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FEDERAL ENERGY
REGULATORY COMMISSION

November 28, 2001

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

RE: Way Dam Hydroelectric Project and Michigamme Reservoir- FERC No. 1759-~~036~~ 046
Hemlock Falls Hydroelectric Project - FERC No. 2074-~~007~~ 010
Peavy Falls Hydroelectric Project - FERC No. 11830-~~000~~ 003
Lower Paint Hydroelectric Project - FERC No. 2072-~~008~~ 011
Michigamme Falls Hydroelectric Project - FERC No. 2073-~~008~~ 012
Twin Falls Hydroelectric Project - FERC No. 11831-~~000~~ 003
Kingsford Hydroelectric Project - FERC No. 2131-~~020~~ 026
Big Quinnesec Falls Hydroelectric Project- FERC No. 1980-~~009~~ 017

Articles 407 (Project Nos. 2072, 11830); 408 (Project Nos. 2073, 2074, 2131, 11831); and 409 (Project Nos. 1759, 1980) -Year 2001 - Water Quality Monitoring Report

Wisconsin Electric is hereby filing one original and eight additional copies of the results of water quality monitoring for the above identified Projects performed during 2001 in partial fulfillment of the monitoring plans approved and incorporated in the articles identified above for each of the projects.

The Commission issued new licenses for the above Projects on January 12, 2001 and by Order issued March 9, 2001 clarified certain Water Quality Monitoring requirements. The approved monitoring plan assures that the discharges from the above Projects meet the state's water quality standards for temperature and dissolved oxygen (DO). The applicable mean temperature standards for the months during which continuous monitoring takes place are shown in the table below:

Month	June	July	August	September
°F	80	83	81	74
°C	26.7	28.3	27.2	23.3

The applicable D.O. standard is 5.0 mg/l at all times.

The Plan as approved by FERC order dated January 12, 2001 includes the following three components:

1) **Continuous Water Quality Monitoring of temperature and Dissolved Oxygen (D.O.)**
   - From June 1, to September 30 of each year
   - For two years starting within one year of license issuance (by choice, the licensee commenced water quality monitoring in 2001);
   - Nine monitoring locations :
     * Six stations for temperature and dissolved oxygen; three stations for temperature only.
   - Monitoring results are to be filed no later than November 30th, of each year.

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1) **Flowage Monitoring Plan**

- Measurements to be made at 0.5 meter intervals in the deepest part of each flowage;
- Measurements to be taken during February, April, May, September and October (one vertical profile measurement during each month) as well as during the months of June, July and August (Two measurements per month spaced at approximate two-week intervals) during each of the first two years of the monitoring program;
- Vertical profile measurements are to be filed no later than November 30th of each year.

3) **Water Chemistry Monitoring**

- Samples to be collected in the tailraces of the above Projects
- Samples are collected quarterly (May, July, October, December)
- Results are to be filed no later than March 31st of the following year

The results of our 2001 monitoring for each component is as follows:

I. **Continuous water quality monitoring**

Appendix A contains summary tables for the continuous monitoring data. All nine stations were in compliance with the state's temperature standards. However, discharges from the Peavy Falls, Way Dam, and Michigamme Falls Projects failed to meet the dissolved oxygen standard for periods ranging from a few hours to 24-hours during selected days. While not required during 2001 (license articles for compliance with water quality standards become effective in January 2002, with the attendant requirements for notification, for all projects except Michigamme Falls, which was November 1, 2001), the licensee did share the monitoring results for the Peavy Falls and Michigamme Falls Projects with the MDEQ as deviations from the D.O. standard were discovered by the licensee. Low DO conditions encountered at Way Dam this past year were not communicated to the MDEQ as the agency is well aware of this continuing condition. Permanent corrective measures for the Way Dam situation are to be addressed by a special study specified by Article 418 of the new license for Way Dam.

While we were not required to notify the MDEQ of low DO conditions at Way Dam during 2001, it is important to note we have been following a monitoring strategy and have been carrying out voluntary corrective measures over the past three years. For example, we voluntarily installed a continuous monitor for temperature and DO in the plant's turbine bearing cooling water line in 1997. The purpose of this installation was to provide the plant with an "early warning system" for detecting low DO conditions in the reservoir. The intake for the Way Dam Plant is situated near the bottom of the flowage upstream of the dam. The bearing cooling water is extracted from the intake water. When the reservoir stratifies, low DO is inevitably entrained. However, if and when stratification occurs has been shown to vary significantly among years. Current operations call for the excess water (e.g., over the historic minimum flow) to be used for generation. However, if the DO in the cooling water line drops below 5.0 mg/l, the excess water is instead spilled. This is what was done in 2001. Therefore, it should be noted that, while low DO conditions were detected this past year, the low DO water was not passed downstream of Way Dam during 2001.

It is also important to note that while the current DO monitoring location is an appropriate "early warning system", it cannot, by its very nature, constitute a compliance monitoring location since it does not represent real tailrace conditions. The study planned in response to Article 418 will determine a location for best measuring compliance with the DO standard.

Appendix A also contains the monitoring data recovery statistics, by location for each of the multi-function data sondes as well as for the temperature-only monitoring devices. In spite of warning signs attached to each of the monitoring devices, weeks of data were occasionally lost at nearly every site due to tampering by the curious public (equipment is secured to steel grating, which is attached to shoreline structure by heavy chains; once pulled from the water, they cannot be repositioned by untrained persons). Data was also lost due to fluctuating water levels at the temperature-only sites. When positioned and left unattended for weeks on end, it is not possible to accurately "guess", appriori, where the best spot might be to assure complete submergence for weeks on end. However, lessons learned during this first year of monitoring will be applied in 2002 to minimize data collection problems associated with equipment positioning in the rivers.

As part of this filing, a diskette containing all the raw data and accompanying explanatory sheets is being submitted to the agencies for their use.

II. Flowage measurements

Appendix B contains the results of the vertical profile measurements for each of the projects. Low DO levels were observed high in the water column of the Peavy Falls flowage during much of the summer. The extent of low DO in the water column was not observed during 1993, when the company previously conducted continuous monitoring and vertical profile measurements at this project. The intensity of low DO conditions during 2001 may have been due to higher than normal ambient air temperatures and lower than normal precipitation conditions as depicted on graphs contained in Appendix B. Both of these conditions led to below average flow during the summer as depicted in Figures through , also contained in Appendix B.

As a result of low DO water being entrained by the Peavy Falls Project, low DO conditions were detected in the river segment (approximately 1500 ft long) between the project and the Michigamme Falls flowage. The licensee conducted a comprehensive measurement survey in this river segment during a period of low DO entrainment (early August). During this survey, low DO was detected on the bottom of this river segment near the Peavy draft tubes but the surface was always above the standard (Appendix C).

III Water Chemistry

Water chemistry samples are still being collected as of this filing. These results will be filed by March 31, 2002.

Consideration of Corrective Measures

The work conducted in 2001 represents the first of a two year commitment aimed at identifying problems. The low DO problems at Way Dam were expected, while those encountered at Michigamme Falls and Peavy Falls were suspected, due to the nature of operations and the location of the intake relative to historic flowage thermocline depths. In the case of Michigamme Falls, the problems were mostly confined to periods when the plant was offline and the discharge from the plant was by leakage flow. The source of the leakage flow was believed to be poorly oxygenated hypolimnetic water in the flowage. The change to the new license operating conditions in 2002 and the installation of a new adjustable Kaplan turbine on one of the existing units will allow continuous flows in the discharge area. This additional volume of water withdrawal from the flowage should entrain epilimnetic water containing higher amounts of dissolved oxygen. We believe this should eliminate, if not substantially reduce the number of hours of low DO water discharges. Monitoring during 2002 will evaluate this measure.

With respect to Peavy Falls, we have analyzed some environmental conditions that may have contributed to this year's monitoring findings. These analyses are included as Appendix D. The analyses documented the fact that the summer of 2001 was very dry and quite warm. In addition, spring runoff was quite limited. These conditions are in marked contrast to what was observed during 1993. The environmental conditions (warmer air temperatures, lower rainfall in the basin) probably combined to cause the number of hourly low DO measurements to increase dramatically over what was observed in 1993. Again, monitoring in 2002 will help delineate the problem. However, before the continuous monitoring program is again initiated in 2002, we will consult with the MDEQ as to what corrective measures may be appropriate for adopting in the short term if similar conditions are encountered.

Enclosed is a proof of service to the agencies listed on the copy list.

Please call me at (906) 779-2547, if you have questions on this matter.

Sincerely,

W. Rauscher

William Rauscher

Hydroelectric Operations Division

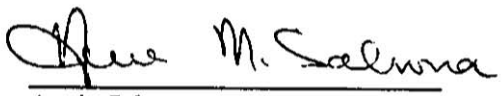
Enclosures

cc: Mr. Thomas Meronek, WDNR w/diskette
Mr. Kurt Newman, MDNR w/ diskette
Mr. Jim Fossum, USFWS
Mr. James Grant, MDEQ

Certificate of Service

I hereby certify that I have this day served the foregoing document upon all entities specified in the order to issue license to be consulted on matters related to the Commission filing. Service was done pursuant to Rule 2010 of FERC's Rules of Practice and Procedure 18 CFR, Section 385.2010

Dated this day Wednesday November 28, 2001.



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Appendix A

Results of Continuous Monitoring for Temperature and Dissolved Oxygen

Way Dam and Michigamme Reservoir- FERC No. 1759-036
Hemlock Falls Hydroelectric Project- FERC No. 2074-007
Peavy Falls Hydroelectric Project –FERC No. 11830-000
Lower Paint Hydroelectric Project – FERC No. 2072-008
Michigamme Falls Hydroelectric Project – FERC No. 2073-008
Twin Falls Hydroelectric Project – FERC No. 11831-000
Kingsford Hydroelectric Project – FERC 2131-020
Big Quinnesec Falls Hydroelectric Project – FERC 1980-009

November 27, 2001

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Table A-1

Wisconsin Electric 2001 Hydro Data - Temperature and Dissolved Oxygen Stations Summary

FERC Project No. 1980-009

Big Quinnesec Tailrace - 2001 Data Summary

Month	OBS	Temperature (Degrees C)			DO % Saturation			Dissolved Oxygen		
		Mean	Max	Min	Mean	Max	Min	Mean	Max	Min
Jun	719	18.5	24.4	13.8	92.9	100.0	82.6	8.6	9.9	7.0
Jul	744	22.9	25.3	21.0	88.3	100.8	76.8	7.4	8.4	6.6
Aug	411	23.2	26.6	21.3	88.1	96.3	77.4	7.4	8.3	6.5
Sep	720	18.1	21.3	13.8	92.2	98.7	84.5	8.6	10.0	7.6

88.6 % Data Recovery

062801 1600 - Lost 1 observation during sonde changeout.
080901 1900 - 082301 1500 Lost 333 observations. Programming error during setup resulted in sonde not turning on.

FERC Project No. 2131-020

Kingsford Tailrace - 2001 Data Summary

Month	OBS	Temperature (Degrees C)			DO % Saturation			Dissolved Oxygen		
		Mean	Max	Min	Mean	Max	Min	Mean	Max	Min
Jun	720	18.6	24.8	13.6	92.2	104.1	87.4	8.5	9.5	7.5
Jul	593	22.7	25.8	20.7	90.0	102.6	82.5	7.6	8.5	7.0
Aug	619	22.5	26.8	20.7	92.1	107.3	82.9	7.8	9.1	7.0
Sep	716	17.9	21.4	13.6	88.5	96.9	78.6	8.3	9.3	7.0

90.4% Data Recovery
Missing Data:

071201 2100-2300, 071301 0000-1200 & 2000-2300
071401 0000-2300, 071501 0000-2300
071601 0000-2300, 071701 0000-1300 & 1700-2300
071801 0000-1400 & 1700-2300, 071901 0000-1400 & 1700
Sonde was tampered with (pulled closer to shore) resulting in the probe being de-watered during some period.

080101 1900-2300, 080201 0000-0700 & 2100-2300
080301 0000-0700 & 2200-2300, 080401 0000-1300 & 1800-2300
080501 0000-1300 & 2000-2300, 080601 0000-1000 & 1400-1600 & 2300
080701 0000-1000 & 2200-2300, 080801 0000-1100 & 2200-2300
080901 0000-1200 & 1400-1900
Sonde was tampered with (pulled closer to shore) , resulting in the probe being de-watered during some periods.
090501 1100-1400 Battery drain at end of monitoring period.

Table A-1

Wisconsin Electric 2001 Hydro Data - Temperature and Dissolved Oxygen Stations Summary

FERC Project No. 2073-008

Michigamme Falls Tailrace - 2001 Data Summary

Month	OBS	Temperature (Degrees C)			DO % Saturation			Dissolved Oxygen		
		Mean	Max	Min	Mean	Max	Min	Mean	Max	Min
Jun	688	17.2	23.2	13.6	81.1	104.8	56.2	7.7	10.2	5.1
Jul	735	21.1	25.9	18.8	72.1	102.7	48.5	6.3	8.8	4.4
Aug	744	21.6	27.7	17.3	65.8	109.7	41.5	5.7	9.2	3.5
Sep	684	17.5	23.0	10.9	75.2	140.3	43.0	7.1	12.9	4.1

97.3 % Data Recovery

The sonde was tampered with on three separate occasions resulting in some lost data each time. The sonde was pulled closer to shore resulting in de-watering during some non-operational hours.

061401 - 061801 Lost 32 observations.
071201 - 071301 Lost 9 observations.
090201 - 090501 Lost 36 observations.

See Table A-2 for daily summaries for July, August and Sept dissolved oxygen data.

FERC Project No. 11830-000

Peavy Tailrace - 2001 Data Summary

Month	OBS	Temperature (Degrees C)			DO % Saturation			Dissolved Oxygen		
		Mean	Max	Min	Mean	Max	Min	Mean	Max	Min
Jun	720	17.0	22.5	13.9	82.6	99.5	46.0	7.9	9.4	4.2
Jul	744	21.0	24.9	18.4	70.1	94.7	47.4	6.1	8.1	4.4
Aug	744	21.8	25.0	20.2	63.9	88.2	29.2	5.5	7.6	2.6
Sep	720	17.9	20.8	13.6	71.1	88.8	43.7	6.6	8.9	3.9

100% Data Recovery

See Table A-3 for daily summaries for July-Sept dissolved oxygen data.

Table A-1

Wisconsin Electric 2001 Hydro Data - Temperature and Dissolved Oxygen Stations Summary

Twin Falls Tailrace - 2001 Data Summary

FERC Project No. 11831-000

Month	OBS	Temperature (Degrees C)			DO % Saturation			Dissolved Oxygen		
		Mean	Max	Min	Mean	Max	Min	Mean	Max	Min
Jun	720	16.1	16.2	15.9	92.0	92.6	91.2	8.9	9.0	8.9
Jul	744	22.6	25.5	20.8	84.4	98.4	67.4	7.2	8.1	5.8
Aug	744	22.9	26.2	21.2	82.5	95.6	69.3	7.0	8.1	6.0
Sep	578	18.8	21.4	13.8	83.5	97.7	68.5	7.7	9.8	6.3

95.2% Data Recovery

The sonde was tampered with resulting in some lost data. The sonde was pulled closer to shore, resulting in de-watering during some hours each day between 092001 & 093001.

092001 1900-2300 092101 0000-0900 & 1700-2300
092201 0000-2300 092301 0000-1200
092401 1800 092501 0200-0600
092601 0400-0800 092701 0200-0800 & 2100-2300
092801 0000-1200 & 1800-2300
092901 0000-2300 093001 0000-0700 & 0900 & 1100-2300

On days where the sonde became de-watered at times, conductivity was used to determine if the sonde was in the water or out. Conductivity reacts quickly to this change and is a good indicator for this purpose.

Way Dam - 2001 Data Summary

FERC Project No. 1759-036

Month	OBS	Temperature (Degrees C)			Dissolved Oxygen		
		Mean	Max	Min	Mean	Max	Min
Jun	648	14.9	17.6	9.9	7.1	9.1	5.2
Jul	730	18.6	20.2	16.7	4.1	7.8	1.0
Aug	721	20.1	21.4	18.9	2.5	8.4	0.8
Sep	710	17.5	20.2	13.3	5.3	8.1	0.0

95.9% Data Recovery

The following hours of data were lost or deleted:

6/26/01 All hours	Low flow to sensor
06/29-6/30/01 All hours	Electrical problem
07/08/01 @ 1500 -07/09/01 @ 0400	Dirty sensor
8/05/01 @ 2300-8/06/01 1500	Low flow to sensor
8/07/01 1100-1600	Bad sensor
09/17/01 0000-0900	Electrical problem due to storm

See Table A-4 for daily summaries for July-Sept dissolved oxygen data.

Table A-2

Wisconsin Electric 2001 Hydro Data- Michigamme Falls

Daily Mean, Maximum and Minimum for those months that had data outside the established limits.

Michigamme Falls 2001 Tailrace Dissolved Oxygen Data

Date	Daily Mean	Daily Max	Daily Min	Hours Below Limit
7/1/01	7.4	8.1	6.0	0
7/2/01	6.7	7.7	5.8	0
7/3/01	6.7	7.7	5.3	0
7/4/01	6.3	7.9	5.0	0
7/5/01	7.1	8.3	5.6	0
7/6/01	7.2	7.8	5.7	0
7/7/01	6.3	7.8	4.4	1
7/8/01	6.1	7.7	4.6	2
7/9/01	6.3	7.9	4.7	1
7/10/01	6.2	8.3	4.4	10
7/11/01	6.4	8.2	4.5	10
7/12/01	6.5	7.9	4.4	6
7/13/01	7.6	8.0	6.4	0
7/14/01	6.9	7.5	6.0	0
7/15/01	6.3	7.1	5.2	0
7/16/01	6.5	8.8	5.2	0
7/17/01	5.9	6.6	5.1	0
7/18/01	5.8	7.0	4.9	3
7/19/01	6.0	7.8	5.0	0
7/20/01	5.7	6.8	4.6	5
7/21/01	5.8	7.0	4.7	5
7/22/01	5.7	6.4	4.4	6
7/23/01	5.6	6.2	4.5	7
7/24/01	6.0	7.2	4.6	4
7/25/01	6.2	7.2	5.1	0
7/26/01	6.2	7.3	5.0	0
7/27/01	6.4	7.1	5.4	0
7/28/01	5.7	6.2	5.1	0
7/29/01	6.4	8.3	4.7	1
7/30/01	5.9	7.6	5.0	0
7/31/01	5.4	6.2	4.4	10
8/1/01	5.4	6.4	4.1	9
8/2/01	5.7	6.5	4.2	7
8/3/01	5.5	6.5	3.8	8
8/4/01	5.8	7.1	4.5	2
8/5/01	5.0	6.3	3.9	1
8/6/01	5.2	6.0	3.8	9
8/7/01	5.1	6.1	3.7	9
8/8/01	5.0	5.8	3.8	10
8/9/01	5.2	6.5	3.5	7
8/10/01	6.0	6.5	4.9	1
8/11/01	5.8	6.3	5.0	0
8/12/01	5.8	9.2	4.6	8
8/13/01	5.7	6.1	4.9	3
8/14/01	5.8	9.0	4.8	3

Table A-2

Wisconsin Electric 2001 Hydro Data- Michigamme Falls

Daily Mean, Maximum and Minimum for those months that had data outside the established limits.

8/15/01	5.4	6.5	4.6	5
8/16/01	5.4	6.0	4.6	7
8/17/01	6.3	8.1	5.0	0
8/18/01	5.4	7.1	4.5	9
8/19/01	5.6	6.4	4.6	6
8/20/01	5.6	6.4	4.6	8
8/21/01	5.3	6.1	4.4	9
8/22/01	5.4	6.5	4.0	8
8/23/01	6.2	7.6	4.1	4
8/24/01	6.3	6.9	5.6	0
8/25/01	6.2	7.9	5.1	0
8/26/01	6.1	7.4	5.2	0
8/27/01	5.8	6.8	4.6	5
8/28/01	5.6	6.2	4.5	5
8/29/01	6.0	7.8	4.9	2
8/30/01	6.3	9.0	4.9	1
8/31/01	6.2	6.9	5.2	0
9/1/01	6.3	6.9	5.5	0
9/2/01	6.1	6.5	5.4	0
9/3/01	7.0	7.2	6.7	0
9/4/01	6.8	6.9	6.7	0
9/5/01	6.5	7.0	5.1	0
9/6/01	6.0	7.5	5.0	0
9/7/01	6.3	8.4	4.8	2
9/8/01	5.9	8.9	4.6	8
9/9/01	5.8	6.7	4.3	10
9/10/01	6.2	6.9	4.8	4
9/11/01	6.4	8.5	5.0	0
9/12/01	5.8	7.2	4.4	7
9/13/01	6.0	6.8	5.0	0
9/14/01	5.9	7.5	4.7	4
9/15/01	5.7	6.8	4.5	10
9/16/01	6.0	9.0	4.1	10
9/17/01	5.7	6.9	4.6	12
9/18/01	5.8	6.9	4.3	9
9/19/01	6.6	7.8	4.8	3
9/20/01	7.9	8.4	7.1	0
9/21/01	7.8	8.2	6.9	0
9/22/01	8.9	12.6	7.3	0
9/23/01	9.2	12.9	6.9	0
9/24/01	8.5	8.7	8.1	0
9/25/01	8.6	9.0	8.1	0
9/26/01	8.9	9.3	8.5	0
9/27/01	8.8	9.3	7.8	0
9/28/01	9.0	12.2	7.8	0
9/29/01	9.3	11.5	8.5	0
9/30/01	9.3	12.0	8.5	0

Table A-3

Wisconsin Electric 2001 Hydro Data - Peavy Falls Tailrace

Daily Mean, Maximum and Minimum for those months that had data outside the established limits.

Peavy Falls 2001 Tailrace Data - Dissolved Oxygen (mg/l)

DATE	Daily Mean	Daily Max	Daily Min	Hours Above Limit
6/1/01	9.0	9.2	8.6	0
6/2/01	9.2	9.4	8.9	0
6/3/01	9.1	9.3	7.1	0
6/4/01	9.2	9.3	9.1	0
6/5/01	9.1	9.3	8.9	0
6/6/01	8.9	9.2	8.8	0
6/7/01	8.9	9.1	8.7	0
6/8/01	8.8	8.9	8.7	0
6/9/01	8.8	9.3	8.5	0
6/10/01	7.5	8.6	5.8	0
6/11/01	7.3	8.4	5.5	0
6/12/01	7.4	8.2	5.6	0
6/13/01	7.7	8.1	5.9	0
6/14/01	7.6	7.8	7.2	0
6/15/01	7.6	7.8	7.2	0
6/16/01	7.5	7.7	7.2	0
6/17/01	7.5	7.9	7.2	0
6/18/01	7.4	7.7	7.1	0
6/19/01	7.7	8.2	7.3	0
6/20/01	7.6	8.0	7.2	0
6/21/01	7.7	8.2	7.0	0
6/22/01	8.1	8.4	7.6	0
6/23/01	7.6	8.0	6.8	0
6/24/01	7.3	7.7	6.7	0
6/25/01	7.3	7.7	6.2	0
6/26/01	7.2	7.7	6.8	0
6/27/01	7.3	7.8	6.8	0
6/28/01	7.0	7.6	5.1	0
6/29/01	6.1	7.1	4.6	3
6/30/01	6.6	7.3	4.2	3
7/1/01	6.8	7.9	5.5	0
7/2/01	5.8	6.9	4.6	7
7/3/01	6.0	7.3	4.5	9
7/4/01	5.6	7.7	4.5	8
7/5/01	6.6	8.0	4.9	2
7/6/01	6.3	7.3	4.8	2
7/7/01	5.9	7.5	4.4	8
7/8/01	5.5	7.1	4.6	9
7/9/01	5.9	7.6	4.5	7
7/10/01	6.2	8.1	4.6	8
7/11/01	6.3	7.5	4.7	1
7/12/01	6.3	7.7	4.6	10
7/13/01	7.2	7.9	6.6	0

Table A-3

Wisconsin Electric 2001 Hydro Data - Peavy Falls Tailrace

Daily Mean, Maximum and Minimum for those months that had data outside the established limits.

