Wisconsin Electric
A WISCONSIN ENERGY COMPANY

ORIGINAL

Wisconsin Electric
231 W. Michigan
P.O. Box 2046
Milwaukee, WI 53201-2046
Phone 414 221-2345



March 4, 1999

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

RE: Brule Hydroelectric Project - FERC No. 2431-018
Article 405 - Water Quality Monitoring Plan

Wisconsin Electric is hereby filing one original and eight additional copies of our request to modify the water quality monitoring plan for the subject project.

The Commission issued a new license on August 29, 1995 for the above project and by order dated September 10, 1997 approved and modified Wisconsin Electric's water quality monitoring plan. The monitoring plan assures that the Brule plant's discharge meets the state's water quality standards for temperature and dissolved oxygen (DO). The applicable mean temperature standards for the months of monitoring (June, July, August, and September) are 80°F (26.7°C), 83°F (28.3°C), 81°F (27.2°C) and 74 °F (23.3 °C), respectively. The applicable DO standard is 5.0 mg/l. at all times.

The plan called for the licensee to conduct continuous monitoring for temperature and DO in two locations (upstream of the impoundment; downstream in the plant's tailrace) for the period June 1 through September 30th for five consecutive years, beginning in 1997. Results for the first two years were filed with the Commission in correspondence dated October 23, 1997 and November 9, 1998.

The results of the two years of monitoring demonstrated this Project's compliance with applicable state water quality standards. These findings prompted the licensee to request a modification to the monitoring schedule from the state of Michigan as detailed in the attached letter dated January 20, 1999, and subsequently augmented by additional analyses dated February 15, 1999.

We are enclosing two letters from the Michigan DNR and Michigan DEQ dated February 26, and March 1, 1999, respectively. These letters support our request to alter the monitoring schedule for the Brule project as outlined in our proposal of January 20, 1998.

We therefore request Commission approval to modify the schedule for the water quality monitoring plan's continuous monitoring activity to a once-every five year schedule, commencing in the year 2002. Approval of this modification by May 15, 1999 would be appreciated so that our staff may plan accordingly.

9903110135-3

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

Please call me at (414) 221-2413, if you have any questions regarding this matter.

Sincerely,

Rita L. Hayen, P.E.
Project Manager, Hydro Licensing

cc: Mr. Tom Thuemler, WDNR
Ms. Jan Fenske, MDNR
Mr. John Suppnick , MDEQ
Mr. Jim Fossum, USFWS
Mr. James Grant, MDEQ
Ms. Diana Shannon, FERC
Mr. Ronald Lesniak, FERC; Chicago Regional Office

# 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 Thursday, March 04, 1999.

Annie Salmona
Hydro Licensing
Wisconsin Electric Power Co.

Annie Salmona
Wisconsin Electric Power Co.
333 W. Everett Street
Milwaukee, WI 53203
(414) 221-4151

STATE OF MICHIGAN

JOHN ENGLER, Governor

**DEPARTMENT OF NATURAL RESOURCES**

STEVENS T MASON BUILDING, PO BOX 30028, LANSING MI 48909-7528

WEBSITE: www.dnr.state.mi.us

K. L. COOL, Director

ORIGINAL

REPLY TO: FISHERIES DIVISION
PO BOX 30446
LANSING MI 48909-7946

Refer to: 4202.2.40M



February 26, 1999

Ms. Rita Hayen
Wisconsin Electric Power Company
P.O. Box 2046
Milwaukee, WI 53201-2345

Dear Ms. Hayen:

Re: Brule Hydroelectric Project (FERC No. 2431)
Water Quality Monitoring Plan – Request for Modification

This is in reference to your letter of January 20, 1999, requesting modification of the water quality monitoring schedule that is prescribed in the Water Quality Monitoring Plan. This Plan was required by license article 405 and was approved by FERC in the Order Modifying and Approving Water Quality Monitoring Plan, issued September 10, 1997.

The approved Plan requires five years of monitoring followed by monitoring once every five years. You have completed two of the initial five years, 1997 and 1998, and are requesting modification of the schedule to eliminate the remaining three years.

It should be noted that although the data collected in 1990 and 1993 also showed no violations, this monitoring occurred prior to replacement of the trash racks. The old trash racks were corroded causing blockage and it was determined that most of the water was being drawn from above the hypolimnion. There was a concern that replacement of the trash racks would allow for discharge of low dissolved oxygen water found in the hypolimnion and would result in low dissolved oxygen levels in the tailwater. We concur that data collected in 1994, 1997, and 1998 indicated no violations of the dissolved oxygen standard of 5 mg/l and therefore this concern was not realized.

We conclude that sufficient data has been collected to determine that the Brule Project is meeting water quality standards for both temperature and dissolved oxygen at this time. We concur that coordinating monitoring between the Pine and Brule Projects is desirable from an efficiency standpoint. We therefore support your request to alter the schedule as outlined in your letter of January 20, 1999.

Thank you for the opportunity to review your proposed modifications. Please contact us if you have any questions on our comments.

Sincerely,

Jan Fenske
MI DNR FERC Project Coordinator
Fisheries Division
517-373-1280

cc: John Suppnick, Surface Water Quality Division, MDEQ
Tom Thuemler, Wisconsin Department of Natural Resources
Jim Fossum, US Fish and Wildlife Service

STATE OF MICHIGAN

JOHN ENGLER, Governor

**DEPARTMENT OF ENVIRONMENTAL QUALITY**

*"Better Service for a Better Environment"*

HOLLISTER BUILDING, PO BOX 30473, LANSING MI 48909-7973

INTERNET: www.deq.state.mi.us

**RUSSELL J. HARDING,** Director

REPLY TO:

SURFACE WATER QUALITY DIVISION
KNAPPS CENTRE
PO BOX 30273
LANSING MI 48909-7773

March 1, 1999

Ms. Rita Hayen
Project Manager, Hydro Licensing
Wisconsin Electric Energy Company
231 W. Michigan
P.O. Box 2046
Milwaukee, Wisconsin 53201-2046

Dear Ms. Hayen:

Your January 20, 1999 letter to Mr. James Grant concerning a change in the schedule for temperature and dissolved oxygen (DO) monitoring at the Brule Hydroelectric Project was referred to me for a response. We have reviewed the data collected so far and agree with your proposal to discontinue further DO and temperature monitoring until the year 2002 at which time the monitoring would be resumed and repeated every fifth year thereafter for the duration of the license.

Our concurrence with your proposal is based on the fact that no exceedances of either standard were observed during two years of monitoring which included a wide range of environmental conditions including low flow and high temperature periods. In addition, the good quality assurance documentation that Mr. Dave Michaud provided to us in his February 15, 1999 letter gives us the necessary assurance that the measured values are reliable.

If you have any questions, please contact me.

Sincerely,

John Suppnick
Great Lakes and Environmental Assessment Section
Surface Water Quality Division
517-335-4192

js:yg
cc: Ms. Jan Fenske, DNR
Mr. Gerald Saalfeld/W.E. Brule FERC File, DEQ

ORIGINAL

Wisconsin Electric
A WISCONSIN ENERGY COMPANY

Wisconsin Electric
231 W Michigan
P.O Box 2046
Milwaukee, WI 53201-2046
Phone 414 221-2345



February 15,1999

Mr. John Suppnick
Department of Environmental Quality
Surface Water Quality Division
Knapps Centre
PO Box 30273
Lansing, MI 48909-7773

Dear Mr. Suppnick:

In response to our phone conversation on February 10th, during which we discussed the need for additional analyses of the continuous water quality monitoring data that had been collected at the Brule Hydroelectric Plant in 1997 and 1998, we agreed that it would be useful for the DO and temperature data to be plotted as scatter plots. To this end, I am enclosing copies of four scatter plots; DO plotted against temperature, and DO plotted against flow for both the 1997 and 1998 monitoring periods. I am also enclosing a copy of our annual assessment of data sonde performance for monitoring year 1998 that was prepared by John Hrobar of our staff as you had requested.

I hope you will find these documents useful and in support of our request to modify the continuous monitoring program for the Brule Project which was dated January 19th of this year. As always, please do not hesitate to call me at ( 414 ) 221-2187 if you have any questions regarding these analyses.

