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Appendix A: Resource Agency, NGO and Local Organization Consultation List

List of Resource Agencies, NGO's and Environment Organizations With Whom Woronoco Hydro LLC Has Regular Consultation About Impact Mitigation

<u>Agency/Interest Group</u>	<u>Primary Issues/Concerns</u>
US Fish and Wildlife Service	Restoration plan, Anadromous fish passage, habitat protection, endangered species protection, minimum flow release, run-of-river operations mode, deepen downstream passage plunge pool, plan to eliminate annual drawdown of impoundment
Mass Division of Fish and Wildlife	Westfield River Restoration plan, Anadromous fish passage, habitat protection, trap and truck program, endangered species protection, minimum flow release, run-of-river operations mode, deepen downstream passage plunge pool, plan to eliminate annual drawdown of impoundment
Trout Unlimited (TU)	Fishermen access, stocking, Anadromous fish passage, water temperature, eel ladder effectiveness testing, and effects of turbines on downstream passage of adult eels and post spawn adult salmon
Pioneer Valley Chapter of TU	Enforcement of proposed mitigation measures, eel passage design and operation
Mass Dept. of Enviro Protection	401 Water Quality Certificate
Office of Coastal Zone Management	Determination of jurisdiction
Mass Office of Environmental Affairs	Assessment of environmental impacts, enforcement of Endangered Species Act
State Historic Preservation Office	Inform SHPO of archeological or historic sites
Local fishing groups	Annual stocking of river, access to fishing pools
Westfield River Canoe Race Com'tee	Take-out location and parking for annual down Westfield River canoe race
Westfield River Watershed Association	Water quality and health of river basin, public access for recreation
Russell Conservation Commission	Wetlands protection, mitigation of impacts on wetland areas, public access for recreation, state listed freshwater mussel protection

WORONOCO PROJECT

SERVICE LIST

Ms. Elizabeth Higgins Congram
Asst. Director for Environmental Review
Environmental Protection Agency Region 1
J.F.K. Building
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Mr. Ronald D. Lambertson
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U.S. Fish and Wildlife Service
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Regional Environmental Officer
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U.S. Department of the Interior
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Room 142
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Habitat Conservation Branch
National Marine Fisheries Service
One Blackburn Park
Gloucester, MA 01930-3097

Mr. Joseph Ignazio, Chief
Attn: Mr. David Sward
Planning Division
Regulatory Branch
U.S. Army Corps of Engineers, N.E.
424 Trapelo Road
Waltham, MA 02254

Mr. Kevin Mendik
National Park Service
Tenth Floor
15 State Street
Boston MA 02109

Dr. Henry Boone, Director
Silvio O. Conte Anadromous
Fish Research Center
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100 Cambridge Street
Boston, MA 02202

Mr. Todd Frederick
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Boston, MA 02202

Judith McDonough, Exec. Director
Massachusetts Historical Commission
220 Morrissey Blvd.
Boston, MA 02125

Mr. Bob Kubit
Massachusetts Dept. of
Environmental Protection
Division of Water Quality
627 Main Street, 2nd Floor
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Environmental Impact Review
MEPA Unit
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Boston, MA 02202

Secretary
Executive Office of Environmental Affairs
Leverett Saltonstall Building, 20th Floor
100 Cambridge Street
Boston, MA 02202

Mr. John R. Higgins
Regional Environmental Engineer
Massachusetts Dept. of
Environmental Protection
436 Dwight Street, 4th Floor
Springfield, MA 01103

Mr. Henry Woolais, Program Coordinator
Division of Fisheries and Wildlife
Massachusetts Natural Heritage Program
100 Cambridge Street
Boston, MA 02202

Mr. Richard Hartley
Massachusetts Division of Fisheries
and Wildlife
Field Headquarters
Westboro, MA 01581

Westfield River Watershed Association
Attn: Mr. Daniel Call, Vice President
P.O. Box 256
Westfield, MA 01086

Mr. Timothy Brennan, Executive Director
Pioneer Valley Planning Commission
26 Central Street
West Springfield, MA 01089

Mr. Robert P. Drake, Chairman
Board of Selectmen
Town of Russell
Russell, MA 01071

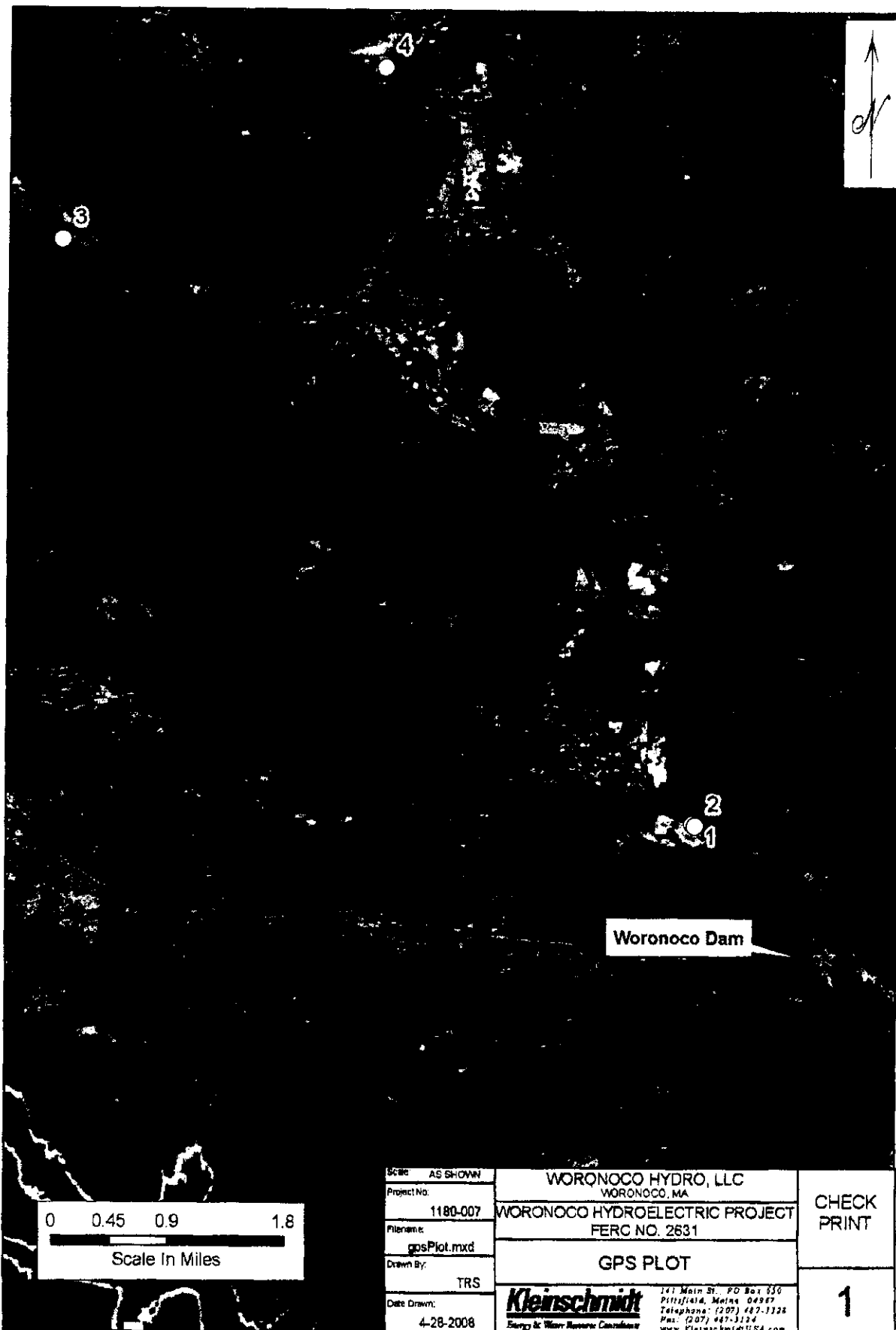
Mr. Donald Pugh
Trout Unlimited
10 Old Stage Road
Wendell, MA 01379

Mr. Michael Parker
Westfield River Coordinator
Executive Office of Environmental Affairs
Hampton Ponds State Park
1098 N. Road
Westfield, MA 01085

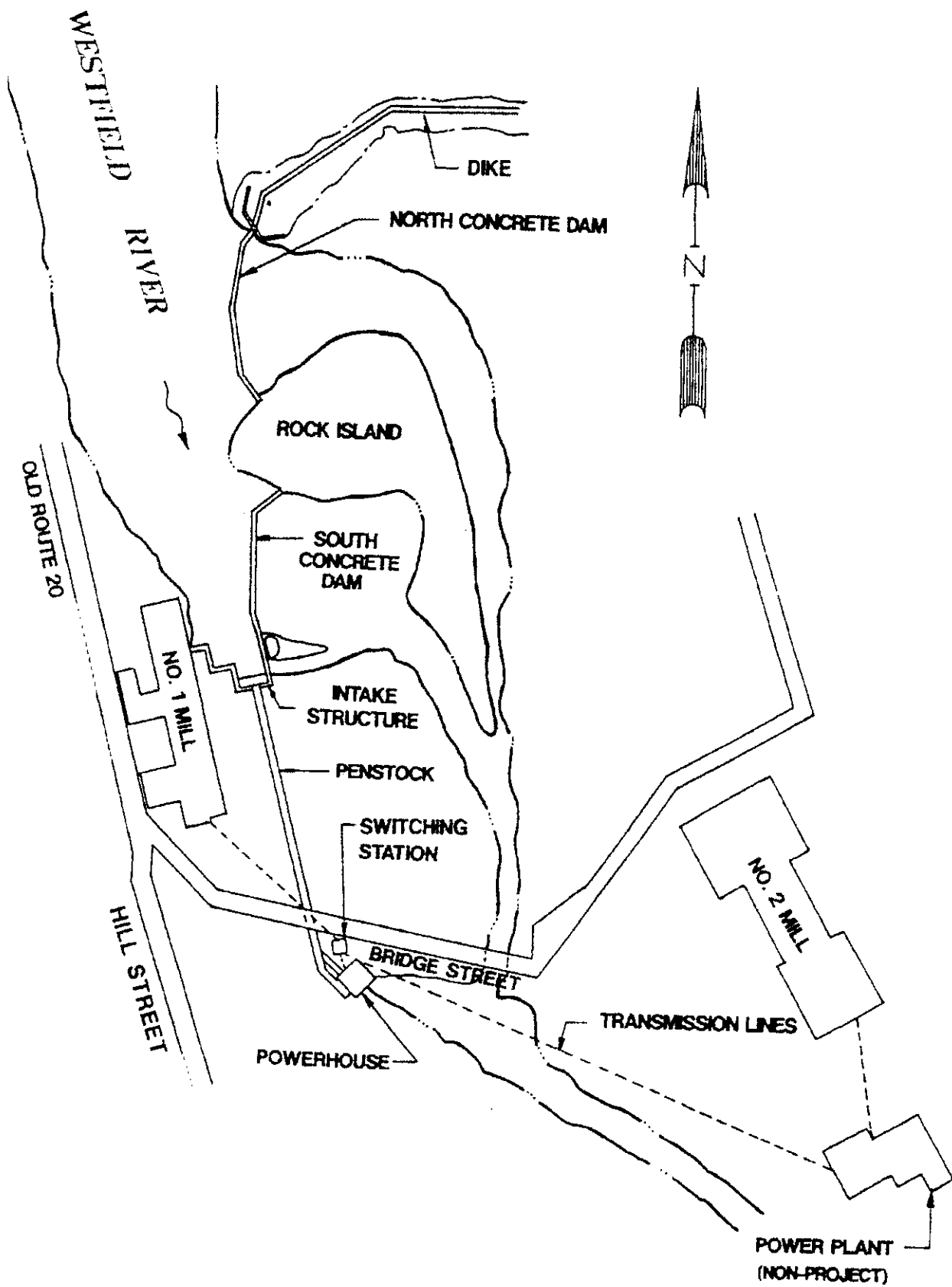
Mr. Jim Lafley
Vice President
Trout Unlimited
Pioneer Valley Chapter
28 Sabin Street
Belchertown, MA 01007

