a Worthington Tuff Boom debris barrier at the Fishway exit in 2021.

2.2.3 Fishway Operation

In 2020, lower River fish passage operations and Passage of American Shad in the River were affected by COVID 19 and the collection and passage of Northern Snakeheads. Due to COVID 19, operation of the Conowingo East lift was delayed until 12 May. From 12 to 15 May, the Conowingo East Lift collected (35) and passed (21) Northern Snakeheads before operations were canceled for the season at the request of the Resource Agencies. Lift operations at Holtwood and Safe Harbor were also canceled on 15 May. While fish passage operations were limited this spring, a total of 485, 28 and 1 American Shad were passed at Conowingo, Holtwood and Safe Harbor, respectively in 2020 (Table 1).

Fishway preparations began in early March and volitional passage (un-staffed) began on 29 March. Since just 1 American Shad was passed at Safe Harbor this spring, the Fishway was not staffed this year. From 29 March through 27 May daily River flows exceeded 30,000 cfs resulting in flows spilled over the Main and East Channel Dams (Figure 3) that exceeded springtime minimum flow requirements of 4,000 cfs and 2,000 cfs at the Main and East Channel Dams, respectively.

The Fishway provided volitional passage through 21 December when the Fishway was closed for the year. During volitional passage, the South fixed wheel gate was closed, and the North fixed wheel gate and ladder were set to deliver a minimum flow of 400 cfs into the East Channel. River flows from 29 March to 21 December varied from 232,000 cfs to 3,250 cfs. (Figure 4). During this period, River flows were less than or equal to station hydraulic capacity

(17,000 cfs) on 174 days and exceeded the upper Fishway operation criteria (150,000 cfs) on 3 days from 1 May to 3 May.

3.0 DOWNSTREAM FISH PASSAGE

The Projects recently issued FERC license and new Water Quality Certification provide for downstream passage of adult and juvenile shad. Downstream passage of adult American Shad is expected to occur from 1 May to 30 June while downstream passage of juvenile American Shad is to occur from 1 October through 30 November.

3.1 Adult Passage

When River flows exceed the sum of Project Hydraulic Capacity, and required flows through the East Channel and required flows (if any) over the Main Dam, the Project, according to its FERC License and 401 Water Quality Certification, the Station is to open and spill water via the forebay Sluice Gate (~370 cfs) to the extent practicable for a period of one to two hours during the morning on weekdays, subject to Project personnel availability and access requirements for operations and maintenance purposes. Spilling may be provided in connection with opening of the forebay Sluice Gate for purposes of passing debris.

As the Fishway was operated to allow volitional upstream fish passage, the forebay Sluice Gate was opened as required (~370 cfs) for two hours, Monday through Friday, throughout May and June as river flows exceeded the Stations hydraulic capacity (Figure 3). Since just one American Shad was passed at Safe Harbor, no physical observations of post-spawned adult American shad were noted by Station personnel.

3.2 Juvenile Passage

During the juvenile American Shad Passage Period (JASPP), 1 October to 30 November, the Project is to operate its turbines in the following order. Depending on available River flow, Units 1-6 (Propeller/Kaplan units) may be operated without restriction up to available River flow. Unit 14 (larger single Francis unit) may be operated if river flow exceeds capacity of Units 1 to 6; Units 7 to 13 and 15 to 20 (double Francis units) may be operated in ascending order if river flow exceeds capacity of Units 1-6 and 14. During the downstream juvenile passage period, the Station is to open and spill water via the Forebay Sluice Gate (~370 cfs) between the hours of 5 PM to 11 PM EST. If during the downstream passage period, River flow exceeds the sum of Project hydraulic capacity, required flows through the East Channel and required flows (if any), the Project is also to open and spill water via the Forebay Sluice Gate to the extent practicable for one to two hours during the morning, subject to Project access requirements for operations and maintenance purposes.

In accordance with the Projects FERC License and 401 Water Quality Certification, the Sluice Gate was generally left opened daily from 1 October to 30 November to provide downstream passage of juvenile American Shad. The Sluice Gate was open 80% to 85% of the two-month period. The sluice gate was normally closed from 0700 hrs to 1400 hrs Monday through Friday and was left open from 1400 hrs Friday until 0700 hrs on Monday.

During the JASPP, river flow was lower than normal due as a result of drought conditions that was experienced in much of the River Basin this year and varied from 17,300 cfs to 3,570 cfs (Figure 5). Flows during the entire two-month period only exceeded the hydraulic capacity (17,000 cfs) of the Station on 15 November. In contrast, 20-year average flow values (2000 to 2019) varied from 47,738 cfs to 17,739 cfs and always exceeded the hydraulic capacity of the Station. Average daily water temperature during the fall downstream migration period (1 October

to 30 November) varied over 22 degrees and ranged from a high of 66.6°F on 23 October to a low of 43.7°F on 25 November.