Sincerely,

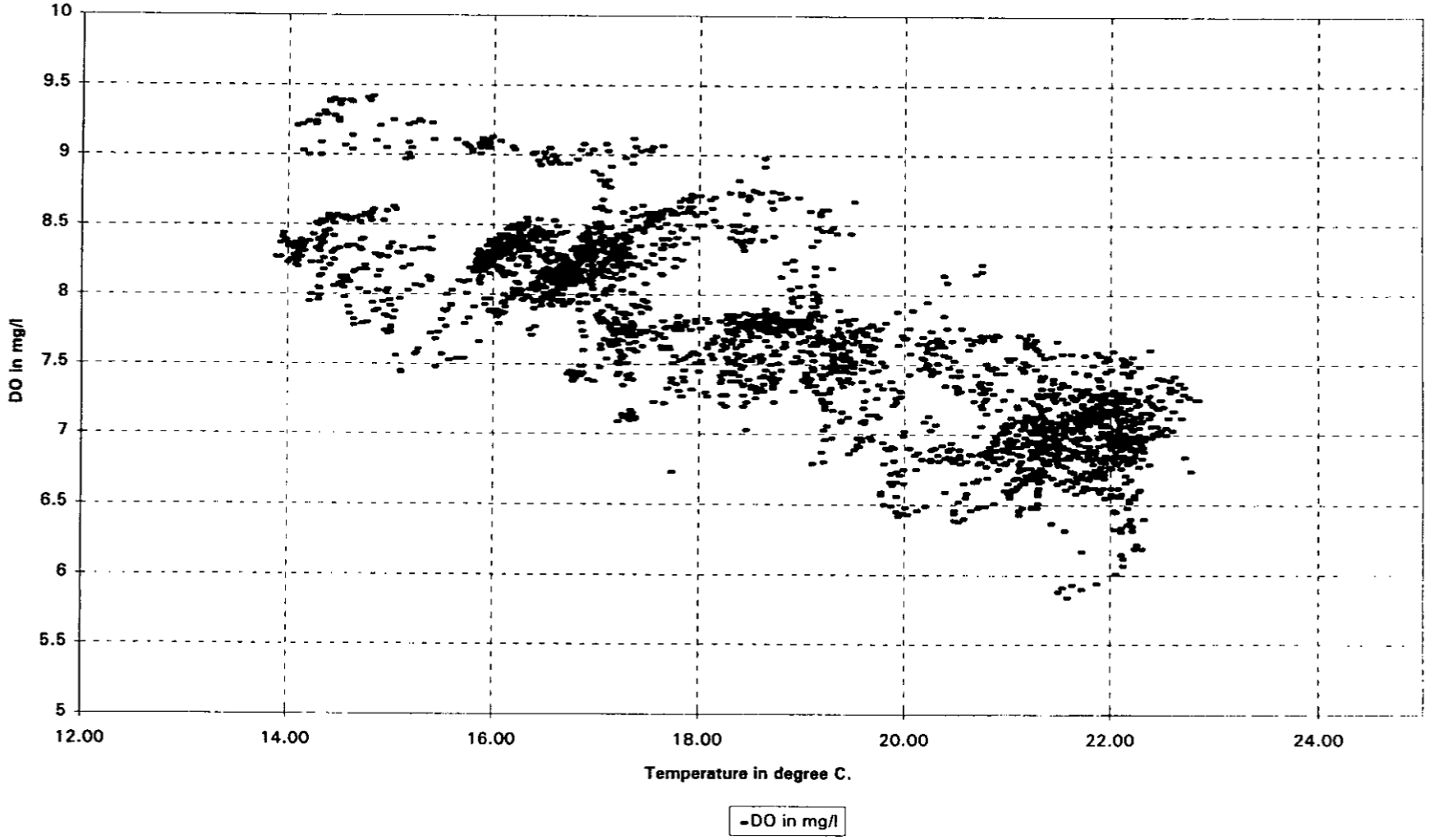
David T. Michaud

David T. Michaud
Principal Environmental Scientist

enclosures

cc: Rita Hayen, WEPCo

**Summer 1997 - Brule Hydroelectric Project Tailrace**
**Temperature and DO measurements**

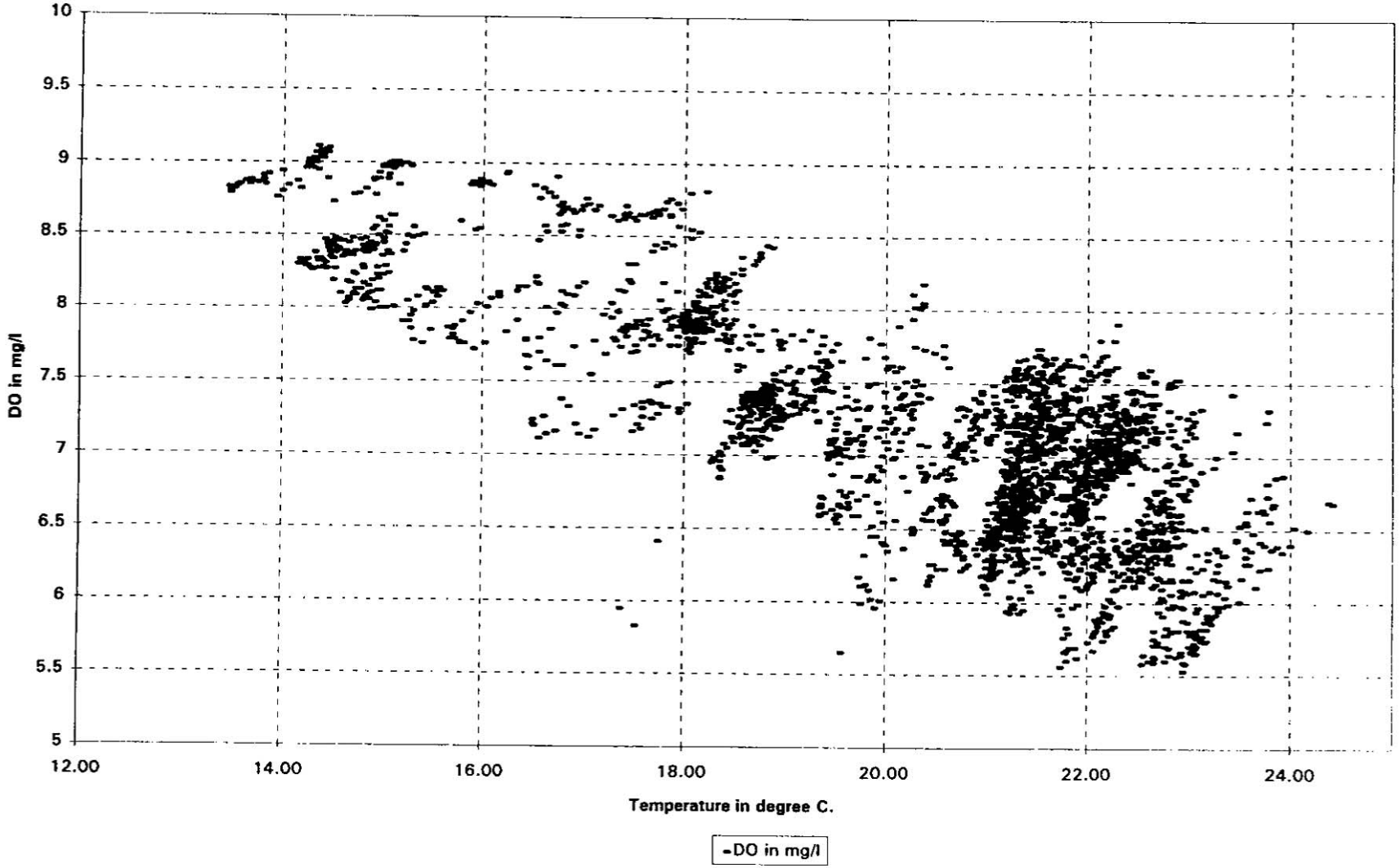



Prepared on 2/11/99

BRL97WQ.XLS do and temp 97

by AMS

**Summer 1998 - Brule Hydroelectric Project Tailrace**
**Temperature and DO measurements**

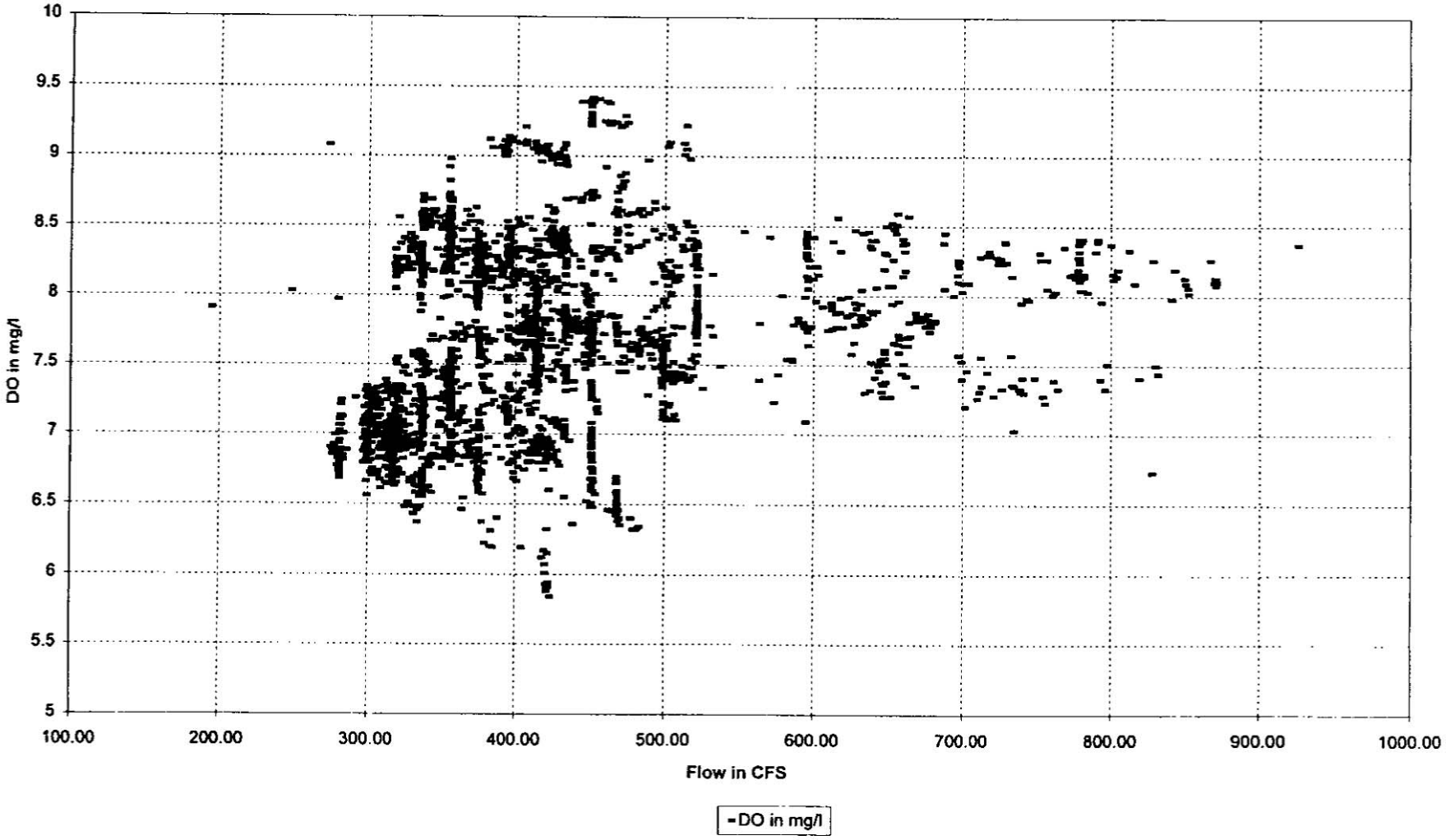



Prepared on 2/11/99

BRL98WQ.XLS do and temp 98

by AMS

**Summer 1997- Brule Hydroelectric Project Tailrace**
**Flow and DO measurements**

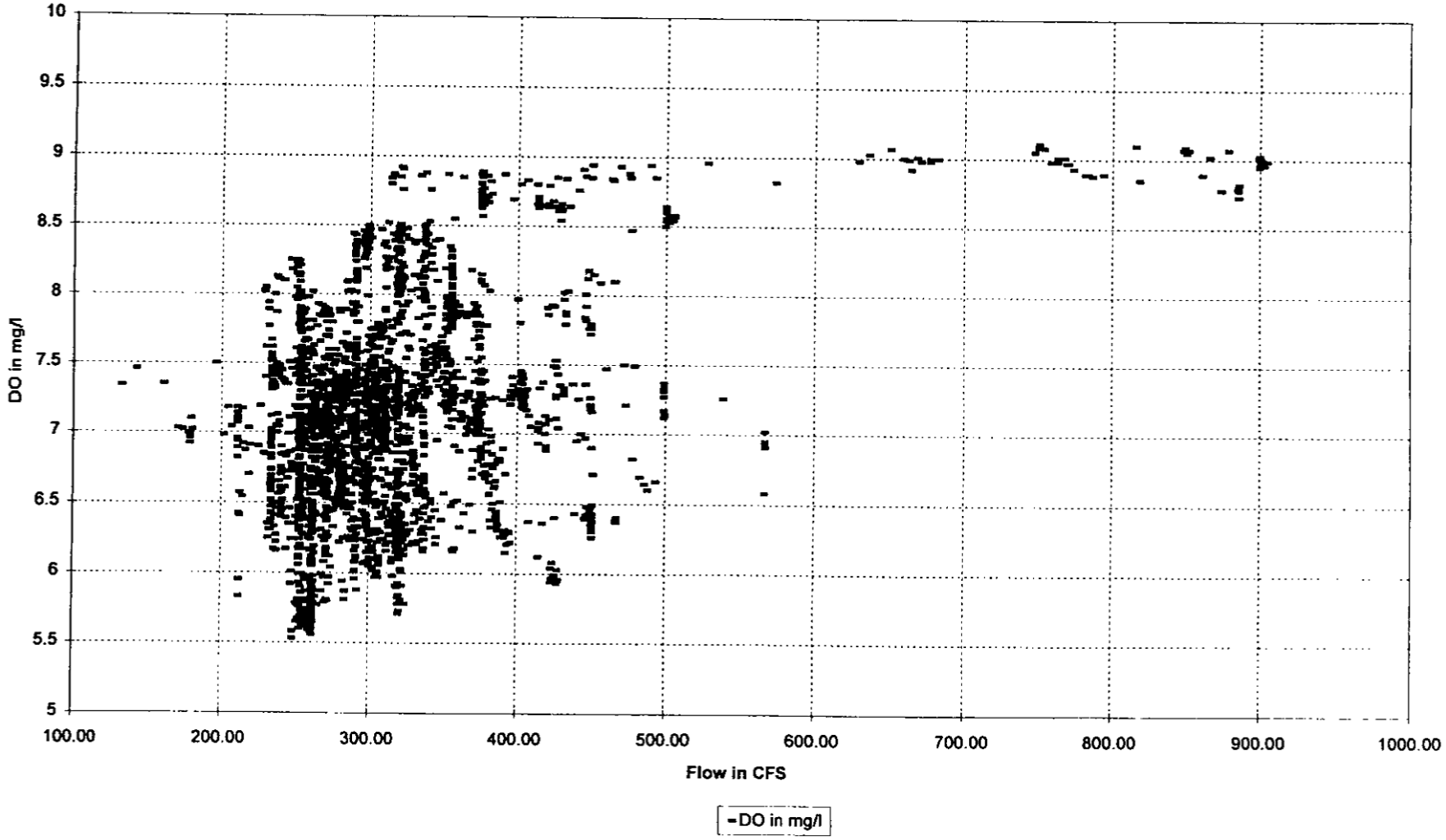



Prepared on 2/15/1999

Brul97.xls Flow and DO 1997

by AMS

**Summer 1998 - Brule Hydroelectric Project Tailrace**
**Flow and DO measurements**




Prepared on 2/15/1999

Brule98.xls Flow and DO 1998

by AMS

January 13, 1999

To: Dave Michaud

Re: 1998 Post Deployment Dissolved Oxygen / QC Checks And Temperature Checks On Hydrolab Recorder/Value Pac And Datasonde 3 Continuous Monitors.

Please find attached seven tables which depict a tally of the 1998 Post Deployment Dissolved Oxygen/ QC Checks at the seven stations monitored in 1998. The tables also list the various monitors' serial numbers to allow tracking of meter deployment and use. The stations monitored were White Rapids Tailrace, Chalk Hill Hwy Z, Sturgeon Falls Tailrace (Norway), Sturgeon River Upstream at HWY 2, Menominee River Upstream at Hwy 8, Brule Tailrace and finally Brule River Upstream at the Former Gauging Station. In addition, an eighth table is attached depicting the results of the temperature checks by sonde.

Two different Dissolved Oxygen (DO) QC checks and approaches were used and are described.

Sonde insitu/ Scout insitu method :

In the attached tables, the continuous Hydrolab sonde value of the last insitu reading prior to changeout (Sonde insitu column) was compared to a insitu reading taken with a Hydrolab Scout 2 instrument during changeout (Scout insitu column). This comparison between two different instruments calibrated at two different times had more of a mixed result than last years monitoring with some poor correlations (differences of greater than 1.0 ppm DO) at several stations and during more than one changeout. Most of the poorer correlation's seemed to be caused by flow differences in the monitoring locations and possibly some increased biofouling in the more downstream Menominee River locations.

Flow was initially measured with a Marsh-McBirney flow meter and borderline (lower flow) stations identified. Low flow was identified at the Menominee River Upstream at Hwy 8 site. Hydrolab uses 1.0 FPS (foot per second) as the flow rate breakpoint between average and low flow. Hydrolab recommends the addition of stirrers if flows drop below the 1.0 FPS consistently or if biofouling problems exist. After the first deployment, and as the spring weather regime evolved into a near drought and below average flow situation, it was determined that stirrers added to those meters in the lower flow and biofouling prone stations would improve accuracy of readings. A total of four stations, the above captioned Menominee River at Hwy 8 (SM), the Sturgeon Falls (Norway) Dam Tailrace (ST), the Chalk Hills Dam Upstream at Hwy Z (CZ) and the White Rapids Dam Tailrace (WT), were targeted as needing stirrers. Two stirrers were purchased and two were cannibalized from other meters. The stirrers were added at WT, ST and SM on 061198. The backordered stirrer arrived later and was installed at CZ on 070998.

A drawback to the Sonde insitu/ Scout insitu method was that the insitu readings could be taken as much as an hour apart (sometimes more) and the data shows that there can be changes from hour to hour.

A positive observation from this method occurred because the Scout insitu measurement always uses a stirrer, thus comparison to a sonde insitu, one without a stirrer, highlights the inaccuracy of the sonde insitu due to low flow or biofouling. The result of this artifact is that the insitu hourly records for a sonde without a stirrer site can be artificially and consistently lower than actual during these low flow or biofouling situations and thus worse case readings. No violations of the 5.0 ppm DO standard occurred even with that artificially lowered " worst case" scenario.

This artifact appears to show up at the Sturgeon River Upstream at Hwy 2 site in that original flows were adequate, but as the summer progressed, overall flows decreased and there was some possible diurnal ( or use related) component to flows. The result was that the Scout insitu measurement ( with stirrer) was consistently higher than the Sonde insitu measurement. The Post Deployment DO Checks for this site showed no such disparity and confirmed the artificially low numbers. Because there were no violations, even with artificially lowered numbers at this site, and because this site was of slightly less priority (sondes

with stirrers were in use at higher priority sites) no stirrer was added to this station once the flow disparity was discovered.

A similar appearing poor correlation between Sonde insitu/ Scout insitu also shows up in the last couple of deployments at the Menominee River Upstream at Hwy 8 site but for a different reason. This site had a stirrer installed after recognizing the low flow/ biofouling problems. The site was located near a parking area next to the river, adjacent to a small intermittent waterway that flowed into the river at the sonde location. It appears that even though near drought conditions persisted throughout the monitoring, the occasional rainfall that did occur was enough to wash sediments onto the sonde and deployment system in enough quantity to partially cover the sonde and cause the stirrer to jam. Because of the jammed stirrer, the sonde recorded DO that was artificially low similar to the no stirrer sites described previously.

Post Deployment DO Check :

This check was conducted within several hours of sonde retrieval. The method was achieved by setting up the retrieved sonde (while data was being recovered) for an air calibration check. This air calibration check (Post DO column) was compared with the expected air calibration DO value (Expected DO column) corrected for Iron Mt., Michigan elevation ( we assumed approximately 730 mm/hg atmospheric pressure) from standard charts. This comparison (Difference column) compared very well (less than 1.0ppm DO) except for a few instances which seemed to be related to biofouling early in the study period.

Results

Brule Stations:

At both Brule Stations, which were also monitored in 1997, the Sonde insitu/Scout insitu comparison was quite favorable. No insitu comparison in the Brule Tailrace was more than 0.67 ppm different between two different instruments. The Brule Gauging St. had only two comparisons that had over 1.0 ppm. difference in readings. All Post Deployment DO Checks were less than 1.0 ppm from the expected DO.
No stirrers were used on the Brule Stations because flows remained near or above 1.0 FPS (foot per second).

White Rapids TR/ Chalk Hill Hwy Z Stations:

The Sonde insitu/Scout insitu method worked favorably for the WRTR station but not very well for the CH HWY Z station. Both had an early > 1.0 ppm insitu comparison but CH HWY Z continued to have poorer ( 5 of 11 total > 1.0 ppm) insitu comparisons throughout deployment even after a stirrer was added to minimize flow effects..My guess is that water depth and flow both affected the DO readings at this station. Flow directly affects accuracy while depth can affect temperature and light penetration which can lead to more rapid accumulation of algae, etc. on the probes and potentially affect reading accuracy.. Twenty -one of twenty-two(both stations) Post Deployment DO accuracy comparisons were < 1.0 ppm DO. Stirrers were added to WRTR on 6/11/98 and to CH HWY Z on 7/9/98 to improve reading accuracy.

Sturgeon Falls (Norway) Stations ( Tailrace, Menominee River Hwy 8, Sturgeon River Hwy 2):

The variability in the physical aspects of each of the three monitoring stations contributed to the variability in the data and the QC/QA checks. The SFTR station correlated well in both the insitu comparisons and the Post Deployment DO checks (11 of 12 differences were less than 1.0 ppm).

The Menominee River Hwy 8 station had very low flows. In addition, quite a bit of dark flocculant or slime, as well as fine sediment would build up on the instruments, and occasionally seemed to contribute to correlation error. The addition of stirrers at both these stations on 6/11/98 improved QC and field data

accuracy. Late in the season, it appears that coarser,sandy sediment may have been impeding the stirrer function and caused lower than actual DO readings at this station..

The Sturgeon River Hwy 2 station had visually clearer water. All Post Deployment DO Checks were well below 1.0 ppm difference. Sonde insitu/ Scout insitu comparisons from 8/6/98 through 10/15/98 were all greater than 1.0 ppm. Overall low flows due to near drought conditions all summer, diurnal fluctuating flows and greater sunlight penetration resulting in increased biofouling all combined to complicate interpretation of this data. The positive aspect of the situation is that the recorded DO appears to be artificially lower than actual (worse case) and no problems were recorded.

Temperature Checks

Highly accurate temperature comparisons require special temperature controlled and stirred fluid baths which can be time consuming and costly. A less expensive, easy to use comparison was chosen for these checks which may have sacrificed a small amount of accuracy which was considered a reasonable tradeoff.

Electronic digital thermometers were calibrated in the lab and a three point calibration reference recorded. These thermometers could then be placed in the Hydrolab sonde calibration cup while a calibration solution for another parameter was being used for an ongoing calibration. The temperature of both the calibrated thermometer and the sonde under calibration was recorded. Later, the difference between the sonde and the reading of the calibrated thermometer was compared. This comparison is shown as the Temperature Deviation per check under the serial number for each sonde. For example: for Check 1 under Sonde 32652, the corrected temperature ( of the calibrated thermometer) was 21.5 degrees C, the sonde was reading 21.0 degrees C so the difference is reflected as a negative (-0.5) degrees C. The sonde was reading 0.5 degrees lower than the calibrated reference.

In studying the chart, most deviations were slightly negative as described above, very few were slightly positive and some were reading exactly the same so no deviation (0) was recorded. To achieve the average deviations given, the negative/ positive aspects were ignored, all deviations were added together and simply averaged. All but one sonde averaged less than 0.2 degrees C deviance. The sole exception averaged 0.82 degrees C deviance and was damaged in its last deployment and has been completely rebuilt.

Since rounding differences (the calibrated thermometers read only to tenths, the sondes to hundredths of a degree C) and not having a circulating bath could easily introduce a tenth or two of error (0.1-0.2 degrees C) this was considered excellent correlation.

Please let me know if you need future explanations or would like to discuss data .

John Hrobar
Environmental Tech.

cc: Russ Rick w/ attachments
Annie Salmona/ Rita Hayen w/ attachments

**1998 Hydrolab Datasonde Usage / Post Deployment Dissolved Oxygen / QC Checks**

Plant: White Rapids Dam Tailrace

| Date Retrieved | Meter SN | Sonde insitu | Scout Insitu | Difference | Post DO | Expected DO | Difference |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| 4/29/98 | 32656 | 10.68 | 11.10 | -0.42 | na | na | na |
| 5/14/98 | 32656 | 5.90 | 8.71 | -2.81 | 6.48 | 8.05 | -1.57 |
| 5/28/98 | 32658 | 6.78 | 7.00 | -0.22 | 7.54 | 7.83 | -0.29 |
| 6/11/98 | 32652 | 8.40 | 9.60 | -1.20 | 7.97 | 8.47 | -0.50 |
| 6/25/98 | 32656 | 6.76 | 6.70 | 0.06 | 7.45 | 7.80 | -0.35 |
| 7/9/98 | 32652 | 7.16 | 7.20 | -0.04 | 8.31 | 8.36 | -0.05 |
| 7/22/98 | 32657 | 7.00 | 7.40 | -0.40 | 6.84 | 7.53 | -0.69 |
| 8/5/98 | 32654 | 7.63 | 7.70 | -0.07 | 7.84 | 7.90 | -0.06 |
| 8/20/98 | 32656 | 7.57 | 7.70 | -0.13 | 8.01 | 8.28 | -0.27 |
| 9/2/98 | 32653 | na | na | na | 8.08 | 8.30 | -0.22 |
| 9/17/98 | 32655 | 7.80 | 8.00 | -0.20 | 8.58 | 8.36 | 0.22 |
| 10/1/98 | 32657 | 8.48 | 8.70 | -0.22 | 8.25 | 8.44 | -0.19 |

Plant: Chalk Hill Dam Upstream Hwy Z

| Date Retrieved | Meter SN | Sonde insitu | Scout Insitu | Difference | Post DO | Expected DO | Difference |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| 4/29/98 | 32657 | 10.85 | 11.70 | -0.85 | na | na | na |
| 5/14/98 | 32657 | 8.43 | 9.82 | -1.39 | 7.62 | 8.05 | -0.43 |
| 5/28/98 | 32655 | 8.06 | 8.73 | -0.67 | 7.35 | 7.83 | -0.48 |
| 6/11/98 | 32653 | 8.68 | 9.20 | -0.52 | 8.09 | 8.47 | -0.38 |
| 6/25/98 | 32657 | 6.78 | 7.60 | -0.82 | 7.60 | 8.48 | -0.88 |
| 7/9/98 | 32655 | 8.20 | 9.00 | -0.80 | 7.73 | 8.44 | -0.71 |
| 7/22/98 | 32658 | 8.19 | 9.00 | -0.81 | 6.75 | 7.55 | -0.80 |
| 8/6/98 | 32653 | 6.76 | 8.00 | -1.24 | 7.71 | 8.24 | -0.53 |
| 8/20/98 | 32655 | 7.93 | 9.50 | -1.57 | 7.54 | 8.28 | -0.74 |
| 9/2/98 | 32653 | 8.29 | 8.90 | -0.61 | 7.84 | 8.32 | -0.48 |
| 9/17/98 | 32656 | 8.06 | 9.17 | -1.09 | 7.80 | 8.36 | -0.56 |
| 10/1/98 | 32658 | 7.92 | 9.50 | -1.58 | 8.00 | 8.44 | -0.44 |

**1998 Hydrolab Datasonde Usage / Post Deployment Dissolved Oxygen / QC Checks**

Sturgeon Falls (Norway) Tailrace

| Date Retrieved | Meter SN | Sonde insitu | Scout Insitu | Difference | Post DO | Expected DO | Difference |
|---|---|---|---|---|---|---|---|
| 4/29/98 | 32652 | na | na | na | na | na | na |
| 5/14/98 | 32652 | 8.83 | 9.07 | -0.24 | 6.60 | 8.20 | -1.60 |
| 5/28/98 | 10190 | 7.28 | 8.00 | -0.72 | 7.31 | 7.87 | -0.56 |
| 6/11/98 | 32654 | 7.78 | 9.10 | -1.32 | 7.99 | 8.44 | -0.45 |
| 6/24/98 | 32658 | 8.20 | 7.81 | 0.39 | 7.32 | 7.86 | -0.54 |
| 7/9/98 | 32654 | 7.66 | 7.90 | -0.24 | 8.21 | 8.55 | -0.34 |
| 7/23/98 | 32655 | 6.78 | 7.60 | -0.82 | 7.57 | 8.36 | -0.79 |
| 8/6/98 | 32657 | 7.17 | 7.70 | -0.53 | 7.89 | 8.24 | -0.35 |
| 8/19/98 | 32654 | 7.78 | 8.00 | -0.22 | 7.62 | 8.18 | -0.56 |
| 9/3/98 | 32658 | 7.79 | 7.80 | -0.01 | 8.47 | 8.78 | -0.31 |
| 9/17/98 | 32653 | 8.17 | 8.30 | -0.13 | 8.43 | 8.57 | -0.56 |
| 9/30/98 | 32654 | 8.27 | 8.70 | -0.43 | 8.30 | 8.80 | -0.50 |
| 10/15/98 | 32655 | 10.21 | 10.60 | -0.39 | 8.17 | 8.31 | -0.14 |

