

DEEP CREEK HYDROELECTRIC STATION  
MARYLAND DEPARTMENT of the ENVIRONMENT  
WATER APPROPRIATION  
PERMIT NO. GA92S009 (03)  
GARRETT COUNTY, MARYLAND

**2004 ANNUAL REPORT**

January 2005

BY

RELIANT ENERGY MARYLAND HOLDINGS, LLC

292005-001

**DEEP CREEK HYDROELECTRIC STATION  
MDE WATER APPROPRIATION PERMIT NO. GA92S009 (03)  
ANNUAL REPORT for 2004**

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**DEEP CREEK HYDROELECTRIC STATION  
MDE WATER APPROPRIATION PERMIT NO. GA92S009 (03)  
ANNUAL REPORT 2004**

**1.0 SUMMARY**

Reliant Energy Maryland Holdings, LLC (Permittee) holds Water Appropriation Permit GA92S009(03) issued by the Maryland Department of the Environment (Department). Permit GA92S009(03) provides for the continued operation of the Deep Creek Hydroelectric Station.

Permit Condition 23 requires the Permittee to submit an annual report to the Department, including data and information as specified in Permit Conditions 15 – 19 and 21.

**1.1 LAKE LEVEL MONITORING**

**End of Month Levels**

Appendix A contains daily water level data for 2004. Reservoir levels exceeded the desired end of month Upper Rule Band (URB) by 0.17 feet in July, 0.27 feet in August, and 0.08 feet in September. Reservoir levels were 2.1 feet, 1.4 feet, 0.55 feet, 0.15 feet, 0.1 feet, 0.2 feet, 0.12 feet, 0.2 feet, and 1.0 feet below the URB in January, February, March, April, May, June, October, November and December, respectively. Water levels were maintained above the Lower Rule Band (LRB) for the entire year.

**Daily Levels**

The following text describes each daily exceedance of the URB. Table 1.0 provides a summary of this text in a table format. As indicated above, the impoundment was maintained above the LRB for the entire year.

The reservoir level was maintained between 2457.7 and 2461.0 feet from the first of the year until the middle of May. The Deep Creek area received 1.95” of rain on May 19<sup>th</sup>, 0.45” on May 20<sup>th</sup>, and another 1.07” on May 22. These events forced the reservoir level above the URB to 2461.1 feet on May 20<sup>th</sup>, 2461.2 feet on May 22<sup>nd</sup>, and 2461.10 feet on May 23<sup>rd</sup>. From May 25<sup>th</sup> through June 4<sup>th</sup>, the Deep Creek area received at least 0.25” of precipitation on 6 of these 11 days, which forced the reservoir slightly above the URB by 0.1 feet from June 4<sup>th</sup> until June 8<sup>th</sup>. The reservoir elevated above the URB to 2461.3 feet on June 12<sup>th</sup>, 2461.2 feet on June 13<sup>th</sup> and 14<sup>th</sup>, and 2461.1 feet on June 15<sup>th</sup> due to 1.92” of precipitation on June 12. The reservoir remained at or below the URB from June 16<sup>th</sup> through August 1<sup>st</sup>. On July 28<sup>th</sup> and 29<sup>th</sup> the Deep Creek area received 0.92” and 0.62” of precipitation, resulting in the reservoir being above the URB on August 1<sup>st</sup> and August 2<sup>nd</sup> by 0.1 feet. From

August 3<sup>rd</sup> through September 1<sup>st</sup>, the reservoir remained at or below the URB. From September 1<sup>st</sup> through September 22<sup>nd</sup>, excluding the 7<sup>th</sup>, 8<sup>th</sup>, and 15<sup>th</sup>-17<sup>th</sup> the reservoir elevation exceeded the URB from 0.10 feet to 0.3 feet (0.18 feet average) above the upper rule band. During this period rainfall total was approximately 5.0". The Deep Creek reservoir remained at or below the URB from September 23<sup>rd</sup> through November 5<sup>th</sup>. On November 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> the reservoir was at 2458.0 feet – 0.10 feet above the URB due to a previous 4-day total rainfall of approximately 1.5". The reservoir remained at or below the URB for the rest of the year, except for December 2<sup>nd</sup> and 7<sup>th</sup> when the reservoir was 0.1 feet above the URB due to 1.55" of precipitation on December 1<sup>st</sup> and 0.47" on December 6<sup>th</sup> and 7<sup>th</sup>.