7/14/01	6.6	6.8	6.0	0
7/15/01	6.1	6.3	5.9	0
7/16/01	6.0	6.5	5.7	0
7/17/01	6.2	6.6	5.7	0
7/18/01	5.9	6.7	5.4	0
7/19/01	6.2	7.0	5.5	0
7/20/01	6.1	6.5	5.7	0
7/21/01	6.0	6.9	5.3	0
7/22/01	5.8	6.3	5.1	0
7/23/01	5.6	6.0	5.1	0
7/24/01	6.1	6.8	5.0	0
7/25/01	6.6	7.0	6.1	0
7/26/01	6.7	7.1	5.2	0
7/27/01	6.4	6.8	6.0	0
7/28/01	5.9	6.5	5.4	0
7/29/01	6.1	6.5	5.2	0
7/30/01	5.9	6.2	5.6	0
7/31/01	5.7	6.0	5.3	0
8/1/01	5.6	6.2	4.8	2
8/2/01	6.3	6.8	5.6	0
8/3/01	6.2	6.6	5.5	0
8/4/01	5.9	6.2	5.6	0
8/5/01	5.6	6.5	4.7	1
8/6/01	5.8	6.1	4.9	2
8/7/01	5.9	6.3	5.4	0
8/8/01	5.5	5.9	4.9	1
8/9/01	5.8	6.6	5.1	0
8/10/01	5.3	6.3	4.2	9
8/11/01	5.0	5.5	3.9	6
8/12/01	4.5	5.5	3.7	17
8/13/01	5.1	6.4	3.2	10
8/14/01	4.4	5.2	3.4	20
8/15/01	4.0	4.8	3.1	24
8/16/01	4.3	5.9	2.6	16
8/17/01	5.8	7.0	4.0	6
8/18/01	5.1	6.1	4.3	14
8/19/01	5.5	6.9	4.2	10
8/20/01	5.9	6.9	4.6	7
8/21/01	5.4	6.4	4.3	10
8/22/01	5.4	6.6	4.1	9
8/23/01	6.2	7.6	4.2	5
8/24/01	6.2	6.9	4.7	1
8/25/01	5.3	6.8	4.5	9
8/26/01	5.7	7.2	4.2	9
8/27/01	6.1	7.5	4.6	2
8/28/01	5.8	6.6	4.6	5

Table A-3

Wisconsin Electric 2001 Hydro Data - Peavy Falls Tailrace

Daily Mean, Maximum and Minimum for those months that had data outside the established limits.

8/29/01	5.1	6.3	3.9	11
8/30/01	5.2	6.8	3.4	11
8/31/01	6.6	7.6	4.7	2
9/1/01	6.0	7.4	4.5	5
9/2/01	5.3	6.5	4.1	11
9/3/01	5.7	6.9	3.9	8
9/4/01	6.0	7.4	4.5	5
9/5/01	6.2	7.0	4.6	2
9/6/01	6.3	6.7	5.9	0
9/7/01	6.1	6.2	5.7	0
9/8/01	6.1	6.6	5.8	0
9/9/01	6.5	6.8	5.9	0
9/10/01	6.7	7.1	6.2	0
9/11/01	6.7	7.0	6.3	0
9/12/01	6.8	7.4	6.2	0
9/13/01	6.8	7.3	6.4	0
9/14/01	6.8	7.2	6.6	0
9/15/01	6.7	7.0	6.5	0
9/16/01	6.6	6.9	6.4	0
9/17/01	6.5	6.6	6.3	0
9/18/01	6.6	6.9	6.2	0
9/19/01	6.8	7.5	6.2	0
9/20/01	6.9	8.1	5.3	0
9/21/01	7.0	8.0	5.4	0
9/22/01	6.4	8.0	5.3	0
9/23/01	6.6	8.2	5.6	0
9/24/01	7.5	8.4	6.2	0
9/25/01	7.7	8.6	6.0	0
9/26/01	7.9	8.9	6.2	0
9/27/01	7.4	8.7	6.0	0
9/28/01	7.1	8.5	5.8	0
9/29/01	6.8	8.3	6.0	0
9/30/01	6.9	8.3	5.9	0

Table A-4

Wisconsin Electric 2001 Hydro Data - Way Dam Powerhouse

Daily Mean, Maximum and Minimums for those months that had data outside the established limits.

Date	Daily Mean	Daily Maximum	Daily Minimum	Hour Over Limit
7/1/2001	6.1	7.3	5.2	0
7/2/2001	5.9	6.6	5.2	0
7/3/2001	5.4	5.8	4.8	1
7/4/2001	5.6	6.7	5.0	0
7/5/2001	7.1	7.8	6.4	0
7/6/2001	7.2	7.7	6.7	0
7/7/2001	7.1	7.7	6.6	0
7/8/2001	6.7	7.3	6.1	0
7/9/2001	6.3	6.9	5.5	0
7/10/2001	5.9	6.5	5.3	0
7/11/2001	5.3	6.1	4.5	4
7/12/2001	5.0	5.5	4.4	13
7/13/2001	4.5	4.9	3.8	24
7/14/2001	4.2	5.0	3.3	24
7/15/2001	4.3	4.9	3.9	24
7/16/2001	4.0	4.6	3.5	24
7/17/2001	4.0	4.5	3.6	24
7/18/2001	3.5	4.2	3.0	24
7/19/2001	3.3	3.9	2.9	24
7/20/2001	2.7	3.4	1.8	24
7/21/2001	1.6	1.8	1.4	24
7/22/2001	1.4	1.6	1.3	24
7/23/2001	1.2	1.5	1.0	24
7/24/2001	1.7	2.5	1.0	24
7/25/2001	2.2	2.6	1.9	24
7/26/2001	3.0	3.9	2.2	24
7/27/2001	2.9	3.6	2.6	24
7/28/2001	2.8	3.3	2.4	24
7/29/2001	2.8	3.2	2.3	24
7/30/2001	2.1	3.2	1.5	24
7/31/2001	2.1	2.7	1.9	24
8/1/2001	2.0	2.7	1.2	24
8/2/2001	2.6	3.4	2.1	24
8/3/2001	2.7	3.1	2.2	24
8/4/2001	2.4	3.1	1.8	24
8/5/2001	2.4	2.8	1.9	24
8/6/2001	2.6	2.9	2.3	24
8/7/2001	2.6	5.3	1.9	23
8/8/2001	1.7	2.1	1.3	24
8/9/2001	1.6	2.0	1.4	24
8/10/2001	1.6	1.9	1.4	24
8/11/2001	1.7	2.0	1.4	24
8/12/2001	1.4	1.8	1.2	24
8/13/2001	1.8	2.7	1.5	24
8/14/2001	1.6	2.0	1.1	24
8/15/2001	1.4	1.9	1.1	24

Table A-4

Wisconsin Electric 2001 Hydro Data - Way Dam Powerhouse

Daily Mean, Maximum and Minimums for those months that had data outside the established limits.

8/16/2001	2.2	2.7	1.5	24
8/17/2001	2.6	3.8	0.8	24
8/18/2001	2.4	3.0	0.9	24
8/19/2001	3.4	4.3	1.6	24
8/20/2001	3.9	4.4	2.6	24
8/21/2001	4.3	5.0	3.8	24
8/22/2001	4.9	5.2	4.3	18
8/23/2001	4.1	5.1	1.7	23
8/24/2001	2.9	3.4	2.4	24
8/25/2001	2.7	3.1	2.3	24
8/26/2001	2.0	2.5	1.7	24
8/27/2001	1.7	1.9	1.2	24
8/28/2001	1.9	2.0	1.6	24
8/29/2001	1.9	2.1	1.8	24
8/30/2001	2.1	2.7	1.8	24
8/31/2001	4.8	8.4	2.3	24
9/1/2001	6.3	6.9	6.1	0
9/2/2001	6.3	6.3	6.1	0
9/3/2001	6.0	6.4	5.6	0
9/4/2001	6.7	7.1	6.3	0
9/5/2001	6.0	6.5	1.7	2
9/6/2001	4.6	6.6	2.0	7
9/7/2001	5.6	6.5	2.3	4
9/8/2001	2.8	6.4	1.7	19
9/9/2001	2.7	6.4	1.3	18
9/10/2001	2.2	6.6	1.0	20
9/11/2001	2.2	6.7	0.6	20
9/12/2001	1.5	1.6	1.3	24
9/13/2001	1.0	1.3	0.5	24
9/14/2001	0.7	1.3	0.0	24
9/15/2001	4.5	7.7	0.7	11
9/16/2001	1.3	7.4	0.5	23
9/17/2001	6.7	7.3	6.3	0
9/18/2001	7.1	7.6	6.3	0
9/19/2001	7.3	7.6	7.1	0
9/20/2001	7.2	7.4	7.0	0
9/21/2001	7.3	8.1	7.2	0
9/22/2001	7.2	7.3	7.1	0
9/23/2001	7.3	7.3	7.2	0
9/24/2001	7.3	7.4	7.0	0
9/25/2001	7.4	7.7	7.3	0
9/26/2001	7.4	7.5	7.3	0
9/27/2001	7.3	7.4	7.2	0
9/28/2001	7.0	7.3	6.8	0
9/29/2001	6.8	7.0	6.8	0
9/30/2001	6.8	7.0	6.8	0

Table A-5

Wisconsin Electric 2001 Hydro Data - Temperature Only Stations Data Summary

Lower Paint Tailrace - 2001 Data Summary

Month	OBS	Temperature (Degrees C)		
		Mean	Max	Min
Jun	720	19.6	26.8	12.0
Jul	744	22.6	27.5	19.8
Aug	744	22.4	28.0	19.5
Sep	720	16.5	21.1	11.4

FERC Project No. 2072-008

100% Data Recovery - See attached plot.

Michigamme River Upstream - 2001 Summary Data

Month	OBS	Temperature (Degrees C)		
		Mean	Max	Min
Jun	720	18.8	25.9	11.1
Jul	744	21.2	26.4	17.2
Aug	744	21.1	28.0	17.0
Sep	480	16.2	20.4	11.6

FERC Project No. 1759-036

91.8% Data Recovery

The temperature logger became de-watered near the end of the sample period when the Michigamme Reservoir was lowered for the fall season. Data from 9/21-9/30 was deleted. The attached plot was used to determine which data to delete.

Hemlock Tailrace 2001 summary Data

Month	OBS	Temperature (Degrees C)		
		Mean	Max	Min
Jun	240	14.3	16.1	13.2
Jul	456	21.0	25.4	19.4
Aug	744	21.3	23.7	20.0
Sep	504	18.8	21.0	16.6

FERC Project No. 2074-007

66.4 % Data Recovery

The temperature logger was tampered with resulting in lost data from June 11- June 19 @ 1500 and June 22 @ 1200-July 12th. The temperature logger was de-watered at times depending on the the water levels in the tailrace. All data for these time periods were deleted. The logger was again pulled out of the water near the end of the study period and data from 9/22-9/30 was also deleted. The attached plot was used to determine which data to delete.

Michigamme-Brule Confluence 2001 Summary Data

Month	OBS	Temperature (Degrees C)		
		Mean	Max	Min
Jun	720	17.7*	24.6*	11.3*
Jul	744	20.7*	25.9*	8.2*
Aug	744	20.1*	27.0*	8.4*
Sep	720	15.5*	21.5*	6.0*

FERC Project No. 2073-008

100% Data Recovery

* During low flow conditions the temperature logger became de-watered. All data has been included in both the data files and summary information table. See attached plot.

Figure A-1

FERC Project No. 1759-036

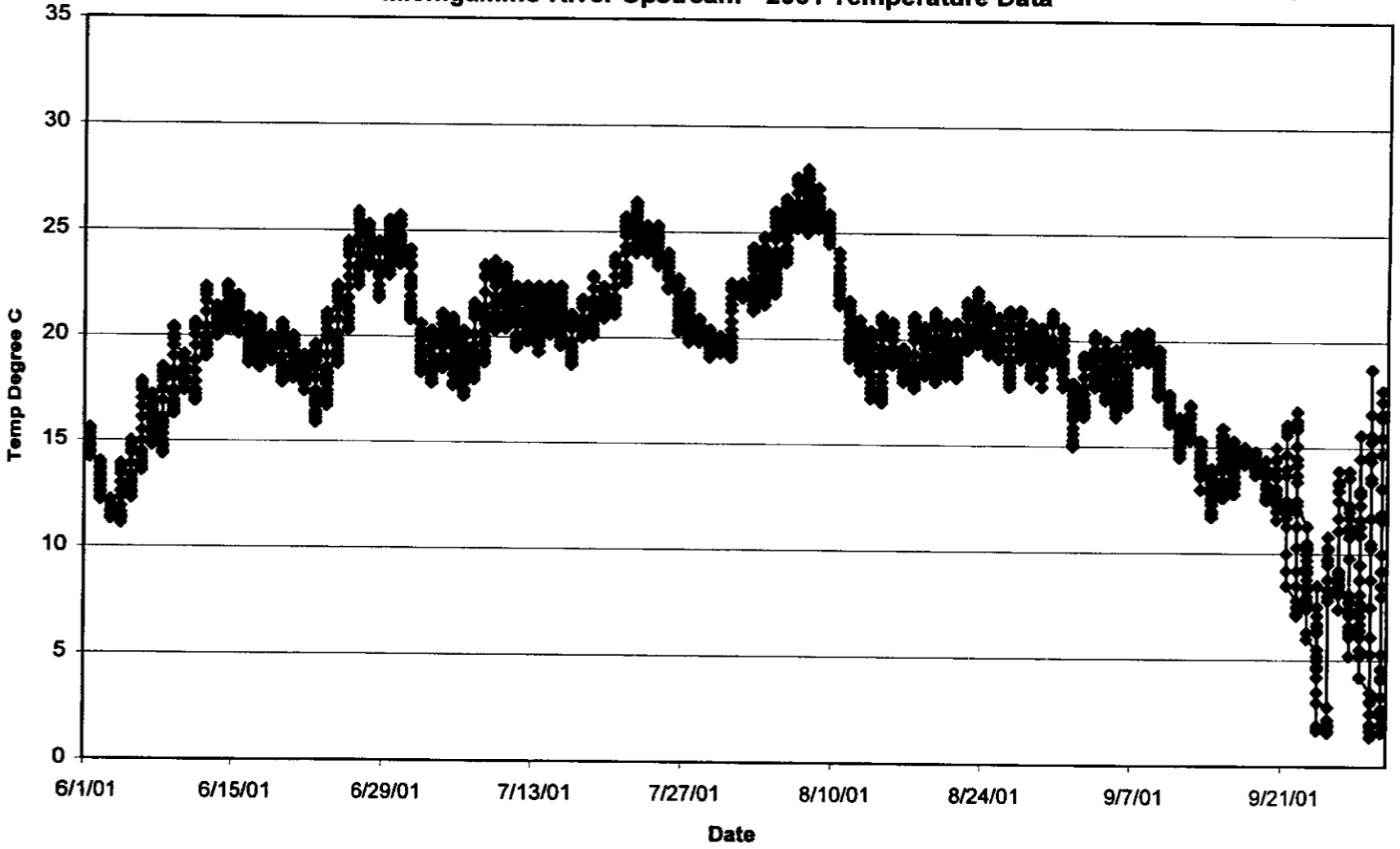


Figure A-2

Lower Paint Tailrace - 2001 Temperature Data

FERC Project No. 2072-008

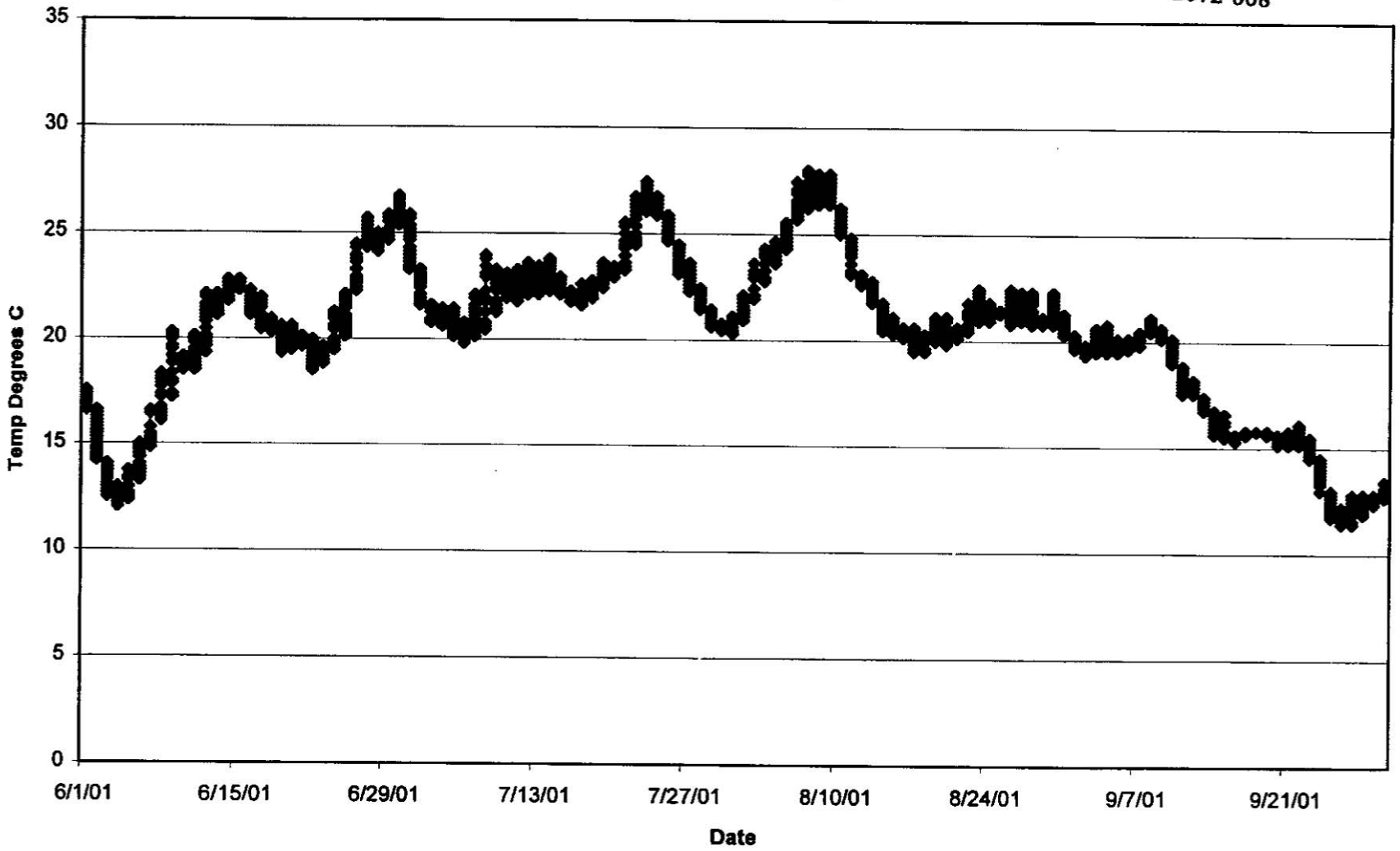


Figure A-3

FERC Project No.
2074-007

Hemlock Tailrace - 2001 Temperature Data

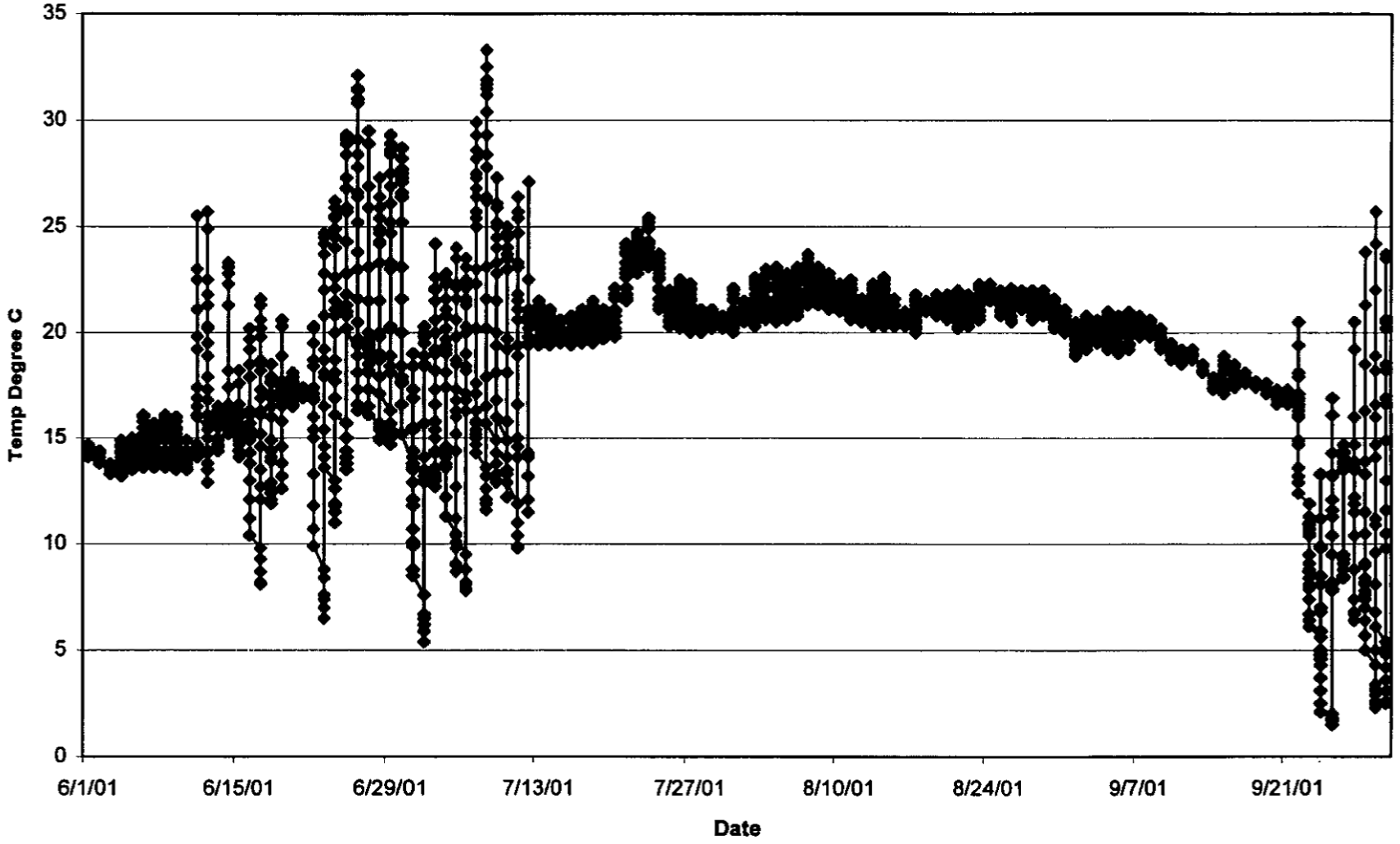
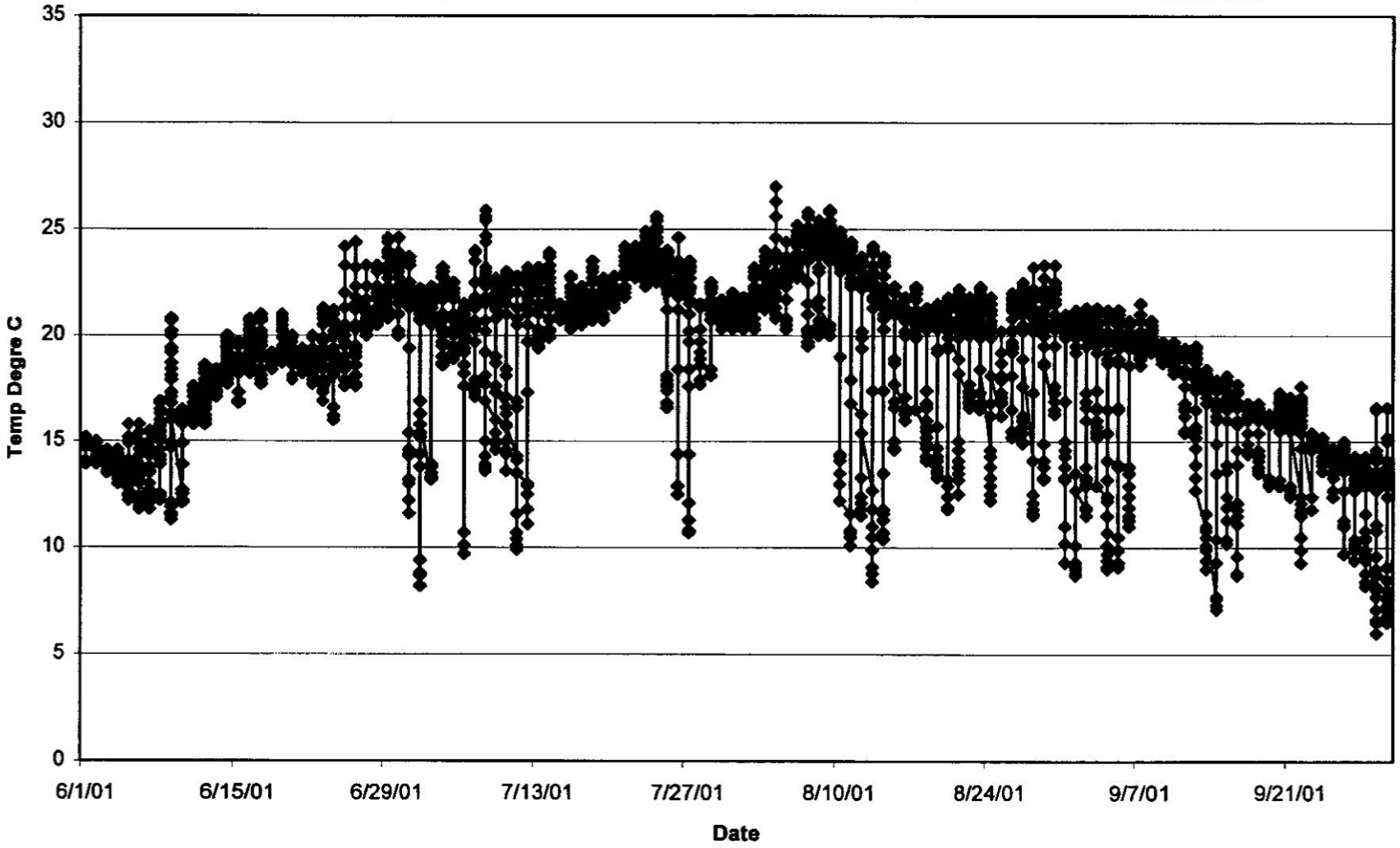