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Appendix B: Site Drawings, Plans and Maps



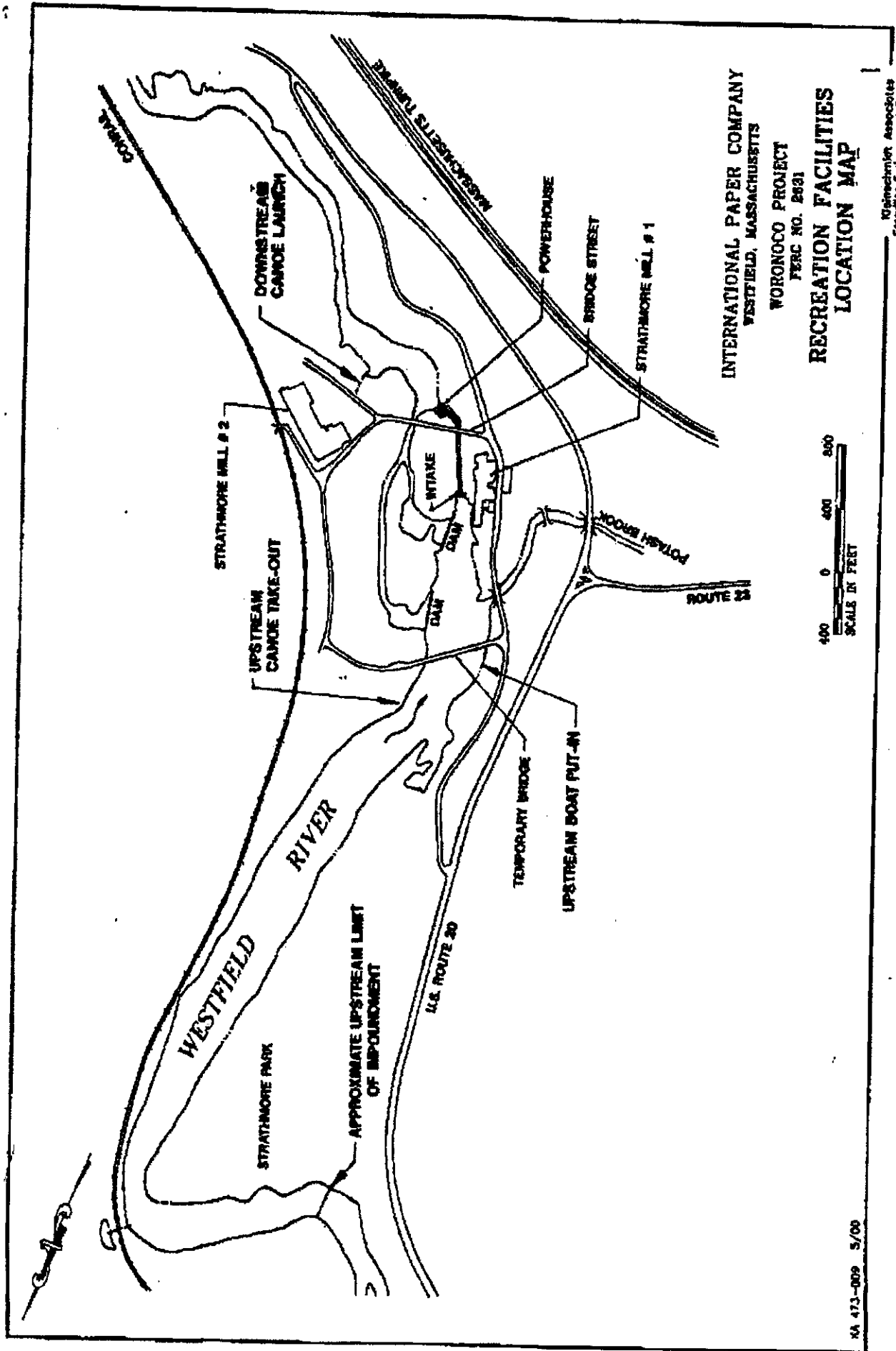
Scale	AS SHOWN	WORONOCO HYDRO, LLC WORONOCO, MA WORONOCO HYDROELECTRIC PROJECT FERC NO. 2631	CHECK PRINT
Project No.	1180-007		
Filename:	gpsPlot.mxd		
Drawn By:	TRS	GPS PLOT	1
Date Drawn:	4-28-2008		
Kleinschmidt Energy & Water Resources Consultants		141 Main St., PO Box 836 Pittsfield, Maine 04907 Telephone: (207) 487-3328 Fax: (207) 487-3124 www.KleinschmidtUSA.com	



INTERNATIONAL PAPER COMPANY
WORONOCO HYDRO STATION

FERC NO. 2631

SITE PLAN



INTERNATIONAL PAPER COMPANY
WESTFIELD, MASSACHUSETTS
WORONOCO PROJECT
FERC NO. 2631
**RECREATION FACILITIES
LOCATION MAP**

Kleinwachter Associates
Consulting Engineers and Scientists



DRAWN: RJS
 CHECKED: NLS
 APPROVED: NLS
 No. 26-2009

General Notes

LEGEND

- BUILDING(S)
- PROPOSED
- EASEMENT
- RIGHT OF WAY
- BOUNDARY LINE

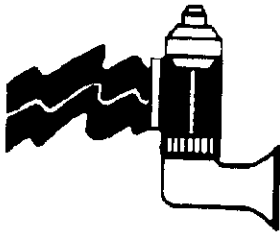
No.	Revision/Issue	Date

TITLE
 Morongo
 Hydro LLC
 Site Plan
 Aerial Photo

SWIFT RIVER HYDRO
 Operations Co.
 Wilbercham, Mo

SCALE
 1" = 500'-4"
 AS SHOWN

Appendix C: Woronoco Hydro's Annual FERC Compliance Letter



Swift River Hydro Operations Company
176 Cottage Avenue
Wilbraham, Ma 01095
413-599-1211

March 15, 2008

Mr. Charles Goggins
Deputy Regional Engineer
Federal Energy Regulatory Commission
New York Regional Office
19 West 34th Street, Suite 200
New York, NY 10001

Re: **Compliance P- 2631-MA, NATDAM No. MA00737, Woronoco Hydro**

Dear Mr. Goggins:

This letter responds to the Commissions request for a statement of compliance regarding project **P-2631-MA**, Woronoco Hydroelectric.

There were no events or occurrences during the calendar year 2007 that prevented Woronoco Hydroelectric from complying with the terms and conditions of the license exemption. Minimum flow requirements were met.

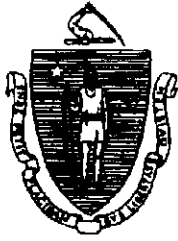
No accidents or injuries were reported for the year.

Should any further information be required on this matter, I may be reached at telephone number (413) 599 1211 or by email at wbailey@swiftriverhydro.com

Sincerely,

R Wayne Bailey
Operations Manager
Swift River Hydro Operations Company

Appendix D: Woronoco 401 Water Quality Certificate



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WESTERN REGIONAL OFFICE

ARGEO PAUL CELLUCCI
Governor

JANE SWIFT
Lieutenant Governor

BOB DURAND
Secretary

LAUREN A. LISS
Commissioner

Mr. Ted Lewellyn, P.E.
International Paper Company
Paper Mill Road
Millers Falls MA 01349

September 29, 2000

RE: Water Quality Certification
AMENDMENT
BRPWW10
Major Project Certification
Transmittal No.116384

AT: Woronoco Project
FERC No. 2631

Dear Mr. Lewellyn,

Attached is the Department's amended Water Quality Certification for the Woronoco Project pursuant to Section 401 of the federal Clean Water Act and the Massachusetts Surface Water Quality Standards at 314 CMR 4.00.

Any person aggrieved by the Certification may request an adjudicatory hearing within 30 days of issuance, pursuant to 310 CMR 1.01.

If you have any questions about the certification, please call Robert Kubit, at 508/767-2854.

Sincerely,

Lawrence Golonka
Watershed Chief
Westfield River Basin

Attachment
Cc: Jon Christensen/Kleinschmidt Associates
Michael Chapman/International Paper Co.


This information is available in alternate format by calling our ADA Coordinator at (617) 574-6872.

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channel and 22 cfs to the north channel. The bypass channel is to have a continuous flow from the downstream bypass gate. This flow and the south channel flow combine to 35 cfs. The applicant will consult with the MADFW and obtain approval from the MADEP regarding the timeframe, location and design of notches to be installed.