Rainfall totals for May, June, August, September, November, and December were 7.53 inches, 4.43 inches, 5.84 inches, 5.65 inches, 4.01 inches, and 4.03 inches respectively. The rainfall total for these months in 2004 was 31.49 inches. Appendix A includes the monthly reservoir levels in tabular and graphical format. Reservoir levels during these months exceeded the URB as follows:

**Table 1.0**  
**Summary of Daily Exceedances of the URB**

<b>Date</b>	<b>Reservoir Level (Ft)</b>	<b>Upper Rule Band (Ft)</b>	<b>Δ (Ft)</b>
May 20	2461.10	2461.00	0.10
May 22	2461.20	2461.00	0.20
May 23	2461.10	2461.00	0.10
June 4	2461.10	2461.00	0.10
June 5	2461.10	2461.00	0.10
June 6	2461.10	2461.00	0.10
June 7	2461.10	2461.00	0.10
June 8	2461.10	2461.00	0.10
June 12	2461.30	2461.00	0.30
June 13	2461.20	2461.00	0.20
June 14	2461.20	2461.00	0.20
June 15	2461.10	2461.00	0.10
August 1	2460.10	2460.00	0.10
August 2	2460.10	2460.00	0.10

<b>Date</b>	<b>Reservoir Level (Ft)</b>	<b>Upper Rule Band (Ft)</b>	<b><math>\Delta</math> (Ft)</b>
September 1	2459.30	2459.00	0.30
September 2	2459.30	2459.00	0.30
September 3	2459.20	2459.00	0.20
September 4	2459.10	2459.00	0.10
September 5	2459.10	2459.00	0.10
September 6	2459.10	2459.00	0.10
September 9	2459.20	2459.00	0.20
September 10	2459.40	2459.00	0.40
September 11	2459.30	2459.00	0.30
September 12	2459.20	2459.00	0.20
September 13	2459.10	2459.00	0.10
September 14	2459.10	2459.00	0.10
September 18	2459.10	2459.00	0.10
September 19	2459.20	2459.00	0.20
September 20	2459.20	2459.00	0.20
September 21	2459.10	2459.00	0.10
September 22	2459.10	2459.00	0.10
November 6	2458.00	2457.90	0.10
November 7	2458.00	2457.90	0.10
November 8	2458.00	2457.90	0.10
December 2	2458.00	2457.90	0.10

<b>Date</b>	<b>Reservoir Level (Ft)</b>	<b>Upper Rule Band (Ft)</b>	<b>Δ (Ft)</b>
December 7	2458.00	2457.90	0.10

## **1.2 TEMPERATURE MONITORING**

The Permittee monitored water temperature in the Youghiogheny River in accordance with “Deep Creek Station, Water Temperature Enhancement Plan” (approved June 8, 1996, revised September 2001). The Plan was designed to maintain river water temperatures below 25° C in the Youghiogheny River. The Permittee released water in accordance with the Water Temperature Enhancement Plan on two days in 2004. The temperature enhancement protocol predicted water temperatures in excess of 25° C on July 22 and August 4, however actual water temperature on those days remained below 25° C.

The temperature enhancement protocol called for a 2-hour temperature release on July 22 and August 4, 2004, to supplement the 25-cfs and 48-cfs, respectively, at the Oakland gage. On July 22, 2004, Reliant began the release at 1115 hours and continued until 1410 hours. That day, Sang Run’s maximum water temperature of 20.59° C occurred at 1320 hours. On August 4, 2004, Reliant began the release at 1100 hours and continued until 1515 hours. That day, Sang Run’s maximum water temperature of 22.77° C occurred at 1340 hours.

Water temperature at Sang Run climbed above 25° C on June 1, 4, 6, 7, 11, 24, and 25. The temperature enhancement protocol was not required on June 1-9, 11-27, July 13, 27, 28, and August 1, 13, 19-24, 30, and 31 as flows at the Oakland gage were greater than 100 cfs, as outlined in the temperature enhancement plan. Due to a data downloading malfunction there are no SMAX temperature readings from July 28-31 for Sang Run. Summary tables of the temperature exceedance dates at Sang Run, the temperature enhancement release dates, the maximum daily temperature comparison table (Reliant and VERSAR data), and the daily Temperature Enhancement Plan sheets are provided in Appendix B.

## **1.3 MINIMUM FLOW RELEASE MONITORING**

The Permittee operated the flow bypass in accordance with the “Deep Creek Station Flow Bypass Operation Protocol” (May 1995, revised September 2001). The flow bypass protocol requires the Permittee to maintain a minimum flow of 40 cfs in the Youghiogheny River immediately downstream of the tailrace. Starting June 1, and continuing through November 30, the Permittee monitored the river flows at the Oakland gage. When flows at the Oakland gage fall below 26 cfs, the Permittee may be required to open a bypass valve to release enough water to maintain 40 cfs in the river immediately below the tailrace.

The table in Appendix C summarizes flow bypass data for June through November 2004, when flows in the Youghiogheny River were less than 26 cfs. Flow data were obtained from the USGS recording at the Oakland gage, direct readings from the Oakland gage, or from the tailrace gage at the station, per guidance provided in the protocol. Valve openings were determined from Table 3 of the protocol (See Appendix C) based on station operating status.