Sturgeon Falls (Norway) Upstream, Menominee River at Hwy 8

| Date Retrieved | Meter SN | Sonde insitu | Scout Insitu | Difference | Post DO | Expected DO | Difference |
|---|---|---|---|---|---|---|---|
| 4/29/98 | 32654 | na | na | na | na | na | na |
| 5/14/98 | 32654 | 10.59 | 9.60 | 0.99 | 8.08 | 8.28 | -0.20 |
| 5/28/98 | 10189 | 5.89 | 8.10 | -2.21 | 5.55 | 8.32 | -2.77 |
| 6/11/98 | 32655 | na | na | na | na | na | na |
| 6/24/98 | 32655 | 8.21 | 8.00 | 0.21 | 6.80 | 7.84 | -1.04 |
| 7/9/98 | 32653 | 7.58 | 8.20 | -0.62 | 8.31 | 8.52 | -0.21 |
| 7/23/98 | 32652 | 6.40 | 7.80 | -1.40 | 7.47 | 8.36 | -0.89 |
| 8/6/98 | 32658 | 7.08 | 8.20 | -1.12 | 7.59 | 8.22 | -0.63 |
| 8/19/98 | 32653 | 7.65 | 8.50 | -0.85 | 7.40 | 8.17 | -0.77 |
| 9/3/98 | 32657 | 7.63 | 8.20 | -0.57 | 8.60 | 8.67 | -0.07 |
| 9/16/98 | 32654 | 8.27 | 8.80 | -0.13 | 8.01 | 8.20 | -0.18 |
| 9/30/98 | 32652 | 8.16 | 9.30 | -1.14 | 8.81 | 8.93 | -0.12 |
| 10/15/98 | 32656 | 8.07 | 10.70 | -2.63 | 8.28 | 8.31 | -0.03 |

Sturgeon Falls (Norway) Upstream, Sturgeon River at HWY 2

| Date Retrieved | Meter SN | Sonde insitu | Scout Insitu | Difference | Post DO | Expected DO | Difference |
|---|---|---|---|---|---|---|---|
| 4/29/98 | 32653 | na | na | na | na | na | na |
| 5/14/98 | 32653 | 9.03 | 9.07 | -0.04 | 8.15 | 8.28 | -0.13 |
| 5/28/98 | 10191 | na | 7.23 | na | 8.23 | 8.36 | -0.13 |
| 6/11/98 | 32658 | 8.82 | 9.70 | -0.88 | 8.25 | 8.63 | -0.38 |
| 6/25/98 | 10189 | 6.87 | 6.90 | -0.03 | 8.39 | 8.64 | -0.25 |
| 7/8/98 | 32657 | 7.83 | 8.00 | -0.17 | 6.96 | 7.76 | -0.80 |
| 7/23/98 | 10191 | 8.49 | 9.40 | -0.91 | 8.14 | 8.48 | -0.34 |
| 8/6/98 | 10191 | 6.55 | 7.70 | -1.15 | 8.13 | 8.36 | -0.23 |
| 8/20/98 | 32652 | 7.11 | 8.20 | -1.09 | 7.65 | 8.25 | -0.60 |
| 9/2/98 | 10189 | 7.43 | 9.40 | -1.97 | 8.25 | 8.36 | -0.11 |
| 9/17/98 | 10190 | 7.08 | 9.40 | -2.26 | 7.98 | 8.24 | -0.26 |
| 10/1/98 | 32653 | 9.07 | 11.00 | -1.93 | 8.07 | 8.47 | -0.40 |
| 10/15/98 | 32652 | 8.14 | 11.30 | -3.16 | 8.00 | 8.31 | -0.31 |

**1998 Hydrolab Datasonde Usage / Post Deployment Dissolved Oxygen / QC Checks**

Plant: Brule Dam Tailrace

| Date Retrieved | Meter SN | Sonde insitu | Scout Insitu | Difference | Post DO | Expected DO | Difference |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| 5/28/98 | 32656 | 8.71 | 8.60 | 0.11 | na | na | na |
| 6/11/98 | 32656 | 8.43 | 8.70 | -0.27 | 8.70 | 8.74 | -0.04 |
| 6/25/98 | 10191 | 7.33 | 7.00 | 0.33 | 8.67 | 8.69 | -0.02 |
| 7/8/98 | 32656 | 6.66 | 7.00 | -0.34 | 7.59 | 7.76 | -0.17 |
| 7/23/98 | 10189 | 6.33 | 7.00 | -0.67 | 8.14 | 8.40 | -0.26 |
| 8/5/98 | 32652 | 6.63 | 6.90 | -0.27 | 7.41 | 8.00 | -0.59 |
| 8/20/98 | 10190 | 7.35 | 7.60 | -0.25 | 7.29 | 8.28 | -0.99 |
| 9/3/98 | 32652 | 6.56 | 6.90 | -0.34 | 8.19 | 8.42 | -0.23 |
| 9/16/98 | 32658 | 7.32 | 7.80 | -0.48 | 7.87 | 8.28 | -0.41 |
| 10/1/98 | na | na | na | na | na | na | na |

Plant: Brule Gauging St.

| Date Retrieved | Meter SN | Sonde insitu | Scout Insitu | Difference | Post DO | Expected DO | Difference |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| 5/28/98 | 32657 | 8.16 | 8.45 | -0.29 | na | na | na |
| 6/11/98 | 32657 | 8.98 | 9.50 | -0.52 | 8.48 | 8.78 | -0.30 |
| 6/25/98 | 10190 | na | na | na | 7.92 | 8.36 | -0.44 |
| 7/8/98 | 32658 | 9.01 | 9.50 | -0.49 | 7.15 | 7.73 | -0.58 |
| 7/23/98 | 10190 | 7.82 | 8.90 | -1.08 | 7.88 | 8.44 | -0.56 |
| 8/5/98 | 32655 | 8.96 | 9.80 | -0.84 | 7.95 | 7.97 | -0.02 |
| 8/19/98 | 10189 | 8.51 | 9.20 | -0.69 | 7.91 | 8.20 | -0.29 |
| 9/3/98 | 10191 | 9.62 | 9.80 | -0.18 | 8.44 | 8.44 | 0.00 |
| 9/16/98 | 32657 | 8.42 | 9.60 | -1.18 | 7.86 | 8.28 | -0.42 |
| 10/1/98 | 10189 | 11.83 | 11.90 | -0.07 | 9.02 | 8.57 | 0.45 |

# 1998 Hydrolab Datasonde Temperature Checks

| Temp. C Deviation per check | Sondes by serial number | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 32652 | 32653 | 32654 | 32655 | 32656 | 32657 | 32658 | 10189 | 10190 | 10191 |
| Check 1 | -0.5 | -0.2 | -0.2 | -0.1 | -0.2 | -0.1 | -0.3 | -0.2 | -0.2 | -0.8 |
| Check 2 | -0.3 | -0.2 | -0.3 | -0.1 | -0.2 | -0.3 | -0.3 | -0.2 | -0.2 | -0.6 |
| Check 3 | -0.2 | -0.1 | -0.1 | 0 | -0.2 | -0.3 | -0.2 | -0.2 | -0.2 | -1 |
| Check 4 | 0.1 | -0.2 | -0.1 | 0 | -0.1 | -0.3 | -0.1 | -0.2 | -0.1 | -0.6 |
| Check 5 | 0 | 0 | 0.1 | 0 | -0.2 | -0.1 | 0 | -0.1 | -0.1 | -0.9 |
| Check 6 | 0.1 | -0.1 | 0 | 0 | -0.1 | -0.1 | -0.1 | 0.1 | | -1 |
| Check 7 | 0.1 | -0.1 | -0.1 | -0.2 | | -0.1 | -0.2 | -0.1 | | |
| Check 8 | -0.2 | | -0.1 | | | -0.2 | | | | |
| Check 9 | -0.1 | | | | | | | | | |
| Average Deviation | 0.18 | 0.13 | 0.12 | 0.06 | 0.17 | 0.19 | 0.17 | 0.16 | 0.16 | 0.82 |

ORIGINAL

Wisconsin Electric
A WISCONSIN ENERGY COMPANY

Wisconsin Electric
231 W Michigan
PO Box 2046
Milwaukee, WI 53201-2046
Phone 414 221-2345



January 20, 1999

**Ms. Janice Fenske**
Michigan Dept. of Natural Resources
Fisheries Division
530 West Allegan St.
P.O. Box 30446
Lansing, MI 48909

**Mr. James Grant**
Michigan Department of Environmental Quality
Knapps Centre
P.O. Box 30273
Lansing, MI 48909-7773

RE: Brule Hydroelectric Project - FERC No. 2431-018
Water Quality Monitoring Program
Request for Modification

Dear Mr. Grant and Ms. Fenske:

The FERC issued a new license on August 29, 1995 for the above project and by order dated September 10, 1997 approved and modified Wisconsin Electric's Water Quality Monitoring Plan. The monitoring plan is designed to assure that the Brule Plant's discharge meets the state's water quality standards for temperature and dissolved oxygen (DO). The applicable mean temperature standards for the month of monitoring (June, July, August and September) are 80° F (26.7C°), 83°F (28.3°C), 81°F (27.2°C) and 74°F (23.3C°), respectively. The applicable DO standard is 5.0 mg/l. at all times.

Wisconsin Electric has completed two years of continuous monitoring for temperature and DO during the required months and have filed reports with the FERC documenting compliance with state water quality standards. These filings were dated October 23, 1997 and November 9, 1998 and copies of these filings were provided to MDEQ, the Michigan DNR, the Wisconsin DNR and the USFWS.

The purpose of this letter is to request a modification to the water quality monitoring plan, specifically that section which specifies the schedule for conducting the continuous monitoring for temperature and DO. As now directed by the plan, Wisconsin Electric is to conduct continuous monitoring for the first five years following plan approval by FERC. Wisconsin Electric can petition the MDEQ and MDNR for an alternative schedule for the remaining term of the license period.

Wisconsin Electric respectfully requests MDEQ and MDNR concurrence with this request to modify the continuous monitoring program's schedule at this time. Specifically, Wisconsin Electric proposes to suspend monitoring during 1999, 2000 and 2001. The monitoring would recommence in 2002 and be repeated every 5th year thereafter for the duration of the new license. No other changes to the plan are being proposed. The reasons for this modification request are detailed in the following paragraphs and are supported by figures summarizing the findings, to date.

### *Compliance with Water Quality Standards*

As documented by the data supplied to FERC and the state agencies, water discharged by the Brule Hydroelectric Plant has met both DO and temperature standards. Plots of flow vs DO (Figures 1-4 for 1997; 5-8 for 1998) depict the seasonal variations in DO from higher levels in late spring and early autumn to lower levels during the warmest months of summer. Note that with one brief exception (Figure 2), DO levels did not fall below 6.0 mg/l in 1997. In 1998, DO levels declined to about 5.5 mg/l during a one week period in July when total flows were less than 300 cfs (Figure 6). Flows, in general, were lower in 1998 than in 1997 due to an exceptionally dry period which began the previous winter and extended well into the fall. Note that flows in September, normally a wet month for this region, were still below 300 cfs for much of the month (Figure 8). Yet DO levels were substantially above 7.0 mg/l for much of this month.

Plots of flow vs. temperature (Figures 9-12 for 1997; 13-16 for 1998) depict expected seasonal variations. No relationship between flow and water temperature is apparent for either year.

### *No violations of Either Standard In Spite of Above Normal Ambient Air Temperatures.*

Figures 17-20 depict tailrace water temperature plotted against mean daily ambient air temperatures recorded at Iron Mountain In 1997. While ambient air temperatures do fluctuate from day to day, water temperature exhibits much less drastic fluctuations.

Figures 21- 23 provide similar data for 1998, with the exception that September data is currently unavailable. Again, air temperatures fluctuate significantly, yet water temperatures exhibit less tendency to fluctuate as much. Note also that with the obvious exception of early June, ambient air temperatures were higher in 1998 than in 1997 (Figures 24-26). Thus in spite of higher air temperatures and below long term average flow [1], conditions which have in the past promoted intense stratification in Brule flowage based on vertical profile measurements conducted in 1990, 1993 and 1994, the Project did not cause DO levels to fall below the states' 5.0 mg/l standard.

### *Schedule modification will allow Wisconsin Electric To Make Maximum Use of its Limited Resources.*

By eliminating monitoring in 1999, 2000 and 2001, and conducting once every five year monitoring beginning in 2002, Wisconsin Electric will be able to coordinate monitoring between the Brule and Pine (FERC 2486-031) Projects for the remaining years of both projects' license periods. This is possible because the two projects are only 12 miles

[1] As reported in Exhibit B, Brule License Application, Table B-3, the 30 year mean monthly flows for June, July, August and September are 625, 435, 415 and 455 cfs, respectively.

apart. Data retrieval and sonde maintenance at both projects could be accomplished in less than one day.

### *Conclusion*

Wisconsin Electric has completed two years of continuous water quality monitoring at Brule Project. No violations of Michigan's or Wisconsin's water quality standards have been detected in spite of adverse air temperature and flow conditions. This suggests that there is little likelihood of future violations. Indeed, no violations had been detected in 1990, 1993 or 1994, when continuous water quality monitoring had been performed in support of the license application and in conjunction with a trash rack replacement project.

The proposal to modify the schedule to a once every five years effort is consistent with other FERC - approved monitoring plans and reflects Wisconsin Electric's long term commitment to environmental protection at its hydroelectric generating facilities.

In light of these considerations, we respectfully request permission to file an amended monitoring plan with the FERC and welcome your support of this modification request. A response by March 1, 1999 would be appreciated as this would allow us to file the amended plan with the FERC in time to prevent unnecessary work in 1999.

Thank you in advance for your attention to this matter. Please call me at (414) 221-2413 if you have any questions regarding this submittal.

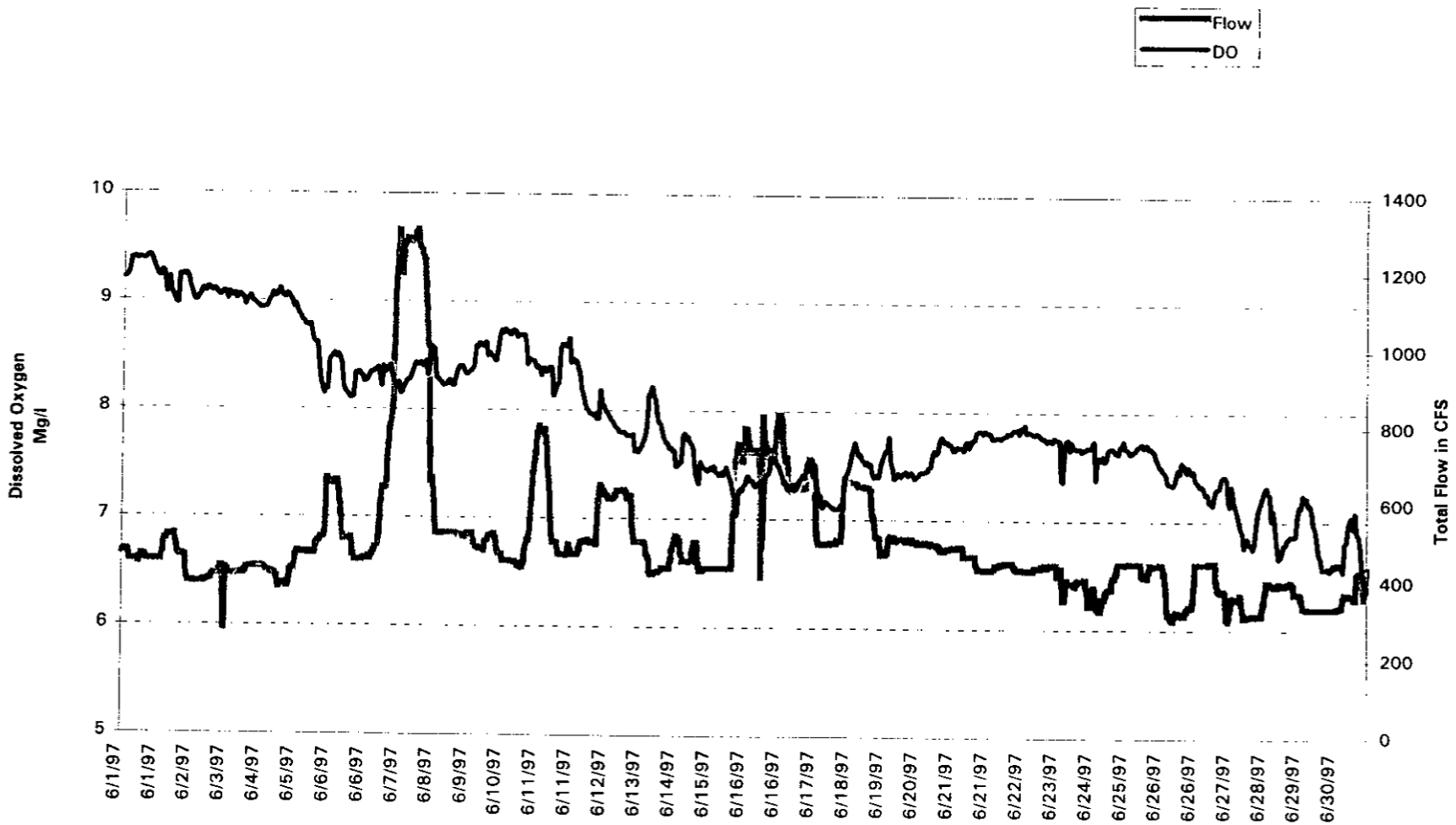
Sincerely,

Rita L. Hayen, P.E.
Project Manager, Hydro Licensing

Encl.