Figure A-4

Michigamme - Brule Confluence - 2001 Temperature Data

FERC Project No.
2073-008



Wisconsin Electric- Wisconsin Gas

Appendix B

Results of Vertical Profile Measurements by Flowage

Way Dam and Michigamme Reservoir- FERC No. 1759-036
Hemlock Falls Hydroelectric Project- FERC No. 2074-007
Peavy Falls Hydroelectric Project –FERC No. 11830-000
Lower Paint Hydroelectric Project – FERC No. 2072-008
Michigamme Falls Hydroelectric Project – FERC No. 2073-008
Twin Falls Hydroelectric Project – FERC No. 11831-000
Kingsford Hydroelectric Project – FERC 2131-020
Big Quinnesec Falls Hydroelectric Project – FERC 1980-009

November 27, 2001

Appendix B-1

Way Dam Hydroelectric Project
Vertical Profile Data -

14-Feb-01

Approximate air temp: -6.6 C

Secci Depth: 5.0 ft. *Time:0845*

NNW wind 8-12 mph and gusty *Cold,clear and sunny*

Ice thickness: 12-16" approximately

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	0.2	10.5	73.7	139	7.5
0.5	0.2	10.5	72.9	139	7.5
1.0	0.3	10.5	73.1	140	7.4
1.5	0.4	10.4	72.7	139	7.4
2.0	0.9	10.5	75.5	735	7.4
2.5	1.3	11.1	80.3	131	7.4
3.0	1.6	11.3	81.3	132	7.5
3.5	1.7	11.4	83.1	132	7.4
4.0	3.2	7.6	57.4	154	7.4
4.5	3.2	7.5	56.2	154	7.3
5.0	3.1	7.4	56.1	159	7.3
5.5	3	7.4	55.8	163	7.3
6.0	3.1	7.4	56.1	164	7.3
6.5	3.1	7.4	55.6	164	7.3
7.0	3.2	6.7	20.5	169	7.3
7.5	3.4	6.0	45.6	187	7.3
8.0	3.4	5.9	44.6	173	7.3
8.4	3.4	5.8	44.3	189	7.3

25-Apr-01

Approximate air temp:10 C

Secci Depth: 4.5 ft. *Time:0800*

Calm *Sunny, clear sky*

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	5.7	11.6	94.1	73.0	7.4
0.5	5.7	11.4	93.4	74.0	7.4
1.0	5.7	11.4	93.3	74.0	7.4
1.5	5.7	11.4	92.9	73.0	7.3
2.0	5.7	11.3	92.3	73.0	7.3
2.5	5.7	11.3	92.5	73.0	7.3
3.0	5.7	11.3	92.5	73.0	7.3
3.5	5.7	11.3	92.3	73.0	7.3
4.0	5.7	11.3	92.3	73.0	7.3
4.5	5.7	11.2	92.0	73.0	7.3
5.0	5.7	11.2	91.9	72.0	7.3
5.5	5.7	11.2	91.5	72.0	7.3
6.0	5.7	11.2	91.6	73.0	7.2
6.5	5.6	11.2	91.2	73.0	7.2
7.0	5.6	11.1	90.7	73.0	7.2
7.5	5.5	11.1	90.6	73.0	7.2
8.0	5.5	11.1	90.5	73.0	7.2
8.5	5.5	11.1	90.5	72.0	7.2
9.0	5.4	11.1	90.5	72.0	7.2
9.5	5.4	11.1	90.3	73.0	7.2
10.0	5.4	11.1	90.1	73.0	7.2
10.5	5.4	11.1	89.9	73.0	7.2
11.0	5.4	11.0	89.7	72.0	7.2
11.5	5.4	11.1	89.9	73.0	7.2
11.7	5.4	11.1	90.1	73.0	7.2

15-May-01

Approximate air temp:16 C

Secci Depth: 5.5 ft. *Time:1420*

Wind SSE 8-12 mph and gusty *Overcast*

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	13.4	9.6	94.3	67	7.4
0.5	13.4	9.6	94.3	69	7.4
1.0	13.4	9.6	93.8	69	7.4
1.5	13.4	9.6	94.0	69	7.4
2.0	13.3	9.6	93.5	69	7.4
2.5	13.3	9.5	93.5	69	7.4
3.0	13.1	9.4	91.1	69	7.4
3.5	13.1	9.4	92.3	69	7.4
4.0	13.1	9.4	91.7	69	7.4
4.5	13.1	9.4	92.1	69	7.3
5.0	13.1	9.3	90.8	69	7.4
5.5	13.1	9.2	90.2	69	7.4
6.0	13.1	9.2	90.0	68	7.3
6.5	13.0	9.2	90.1	67	7.3
7.0	13.0	9.2	90.0	67	7.3
7.5	13.0	9.2	90.1	68	7.3
8.0	13.0	9.1	89.4	68	7.3
8.5	12.9	9.0	88.0	68	7.3
9.0	12.8	9.0	87.5	68	7.3
9.5	12.7	9.0	87.1	68	7.2
10.0	12.7	8.9	86.3	69	7.2
10.5	12.5	8.9	85.8	68	7.2
11.0	12.4	8.8	84.4	67	7.2
11.5	12.3	8.7	83.1	67	7.2
12.0	12.2	8.6	82.4	66	7.2
12.5	12.3	8.6	82.4	68	7.2

Indicates opening of intake forebay (10-15.5m)

Appendix B-1
Way Dam Hydroelectric Project
Vertical Profile Data -

7-Jun-01

Approximate air temp:10 C
Secci Depth: 5.5 ft.
Winds Calm to litght variable *20% clouds bright sun*

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	16.5	10.1	106.0	75	7.5
0.5	16.5	10.0	104.7	74	7.4
1.0	16.1	10.0	104.0	73	7.4
1.5	15.7	9.8	101.2	73	7.4
2.0	15.3	9.8	101.2	73	7.4
2.5	15.0	9.7	98.3	73	7.4
3.0	14.9	9.6	97.7	72	7.4
3.5	14.8	9.4	95.2	73	7.3
4.0	14.6	9.4	94.7	72	7.4
4.5	14.4	9.4	93.6	73	7.3
5.0	14.3	9.2	92.8	73	7.3
5.5	14.2	9.3	93.6	72	7.3
6.0	14.2	9.3	92.9	72	7.3
6.5	14.2	9.3	92.8	72	7.3
7.0	14.2	9.2	92.2	71	7.2
7.5	14.1	9.2	91.6	72	7.2
8.0	14.1	9.2	91.3	72	7.2
8.5	14.1	9.1	90.8	72	7.2
9.0	14.1	9.1	90.8	72	7.2
9.5	14.0	9.0	89.5	73	7.2
10.0	14.0	9.0	89.4	72	7.2
10.5	13.9	8.9	89.0	72	7.2
11.0	13.9	8.9	88.3	72	7.2
11.5	13.8	8.7	85.9	72	7.1
12.0	13.7	8.4	83.0	73	7.1
12.5	13.6	8.3	81.5	73	7.1
13.0	13.6	8.2	80.5	71	7.1

20-Jun-01

Approximate air temp:21 C
Secci Depth: 5.5 ft. *Time:1815*
light variable wind *50% cloud cover*

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	20.4	9.0	102.0	83	7.5
0.5	20.4	8.9	101.7	83	7.5
1.0	20.4	8.9	100.6	83	7.5
1.5	20.3	8.8	99.3	83	7.5
2.0	20.2	8.7	98.0	83	7.5
2.5	20.1	8.7	98.6	83	7.5
3.0	20.1	8.7	98.5	83	7.5
3.5	19.9	8.7	98.0	82	7.5
4.0	19.4	8.4	94.4	83	7.5
4.5	19.3	8.1	88.7	82	7.4
5.0	18.2	8.2	88.6	82	7.3
5.5	18.1	8.1	87.8	81	7.3
6.0	18.1	8.0	86.8	81	7.2
6.5	17.6	7.7	82.9	82	7.2
7.0	17.5	7.6	81.6	81	7.2
7.5	17.4	7.5	80.6	81	7.1
8.0	16.9	7.3	77.1	81	7.2
8.5	16.0	6.7	70.0	80	7.1
9.0	15.3	6.2	62.9	78	7.0
9.5	14.8	5.8	58.4	78	7.0
10.0	14.9	5.8	58.9	79	6.9
10.5	14.9	5.7	57.9	76	6.9
11.0	14.8	5.7	57.9	78	6.9
11.5	14.8	5.7	57.5	77	6.9
12.0	14.7	5.7	57.9	78	6.8
12.5	14.6	5.9	58.7	80	6.9
13.0	14.5	5.8	57.9	80	6.8

11-Jul-01

Approximate air temp: 16 C
Secci Depth: 6.5 42-44' *Time:0830*
8-10 mph and higher *sunny, no clouds*
cool pleasant clear blue sky

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	21.6	9.0	104.0	89	7.7
0.5	21.6	8.9	103.8	89	7.7
1.0	21.6	8.9	104.3	89	7.7
1.5	21.6	9.0	104.7	89	7.7
2.0	21.6	9.0	104.7	89	7.7
2.5	21.6	9.0	104.4	88	7.7
3.0	21.6	8.9	104.4	89	7.7
3.5	21.7	8.7	101.7	88	7.6
4.0	21.7	8.7	101.5	89	7.6
4.5	21.7	8.7	101.6	89	7.6
5.0	21.6	8.7	101.6	89	7.6
5.5	21.6	8.6	99.8	89	7.6
6.0	21.3	7.9	92.5	89	7.4
6.5	21.1	7.9	89.6	88	7.3
7.0	20.7	7.3	82.2	87	7.2
7.5	20.1	6.5	73.2	87	7.0
8.0	20.0	6.4	71.9	86	7.0
8.5	19.8	6.2	70.3	88	6.9
9.0	19.1	5.8	64.8	91	6.9
9.5	19.1	5.8	64.2	92	6.8
10.0	19.0	5.8	63.9	93	6.8
10.5	18.7	5.1	57.0	93	6.8
11.0	18.2	5.2	56.2	92	6.8
11.5	18.1	5.0	54.8	93	6.7
12.0	17.4	4.0	42.4	93	6.8
12.5	17.6	4.2	45.6	94	6.8
13.0	17.4	3.9	41.4	94	6.7

☐ Indicates opening of intake forebay (10-15.5m)

Appendix B-1

Way Dam Hydroelectric Project
Vertical Profile Data -

26-Jul-01						8-Aug-01						22-Aug-01					
Approximate air temp: 18 C						*Approximate air temp: 31 C*						*Approximate air temp: 21 C*					
Secci Depth: 5.5 38-40'			*Time:0845*			*Secci Depth: 6.0 40-42'*			*Time: 1225*			*No Secci Depth taken*			*Time: 1220*		
Winds NNE 12-18 mph			*Bright sun, no clouds*			*N NE winds 1-3 mph*			*100% clouds moving in from clear sky (north)*			*Light wind NW ~10 mph*			*Overcast, Humid*		
Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)	Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)	Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	22.7	7.4	88.9	93	7.5	0.0	27.6	7.8	101.3	107	7.8	0.0	22.0	8.1	92.7	101	7.7
0.5	22.7	7.5	89.3	93	7.5	0.5	27.5	7.7	100.2	108	7.8	0.5	21.6	7.5	85.6	101	7.7
1.0	22.7	7.5	88.9	92	7.5	1.0	27.0	7.8	99.7	106	7.8	1.0	21.1	7.2	80.6	104	7.7
1.5	22.7	7.5	88.6	92	7.5	1.5	26.9	7.7	99.5	106	7.8	1.5	21.0	7.0	78.7	104	7.7
2.0	22.7	7.4	88.2	92	7.5	2.0	26.7	7.7	98.5	106	7.8	2.0	21.0	6.9	78.3	104	7.7
2.5	22.7	7.4	88.2	92	7.5	2.5	26.6	7.7	97.5	106	7.8	2.5	21.0	7.0	78.7	104	7.6
3.0	22.7	7.4	88.0	92	7.5	3.0	26.0	6.7	95.0	105	7.7	3.0	21.0	6.9	78.2	104	7.6
3.5	22.7	7.4	88.6	91	7.5	3.5	23.8	6.8	81.8	103	7.4	3.5	20.8	6.9	77.8	103	7.6
4.0	22.7	7.4	87.4	92	7.4	4.0	23.4	6.4	77.1	103	7.2	4.0	20.9	6.9	77.7	104	7.6
4.5	22.7	7.3	87.2	91	7.4	4.5	23.1	6.2	72.3	103	7.1	4.5	20.9	6.8	77.2	104	7.6
5.0	22.7	7.3	87.4	92	7.4	5.0	22.8	5.8	68.1	104	7.0	5.0	20.9	6.8	77.2	104	7.6
5.5	22.7	7.3	87.3	91	7.4	5.5	22.4	5.2	60.9	105	6.9	5.5	20.9	6.8	76.5	104	7.6
6.0	22.7	7.3	87.3	91	7.4	6.0	22.0	5.0	58.2	105	6.9	6.0	20.9	6.7	76.2	104	7.6
6.5	22.7	7.3	87.1	91	7.4	6.5	21.6	4.8	55.1	106	7.0	6.5	20.9	6.7	75.3	104	7.6
7.0	22.4	7.0	82.5	91	7.3	7.0	21.5	4.3	49.9	106	7.0	7.0	20.8	6.6	74.0	104	7.6
7.5	22.3	6.7	80.3	92	7.2	7.5	21.4	4.2	48.2	106	6.8	7.5	20.8	6.3	70.7	104	7.6
8.0	21.7	3.5	40.2	96	6.7	8.0	21.1	3.6	44.6	105	6.8	8.0	20.7	6..2	70.0	105	7.6
8.5	20.3	3.1	34.4	96	6.8	8.5	21.0	3.3	36.7	107	6.7	8.5	20.7	6.2	68.8	105	7.5
9.0	19.6	1.6	17.6	96	6.7	9.0	20.7	2.7	30.7	107	6.8	9.0	20.6	5.9	65.6	105	7.5
9.5	19.6	1.5	16.0	97	6.6	9.5	20.5	2.2	29.1	108	6.7	9.5	20.5	5.6	62.1	105	7.5
10.0	19.5	1.5	16.0	97	6.6	10.0	20.3	1.8	20.3	108	6.6	10.0	20.5	5.4	60.6	106	7.5
10.5	19.3	2.0	22.1	100	6.6	10.5	20.2	1.6	19.0	109	6.6	10.5	20.2	4.2	47.7	107	7.4
11.0	19.2	2.0	22.3	101	6.6	11.0	19.9	1.8	19.4	111	6.6	11.0	19.9	3.8	38.6	110	7.3
11.5	19.1	2.0	16.4	101	6.6	11.5	19.4	1.1	14.5	111	6.6	11.5	19.6	2.3	24.5	111	7.3
12.0	18.6	1.7	16.4	101	6.6	12.0	18.6	0.7	7.0	111	6.6	12.0	19.4	1.7	18.6	113	7.2
12.5	17.9	1.4	14.9	100	6.6	12.5	18.2	0.5	5.1	111	6.6	12.5	19.4	1.6	17.4	115	7.2
13.0						13.0	18.2	0.4	4.5	111	6.6	13.0					

[ ] Indicates opening of intake forebay (10-15.5m)

Appendix B-1

Way Dam Hydroelectric Project
Vertical Profile Data -

18-Sep-01						2-Oct-01					
Approximate air temp: 23 C						*Approximate air temp: 22 C*					
Secci Depth 5.5			*Time: 1300*			*Secci Depth 6.5*			*Time: 1500*		
NNE winds 4-7 mph			*70% clouds*			*winds near calm*			*100% clouds Threat of rain and thunder to west*		
Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)	Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	18.2	8.1	87.5	114	7.9	0.0	17.3	9.8	101.5	113	8.4
0.5	18.2	8.0	86.9	114	7.8	0.5	15.3	9.8	99.7	111	8.5
1.0	18.0	8.0	86.5	114	7.9	1.0	15.2	9.8	99.7	111	8.5
1.5	18.0	8.0	86.4	113	7.9	1.5	15.0	9.7	84.0	110	8.4
2.0	17.9	7.9	85.7	113	7.8	2.0	14.8	9.6	96.8	109	8.4
2.5	17.9	7.9	85.3	114	7.8	2.5	14.7	9.4	94.1	108	8.3
3.0	17.9	7.8	84.1	114	7.8	3.0	14.7	9.3	94.1	108	8.3
3.5	17.9	7.8	84.1	114	7.8	3.5	14.4	9.2	92.2	107	8.2
4.0	17.9	7.7	83.5	113	7.8	4.0	14.3	9.1	90.4	107	8.1
4.5	17.9	7.7	82.5	113	7.8	4.5	14.0	8.5	83.9	106	8.1
5.0	17.9	7.4	79.8	114	7.8	5.0	14.0	8.5	83.9	106	8.0
5.5	17.9	7.3	79.2	113	7.7	5.5	14.0	8.5	84.0	108	8.0
6.0	17.9	7.3	78.5	113	7.7	6.0	13.9	8.5	83.8	108	8.5
6.5	17.9	7.2	78.0	114	7.7	6.5	13.9	8.5	83.9	109	8.0
7.0	17.9	7.2	78.5	113	7.7	7.0	13.9	8.5	82.9	116	8.0
7.5	17.9	7.2	78.1	113	7.7	7.5	13.8	8.8	82.1	123	8.0
8.0	17.9	7.3	77.6	111	7.7	8.0	13.7	8.3	81.2	126	8.0
8.5	17.8	6.6	70.6	119	7.6	8.5	13.7	8.2	81.1	126	8.0
9.0	17.7	6.6	70.9	120	7.6	9.0	13.7	8.2	81.2	127	8.0
9.5	17.7	6.6	70.5	120	7.5	9.5	13.7	8.2	80.8	127	8.0
10.0	17.3	6.4	67.8	129	7.5	10.0	13.7	8.2	80.2	128	8.0
10.5	16.9	6.0	63.2	148	7.5	10.5	13.6	8.1	80.0	127	8.0
11.0	16.7	6.0	63.7	149	7.5	11.0	13.6	8.1	80.0	127	8.0
11.5	16.6	6.0	63.0	150	7.5	11.5	13.6	8.2	81.1	127	7.9
12.0	16.6	6.1	N/A	151	7.5	12.0	13.6	8.2	80.7	128	7.9
12.5	16.6	6.0	63.8	150	7.5	12.5	13.6	8.1	79.4	126	7.9
12.9	16.6	5.9	63.0	152	7.5	12.9					

Indicates opening of intake forebay (10-15.5m)

Appendix B- 2
Hemlock Hydroelectric Project
Vertical Profile Data

14-Feb-01

Approximate air temp: -6.6 C
Secci Depth: no data *Time:1030*
NNW wind 8-12 mph and gusty *Clear, sunny and windy*
No Ice

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	1.4	11.1	79.8	154	7.4
0.5	1.4	11.2	80.3	154	7.4
1.0	1.4	11.2	80.4	149	7.4
1.5	1.4	11.2	80.6	157	7.3
2.0	1.4	11.2	80.8	151	7.4
2.5	1.5	11.4	82.1	149	7.4

25-Apr-01

Approximate air temp: 10 C
Secci Depth:4.5 ft *Time:1015*
Calm *Sunny*

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	7.3	11.6	98.9	77	7.4
0.5	7.3	11.5	98.7	76	7.4
1.0	7.3	11.6	97.7	76	7.4
1.5	7.3	11.7	100.1	77	7.4
2.0	7.3	11.8	100.9	77	7.4

16-May-01

Approximate air temp: 27 C
No Secci Depth *Time:1630*
Breezy *50 % Cloudy/sunny*

Depth	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	15.4	10.0	101.8	68	7.2
0.5	15.4	9.9	99.9	68	7.2
1.0	15.4	10.1	103.7	68	7.2
1.5	no reading taken				
2.0	15.4	10.2	104.6	69	7.2
2.5					

Opening of intake forebay: Greater than 9 m

Appendix B- 2
Hemlock Hydroelectric Project
Vertical Profile Data

7-Jun-01

Approximate air temp: 13 C
No Secci Depth taken *Time:0930*
Light variable winds *50 % Cloudy/sunny*

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	14.1	9.3	92.0	75	7.2
0.5	14.1	9.3	93.3	75	7.2
1.0	14.1	9.3	92.9	75	7.2
1.5	14.1	9.4	93.5	75	7.2
2.0	14.1	9.4	94.3	75	7.3
2.5	14.0	9.5	95.1	74	7.3

20-Jun-01

Approximate air temp: 21 C
No Secci Depth taken *Time:1650*
Light variable winds *40 % overcast*

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	18.1	8.2	88.8	85	7.3
0.5	18.1	8.2	89.0	85	7.3
1.0	18.1	8.3	90.0	85	7.3
1.5	18.1	8.4	92.3	86	7.4
2.0	18.1	8.4	90.6	86	7.4
2.5	18.1	8.6	93.0	86	7.4
2.9	18.1	8.7	93.8	86	7.4

12-Jul-01

Approximate air temp: 21 C
No Secci Depth taken *Time:0800*
Calm *Clear and Sunny*
Beautiful day

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	19.2	6.7	75.1	90	7.0
0.5	19.2	6.8	75.8	90	6.9
1.0	19.2	6.8	76.0	90	6.9
1.5	19.2	6.8	75.7	89	6.9
2.0	19.2	6.8	75.6	90	7.0
2.5	19.2	6.9	77.1	89	7.0
2.7	bottom				