#### **1.4 DISSOLVED OXYGEN MONITORING**

The Permittee operated the dissolved oxygen enhancement weir during 2004 in accordance with the "Dissolved Oxygen (DO) Enhancement Operations and Monitoring Protocol" approved by the Department on January 6, 1995. Data obtained from DO monitoring in 2004 are included in Appendix D.

The DO levels in the tailrace fell below 6.0 mg/l during 2004 on only one occasion. On July 26, 2004 the dissolved oxygen concentration fell to 5.92 mg/l.

#### **1.5 RELEASES UNSUITABLE FOR WHITEWATER RECREATION**

Permit Condition 19 outlines several operating rules designed to enhance whitewater boating opportunities in the Youghiogheny River. One operating rule restricts generation during certain times of the day unless flows suitable for whitewater boating also occur. The specific criteria for this operating rule are:

- Applies only from April 15 through October 15,
- Applies only when the Lake is between the upper and lower rule bands,
- May be suspended during emergency conditions described in Condition 14, and
- Prohibits releases between 1600 hours and 0800 hours of the following morning unless:
  1. A release providing three consecutive hours suitable for whitewater boating occurs during the 0800 to 1600 hour period immediately preceding the release.
  2. A release providing three consecutive hours suitable for whitewater boating occurs during the 0800 to 1600 hour period immediately following the release.

Condition 19 requires the Permittee to document "times and dates when generation releases not suitable for whitewater recreation occurred." Using the criteria above, generation releases during 2004 not suitable for whitewater recreation occurred on April 15<sup>th</sup> and 20<sup>th</sup> and July 7<sup>th</sup> and 13<sup>th</sup>.

On April 15<sup>th</sup> a release occurred for 3 hours from 1900-2200 hours, with no release occurring during the preceding 0800-1600 time period and no release occurring during the 0800-1600 period following this release.

On April 20<sup>th</sup> two releases occurred for a total of 4 hours and 15 minutes from 1315-1700 and from 2130-2200, with only a 2 hour and 45 minute release occurring during the preceding 0800-1600 time period and no release occurring in the 0800-1600 time period following this release.

On July 7<sup>th</sup> a release occurred for 3 hours from 1400-1900 hours, with only a 2 hour release occurring during the preceding 0800-1600 time period and no release occurring in the 0800-1600 period following this release.

On July 13<sup>th</sup> a release occurred for 3 hours from 1330-1630 hours, with only a 2 hour and 30 minute release occurring during the preceding 0800-1600 time period and no release occurring in the 0800-1600 period following this release.

On each of these days there were no emergency situations and the impoundment level was within the rule band.

## **1.2 ZEBRA MUSSEL MONITORING**

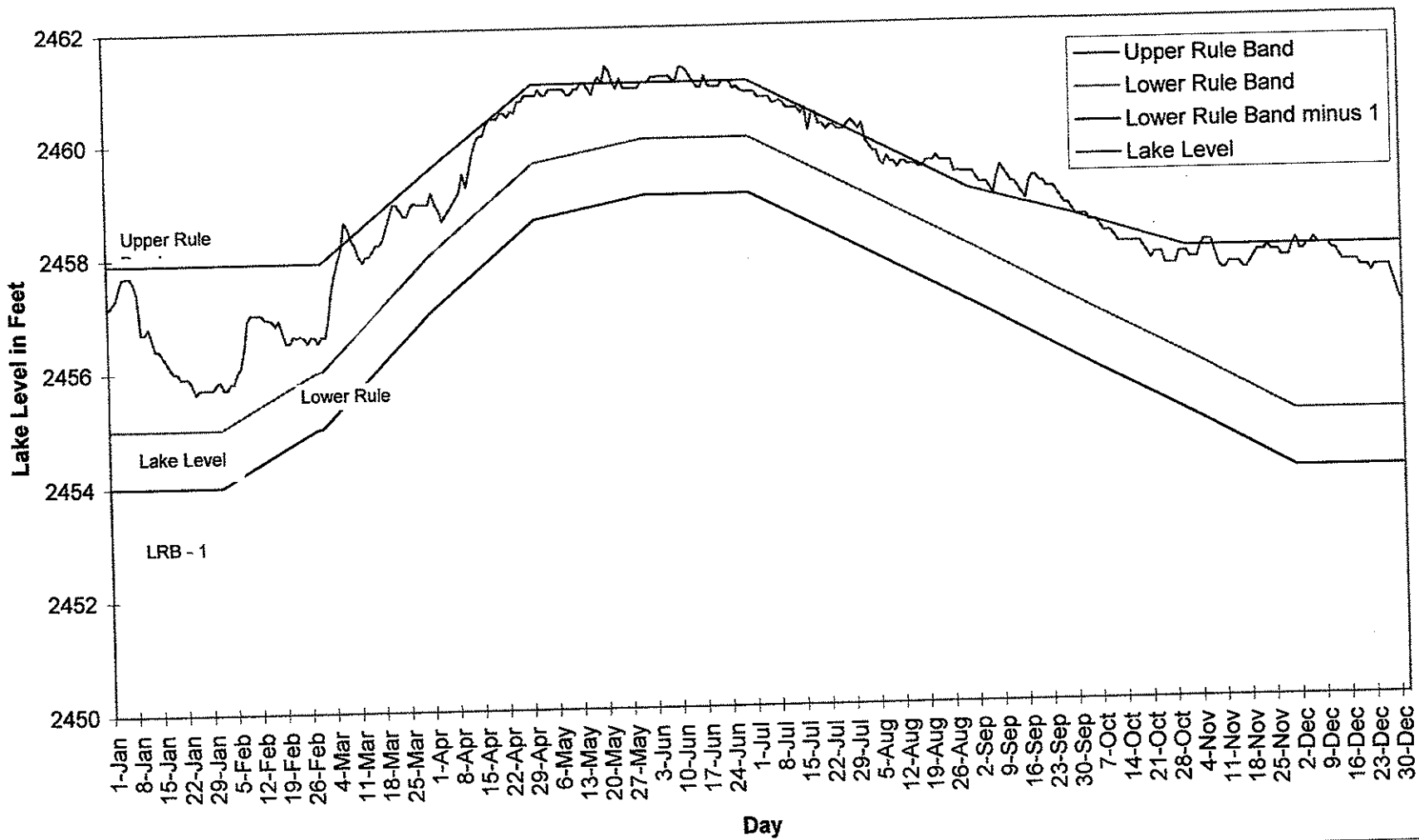
Artificial substrates placed at the station intake area during 2004 showed no signs of zebra mussel infestation. Appendix E contains the 2004 Zebra Mussel Monitoring Report data sheet.