4.0 LITERATURE CITED

Commonwealth of Pennsylvania Department of Environmental Protection. August 19, 2014, Water Quality Certification for the York Haven Hydroelectric Project and Related Mitigation, DEP File NO. –EA67-023: York Haven Power Company, LLC, 65 pp.

Federal Energy Regulatory Commission, December 15, 2015. Order Issuing New License for York Haven Power Company, LLC. 135 pp.

Kleinschmidt. 2000. Summary of operation at the York Haven Fishway in 2000. Prepared for York Haven Power Company, GPU Energy by Kleinschmidt, Strasburg, Pennsylvania. 21 pp.

Kleinschmidt. 2002. Summary of operation at the York Haven Fishway in 2001. Prepared for York Haven Power Company, GPU Energy/FirstEnergy by Kleinschmidt, Strasburg, Pennsylvania. 21 pp.

York Haven Power Company, LLC and Kleinschmidt. April 2019. Fishway Operation Plan. Prepared for York Haven Hydroelectric Project, York Haven, Pennsylvania. 128 pp.

TABLE

Table 1. American Shad Passage and the "Perceived Effectiveness" of Fish Passage Facilities at the Four Mainstem Susquehanna River Hydroelectric Projects, 1997 to 2020

Year	Conowingo (RM 10)	Holtwood (RM 24)	Safe Harbor (RM 31)		York Haven (RM 55.6)			
	Number Passed	Number Passed	% of Conowingo	Number Passed	% of Holtwood	Number Passed	% of Safe Harbor	% of Conowingo
1997	90,971	28,063	30.8%	20,828	74.2%			
1998	39,904	8,235	20.6%	6,054	73.5%			
1999	69,712	34,702	49.8%	34,150	98.4%			
2000	153,546	29,421	19.2%	21,079	71.6%	4,687	22.2%	3.1%
2001	193,574	109,976	56.8%	89,816	81.7%	16,200	18.0%	8.4%
2002	108,001	17,522	16.2%	11,705	66.8%	1,555	13.3%	1.4%
2003	125,135	25,254	20.2%	16,646	65.9%	2,536	15.2%	2.0%
2004	109,360	3,428	3.1%	2,109	61.5%	219	10.4%	0.2%
2005	68,926	34,189	49.6%	25,425	74.4%	1,772	7.0%	2.6%
2006	56,899	35,968	63.2%	24,929	69.3%	1,913	7.7%	3.4%
2007	25,464	10,338	40.6%	7,215	69.8%	192	2.7%	0.8%
2008	19,914	2,795	14.0%	1,252	44.8%	21	1.7%	0.1%
2009	29,272	10,896	37.2%	7,994	73.4%	402	5.0%	1.4%
2010	37,757	16,472	43.6%	12,706	77.1%	907	7.1%	2.4%
2011	20,571	21	0.1%	8	38.1%	0	0.0%	0.0%
2012	22,143	4,238	19.1%	3,089	72.9%	224	7.3%	1.0%
2013	12,733	2,503	19.7%	1,927	77.0%	202	10.5%	1.6%
2014	10,425	2,589	24.8%	1,336	51.6%	8	0.6%	0.1%
2015	8,341	5,286	63.4%	3,896	73.7%	43	1.1%	0.5%
2016	14,276	6,718	47.1%	4,242	63.1%	178	4.2%	1.2%
2017	16,248	3,169	19.5%	2,007	63.3%	62	3.1%	0.4%
2018*	6,992	1,458	20.9%	661	45.3%	*	*	*
2019*	4,787	570	11.9%	316	55.4%	*	*	*
2020**	485	28	5.8%	1	3.6%	*	*	*
AVG			31.4%		68.7%		7.6%	1.7%
	1,245,436	393,839		299,391		31,121		

* Due to limited shad passage at the lower 3 Susquehanna River fish lifts, the York Haven Fishway was not manned.