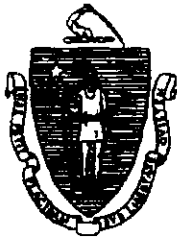
SIGNED:


Lawrence Golonka
Watershed Chief
Westfield River Basin

9-29-2000
Date

An application for a Water Quality Certificate shall be submitted to and approved by the MADEP prior to any activity that will cause a discharge subject to Section 404.

3. The applicant shall comply with Massachusetts General Laws Chapter 91.
4. All maintenance and repair activities, including disposal of debris and removal of sediments in impounded areas, shall be conducted in a manner so as not to impair water quality.
5. Any change to the project that would have a significant or material effect on the findings, conclusions, or conditions of this certification, including project operation, must be submitted to the MADEP for prior review and written approval where appropriate and authorized by law and only as related to the change proposed.
6. The MADEP may request, at any time during which this certification is in effect, that the FERC reopen the license to make modifications necessary to maintain compliance with the Massachusetts Surface Water Quality Standards or other appropriate requirements of state law.
7. The MADEP reserves the right to add and alter terms and conditions of this certification when authorized by law and as appropriate to carry out its responsibilities during the life of the project with respect to water quality.
8. A plan should be submitted for maintaining a run-of-river mode of operation in consultation with the Massachusetts Division of Fisheries & Wildlife (MADFW) and approved by the MADEP within six months of license issuance. The plan should address provisions for maintaining pond height at 229.0 feet, a means of recording (hourly) and reporting (yearly) pond elevation, and notification of the MADEP when the pond falls below 229.0 feet.
9. The project will be operated to maintain the elevation of the impoundment at its current high water elevation of 229.0 feet. The applicant will develop and implement a mussel and fish stranding protection plan during maintenance drawdowns within one year of license issuance in consultation with the MADFW and approval by the MADEP. The plan should address the possibility of performing maintenance without conducting a drawdown, limiting the number of drawdowns necessary and notification and justification to the MADEP when a drawdown is planned. No drawdown is permitted prior to the approval of the mussel and fish stranding protection plan without MADEP approval.
10. The applicant will provide upstream eel passage within one year of license issuance. Operation dates, fishway design and locations are to be determined in consultation with the MADFW and approved by the MADEP.
11. The applicant will evaluate the effectiveness of the downstream fishway designed to pass Atlantic salmon and resident fish during the first passage season following issuance of a new license for the project. The plan of study and study results need to be reviewed by the MADFW and approved by the MADEP.
12. Upon license issuance, the bypass reach will be provided a total minimum flow of 57 cfs or inflow, whichever is less. The total flow will provide 35 cfs to the south



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Governor

JANE SWIFT
Lieutenant Governor

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WESTERN REGIONAL OFFICE

00 OCT 10 PM 3:50

FEDERAL ENERGY
REGULATORY COMMISSION
BOB DURAND
Secretary

LAUREN A. LISS
Commissioner

**401 Water Quality Certification
AMENDMENT**
Applicant: International Paper Company
Woronoco Project (FERC No. 2631)
BRPWW10

The Massachusetts Department of Environmental Protection (MADEP) has received additional information regarding the application for Water Quality Certification, as referenced above and hereby amends the water quality certificate issued to the International Paper Company on August 30, 2000.

In accordance with the provisions of MGL c.21, §§ 26-53 and Section 401 of the Federal Clean Water Act as amended (33 U.S.C. §1251 *et seq.*), it has been determined there is reasonable assurance the project or activity will be conducted in a manner which will not violate applicable water quality standards.

The Woronoco Project is an automatically operated run-of-river project with an existing installed capacity of 2,700 kW. The project consists of two non-contiguous dam sections, an earthen dike with a sheet core, an intake structure, a 550 foot long penstock and a powerhouse containing three generating units with appurtenances. The project is proposed to be operated in a run-of-river mode with no alteration of the existing waterpower facility or new construction. It is understood turbine upgrade may occur in the future.

Based on information currently in the record, the MADEP grants a Water Quality Certification for this project subject to the following conditions to maintain water quality, to minimize impact on waters and wetlands, and to ensure compliance with appropriate state law:

1. The project shall be operated in accordance with the conditions contained in this certification and the provisions included in the Federal Energy Regulatory Commission (FERC) application and any modifications made thereto, to the extent such application provisions and modifications are consistent with this water quality certification. The operation of the hydrofacility shall be operated to maintain the designated uses of the Westfield River as outlined in the Massachusetts Surface Water Quality Standards (314 CMR 4.00) and the maintenance of an integrated and diverse biological community in the Westfield River.
2. All activities shall be conducted in compliance with the Massachusetts Wetlands Protection Act (including the Rivers Protection Act)(MGL Chapter 131, Section 40).

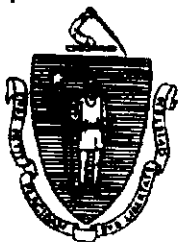
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COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WESTERN REGIONAL OFFICE

00 OCT 10 PM 3:50

REGULATORY COMMISSION
ENERGY
SECRETARY

LAUREN A. LISS
Commissioner

David P. Boergers, Secretary
Federal Energy Regulatory Commission
888 First Street NE
Washington, D.C. 20426

September 29, 2000

RE: Woronoco Project
FERC No. 2631
Amended Water Quality Certificate

Dear Mr. Boergers,

Attached is an original and eight (8) copies of the Massachusetts Department of Environmental Protection's amended Water Quality Certification for the Woronoco Project, pursuant to Section 401 of the federal Clean Water Act and the Massachusetts Surface Water Quality Standards at 314 CMR 4.00.

If you have any questions about the certification, please call Robert Kubit at 508/767-2854.

Sincerely,

Lawrence Golonka
Watershed Chief
Westfield River Basin

Attachment

001023.0144.3

This information is available in alternate format by calling our ADA Coordinator at (617) 574-6872.

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Appendix E: Westfield River Water Quality Assessment

APPENDIX A- WATER QUALITY MONITORING DATA, 2001



Massachusetts
Department
of
ENVIRONMENTAL
PROTECTION

Technical Memorandum TM-92-5
WESTFIELD RIVER WATERSHED
DWM YEAR 2001 WATER QUALITY MONITORING DATA

DWM Control Number: 088.1

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
ELLEN ROY HERZFELDER, SECRETARY
MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
ROBERT W. GOLLEDGE, COMMISSIONER
BUREAU OF RESOURCE PROTECTION
CYNTHIA GILES, ASSISTANT COMMISSIONER
DIVISION OF WATERSHED MANAGEMENT
GLENN HAAS, DIRECTOR

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Figure 1: Ipswich River Basin Water Quality Sampling Stations - 2000 ...	Error! Bookmark not defined.
Figure A1: Ipswich River Basin 2000 Precipitation and Discharge-July 27, 2000-September 7, 2000.....	Error! Bookmark not defined.

Introduction

Water quality sampling of the Westfield River basin was conducted in 2001 to address DWM program objectives. Specific objectives for the Westfield River are outlined below. The DWM sampling plan matrix for the Year Two monitoring is presented in Table 1. Sampling components at river stations included: *in-situ* Hydrolab™ measurements, physico-chemical and nutrient sampling.

Project Objectives

The primary water quality objective of this Year Two sampling, as outlined in CN 062.0 Westfield River Water Quality-Quality Assurance Project Plan, was to obtain sufficient data to help determine the status of certain segments and tributaries with regards to the Massachusetts surface water quality standards.

This technical memorandum presents the water quality sampling component of the survey. Results of other monitoring efforts, such as biological assessments and lake Total Maximum Daily Load assessments, are described in separate appendices.

Methods

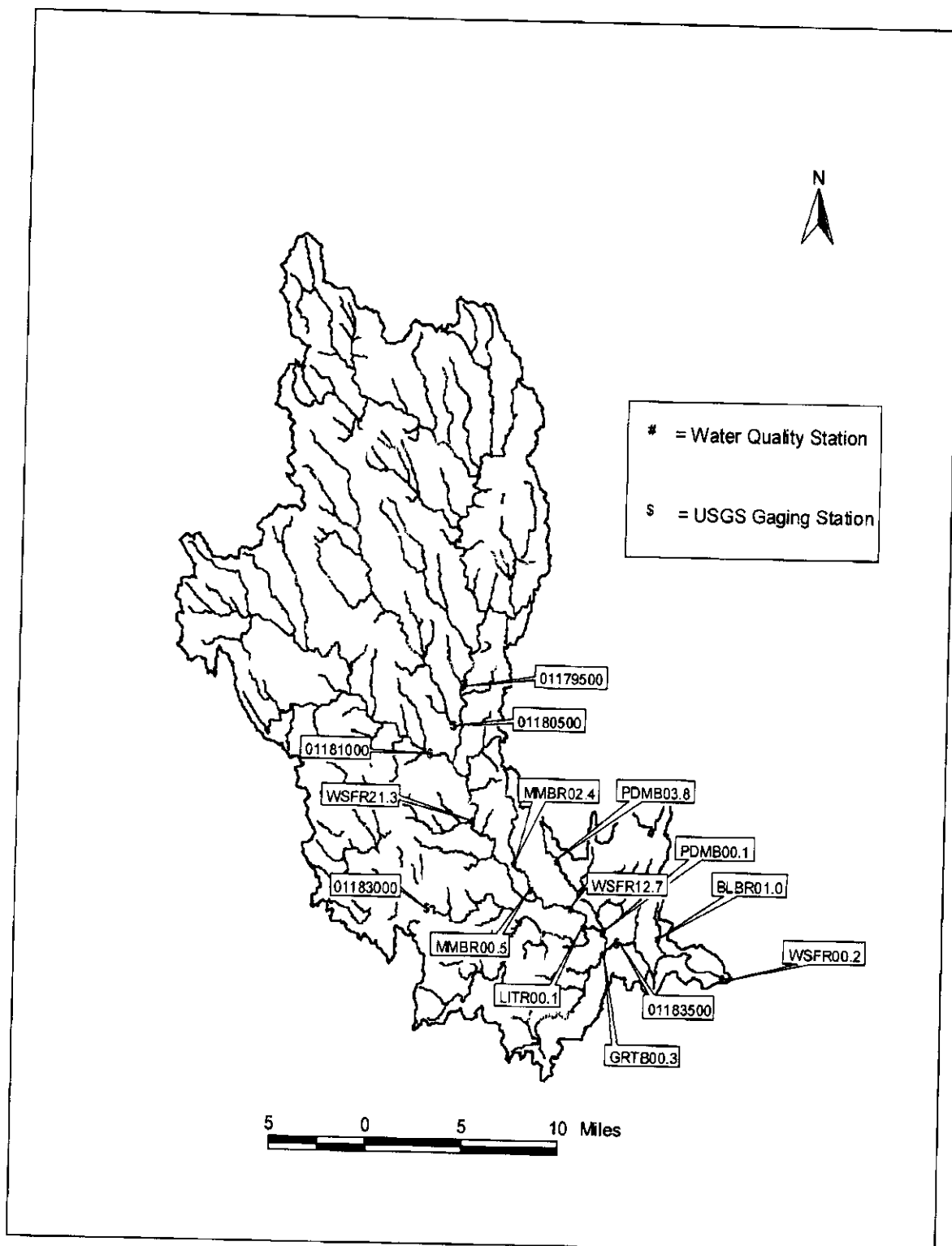
Water quality samples were collected in the Westfield River basin on the dates and for the parameters as shown in Table 1. See figure 1 for station locations. The parameters included in the sampling were: *in-situ* Hydrolab™ measurements (dissolved oxygen, percent dissolved oxygen saturation, pH, conductivity, water temperature and total dissolved solids), physico-chemical and nutrient sampling. The water quality sampling procedures are included in the publication: *Grab Collection Techniques for DWM Water Quality Sampling, Standard Operating Procedure* (MA DEP 1999). SOP (2001) CN 4.0 outlines the standard operating procedures for the Hydrolab™. Samples for total suspended solids, bacteria, nutrients (nitrate-N, ammonia-N, total phosphorus) total alkalinity, total hardness, chlorides and conductivity were analyzed at the Wall Experiment Station (WES), the Department's analytical laboratory in Lawrence, Massachusetts.