Opening of intake forebay: Greater than 9 m

Appendix B- 2
Hemlock Hydroelectric Project
Vertical Profile Data

24-Jul-01

Approximate air temp: 22 C
No Secci Depth taken *Time:0830*
Breezy NW winds *Water turbid from rain*
12-18 mph *Very windy*

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	22.9	6.8	81.6	99	7.5
0.5	22.9	7.0	83.6	98	7.5
1.0	22.9	7.0	83.3	98	7.5
1.5	22.9	6.9	81.5	98	7.5
2.0	22.9	7.0	83.7	99	7.5
2.5	22.8	7.2	84.4	98	7.5

9-Aug-01

Approximate air temp: 29 C
No Secci Depth taken *Time:1530*

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	22.8	5.7	67.8	105	7.1
0.5	22.8	5.9	70.9	105	7.1
1.0	22.8	5.7	69.5	105	7.1
1.5	22.8	5.6	67.1	105	7.1
2.0	22.8	5.6	67.0	105	7.1
2.5	22.8	5.7	68.3	105	7.1
3.0	22.7	6.0	70.7	105	7.1

23-Aug-01

Approximate air temp: 27 C
No Secci Depth taken *Time:1145*

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	21.2	7.3	81.4	106	7.7
0.5	21.2	7.1	81.0	106	7.7
1.0	21.2	7.1	80.6	106	7.6
1.5	21.2	7.0	79.7	107	7.7
2.0	21.1	7.0	79.6	106	7.6
2.5	21.1	7.0	78.9	107	7.6
2.9	21.1	7.0	78.6	107	7.6

Opening of intake forebay: Greater than 9 m

Appendix B- 2
Hemlock Hydroelectric Project
Vertical Profile Data

19-Sep-01						4-Oct-01					
Approximate air temp: 10 C						*Approximate air temp: 10C*					
No Secci Depth taken			*Time:1300*			*No Secci Depth taken*			*Time:0927*		
Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)	Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	17.4	8.9	82.7	116	7.5	0.0	13.7	9.1	90.2	115	7.9
0.5	17.4	8.0	84.5	116	7.5	0.5	13.7	9.1	88.8	114	7.9
1.0	17.4	7.9	84.5	116	7.5	1.0	13.7	9.0	87.9	115	7.9
1.5	17.4	8.2	87.3	116	7.5	1.5	13.7	9.3	90.1	115	7.9
2.0	17.4	8.3	88.5	116	7.6	2.0	13.7	9.5	92.3	116	7.9
2.3	17.4	8.3	88.6	116	7.6	2.4	13.7	9.8	96.5	115	8.0

Opening of intake forebay: Greater than 9 m

Appendix B-3
Paint Diversion Canal Hydroelectric Project
Vertical Profile Data -

14-Feb-01						25-Apr-01					
Approximate air temp: -7 C						*Approximate air temp: 10 C*					
Secci Depth: 4.0 ft.			*Time:1130*			*no secci depth taken*			*Time:1115*		
NNW wind 8-12 mph and gusty			*Clear, cold and brisk*			*SSW wind 8-12 mph*			*Overcast*		
Ice thickness: 15 to 20"						*Ice thickness: 14-16" approximately*					
Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH	Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	0.0	11.3	78.3	175	7.6	0.0	9.2	10.8	96.4	68	7.2
0.5	0.0	11.2	77.6	166	7.6	0.5	9.2	10.8	96.5	68	7.2
1.0	0.0	11.2	77.1	165	7.6	1.0	9.2	10.9	97.0	68	7.2
1.5	0.0	11.2	77.3	167	7.6	1.5	9.2	10.9	97.2	68	7.2
2.0	0.1	11.2	77.3	166	7.6	2.0	9.2	10.9	97.2	68	7.2
2.5	0.1	11.1	77.1	165	7.5	2.5	9.2	11.0	98.0	68	7.3
2.6	0.1	11.0	76.5	175	7.5	2.8	9.2	11.2	99.4	68	7.3

Appendix B-3

Paint Diversion Canal Hydroelectric Project

Vertical Profile Data -

16-May-01

Approximate air temp: 27 C

no secci depth taken *Time:1745*

Took readings from shore downstream of dam gate

Depth(m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	16.4	9.1	95.2	117	7.4
0.5	16.4	9.1	95.2	117	7.4
1.0	16.4	9.1	95.6	118	7.4
1.5	16.3	9.1	95.7	117	7.4
2.0	16.4	9.2	96.1	117	7.3
2.5	16.4	9.2	99.4	118	7.2

7-Jun-01

Approximate air temp: 16 C

no secci depth taken *Time:1000*

Light southerly breeze *40% clouds*

Took readings from shore downstream of dam gate

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	16.1	9.8	102.1	131	7.6
0.5	16.0	9.7	100.9	131	7.6
1.0	15.5	9.5	98.1	131	7.6
1.5	15.3	9.4	97.4	131	7.6
2.0	14.7	9.4	96.0	130	7.5
2.5	14.6	9.4	95.4	131	7.5
	bottom				

20-Jun-01

Approximate air temp: 21 C

no secci depth taken *Time:1600*

Calm *90% overcast*

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	21.9	9.2	103.5	153	8.0
0.5	20.9	9.0	103.3	153	7.9
1.0	20.9	9.0	103.1	153	7.9
1.5	20.5	8.9	102.1	154	7.9
2.0	19.9	8.3	93.3	157	7.8
2.5	19.9	8.1	91.5	153	7.7
	bottom				

Appendix B-3
Paint Diversion Canal Hydroelectric Project
Vertical Profile Data -

12-Jul-01

Approximate air temp: 21 C

no secci depth taken *Time:1000*

light variable wind *Clear sky 10% cloud*

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	23.1	8.5	101.7	175	7.9
0.5	23.1	8.4	100.5	177	7.9
1.0	23.0	8.4	100.1	175	7.9
1.5	23.0	8.4	100.1	177	7.9
2.0	23.1	8.3	100.1	174	7.9
2.5	23.0	8.2	98.6	178	7.9
2.8	22.8	8.2	99.6	176	7.9

24-Jul-01

Approximate air temp: 21 C

no secci depth taken *Time:0920*

Verty srong NNW winds *10% cloud*

12-18 mph

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	26.2	7.0	87.9	173	7.9
0.5	26.2	7.0	89.1	169	7.9
1.0	26.2	7.1	90.0	172	7.9
1.5	26.1	6.7	83.7	169	7.8
2.0	26.1	6.6	83.8	171	7.8
2.5	26.1	6.6	83.6	176	7.8
2.6	Bottom				

9-Aug-01

Approximate air temp: 32 C

no secci depth taken *Time:1620*

breezy and hot

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	27.8	6.7	87.7	164	7.7
0.5	27.8	6.6	86.6	164	7.7
1.0	27.8	6.6	85.6	165	7.8
1.5	27.8	6.5	85.8	164	7.7
2.0	27.8	6.5	84.9	165	7.7
2.5	27.7	6.2	80.4	162	7.6
2.6	Bottom				

Appendix B-3

Paint Diversion Canal Hydroelectric Project

Vertical Profile Data -

23-Aug-01

Approximate air temp: 24 C

no secci depth taken *Time:1215*

sunny 20% clouds

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	22.1	8.5	98.3	186	8.3
0.5	22.0	8.4	96.7	187	8.4
1.0	21.9	8.4	95.7	187	8.4
1.5	21.8	8.2	95.4	188	8.4
2.0	21.9	8.1	93.6	188	8.4
2.5	21.9	8.2	94.9	188	8.4
3.0	21.9	8.2	94.8	188	8.4
3.5	21.9	8.2	93.8	188	8.4
4.0	21.6	8.3	92.6	188	8.4
4.1	bottom				

19-Sep-01

Approximate air temp: 10 C

no secci depth taken *Time:1400*

100% clouds Rainy and cool

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
4.0	16.1	8.7	90.4	173	7.8
0.5	16.1	8.6	89.5	178	7.8
1.0	16.1	8.5	87.9	177	7.8
1.5	16.0	8.3	86.4	177	7.8
2.0	16.0	8.3	86.2	175	7.8
2.5	16.0	8.2	85.4	173	7.8
2.6	bottom				
3.5					
4.0					
4.1					

4-Oct-01

Approximate air temp: 10 C

no secci depth taken *Time:1015*

Sunny 20% Clouds

Northernly winds 8-12 mph

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	13.6	9.0	88.2	184	8.0
0.5	13.6	8.9	88.1	184	8.0
1.0	13.6	8.9	87.5	181	8.0
1.5	13.6	8.9	87.1	181	8.0
2.0	13.5	8.8	86.9	184	8.0
2.4	13.6	8.8	86.5	18.3	8.0
2.6					
3.5					
4.0					
4.1					

Appendix B- 4
Peavy Hydroelectric Project
Vertical Profile Data -

14-Feb-01

Approximate air temp: -7.7 C

Secci Depth:6.0 ft. *Time:1330*

NNW wind 12-18mph and gusty *Sunny, Cold*

Ice thickness: 15-20" *and windy*

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	0.3	12.0	83.6	156	7.6
0.5	0.4	11.9	83.6	154	7.6
1.0	0.4	11.9	83.4	158	7.6
1.5	0.5	11.8	83.3	162	7.6
2.0	0.8	11.8	83.3	152	7.6
2.5	1.1	11.7	83.6	151	7.5
3.0	1.1	11.7	83.5	154	7.5
3.5	1.2	11.6	83.3	157	7.5
4.0	1.2	11.6	83.1	147	7.5
4.5	1.3	11.6	82.9	159	7.5
5.0	1.3	11.4	81.9	155	7.5
5.5	1.4	11.3	81.3	162	7.5
6.0	1.4	11.2	80.8	159	7.5
6.5	1.4	11.2	80.4	150	7.5
7.0	1.4	11.1	79.9	166	7.5
7.5	1.4	11.0	78.8	168	7.5
8.0	1.4	10.9	78.3	174	7.5
8.5	1.5	10.8	77.6	164	7.4
9.0	1.5	10.7	77.2	164	7.5
9.5	1.5	10.7	77.0	168	7.4
10.0	1.5	10.6	76.6	146	7.4
10.5	1.5	10.6	76.2	160	7.4
11.0	1.6	10.5	75.9	169	7.4
11.5	1.7	10.4	75.2	152	7.4
12.0	1.9	10.2	74.0	161	7.4
12.5	2.2	9.8	71.0	160	7.4
13.0	2.3	9.4	69.3	170	7.4
13.5	2.5	9.3	67.9	165	7.4
14.0	2.7	8.8	64.8	137	7.3
14.5	2.8	8.3	61.6	160	7.3
15.0	3	8.0	59.4	179	7.3
15.5	3.1	7.7	57.7	148	7.3
16.0	3.1	7.5	56.9	175	7.3
16.5	3.1	7.5	56.5	178	7.3
17.0	3.2	7.5	56.0	172	7.3
17.5	3.3	7.2	54.5	156	7.2
18.0	3.4	7.1	53.3	176	7.2
18.5	3.4	6.9	51.8	176	7.2
19.0	3.4	6.8	51.2	163	7.2
19.4	3.4	6.7	51.0	162	7.2

25-Apr-01

Approximate air temp: 10 C

Secci Depth: 4.5 ft. *Time:1240*

NNW breeze 8-12 mph *sunny 30% clouds*

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	9.0	11.2	100.0	79	7.4
0.5	8.8	11.2	99.8	79	7.3
1.0	8.4	11.3	98.7	78	7.3
1.5	8.0	11.2	97.7	79	7.3
2.0	7.4	11.2	95.6	79	7.3
2.5	7.4	11.1	94.8	80	7.3
3.0	7.3	11.1	94.4	80	7.3
3.5	7.3	11.1	94.5	80	7.3
4.0	7.2	11.1	94.1	79	7.3
4.5	7.3	11.1	94.5	79	7.2
5.0	7.3	11.0	93.9	79	7.2
5.5	7.2	11.0	93.8	91	7.2
6.0	7.2	11.0	93.7	80	7.2
6.5	7.1	11.0	93.3	80	7.2
7.0	7.1	11.0	93.0	80	7.2
7.5	7.0	11.0	93.0	82	7.2
8.0	6.9	11.0	93.0	80	7.2
8.5	6.9	11.0	92.7	79	7.2
9.0	6.8	11.0	92.3	79	7.2
9.5	6.8	11.0	92.8	81	7.2
10.0	6.7	11.0	92.5	81	7.2
10.5	6.8	11.0	92.5	80	7.2
11.0	6.7	11.0	93.3	81	7.2
11.5	6.4	11.0	91.5	80	7.2
12.0	6.4	11.0	91.2	82	7.2
12.5	6.4	10.9	91.1	80	7.2
13.0	6.3	10.9	90.5	81	7.2
13.5	6.3	11.0	91.1	80	7.2
14.0	6.3	10.9	90.8	80	7.2
14.5	6.3	10.9	90.6	80	7.2
15.0	6.3	10.9	90.6	81	7.2
15.5	6.3	10.9	90.5	78	7.2
16.0	6.2	10.9	90.4	82	7.2
16.5	6.2	10.9	90.3	79	7.2
17.0	6.2	10.9	90.6	82	7.2
17.5	6.2	10.9	90.3	81	7.2
18.0	6.2	10.9	90.1	82	7.2
18.5	6.2	10.8	89.6	78	7.2
19.0	6.2	10.8	89.5	80	7.2
19.1	bottom				

15-May-01

Approximate air temp: 16 C

Secci Depth: 5.5 ft. water depth 65-70 feet *Time:1600*

SSE wind 8-12 mph and gusty *Overcast*

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	13.9	9.3	92.7	93	7.4
0.5	13.9	9.3	92.5	94	7.4
1.0	13.9	9.3	91.9	93	7.4
1.5	13.9	9.2	91.7	93	7.3
2.0	13.9	9.2	91.4	94	7.4
2.5	13.9	9.2	91.1	93	7.4
3.0	13.8	9.2	91.5	94	7.4
3.5	13.6	9.0	89.0	92	7.4
4.0	13.6	9.0	88.8	93	7.3
4.5	13.5	8.9	88.1	93	7.3
5.0	13.4	8.4	82.8	93	7.3
5.5	13.1	8.3	82.0	93	7.2
6.0	13.0	8.6	84.2	90	7.2
6.5	12.8	8.6	83.4	90	7.2
7.0	12.8	8.6	83.3	89	7.2
7.5	12.7	8.5	82.0	89	7.2
8.0	12.6	8.6	81.8	88	7.2
8.5	12.4	8.5	81.3	88	7.2
9.0	12.4	8.5	81.5	87	7.2
9.5	12.2	8.5	81.0	87	7.2
10.0	12.1	8.5	81.0	85	7.2
10.5	12.0	8.4	80.2	86	7.1
11.0	11.3	8.4	79.1	86	7.1
11.5	10.6	8.3	76.4	88	7.1
12.0	10.2	8.2	74.6	88	7.1
12.5	9.9	8.2	73.3	91	7.1
13.0	9.1	8.1	72.5	92	7.0
13.5	9.0	8.1	71.8	91	7.0
14.0	8.6	8.1	71.1	93	7.0
14.5	8.5	8.1	71.0	94	7.0
15.0	8.5	8.1	70.7	94	7.0
15.5	8.3	8.0	69.8	95	7.0
16.0	8.2	7.9	69.1	94	7.0
16.5	8.1	8.0	69.2	92	7.0
17.0	8.1	7.9	68.6	93	7.0
17.5	7.9	7.8	66.9	94	7.0
18.0	7.8	7.6	65.2	96	7.0
18.5	7.8	7.2	63.3	96	7.0
19.0	7.6	6.7	57.9	98	7.0
19.5	7.4	6.1	51.8	98	7.0
19.8	bottom				

Highlighted Depth: Opening of the intake forebay (2 to 10 m)

Appendix B- 4
Peavy Hydroelectric Project
Vertical Profile Data -

7-Jun-01

Approximate air temp: 18 C

Secci Depth: 5.5 ft. water depth 60 to 66' *Time:1130*

Light variable winds *30% clouds*

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	17.3	9.4	100.4	93	7.4
0.5	17.1	9.5	101.1	93	7.4
1.0	15.8	9.5	95.5	93	7.4
1.5	15.2	9.4	96.2	93	7.4
2.0	14.9	9.4	95.2	94	7.4
2.5	14.8	9.2	93.1	95	7.4
3.0	14.8	9.1	92.0	96	7.4
3.5	14.8	9.0	91.8	95	7.4
4.0	14.6	9.0	90.5	75	7.4
4.5	14.6	8.9	90.0	95	7.4
5.0	14.6	8.9	89.6	96	7.4
5.5	14.5	8.8	89.3	95	7.4
6.0	14.4	8.8	89.2	96	7.3
6.5	14.4	8.8	88.6	96	7.3
7.0	14.3	8.8	87.9	97	7.3
7.5	14.2	8.6	86.3	97	7.3
8.0	14.2	8.6	85.9	96	7.4
8.5	14.2	8.5	85.2	96	7.3
9.0	14.0	8.5	84.5	95	7.3
9.5	13.9	8.4	83.5	99	7.3
10.0	13.8	8.3	82.3	105	7.2
10.5	13.6	8.3	81.4	107	7.2
11.0	13.4	8.2	79.9	109	7.2
11.5	13.1	7.7	75.9	109	7.2
12.0	12.5	6.3	61.8	102	7.1
12.5	11.9	5.9	57.6	101	7.0
13.0	11.6	4.8	46.1	91	6.9
13.5	11.1	4.8	44.4	91	6.9
14.0	10.8	4.7	43.0	91	6.8
14.5	10.7	4.6	42.4	92	6.8
15.0	10.5	4.6	41.6	91	6.8
15.5	10.2	4.5	40.5	91	6.8
16.0	10.0	4.4	40.2	94	6.8
16.5	9.5	4.3	38.1	94	6.8
17.0	9.2	4.3	37.9	93	6.8
17.5	9.1	4.2	37.3	95	6.8
18.0	8.9	4.0	35.7	96	6.8
18.5	8.8	4.0	35.1	99	6.8
19.0	8.5	3.9	33.2	100	6.8
19.5	8.2	2.9	25.6	103	6.8
19.8					

21-Jun-01

Approximate air temp: 22 C

Secci Depth: 5.5 ft. water depth 62to 67' *Time:0830*

calm winds *100% overcast*

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	19.6	8.6	96.5	106	7.4
0.5	19.6	8.6	95.8	106	7.4
1.0	19.6	8.6	96.2	105	7.4
1.5	19.5	8.5	95.2	106	7.5
2.0	19.5	8.3	93.5	105	7.4
2.5	19.5	8.3	92.7	106	7.4
3.0	19.3	8.2	91.2	105	7.4
3.5	19.2	7.9	87.6	104	7.3
4.0	19.0	7.9	87.1	103	7.3
4.5	18.8	7.8	85.2	102	7.2
5.0	18.7	7.7	84.5	102	7.2
5.5	18.6	7.4	81.6	100	7.2
6.0	18.3	7.4	80.9	100	7.1
6.5	18.1	7.4	80.2	98	7.1
7.0	17.2	6.8	72.5	96	7.0
7.5	16.1	6.6	68.7	94	6.9
8.0	15.5	6.4	65.4	93	7.0
8.5	15.2	6.2	63.9	93	6.9
9.0	14.8	6.0	60.7	94	6.9
9.5	14.3	6.0	60.2	94	6.8
10.0	14.0	5.9	58.9	93	6.8
10.5	13.7	5.9	58.2	94	6.8
11.0	13.4	5.8	57.4	94	6.8
11.5	13.1	5.5	53.9	94	6.8
12.0	13.1	5.4	52.6	93	6.9
12.5	12.8	4.9	49.4	96	6.8
13.0	12.4	4.6	44.0	98	6.8
13.5	12.2	4.4	41.7	98	6.8
14.0	11.9	4.1	38.7	100	6.8
14.5	11.7	3.9	36.3	99	6.8
15.0	11.5	3.5	33.1	100	6.7
15.5	11.1	3.3	30.5	99	6.7
16.0	10.9	3.0	28.0	100	6.7
16.5	10.4	2.8	25.4	100	6.7
17.0	10.0	2.5	22.5	99	6.7
17.5	10.0	2.3	21.1	99	6.7
18.0	9.5	1.9	17.1	101	6.6
18.5	9.5	1.8	16.5	100	6.6
19.0	9.4	1.8	15.5	104	6.6
19.5	9.3	1.6	13.8	105	6.7
19.6	bottom				

11-Jul-01

Approximate air temp: 21 C

Secci Depth:7.0 ft. water depth 62to 66' *Time: 1000*

NNW winds *10% clouds*

8-12 mph

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	22.7	8.8	104.2	115	8.0
0.5	22.7	8.8	105.3	115	8.0
1.0	22.5	8.9	105.9	115	8.0
1.5	22.4	8.9	104.9	115	8.0
2.0	22.4	8.8	104.1	115	7.9
2.5	22.3	8.7	103.0	115	7.9
3.0	22.3	8.7	102.9	115	7.9
3.5	22.3	8.6	101.9	115	7.9
4.0	22.3	8.7	102.5	114	7.9
4.5	22.3	8.7	102.6	115	7.9
5.0	22.3	8.6	101.9	115	7.9
5.5	22.0	8.4	99.4	115	7.8
6.0	21.6	8.0	92.6	114	7.6
6.5	20.5	6.9	79.3	112	7.3
7.0	19.9	6.6	76.2	111	7.2
7.5	19.5	6.3	69.4	109	7.1
8.0	18.9	5.4	63.5	107	7.0
8.5	18.4	5.4	58.7	103	7.0
9.0	17.6	4.6	48.6	99	6.8
9.5	17.5	4.4	47.9	99	6.8
10.0	16.6	4.3	44.4	96	6.8
10.5	16.2	4.0	42.3	93	6.8
11.0	15.7	3.9	40.1	93	6.7
11.5	14.9	3.7	37.2	92	6.7
12.0	14.1	3.3	62.1	93	6.7
12.5	13.7	3.1	31.1	91	6.7
13.0	13.0	3.1	30.2	93	6.7
13.5	12.9	3.2	31.3	93	6.8
14.0	12.5	2.9	27.8	96	6.8
14.5	12.2	2.8	26.6	97	6.8
15.0	11.8	2.6	23.7	95	6.7
15.5	11.5	2.2	20.6	97	6.7
16.0	11.2	1.7	15.9	99	6.7
16.5	10.6	1.3	11.0	102	6.6
17.0	10.5	1.0	9.5	102	6.7
17.5	10.5	1.0	9.5	105	6.7
18.0	10.2	0.8	7.3	104	6.7
18.5	9.9	0.7	5.9	105	6.7
19.0	9.8	0.5	4.5	111	6.7
19.5	9.6	0.5	4.5	111	6.7
19.6	bottom				

Highlighted Depth: Opening of the intake forebay (2 to 10 m)