APPENDIX A  
LAKE LEVEL DATA

DEEP CREEK LAKE LEVEL GRAPH

# Deep Creek Lake Level



DEEP CREEK LAKE LEVEL TABLE

## Deep Creek Lake Level 2004

Month	Day	Lake Level	Rain Fall	Month	Day	Lake Level	Rain Fall	Month	Day	Lake Level	Rain Fall
Jan	1	2457.15	0	Feb	1	2455.84	0	Mar	1	2456.6	0
	2	2457.23	N/A		2	2455.7	0		2	2456.6	0
	3	2457.31	0.1		3	2455.7	0.00		3	2456.9	0.02
	4	2457.52	0.75		4	2455.8	0.50		4	2457.4	0
	5	2457.68	0.4		5	2455.8	0.00		5	2457.7	0.46
	6	2457.69	0.55		6	2456	0.7		6	2457.93	0.87
	7	2457.7	0.1		7	2456.1	0.05		7	2458.15	0.94
	8	2457.6	0		8	2456.4	0		8	2458.6	0.47
	9	2457.4	0.05		9	2456.9	0		9	2458.5	0.4
	10	2456.7	0		10	2457	0		10	2458.3	0.12
	11	2456.7	0		11	2457	0		11	2458.2	0
	12	2456.8	0		12	2457	0		12	2458	0
	13	2456.6	0.05		13	2457	0		13	2457.9	0
	14	2456.4	0.05		14	2456.93	0		14	2457.99	0.2
	15	2456.4	0.15		15	2456.92	0		15	2458	0
	16	2456.3	0.05		16	2456.9	0		16	2458.1	0
	17	2456.2	0.05		17	2456.8	0		17	2458.2	0.75
	18	2456.1	0.35		18	2456.9	0		18	2458.2	0.12
	19	2456	0.5		19	2456.7	0		19	2458.3	0.45
	20	2456	0.05		20	2456.5	0		20	2458.5	0.15
	21	2455.9	0.02		21	2456.5	0.11		21	2458.7	0.75
	22	2455.9	0		22	2456.82	0.10		22	2458.9	0.07
	23	2455.9	0		23	2456.6	0		23	2458.9	0
	24	2455.8	0.25		24	2456.62	0		24	2458.8	0
	25	2455.63	0		25	2456.6	0.1		25	2458.7	0
	26	2455.7	0.1		26	2456.5	0		26	2458.7	0.07
	27	2455.7	0.05		27	2456.6	0		27	2458.87	0.15
	28	2455.7	0.5		28	2456.6	0		28	2458.93	0.03
	29	2455.7	0.1						29	2458.9	0
	30	2455.7	0.1						30	2458.9	0
	31	2455.8	0						31	2458.9	0.2
Total			4.32				1.56				6.22
Apr	1	2458.9	0.17	May	1	2460.8	0	Jun	1	2461	0
	2	2459.1	0.75		2	2460.8	0.52		2	2461	0.02
	3	2458.9	0.75		3	2460.9	0.02		3	2460.99	0.25
	4	2458.8	0.07		4	2460.8	0		4	2461.09	0
	5	2458.6	0.4		5	2460.8	0		5	2461.09	0.08
	6	2458.7	0		6	2460.9	0.03		6	2461.1	0.1
	7	2458.8	0		7	2460.9	0		7	2461.1	0
	8	2458.9	0.2		8	2460.9	0.43		8	2461.1	0
	9	2459	0.2		9	2460.9	0		9	2461.11	0
	10	2459.1	0.3		10	2460.9	0		10	2461.04	0
	11	2459.43	0.05		11	2460.8	0.05		11	2461.02	0.2
	12	2459.2	0		12	2460.8	0.67		12	2461.26	1.92
	13	2459.5	1.05		13	2460.9	0		13	2461.26	0
	14	2459.8	1.8		14	2460.9	0		14	2461.2	0.15
	15	2460	0.15		15	2460.99	0.25		15	2461.1	0.02
	16	2460.1	0		16	2461	0		16	2461	0
	17	2460.1	0		17	2460.9	0		17	2460.9	0
	18	2460.3	0		18	2460.8	0.05		18	2460.9	0.75
	19	2460.4	0		19	2461	1.95		19	2461.1	0.37
	20	2460.4	0		20	2461.1	0.45		20	2460.93	0
	21	2460.4	0.05		21	2461	0.05		21	2460.9	0
	22	2460.5	0		22	2461.3	1.07		22	2460.9	0
	23	2460.5	0.1		23	2461.21	0		23	2460.9	0.32
	24	2460.43	0.25		24	2461	0		24	2461	0
	25	2460.53	0		25	2460.9	0.25		25	2461	0
	26	2460.5	0.57		26	2461.07	0.26		26	2461	0
	27	2460.7	0.59		27	2460.9	0.27		27	2460.86	0
	28	2460.7	0.17		28	2460.9	0.38		28	2460.9	0
	29	2460.8	0		29	2460.9	0.09		29	2460.84	0.25
	30	2460.8	0.05		30	2460.9	0.1		30	2460.8	0
						31	2460.9		0.64		
Total			7.67				7.53				4.43