The quality control and assurance plan is included in CN 062.0 *Westfield River Water Quality Quality Assurance Project Plan* and 2001 *Benthic Macroinvertebrate Biomonitoring Quality Assurance Project Plan*.

Field sheets, raw data files, chain of custody forms, lab reports, and other metadata used in this report are managed and maintained by DEP DWM in the *Water Quality Access Database* in Worcester, MA. Several people were involved in the validation of the water quality data. This work included data entry into DWM databases, data entry quality control checks, analysis for outliers, blank contamination, duplicates, precision and holding time violations and project level review. Following this is project level review. The project coordinator, as identified in the QAPP for the Westfield River, reviews the data for reasonableness, completeness and acceptability, see CN 000.8 for more detail regarding DWM data validation of 2001 Westfield data.

Table 1: Westfield River Basin Sampling Summary For Water Quality - 2001 Location, Parameters, Segment Numbers					
Location and segment numbers	Station #	Aug 1	Aug 22	Sept 12	Oct 3
Westfield River, Frog Hollow Rd., Russell, Upstream of Carrington Rd. Bridge (segment 32-05)	WSFR21.3	DO, C, N, TSS	DO, C, N, TSS, B	DO, C, N, TSS, B	DO, C, N, TSS, B
Moose Meadow Brook, below Tekoa Res., Westfield, (segment 32-23)	MMBR02.4	DO, C, N, TSS, B	DO, C, N, TSS, B	DO, C, N, TSS, B	DO, C, N, TSS, B
Moose Meadow Brook nr Pochassic Rd., Westfield (segment 32-23)	MMBR00.5	DO, C, N, TSS, B	DO, C, N, TSS, B	DO, C, N, TSS, B	DO, C, N, TSS, B
Westfield River, nr Rte. 202/10 Bridge, Westfield (segment 32-05)	WSFR12.7	DO, C, N, TSS, B	DO, C, N, TSS, B	DO, C, N, TSS, B	DO, C, N, TSS, B
Little River, East Main St., Westfield (segment 32-08)	LITR00.1	DO, C, TSS, B	DO, C, TSS, B	DO, C, TSS, B	DO, C, TSS, B
Powdermill Brook, Russellville Rd., Westfield (segment 32-09)	PDMB03.8	DO, C, N, TSS, B	DO, C, N, TSS, B	DO, C, N, TSS, B	DO, C, N, TSS, B
Powdermill Brook nr East Main St., Westfield (segment 32-09)	PDMB00.1	DO, C, TSS, B	DO, C, TSS, B	DO, C, TSS, B	DO, C, TSS, B
Great Brook, Little River Rd., Westfield (segment 32-25)	GRTB00.3	DO, C, TSS, B	DO, C, TSS, B	DO, C, TSS, B	DO, C, TSS, B
Block Brook, Plymouth Terrace, Agawam (segment 32-01)	BLBR01.0	DO, C, TSS, B	DO, C, TSS, B	DO, C, TSS, B	DO, C, TSS, B
Westfield River, Rte. 5, Agawam (segment 32-07)	WSFR00.2	DO, C, TSS, B	DO, C, TSS, B	DO, C, TSS, B	DO, C, TSS, B
DO = dissolved oxygen, DO-am = pre-dawn DO C = total alkalinity, total hardness, chlorides N = nitrates, ammonia, total phosphorus (low level) TSS = total suspended solids B = bacteria					

Figure 1:



Survey Conditions

Table 2 (precipitation) and Table 3 (stream discharge) contain information on the survey conditions prior, and during, each sampling event. The stream discharge data are used to estimate hydrological conditions during water quality sampling.

Data from three USGS stream gages were used for discharge assessment. Those gages were 01179500 - Westfield River at Knightville, MA, 01181000 - West Branch Westfield River at Huntington, MA, and 01183500 - West Branch Westfield River near Westfield, MA.

Gage 01179500 is located 0.2 miles downstream of Knightville Dam (Huntington, MA). This impoundment is managed by the ACOE, and there is a generating facility associated with this impoundment that is capable of producing 3000kwh. As such, the gage reading is a measurement of the release from Knightville Dam, rather than a measurement of natural flow conditions. Gage 01181000 is located upstream of Huntington center. The flow at this gage does not appear to be regulated by any major upstream impoundment, and represents the best measure of natural flow conditions. A chart of the 2001 summer discharge, and dates of sample collection may be seen in figure 2. Gage 01183500 is located in the city of Westfield. Borden Brook Reservoir, Cobble Mountain Reservoir, Knightville Reservoir, and Littleville Lake regulate flow past this gage.

The National Weather Service station at Barnes Municipal Airport (BAF) collected precipitation data. This precipitation data was taken from the NOAA website (tgsv5.nws.noaa.gov/cgi-bin/box). Appendix A contains figures of the discharge and precipitation data combined for the days prior to the sampling dates. The determination of 7Q10 was from the *USGS Water Resources Data Massachusetts and Rhode Island Water Year 2001* (USGS 2003).

In general, water conditions in the Westfield Watershed, during the 2001 DWM water quality sampling season, were normal to dry (http://ma.water.usgs.gov/drought/Surface_Water_Maps_for_Water_Year_2001.htm). This resulted in a decrease in instream flow below historic mean levels.

August 1, 2001- This survey was conducted during a dry period, with no rain reported at Barnes Municipal Airport (BAF, Westfield, MA) during the week prior to sampling. Gage data (USGS gage 01181000) revealed a consistent decline in flow in the week prior to sample collection.

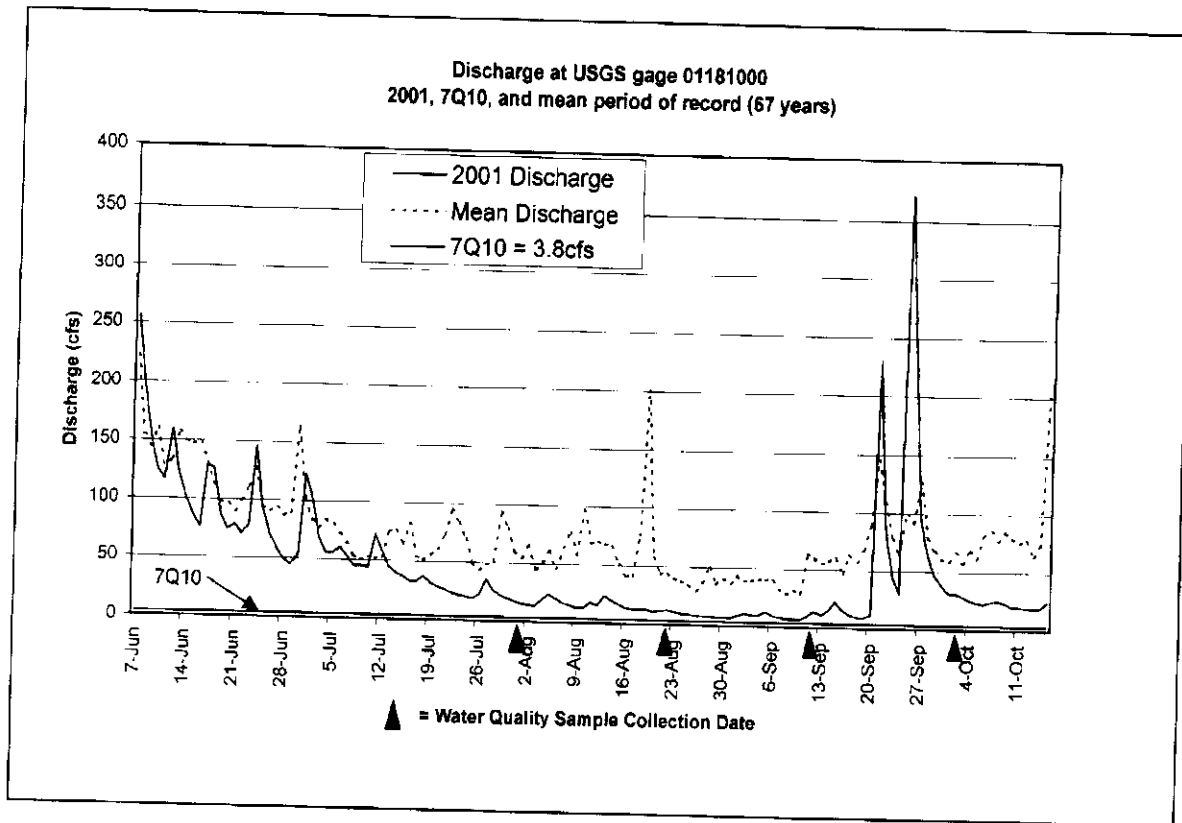
August 22, 2001- This survey was conducted during a relatively dry period, with less than ¼ inch of rain falling on any one day during the week prior to sampling. The total rainfall during the week prior to sampling was 0.33 inches. Discharge (at USGS gage 01181000) remained relatively steady (~13cfs), with less than a 1cfs variation in discharge during the week prior to sample collection.