Appendix B- 4

Peavy Hydroelectric Project
Vertical Profile Data -

26-Jul-01						8-Aug-01						22-Aug-01					
Approximate air temp: 21 C						*Approximate air temp: 32 C*						*Approximate air temp: 24 C*					
Secci Depth:6.0 ft. water depth 60to 65'				*Time: 1015*		*Secci Depth:7.5 ft. water depth 65' to 66'*				*Time: 1400*		*Secci Depth:7.0 ft. water depth 65' to 66'*				*Time: 1400*	
NE winds 12-18 mph				*10% clouds*		*southernly winds light variable*				*100% clouds*						*Partly Cloudy*	
breezy				*Bright Sun*		*Hot and muggy*											
Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)	Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)	Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	23.7	7.9	95.6	127	8.0	0.0	29.3	7.8	103.4	137	8.1	0.0	22.3	7.3	85.5	123	7.4
0.5	23.7	7.8	94.9	127	8.0	0.5	29.3	7.8	103.7	137	8.1	0.5	22.0	7.4	86.0	123	7.5
1.0	23.7	7.8	94.9	126	8.0	1.0	28.2	7.8	102.3	137	8.1	1.0	21.6	7.1	83.6	122	7.5
1.5	23.7	7.8	94.4	126	8.0	1.5	28.0	7.7	100.5	137	8.1	1.5	21.3	7.2	82.8	122	7.5
2.0	23.7	7.7	93.3	126	8.0	2.0	27.4	7.5	97.0	138	8.0	2.0	21.2	7.2	81.7	124	7.6
2.5	23.6	7.6	92.2	125	7.9	2.5	26.8	7.6	98.5	137	8.0	2.5	21.1	7.1	80.5	124	7.6
3.0	23.6	7.6	91.3	125	7.9	3.0	25.9	7.4	91.5	133	7.8	3.0	21.1	6.9	77.3	123	7.6
3.5	23.5	7.4	90.6	126	7.9	3.5	24.8	7.0	85.8	130	7.6	3.5	21.0	6.6	74.5	124	7.6
4.0	23.5	7.4	90.0	126	7.8	4.0	23.9	6.3	75.0	128	7.4	4.0	21.0	6.5	73.2	123	7.6
4.5	23.5	7.4	89.6	126	7.9	4.5	23.0	5.8	67.2	126	7.3	4.5	20.9	6.4	72.8	122	7.6
5.0	23.5	7.3	88.0	126	7.9	5.0	22.4	5.3	62.7	124	7.1	5.0	20.9	6.4	72.1	123	7.6
5.5	23.4	7.1	85.3	125	7.8	5.5	21.9	4.8	54.6	121	7.1	5.5	20.9	6.3	72.8	122	7.6
6.0	23.4	7.2	87.4	124	7.8	6.0	21.6	4.4	50.2	120	7.0	6.0	20.8	6.2	70.3	123	7.6
6.5	22.9	6.1	64.4	117	7.4	6.5	21.1	3.8	42.4	118	6.9	6.5	20.8	6.1	69.2	123	7.5
7.0	20.8	4.4	48.9	104	7.1	7.0	20.8	3.3	37.8	116	6.8	7.0	20.8	6.1	68.7	124	7.5
7.5	19.6	3.6	38.1	104	6.8	7.5	20.3	2.4	26.1	115	6.8	7.5	20.7	6.0	67.4	127	7.5
8.0	19.1	3.7	35.1	103	6.8	8.0	20.0	2.0	22.3	114	6.7	8.0	20.5	5.8	64.0	127	7.5
8.5	18.8	2.9	32.0	101	6.8	8.5	19.6	1.8	18.7	112	6.7	8.5	20.4	5.4	60.6	129	7.5
9.0	17.7	2.8	27.1	96	6.7	9.0	19.2	1.5	16.1	110	6.7	9.0	20.4	5.3	59.0	129	7.5
9.5	17.0	2.3	22.5	95	6.7	9.5	18.6	1.3	14.3	107	6.6	9.5	19.6	3.4	37.1	126	7.3
10.0	15.9	1.9	18.7	91	6.7	10.0	16.8	0.6	6.4	100	6.6	10.0	18.8	2.2	24.3	119	7.3
10.5	15.1	1.6	15.9	88	6.6	10.5	15.9	0.5	4.8	97	6.6	10.5	17.6	0.5	4.9	110	7.1
11.0	14.3	1.5	15.1	88	6.6	11.0	15.2	0.4	4.4	96	6.6	11.0	15.4	0.3	3.3	99	7.1
11.5	13.8	1.5	14.8	89	6.6	11.5	14.5	0.4	4.6	94	6.6	11.5	14.3	0.3	2.9	97	7.0
12.0	13.4	1.5	14.3	87	6.6	12.0	14.0	0.5	5.0	93	6.6	12.0	13.7	0.3	2.8	96	7.0
12.5	12.9	1.4	13.5	89	6.5	12.5	13.5	0.5	4.8	93	6.5	12.5	13.1	0.3	2.7	97	7.0
13.0	12.7	1.3	12.6	89	6.5	13.0	12.7	0.5	4.3	95	6.5	13.0	12.9	0.3	2.6	97	7.0
13.5	12.4	1.2	11.7	91	6.5	13.5	12.5	0.4	4.2	96	6.5	13.5	12.5	0.3	2.6	98	6.9
14.0	12.1	1.2	10.7	91	6.5	14.0	12.2	0.4	4.2	95	6.5	14.0	12.3	0.3	2.6	100	6.9
14.5	12.1	1.4	12.7	91	7.0	14.5	12.0	0.4	4.1	95	6.4	14.5	12.1	0.3	2.5	101	6.9
15.0	11.7	1.0	8.1	93	6.8	15.0	11.7	0.4	4.0	96	6.5	15.0	11.9	0.3	2.4	101	6.9
15.5	11.3	0.5	4.4	93	6.6	15.5	11.5	0.4	4.0	101	6.5	15.5	11.3	0.3	2.5	105	6.9
16.0	11.1	0.5	3.9	98	6.6	16.0	11.2	0.4	3.9	102	6.5	16.0	10.9	0.3	2.4	113	6.9
16.5	10.8	0.4	3.3	102	6.6	16.5	10.9	0.4	3.8	105	6.5	16.5	10.5	0.3	2.4	117	6.8
17.0	10.7	0.3	3.0	101	6.7	17.0	10.8	0.4	4.0	106	6.5	17.0	10.4	0.3	2.5	119	6.9
17.5	10.4	0.3	3.0	103	6.7	17.5	10.6	0.4	3.8	107	6.5	17.5	10.1	0.3	2.4	122	6.9
18.0	10.3	0.3	2.9	107	6.7	18.0	10.4	0.4	3.9	110	6.6	18.0	9.9	0.3	2.2	128	0.3
18.5	10.1	0.3	3.1	109	6.7	18.5	10.1	0.4	3.9	114	6.6	18.5	9.7	0.3	2.2	135	6.9
19.0	9.9	0.3	3.1	111	6.7	19.0	9.8	0.4	3.8	124	6.6	19.0	9.5	0.3	2.2	144	6.9
19.5	9.8	0.3	3.1	103	6.7	19.4	bottom					19.4	9.5	0.3	2.8	390	7.2

Highlighted Depth: Opening of the intake forebay (2 to 10 m)

Appendix B- 4
Peavy Hydroelectric Project
Vertical Profile Data -

18-Sep-01						3-Oct-01					
Approximate air temp: 10 C						*Approximate air temp: 10 C*					
Secci Depth:7.0 ft. water depth 65' to 66'				*Time: 1445*		*Secci Depth:8.0 ft. water depth 65' to 66'*				*Time: 0845*	
Winds S SE breeze				*100% clouds*		*North winds 4-7 mph*				*100% clouds*	
										foggy, misty	
Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)	Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	18.3	7.6	82.8	136	7.8	0.0	14.8	9.4	94.3	131	8.0
0.5	18.2	7.5	81.9	135	7.8	0.5	14.8	9.3	94.3	131	8.0
1.0	18.2	7.4	80.6	135	7.8	1.0	14.8	9.3	94.3	131	8.0
1.5	18.2	7.3	7.8	135	7.8	1.5	14.7	9.3	93.7	131	8.0
2.0	18.2	7.1	79.9	134	7.7	2.0	14.7	9.3	93.6	131	8.0
2.5	18.1	7.1	76.9	134	7.7	2.5	14.7	9.3	93.4	131	8.0
3.0	18.1	7.0	76.1	135	7.7	3.0	14.6	9.3	93.3	131	8.0
3.5	18.1	7.2	77.7	135	7.7	3.5	14.6	9.3	93.3	131	8.0
4.0	18.1	7.1	77.6	135	7.7	4.0	14.6	9.3	92.9	131	8.0
4.5	18.1	7.0	76.6	135	7.7	4.5	14.6	9.2	92.3	131	8.0
5.0	18.1	7.0	75.3	135	7.7	5.0	14.6	8.9	90.2	132	8.0
5.5	18.1	6.9	74.6	135	7.7	5.5	14.3	8.7	86.7	132	7.9
6.0	18.1	6.8	74.2	136	7.7	6.0	14.2	8.6	85.5	133	7.9
6.5	18.1	6.8	73.4	135	7.6	6.5	14.2	8.5	85.5	133	7.9
7.0	18.0	6.6	71.8	137	7.6	7.0	14.2	8.5	84.7	133	7.9
7.5	18.0	6.7	72.3	137	7.6	7.5	14.2	8.5	84.8	132	7.9
8.0	17.9	6.6	71.7	136	7.6	8.0	14.1	8.5	84.8	133	7.9
8.5	17.9	6.6	71.3	137	7.6	8.5	14.1	8.5	84.9	133	7.9
9.0	17.8	6.5	70.7	140	7.6	9.0	14.1	8.5	84.9	133	7.9
9.5	17.8	6.5	69.8	141	7.6	9.5	14.1	8.5	85.0	133	7.9
10.0	17.5	6.4	68.1	140	7.5	10.0	14.0	8.5	84.5	136	7.9
10.5	17.3	5.9	63.5	142	7.5	10.5	13.9	8.5	84.3	141	7.9
11.0	17.1	5.6	59.2	146	7.5	11.0	13.8	8.5	84.1	147	7.9
11.5	16.9	4.1	44.3	138	7.3	11.5	13.7	8.5	83.9	148	7.9
12.0	16.4	1.6	16.2	123	7.2	12.0	13.6	8.5	83.3	152	7.9
12.5	16.0	0.6	6.0	115	7.1	12.5	13.4	8.4	81.8	167	7.9
13.0	15.0	0.5	4.7	105	7.0	13.0	13.4	8.3	81.6	164	7.9
13.5	14.1	0.5	4.7	103	7.0	13.5	13.4	8.3	81.4	161	7.9
14.0	13.4	0.5	4.6	102	7.0	14.0	13.4	8.3	81.4	168	7.9
14.5	12.9	0.5	4.6	103	7.0	14.5	13.3	8.3	81.0	174	7.9
15.0	12.5	0.5	4.4	104	7.0	15.0	13.2	8.3	81.1	156	7.9
15.5	12.2	0.5	4.5	105	7.0	15.5	13.1	8.3	80.8	155	7.9
16.0	11.7	0.5	4.4	108	7.0	16.0	13.1	8.2	80.1	164	7.9
16.5	11.3	0.5	4.3	117	7.0	16.5	13.0	8.1	78.3	173	7.9
17.0	10.8	0.5	4.3	121	7.0	17.0	13.0	8.2	79.5	174	7.9
17.5	10.4	0.5	4.3	127	7.0	17.5	12.9	7.6	75.3	174	7.8
18.0	10.2	0.5	4.1	131	7.1	18.0	12.8	7.3	70.3	165	7.8
18.5	10.1	0.5	4.2	139	7.1	18.5	12.8	7.1	68.0	158	7.8
19.0	19.0	0.5	4.1	14.6	7.1	19.0	12.6	6.7	64.0	175	7.7
19.5	9.6	0.5	4.1	152	7.2	19.5	12.6	6.5	62.6	164	7.7

Highlighted Depth: Opening of the intake forebay (2 to 10 m)

Appendix B- 5

Michigamme Falls Hydroelectric Project

Vertical Profile Data -

14-Feb-01						25-Apr-01						15-May-01					
Approximate air temp: -7.7 C			*Time: 15:45*			*Approximate air temp: 10 C*			*Time: 14:45*			*Approximate air temp. : 16 C*			*Time: 1730*		
Secci Depth 6.0 ft			*Sunny, Cold and*			*Secci Depth 4.5 ft*			*Sunny 30% clouds*			*Secci Depth: 6.0 ft water depth: 40-43'*			*Overcast, misty*		
NNW winds 12-18 mph and gusty			*windy*			*NNW breeze 8-12 mph*						*SSE wind 8-12 mph*			*foggy*		
Ice Thickness 15-20"																	
Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH	Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH	Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	0.2	11.3	78.4	106	7.5	0.0	8.9	11.6	102.8	82	7.4	0.0	14.1	9.2	91.8	91	7.3
0.5	0.4	11.2	74.9	147	7.5	0.5	9.0	11.4	101.3	82	7.3	0.5	14.1	9.2	91.8	91	7.3
1.0	0.5	11.0	77.4	147	7.5	1.0	8.9	11.3	100.0	82	7.3	1.0	14.1	9.2	91.8	91	7.3
1.5	0.6	11.0	77.0	151	7.5	1.5	8.5	11.3	99.9	82	7.3	1.5	14.1	9.2	91.5	91	7.3
2.0	0.8	10.9	77.3	157	7.5	2.0	8.3	11.3	98.5	82	7.3	2.0	14.1	9.2	91.3	92	7.3
2.5	1.1	10.8	77.7	153	7.5	2.5	8.2	11.2	98.0	81	7.3	2.5	14.0	9.1	90.0	91	7.3
3.0	1.1	10.9	78.1	154	7.5	3.0	7.5	11.2	95.6	81	7.3	3.0	14.0	9.1	91.0	91	7.3
3.5	1.1	10.9	78.2	166	7.5	3.5	7.0	11.2	94.8	81	7.3	3.5	14.1	9.1	90.7	92	7.3
4.0	1.1	10.9	77.8	152	7.5	4.0	7.0	11.2	94.5	81	7.2	4.0	14.1	9.1	90.5	91	7.3
4.5	1.1	10.9	77.7	161	7.5	4.5	6.9	11.2	94.0	81	7.2	4.5	14.1	9.1	90.6	92	7.3
5.0	1.1	10.9	77.6	157	7.5	5.0	6.8	11.1	93.8	82	7.2	5.0	14.0	9.0	90.2	92	7.3
5.5	1.2	10.8	77.9	163	7.5	5.5	6.8	11.1	93.4	82	7.2	5.5	14.0	9.0	90.0	92	7.3
6.0	1.2	10.9	77.5	170	7.4	6.0	6.8	11.1	93.0	83	7.2	6.0	14.0	9.0	89.9	92	7.2
6.5	1.2	10.8	77.6	156	7.4	6.5	6.8	11.0	92.8	82	7.2	6.5	13.9	9.0	89.2	92	7.3
7.0	1.2	10.8	77.6	165	7.4	7.0	6.7	11.1	93.2	83	7.2	7.0	13.9	8.9	89.0	92	7.2
7.5	1.2	10.8	77.7	164	7.4	7.5	6.7	11.1	93.4	83	7.2	7.5	13.9	8.9	89.1	92	7.2
8.0	1.2	10.8	77.4	148	7.4	8.0	6.7	11.1	93.2	82	7.2	8.0	13.9	8.9	88.6	93	7.2
8.5	1.2	10.8	77.4	158	7.4	8.5	6.3	11.0	91.3	82	7.2	8.5	13.8	8.9	87.9	92	7.2
9.0	1.2	10.8	77.2	165	7.4	9.0	6.2	11.0	91.1	82	7.2	9.0	13.8	8.8	87.7	92	7.2
9.5	1.2	10.8	77.2	158	7.4	9.5	6.3	11.0	91.6	84	7.2	9.5	13.8	8.8	87.2	92	7.2
10.0	1.2	10.8	77.0	155	7.4	10.0	6.2	11.0	91.3	83	7.2	10.0	13.8	8.8	87.7	90	7.2
10.5	1.2	10.8	77.1	168	7.4	10.5	6.2	10.9	90.8	83	7.2	10.5	13.8	8.8	87.7	90	7.2
11.0	1.2	10.8	77.0	164	7.4	11.0	6.2	10.9	90.6	83	7.2	11.0	13.8	8.8	87.6	92	7.2
11.5	1.2	10.8	77.2	153	7.4	11.5	6.2	10.9	90.5	85	7.2	11.5	13.8	8.8	87.4	92	7.2
12.0	1.2	10.8	72.2	161	7.4	12.0	6.1	11.0	90.5	83	7.2	12.0	13.8	8.8	87.2	93	7.2
12.5	1.2	10.7	77.0	160	7.4	12.5	6.1	11.0	90.6	84	7.2	12.5	13.8	8.8	87.0	92	7.2
12.8	1.2	10.7	76.8	151	7.2	12.6	bottom					13.0	13.8	8.7	85.0	93	7.2

Highlighted depths- Opening to intake forebay (1.5 to 9.4m)

Appendix B- 5

Michigamme Falls Hydroelectric Project

Vertical Profile Data -

7-Jun-01

Approximate air temp. : 21 C — *Time: 1250*

Secci Depth: 6.0 ft water depth: 40-43' — *50% clouds*

Light variable winds — *sunny, beautiful day*

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	18.1	9.1	99.3	96	7.4
0.5	16.8	9.4	99.9	95	7.5
1.0	16.3	9.3	97.8	95	7.5
1.5	16.1	9.3	96.6	95	7.4
2.0	15.9	9.1	94.9	94	7.4
2.5	15.4	9.1	93.7	94	7.4
3.0	15.2	9.1	92.9	94	7.4
3.5	15.0	9.0	91.9	94	7.3
4.0	14.9	9.0	91.2	93	7.3
4.5	14.8	8.9	90.3	95	7.3
5.0	14.7	8.9	89.6	95	7.3
5.5	14.5	8.8	88.2	95	7.3
6.0	14.4	8.7	87.6	94	7.3
6.5	14.3	8.7	87.0	94	7.3
7.0	14.4	8.7	87.0	93	7.3
7.5	14.3	8.7	86.4	93	7.2
8.0	14.3	8.6	86.0	93	7.2
8.5	14.3	8.6	86.3	94	7.2
9.0	14.3	8.6	86.4	94	7.2
9.5	14.2	8.6	86.4	93	7.2
10.0	14.2	8.6	85.7	95	7.2
10.5	14.2	8.5	85.3	93	7.2
11.0	14.2	8.5	85.3	94	7.2
11.5	14.2	8.5	85.1	93	7.2
11.9	14.2	8.5	84.6	94	7.2

21-Jun-01

Approximate air temp. : 21 C — *Time: 1030*

Secci Depth: 6.0 ft water depth: 40-42' — *100% overcast*

Calm — *Drizzly*

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	19.2	8.2	91.5	102	7.4
0.5	19.2	8.2	91.3	101	7.3
1.0	19.2	8.1	90.1	101	7.3
1.5	19.2	8.0	89.0	100	7.3
2.0	19.1	8.0	88.9	101	7.3
2.5	19.1	7.9	87.8	101	7.3
3.0	19.0	8.0	88.2	101	7.2
3.5	18.8	7.7	86.1	101	7.2
4.0	18.7	7.7	85.0	102	7.2
4.5	18.5	7.5	82.7	102	7.2
5.0	18.4	7.6	83.2	102	7.2
5.5	18.4	7.4	81.3	101	7.3
6.0	18.4	7.5	81.9	101	7.2
6.5	18.3	7.4	80.7	101	7.2
7.0	18.3	7.4	79.8	99	7.1
7.5	18.1	7.2	77.5	100	7.1
8.0	18.0	7.1	77.1	99	7.1
8.5	17.9	7.1	76.8	101	7.1
9.0	17.9	7.0	76.3	100	7.1
9.5	17.8	7.1	76.6	101	7.1
10.0	17.8	6.9	74.8	100	7.0
10.5	17.8	6.9	74.7	101	7.0
11.0	17.6	6.7	71.7	99	7.0
11.5	17.6	6.6	71.4	101	7.0
12.0	17.5	6.5	69.4	99	7.0
12.5	17.4	6.3	67.9	99	7.0
12.8	17.3	6.2	66.8	100	7.0

11-Jul-01

Approximate air temp. : 22 C — *Time: 1130*

Secci Depth: 6.5 ft water depth: 40-42' — *30% clouds*

NNW winds 8-12 mph and gusty

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	22.4	8.5	100.3	110	7.6
0.5	22.4	8.4	101.0	110	7.6
1.0	22.4	8.5	101.0	110	7.6
1.5	22.3	8.5	100.5	110	7.6
2.0	22.3	8.5	100.0	110	7.6
2.5	22.3	8.4	99.7	111	7.6
3.0	22.3	8.4	99.7	110	7.6
3.5	22.3	8.4	99.6	110	7.6
4.0	22.2	8.4	99.0	111	7.6
4.5	22.2	8.3	98.0	110	7.5
5.0	22.2	8.3	98.6	110	7.5
5.5	22.1	8.4	98.3	110	7.5
6.0	21.8	8.2	96.1	110	7.5
6.5	21.8	8.1	94.4	110	7.5
7.0	20.9	7.2	82.6	111	7.2
7.5	20.7	7.1	81.9	109	7.2
8.0	20.5	7.0	79.4	111	7.2
8.5	20.3	6.8	77.7	110	7.1
9.0	20.2	6.6	74.7	109	7.1
9.5	19.8	6.3	70.7	108	7.1
10.0	19.8	6.2	69.4	109	7.1
10.5	19.8	6.0	67.7	109	7.0
11.0	19.7	5.9	66.1	109	7.0
11.5	19.6	5.9	65.9	107	7.0
12.0	19.5	5.7	63.8	108	7.0
12.5	19.3	5.3	58.8	111	6.9
12.9	19.2	5.1	56.9	111	6.9

Appendix B- 5

Michigamme Falls Hydroelectric Project

Vertical Profile Data -

27-Jul-01						9-Aug-01						22-Aug-01					
Approximate air temp. : 20 C				*Time: 1015*		*Approximate air temp. : 29 C*				*Time: 0915*		*Approximate air temp. : 24 C*				*Time: 1515*	
Secci Depth: 6.5 ft water depth: 40-42'				*Light Clouds*		*Secci Depth: 6.0 ft water depth: 40-42'*				*10% clouds, warm*		*Secci Depth: 8.0 ft water depth: 40-42'*				*Sunny and clear*	
Winds calm to light easterly 1-3 mph						*Winds WSW 8-12 mph.*				*muggy day*		*Light north wind*					
Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)	Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)	Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	22.8	7.3	86.6	113	7.4	0.0	25.7	7.2	90.9	123	7.7	0.0	23.1	6.9	81.7	123	7.4
0.5	22.8	7.1	85.3	113	7.5	0.5	25.7	7.4	92.4	122	7.7	0.5	22.9	7.1	82.9	122	7.4
1.0	22.8	7.2	85.7	113	7.5	1.0	25.6	7.4	92.5	122	7.7	1.0	22.6	7.2	83.9	123	7.5
1.5	22.8	7.2	85.7	113	7.5	1.5	25.5	7.4	93.1	122	7.8	1.5	22.3	7.2	83.9	123	7.5
2.0	22.8	7.2	85.2	113	7.5	2.0	24.9	6.3	77.3	123	7.4	2.0	22.3	7.2	83.9	122	7.6
2.5	22.8	6.9	81.2	113	7.4	2.5	24.6	5.8	71.8	123	7.2	2.5	22.3	7.0	81.5	123	7.6
3.0	22.7	6.9	82.8	113	7.4	3.0	24.4	5.5	68.7	123	7.2	3.0	22.3	7.0	80.7	122	7.6
3.5	22.7	6.9	81.5	113	7.4	3.5	24.3	5.5	66.6	123	7.2	3.5	21.7	6.2	71.1	122	7.6
4.0	22.7	6.9	82.6	113	7.4	4.0	24.1	5.4	65.7	123	7.1	4.0	21.4	6.2	71.4	123	7.6
4.5	22.7	6.9	81.8	113	7.4	4.5	24.1	5.3	65.1	123	7.1	4.5	21.3	6.2	69.6	122	7.6
5.0	22.7	6.8	79.6	113	7.4	5.0	23.9	5.3	64.0	123	7.1	5.0	21.3	5.9	67.2	122	7.5
5.5	22.6	6.6	77.5	113	7.3	5.5	23.9	5.3	63.3	122	7.1	5.5	21.3	5.9	66.5	122	7.5
6.0	22.5	6.3	75.1	114	7.3	6.0	23.8	5.2	63.6	123	7.1	6.0	21.1	5.8	66.5	122	7.5
6.5	22.5	5.9	69.9	114	7.2	6.5	23.7	5.1	61.0	122	7.1	6.5	21.1	5.8	66.2	123	7.6
7.0	22.5	5.8	68.9	114	7.2	7.0	23.3	4.8	58.5	122	7.0	7.0	21.1	5.3	60.4	123	7.5
7.5	22.5	5.9	69.8	112	7.1	7.5	23.0	4.4	53.8	120	7.0	7.5	21.0	5.3	58.9	123	7.5
8.0	22.3	5.5	63.5	113	7.1	8.0	22.9	4.5	53.6	120	7.0	8.0	21.0	5.2	58.8	123	7.5
8.5	22.2	5.2	58.5	113	7.1	8.5	22.5	3.8	45.0	121	6.9	8.5	20.9	5.1	58.0	123	7.5
9.0	22.1	4.8	55.1	112	7.1	9.0	22.3	3.6	44.2	121	6.9	9.0	20.9	5.4	60.8	123	7.5
9.5	21.9	4.3	48.5	111	6.9	9.5	22.3	3.5	41.8	121	6.8	9.5	20.9	5.3	59.8	123	7.5
10.0	21.9	4.2	49.3	113	6.9	10.0	22.3	3.5	41.8	121	6.8	10.0	20.9	5.3	59.8	123	7.5
10.5	21.8	4.0	46.9	113	6.9	10.5	22.2	3.5	41.6	121	6.8	10.5	20.9	5.3	59.4	123	7.5
11.0	21.5	3.4	40.6	113	6.8	11.0	22.1	3.3	39.0	120	6.8	11.0	20.8	4.7	53.2	126	7.5
11.5	21.4	3.5	39.4	111	6.8	11.5	21.9	3.0	35.5	121	6.8	11.5	20.8	4.7	54.3	125	7.5
12.0	21.2	3.2	30.3	115	6.8	12.0	21.6	2.7	31.9	123	6.8	12.0	20.7	4.7	53.7	126	7.5
12.5	20.8	2.7	30.3	115	6.8	12.5	21.3	2.1	24.5	124	6.8	12.5	20.5	3.9	42.1	129	7.4
13.0	20.2	2.3	21.3	117	6.8	12.8	bottom					12.8					
13.1	bottom					13.1						13.1					