cc: Mr. Thomas Thuemler, WDNR
Mr. James Fossum, USFWS
Mr. John Suppnick, MDEQ

**Hourly Plots of Flow and DO**
**Brule Hydroelectric Project Tailrace**
**Summer 1997**




Prepared on 1/15/99

BRL97WQ.XLS Flow and DO, June 97

by AMS

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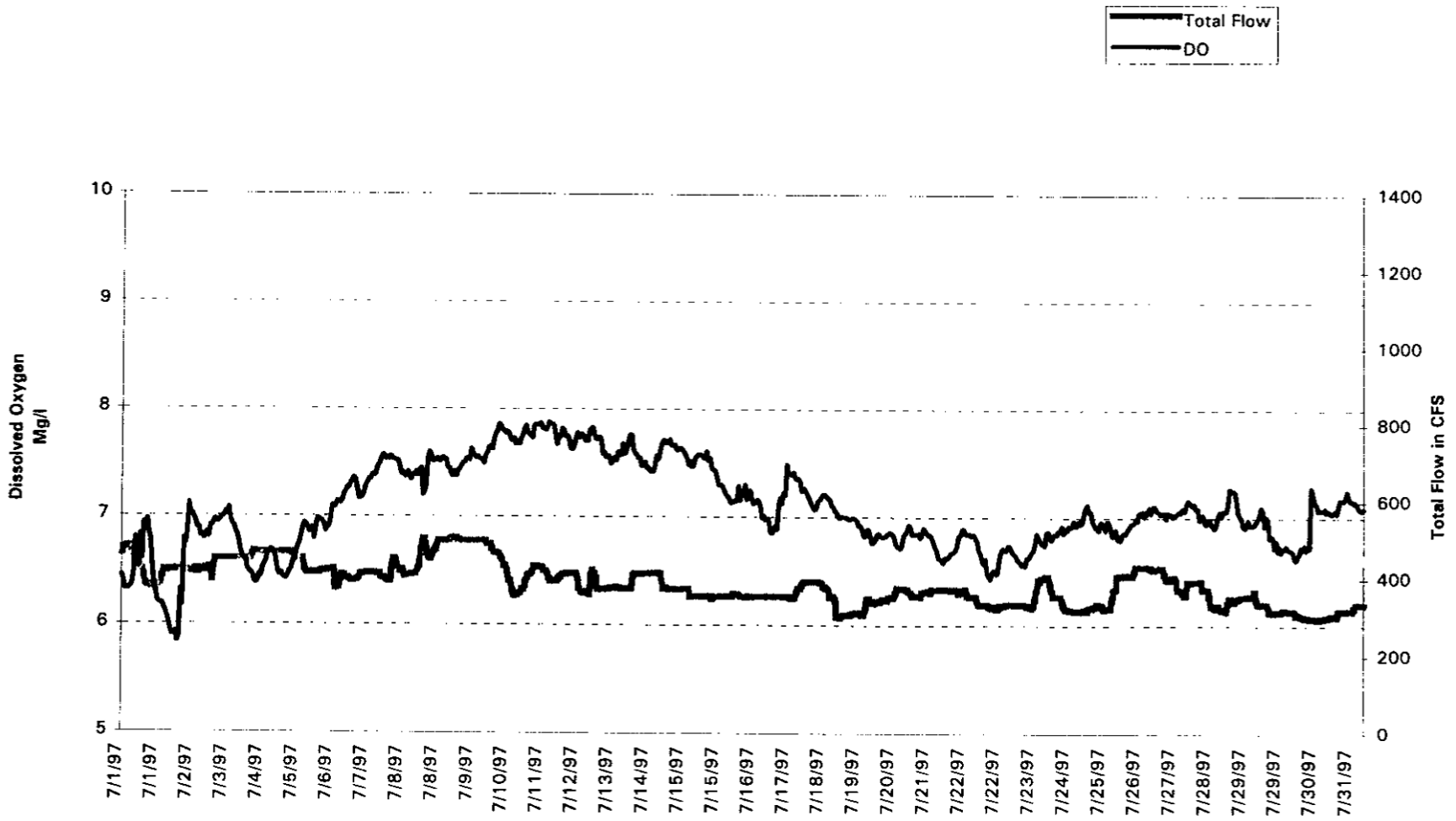
**Brule Hydroelectric Project Tailrace**
**Summer 1997**



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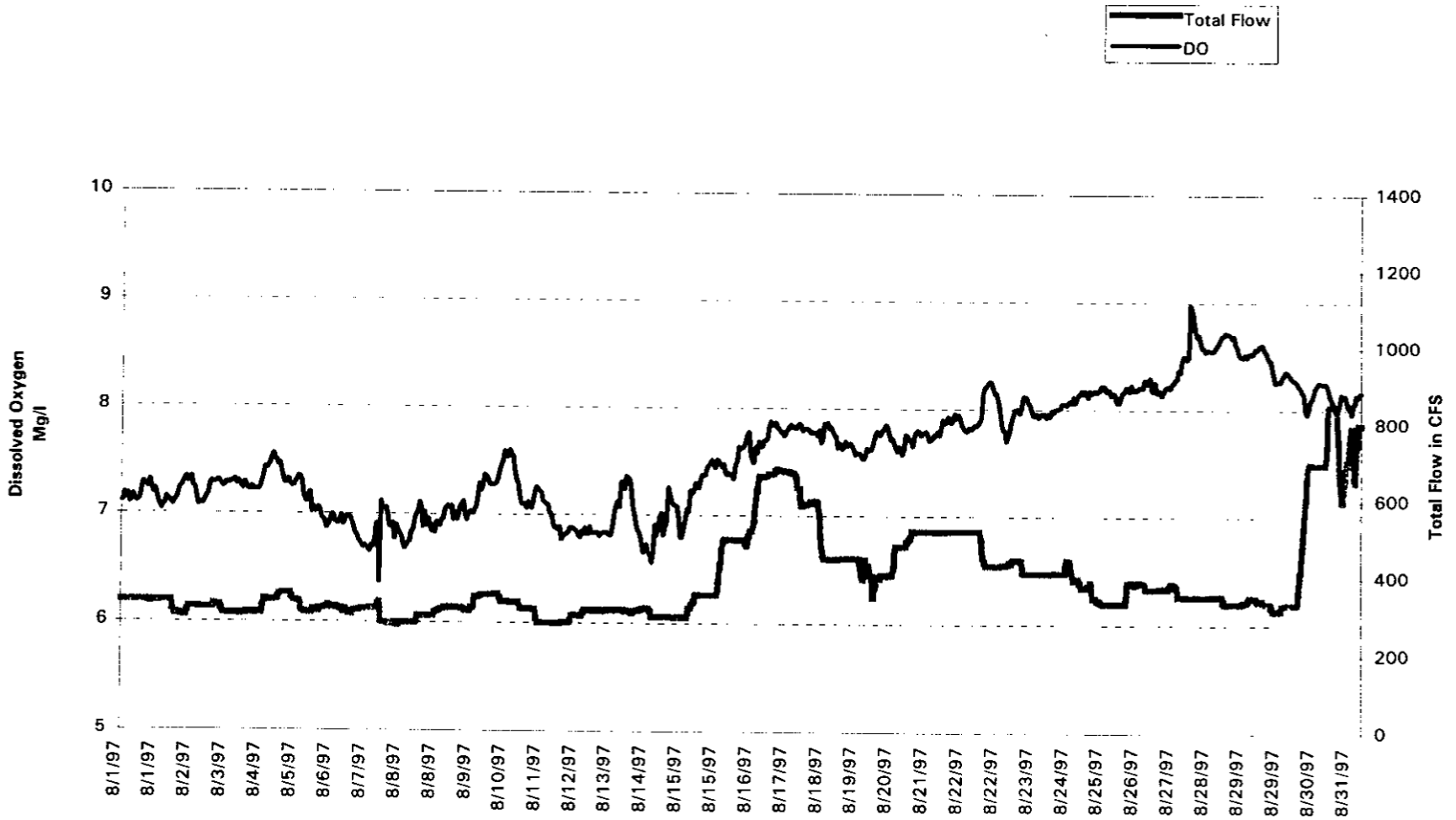

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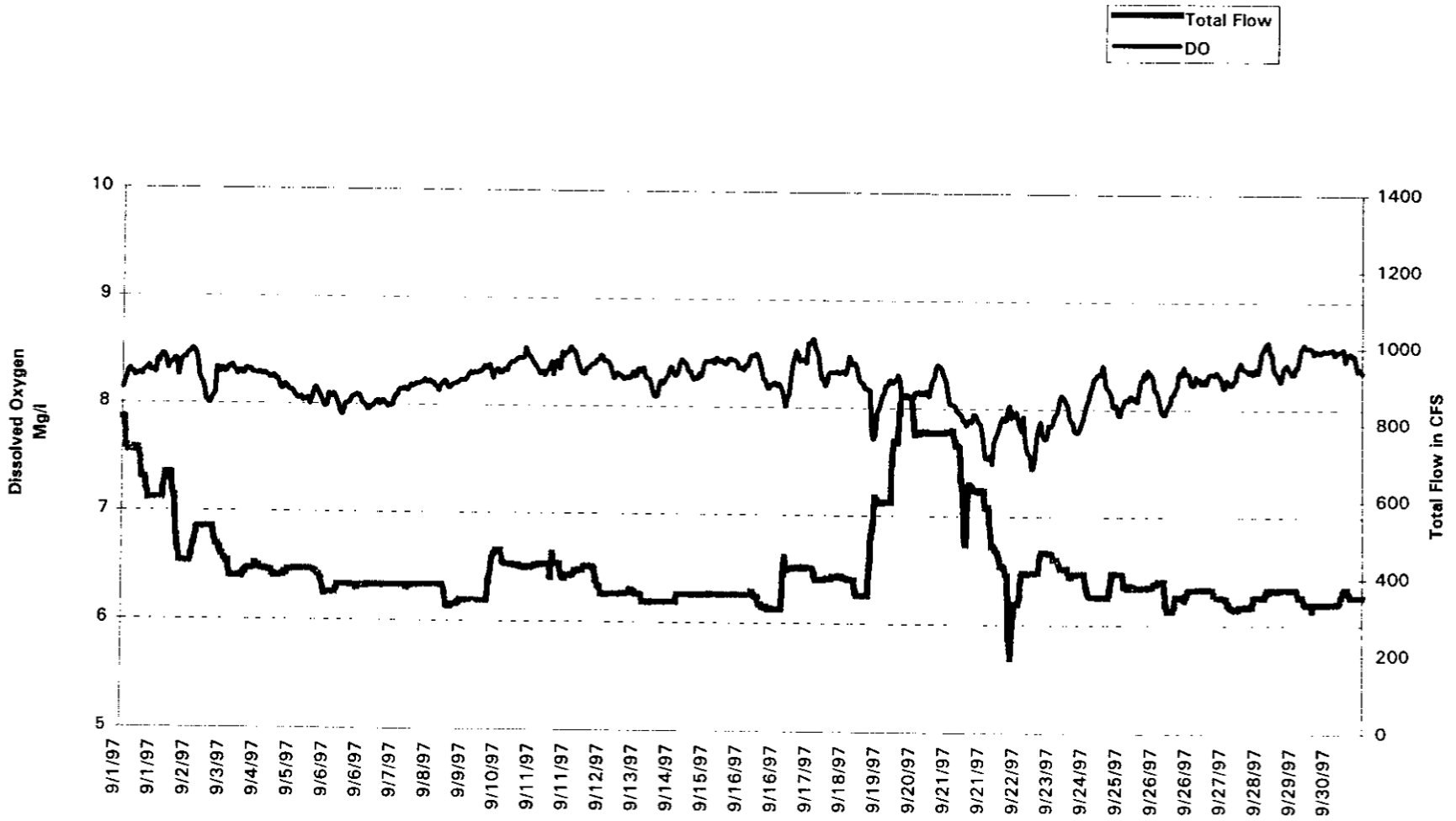

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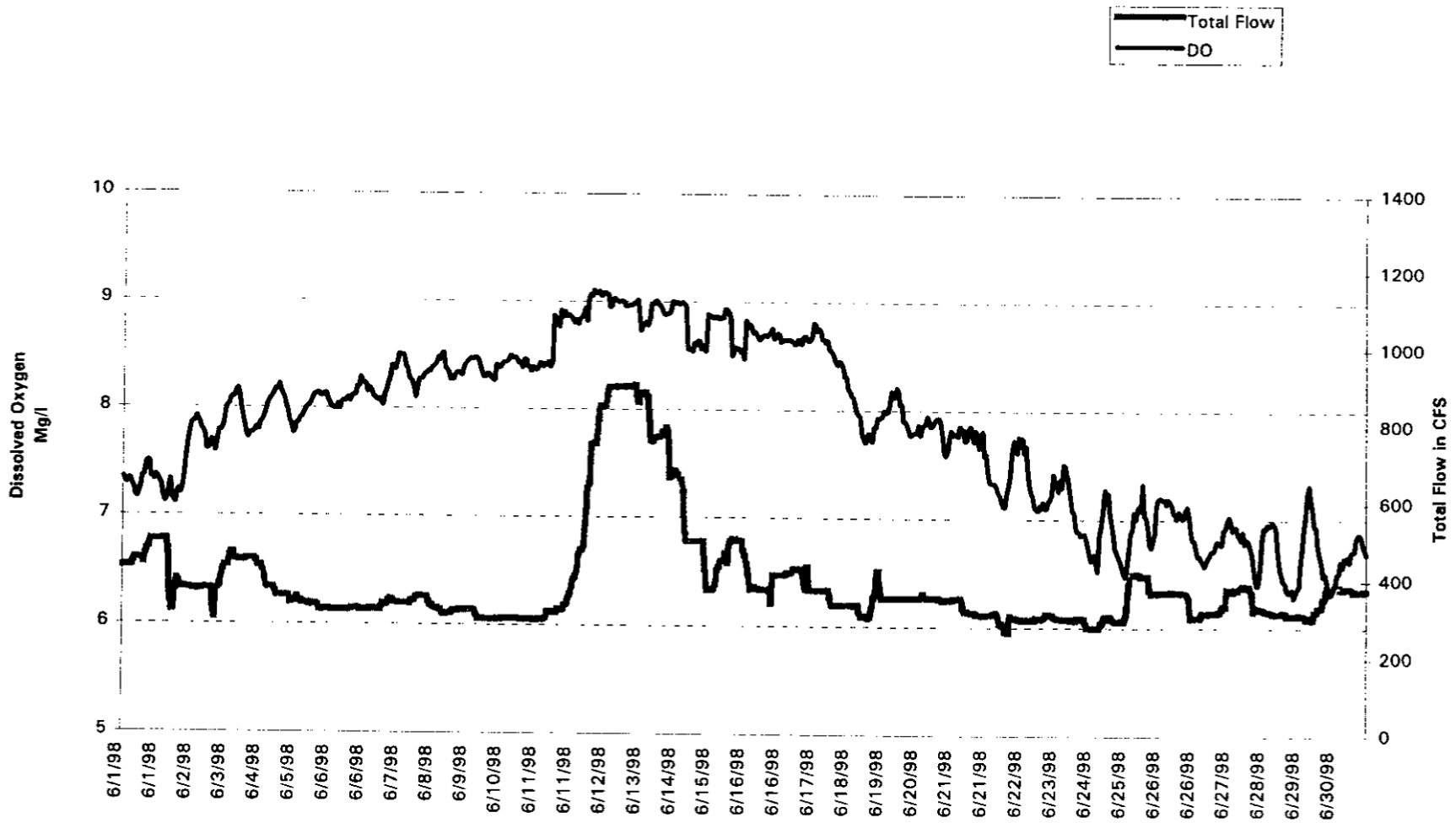


Prepared on 1/15/99

BRL98WQ.XLS Flow and DO, June 98

by AMS

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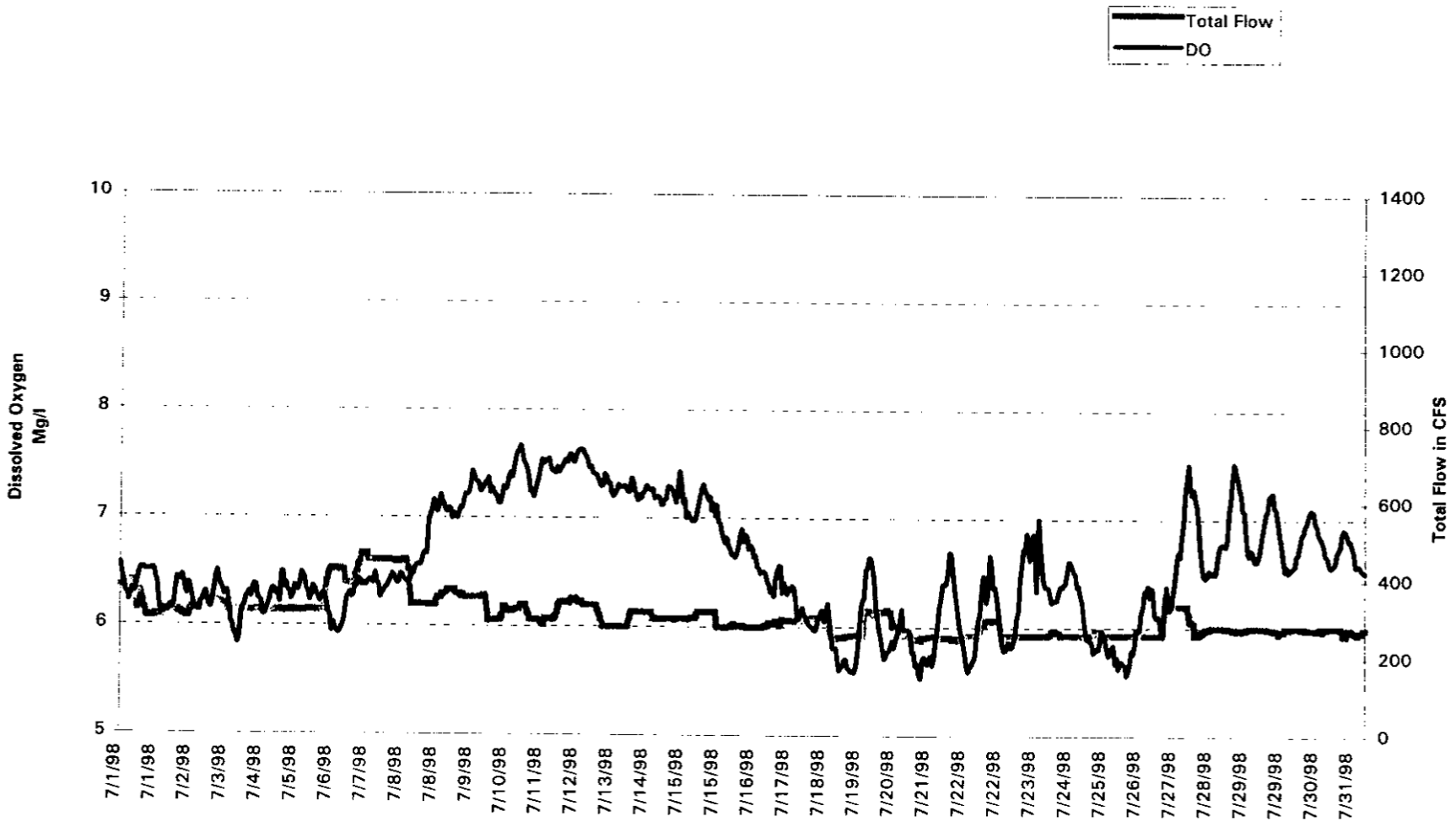
**Summer 1998**