September 12, 2001- This survey was also during a relatively dry period, with less than ¼ inch of rain falling on any one day during the week prior to sampling. The total rainfall during the week prior to sampling was 0.18 inches. Discharge (USGS gage 01181000) remained low, with a mean discharge of 9cfs during the week prior to sample collection.

October 3, 2001- This survey was also conducted during a relatively dry period, with less than ¼ inch of rain falling on any one day during the week prior to sampling. However, a rain event

that dropped 0.83 inches at BAF occurred on September 25th. This event resulted in a short-term (<48hr) increase in measured discharge at USGS gage 01181000. The discharge during the week prior to sampling displayed a steady decline, with a mean discharge of 48cfs for the week.

Figure 2:



**Table 2: Westfield River Basin 2001 Precipitation Data Summary
(reported in inches of rain)**

Survey Dates	5 Days Prior	4 Days Prior	3 Days Prior	2 Days Prior	1 Day Prior	Sample Date
National Weather Service at Barnes Airfield, MA (unofficial NWS data at http://tgs5.nws.noaa.gov/er/box/clstns.htm)						
1 Aug	0.00	0.00	0.00	0.00	0.00	0.00
22 Aug	0.24	0.00	0.01	0.03	0.01	0.00
12 Sep	0.00	0.01	0.00	0.16	0.00	0.01
3 Oct	0.00	0.00	0.08	0.03	0.00	0.01

Table 3: Westfield River at Knightville, MA-USGS Flow Data Summary Discharge in Cubic Feet per Second (cfs) Gage # 01179500								
Survey Dates	5 Days Prior	4 Days Prior	3 Days Prior	2 Days Prior	1 Day Prior	Sample Date	Monthly Mean	POR* Mean
1 Aug	154	113	88	73	63	56	125	130
22 Aug	31	30	28	28	27	26	44.9	108
12 Sep	23	20	19	17	47	53	124	126
3 Oct	168	119	103	86	74	64	124	126
7Q10 @ USGS Gage 01179500 = 8.9 cfs, Westfield Period of Record: 1910-1990, 1996-present (mean annual discharge = 333 cfs)								

Table 3A: West Branch Westfield River at Huntington, MA-USGS Flow Data Summary Discharge in Cubic Feet per Second (cfs) Gage # 01181000								
Survey Dates	5 Days Prior	4 Days Prior	3 Days Prior	2 Days Prior	1 Day Prior	Sample Date	Monthly Mean	POR* Mean
1 Aug	36	26	23	20	18	16	42.7	67.8
22 Aug	13	13	13	11	12	13	13.8	58.4
12 Sep	8.3	7.4	7.0	7.1	9.6	14	48.6	64.3
3 Oct	63	46	39	32	32	29	23.8	106
7Q10 @ USGS Gage 01181000 = 3.8 cfs, Westfield Period of Record: 1935 - present (mean annual discharge = 191 cfs)								

Table 3B: West Branch Westfield River near Westfield, MA-USGS Flow Data Summary Discharge in Cubic Feet per Second (cfs) Gage # 01183500								
Survey Dates	5 Days Prior	4 Days Prior	3 Days Prior	2 Days Prior	1 Day Prior	Sample Date	Monthly Mean	POR* Mean
1 Aug	216	201	158	145	130	122	291	407
22 Aug	121	133	114	113	110	104	145	387
12 Sep	104	98	98	80	83	105	299	400
3 Oct	507	398	342	292	250	239	299	400
7Q10 @ USGS Gage 01183500 = 50 cfs, Westfield Period of Record: 1935 - present (mean annual discharge = 931 cfs)								

Water Quality Data

Water quality data are included for Hydrolab™ parameters (dissolved oxygen, percent saturation, pH, temperature, dissolved solids and conductivity) (Appendix B), as well as for nutrients (total phosphorus, nitrate-N, ammonia-N), and physical chemistry (alkalinity, hardness, chloride, total suspended solids), and fecal and e-coli bacteria (Appendix C).

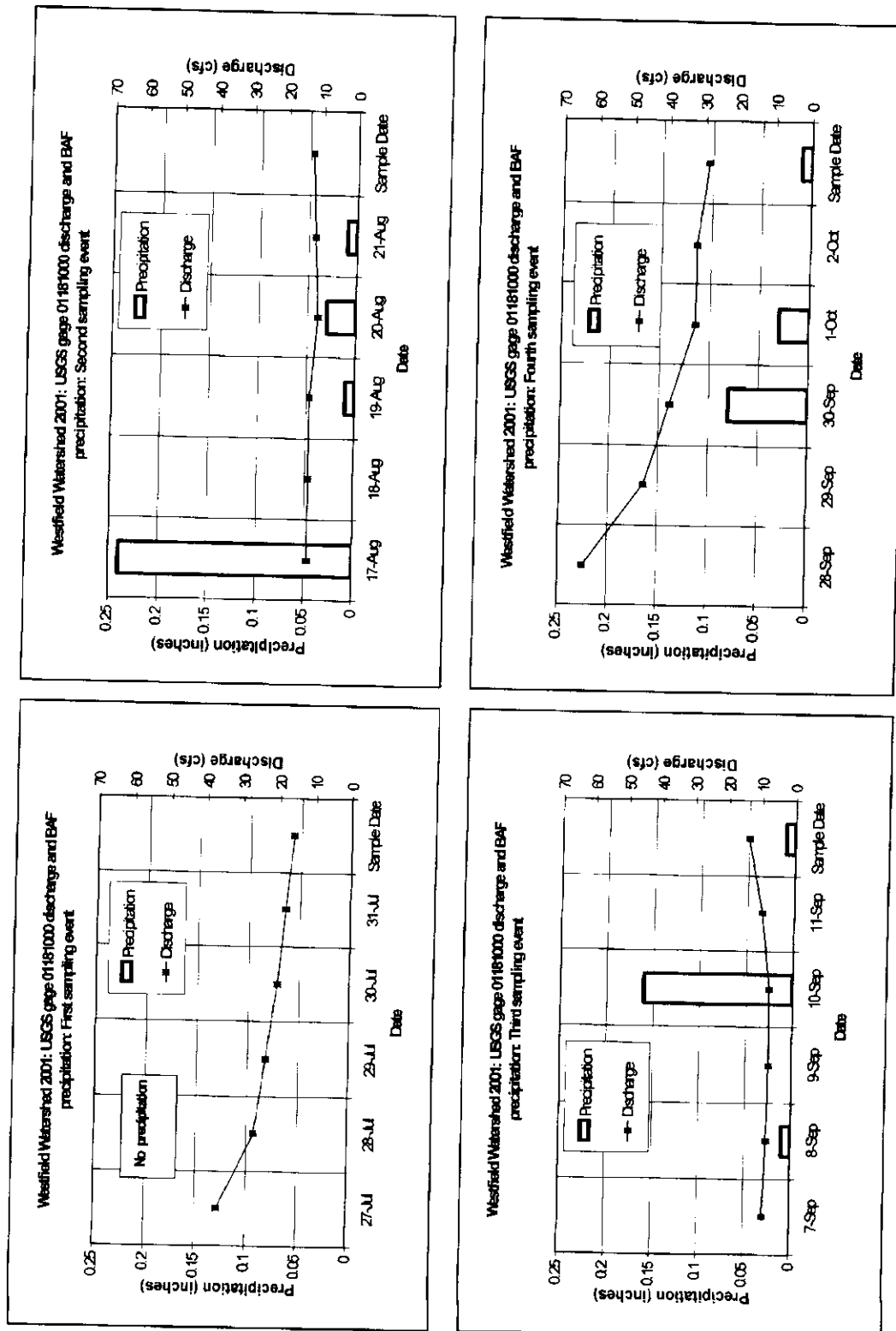
Quality control sample data are also provided in Appendix C. Based on acceptable RPD's for field duplicates and the lack of contamination (i.e. <MDL) for ambient field duplicates, there was no censoring or qualification decisions made for 2001 Westfield water quality for rivers (except for minor Hydrolab data qualifications, i.e. unstable readings-see Appendix B).

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Appendix A: Graphs of Precipitation and Discharge Data

Figure A1: Westfield Watershed 2001 Precipitation (inches) Measured at Barnes Municipal Airport (BAF) Westfield, MA and Discharge (cfs) Measured at USGS gage 01181000 West Branch Westfield at Huntington.