## Deep Creek Lake Level 2004

Month	Day	Lake Level	Rain Fall	Month	Day	Lake Level	Rain Fall	Month	Day	Lake Level	Rain Fall
Jul	1	2460.8	0	Aug	1	2460.1	0	Sep	1	2459.3	0
	2	2460.8	0.38		2	2460.2	0		2	2459.3	0
	3	2460.8	0		3	2459.9	0		3	2459.2	0
	4	2460.7	0.08		4	2459.8	0.17		4	2459.1	0
	5	2460.7	0		5	2459.7	0.15		5	2459.1	0
	6	2460.7	0		6	2459.7	0		6	2459.1	0
	7	2460.7	0.05		7	2459.5	0		7	2459	0
	8	2460.6	0		8	2459.44	0		8	2458.9	2.12
	9	2460.6	0		9	2459.6	0		9	2459.2	0.23
	10	2460.64	0.07		10	2459.5	0		10	2459.4	0
	11	2460.6	0		11	2459.5	0		11	2459.3	0
	12	2460.5	1.6		12	2459.4	0.6		12	2459.2	0
	13	2460.5	0.03		13	2459.5	0.04		13	2459.1	0
	14	2460.5	0.05		14	2459.5	0		14	2459.1	0
	15	2460.5	0		15	2459.45	0.08		15	2459	0
	16	2460.4	0		16	2459.46	0.27		16	2458.9	0
	17	2460.5	0.1		17	2459.45	0		17	2458.8	0.5
	18	2460.1	0.82		18	2459.4	0		18	2459.1	2.12
	19	2460.4	0		19	2459.4	0.9		19	2459.2	0
	20	2460.41	0		20	2459.5	0.25		20	2459.2	0
	21	2460.2	0		21	2459.52	0.97		21	2459.1	0
	22	2460.2	0		22	2459.51	0		22	2459.1	0
	23	2460.1	0		23	2459.6	0		23	2459	0
	24	2460.18	0		24	2459.5	0		24	2459	0
	25	2460.18	0		25	2459.5	0		25	2459	0
	26	2460.11	0.92		26	2459.5	0.02		26	2458.9	0
	27	2460.1	0.62		27	2459.5	0		27	2458.8	0.02
	28	2460.1	0		28	2459.3	0.07		28	2458.7	0.6
	29	2460.2	0		29	2459.31	0.72		29	2458.7	0.06
	30	2460.26	0.07		30	2459.3	1.58		30	2458.6	0
	31	2460.19	0.63		31	2459.3	0.02				5.65
Total			5.42				5.84				
Oct	1	2458.5	0	Nov	1	2457.8	0	Dec	1	2457.9	1.55
	2	2458.5	0		2	2457.7	0.4		2	2458	0
	3	2458.5	0		3	2457.7	0.18		3	2457.8	0
	4	2458.5	0		4	2457.7	0.83		4	2457.8	0
	5	2458.4	0		5	2457.9	0.07		5	2457.9	0
	6	2458.4	0		6	2458	0		6	2457.9	0.12
	7	2458.4	0		7	2458	0		7	2458	0.35
	8	2458.3	0		8	2458	0		8	2457.9	0
	9	2458.2	0		9	2457.8	0		9	2457.9	0.06
	10	2458.2	0		10	2457.6	0		10	2457.9	0.38
	11	2458.2	0		11	2457.5	0		11	2457.9	0.15
	12	2458.1	0		12	2457.5	0.062		12	2457.8	0.22
	13	2458	0.2		13	2457.6	0		13	2457.8	0.15
	14	2458	0.25		14	2457.6	0		14	2457.7	0.47
	15	2458	0.12		15	2457.6	0		15	2457.6	0.05
	16	2458	0.48		16	2457.6	0		16	2457.6	0
	17	2458	0		17	2457.5	0.25		17	2457.6	0.03
	18	2458	0.42		18	2457.5	0.05		18	2457.6	0.04
	19	2458	0.08		19	2457.6	0.67		19	2457.6	0.07
	20	2457.9	0.05		20	2457.7	0.25		20	2457.5	0.02
	21	2457.8	0		21	2457.8	0.08		21	2457.5	0
	22	2457.7	0.18		22	2457.8	0.02		22	2457.5	0
	23	2457.8	0.3		23	2457.8	0.03		23	2457.4	0.22
	24	2457.8	0		24	2457.9	0.45		24	2457.5	0
	25	2457.8	0		25	2457.8	0.15		25	2457.5	0.03
	26	2457.6	0		26	2457.8	0.1		26	2457.5	0.04
	27	2457.6	0.05		27	2457.8	0.42		27	2457.5	0.05
	28	2457.6	0		28	2457.7	0		28	2457.5	0.03
	29	2457.6	1.3		29	2457.7	0		29	2457.3	0
	30	2457.8	0		30	2457.7	0		30	2457.1	0
	31	2457.8	0						31	2456.9	0
Total			3.43				4.012			Year Total	60.112

