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P.O. Box 330
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April 4, 2016

D33525

U.S. Environmental Protection Agency
Region 1: New England
Office of Ecosystem Protection
Water Technical Unit (OES04 – SMR)
5 Post Office Square - Suite 100
Boston, MA 02109-3912

Dear Sir/Madam:

Merrimack Station
NPDES Permit No. NH0001465
2015 Annual Fish Impingement Report

Public Service Company of New Hampshire d/b/a Eversource Energy ("PSNH") herein submits this Annual Fish Impingement Report for the year 2015 pursuant to Part I., Section A.10.b. of the Merrimack Station NPDES Permit, No. NH0001465. This permit condition requires PSNH to conduct impingement monitoring at Merrimack Station according to the provisions below.

- PSNH shall provide impingement monitoring at Merrimack Station when flows from Garvins Falls Hydroelectric Station are less than 900 cubic feet per second (cfs) during any period from July 1 through October 15.
- PSNH shall collect all fish from both MK-1 and MK-2 traveling screen washes during one continuous 48-hour period per week when the conditions outlined above are met.
- PSNH shall report in writing to the New Hampshire Fish & Game Department (NHFGD), United States Fish and Wildlife Service (USFWS), New Hampshire Department of Environmental Services (NHDES) and the United States Environmental Protection Agency (USEPA) any Extraordinary Impingement Event (EIE) at Merrimack Station. An EIE is defined as an event when 50 or more fish at any one time, of any size or species, are either distressed or killed as a result of impingement.

Based on river flows at Garvins Falls Hydro and unit operation, Merrimack Station was required to collect two weekly samples from the intake screens between July 1 and October 15 in 2015. A total of ten fish were collected over the entire sampling season. Impingement rates for the sampling periods were calculated by dividing the total number

of fish collected by the total volume of water passed through the units. The volume of water reported is based on circulating pump capacities and the number of pumps that were operating during each screen wash cycle. Each operating unit has two pumps; the pumps servicing Unit 1 are rated at 63 cfs each (126 cfs total), the pumps servicing Unit 2 are rated at 144.5 cfs each (289 cfs total).

Table 1 summarizes the total number of fish collected and the impingement rate for each sampling period. The average impingement rate for 2015 was 0.08 fish per million cubic feet of screened water. As demonstrated every year, the rate of fish impingement at Merrimack Station is extremely low by all industry standards even though the data is collected during worse case conditions, i.e., when river flows are less than 900 cfs. Table 2 identifies the ten impinged fish by common name as well as the respective total lengths. Table 3 provides corresponding scientific names of the fish species commonly found in this section of the Merrimack River. All of the weekly data sheets are attached to demonstrate river flows above 900 cfs and the operational status of the two units. There were no extraordinary impingement events in 2015.

If you have any questions regarding this report, please call Mr. Allan G. Palmer, NH Generation, at (603) 634-2439.

Very truly yours,

EVERSOURCE ENERGY



Elizabeth H. Tillotson
Manager - Regulatory and Environmental
NH Generation

Enclosures

cc: Ms. Sharon M. DeMeo
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Mr. Eric Nelson
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NH Department of Environmental Services
Water Division
Wastewater Engineering Bureau
Permits and Compliance Section
29 Hazen Drive, P.O. Box 95
Concord, NH 03302-0095

Mr. Joseph F. McKeon
US Fish and Wildlife Service
Central New England Fishery Resources Office
151 Broad Street
Nashua, NH 03063

Mr. John Magee, Fish Habitat Biologist
New Hampshire Fish and Game Department
Inland Fisheries Division
11 Hazen Drive
Concord, NH 03301

Ms. Carol Henderson, Environmental Review Coordinator
New Hampshire Fish and Game Department
11 Hazen Drive
Concord, NH 03301

TABLE 1

Merrimack Station
Fish Impingement Monitoring Program
2015 Schedule and Impingement Rates

<u>48 Hour Sample Dates</u>	<u>Unit(s) Sampled</u>	<u>48 Hour Flow Through the Units</u>	<u>Impingement Rate</u>	<u>Fish Count</u>
08/17 - 08/19	1	71,712,000 cu. ft.	0.06/million cu. ft.	4
09/08 - 09/10	1&2	46,742,400 cu. ft.	0.13/million cu. ft.	6

The average impingement rate for the two sampling periods was 0.08 fish per million cubic feet of screened water.