Appendix B: Westfield River Basin Survey 2001 Hydrolab Data
 Temperature, pH, Conductivity, Total Dissolved Solids, Dissolved Oxygen, % Saturation

WESTFIELD RIVER (Saris: 3208250)

Station: WSFR21.3, Mile Point: 22.1, Unique ID: W0810

Description: Western bank at Main Street Bridge, Russell

Date	OWMID	Time	Depth	Temp	pH	Conductivity @ 25°C	TDS	DO	Saturation
		(24hr)	(m)	(°C)	(SU)	(uS/cm)	(mg/l)	(mg/l)	(%)
8/1/2001	32-0113	04:33	##	22.4u	7.3c	108	69.3	8.2u	92u
8/22/2001	32-0148	04:08	0.8	24.0	7.3cu	120	77.1	8.5u	99u
9/12/2001	32-0174	04:16	0.6	20.6	7.3cu	119	76.0	8.9iu	96iu
10/3/2001	32-0203	11:08	0.4	14.2	7.0cu	96.2	61.6	10.0u	96u

MOOSE MEADOW BROOK (Saris: 3209700)

Station: MMBR02.4, Mile Point: 2.5, Unique ID: W0809

Description: ~250 feet downstream of Tekoa Reservoir, Montgomery

Date	OWMID	Time	Depth	Temp	pH	Conductivity @ 25°C	TDS	DO	Saturation
		(24hr)	(m)	(°C)	(SU)	(uS/cm)	(mg/l)	(mg/l)	(%)
8/1/2001	32-0112	03:13	##	18.1	6.8u	43.0	27.5	9.5u	98u
8/22/2001	32-0147	03:13	1.0	20.1	6.8u	44.7	28.6	8.9	96
9/12/2001	32-0173	03:20	0.9	17.3	6.9u	41.5	26.6	9.5iu	97iu
10/3/2001	32-0202	10:09	0.9	12.1	6.6u	46.1	29.5	10.8u	99u

MOOSE MEADOW BROOK (Saris: 3209700)

Station: MMBR00.5, Mile Point: 0.4, Unique ID: W0812

Description: at farm road (private road off Pochassic Road) bridge, Westfield

Date	OWMID	Time	Depth	Temp	pH	Conductivity @ 25°C	TDS	DO	Saturation
		(24hr)	(m)	(°C)	(SU)	(uS/cm)	(mg/l)	(mg/l)	(%)
8/1/2001	32-0111	02:29	##	18.8	6.8	175	112	7.2	76
8/22/2001	32-0146	02:36	0.5	20.3	6.7u	214	137	6.2	67
9/12/2001	32-0172	02:41	0.3	18.2	7.0c	410	263	4.7iu	49iu
10/3/2001	32-0201	09:28	0.3	12.1	6.9cu	165	105	10.1	93

WESTFIELD RIVER (Saris: 3208250)

Station: WSFR12.7, Mile Point: 13, Unique ID: W0807

Description: ~350 feet upstream of Route 202/10 bridge, Westfield

Date	OWMID	Time	Depth	Temp	pH	Conductivity @ 25°C	TDS	DO	Saturation
		(24hr)	(m)	(°C)	(SU)	(uS/cm)	(mg/l)	(mg/l)	(%)
8/1/2001	32-0116	05:09	##	22.3	7.2cu	122	78.2	8.1	91
8/22/2001	32-0151	04:43	0.5	23.3	7.2cu	149	95.1	7.9u	91u
9/12/2001	32-0177	04:55	0.4	20.0	7.3cu	149	95.0	8.6iu	92iu
10/3/2001	32-0206	11:48	0.2	14.1	7.2cu	106	67.9	11.1u	107u

LITTLE RIVER (Saris: 3208725)**Station: LITR00.1, Mile Point: 0.04, Unique ID: W0808**

Description: ~100 feet upstream of Route 20 bridge, Westfield

Date	OWMID	Time	Depth	Temp	pH	Conductivity @ 25°C	TDS	DO	Saturation
		(24hr)	(m)	(°C)	(SU)	(uS/cm)	(mg/l)	(mg/l)	(%)
8/1/2001	32-0125	01:54	##i	21.8	7.2c	134	85.7	8.3u	92u
8/22/2001	32-0152	02:00	0.1i	22.5	7.1cu	139	89.1	7.9	89
9/12/2001	32-0178	01:58	0.2	19.4	7.2cu	149	95.5	8.5i	90i
10/3/2001	32-0207	08:53	0.1i	12.7	7.0c	120	76.7	10.2	94

POWDERMILL BROOK (Saris: 3208575)**Station: PDMB03.8, Mile Point: 5.4, Unique ID: W0234**

Description: at Russellville Road

Date	OWMID	Time	Depth	Temp	pH	Conductivity @ 25°C	TDS	DO	Saturation
		(24hr)	(m)	(°C)	(SU)	(uS/cm)	(mg/l)	(mg/l)	(%)
8/1/2001	32-0117	01:46	##i	17.1	6.9cu	133	84.9	8.9	90
8/22/2001	32-0145	02:02	0.4	18.9	6.8u	142	90.8	8.3u	88u
9/12/2001	32-0171	02:11	0.4	16.3	6.6	175	112	6.1iu	61iu
10/3/2001	32-0200	08:58	0.2	11.0	6.7u	156	100	10.6u	94u

POWDERMILL BROOK (Saris: 3208575)**Station: PDMB00.1, Mile Point: 0.3, Unique ID: W0805**

Description: downstream of Union Street culvert, Westfield

Date	OWMID	Time	Depth	Temp	pH	Conductivity @ 25°C	TDS	DO	Saturation
		(24hr)	(m)	(°C)	(SU)	(uS/cm)	(mg/l)	(mg/l)	(%)
8/1/2001	32-0128	03:19	0.2	17.9	7.8c	292	187	9.9u	102u
8/22/2001	32-0154	02:51	0.4	18.4	7.4cu	283	181	9.1	96
9/12/2001	32-0180	02:49	0.4	16.4	7.6cu	311	199	9.5iu	95iu
10/3/2001	32-0209	09:38	0.3	11.9	7.3cu	299	191	9.9	90

GREAT BROOK (Saris: 3208375)**Station: GRTB00.3, Mile Point: 0.3, Unique ID: W0804**

Description: ~250 feet upstream of Route 187 bridge, Westfield

Date	OWMID	Time	Depth	Temp	pH	Conductivity @ 25°C	TDS	DO	Saturation
		(24hr)	(m)	(°C)	(SU)	(uS/cm)	(mg/l)	(mg/l)	(%)
8/1/2001	32-0126	02:29	0.3	16.0	7.2c	230	147	7.7u	76u
8/22/2001	32-0153	02:27	0.3	17.5	7.2cu	224	144	7.8	80
9/12/2001	32-0179	02:23	0.4	15.5	7.2cu	227	145	7.5i	74i
10/3/2001	32-0208	09:16	0.4	11.0	7.1cu	225	144	9.0	81

BLOCK BROOK (Saris: 3208275)**Station: BLBR01.0, Mile Point: 1, Unique ID: W0806****Description: at Plymouth Terrace crossing, West Springfield**

Date	OWMID	Time	Depth	Temp	pH	Conductivity @ 25°C	TDS	DO	Saturation
		(24hr)	(m)	(°C)	(SU)	(uS/cm)	(mg/l)	(mg/l)	(%)
8/1/2001	32-0129	04:10	0.1i	17.9	7.6c	594	380	8.0u	82u
8/22/2001	32-0155	03:30	0.2	19.4	7.6c	486	311	8.0	85
9/12/2001	32-0181	03:22	0.2	16.7	7.5cu	515	329	7.4i	74i
10/3/2001	32-0210	10:06	0.2	12.1u	7.5cu	510	327	9.5	87

WESTFIELD RIVER (Saris: 3208250)**Station: WSFR00.2, Mile Point: 0.4, Unique ID: W0857****Description: ~250 feet upstream of Route 5 bridge, Agawam**

Date	OWMID	Time	Depth	Temp	pH	Conductivity @ 25°C	TDS	DO	Saturation
		(24hr)	(m)	(°C)	(SU)	(uS/cm)	(mg/l)	(mg/l)	(%)
8/1/2001	32-0130	04:51	0.4	22.3	7.1c	190	122	6.6u	74u
8/22/2001	32-0158	04:01	0.4	23.7	7.1c	226	145	6.3u	72u
9/12/2001	32-0184	04:00	0.5	21.0	7.2c	259	166	6.6iu	72iu
10/3/2001	32-0213	10:39	0.6	14.3	7.1cu	158	101	9.7	93

Appendix C: Westfield River Basin Survey 2001 Water Quality Data – fecal bacteria, e-coli bacteria, Alkalinity, Hardness, Chloride, Ammonia Nitrogen, Nitrate-Nitrite Nitrogen, Total Phosphorus, and Suspended Solids

[REDACTED] (Saris: 00000)

Station: BLANK

Description: QAQC: Field Blank Sample

Date	OWMID	QAQC	Fecal	Ecolil	Chloride	Alkalinity	Hardness	NH3-N	NO3-NO2-N	TP	SSolids
			CFU/100ml	CFU/100ml	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
8/1/2001	32-0114	Blank			<1	<2	<0.66	<0.02	<0.06	<0.005	<1.0
8/1/2001	32-0122	Blank			<1	<2	<0.66				
8/1/2001	32-0131	Blank	<5	<5							
8/22/2001	32-0149	Blank			<1	<2	<0.66	<0.02	<0.06	<0.005	<1.0
8/22/2001	32-0156	Blank			<1	<2	<0.66				
8/22/2001	32-0168	Blank	<5	<5							
9/12/2001	32-0175	Blank			<1	<2	<0.66	<0.02	<0.06	<0.005	<1.0
9/12/2001	32-0182	Blank			<1	<2	<0.66				
9/12/2001	32-0194	Blank	<2	<2							
10/3/2001	32-0204	Blank			<1	<2	<0.66	<0.02	<0.06	<0.005	<1.0
10/3/2001	32-0211	Blank			<1	<2	<0.66				
10/3/2001	32-0223	Blank	<5	<5							

WESTFIELD RIVER (Saris: 3208250)

Station: WSFR21.3, Mile Point: 22.1, Unique ID: W0810

Description: Western bank at Main Street Bridge, Russell

Date	OWMID	QAQC	Chloride	Alkalinity	Hardness	NH3-N	NO3-NO2-N	TP	SSolids
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
8/1/2001	32-0115	32-0113	15	20	28	<0.02	<0.06	0.010	<1.0
8/1/2001	32-0113	32-0115	14	22	28	<0.02	<0.06	0.011	<1.0
<i>Relative</i>	<i>Percent</i>	<i>Difference</i>	<i>6.9%</i>	<i>9.5%</i>	<i>0.0%</i>	<i>0.0%</i>	<i>0.0%</i>	<i>9.5%</i>	<i>0.0%</i>
8/22/2001	32-0150	32-0148	20	22	30	<0.02	0.06	0.011	<1.0
8/22/2001	32-0148	32-0150	20	22	30	<0.02	0.06	0.011	<1.0
<i>Relative</i>	<i>Percent</i>	<i>Difference</i>	<i>0.0%</i>	<i>0.0%</i>	<i>0.0%</i>	<i>0.0%</i>	<i>0.0%</i>	<i>0.0%</i>	<i>0.0%</i>
9/12/2001	32-0176	32-0174	18	20	28	<0.02	0.12	0.015d	1.3d
9/12/2001	32-0174	32-0176	19	21	28	<0.02	0.12	0.030d	2.9d
<i>Relative</i>	<i>Percent</i>	<i>Difference</i>	<i>5.4%</i>	<i>4.9%</i>	<i>0.0%</i>	<i>0.0%</i>	<i>0.0%</i>	<i>66.7%</i>	<i>76.2%</i>
10/3/2001	32-0205	32-0203	13	18	25	<0.02	<0.06	0.009d	<1.0
10/3/2001	32-0203	32-0205	13	18	25	<0.02	<0.06	0.019d	<1.0
<i>Relative</i>	<i>Percent</i>	<i>Difference</i>	<i>0.0%</i>	<i>0.0%</i>	<i>0.0%</i>	<i>0.0%</i>	<i>0.0%</i>	<i>71.4%</i>	<i>0.0%</i>