Appendix B- 5

Michigamme Falls Hydroelectric Project
Vertical Profile Data -

18-Sep-01						3-Oct-01					
Approximate air temp. : 13 C			*Time: 1610*			*Approximate air temp. : 10 C*			*Time: 1610*		
Secci Depth: 8.0 ft water depth: 40-42'			*100% Overcast*			*Secci Depth:7.5 ft water depth: 40-42'*			*100% Overcast*		
calm						*N winds 4-7 mph.*					
Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)	Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	18.5	7.1	77.6	132	7.8	0.0	14.6	8.9	90.3	130	8.0
0.5	18.5	7.1	77.7	132	7.8	0.5	14.9	8.9	90.3	131	8.0
1.0	18.5	7.0	77.1	133	7.8	1.0	14.9	8.9	90.5	131	8.0
1.5	18.5	7.1	77.4	132	7.7	1.5	14.8	8.8	89.1	130	8.0
2.0	18.4	7.1	77.6	132	7.7	2.0	14.8	8.7	87.9	131	8.0
2.5	18.4	7.0	76.7	132	7.7	2.5	14.8	8.7	88.2	132	7.9
3.0	18.4	7.0	76.2	132	7.7	3.0	14.8	8.7	87.9	132	7.9
3.5	18.4	7.0	76.7	132	7.7	3.5	14.8	8.6	87.3	131	7.9
4.0	18.4	6.9	75.5	132	7.7	4.0	14.8	8.6	87.3	131	7.9
4.5	18.4	6.9	75.3	132	7.7	4.5	14.7	8.7	87.7	131	7.9
5.0	18.3	6.8	74.6	132	7.7	5.0	14.7	8.7	87.3	132	7.9
5.5	18.3	6.8	74.8	132	7.6	5.5	14.7	8.5	85.9	131	7.9
6.0	18.3	6.8	74.5	132	7.6	6.0	14.6	8.3	83.4	131	7.8
6.5	18.3	6.7	73.3	132	7.6	6.5	14.6	8.3	83.0	131	7.8
7.0	18.3	6.7	73.3	132	7.6	7.0	14.6	8.2	82.4	130	7.8
7.5	18.3	6.9	75.2	132	7.6	7.5	14.6	8.2	82.4	131	7.8
8.0	18.3	6.7	73.0	130	7.6	8.0	14.6	8.2	82.5	131	7.8
8.5	18.3	6.6	72.1	131	7.6	8.5	14.6	8.2	82.5	131	7.8
9.0	18.3	6.6	71.6	132	7.6	9.0	14.5	8.1	81.3	130	7.8
9.5	18.2	6.6	71.4	131	7.6	9.5	14.5	8.1	81.0	130	7.8
10.0	18.2	6.5	70.5	132	7.6	10.0	14.5	8.0	80.4	129	7.8
10.5	18.2	6.4	68.6	131	7.6	10.5	14.5	8.0	79.8	128	7.8
11.0	18.2	6.3	67.9	132	7.5	11.0	14.5	8.0	80.1	129	7.7
11.5	18.2	6.2	67.9	131	7.5	11.5	14.5	8.0	79.6	130	7.8
12.0	18.2	6.2	67.1	131	7.5	12.0	14.5	7.9	79.2	130	7.8
12.5	18.2	6.0	67.3	133	7.5	12.5	14.5	7.8	78.5	130	7.8
12.9	18.2	5.9	63.8	133	7.5	12.7	bottom				
13.1						13.1					

Appendix B- 6
Twin Falls Hydroelectric Project
Vertical Profile Data

14-Feb-01

Approximate air temp: -22.2 C
Secci Depth:6.0 ft. *Time: 0700-0830*
Light north wind *Overcast*
Ice thickness: 7-8"

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	0.5	11.9	83.8	171	7.4
0.5	0.4	112.0	84.0	172	7.4
1.0	0.5	11.9	83.4	176	7.4
1.5	0.5	11.9	83.4	172	7.4
2.0	0.5	11.8	83.2	176	7.4
2.5	0.5	11.8	83.2	176	7.4
3.0	0.5	11.8	83.1	176	7.4
3.5	0.5	11.8	83.0	174	7.4
4.0	0.5	11.8	83.0	169	7.4
4.5	0.5	11.8	82.9	171	7.4
5.0	0.5	11.8	82.9	166	7.4
5.5	0.5	11.8	82.8	166	7.4
6.0	0.5	11.8	82.4	174	7.4
6.5	0.5	11.8	82.8	165	7.4
7.0	0.5	11.8	82.8	172	7.4
7.5	0.7	11.7	82.3	165	7.4
8.0	0.7	11.6	82.4	169	7.4
8.5	0.5	11.8	82.3	179	7.4
9.0	0.5	11.7	82.4	176	7.4
9.5	0.5	11.7	82.4	177	7.4
9.6	bottom				

25-Apr-01

Approximate air temp: 10 C
Secci Depth:4.0 ft. *Time: 1600*
Light variable winds 4-7 mph *Sunny 30% clouds*

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	8.4	11.2	97.9	115	7.5
0.5	8.4	11.2	97.7	115	7.5
1.0	8.3	11.1	97.3	115	7.5
1.5	8.3	11.1	96.9	115	7.5
2.0	8.3	11.0	96.1	115	7.5
2.5	8.3	11.0	96.1	115	7.5
3.0	8.3	11.0	95.8	115	7.5
3.5	8.3	10.9	95.5	115	7.5
4.0	8.3	10.9	95.3	115	7.5
4.5	8.3	10.9	95.6	116	7.5
5.0	8.3	10.9	95.6	116	7.5
5.5	8.3	10.9	95.5	116	7.5
6.0	8.3	10.9	95.8	116	7.5
6.5	8.3	11.0	96.2	115	7.4
7.0	8.3	11.0	96.2	114	7.4
7.5	8.3	11.0	96.3	115	7.4
8.0	8.3	11.0	96.4	115	7.4
8.5	8.3	11.0	96.4	114	7.4
9.0	8.2	11.0	96.5	114	7.4
9.5	8.2	11.0	90.4	114	7.4
10.0	8.2	11.0	96.4	116	7.4
10.5	8.3	10.9	95.6	116	7.4
11.0	8.3	10.9	95.6	114	7.4
11.5	8.3	11.0	95.7	115	7.4
12.0	8.3	10.9	95.5	116	7.4
12.5	8.3	10.9	94.7	115	7.4
13.0	8.3	10.8	94.1	114	7.4
13.5	8.3	10.7	94.0	115	7.4
14.0	8.3	10.7	94.0	116	7.4
14.5	8.3	10.8	94.1	113	7.4
15.0	8.3	10.8	93.9	116	7.4
15.5	8.3	10.8	94.0	115	7.4
16.0	8.3	10.8	94.0	115	7.4
16.5	8.3	10.8	94.4	116	7.4
17.0	8.3	10.8	91.6	115	7.4
17.1	Bottom				

15-May-01

Approximate air temp: 15 C
Secci Depth:4.5 ft. *Time: 1900*
SSE wind 8-12 mph with gusts *Overcast, damp, misty*

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	14.0	9.1	90.4	120	7.3
0.5	14.0	9.0	90.1	121	7.4
1.0	14.0	8.9	89.5	121	7.4
1.5	14.0	9.0	89.5	121	7.4
2.0	14.0	9.0	89.3	121	7.4
2.5	14.1	8.9	89.0	121	7.4
3.0	14.0	8.9	88.7	120	7.4
3.5	14.0	8.9	88.4	121	7.4
4.0	14.0	8.9	88.7	121	7.4
4.5	14.0	8.8	88.2	121	7.4
5.0	14.0	8.8	88.0	120	7.4
5.5	14.0	8.8	88.2	122	7.4
6.0	14.1	8.8	88.1	122	7.4
6.5	14.1	8.8	88.0	122	7.4
7.0	14.1	8.8	87.7	122	7.4
7.5	14.1	8.8	87.7	122	7.4
8.0	14.1	8.8	87.4	123	7.4
8.5	14.1	8.8	87.6	123	7.4
9.0	14.1	8.8	87.6	122	7.4
9.5	14.1	8.7	87.5	122	7.4
10.0	14.1	8.8	87.4	124	7.4
10.5	14.0	8.8	87.1	119	7.4
11.0	14.0	8.7	87.3	122	7.4
11.5	14.0	8.7	87.3	122	7.4
12.0	14.0	8.8	87.3	123	7.4
12.5	14.0	8.8	87.4	120	7.4
13.0	14.0	8.7	87.1	122	7.4
13.5	14.0	8.7	87.0	121	7.4
14.0	14.0	8.8	86.8	122	7.4
14.5	14.0	8.7	87.2	122	7.4
15.0	14.0	8.8	87.2	123	7.4
15.5	14.0	8.8	87.3	120	7.4
16.0	14.0	8.8	87.1	122	7.4
16.5	14.0	8.7	86.6	120	7.4
16.8	14.0	8.7	86.7	121	7.4

Highlighted depths- Opening to intake forebay (0-10m)

Appendix B- 6
Twin Falls Hydroelectric Project
Vertical Profile Data

7-Jun-01

Approximate air temp: 21 C
Secci Depth:5.5 ft. water depth 53-56' *Time: 1430*
calm to light variable wind *100% overcast*

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	16.0	9.5	99.3	129	7.6
0.5	15.9	9.4	96.9	128	7.5
1.0	15.8	9.2	95.3	128	7.5
1.5	15.7	9.2	95.7	128	7.5
2.0	15.7	9.2	95.1	128	7.5
2.5	15.6	9.1	94.2	128	7.5
3.0	15.6	9.1	93.9	128	7.5
3.5	15.6	9.1	93.3	128	7.5
4.0	15.5	9.0	92.0	127	7.5
4.5	15.5	8.9	92.0	127	7.5
5.0	15.5	8.9	92.1	128	7.5
5.5	15.4	8.9	92.1	128	7.5
6.0	15.4	8.9	92.1	128	7.4
6.5	15.4	9.0	92.2	128	7.4
7.0	15.4	9.0	92.1	128	7.4
7.5	15.4	9.0	92.1	128	7.4
8.0	15.4	9.0	92.2	127	7.4
8.5	15.3	8.9	91.7	128	7.4
9.0	15.3	8.9	91.4	127	7.4
9.5	15.3	8.9	91.4	128	7.4
10.0	15.3	8.9	91.4	128	7.4
10.5	15.3	8.9	91.3	128	7.4
11.0	15.2	8.9	90.6	128	7.4
11.5	15.2	8.8	89.9	127	7.4
12.0	15.1	8.8	89.8	130	7.4
12.5	15.1	8.8	89.7	129	7.4
13.0	15.0	8.8	89.4	130	7.4
13.5	15.0	8.8	89.2	130	7.4
14.0	14.9	8.7	58.7	132	7.4
14.5	14.9	8.7	88.0	132	7.4
15.0	14.9	8.7	88.2	131	7.4
15.5	14.9	8.7	87.8	131	7.4
16.0	14.8	8.6	87.3	131	7.3
16.4	14.8	8.5	85.9	131	7.3

21-Jun-01

Approximate air temp: 18 C
Secci Depth:5.5 ft. water depth 54-57' *Time: 1230*
calm *100% overcast*
Drizzle

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	19.2	8.0	88.5	140	7.4
0.5	19.2	7.9	88.6	140	7.4
1.0	19.2	7.9	87.7	140	7.4
1.5	19.2	7.8	87.2	139	7.4
2.0	19.2	7.8	87.2	140	7.4
2.5	19.2	7.8	86.9	140	7.4
3.0	19.2	8.0	88.6	140	7.4
3.5	19.2	8.0	88.9	140	7.4
4.0	19.2	7.9	87.6	140	7.4
4.5	19.2	7.9	88.2	140	7.4
5.0	19.2	7.8	87.4	140	7.4
5.5	19.2	7.8	87.1	140	7.4
6.0	19.2	7.8	87.0	140	7.4
6.5	19.2	7.8	86.7	140	7.4
7.0	19.2	7.8	86.7	140	7.4
7.5	19.2	7.8	86.9	140	7.4
8.0	19.2	7.8	86.9	140	7.4
8.5	19.2	7.8	87.1	140	7.4
9.0	19.2	7.8	86.7	140	7.4
9.5	19.2	7.9	87.0	140	7.4
10.0	19.2	7.8	87.4	140	7.4
10.5	19.2	7.9	87.2	140	7.4
11.0	19.2	7.8	87.2	140	7.3
11.5	19.2	7.9	88.3	140	7.4
12.0	19.2	7.9	88.2	139	7.3
12.5	19.2	7.9	87.9	141	7.3
13.0	19.2	7.8	87.3	140	7.3
13.5	19.2	7.9	87.5	140	7.3
14.0	19.2	7.9	87.8	138	7.3
14.5	19.2	7.9	87.5	140	7.3
15.0	19.2	7.9	87.7	138	7.3
15.5	19.2	7.9	87.9	140	7.3
16.0	19.2	7.9	87.1	140	7.3
16.5	19.2	7.8	86.9	141	7.3
16.7	19.2	7.8	86.9	139	7.3

10-Jul-01

Approximate air temp: 26 C
Secci Depth:6.0 ft. water depth 55-57' *Time: 1600*
NW winds 8-12 mph and higher *30-40% clouds*

Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	23.1	8.5	101.7	169	8.0
0.5	23.1	8.4	100.7	167	7.9
1.0	22.8	8.3	98.9	171	7.9
1.5	22.8	8.2	96.5	171	7.9
2.0	22.7	8.1	96.1	170	7.9
2.5	22.6	8.1	96.3	171	7.9
3.0	22.6	8.1	96.4	173	7.8
3.5	22.6	8.1	95.6	172	7.8
4.0	22.4	8.0	95.5	165	7.8
4.5	22.4	8.0	94.6	172	7.8
5.0	22.4	8.0	94.4	172	7.8
5.5	22.4	8.0	94.4	172	7.8
6.0	22.4	8.0	94.9	164	7.8
6.5	22.4	8.0	94.7	168	7.8
7.0	22.3	7.9	93.5	175	7.8
7.5	22.3	7.9	93.0	159	7.7
8.0	22.2	7.8	92.2	167	7.7
8.5	22.2	7.7	90.9	167	7.7
9.0	21.6	7.5	86.8	168	7.7
9.5	21.2	7.2	83.7	167	7.7
10.0	21.2	7.2	83.0	168	7.6
10.5	21.2	7.0	81.2	162	7.5
11.0	21.0	6.9	78.1	181	7.5
11.5	21.0	6.6	75.8	182	7.5
12.0	20.9	6.5	75.4	171	7.5
12.5	20.7	6.5	74.9	164	7.5
13.0	20.6	6.5	73.4	172	7.5
13.5	20.4	6.0	68.4	169	7.4
14.0	20.4	6.0	67.6	176	7.4
14.5	20.3	5.7	64.6	166	7.4
15.0	20.3	5.6	61.9	160	7.3
15.5	20.0	4.7	48.8	169	7.3
16.0	19.3	1.6	17.3	187	7.1
16.5	19.2	1.4	15.5	164	7.1
17.0	19.0	1.2	10.7	184	7.0

Highlighted depths- Opening to intake forebay (0-10m)

Appendix B- 6
Twin Falls Hydroelectric Project
Vertical Profile Data

27-Jul-01						8-Aug-01						23-Aug-01					
Approximate air temp: 18 C						*Approximate air temp: 32 C*						*Approximate air temp: 24 C*					
Secci Depth:6.0 ft. water depth 55-57'				*Time: 0815*		*Secci Depth:5.5 ft. water depth 55-57'*				*Time: 1745*		*Secci Depth:8.0 ft. water depth 55-57'*				*Time: 0905*	
Winds calm to light easterly				*light clouds 30%*						*Clear blue sky*		*Light S. winds 5-10 mph*				*Sunny clear*	
1-3 mph										*5% clouds*							
Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)	Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)	Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	22.9	7.1	84.2	156	7.6	0.0	27.2	7.7	97.7	160	8.0	0.0	22.5	7.5	87.4	178	8.2
0.5	22.9	7.1	84.2	155	7.6	0.5	27.2	7.5	95.4	160	7.9	0.5	22.5	7.4	87.1	178	8.2
1.0	22.9	7.1	84.4	156	7.6	1.0	27.1	7.4	96.1	160	7.9	1.0	22.4	7.4	86.2	178	8.2
1.5	22.9	7.0	84.9	157	7.6	1.5	27.0	7.3	94.8	160	7.9	1.5	22.3	7.4	86.1	179	8.2
2.0	22.9	7.2	86.0	158	7.6	2.0	26.8	7.0	88.2	160	7.7	2.0	22.2	7.3	85.0	180	8.2
2.5	22.9	7.2	85.7	156	7.6	2.5	25.4	6.4	80.9	158	7.6	2.5	22.1	7.3	84.1	180	8.2
3.0	22.9	7.0	83.8	159	7.6	3.0	25.3	6.4	80.8	160	7.5	3.0	22.0	7.2	82.7	180	8.1
3.5	22.9	7.0	84.0	161	7.6	3.5	25.3	6.4	80.4	160	7.5	3.5	21.9	7.0	81.4	181	8.1
4.0	22.9	7.0	83.0	160	7.6	4.0	25.3	6.4	80.7	160	7.5	4.0	21.7	6.9	79.1	183	8.1
4.5	22.9	7.0	82.5	153	7.6	4.5	24.9	6.0	74.1	155	7.4	4.5	21.7	6.4	79.0	184	8.1
5.0	22.9	7.0	82.7	158	7.6	5.0	24.8	6.0	74.0	160	7.4	5.0	21.6	6.8	78.3	184	8.1
5.5	22.9	6.9	82.6	159	7.5	5.5	24.8	6.0	73.3	160	7.3	5.5	21.6	6.8	77.8	184	8.1
6.0	22.9	6.9	82.9	161	7.5	6.0	24.6	5.9	71.8	160	7.3	6.0	21.6	6.8	78.0	184	8.1
6.5	22.9	7.0	83.5	153	7.6	6.5	24.7	5.8	71.3	155	7.3	6.5	21.6	6.8	77.8	184	8.1
7.0	22.9	7.0	83.4	161	7.6	7.0	24.5	5.7	70.2	160	7.3	7.0	21.6	6.8	77.7	184	8.1
7.5	22.9	7.0	83.9	158	7.6	7.5	24.4	5.6	96.0	160	7.3	7.5	21.5	6.7	77.3	184	8.1
8.0	22.9	7.0	83.9	161	7.5	8.0	24.4	5.6	68.9	155	7.3	8.0	21.5	6.6	75.6	185	8.0
8.5	22.9	7.1	84.3	150	7.5	8.5	24.3	5.6	68.6	155	7.3	8.5	21.4	6.6	75.3	185	8.0
9.0	22.9	7.1	84.1	159	7.5	9.0	24.3	5.6	68.3	155	7.3	9.0	21.4	6.6	75.4	185	8.0
9.5	22.9	7.0	83.9	164	7.5	9.5	24.3	5.5	67.7	155	7.3	9.5	21.4	6.6	75.3	185	8.0
10.0	22.9	7.1	84.4	146	7.5	10.0	24.2	5.5	65.3	160	7.2	10.0	21.4	6.3	71.8	185	8.0
10.5	22.9	6.9	81.9	166	7.5	10.5	24.1	4.8	63.3	160	7.2	10.5	21.3	6.3	72.3	184	8.0
11.0	22.9	6.8	81.0	165	7.5	11.0	23.3	4.6	55.5	165	7.2	11.0	21.3	6.3	72.0	184	8.0
11.5	22.9	6.7	79.9	156	7.5	11.5	22.9	4.3	50.0	165	7.1	11.5	21.2	6.2	70.5	184	8.0
12.0	22.9	6.7	79.6	150	7.5	12.0	22.5	4.0	45.7	161	7.1	12.0	21.2	6.1	69.1	184	8.0
12.5	22.8	6.6	78.9	166	7.5	12.5	22.3	3.8	45.2	165	7.0	12.5	21.2	6.0	68.2	183	7.9
13.0	22.8	6.6	78.8	152	7.5	13.0	22.1	3.6	41.7	165	7.0	13.0	21.1	5.7	65.5	183	7.9
13.5	22.8	6.5	78.1	156	7.4	13.5	21.9	3.3	37.0	165	7.0	13.5	21.1	5.6	63.7	182	7.9
14.0	22.3	5.2	62.8	148	7.3	14.0	21.8	3.0	34.4	170	6.9	14.0	21.0	5.5	61.8	180	7.8
14.5	20.5	1.2	9.5	167	7.0	14.5	21.4	1.7	18.0	170	6.9	14.5	20.9	4.6	52.2	178	7.8
15.0	19.0	0.5	5.4	193	6.9	15.0	20.8	0.4	4.1	170	6.8	15.0	20.7	3.3	37.6	178	7.6
15.5	18.5	0.4	4.4	194	6.8	15.5	20.5	0.4	4.0	190	6.8	15.5	20.6	2.8	31.8	180	7.6
16.0	18.1	0.5	5.1	190	6.9	16.0	20.6	0.4	4.0	180	6.8	16.0	20.5	1.8	20.0	183	7.5
16.5	18.0	0.4	4.2	198	6.8	16.5	20.4	0.4	4.4	190	6.0	16.5	20.3	1.0	11.9	189	7.5
16.7	Bottom					16.7	20.4	0.4	4.0	190	6.8	16.7					

Highlighted depths- Opening to intake forebay (0-10m)