** Lower River Fish Lifts shutdown to prevent the passage of the Northern Snakehead, per Resource Agency Request.

FIGURES

Figure 1. General Layout of the York Haven Hydroelectric Project Showing the Location of the Fishway

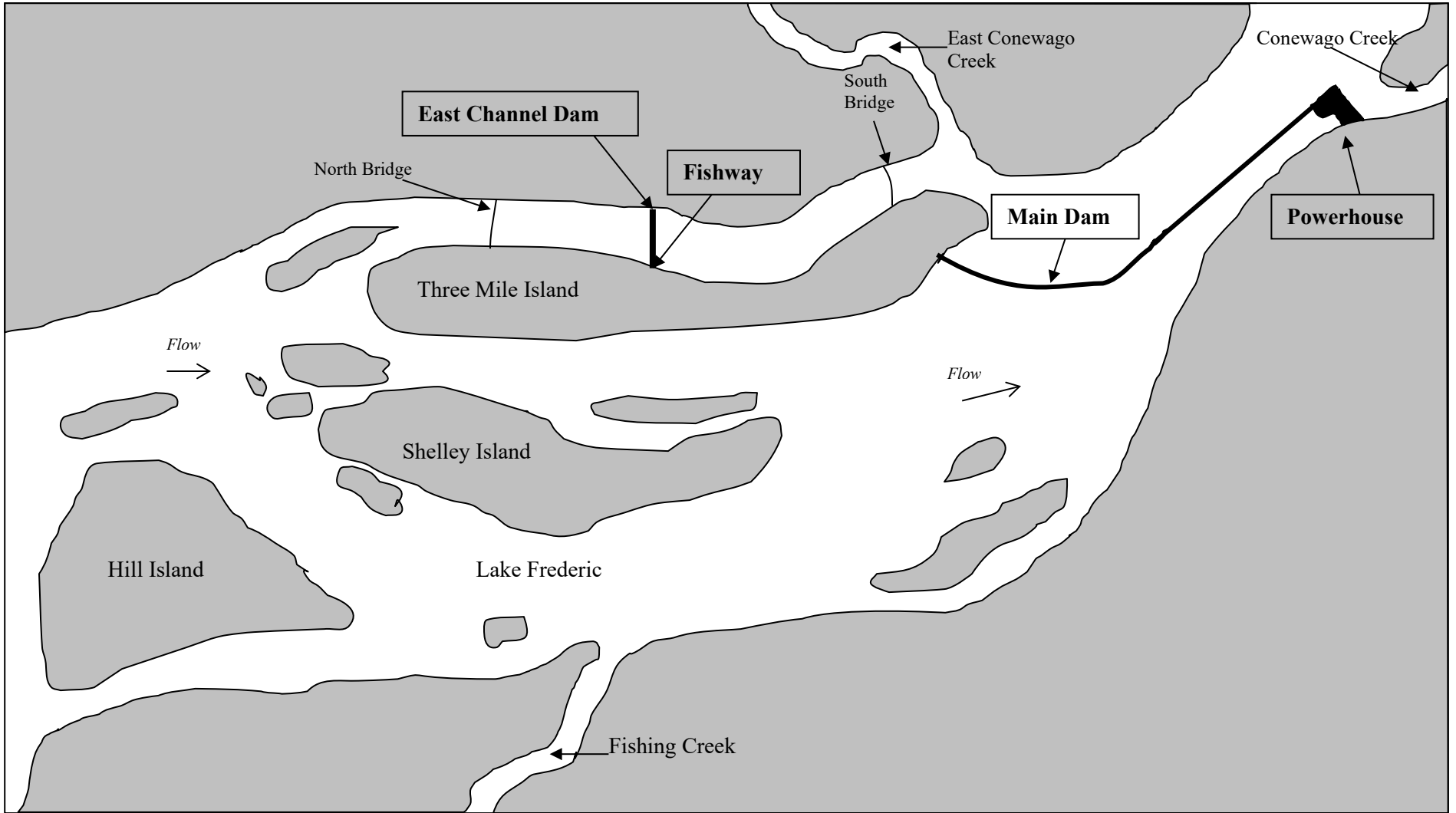