Prepared on 1/15/99

BRL98WQ.XLS Flow and DO July 98

by AMS

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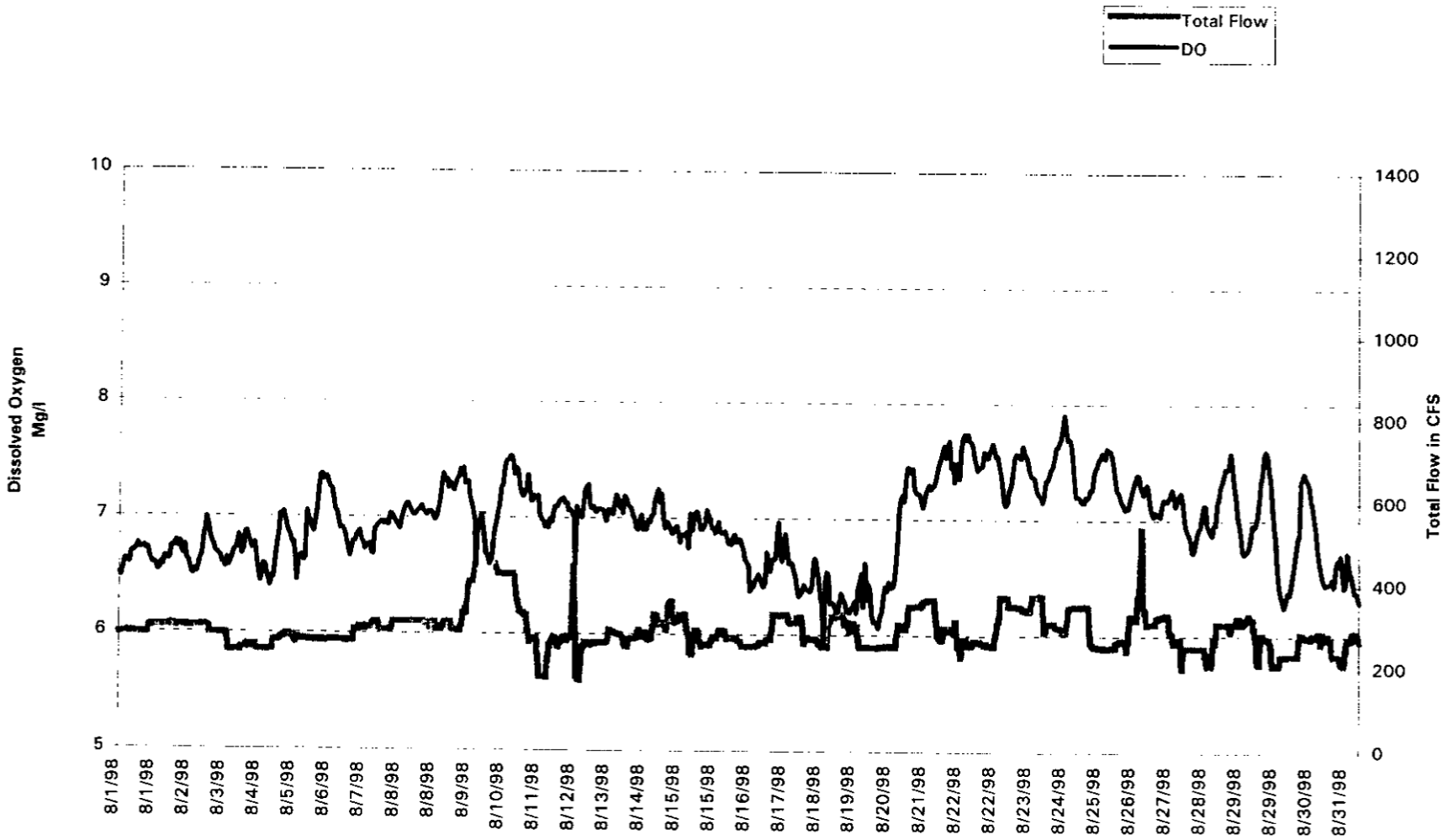
**Brule Hydroelectric Project Tailrace**
**Summer 1998**




Prepared on 1/15/99

BRL98WQ.XLS Flow and DO, August 98

by AMS

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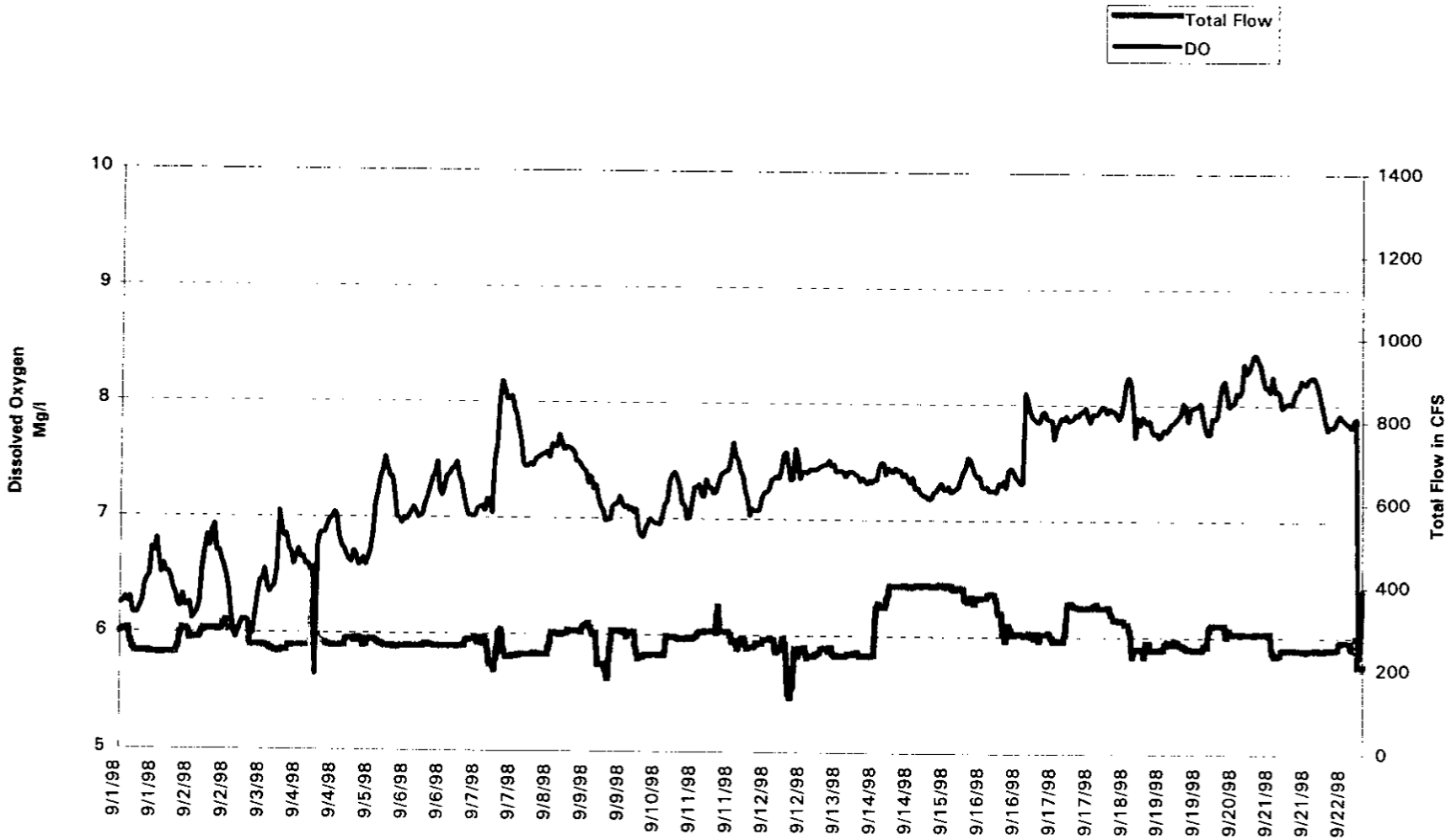
**Summer 1998**




Prepared on 1/15/99

BRL98WQ.XLS Flow and DO, September 98

by AMS

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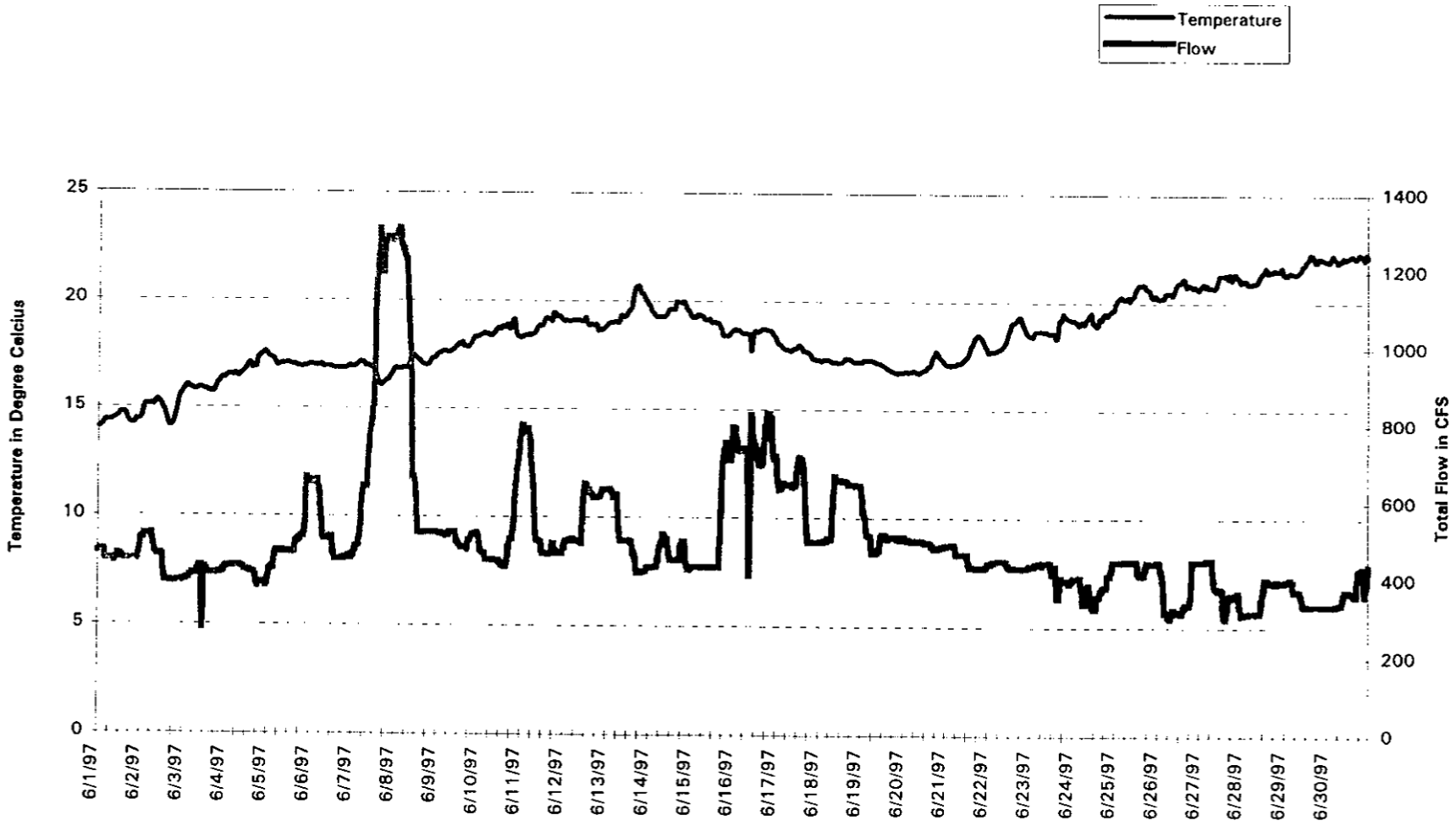

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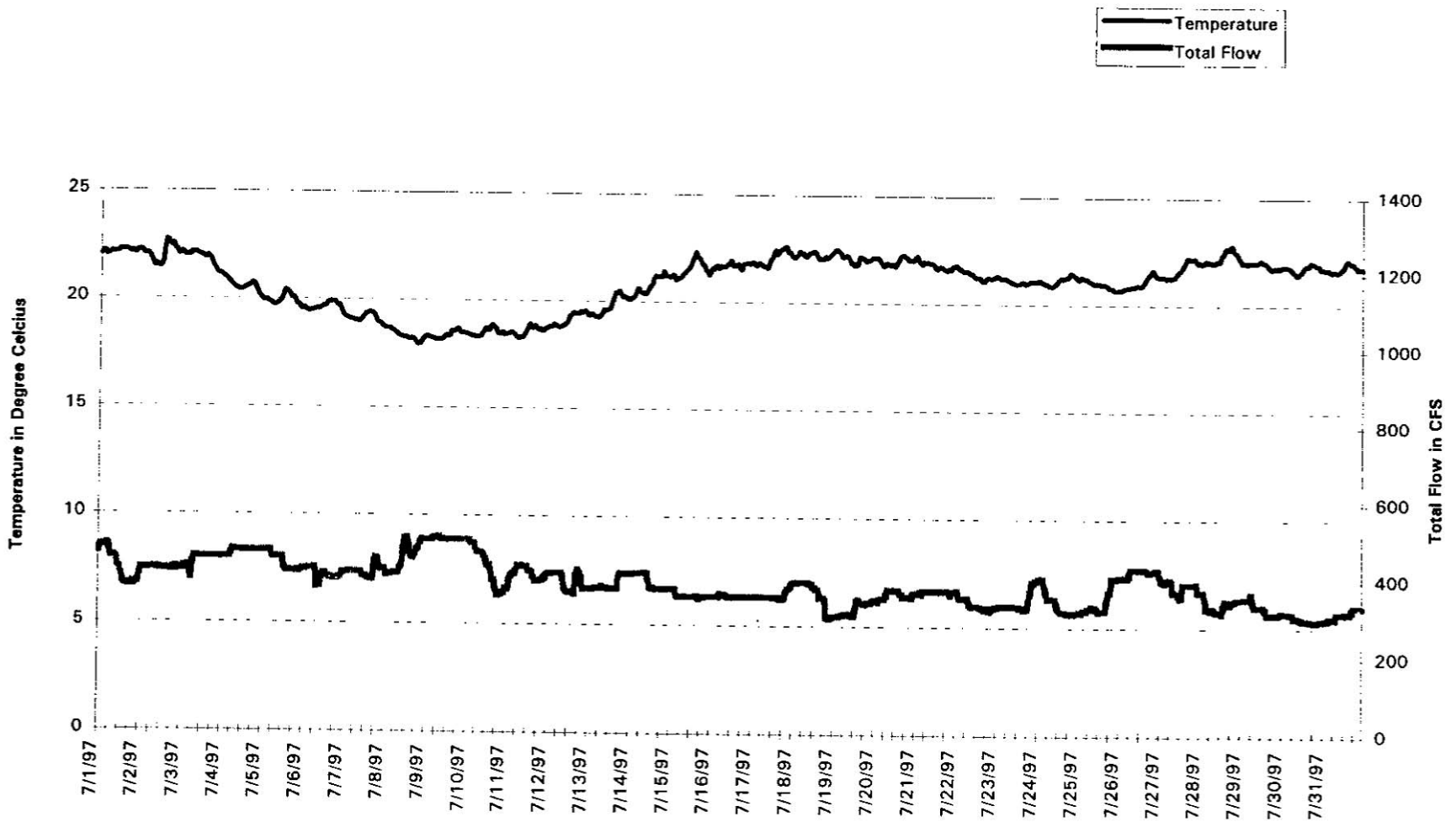


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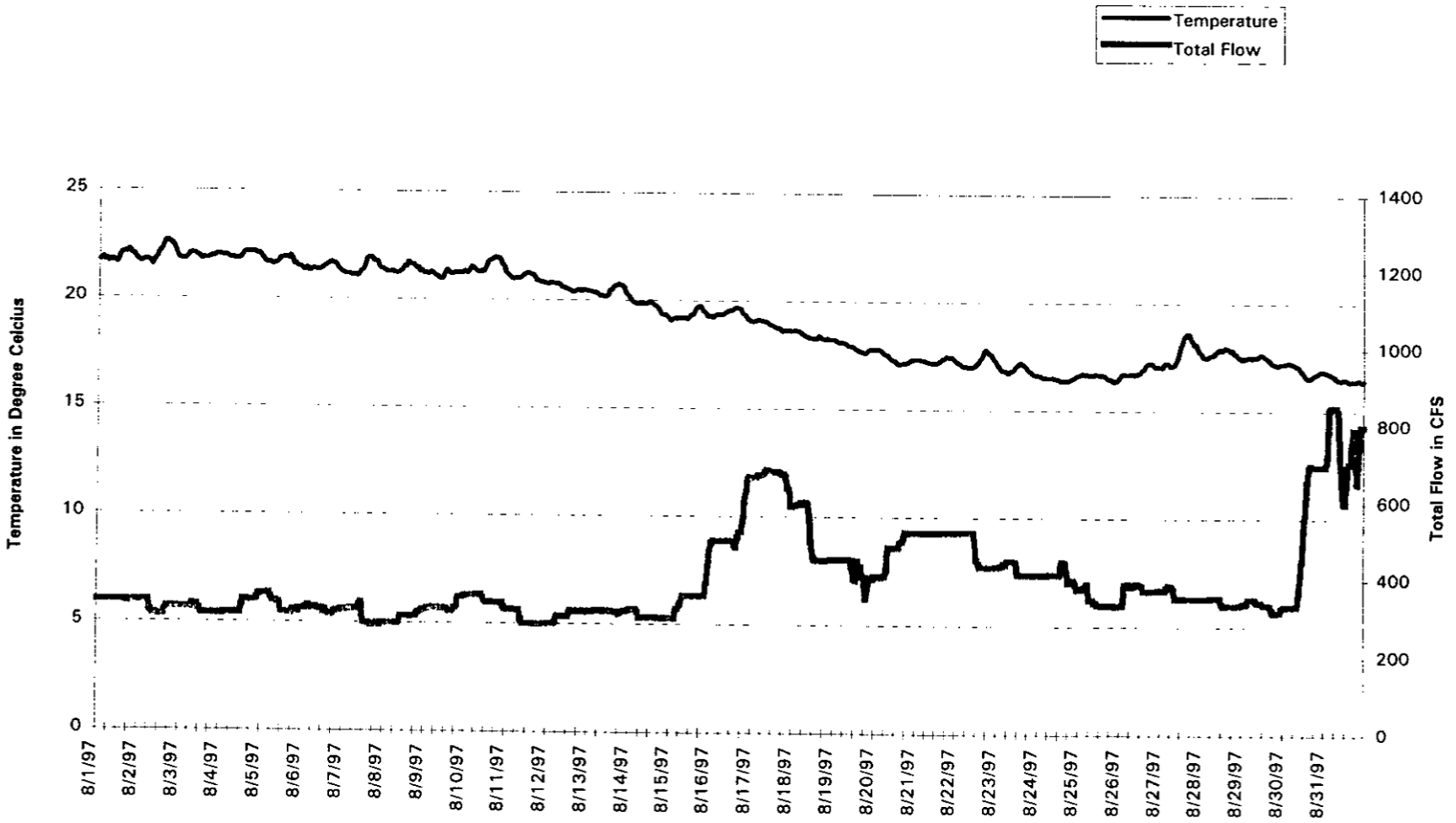