TABLE 2

Merrimack Station
Fish Species Collected During Impingement Monitoring
July 1, 2015 through October 15, 2015

<u>Sampling Period</u>	<u>Fish Species Collected</u>	<u>Total Length (cm)</u>
08/17 - 08/19	Alewife	7.0
	Alewife	6.0
	Alewife	7.0
	Alewife	6.5
09/08 – 09/10	Alewife	12.7
	Smallmouth Bass	7.6
	Smallmouth Bass	8.9
	Smallmouth Bass	15.2
	Smallmouth Bass	14.3
	Yellow Perch	13.9

TABLE 3

Merrimack Station
Scientific Names of Species
Common in the Merrimack River

Smallmouth Bass	<i>Micropterus dolomieu</i>
Largemouth Bass	<i>Micropterus salmoides</i>
Bluegill Sunfish	<i>Lepomis macrochirus</i>
Pumpkinseed Sunfish	<i>Lepomis gibbosus</i>
Redbreast Sunfish	<i>Lepomis auritus</i>
Brown Bullhead	<i>Ictalurus nebulosus</i>
White Sucker	<i>Catostomus commersoni</i>
Yellow Perch	<i>Perca flavescens</i>
Common Shiner	<i>Notropis cornutus</i>
Spottail Shiner	<i>Notropis hudsonius</i>
Alewife	<i>Alosa pseudoharengus</i>
Chain Pickerel	<i>Esox niger</i>
Northern Pike	<i>Esox Lucius</i>
Creek Chub	<i>Semotilus atromaculatus</i>
Common Carp	<i>Cyprinus carpio</i>
American Eel	<i>Anguilla rostrata</i>



Public Service of
New Hampshire

MERRIMACK STATION FISH IMPINGEMENT MONITORING REPORT

JULY 1 TO OCTOBER 15
2015

ENVIRONMENTAL DATA

FISH IMPINGEMENT MONITORING WEEKLY DATA SHEET MERRIMACK STATION

Week Ending 7/4/15

SAMPLING PERIOD

Begin ☐

End ☐

UNIT STATUS

MK-1 ☐ OFF

MK-2 ☐ OFF

CIRC PUMP STATUS

MK-1 ☐

MK-2 ☐

Species	Total length (TL) of up to 20 fish per species measured to the nearest centimeter (cm)																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Alewife																				
American Shad																				
Small mouth Bass																				
Largemouth Bass																				
Bluegill Sunfish																				
Pumpkinseed Sunfish																				
Redbreasted Sunfish																				
Brown Bullhead																				
White Sucker																				
Yellow Perch																				
Common Shiner																				
Spottail Shiner																				
American eel																				
Unidentified Species																				
Additional Fish																				

FISH IMPINGEMENT MONITORING WEEKLY DATA SHEET MERRIMACK STATION

Week Ending 7/11/15

SAMPLING PERIOD

Begin	
End	

UNIT STATUS

MK-1	OFF
MK-2	OFF

CIRC PUMP STATUS

MK-1	
MK-2	

Species	Total length (TL) of up to 20 fish per species measured to the nearest centimeter (cm)																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Alewife																				
American Shad																				
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Brown Bullhead																				
White Sucker																				
Yellow Perch																				
Common Shiner																				
Spottail Shiner																				
American eel																				
Unidentified Species																				
Additional Fish																				