Figure 2. General Arrangement - York Haven Fishway

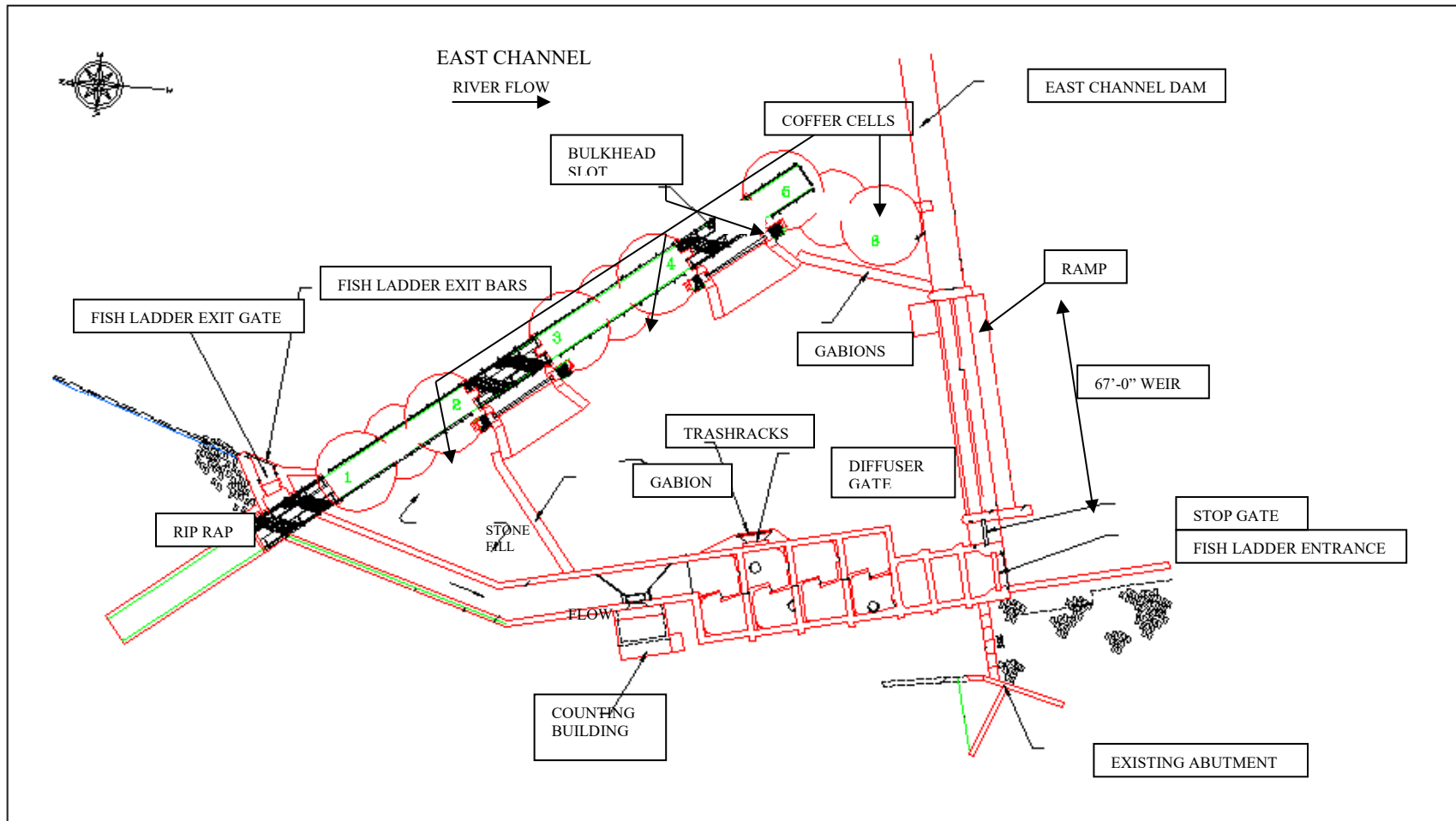


Figure 3. Plot of River Flow (x 1000 cfs) at the USGS Harrisburg Station (#01570500) and Water Temperature (F) at the York Haven Hydroelectric Project in Spring 2020 and 20-year Average Flow Values (2000-2019)