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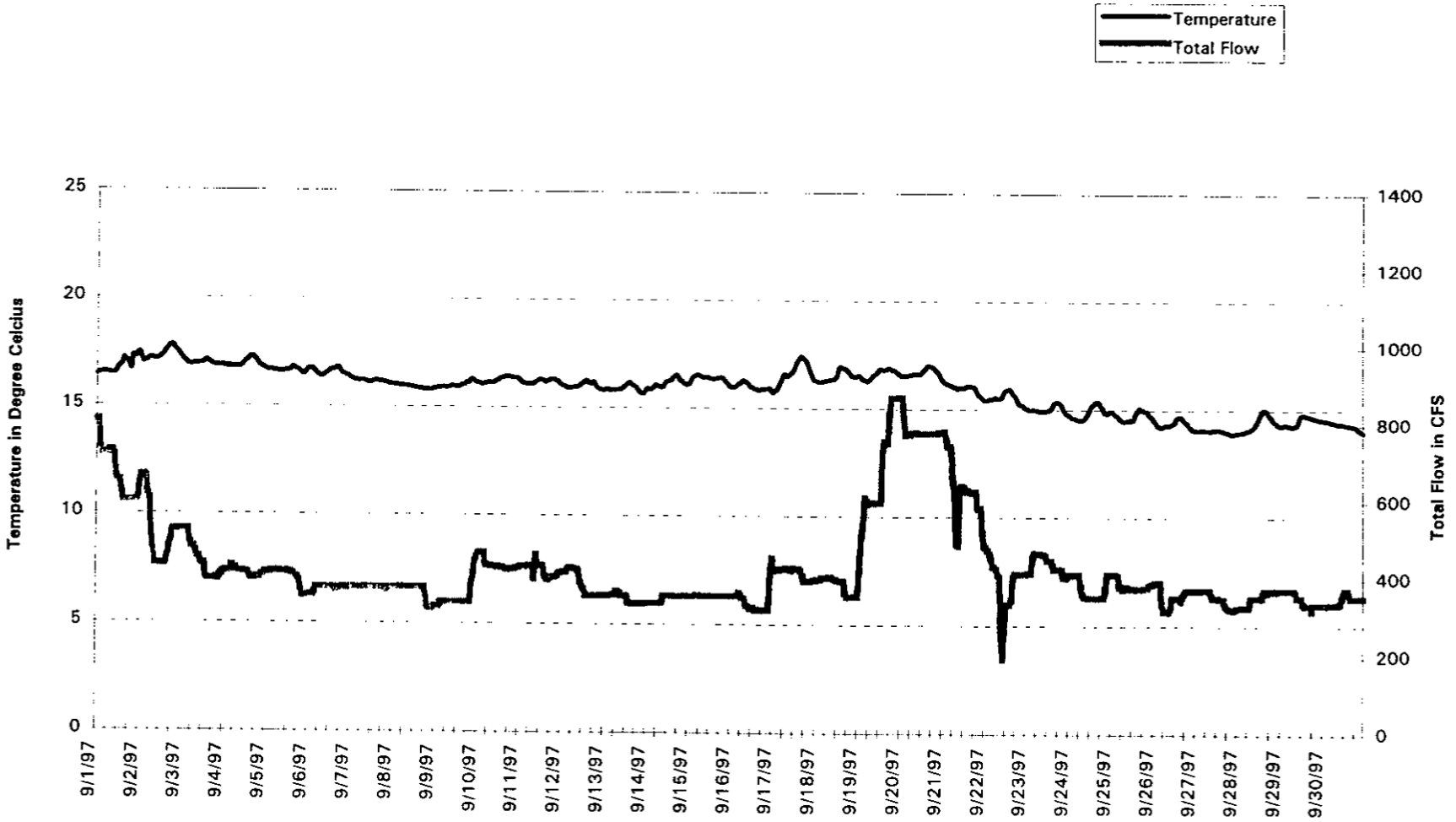


Prepared on 1/15/99

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by AMS

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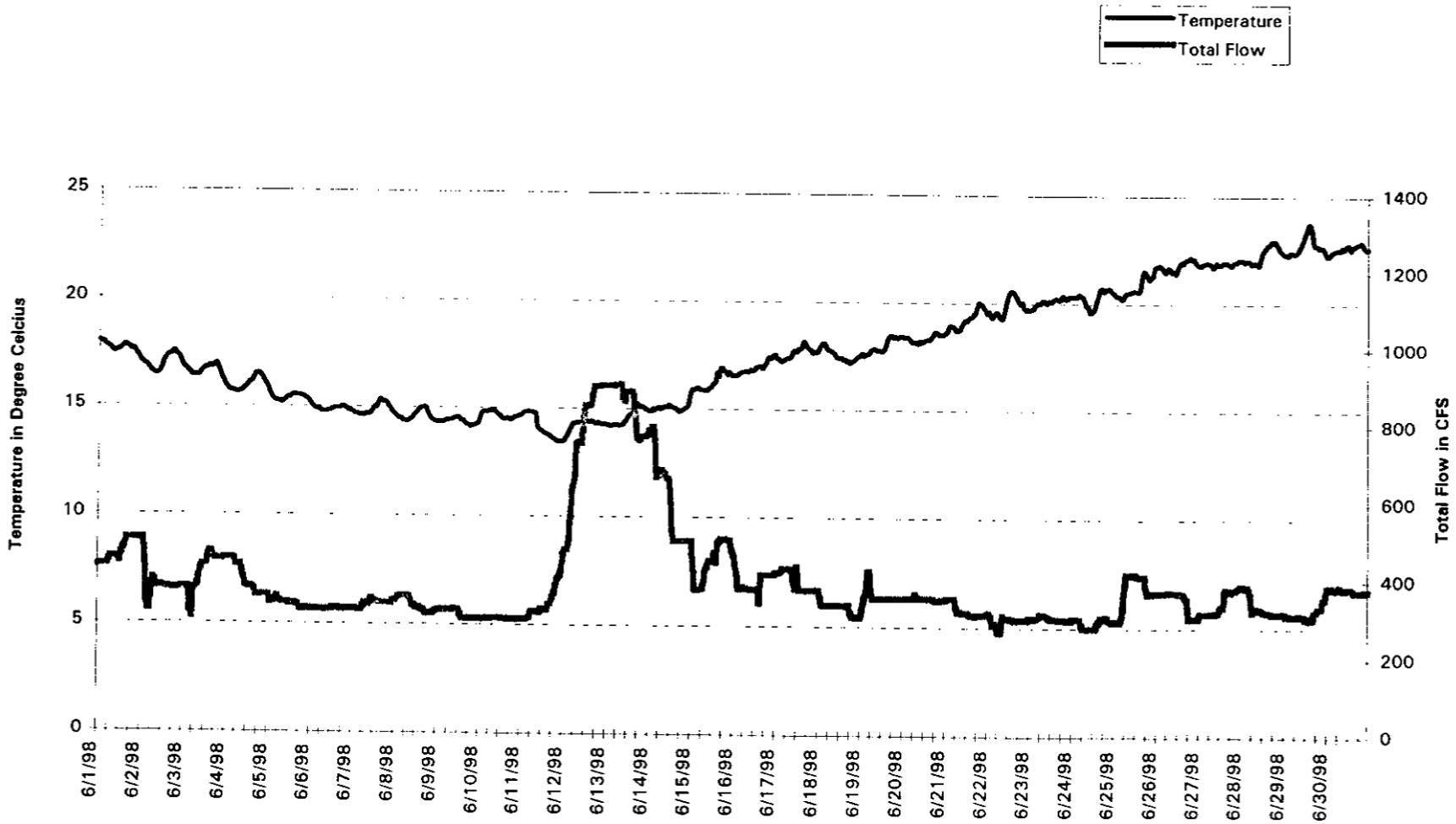

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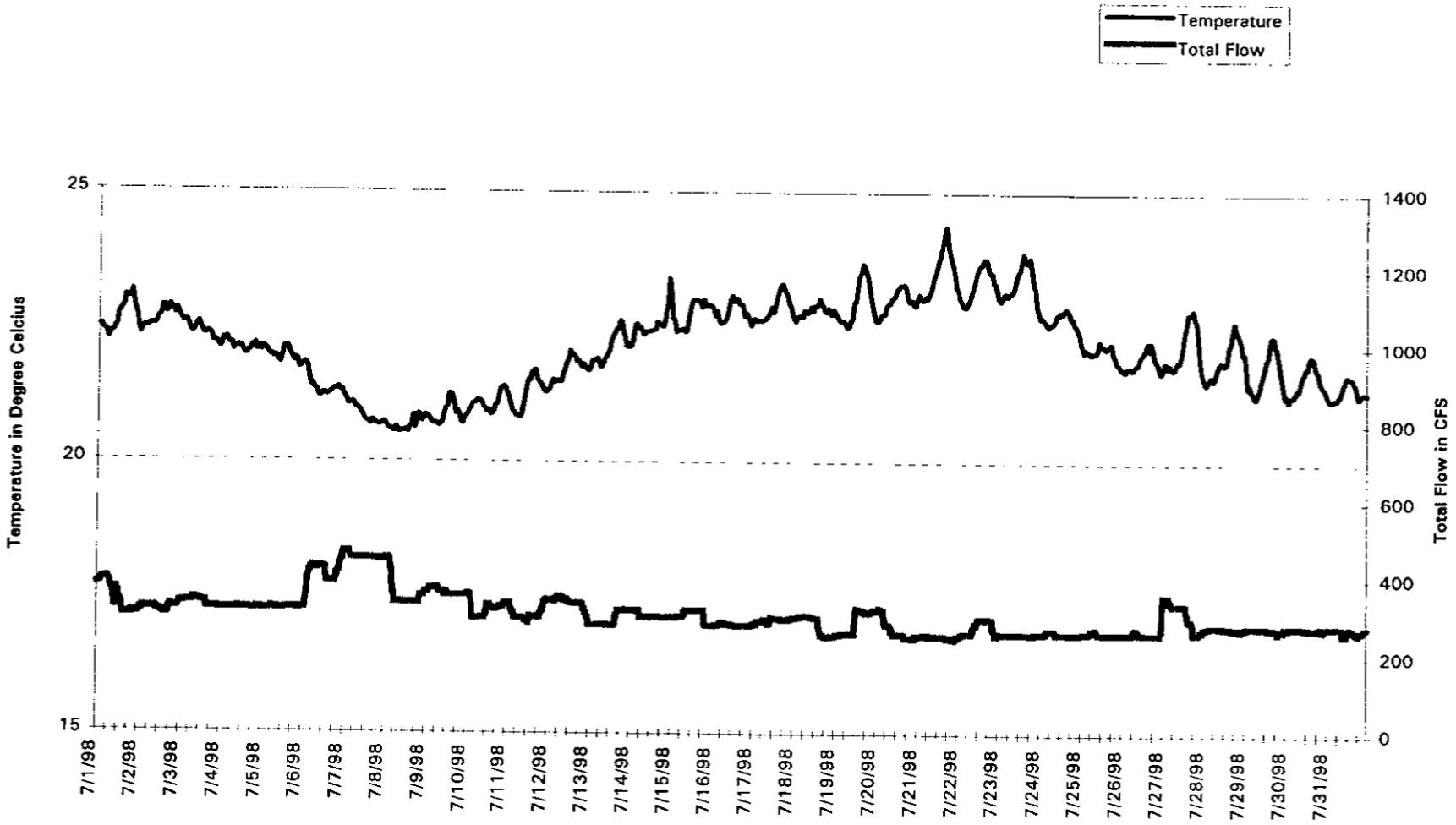


Prepared on 1/15/99

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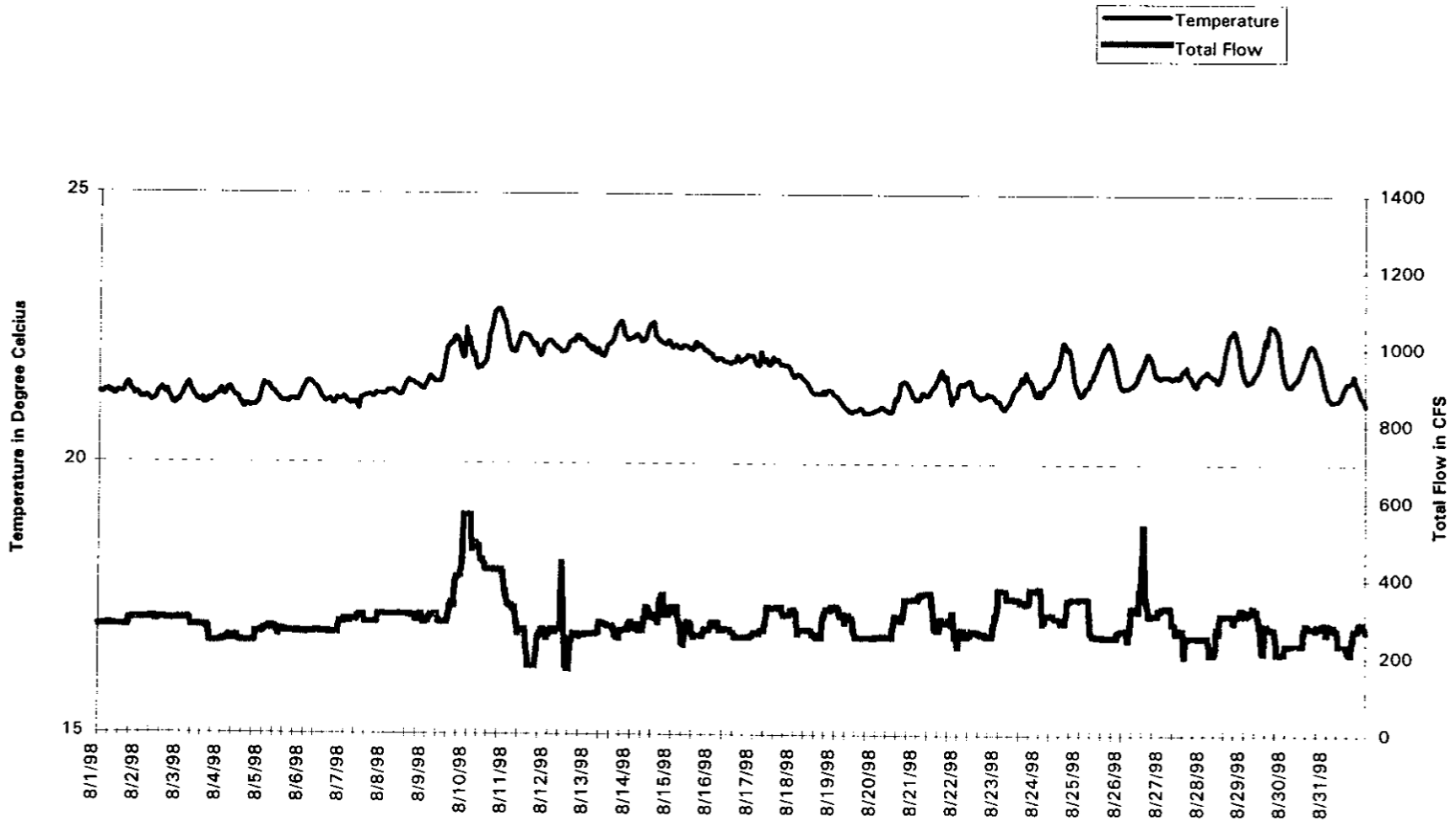
**Summer 1998**



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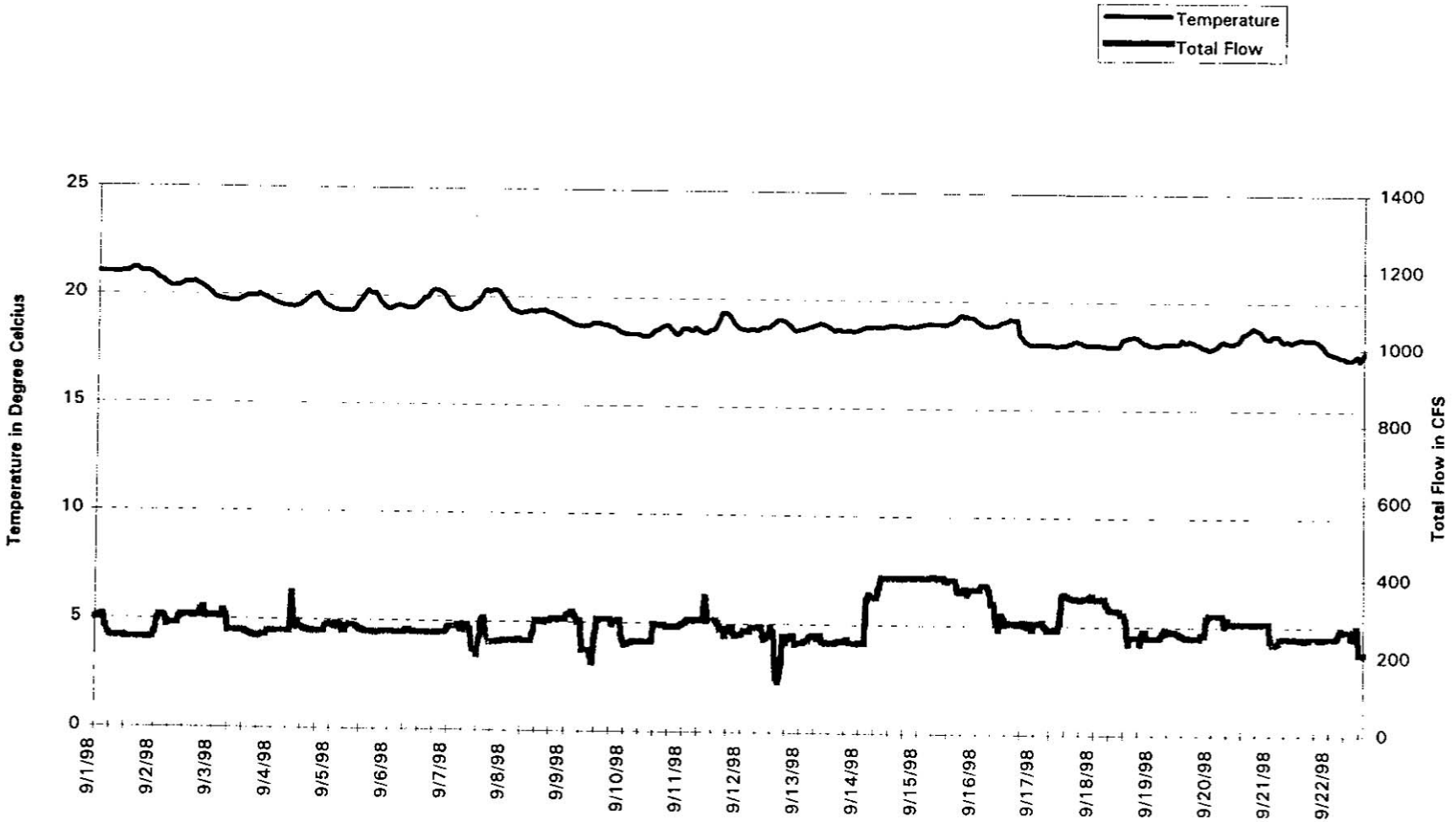
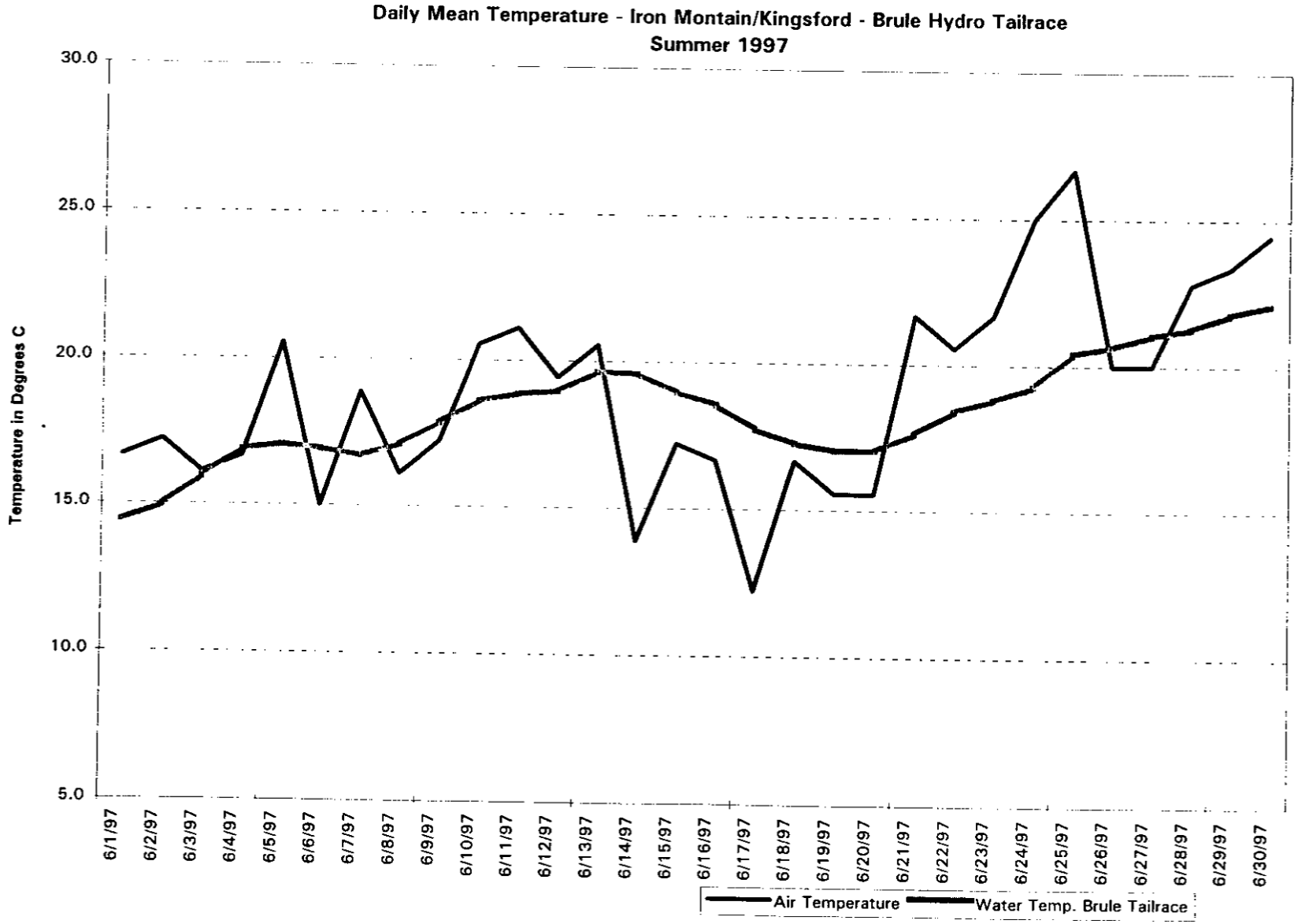