Appendix B- 6
Twin Falls Hydroelectric Project
Vertical Profile Data

19-Sep-01						3-Oct-01					
Approximate air temp: 10 C						*Approximate air temp: 10 C*					
Secci Depth:7.5ft. water depth 55-57'				*Time: 0745*		*Secci Depth:7.5ft. water depth 55-57'*				*Time: 10455*	
WNW winds 4-7 mph				*100% clouds*		*WNW winds 4-7 mph*				*100% clouds*	
										Foggy, misty	
Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)	Depth (m)	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH (S.U.)
0.0	17.8	7.9	85.0	188	7.8	0.0	14.9	9.0	91.0	186	8.2
0.5	17.8	7.9	85.3	189	7.8	0.5	14.9	9.0	91.1	187	8.2
1.0	17.8	7.9	85.2	186	7.9	1.0	14.9	9.0	91.1	183	8.2
1.5	17.8	7.8	84.1	185	7.8	1.5	14.9	9.1	91.6	183	8.2
2.0	17.8	7.8	84.0	187	7.8	2.0	14.9	9.0	91.2	182	8.2
2.5	17.8	7.8	84.5	187	7.8	2.5	14.8	8.9	90.7	184	8.1
3.0	17.8	7.7	83.4	190	7.8	3.0	14.8	9.0	90.6	187	8.1
3.5	17.8	7.7	83.2	185	7.8	3.5	14.8	8.9	90.4	182	8.1
4.0	17.8	7.8	84.5	190	7.8	4.0	14.8	8.9	90.2	188	8.1
4.5	17.8	7.8	84.4	185	7.8	4.5	14.8	8.9	89.9	188	8.1
5.0	17.8	7.8	84.3	190	7.8	5.0	14.8	8.9	89.3	188	8.1
5.5	17.8	7.8	84.5	194	7.8	5.5	14.8	8.8	89.2	182	8.1
6.0	17.8	7.8	84.0	187	7.8	6.0	14.8	8.8	89.2	188	8.1
6.5	17.8	7.8	84.1	185	7.8	6.5	14.8	8.8	88.8	187	8.1
7.0	17.8	7.7	83.7	191	7.8	7.0	14.8	8.8	88.9	176	8.1
7.5	17.8	7.8	83.8	188	7.8	7.5	14.8	8.8	89.3	191	8.1
8.0	17.8	7.7	82.4	185	7.8	8.0	14.8	8.9	89.7	176	8.1
8.5	17.8	7.6	82.2	196	7.8	8.5	14.8	8.9	89.7	195	8.1
9.0	17.8	7.6	81.9	191	7.8	9.0	14.8	8.8	88.8	191	8.1
9.5	17.8	7.5	81.7	190	7.8	9.5	14.7	8.8	88.0	182	8.1
10.0	17.8	7.5	81.3	185	7.8	10.0	14.7	8.8	88.3	182	8.1
10.5	17.8	7.6	81.8	181	7.8	10.5	14.7	8.8	88.2	192	8.1
11.0	17.8	7.6	81.8	190	7.7	11.0	14.7	8.7	87.6	199	8.0
11.5	17.8	7.6	81.5	176	7.7	11.5	14.7	8.7	87.5	200	8.0
12.0	17.8	7.5	81.4	185	7.7	12.0	14.7	8.7	87.3	182	8.0
12.5	17.8	7.5	81.4	177	7.8	12.5	14.7	8.6	86.5	193	8.0
13.0	17.8	7.5	81.0	193	7.8	13.0	14.5	8.4	84.7	183	8.0
13.5	17.8	7.6	81.5	173	7.7	13.5	14.5	8.3	81.6	198	8.0
14.0	17.8	7.4	79.3	178	7.8	14.0	14.5	8.2	83.1	192	7.9
14.5	17.8	7.4	80.5	184	7.7	14.5	14.3	7.6	77.4	196	7.9
15.0	17.8	7.5	80.5	180	7.7	15.0	14.5	8.3	83.7	184	8.0
15.5	17.8	7.4	80.6	189	7.7	15.5	14.5	8.0	79.6	184	8.0
16.0	17.8	7.4	79.7	184	7.7	16.0	14.2	7.3	72.9	186	7.8
16.5	17.8	7.4	79.7	184	7.7	16.5	14.2	7.3	72.5	176	7.8
17.0	17.8	7.2	77.0	189	7.8	17.0	14.3	7.3	73.0	185	7.8
						17.3	bottom				

Highlighted depths- Opening to intake forebay (0-10m)

Appendix B-7

Kingsford Hydroelectric Project

Vertical Profile Data -

13-Feb-01

Approximate air temp: -1.1 C

Secci Depth: 5.0 ft. *Time:1630*

W SW wind 8-12 mph *Overcast*

Ice thickness: 12-16" approximately

Depth	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	0.1	12.4	86.1	190	7.5
0.5	0.1	12.3	85.4	191	7.6
1.0	0.1	12.2	84.9	193	7.6
1.5	0.2	12.1	84.3	189	7.6
2.0	0.2	12.1	84.2	186	7.6
2.5	0.2	12.1	84.0	185	7.6
3.0	0.2	12.1	83.8	193	7.6
3.5	0.2	12.0	83.6	187	7.6
4.0	0.2	12.0	83.5	184	7.6
4.5	0.2	12.0	83.4	195	7.6
5.0	0.2	12.0	83.4	187	7.6
5.5	0.2	12.0	83.4	198	7.6
6.0	0.2	12.0	83.4	179	7.6
6.5	0.2	12.0	83.5	195	7.6
7.0	0.2	12.0	83.3	194	7.6
7.5	0.2	12.0	83.2	196	7.6
8.0	0.2	11.9	83.1	195	7.6
8.5	0.2	11.9	82.9	173	7.6
9.0	0.2	11.9	83.1	19	7.6
9.4	0.2	11.9	82.9	196	7.7

24-Apr-01

Approximate air temp: 10 C

Secci Depth: 4.0 ft. *Time:1700*

West wind 8-12 mph *Sunny 30% clouds*

Depth	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	8.8	11.2	98.3	105	7.5
0.5	8.7	11.1	98.3	105	7.5
1.0	8.7	11.1	97.9	105	7.5
1.5	8.6	11.1	97.7	105	7.5
2.0	8.5	11.0	96.1	105	7.5
2.5	8.5	10.9	96.2	104	7.5
3.0	8.5	11.0	96.5	104	7.5
3.5	8.5	11.0	96.5	106	7.5
4.0	8.5	11.0	96.4	105	7.5
4.5	8.4	10.9	94.9	104	7.5
5.0	8.4	10.8	94.7	104	7.5
5.5	8.4	10.9	95.1	105	7.5
6.0	8.4	10.9	95.5	103	7.5
6.5	8.5	10.9	95.5	105	7.5
7.0	8.5	10.9	95.6	105	7.5
7.5	8.4	10.9	95.3	105	7.5
8.0	8.4	10.8	94.8	104	7.5
8.5	8.4	10.8	94.8	104	7.5
9.0	8.4	10.8	94.4	104	7.5
9.5	8.4	10.8	94.4	104	7.5
10.0	8.4	10.7	93.9	105	7.5
10.5	8.4	10.7	93.6	104	7.5
10.9	8.5	10.7	93.9	105	7.5

16-May-01

Approximate air temp: 23.6 C

Secci Depth: 4.5 ft.depth 32-34 ' *Time:1100*

SSW winds 8-12 mph *Sunny 20% clouds*

Bright sun

Depth	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	15.3	9.2	94.5	124	7.4
0.5	15.2	9.2	94.4	124	7.4
1.0	14.9	9.1	92.4	124	7.4
1.5	14.3	8.9	89.6	125	7.4
2.0	14.4	8.9	90.1	125	7.4
2.5	14.4	8.9	90.1	124	7.4
3.0	14.5	8.9	90.1	125	7.4
3.5	14.4	8.9	89.5	125	7.4
4.0	14.3	8.8	88.1	125	7.4
4.5	14.3	8.7	88.0	126	7.4
5.0	14.3	8.8	88.7	125	7.4
5.5	14.2	8.8	88.2	127	7.4
6.0	14.2	8.8	86.9	126	7.4
6.5	14.2	8.8	87.8	127	7.4
7.0	14.1	8.7	86.1	127	7.4
7.5	14.1	8.7	86.6	128	7.4
8.0	14.0	8.6	85.7	128	7.4
8.5	14.0	8.6	85.5	129	7.4
9.0	14.0	8.6	86.3	130	7.4
9.5	14.0	8.6	85.2	130	7.4
9.9	14.0	8.4	84.6	130	7.3

Highlighted depths- opening to intake forebay (0-10m)

Appendix B-7

Kingsford Hydroelectric Project
Vertical Profile Data -

6-Jun-01						21-Jun-01						10-Jul-01					
Approximate air temp: 22 C						*Approximate air temp: 18 C*						*Approximate air temp: 26 C*					
Secci Depth: 5.0 ft.depth 32-34 '				*Time:1700*		*Secci Depth: 4.5 ft.depth 32-34 '*				*Time:1600*		*Secci Depth: 7.0 ft.depth 32-34 '*				*Time:1600*	
Light variable winds				*Sunny 20% clouds*		*Light variable winds*				*100% overcast*		*NW winds 8-12 mph and higher*				*40 to 50 % clouds*	
				Bright sun						*slight drizzle*						*Very pleasant*	
Depth	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH	Depth	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH	Depth	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	16.6	9.9	104.8	144	7.8	0.0	20.2	8.6	97.5	146	7.7	0.0	24.0	9.2	112.6	165	8.3
0.5	16.1	9.7	101.3	143	7.8	0.5	20.1	8.6	96.7	146	7.7	0.5	23.8	8.9	108.6	168	8.2
1.0	15.2	9.6	97.7	143	7.8	1.0	19.7	8.4	93.2	147	7.6	1.0	23.5	8.8	105.8	168	8.1
1.5	15.0	9.5	95.9	143	7.7	1.5	20.0	8.5	97.4	146	7.6	1.5	23.4	8.7	105.0	167	8.0
2.0	14.5	9.4	94.3	142	7.7	2.0	19.5	8.2	92.2	146	7.6	2.0	23.3	8.6	103.9	168	8.0
2.5	14.4	9.4	94.6	143	7.7	2.5	19.5	8.2	91.7	147	7.5	2.5	23.4	8.6	104.4	172	8.0
3.0	14.3	9.4	93.9	143	7.7	3.0	19.4	8.1	91.2	147	7.5	3.0	23.3	8.5	102.6	170	8.0
3.5	14.3	9.3	93.7	143	7.7	3.5	19.5	8.1	90.7	147	7.5	3.5	23.3	8.5	103.1	166	7.9
4.0	14.3	9.3	93.7	143	7.7	4.0	19.4	8.1	89.5	147	7.5	4.0	23.4	8.5	103.0	170	7.9
4.5	14.2	9.3	93.1	143	7.7	4.5	19.3	8.1	89.7	147	7.5	4.5	23.4	8.5	102.8	173	7.9
5.0	14.1	9.3	93.6	144	7.7	5.0	19.3	7.9	88.9	146	7.5	5.0	23.4	8.5	102.1	172	7.9
5.5	14.0	9.3	92.9	144	7.7	5.5	19.2	7.9	87.7	147	7.5	5.5	22.7	8.0	95.7	165	7.8
6.0	13.8	9.4	93.7	143	7.7	6.0	19.2	7.9	87.3	147	7.4	6.0	22.1	7.7	87.8	168	7.7
6.5	13.6	9.4	92.9	142	7.6	6.5	19.2	8.0	89.3	147	7.4	6.5	22.1	7.4	87.2	170	7.6
7.0	13.4	9.3	91.6	144	7.7	7.0	19.2	8.0	89.2	146	7.4	7.0	21.9	7.3	84.7	172	7.6
7.5	13.2	9.3	91.0	143	7.7	7.5	19.2	8.0	89.5	147	7.4	7.5	21.8	7.2	84.0	176	7.6
8.0	13.2	9.3	91.3	143	7.7	8.0	19.2	8.0	88.0	147	7.4	8.0	21.2	7.0	82.2	181	7.5
8.5	13.1	9.3	91.0	142	7.7	8.5	19.2	7.9	87.8	148	7.4	8.5	21.1	6.7	78.4	177	7.5
9.0	12.9	9.3	90.3	143	7.6	9.0	19.2	8.1	90.1	148	7.5	9.0	20.7	6.7	74.4	173	7.4
9.5	12.8	9.2	89.5	143	7.6	9.5	19.2	8.1	90.1	148	7.5	9.5	20.6	6.4	73.2	178	7.4
10.0	12.8	9.2	88.7	141	7.6	10.0	19.1	8.0	88.5	146	7.5	10.0	20.6	6.4	72.4	178	7.4
						10.5	19.1	8.1	89.1	146	7.4	10.3	20.5	6.0	68.8	175	7.4
						10.6	Bottom										

☐ Highlighted depths- opening to intake forebay (0-10m)

Appendix B-7
Kingsford Hydroelectric Project
Vertical Profile Data -

28-Jul-01

Approximate air temp: 21 C

Secci Depth:4.5 ft.depth 32-34 ' *Time:0745*

winds calm *100 % clouds, raining*

Depth	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	22.7	8.4	99.7	180	7.7
0.5	22.7	8.5	101.9	176	7.7
1.0	22.7	8.3	96.3	181	7.7
1.5	22.7	8.1	96.2	179	7.7
2.0	22.7	7.8	93.5	177	7.7
2.5	22.7	7.5	91.9	176	7.7
3.0	22.7	7.8	92.0	176	7.7
3.5	22.7	7.3	86.2	171	7.7
4.0	22.7	7.2	85.8	177	7.7
4.5	22.7	7.2	86.0	184	7.7
5.0	22.7	7.0	83.2	172	7.6
5.5	22.5	6.9	81.3	174	7.6
6.0	22.4	6.8	80.5	168	7.6
6.5	22.3	6.8	79.9	177	7.6
7.0	22.3	6.8	80.7	173	7.6
7.5	22.2	6.8	79.6	173	7.6
8.0	22.2	6.7	78.9	173	7.6
8.5	22.2	6.7	78.6	184	7.6
9.0	22.2	6.6	78.2	184	7.6
9.5	22.2	6.6	78.0	178	7.6
10.0	22.2	6.7	78.6	173	7.6
10.2	22.2	6.6	77.3	168	7.6

9-Aug-01

Approximate air temp: 31 C

Secci Depth:5.5 ft.depth 32-34 ' *Time:1130*

Breezy NE winds 8-12 mph *80 % clouds,*

Depth	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	27.4	7.8	100.3	183	8.1
0.5	27.4	7.7	99.5	181	8.1
1.0	27.3	7.6	98.8	180	8.1
1.5	27.3	7.6	99.8	182	8.1
2.0	27.3	7.6	97.5	183	8.1
2.5	27.0	7.4	94.0	180	7.1
3.0	26.6	6.8	85.6	174	7.7
3.5	26.4	6.7	84.6	172	7.7
4.0	26.2	6.5	83.2	170	7.6
4.5	26.1	6.4	81.0	172	7.5
5.0	25.9	6.3	80.1	168	7.5
5.5	25.9	6.3	78.5	170	7.4
6.0	25.8	6.2	77.8	168	7.4
6.5	25.7	6.0	75.6	168	7.4
7.0	25.6	6.0	76.0	168	7.4
7.5	25.6	6.0	72.0	160	7.4
8.0	25.4	5.8	71.5	160	7.3
8.5	25.3	5.7	71.2	165	7.3
9.0	25.3	5.7	71.5	170	7.3
9.5	25.0	5.3	62.1	155	7.2
10.0	24.5	4.6	52.7	165	7.2
10.2	24.5	4.6	58.7	170	7.2

23-Aug-01

Approximate air temp: 21 C

Secci Depth:6.5 ft.depth 32-34 ' *Time:0755*

Winds East 10-12 mph *Clear*

Depth	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	22.8	8.0	93.7	182	8.2
0.5	22.7	8.0	92.8	183	8.3
1.0	22.8	8.0	94.2	182	8.3
1.5	22.7	7.9	94.3	182	8.3
2.0	22.7	7.9	92.6	182	8.3
2.5	22.4	7.8	90.5	182	8.3
3.0	22.0	7.4	85.5	182	8.2
3.5	22.0	7.6	87.5	183	8.2
4.0	21.9	7.3	84.7	183	8.2
4.5	21.7	7.3	84.3	186	8.2
5.0	21.7	7.3	83.8	188	8.2
5.5	21.6	7.1	81.4	186	8.2
6.0	21.4	7.2	82.6	195	8.2
6.5	21.4	7.2	82.8	195	8.2
7.0	21.0	7.3	82.3	205	8.2
7.5	20.8	6.9	77.9	204	8.2
8.0	20.7	7.0	79.3	208	8.2
8.5	20.6	6.9	77.7	210	8.2
9.0	20.4	6.6	73.5	210	8.1
9.5	20.3	6.5	72.5	211	8.1
10.0	20.1	5.9	67.2	214	8.1
10.5	20.1	6.2	69.0	212	8.1

[ ] Highlighted depths- opening to intake forebay (0-10m)

Appendix B-7

Kingsford Hydroelectric Project

Vertical Profile Data -

19-Sep-01						3-Oct-01					
Approximate air temp: 10 C						*Approximate air temp: 10 C*					
Secci Depth:7.5 ft.depth 32-34 '			*Time:0900*			*Secci Depth:8.5 ft.depth 32-34 '*			*Time:1400*		
Winds WNW 4-7 mph			*100% clouds*			*Northernly winds 8-12 mph*			*100% clouds*		
									Drizzling		
Depth	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH	Depth	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	18.0	8.2	88.7	194	8.0	0.0	15.3	9.4	95.1	176	8.2
0.5	18.0	8.0	86.9	191	8.0	0.5	15.3	9.2	94.2	175	8.3
1.0	18.0	8.0	86.7	191	8.0	1.0	15.3	9.2	94.5	180	8.3
1.5	18.0	8.0	87.0	193	8.0	1.5	15.3	9.2	94.1	177	8.2
2.0	18.0	7.9	85.0	191	8.0	2.0	15.3	9.2	94.6	179	8.2
2.5	18.0	7.9	85.4	191	8.0	2.5	15.3	9.3	94.1	173	8.2
3.0	18.0	7.9	85.5	187	8.0	3.0	15.3	9.2	93.9	177	8.2
3.5	18.0	7.8	85.3	189	8.0	3.5	15.3	9.2	94.1	177	8.2
4.0	18.0	7.7	83.4	186	7.9	4.0	15.3	9.2	93.8	179	8.2
4.5	18.0	7.6	82.5	189	7.9	4.5	15.3	9.2	93.2	180	8.2
5.0	17.9	7.5	80.8	189	7.9	5.0	15.2	9.1	92.9	180	8.2
5.5	17.7	7.4	79.5	198	7.9	5.5	14.8	9.0	90.4	182	8.1
6.0	17.2	7.5	80.8	203	7.9	6.0	14.4	8.9	88.3	199	8.1
6.5	16.9	7.6	81.2	200	7.9	6.5	13.9	8.9	87.7	204	8.1
7.0	16.6	7.5	77.7	216	7.9	7.0	13.8	8.7	86.2	207	8.2
7.5	16.4	7.3	76.8	211	7.9	7.5	14.0	8.7	87.1	193	8.1
8.0	16.4	7.3	76.6	213	7.9	8.0	13.5	8.7	85.7	204	8.1
8.5	16.3	7.4	76.8	208	7.9	8.5	13.4	8.7	85.1	215	8.1
9.0	16.3	7.3	76.6	206	7.9	9.0	13.3	8.7	84.8	204	8.1
9.5	16.3	7.3	77.4	209	7.9	9.5	13.3	8.6	83.7	213	8.1
10.0	16.3	7.1	73.9	208	7.9	10.0	13.2	8.6	83.9	209	8.1
10.5						10.4	13.2	8.4	83.0	204	8.1

Highlighted depths- opening to intake forebay (0-10m)

Appendix B-8
Big Quinnesec Falls Hydroelectric Project
Vertical Profile Data

13-Feb-01

Approximate air temp: -1.1 C
Secci Depth: 6.0 ft. *Time:1500*
W SW wind 8-12 mph *Overcast*
Ice thickness: 12-16" approximately

Depth	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	0.1	12.5	86.5	195	7.5
0.5	0.1	12.4	86.0	193	7.5
1.0	0.1	12.3	85.6	191	7.5
1.5	0.1	12.3	85.3	195	7.5
2.0	0.1	12.3	85.1	189	7.5
2.5	0.1	12.2	85.0	191	7.5
3.0	0.1	12.2	84.8	193	7.5
3.5	0.1	12.2	84.9	195	7.5
4.0	0.1	12.2	84.8	189	7.5
4.5	0.1	12.2	84.6	196	7.6
5.0	0.1	12.2	84.4	193	7.6
5.5	0.1	12.1	84.3	204	7.6
6.0	0.1	12.1	84.3	185	7.6
6.5	0.1	12.1	84.3	190	7.6
7.0	0.1	12.1	84.3	198	7.6
7.5	0.1	12.1	83.9	181	7.6
8.0	0.1	12.1	83.9	179	7.6
8.5	0.1	12.1	84.1	197	7.6
9.0	0.1	12.1	83.9	198	7.6
9.5	0.1	12.1	83.8	197	7.6
10.0	0.1	12.1	83.9	206	7.6
10.5	0.1	12.1	83.9	185	7.6
11.0	0.1	12.0	83.6	202	7.6
11.5	0.1	12.0	83.6	181	7.6
12.0	0.1	12.0	83.6	185	7.6
12.5	0.1	12.0	83.4	202	7.6
13.0	0.1	12.0	83.4	191	7.7
13.5	0.1	12.0	83.4	185	7.7
14.0	0.1	12.0	83.4	199	7.7
14.5	0.1	12.0	83.4	212	7.7
15.0	0.1	12.0	83.3	182	7.7
15.5	0.1	12.0	83.2	206	7.7
16.0	0.1	12.0	83.3	197	7.7
16.5	0.1	12.0	83.3	209	7.7
17.0	0.1	12.0	83.3	204	7.7
17.3	0.1	11.9	82.9	176	7.7

24-Apr-01

Approximate air temp:10 C
Secci Depth: 5.0 ft. *Time:1500-1530*
NE 8-12 mph *Sunny day 20% clouds*

Depth	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	8.9	11.1	98.1	105	7.6
0.5	8.9	11.0	98.1	105	7.6
1.0	8.8	11.0	97.9	105	7.6
1.5	8.8	11.0	97.3	105	7.6
2.0	8.6	11.0	96.5	104	7.6
2.5	8.6	11.0	96.2	104	7.6
3.0	8.5	11.0	96.2	104	7.6
3.5	8.5	11.0	96.2	104	7.6
4.0	8.4	11.0	96.0	105	7.6
4.5	8.4	10.9	95.9	103	7.6
5.0	8.5	10.9	95.7	105	7.6
5.5	8.5	10.9	95.6	103	7.6
6.0	8.5	10.9	95.6	105	7.6
6.5	8.4	10.9	95.2	105	7.6
7.0	8.3	10.9	95.2	103	7.6
7.5	8.3	10.9	95.0	103	7.6
8.0	8.3	10.8	94.6	103	7.6
8.5	8.2	10.9	94.8	104	7.6
9.0	8.2	10.8	94.5	105	7.6
9.5	8.2	10.9	94.8	105	7.5
10.0	8.2	10.8	94.5	104	7.6
10.5	8.2	10.8	94.0	108	7.6
11.0	8.2	10.7	93.7	104	7.6
11.5	8.2	10.7	93.7	104	7.6
12.0	8.2	10.7	93.4	104	7.6
12.5	8.2	10.7	93.4	104	7.6
13.0	8.2	10.7	93.4	104	7.6
13.5	8.2	10.7	93.9	105	7.6
14.0	8.2	10.7	93.9	105	7.6
14.5	8.3	10.8	94.1	103	7.6
15.0	8.2	10.8	94.1	103	7.6
15.5	8.2	10.8	94.0	104	7.6
16.0	8.2	10.6	93.1	102	7.6
16.5	8.2	10.7	93.6	105	7.6
17.0	8.2	10.7	93.6	104	7.6
17.5	8.2	10.7	93.2	102	7.6
18.0	8.2	10.7	93.0	104	7.7
18.5	8.2	10.6	92.1	104	7.7
19.0	8.2	10.6	92.3	105	7.7

16-May-01

Approximate air temp:26 C
Secci Depth: 5.5 ft.depth 60-65' *Time:1230*
Breezy day *Sunny day 80% clouds*
W Southerly wind 8-12 mph w/gusts