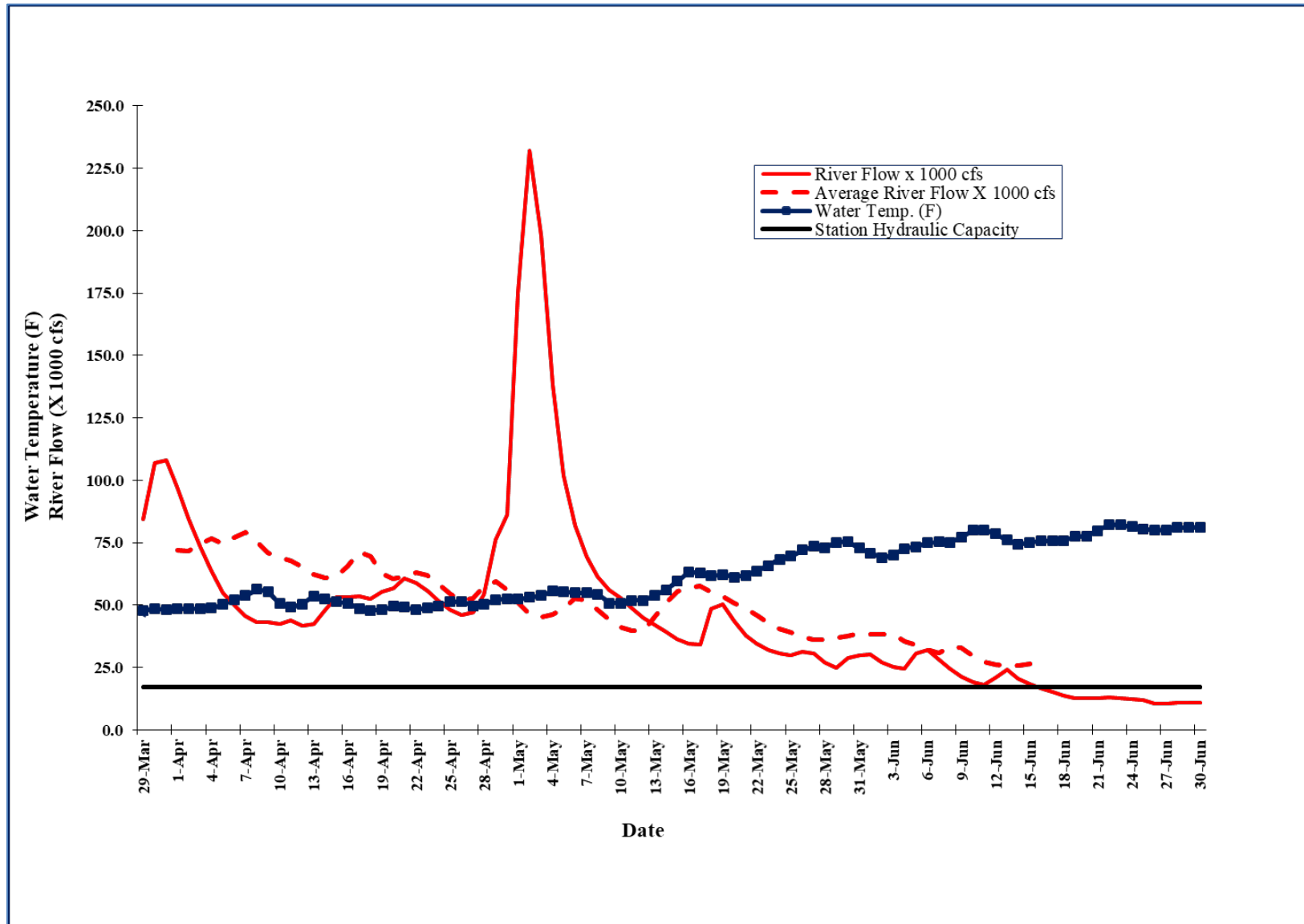


Figure 4. Plot of River Flow (x 1000 cfs) at the USGS Harrisburg Station (#01570500) on the Susquehanna River, 29 March to 21 December 2020