VHH

FISH IMPINGEMENT MONITORING WEEKLY DATA SHEET MERRIMACK STATION

Week Ending 7/18/15

SAMPLING PERIOD

Begin ☐

End ☐

UNIT STATUS

MK-1 ☐ OFF

MK-2 ☐ OFF

CIRC PUMP STATUS

MK-1 ☐

MK-2 ☐

Species	Total length (TL) of up to 20 fish per species measured to the nearest centimeter (cm)																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Alewife																				
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Brown Bullhead																				
White Sucker																				
Yellow Perch																				
Common Shiner																				
Spottail Shiner																				
American eel																				
Unidentified Species																				
Additional Fish																				

FISH IMPINGEMENT MONITORING WEEKLY DATA SHEET MERRIMACK STATION

Week Ending 7/25/15

SAMPLING PERIOD
Begin /
End /

UNIT STATUS
MK-1 ON
MK-2 ON

CIRC PUMP STATUS
MK-1 A+B
MK-2 A+B


* River flow above 900 cfs.


Species	Total length (TL) of up to 20 fish per species measured to the nearest centimeter (cm)																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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American Shad																				
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White Sucker																				
Yellow Perch																				
Common Shiner																				
Spottail Shiner																				
American eel																				
Unidentified Species																				
Additional Fish																				

FISH IMPINGEMENT MONITORING WEEKLY DATA SHEET MERRIMACK STATION

Week Ending 8/1/15

SAMPLING PERIOD

Begin 

End 

UNIT STATUS

MK-1 **ON**

MK-2 **OFF**

CIRC PUMP STATUS

MK-1 **A+B**

MK-2 **A**

*River flow above 900cfs

Species	Total length (TL) of up to 20 fish per species measured to the nearest centimeter (cm)																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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White Sucker																				
Yellow Perch																				
Common Shiner																				
Spottail Shiner																				
American eel																				
Unidentified Species																				
Additional Fish																				

FISH IMPINGEMENT MONITORING WEEKLY DATA SHEET MERRIMACK STATION

Week Ending 8/8/15

SAMPLING PERIOD

Begin

End

UNIT STATUS

MK-1

MK-2

CIRC PUMP STATUS

MK-1

MK-2

Species	Total length (TL) of up to 20 fish per species measured to the nearest centimeter (cm)																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Alewife																				
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Brown Bullhead																				
White Sucker																				
Yellow Perch																				
Common Shiner																				
Spottail Shiner																				
American eel																				
Unidentified Species																				
Additional Fish																				

FISH IMPINGEMENT MONITORING WEEKLY DATA SHEET MERRIMACK STATION

Week Ending 8/15/15

SAMPLING PERIOD

Begin

End

UNIT STATUS

MK-1

MK-2

CIRC PUMP STATUS

MK-1

MK-2

Species	Total length (TL) of up to 20 fish per species measured to the nearest centimeter (cm)																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Alewife																				
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White Sucker																				
Yellow Perch																				
Common Shiner																				
Spottail Shiner																				
American eel																				
Unidentified Species																				
Additional Fish																				

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A+B

A

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FISH IMPINGEMENT MONITORING WEEKLY DATA SHEET MERRIMACK STATION

Week Ending 8/29/15

SAMPLING PERIOD
 Begin ☐
 End ☐

UNIT STATUS

MK-1 ☐ OFF
 MK-2 ☐ OFF

CIRC PUMP STATUS

MK-1 ☐
 MK-2 ☐

Species	Total length (TL) of up to 20 fish per species measured to the nearest centimeter (cm)																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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Yellow Perch																				
Common Shiner																				
Spottail Shiner																				
American eel																				
Unidentified Species																				
Additional Fish																				