Depth	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	16.4	9.1	95.8	125	7.3
0.5	15.4	9.0	91.6	125	7.3
1.0	15.0	9.0	92.3	125	7.3
1.5	14.8	9.0	91.1	125	7.3
2.0	14.8	9.0	90.6	125	7.3
2.5	14.4	8.9	89.9	125	7.3
3.0	14.4	8.9	89.5	125	7.3
3.5	14.4	8.8	88.5	125	7.3
4.0	14.4	8.8	88.2	125	7.3
4.5	14.4	8.8	88.9	125	7.3
5.0	14.4	8.8	87.6	125	7.4
5.5	14.4	8.7	87.3	125	7.3
6.0	14.3	8.8	88.1	125	7.3
6.5	14.3	8.7	87.5	124	7.3
7.0	14.3	8.8	87.6	125	7.3
7.5	14.3	8.6	86.6	126	7.4
8.0	14.3	8.6	86.6	125	7.3
8.5	14.3	8.6	86.6	127	7.3
9.0	14.3	8.6	86.6	127	7.3
9.5	14.3	8.7	87.3	127	7.3
10.0	14.3	8.6	86.8	126	7.3
10.5	14.3	8.8	87.6	126	7.3
11.0	14.3	8.7	87.2	125	7.3
11.5	14.3	8.6	87.1	126	7.3
12.0	14.3	8.7	87.4	126	7.3
12.5	14.3	8.7	86.6	127	7.3
13.0	14.3	8.7	86.8	126	7.3
13.5	14.3	8.6	86.6	125	7.3
14.0	14.3	8.6	86.4	127	7.3
14.5	14.3	8.6	86.3	125	7.3
15.0	14.3	8.6	86.5	124	7.3
15.5	14.3	8.6	86.2	125	7.3
16.0	14.3	8.7	87.1	125	7.3
16.5	14.3	8.6	86.2	126	7.3
17.0	14.3	8.6	86.2	126	7.3
17.5	14.3	8.6	86.4	127	7.3
18.0	14.3	8.6	86.2	127	7.3
18.5	14.3	8.5	85.7	125	7.3

Highlighted depths- Opening to intake penstocks on headworks (2.5-10 m)

Appendix B-8
Big Quinnesec Falls Hydroelectric Project
Vertical Profile Data

6-Jun-01

Approximate air temp:22 C
Secci Depth: 5.5 ft.depth 60-64' *Time:1530*
light variable winds *30% clouds, nice sun*

Depth	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	15.7	9.6	98.7	141	7.8
0.5	15.5	9.5	98.7	141	7.8
1.0	15.4	9.6	98.5	141	7.8
1.5	15.3	9.4	96.2	140	7.8
2.0	14.5	9.4	94.6	140	7.8
2.5	14.3	9.4	94.7	140	7.8
3.0	14.3	9.3	93.2	140	7.8
3.5	14.2	9.3	93.3	140	7.8
4.0	14.1	9.3	93.5	140	7.8
4.5	14.1	9.3	93.2	139	7.8
5.0	14.2	9.3	93.5	140	7.8
5.5	14.1	9.3	92.7	140	7.8
6.0	14.1	9.2	92.3	139	7.8
6.5	14.2	9.3	92.9	140	7.8
7.0	14.2	9.3	92.8	141	7.8
7.5	14.1	9.2	92.3	140	7.8
8.0	14.1	9.1	91.3	140	7.8
8.5	14.1	9.1	91.5	139	7.8
9.0	14.1	9.2	92.2	139	7.8
9.5	14.1	9.2	91.7	140	7.7
10.0	14.1	9.2	91.8	140	7.7
10.5	14.2	9.1	91.3	141	7.7
11.0	14.2	9.1	91.2	140	7.7
11.5	14.2	9.1	91.2	139	7.7
12.0	14.2	9.1	91.6	140	7.7
12.5	14.1	9.2	92.1	140	7.7
13.0	14.1	9.2	92.0	140	7.7
13.5	14.1	9.2	91.9	141	7.7
14.0	14.1	9.1	91.5	139	7.7
14.5	14.1	9.2	92.6	138	7.7
15.0	14.1	9.2	91.7	139	7.7
15.5	14.1	9.2	91.9	140	7.7
16.0	14.1	9.2	91.9	140	7.7
16.5	14.1	9.2	92.2	140	7.7
17.0	14.1	9.2	91.4	139	7.7
17.5	14.1	9.1	90.9	139	7.7
18.0	14.1	9.1	91.9	139	7.7
18.5	14.1	9.2	91.6	139	7.7
19.0	14.0	9.1	90.2	140	7.7
19.4	14.0	9.0	90.5	138	7.7

Highlighted depths- Opening to intake penstocks on headworks (2.5-10 m)

21-Jun-01

Approximate air temp:18 C
Secci Depth: 5.0 ft.depth 60-67' *Time:1730*
calm *100% clouds Drizzle*

Depth	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	19.4	8.1	90.4	152	7.5
0.5	19.5	8.2	91.9	154	7.5
1.0	19.5	8.1	90.2	153	7.5
1.5	19.5	8.1	90.7	157	7.5
2.0	19.5	8.0	89.3	154	7.5
2.5	19.4	8.1	90.3	155	7.5
3.0	19.4	8.0	89.1	153	7.5
3.5	19.4	8.0	88.7	152	7.5
4.0	19.4	8.0	90.2	150	7.5
4.5	19.4	8.1	89.8	160	7.5
5.0	19.4	8.0	89.0	155	7.5
5.5	19.4	8.0	89.6	149	7.5
6.0	19.4	8.0	89.1	155	7.5
6.5	19.4	8.0	88.8	150	7.5
7.0	19.4	8.0	89.2	156	7.5
7.5	19.4	8.0	88.5	155	7.5
8.0	19.4	8.0	88.9	149	7.5
8.5	19.3	7.9	88.3	153	7.4
9.0	19.3	7.9	88.4	155	7.4
9.5	19.3	7.9	88.2	153	7.5
10.0	19.3	8.0	89.1	156	7.4
10.5	19.3	7.9	87.7	149	7.4
11.0	19.3	7.8	87.0	146	7.4
11.5	19.3	7.8	87.5	144	7.4
12.0	19.4	7.8	87.3	153	7.4
12.5	19.4	7.8	87.3	154	7.4
13.0	19.4	7.8	87.3	153	7.4
13.5	19.4	7.8	86.7	139	7.4
14.0	19.4	7.8	87.5	161	7.4
14.5	19.3	7.8	87.4	154	7.4
15.0	19.3	7.8	86.2	171	7.4
15.5	19.3	7.7	86.2	184	7.4
16.0	19.3	7.7	84.3	154	7.4
16.5	19.3	7.7	86.9	154	7.4
17.0	19.3	7.8	86.9	148	7.4
17.5	19.3	7.8	86.5	151	7.4
18.0	19.3	7.4	84.2	161	7.4
18.5	19.3	7.7	86.2	166	7.4
19.0	19.3	7.7	86.1	142	7.4
19.1	bottom				

Highlighted depths- Opening to intake penstocks on headworks (2.5-10 m)

11-Jul-01

Approximate air temp:27C
Secci Depth: 6.0 ft.depth 60-67' *Time:1545*
NNE winds

Depth	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	24.0	8.6	104.8	170	7.8
0.5	23.3	8.5	101.6	170	7.8
1.0	23.0	8.4	101.1	170	7.8
1.5	23.1	8.5	101.5	171	7.7
2.0	23.1	8.4	101.3	172	7.7
2.5	23.0	8.3	99.5	164	7.7
3.0	22.7	8.3	98.2	168	7.7
3.5	22.6	8.0	94.7	177	7.6
4.0	22.4	7.9	92.5	175	7.6
4.5	22.4	7.6	90.5	176	7.6
5.0	22.3	7.6	90.5	178	7.6
5.5	22.3	7.6	89.8	180	7.6
6.0	22.3	7.5	88.9	168	7.6
6.5	22.3	7.5	89.0	176	7.6
7.0	22.3	7.5	88.1	175	7.6
7.5	22.3	7.4	87.5	171	7.6
8.0	22.2	7.5	88.5	163	7.5
8.5	22.2	7.4	88.1	166	7.5
9.0	22.1	7.5	87.9	174	7.5
9.5	22.1	7.4	86.8	179	7.5
10.0	22.1	7.2	84.3	173	7.5
10.5	22.0	7.1	84.2	177	7.5
11.0	22.0	7.3	85.4	160	7.5
11.5	22.0	7.2	84.7	173	7.5
12.0	22.0	7.2	84.7	177	7.5
12.5	21.9	7.0	82.1	172	7.5
13.0	21.9	7.0	84.3	160	7.4
13.5	21.2	5.4	63.5	165	7.3
14.0	20.8	4.9	55.9	175	7.2
14.5	20.5	4.5	50.9	173	7.2
15.0	20.4	4.2	47.2	165	7.2
15.5	20.4	4.0	45.9	172	7.1
16.0	20.4	3.8	44.1	171	7.1
16.5	20.3	3.5	40.6	165	7.1
17.0	20.1	2.7	30.8	178	7.0
17.5	20.1	2.3	25.8	182	7.0
18.0	20.0	2.1	23.8	165	7.0
18.5	19.9	1.1	12.7	180	7.0
19.0					

Appendix B-8
Big Quinnesec Falls Hydroelectric Project
Vertical Profile Data

27-Jul-01

Approximate air temp:24C
Secci Depth: 6.5 ft.depth 60-67' *Time:1530*
South East winds 12-18 mph *30% clouds*

Depth	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	25.5	7.5	94.4	189	7.9
0.5	25.4	7.5	93.0	191	7.9
1.0	24.6	7.3	89.7	190	7.8
1.5	24.6	7.2	88.5	189	7.7
2.0	24.3	6.8	84.1	191	7.7
2.5	24.2	6.7	82.5	187	7.6
3.0	24.1	6.7	82.7	188	7.6
3.5	24.1	6.7	81.3	185	7.6
4.0	23.9	6.6	78.6	182	7.6
4.5	23.4	6.5	78.5	196	7.6
5.0	23.4	6.5	78.2	189	7.6
5.5	23.4	6.4	77.5	188	7.5
6.0	23.5	6.4	77.7	193	7.5
6.5	23.5	6.5	78.0	193	7.5
7.0	23.5	6.4	77.8	185	7.5
7.5	23.4	6.4	77.8	196	7.5
8.0	23.3	6.4	76.7	191	7.5
8.5	23.1	6.4	77.0	190	7.5
9.0	23.2	6.5	78.4	192	7.5
9.5	23.2	6.5	78.1	193	7.5
10.0	23.2	6.5	78.2	195	7.5
10.5	23.2	6.5	77.6	198	7.5
11.0	23.1	6.4	76.7	186	7.5
11.5	23.1	6.4	76.9	199	7.5
12.0	23.1	6.4	75.8	196	7.5
12.5	13.1	6.2	74.6	190	7.5
13.0	23.1	6.2	74.5	183	7.5
13.5	23.1	6.2	74.5	189	7.5
14.0	23.1	6.4	76.6	187	7.5
14.5	23.1	6.4	76.5	200	7.5
15.0	23.1	6.4	76.4	179	7.5
15.5	23.1	6.4	76.3	195	7.5
16.0	23.2	6.5	77.5	185	7.5
16.5	23.1	6.5	77.3	201	7.5
17.0	23.2	6.4	76.8	182	7.5
17.5	23.1	6.4	77.2	193	7.5
18.0	23.1	6.5	77.4	176	7.5
18.5	23.1	6.4	76.1	185	7.5
19.0	23.1	6.3	74.6	217	7.5

9-Aug-01

Approximate air temp:32C
Secci Depth: 6.03 ft.depth 60-67' *Time:1300*
NNW 8-12 mph winds *100% clouds*
winds make it difficult to stay put

Depth	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	27.0	6.9	88.5	178	7.7
0.5	27.0	6.8	88.6	177	7.7
1.0	27.0	6.9	88.4	178	7.7
1.5	26.9	6.8	88.0	178	7.7
2.0	26.9	6.8	87.3	180	7.7
2.5	26.8	6.6	84.9	175	7.7
3.0	26.5	6.5	82.4	175	7.5
3.5	26.4	6.5	82.2	175	7.6
4.0	26.3	6.3	79.7	175	7.6
4.5	26.3	6.4	83.0	175	7.6
5.0	26.2	6.3	82.6	175	7.6
5.5	26.3	6.3	80.1	175	7.6
6.0	26.1	6.3	79.8	175	7.6
6.5	25.8	6.1	76.0	175	7.5
7.0	25.8	6.0	75.7	179	7.5
7.5	25.8	6.0	75.0	180	7.4
8.0	25.6	5.9	74.0	180	7.4
8.5	25.7	5.8	73.7	170	7.4
9.0	25.7	5.8	74.2	175	7.4
9.5	25.6	5.8	73.0	180	7.4
10.0	25.5	5.7	71.3	175	7.4
10.5	25.5	5.7	72.0	180	7.4
11.0	25.6	5.8	72.5	180	7.4
11.5	25.6	5.8	71.8	170	7.4
12.0	25.3	5.4	69.9	180	7.4
12.5	25.2	5.0	55.8	180	7.3
13.0	23.7	3.1	46.0	180	7.1
13.5	23.1	2.3	31.5	175	7.0
14.0	22.4	1.5	22.1	190	7.0
14.5	22.3	1.0	12.7	180	7.0
15.0	22.1	7.0	7.6	180	6.9
15.5	22.0	0.6	7.3	190	6.9
16.0	21.9	0.5	5.0	200	6.9
16.5	21.8	0.4	4.0	190	6.9
17.0	21.7	0.3	4.0	190	6.9
17.5	21.4	0.3	3.9	200	6.9
18.0	21.2	0.3	4.1	210	6.9
	bottom				

23-Aug-01

Approximate air temp:20C
Secci Depth: 7 ft.depth 60-67' *Time:0645*
Light East winds *Sunny*

Depth	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	22.0	7.4	85.6	191	8.1
0.5	22.0	7.4	85.7	191	8.1
1.0	22.0	7.4	85.9	191	8.1
1.5	22.0	7.4	85.7	190	8.1
2.0	22.0	7.4	85.4	190	8.1
2.5	22.0	7.4	85.4	190	8.1
3.0	22.0	7.4	85.3	190	8.1
3.5	22.0	7.3	85.2	190	8.1
4.0	22.0	7.3	85.1	190	8.1
4.5	22.0	7.3	84.5	190	8.1
5.0	22.0	7.3	85.0	190	8.1
5.5	21.9	7.3	84.9	190	8.1
6.0	21.9	7.3	84.8	190	8.1
6.5	21.9	7.3	84.2	190	8.1
7.0	21.9	7.2	83.0	190	8.1
7.5	21.9	7.2	83.1	190	8.1
8.0	21.7	7.1	81.8	191	8.1
8.5	21.4	6.8	77.5	191	8.1
9.0	21.2	6.8	77.4	193	8.1
9.5	21.2	6.8	77.1	192	8.0
10.0	21.1	6.7	75.7	192	8.0
10.5	21.0	6.5	73.5	192	8.0
11.0	21.0	6.5	73.5	192	8.0
11.5	21.0	6.4	73.5	192	8.0
12.0	21.0	6.5	73.3	194	8.0
12.5	20.9	6.4	72.7	193	8.0
13.0	20.9	6.3	71.9	193	8.0
13.5	20.9	6.2	70.3	193	8.0
14.0	20.9	6.2	69.8	194	8.0
14.5	20.8	6.2	70.5	194	8.0
15.0	20.8	6.2	70.4	194	7.8
15.5	20.8	6.1	69.6	194	8.0
16.0	20.8	6.2	69.6	194	8.0
16.5	20.8	6.2	69.8	194	8.0
17.0	20.8	6.2	69.7	194	8.0
17.5	20.8	6.0	67.8	193	8.0
18.0	20.8	5.7	64.5	196	7.9
18.5	20.8	0.5	36.1	196	8.2

Highlighted depths- Opening to intake penstocks on headworks (2.5-10 m)

Appendix B-8
Big Quinnesec Falls Hydroelectric Project
Vertical Profile Data

19-Sep-01						3-Oct-01					
Approximate air temp:10C						*Approximate air temp:10C*					
Secci Depth: 7 ft.depth 60-67'				*Time:1000*		*Secci Depth: 8 ft.depth 60-67'*				*Time:1500*	
WNW winds 8-12 mph , increasing				*100% clouds, light rain light rain*		*Northernly winds 8-12 mph*				*100% clouds*	
Depth	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH	Depth	Temp. (C)	D.O. (mg/l)	D.O. % Saturation	Cond. (uS/cm)	pH
0.0	17.6	7.9	84.7	205	7.9	0.0	14.6	9.0	91.1	191	8.1
0.5	17.6	7.8	84.1	204	7.9	0.5	14.6	9.1	91.1	191	8.1
1.0	17.6	7.8	83.7	204	7.9	1.0	14.6	9.1	91.5	192	8.1
1.5	17.6	7.8	83.2	204	7.9	1.5	14.6	9.1	91.0	192	8.1
2.0	17.6	7.7	82.8	205	7.9	2.0	14.6	9.0	90.2	192	8.1
2.5	17.6	7.6	81.8	209	7.9	2.5	14.6	9.0	90.2	189	8.1
3.0	17.6	7.6	81.8	209	7.9	3.0	14.6	9.0	90.7	190	8.1
3.5	17.6	7.6	82.0	202	7.9	3.5	14.5	8.9	89.6	187	8.1
4.0	17.6	7.6	82.1	199	7.9	4.0	14.4	8.9	89.0	189	8.1
4.5	17.6	7.6	82.2	210	7.8	4.5	14.5	8.9	89.2	196	8.1
5.0	17.6	7.6	81.9	203	7.8	5.0	14.4	8.8	88.5	196	8.1
5.5	17.6	7.6	81.9	212	7.8	5.5	14.4	8.8	88.4	195	8.1
6.0	17.6	7.6	81.9	198	7.8	6.0	14.4	8.8	88.1	188	8.1
6.5	17.6	7.6	81.6	198	7.8	6.5	14.4	8.8	88.3	193	8.1
7.0	17.6	7.6	81.3	200	7.8	7.0	14.3	8.8	87.8	182	8.1
7.5	17.6	7.5	80.6	219	7.8	7.5	14.3	8.8	87.7	189	8.1
8.0	17.6	7.4	79.9	216	7.8	8.0	14.3	8.8	87.8	200	8.1
8.5	17.6	7.4	80.0	198	7.8	8.5	14.3	8.7	86.6	193	8.0
9.0	17.6	7.4	79.9	204	7.8	9.0	14.4	8.7	86.7	189	8.0
9.5	17.6	7.4	79.7	200	7.8	9.5	14.3	8.7	86.8	187	8.0
10.0	17.5	7.4	79.8	210	7.8	10.0	14.3	8.7	86.7	198	8.0
10.5	17.5	7.2	77.9	213	7.8	10.5	14.3	8.6	86.6	202	8.0
11.0	17.5	7.2	77.7	199	7.8	11.0	14.3	8.6	86.3	192	8.0
11.5	17.5	7.2	77.9	194	7.8	11.5	14.3	8.6	86.1	191	8.0
12.0	17.5	7.2	77.8	197	7.8	12.0	14.2	8.6	85.9	192	8.0
12.5	17.5	7.2	77.0	205	7.8	12.5	14.3	8.6	85.8	186	8.0
13.0	17.5	7.1	76.2	209	7.7	13.0	14.2	8.6	85.9	192	8.0
13.5	17.5	7.1	76.1	201	7.7	13.5	14.2	8.6	85.8	195	8.0
14.0	17.5	7.0	75.6	216	7.7	14.0	14.2	8.6	85.7	204	8.0
14.5	17.5	7.0	75.6	22	7.7	14.5	14.2	8.6	85.2	206	8.0
15.0	17.5	7.2	77.8	206	7.7	15.0	14.2	8.6	85.3	206	8.0
15.5	17.5	7.2	77.8	193	7.7	15.5	14.2	8.6	85.0	207	8.0
16.0	17.5	7.2	77.4	206	7.7	16.0	14.1	8.2	81.6	189	8.0
16.5	17.5	7.2	77.2	195	7.7	16.5	14.1	8.6	85.3	190	8.0
17.0	17.5	7.2	77.2	214	7.7	17.0	14.1	8.3	82.9	199	8.0
17.5	17.5	7.1	77.1	229	7.7	17.5	14.1	8.3	82.9	197	8.0
18.0	17.5	7.1	76.2	200	7.7	18.0	14.0	8.2	81.6	182	8.0
18.5	17.5	7.1	75.8	205	7.7	18.5	13.9	8.2	81.9	205	8.0
19.0	17.5	7.1	75.8	205	7.7	18.8	bottom				
19.5	17.5	6.9	75.3	195	7.7						
20.0	17.5	6.9	73.5	232	7.7						

Highlighted depths- Opening to intake penstocks on head

Wisconsin Electric- Wisconsin Gas

Appendix C

Results of Detailed Peavy Tailrace Measurements for a Low Dissolved Oxygen Discharge Event

Peavy Falls Hydroelectric Project –FERC No. 11830-000

November 27, 2001

Appendix C

November 6, 2001
To : Dave Michaud
From: John Hrobar

Re: Special Verticals for Dissolved Oxygen (D.O.) and Ancillary Parameters taken August 9, 2001 in the Tailrace of Peavy Hydro Plant

Please find attached, a table showing station numbers, time, depth , temp (C), dissolved oxygen (D.O.), specific conductivity (Cond), pH and % saturation of D.O. for the requested survey we conducted in the Peavy Tailrace in August , 2001.

In addition, a section of a USGS map, with the station numbers of the verticals is included. The station numbers on the map reflect the general location of the verticals, since the detail on the map depiction is coarse.

Some general comments about this survey.

We had requested that the plant, once gone offline for the evening, remain in an offline state to allow us to get a "worst case" scenario of the sagging D.O. we had observed in the continuous monitor that spent the 2001 summer season in the tailrace. This was accomplished. We began vertical readings shortly after 0700 per the timeline in the data. We used a Hydrolab Scout 2 to take all readings. The skies were clear with bright sun and light variable wind with the temperatures rapidly warming with the sunrise.

Station one was as close as we could get the boat to the plant in the tailrace area.

Station two was next to the deployed continuous monitor for a reference reading.

Station three was in slightly deeper water approximately in midstream of the tailrace between shore and the constructed flow deflection wall just west of station two. (The map does not depict the deflection wall)

Station four was upstream of the tailrace flow as far as we could safely negotiate the rock outcrops.

The rest of the stations were progressively downstream as depicted.

We began taking surface and bottom data and then went to meter intervals as depths increased.

The staff gauge on the powerhouse structure was reading 8.76' as another reference point.

Let me know if you need further clarification.

Peavy Hydro Plant Tailrace
Vertical Profiles, Plant Offline. August 9, 2001

Station	Time	Depth (m)	Temp (C)	D.O.	Cond	pH	%sat D.O.
1	7:10 AM	0	22.9	5.1	123	7.2	63.3
		2	21.3	4.4	117	7	52.3
		4	21	3.9	115	6.9	43.9
2	7:20 AM	0.7	23	5.3	123	7.2	62.8
3	7:25 AM	0.1	23.4	5.4	123	7.2	71.4
		1.8	21.2	3.6	114	6.9	41.7
4	7:30 AM	0.1	23.1	5.8	127	7.3	65.4
		2.8	22	4.1	118	7	47.2
5	7:40 AM	0.1	23.9	5.8	123	7.3	68.8
		1	23	5.2	123	7.1	62.5
		2	22.9	4.6	122	7.1	57.8
6	7:50 AM	0.1	24.7	6	124	7.4	76.3
		1	23.5	4.9	123	7.2	59.3
		2	23	4.9	123	7.2	59
		2.5	23	4.9	122	7.1	60.1
7	8:00 AM	0.1	25	6.3	124	7.4	79.2
		1	24.8	5.9	124	7.4	72.2
		2	23.1	5	123	7.1	58.1
		2.9	23.1	4.8	123	7.1	57
8	8:15 AM	0.1	25.3	6.3	124	7.4	79.1
		1	25.2	6.1	124	7.4	76.4
		2	23.5	5	122	7.1	59.5
		3	23.2	5	122	7.1	59.5
9	8:25 AM	0.1	25.6	6.7	124	7.5	83.8
		1	25.6	6.4	124	7.5	81.9
		2	25	6.1	123	7.3	75.5
		3	23.3	5.1	122	7.1	61.6
		3.9	23.2	5.1	122	7.1	60.5
10	8:35 AM	0.1	25.9	6.7	125	7.5	84.5
		1	25.7	6.7	124	7.5	82.3
		2	25.7	6.4	123	7.4	80.6
		3	24.5	5.6	124	7.3	67.5
		4	23.6	5.2	122	7.1	62.7
		5	23.3	4.8	122	7.1	57.9
		6.3	23.3	4.8	122	7.1	60.1