BLOCK BROOK(Saris: 3208275)

Station: BLBR01.0, Mile Point: 1, Unique ID: W0806

Description: at Plymouth Terrace crossing, West Springfield

Date	OWMID	QAQC	Log10(Fecal) CFU/100ml	Log10(Ecoli) CFU/100ml	Chloride (mg/l)	Alkalinity (mg/l)	Hardness (mg/l)	SSolids (mg/l)
8/1/2001	32-0121	32-0120			110	82	158	7.8
8/1/2001	32-0120	32-0121			110	83	158	7.3
Relative	Percent	Difference			0.0%	1.2%	0.0%	6.6%
8/22/2001	32-0157	32-0155			82	85	135	4.9
8/22/2001	32-0155	32-0157			84	85	135	5.2
Relative	Percent	Difference			2.4%	0.0%	0.0%	5.9%
8/22/2001	32-0169	32-0167	2.643	2.041				
8/22/2001	32-0167	32-0169	2.519	2.204				
Relative	Percent	Difference	4.8%	7.7%				
9/12/2001	32-0183	32-0181			93	83	126	4.6
9/12/2001	32-0181	32-0183			95	83	126	4.8
Relative	Percent	Difference			2.1%	0.0%	0.0%	4.3%
9/12/2001	32-0195	32-0193	2.954	1.462				
9/12/2001	32-0193	32-0195	2.613	0.699				
Relative	Percent	Difference	12.3%	70.6%				
10/3/2001	32-0212	32-0210			92	83	139	<1.0
10/3/2001	32-0210	32-0212			92	83	140	<1.0
Relative	Percent	Difference			0.0%	0.0%	0.7%	0.0%
10/3/2001	32-0224	32-0222	2.230	2.041				
10/3/2001	32-0222	32-0224	2.255	1.633				
Relative	Percent	Difference	1.1%	22.2%				

POWDERMILL BROOK (Saris: 3208575)

Station: PDMB00.1, Mile Point: 0.3, Unique ID: W0805

Description: downstream of culvert at Union Street, Westfield

Date	OWMID	QAQC	Fecal CFU/100ml	Ecoli CFU/100ml
8/1/2001	32-0137	32-0138	1.826	1.462
8/1/2001	32-0138	32-0137	2.146	1.756
Relative	Percent	Difference	16.1%	18.2%

WESTFIELD RIVER (Saris: 3208250)**Station: WSFR21.3, Mile Point: 22.1, Unique ID: W0810****Description: Western bank at Main Street Bridge, Russell**

Date	OWMID	Time	Fecal	Ecoli1	Alkalinity	Hardness	Chloride	NH3-N	NO3-NO2-N	TP	SSolids
		24hr	CFU/100ml	CFU/100ml	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
8/1/2001	32-0115	**			15	20	28	<0.02	<0.06	0.010	<1.0
8/1/2001	32-0113	04:15			14	22	28	<0.02	<0.06	0.011	<1.0
8/22/2001	32-0150	**			20	22	30	<0.02	0.06	0.011	<1.0
8/22/2001	32-0148	04:10			20	22	30	<0.02	0.06	0.011	<1.0
8/22/2001	32-0162	09:53	90	19							
9/12/2001	32-0176	**			18	20	28	<0.02	0.12	0.015d	1.3d
9/12/2001	32-0174	04:10			19	21	28	<0.02	0.12	0.030d	2.9d
9/12/2001	32-0188	09:54	57	<5							
10/3/2001	32-0205	**			13	18	25	<0.02	<0.06	0.009d	<1.0
10/3/2001	32-0217	09:33	5	5							
10/3/2001	32-0203	11:00			13	18	25	<0.02	<0.06	0.019d	<1.0

MOOSE MEADOW BROOK (Saris: 3209700)**Unique ID: W0809 Station: MMBR02.4, Mile Point: 2.5****Description: approximately 250 feet downstream of Tekoa Reservoir, Montgomery**

Date	OWMID	Time	Fecal	Ecoli1	Alkalinity	Hardness	Chloride	NH3-N	NO3-NO2-N	TP	SSolids
		24hr	CFU/100ml	CFU/100ml	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
8/1/2001	32-0112	**			7	5	8.8	<0.02	<0.06	0.018	<1.0
8/1/2001	32-0133	09:40	19	<5							
8/22/2001	32-0147	03:10			7	6	9.5	<0.02	0.12	0.014	<1.0
8/22/2001	32-0161	09:11	10	<2							
9/12/2001	32-0173	03:18			7	6	9	<0.02	0.09	0.013	1.0
9/12/2001	32-0187	09:13	10	<5							
10/3/2001	32-0216	08:54	<2	5							
10/3/2001	32-0202	10:10			8	4	8.7	<0.02	<0.06	0.020	1.5

MOOSE MEADOW BROOK (Saris: 3209700)**Unique ID: W0812 Station: MMBR00.5, Mile Point: 0.4****Description: at Farm Road (private road south off Pochassic Road) bridge, Westfield**

Date	OWMID	Time	Fecal	Ecoli1	Alkalinity	Hardness	Chloride	NH3-N	NO3-NO2-N	TP	SSolids
		24hr	CFU/100ml	CFU/100ml	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
8/1/2001	32-0134	**	4700	2000							
8/1/2001	32-0111	02:29			39	15	32	<0.02	1.6	0.049	2.0
8/22/2001	32-0146	02:30			43	18	38	<0.02	1.7	0.069	5.3
8/22/2001	32-0160	08:48	3300	1200							
9/12/2001	32-0172	02:13			78	53	61	1.3	0.86	0.29	<1.0
9/12/2001	32-0186	08:50	24000	300							
10/3/2001	32-0215	08:32	7100	5000							
10/3/2001	32-0201	09:30			31	14	26	0.33	0.97	0.052	<1.0

WESTFIELD RIVER (Saris: 3208250)**Unique_ID: W0807 Station: WSFR12.7, Mile Point: 13**

Description: approximately 350 feet upstream/west of Route 202/10 bridge, Westfield

Date	OWMID	Time	Fecal	Ecolil	Alkalinity	Hardness	Chloride	NH3-N	NO3-NO2-N	TP	SSolids
		24hr	CFU/100ml	CFU/100ml	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
8/1/2001	32-0116	**			18	20	30	<0.02	0.23	0.012	1.9
8/1/2001	32-0135	10:15	300	180							
8/22/2001	32-0151	04:45			25	24	34	<0.02	0.27	0.008	<1.0
8/22/2001	32-0163	10:17	210	48							
9/12/2001	32-0177	04:20			23	26	33	<0.02	0.29	0.009	<1.0
9/12/2001	32-0189	10:17	62	<5							
10/3/2001	32-0218	09:57	690	410							
10/3/2001	32-0206	11:45			15	18	27	<0.02	0.12	0.009	<1.0

LITTLE RIVER (Saris: 3208725)**Unique_ID: W0808 Station: LITTR00.1, Mile Point: 0.04**

Description: approximately 100 feet upstream/west of Route 20 bridge, Westfield

Date	OWMID	Time	Fecal	Ecolil	Alkalinity	Hardness	Chloride	NH3-N	NO3-NO2-N	TP	SSolids
		24hr	CFU/100ml	CFU/100ml	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
8/1/2001	32-0118	02:00			22	17	32				<1.0
8/1/2001	32-0136	10:25	670	76							
8/22/2001	32-0152	01:43			22	21	35				<1.0
8/22/2001	32-0164	10:32	590	300							
9/12/2001	32-0178	01:55			22	22	35				1.5
9/12/2001	32-0190	10:31	210	<5							
10/3/2001	32-0207	08:50			19	18	29				<1.0
10/3/2001	32-0219	10:13	200	110							

POWDERMILL BROOK (Saris: 3208575)**Unique_ID: W0234 Station: PDMB03.8, Mile Point: 5.4**

Description: at Russellville Road, Westfield

Date	OWMID	Time	Fecal	Ecolil	Alkalinity	Hardness	Chloride	NH3-N	NO3-NO2-N	TP	SSolids
		24hr	CFU/100ml	CFU/100ml	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
8/1/2001	32-0117	01:45			19	15	30	<0.02	0.40	0.019	1.6
8/1/2001	32-0132	09:00	24	5							
8/22/2001	32-0145	02:05			29	17	31	<0.02	0.51	0.021	<1.0
8/22/2001	32-0159	08:30	43	19							
9/12/2001	32-0171	02:00			35	18	36	<0.02	0.36	0.017	14
9/12/2001	32-0185	08:29	52	<5							
10/3/2001	32-0214	08:15	10	10							
10/3/2001	32-0200	08:55			29	18	34	<0.02	0.21	0.016	7.0

POWDERMILL BROOK (Saris: 3208575)**Unique_ID: W0805 Station: PDMB00.1, Mile Point: 0.3**

Description: downstream of culvert at Union Street, Westfield

Date	OWMID	Time	Fecal	Ecoli	Alkalinity	Hardness	Chloride	NH3-N	NO3-NO2-N	TP	SSolids
		24hr	CFU/100ml	CFU/100ml	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
8/1/2001	32-0124	03:20			48	41	78				
8/1/2001	32-0137	11:00	67d	29							1.9
8/1/2001	32-0138	11:00	140d	57							
8/22/2001	32-0164	02:41			43	52	75				
8/22/2001	32-0166	10:59	81	29							2.3
9/12/2001	32-0180	02:50			51	56	77				
9/12/2001	32-0192	11:04	57	<5							1.7
10/3/2001	32-0209	09:40			45	55	81				
10/3/2001	32-0221	10:55	62	19							<1.0