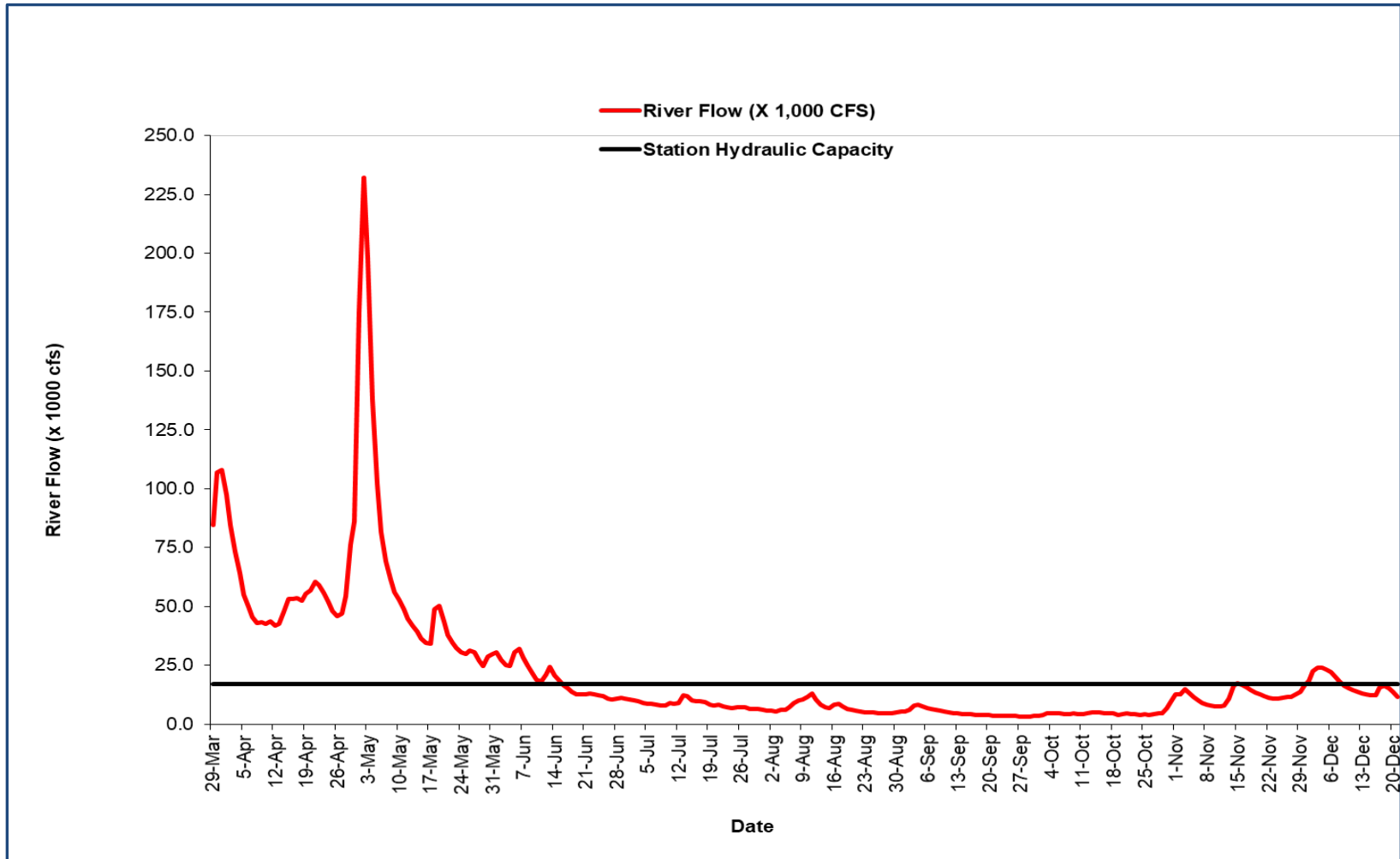
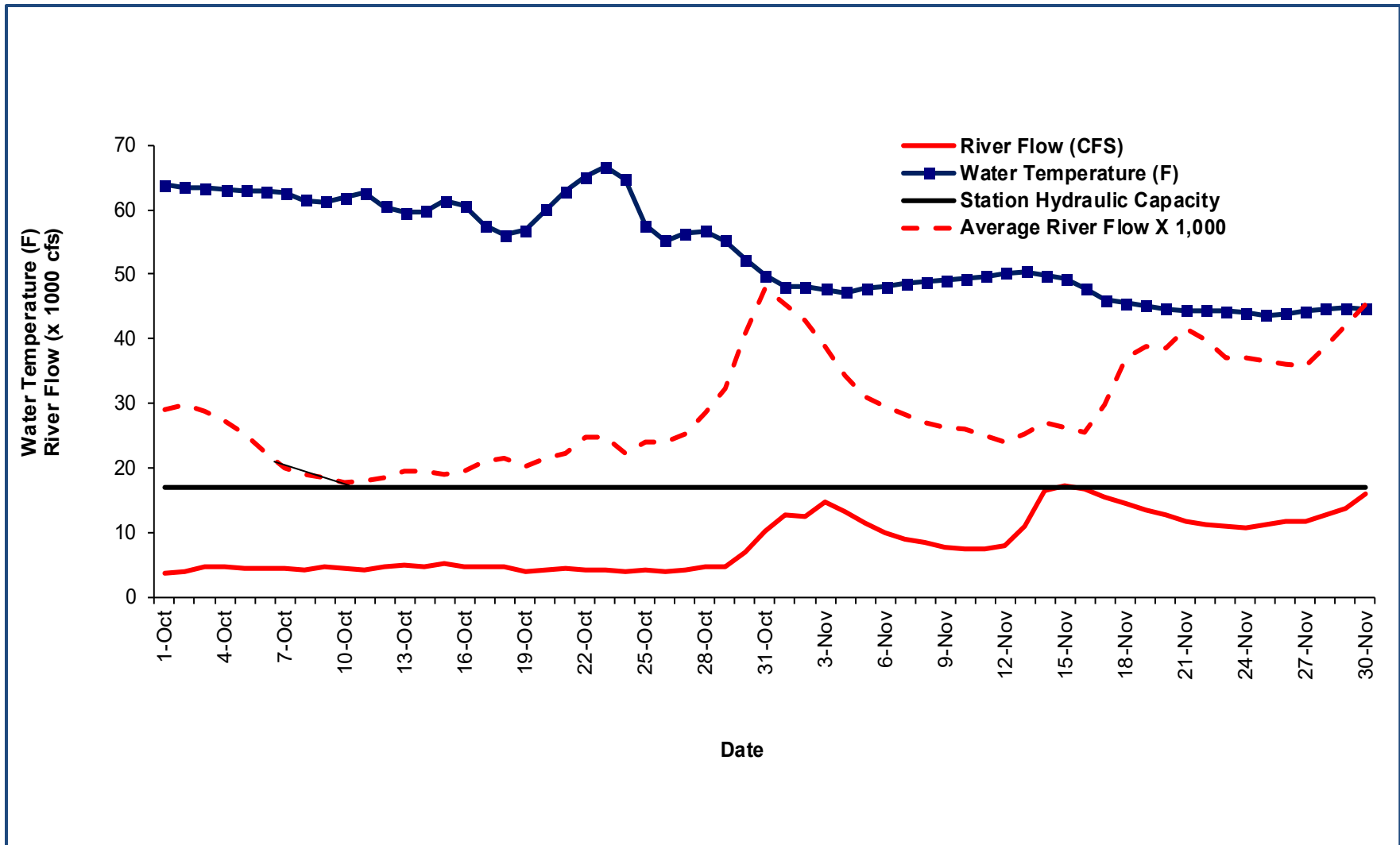