**FISH IMPINGEMENT MONITORING
WEEKLY DATA SHEET
MERRIMACK STATION**

Week Ending 9/5/15

SAMPLING PERIOD

Begin	
End	

UNIT STATUS

MK-1	OFF
MK-2	OFF

CIRC PUMP STATUS

MK-1	
MK-2	

Species	Total length (TL) of up to 20 fish per species measured to the nearest centimeter (cm)																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Alewife																				
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White Sucker																				
Yellow Perch																				
Common Shiner																				
Spottail Shiner																				
American eel																				
Unidentified Species																				
Additional Fish																				

FISH IMPINGEMENT MONITORING WEEKLY DATA SHEET MERRIMACK STATION

Week Ending 9/12/15

SAMPLING PERIOD
Begin 9/8/15
End 9/10/15

UNIT STATUS

MK-1 ON
MK-2 ON

CIRC PUMP STATUS

MK-1 A+B
MK-2 A+B

Species	Total length (TL) of up to 20 fish per species measured to the nearest centimeter (cm)																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Alewife	12.7																			
American Shad																				
Small mouth Bass	7.6	8.9	15.2	14.3																
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Brown Bullhead																				
White Sucker																				
Yellow Perch	13.9																			
Common Shiner																				
Spottail Shiner																				
American eel																				
Unidentified Species																				
Additional Fish																				

FISH IMPINGEMENT MONITORING WEEKLY DATA SHEET MERRIMACK STATION

Week Ending 9/19/15

SAMPLING PERIOD

Begin

/

End

/

UNIT STATUS

MK-1

OFF

MK-2

OFF

CIRC PUMP STATUS

MK-1

/


MK-2



/



Species	Total length (TL) of up to 20 fish per species measured to the nearest centimeter (cm)																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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White Sucker																				
Yellow Perch																				
Common Shiner																				
Spottail Shiner																				
American eel																				
Unidentified Species																				
Additional Fish																				

**FISH IMPINGEMENT MONITORING
WEEKLY DATA SHEET
MERRIMACK STATION**

Week Ending 9/26/15

SAMPLING PERIOD
Begin 
End

UNIT STATUS
MK-1 
MK-2 

CIRC PUMP STATUS
MK-1 
MK-2 

Species	Total length (TL) of up to 20 fish per species measured to the nearest centimeter (cm)																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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White Sucker																				
Yellow Perch																				
Common Shiner																				
Spottail Shiner																				
American eel																				
Unidentified Species																				
Additional Fish																				

FISH IMPINGEMENT MONITORING WEEKLY DATA SHEET MERRIMACK STATION

Week Ending 10/3/15

SAMPLING PERIOD

Begin	/
End	/

UNIT STATUS

MK-1	OFF
MK-2	OFF

CIRC PUMP STATUS

MK-1	/
MK-2	/

Species	Total length (TL) of up to 20 fish per species measured to the nearest centimeter (cm)																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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White Sucker																				
Yellow Perch																				
Common Shiner																				
Spottail Shiner																				
American eel																				
Unidentified Species																				
Additional Fish																				

FISH IMPINGEMENT MONITORING WEEKLY DATA SHEET MERRIMACK STATION

Week Ending 10/10/15

SAMPLING PERIOD
Begin ☐
End ☐

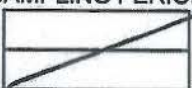
UNIT STATUS
MK-1 ☐ OFF
MK-2 ☐ OFF

CIRC PUMP STATUS
MK-1 ☐
MK-2 ☐

Species	Total length (TL) of up to 20 fish per species measured to the nearest centimeter (cm)																			
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American eel																				
Unidentified Species																				
Additional Fish																				

FISH IMPINGEMENT MONITORING WEEKLY DATA SHEET MERRIMACK STATION

Week Ending 10/17/15

SAMPLING PERIOD
Begin 
End

UNIT STATUS
MK-1 ON
MK-2 OFF

CIRC PUMP STATUS
MK-1 A+B
MK-2 —

*River flow above 900 cfs.

Species	Total length (TL) of up to 20 fish per species measured to the nearest centimeter (cm)																			
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