**APPENDIX B**

**TEMPERATURE MONITORING AND RELEASE REPORTS**

Daily maximum river water temperatures in the Youghiogeny River at Sang Run are presented in the tables in Appendix B. These data were collated and provided by Versar, Inc., consultant to the MDNR Power Plant Assessment Division (PPAD). Due to problems installing equipment, the data provided by Versar, Inc. did not begin until June 6, 2004.

The column labeled "SMAX" lists the arithmetic means of the daily maximum water temperatures, in degrees C, measured by two "Tempmentors" placed in the river by the MDNR. The column labeled "PenSmax" lists the maximum water temperatures, in degrees C, measured by the Permittee's temperature monitor at the Sang Run Bridge. PPAD and Versar analyze the data to evaluate the Water Temperature Enhancement Plan used by the Permittee to determine the need and timing of daily temperature releases.

Days when temperatures exceeded 25° C and days when temperature enhancement releases were made are summarized in the following tables. Daily Temperature Enhancement Plan sheets for each of these dates are also enclosed.



**MAXIMUM DAILY RIVER WATER TEMPERATURES**

**DEEP CREEK STATION  
 YOUGHIOGHENY RIVER TEMPERATURE DATA 2004**

<u>JUNE</u>	<u>SMAX</u>	<u>PENMAX</u>	<u>JULY</u>	<u>SMAX</u>	<u>PENMAX</u>	<u>AUGUST</u>	<u>SMAX</u>	<u>PENMAX</u>
1	N/A	17.27	1	25.2	24.22	1	24.0	24.24
2	N/A	18.36	2	20.8	22.9	2	22.6	21.69
3	N/A	19.06	3	21.6	25.83	3	24.0	23.01
4	N/A	16.21	4	25.8	21.86	4	23.3	22.77
5	N/A	15.33	5	22.3	24.01	5	23.8	24.1
6	N/A	16.99	6	26.8	22.14	6	19.5	19.88
7	18.2	18.93	7	25.1	18.97	7	19.0	19.28
8	22.0	21	8	24.8	19.76	8	21.4	21.46
9	23.8	22.67	9	21.5	18.6	9	21.1	21.56
10	22.3	22.02	10	22.8	18.08	10	23.8	23.71
11	20.2	19.69	11	27.0	17.9	11	22.8	22.18
12	17.4	17.26	12	21.8	17.48	12	18.1	18.1
13	18.2	18.42	13	24.4	18.25	13	18.9	18.97
14	18.1	17.86	14	24.5	19.13	14	21.0	21
15	19.0	18.14	15	21.4	19.24	15	22.5	22.46
16	20.7	20.13	16	21.8	19.21	16	20.0	20.11
17	21.5	21.78	17	20.3	20.39	17	23.8	23.9
18	20.8	21.03	18	23.5	19.96	18	23.8	24.15
19	19.8	19.63	19	19.1	22.86	19	24.2	24.15
20	19.4	19.89	20	21.5	23.84	20	22.1	22.16
21	19.4	19.87	21	23.1	23.12	21	21.0	21.03
22	19.8	19.74	22	20.6	23.14	22	20.8	21.62
23	22.1	22.36	23	20.9	21.69	23	21.1	21.82
24	22.0	20.83	24	25.5	21.46	24	23.8	24.08
25	20.3	20.02	25	26.2	20.89	25	24.3	24.2
26	23.1	22.69	26	20.2	25.17	26	23.7	23.45
27	23.1	22.99	27	20.9	25.13	27	21.1	20.39
28	20.0	20.48	28	N/A	21.94	28	22.8	22.53
29	23.1	23.23	29	N/A	21.43	29	24.2	24.5
30	24.9	24.54	30	N/A	22.39	30	22.0	21.64
			31	N/A	20.17	31	21.2	21.86