GREAT BROOK (Saris: 3208375)**Unique_ID: W0804 Station: GRTB00.3, Mile Point: 0.3**

Description: approximately 250 feet upstream of Route 187 bridge, Westfield

Date	OWMID	Time	Fecal	Ecoli	Alkalinity	Hardness	Chloride	NH3-N	NO3-NO2-N	TP	SSolids
		24hr	CFU/100ml	CFU/100ml	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
8/1/2001	32-0119	02:37			24	53	82				
8/1/2001	32-0139	11:10	52	<5							1.9
8/22/2001	32-0153	02:20			25	53	76				
8/22/2001	32-0165	10:42	120	19							4.4
9/12/2001	32-0179	02:20			23	53	73				
9/12/2001	32-0191	10:48	130	<5							2.7
10/3/2001	32-0208	09:15			23	55	76				
10/3/2001	32-0220	10:35	33	<5							<1.0

BLOCK BROOK (Saris: 3208275)**Unique_ID: W0806 Station: BLBR01.0, Mile Point: 1**

Description: at Plymouth Terrace crossing, West Springfield

Date	OWMID	Time	Fecal	Ecoli	Alkalinity	Hardness	Chloride	NH3-N	NO3-NO2-N	TP	SSolids
		24hr	CFU/100ml	CFU/100ml	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
8/1/2001	32-0121	**			110	82	158				7.8
8/1/2001	32-0120	04:15			110	83	158				7.3
8/1/2001	32-0140	11:25	570	210							
8/22/2001	32-0157	**			82	85	135				
8/22/2001	32-0169	**	440	110							4.9
8/22/2001	32-0155	03:25			84	85	135				
8/22/2001	32-0167	11:21	330	160							5.2
9/12/2001	32-0183	**			93	83	126				
9/12/2001	32-0195	**	900d	29d							4.6
9/12/2001	32-0181	03:25			95	83	126				
9/12/2001	32-0193	11:25	410d	<5d							4.8
10/3/2001	32-0212	**			92	83	139				
10/3/2001	32-0224	**	170	110d							<1.0
10/3/2001	32-0210	10:12			92	83	140				
10/3/2001	32-0222	11:17	180	43d							<1.0

WESTFIELD RIVER (Saris: 3208250)**Unique_ID: W0857 Station: WSR00.2, Mile Point: 0.4****Description: approximately 260 feet upstream of Route 5 bridge, Agawam**

Date	OWMID	Time	Fecal	Ecoli1	Alkalinity	Hardness	Chloride	NH3-N	NO3-NO2-N	TP	SSolids
		24hr	CFU/100ml	CFU/100ml	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
8/1/2001	32-0123	04:55			36	31	50				1.7
8/1/2001	32-0141	11:45	29	<5							
8/22/2001	32-0158	03:50			35	37	58				4.8
8/22/2001	32-0170	11:50	52	<5							
9/12/2001	32-0184	03:55			39	42	61				4.1
9/12/2001	32-0196	11:45	>10000j	<5							
10/3/2001	32-0213	10:46			18	28	41				<1.0
10/3/2001	32-0225	11:39	24	14							

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Appendix F: FERC Downstream Fish Passage Extension Order

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Woronoco Hydro, LLC

Project No. 2631-039

ORDER GRANTING FINAL EXTENSIONS OF TIME

(Issued November 25, 2009)

On October 22, 2009, Woronoco Hydro, LLC, licensee for the Woronoco Project, filed a request for extensions of time to file three reports required by the Commission's Order Approving Downstream Atlantic Salmon Smolt Passage Effectiveness Report and Requiring Further Action Pursuant to License Article 404, issued July 21, 2009.¹ The Woronoco Project is located on the Westfield River in Hampden County, Massachusetts.

LICENSE REQUIREMENTS AND BACKGROUND

Article 404 of the Woronoco Project license, issued April 30, 2002,² requires a comprehensive fish passage plan (comprehensive plan), with provisions to install, operate, maintain, and evaluate, as appropriate, upstream and downstream fish passage for Atlantic salmon and American eel. The licensee's comprehensive plan was addressed in the Commission's April 20, 2006 Order Modifying and Approving Comprehensive Fish Passage Plan Pursuant to License Article 404 and Requiring Further Actions.³

Following the issuance of the April 20, 2006 order, the Commission has granted the licensee six extensions of time for the comprehensive plan or its components related to salmon smolt protection. The Commission has also issued two additional modification and approval orders following revisions to the licensee's comprehensive plan, including the July 21, 2009 order.

Pertinent to the licensee's current request, paragraph (B) of the July 21, 2009 order requires the licensee to file, within 90 days, for Commission approval, a plan and schedule for the annual installation and removal of trashrack overlays, or for the installation of new trashracks. The licensee is to consult with the U.S. Fish and Wildlife Service (FWS) and Massachusetts Division of Fisheries and Wildlife (MDFW) regarding the plan and schedule, and provide specified information regarding agency consultation.

Paragraph (D) of the July 21, 2009 order requires the licensee to perform a study determining intake velocities at the trashrack to be used during smolt migration, and

¹ 128 FERC ¶ 62,050 (2009).

² 99 FERC ¶ 62,075 (2002).

³ 115 FERC ¶ 62,091 (2006).

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develop detailed velocity profiles under varying levels of generation, identifying any areas where velocities exceed 2 feet per second (fps). The licensee is to plan the study, and determine measures to be taken if excessive velocities are found, in consultation with the FWS and the MDFW, and file a report on the study within 90 days. If the study cannot be performed within 90 days, the licensee is to file a schedule for completing the study and filing the report with the Commission before April 15, 2010.

Paragraph (E) of the July 21, 2009 order requires the licensee to file, within 90 days, for Commission approval, a plan for and evaluation of effectiveness of downstream salmon smolt passage at the project, with the new trashrack configuration installed, during spring 2010. The plan as specified in the order is to address issues previously raised by the FWS, MDFW, and Trout Unlimited (TU), and provide specified information regarding agency consultation.

LICENSEE'S REQUEST AND RESOURCE AGENCY COMMENTS

The licensee requests extensions of time to complete the consultation and filing requirements of paragraphs (B), (D), and (E) of the Commission's July 21, 2009 order. The licensee indicates that, in addition to the Woronoco Project, its staff is responsible for three other hydropower developments, including the Indian River Project, FERC No. 12462, located upstream of the Woronoco Project. The licensee indicates that it has developed a schedule for completing the requirements of the July 21, 2009 order, in combination with rehabilitation activities at the Indian River Project. The licensee writes that it is consulting with the agencies on the trashrack designs for both projects, but that it has been difficult to schedule the consultation because of the agencies' seasonal salmon restoration responsibilities.

The FWS and MDFW commented on the licensee's plans and request in letters dated November 10 and November 18, 2009, respectively. Neither agency objected to the licensee's requested extensions. However, both agencies described problems they found in a detailed schedule for fish passage work that was attached to the licensee's request. Regarding salmon smolt protection, the agencies pointed out that it was unclear from the schedule when trashrack overlays would be installed at Woronoco. The agencies indicated that the overlays needed to be installed by April 1, 2010, the beginning of the next downstream fish passage season. They also wrote that the schedule showed that intake velocity measurements for the trashrack overlays were to begin in May 2010, but that the study needed to be done before the 2010 passage season, so that any areas of excessive velocity can be addressed. Also, the Commission's July 21, 2009 order requires that the study results be filed by April 15, 2010. In addition, the agencies noted that downstream smolt passage effectiveness evaluation needed to occur in spring 2010 in accordance with the July 21, 2009 order, but that this was not reflected in the schedule.

The FWS stated that the completion of downstream passage measures at the Woronoco Project has been delayed numerous times, and that salmon smolts have now

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been subjected to years of inadequate passage protection. Both agencies stated that trashrack overlays needed to be installed and evaluated in 2010, and that further delays, as shown in the schedule they had received, were unacceptable.

Comments were also provided by TU, dated November 10, 2009. TU provided calculated flow exceedence curves for the project site in April, May, and June, based on U.S. Geological Survey streamflow data. The curves showed that, after April, chances that flows would be available for velocity tests at full generation decreased to 50 percent or less. TU also found the same problems with the work schedule identified by the agencies, and discussed the history of delays in fish passage work at the project.

DISCUSSION

Approximately seven years have passed since measures were to begin protecting migrating salmon smolts at the Woronoco Project under license article 404. At least six extensions of time have already been granted regarding the comprehensive plan or its components intended to protect salmon smolts, and the Commission has issued three modification and approval orders, including the July 21, 2009 order. During those proceedings, the resource agencies have increasingly expressed frustration with delays in the completion of fish passage protection at the project. We agree with these concerns.

The FWS and MDFW do not object to the licensee's October 22, 2009 request for 60-day extensions of time for filing the reports required by paragraphs (B), (D), and (E) of the Commission's July 21, 2009 order. However, the agencies and TU identified several parts of the schedule that are inconsistent with the requirements of the Commission's July 21, 2009 order, and that would apparently delay downstream fish passage protection by yet another fish passage season.

We believe that the licensee's October 22, 2009 request for 60-day extensions of time for filing the reports required by paragraphs (B), (D), and (E) of the July 21, 2009 order should be approved. Such an approval shall not affect any other work identified in the July 21, 2009 order. For example, the new trashrack overlay configuration will need to be in place by April 1, 2010 in order for the intake velocity study and resulting report to be completed before April 15, 2010. Similarly, the new configuration will need to be in place so that the downstream smolt passage effectiveness study can be conducted in spring 2010 with reasonable assurance that sufficient flows will be available.

Because of the significant delays that have already occurred in the completion of Atlantic salmon smolt protection measures required under license article 404 of the project license, we believe that no extensions regarding Atlantic salmon protection, beyond those approved below, should be considered by the Commission.

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The Director orders:

(A) The licensee's request for 60-day extensions of time for filing the reports required by paragraphs (B), (D), and (E) of the Commission's July 21, 2009 is approved. The three reports shall be filed by December 15, 2009.

(B) This order constitutes final agency action. Requests for rehearing by the Commission may be filed within 30 days of the date of issuance of this order, pursuant to 18 CFR § 385.713.

George H. Taylor
Chief, Biological Resources Branch
Division of Hydropower Administration
and Compliance

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Document Content(s)

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