Prepared on 1/15/99

BRL98WQ.XLS Flow and Temp, September 98

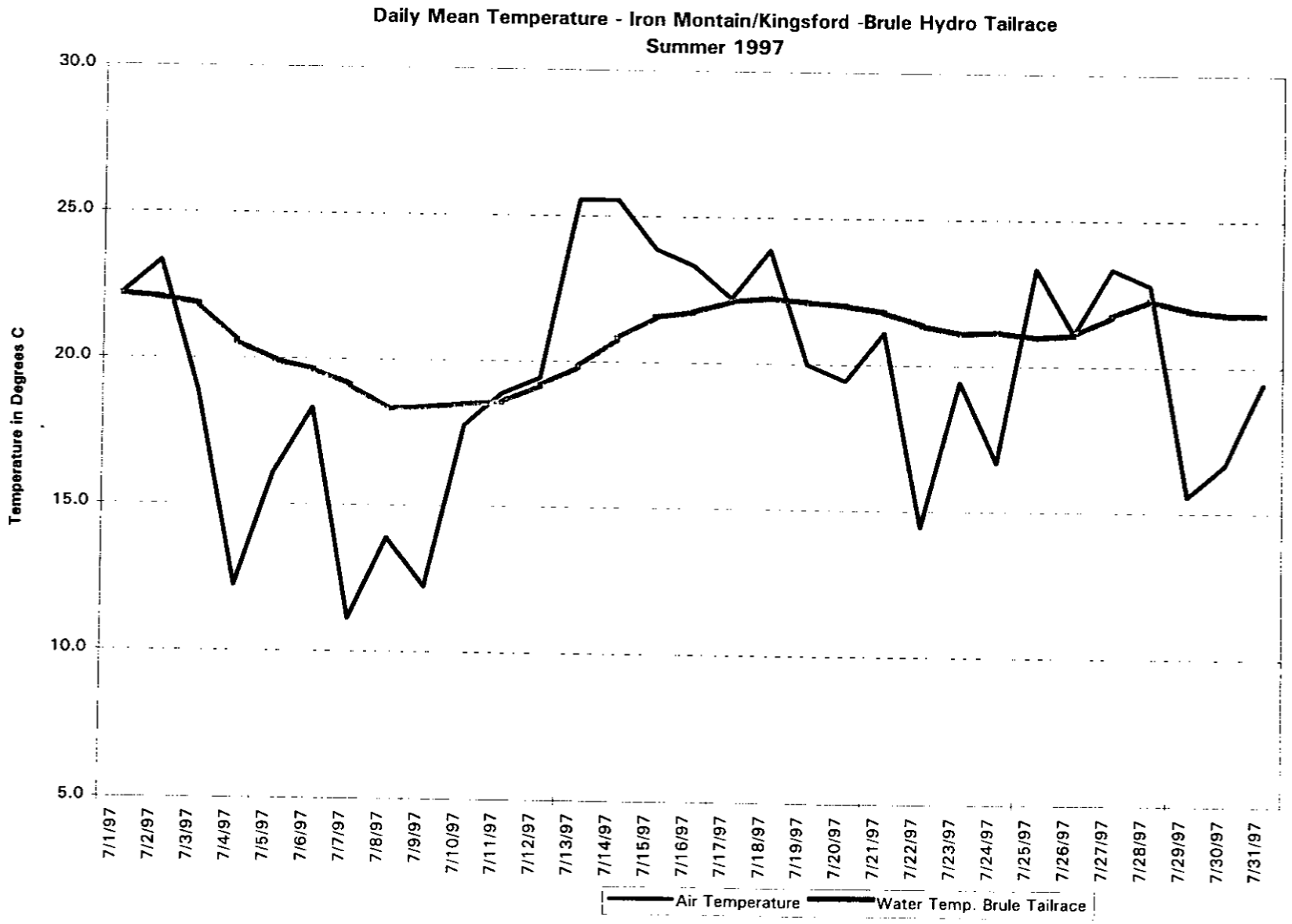
by AMS




Prepared on 1/18/99

CLMAT97.XLS Air and Water Temp, June 1997

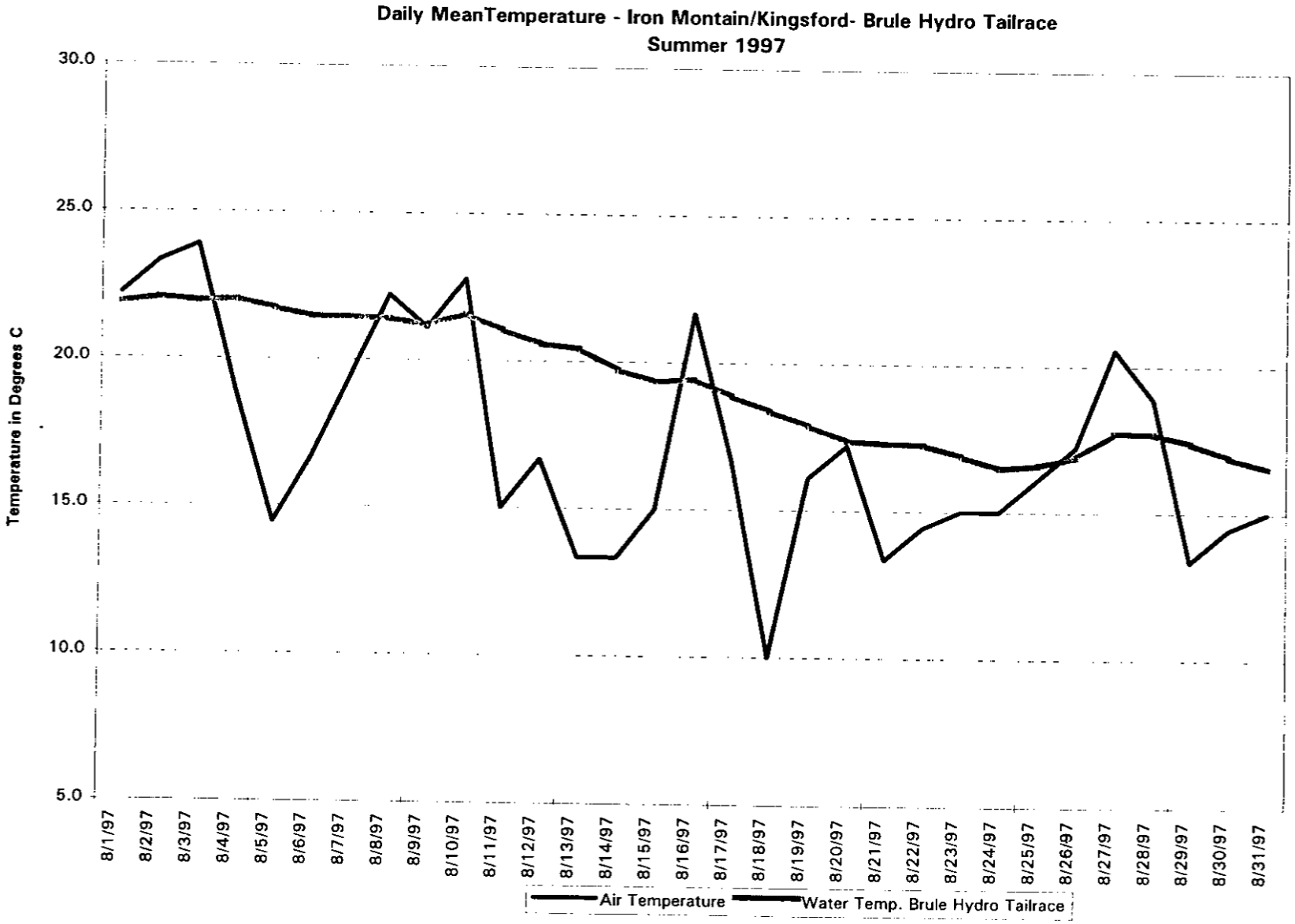
by AMS




Prepared on 1/18/99

CLMAT97.XLS Air and Water Temp, July 1997

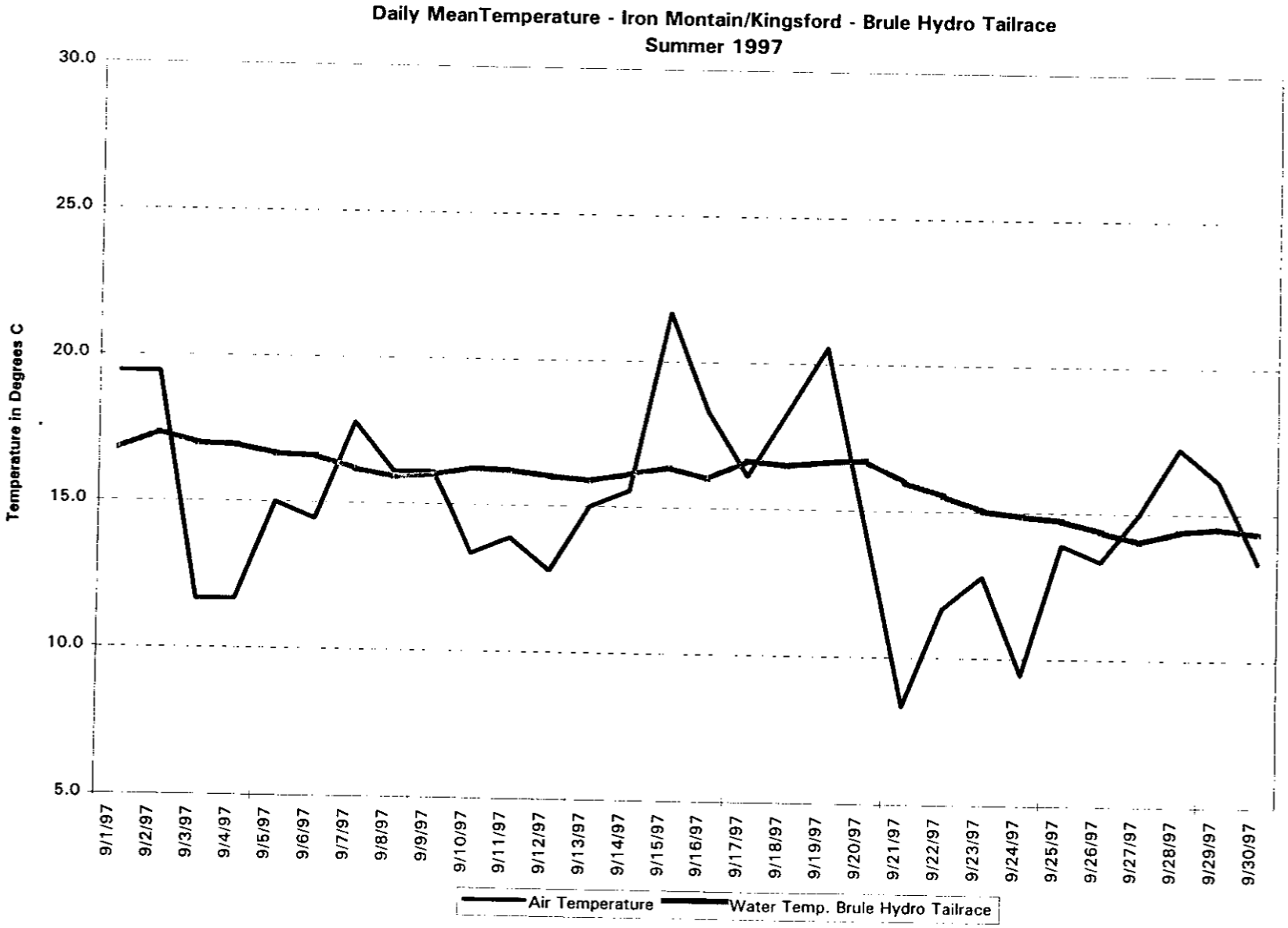
by AMS




Prepared on 1/18/99

CLMAT97.XLS Air and Water Temp, August 1997

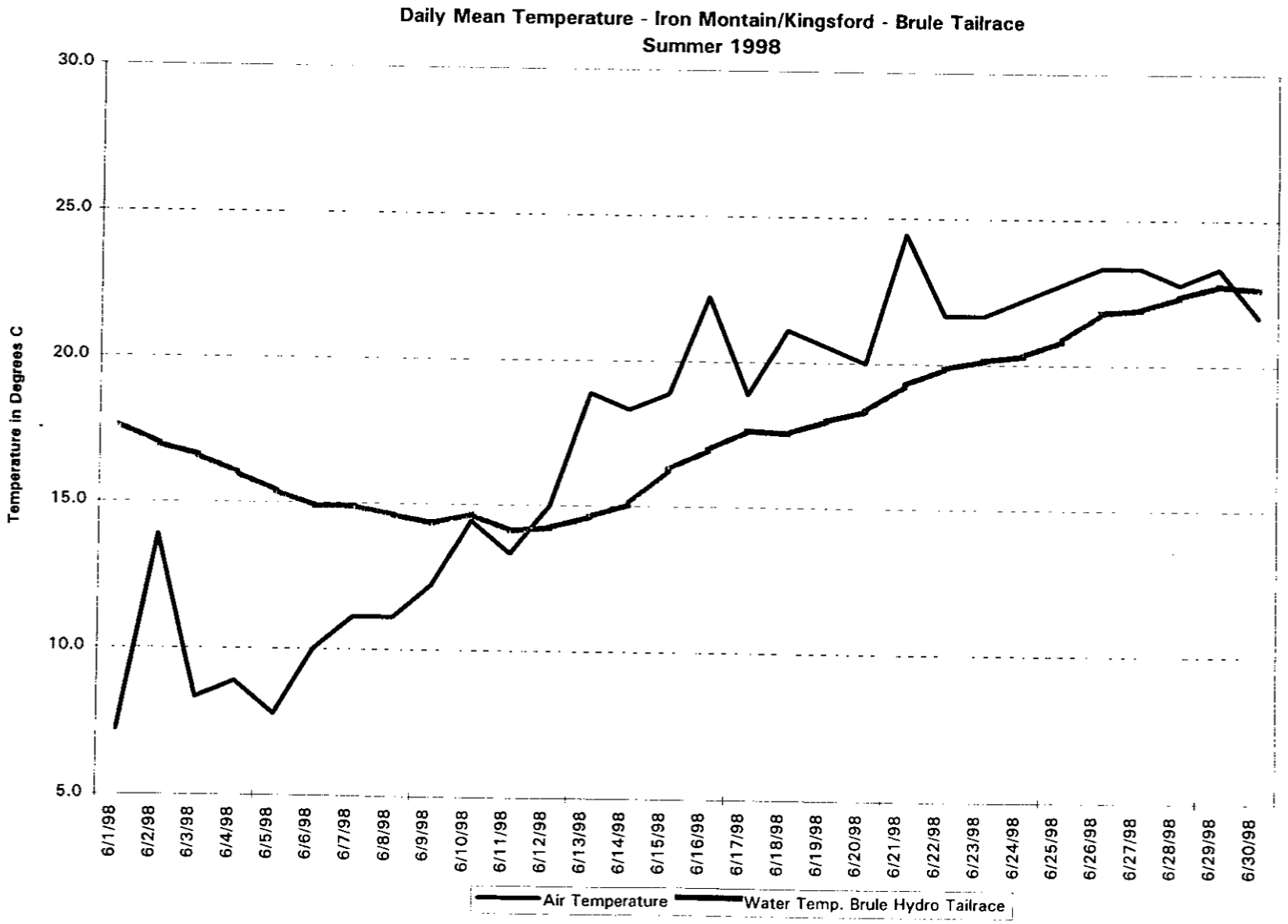
by AMS




Prepared on 1/18/99

CLMAT97.XLS Air and Water Temp September 97

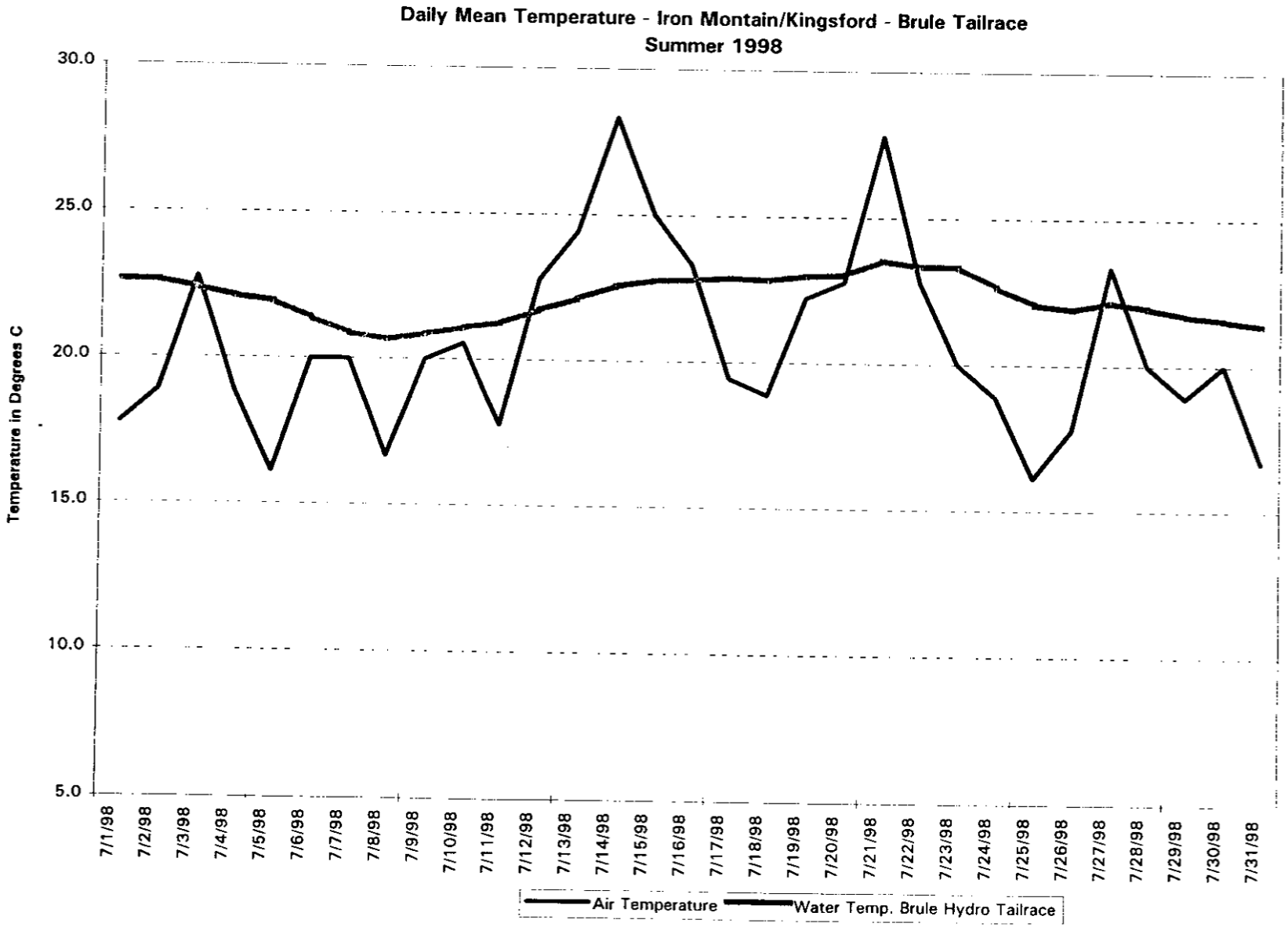
by AMS




Prepared on 1/18/99