Figure 5. Plot of River Flow (cfs) at the USGS Harrisburg Station (#01570500) & Water Temperature (F) at the York Haven Power Station, 1 October to 30 November 2020 & 20-Year Average Flow Values (2000-2019)



Jody Smet

From: Eberts, Ron <reberts@pa.gov>
Sent: Thursday, January 14, 2021 1:07 PM
To: Jody Smet; Sheila Eyler; Miller, Jeremy; Tryniewski, Joshua; Aaron Henning; Newhard, Joshua; Shawn Seaman -DNR-; Chris Frese; Scott Ault; Wendy Bley; Jose Zayas
Cc: McCorkle, Richard; Kevin Nebiolo; Tom O'Connor
Subject: RE: [External] York Haven Annual Fish Passage Operating Report (2020)

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Jody,

DEP has reviewed the 2020 York Haven's Annual Fish Passage Report received on December 22, 2020 and offer the following comments:

1. In the Executive Summary and Juvenile Passage Sections of the report, monitoring of temperature is mentioned. Please provide in detail how temperature monitoring is completed. This shall include but not be limited to the type of equipment deployed, method of recording data, QA/QC documentation and guidance, location map showing where temperature is taken, and depth of meter.
2. Does YHPC have back up temperature meter onsite in case deployed meter needs to be replaced?
3. DEP recommends monitoring temperature at both the YHPC and the East Channel Fishway starting in 2021 if not already in progress.
4. Please provide in detail on how and where cubic feet per second (CFS) is recorded and measured respective to both the YHPC and East Channel Fishway .
5. Figures 3, 4, and 5 show CFS from Harrisburg USGS Station but report does not mention prior to these Figures. Please revise report to include Harrisburg USGS Station within the context.

Thank you for the opportunity to comment.

Regards,

Ronald C. Eberts, Jr. | Environmental Protection Compliance Specialist
Department of Environmental Protection
Southcentral Regional Office
Waterways & Wetlands Program
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24-hour toll free Emergency Response number for SCRO: 1-800-541-2050.

The Department of Environmental Protection (Department) has launched an e-permit for Chapter 105 Wetland and Waterway Obstruction and Encroachment General Permits to make application submittal and review more efficient and enable faster responses to applicants. Information on e-permits can be found on our website at <https://www.dep.pa.gov/Business/Water/Waterways/Pages/ePermitting.aspx>

Jody Smet

From: Eyler, Sheila <sheila_eyler@fws.gov>
Sent: Friday, January 15, 2021 11:37 AM
To: Jody Smet; Miller, Jeremy; Eberts, Ron; Tryniewski, Joshua; Henning, Aaron; Shawn Seaman -DNR-; Chris Frese; Scott Ault; Wendy Bley; Jose Zayas
Cc: McCorkle, Richard; Kevin Nebiolo; Tom O'Connor
Subject: Re: [EXTERNAL] York Haven Annual Fish Passage Operating Report (2020)

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Jody,

The U.S. Fish and Wildlife Service submits the following comments to the 2020 York Haven Annual Fish Passage Operating Report:

1. Additional and more specific information about daily operations to accommodate downstream fish passage should be included in the annual report.
 - a. Downstream Adult American Shad Passage Season: May 1 to June 30
The report will need to include daily values for total project flow (cfs). On days where the downstream sluice is operated, daily start and end times for sluice operation should be reported.
 - b. Downstream Juvenile American Shad Passage Season: October 1 to November 30
The report will need to include hourly turbine unit operation as well as daily start and end times for the operation of the downstream sluice.
 - c. Downstream American Eel Passage Season: September 15 to February 15 when temperatures are above 37 deg. F
Currently, there are no requirements for reporting turbine unit operation during this migration season, however operational data would be useful in evaluating survival at the project based on recent mortality events that have been observed. From September 1 to November 30, 2020, YHPC voluntarily provided daily unit operation. We are requesting that operational data continue to be submitted annually. Hourly unit operational data would be preferred for the migration season, but daily unit operation would be acceptable. A section (3.3) should be added to the report under downstream fish passage to encompass information from the downstream eel migration period.
 - d. Water temperature data during all migration periods should also be reported.
2. The annual report should be accompanied by an excel file containing all required data to be collected for all upstream and downstream migration seasons at York Haven Dam. To the extent that the above referenced data, with respect to the downstream adult and juvenile American shad passage seasons, were collected in 2020, they should be included in the final version of the 2020 annual report and associated excel file.
3. Page 2, section 2.0, paragraph 1: The FERC license date for the project is December 22, 2015 (not December 15).
4. Page 3, section 3.2, paragraph 1, last sentence: Insert the text "over the Main Dam" before the text "(if any)"

I will also be sending a request to you prior to next week's meeting to discuss the potential for YHPC to implement staffed operation of the East Channel Fishway earlier in the 2021 season in response to the planned trap and transport program for American shad and river herring. I'm hoping we can discuss that request, or at least answer any questions you may have on the request, during the meeting next week.

Let me know if you have any questions on these report comments.

Sheila Eyler
U.S. Fish and Wildlife Service
Mid-Atlantic Fish & Wildlife Conservation Office
177 Admiral Cochrane Dr.
Annapolis, MD 21401
717-387-2117

From: Jody Smet <Jody.Smet@eaglecreekre.com>
Sent: Tuesday, December 22, 2020 11:58 AM
To: Eyler, Sheila <sheila_eyler@fws.gov>; Miller, Jeremy <jeremmille@pa.gov>; Eberts, Ron <reberts@pa.gov>; Tryninewski, Joshua <jtryninews@pa.gov>; Henning, Aaron <ahenning@srbc.net>; Newhard, Joshua <joshua_newhard@fws.gov>; Shawn Seaman -DNR- <shawn.seaman@maryland.gov>; Chris Frese <Chris.Frese@KleinschmidtGroup.com>; Scott Ault <Scott.Ault@KleinschmidtGroup.com>; Wendy Bley <Wendy.Bley@Kleinschmidtgroup.com>; Jose Zayas <Jose.Zayas@eaglecreekre.com>
Cc: McCorkle, Richard <richard_mccorkle@fws.gov>; Kevin Nebiolo <Kevin.Nebiolo@KleinschmidtGroup.com>; Tom O'Connor <Tom.OConnor@eaglecreekre.com>
Subject: [EXTERNAL] York Haven Annual Fish Passage Operating Report (2020)

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Good Morning All,

The York Haven FERC License and WQ Certification require YHPC to prepare an annual Fish Passage Operating Report and meet with Agency members of York Haven's Fish Passage Technical Advisory Committee (FPTAC) to review the report. Attached for your review is a copy of the 2020 York Haven Annual Fish Passage Report. Please provide any comments you may have within 30 days (or by January 21, 2021).

I will be reaching out soon (early January) to coordinate a MS Teams meeting to discuss the report. Knowing that upstream and downstream fish passage at York Haven were reviewed during the Susquehanna River Anadromous Fish Restoration Committee (SRAFRC) meeting held on 8 December, I expect this call will be brief. Please feel free to forward the report on to anyone in your agencies that I may have inadvertently omitted.

Happy holidays!

Jody J. Smet, AICP | Vice President Regulatory Affairs
Eagle Creek Renewable Energy

Desk: 804 739 0654

Mobile: 804 382 1764

Email: jody.smet@eaglecreekre.com

Jody Smet

Subject: Review/Discuss York Haven Annual Fish Passage Operating Report (2020)

Location: Microsoft Teams Meeting

Start: Wed 1/20/2021 2:00 PM

End: Wed 1/20/2021 3:00 PM

Recurrence: (none)

Meeting Status: Meeting organizer

Organizer: Jody Smet

Required Attendees: Jody Smet; Miller, Jeremy; Eberts, Ron; Eyler, Sheila; Tryniewski, Joshua; Henning, Aaron; Shawn Seaman -DNR-; Chris Frese; Scott Ault; Wendy Bley; Jose Zayas; McCorkle, Richard; Kevin Nebiolo; Tom O'Connor

Optional Attendees: Matthew Pyle

Microsoft Teams meeting

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