DEEP CREEK TEMPERATURE ENHANCEMENT PLAN  
SANG RUN TEMPERATURE EXCEEDANCES

# DEEP CREEK POWER PLANT TEMPERATURE ENHANCEMENT PLAN

---

EXCEEDANCE OF 25.9 AT SANG RUN TEMPERATURE PROBE

<u>DATE</u>	<u>DURATION</u>	<u>MAXIMUM</u>
07/01/04	16:40 - 18:20	25.23
07/04/04	15:30 - 19:20	25.83
07/06/04	15:00 - 21:10	26.83
07/07/04	15:40 - 16:00	25.13
07/11/04	15:20 - 20:10	27.01
07/24/04	17:00 - 19:20	25.46
07/25/04	16:00 - 20:00	26.24

DEEP CREEK TEMPERATURE ENHANCEMENT RELEASES

**2004 DATES & TIMES OF TEMPERATURE ENHANCEMENT RELEASES**

<b>DATE</b>	<b>START TIME</b>	<b>STOP TIME</b>	<b>RIVER FLOW (CFS)</b>
July 22, 2004	11:15	14:10	25
August 4, 2004	11:00	15:15	48

DEEP CREEK DAILY TEMPERATURE PLAN SHEETS

UA = CFS River Flow at Oakland

July 1, 2004

Print Info for file

Time	Oakland Flow CFS	Predicted Maximum River Water Temperature Degree C	Deep Creek Action
0700	<30 <=30	19.37 20.65	No further predictions necessary today No further predictions necessary today
0900	> 30 <=30	1.18 2.46	No further predictions necessary today No further predictions necessary today
1100	All	10.09	No further predictions necessary today
1200	All	8.99	No further predictions necessary today
1400	All	5.45	No further predictions necessary today
1500	All	3.98	No further predictions necessary today

Tair	18.33	Air Temp, Elkins WV - Degree C
CCF	64.00	Cloud Cover Factor, Elkins WV
T7	14.89	River Temp Sang Run @700
T9	0.00	River Temp Sang Run @900
T11	0.00	River Temp Sang Run @1100
T12	0.00	River Temp Sang Run @1200
T14	0.00	River Temp Sang Run @1400
T15	0.00	River Temp Sang Run @1500
Q	62.00	River Flow at Oakland

65  
SHWRS

Air Temp, Elkins WV - Degree F  
Cloud Cover, Elkins WV



UA = CFS River Flow at Oakland

July 4, 2004

Print Info for file

Time	Oakland Flow CFS	Predicted Maximum River Water Temperature Degree C	Deep Creek Action
0700	<30 <=30	20.05 20.65	No further predictions necessary today No further predictions necessary today
0900	> 30 <=30	1.86 2.46	No further predictions necessary today No further predictions necessary today
1100	All	10.09	No further predictions necessary today
1200	All	8.99	No further predictions necessary today
1400	All	5.45	No further predictions necessary today
1500	All	3.98	No further predictions necessary today

Tair	18.33	Air Temp, Elkins WV - Degree C
CCF	64.00	Cloud Cover Factor, Elkins WV
T7	14.89	River Temp Sang Run @700
T9	0.00	River Temp Sang Run @900
T11	0.00	River Temp Sang Run @1100
T12	0.00	River Temp Sang Run @1200
T14	0.00	River Temp Sang Run @1400
T15	0.00	River Temp Sang Run @1500
Q	45.00	River Flow at Oakland