CLMAT97.XLS Air and Water Temp, June 1998

by AMS

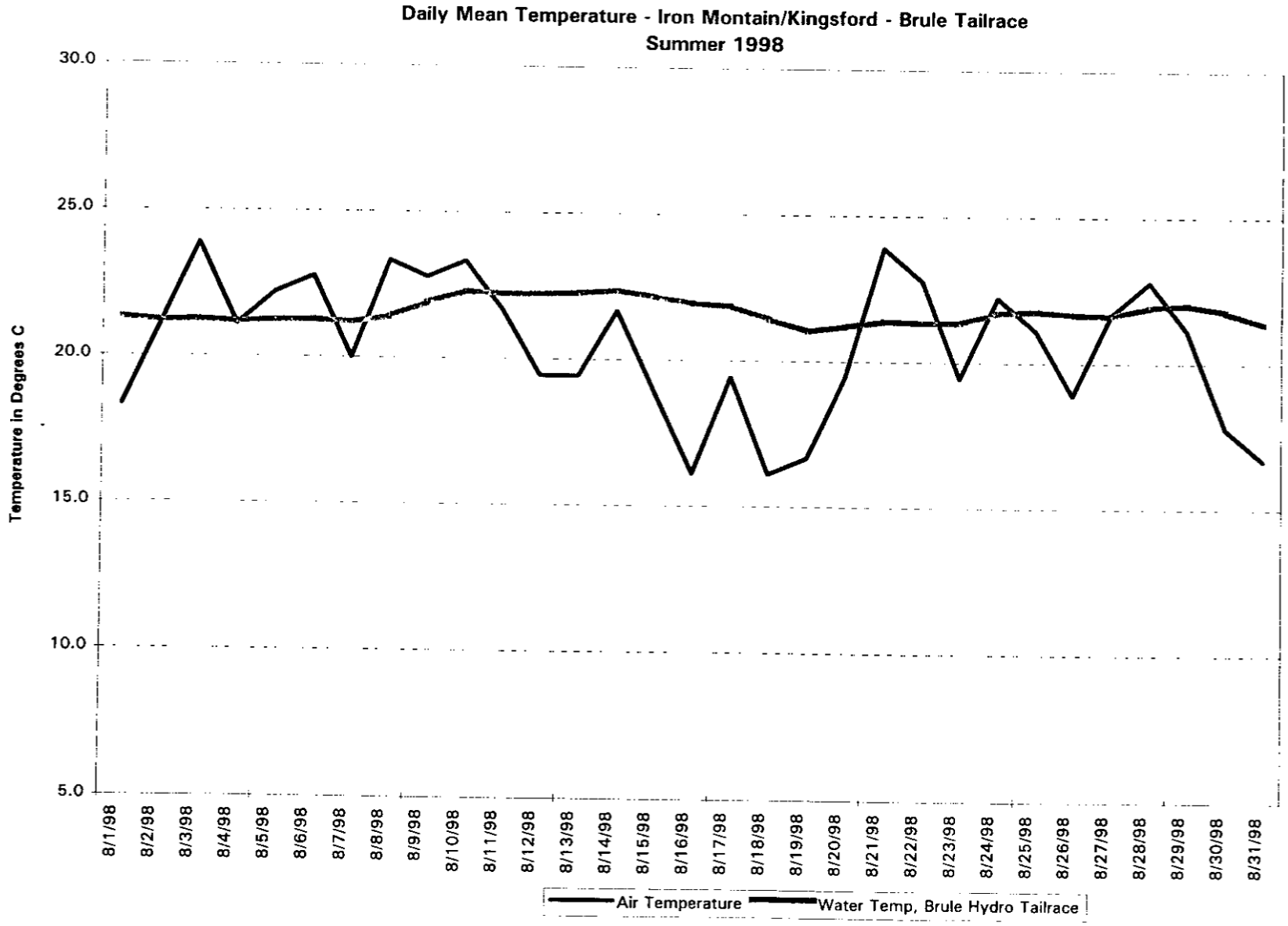



Prepared on 1/18/99

CLMAT97.XLS Air and Water Temp, July 1998

by AMS

Figure 23

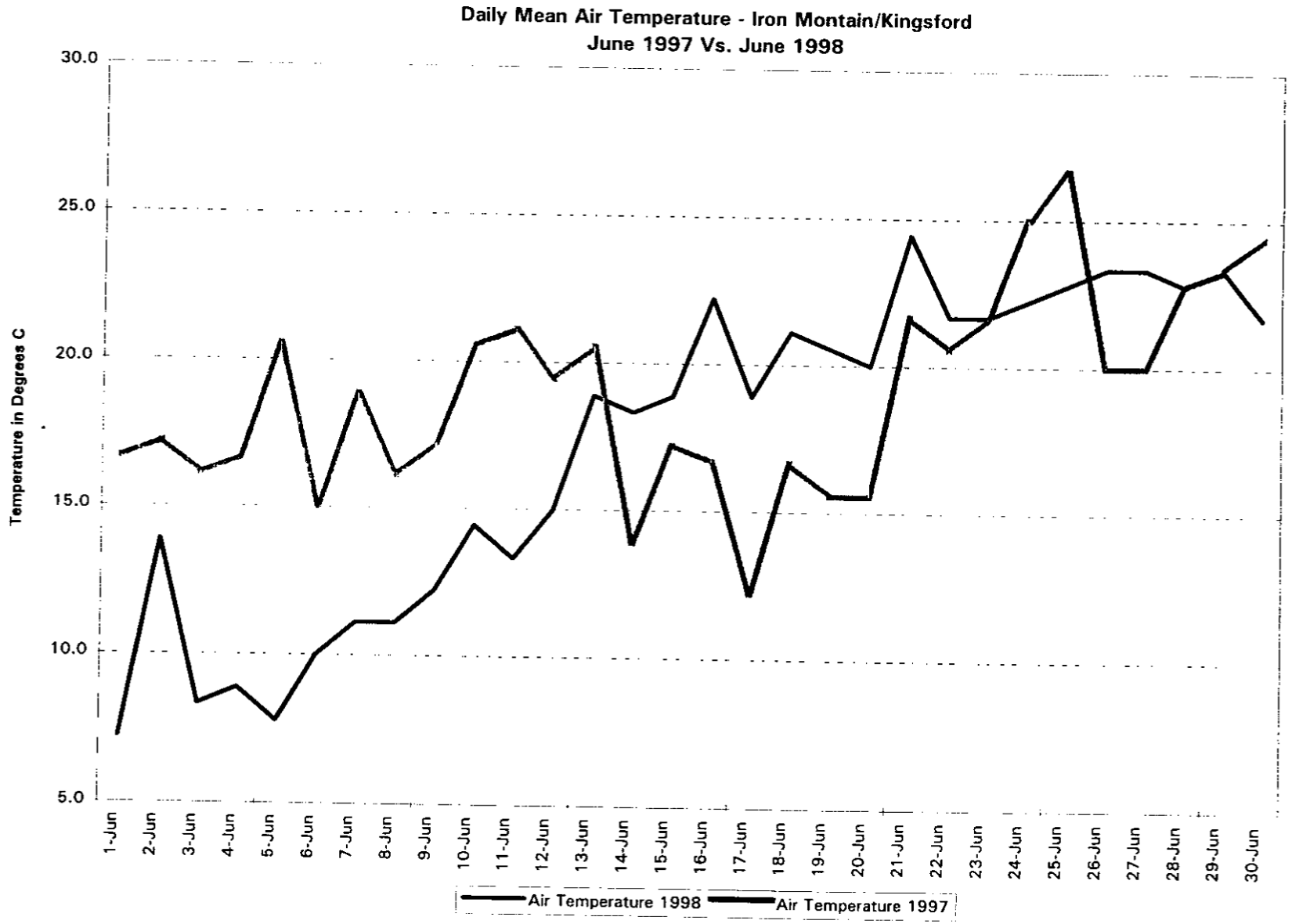



Prepared on 1/18/99

CLMAT97.XLS Air and Water Temp, August 1998

by AMS

Figure 24

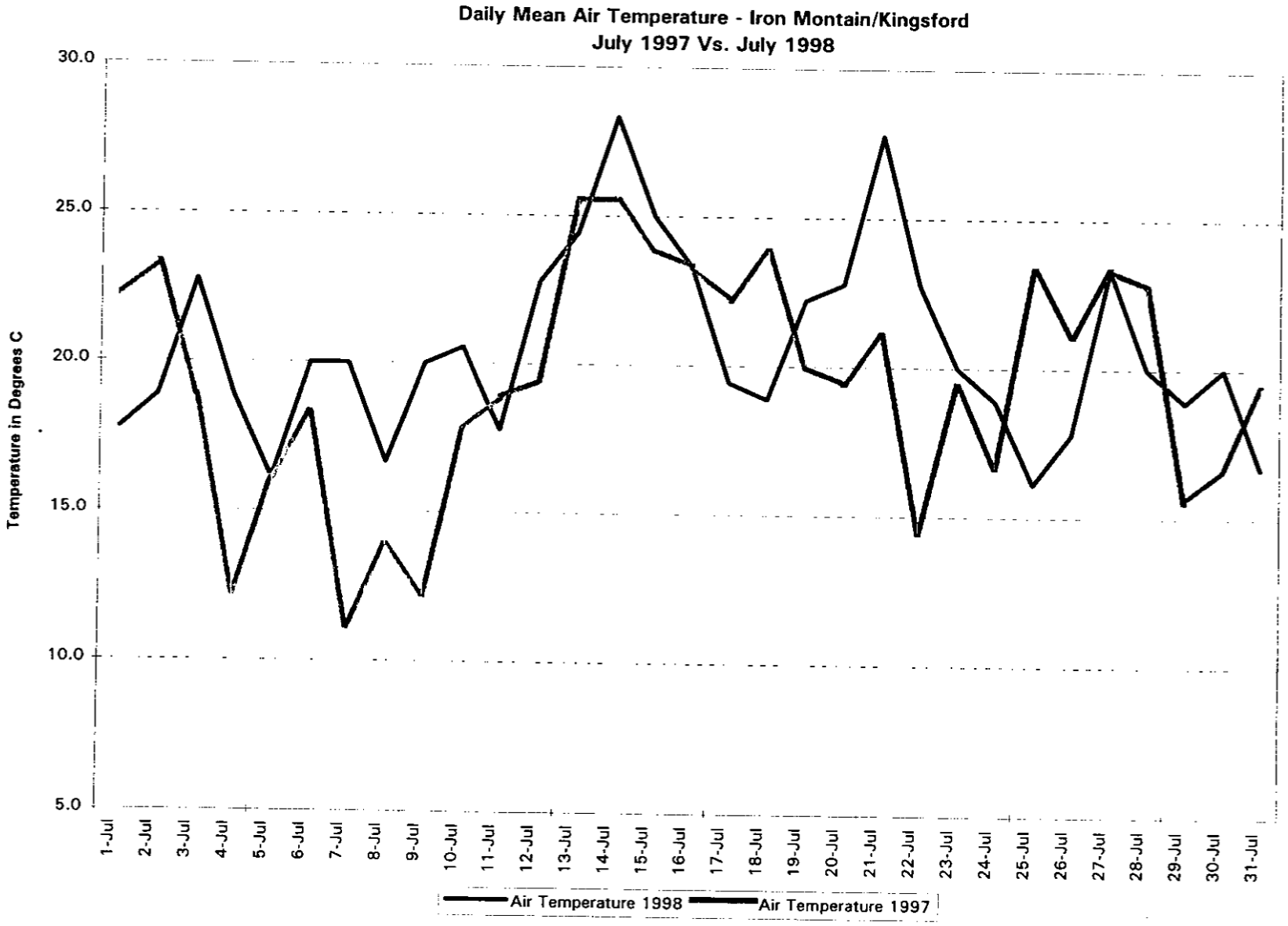



Prepared on 1/18/99

CLMAT97.XLS Air Temperature 97 vs.98- June

by AMS

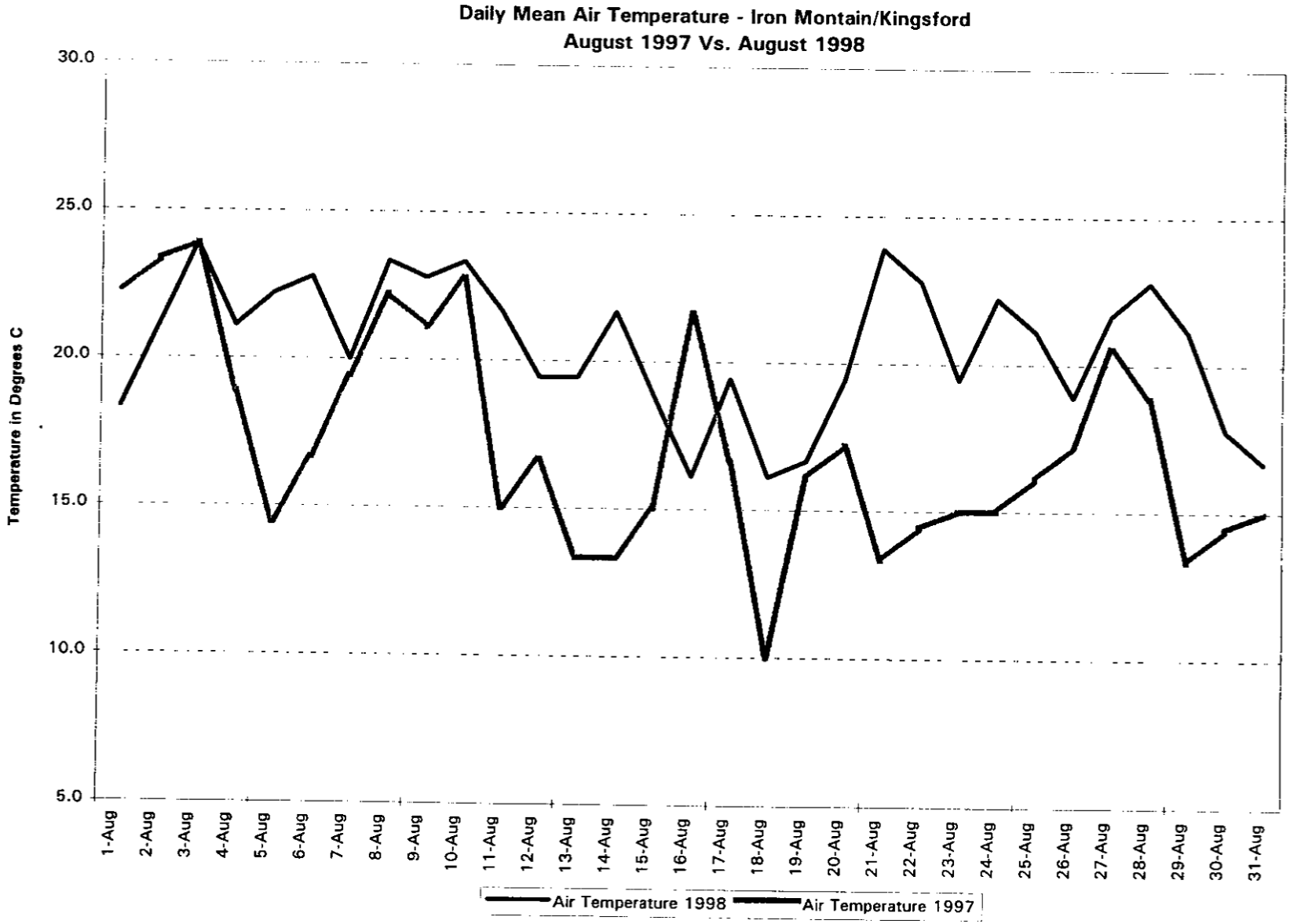
Figure 25




Prepared on 1/18/99

CLMAT97.XLS Air Temperature 97 Vs. 98- July

by AMS




Prepared on 1/18/99

CLMAT97.XLS Air Temperature 97 Vs 98 Aug.

by AMS