65  
SHWRS

Air Temp, Elkins WV - Degree F  
Cloud Cover, Elkins WV

UA = CFS River Flow at Oakland

July 6, 2004

Print Info for file

Time	Oakland Flow CFS	Predicted Maximum River Water Temperature Degree C	Deep Creek Action
0700	<30	20.05	No further predictions necessary today
	≤30	20.65	No further predictions necessary today
0900	> 30	1.86	No further predictions necessary today
	≤30	2.46	No further predictions necessary today
1100	All	10.09	No further predictions necessary today
1200	All	8.99	No further predictions necessary today
1400	All	5.45	No further predictions necessary today
1500	All	3.98	No further predictions necessary today

Tair	18.33	Air Temp, Elkins WV - Degree C
CCF	64.00	Cloud Cover Factor, Elkins WV
T7	14.89	River Temp Sang Run @700
T9	0.00	River Temp Sang Run @900
T11	0.00	River Temp Sang Run @1100
T12	0.00	River Temp Sang Run @1200
T14	0.00	River Temp Sang Run @1400
T15	0.00	River Temp Sang Run @1500
Q	45.00	River Flow at Oakland

65  
SHWRS

Air Temp, Elkins WV - Degree F  
Cloud Cover, Elkins WV

UA = CFS River Flow at Oakland

July 7, 2004

Print Info for file

Time	Oakland Flow CFS	Predicted Maximum River Water Temperature Degree C	Deep Creek Action
0700	<30	20.33	No further predictions necessary today
	<=30	20.65	No further predictions necessary today
0900	> 30	2.14	No further predictions necessary today
	<=30	2.46	No further predictions necessary today
1100	All	10.09	No further predictions necessary today
1200	All	8.99	No further predictions necessary today
1400	All	5.45	No further predictions necessary today
1500	All	3.98	No further predictions necessary today

Tair	18.33	Air Temp, Elkins WV - Degree C
CCF	64.00	Cloud Cover Factor, Elkins WV
T7	14.89	River Temp Sang Run @700
T9	0.00	River Temp Sang Run @900
T11	0.00	River Temp Sang Run @1100
T12	0.00	River Temp Sang Run @1200
T14	0.00	River Temp Sang Run @1400
T15	0.00	River Temp Sang Run @1500
Q	38.00	River Flow at Oakland

65  
SHWRS

Air Temp, Elkins WV - Degree F  
Cloud Cover, Elkins WV

UA = CFS River Flow at Oakland

July 11, 2004

Print info for file

Time	Oakland Flow CFS	Predicted Maximum River Water Temperature Degree C	Deep Creek Action
0700	<30 <=30	20.69 20.65	No further predictions necessary today No further predictions necessary today
0900	> 30 <=30	2.50 2.46	No further predictions necessary today No further predictions necessary today
1100	All	10.09	No further predictions necessary today
1200	All	8.99	No further predictions necessary today
1400	All	5.45	No further predictions necessary today
1500	All	3.98	No further predictions necessary today

Tair	18.33	Air Temp, Elkins WV - Degree C
CCF	64.00	Cloud Cover Factor, Elkins WV
T7	14.89	River Temp Sang Run @700
T9	0.00	River Temp Sang Run @900
T11	0.00	River Temp Sang Run @1100
T12	0.00	River Temp Sang Run @1200
T14	0.00	River Temp Sang Run @1400
T15	0.00	River Temp Sang Run @1500
Q	29.00	River Flow at Oakland

65  
SHWRS

Air Temp, Elkins WV - Degree F  
Cloud Cover, Elkins WV

UA = CFS River Flow at Oakland

July 22, 2004

Print info for file

Time	Oakland Flow CFS	Predicted Maximum River Water Temperature Degree C	Deep Creek Action
0700	<30 <=30	23.18 22.98	Check again at 0900 No further predictions necessary today
0900	> 30 <=30	26.35 26.15	Release at 1100 for 2 hours Release at 1100 for 2 hours
1100	All	24.16	Check again at 1200
1200	All	23.59	Check again at 1400
1400	All	17.55	No further predictions necessary today
1500	All	-1.88	No further predictions necessary today

Tair	25.56	Air Temp, Elkins WV - Degree C
CCF	64.00	Cloud Cover Factor, Elkins WV
T7	14.89	River Temp Sang Run @700
T9	17.91	River Temp Sang Run @900
T11	19.47	River Temp Sang Run @1100
T12	19.90	River Temp Sang Run @1200
T14	17.18	River Temp Sang Run @1400
T15	0.00	River Temp Sang Run @1500
Q	25.00	River Flow at Oakland

78  
SHWRS

Air Temp, Elkins WV - Degree F  
Cloud Cover, Elkins WV

UA = CFS River Flow at Oakland

July 24, 2004

Print Info for file

Time	Oakland Flow CFS	Predicted Maximum River Water Temperature Degree C	Deep Creek Action
0700	<30 <=30	21.66 21.54	No further predictions necessary today No further predictions necessary today
0900	> 30 <=30	3.37 3.25	No further predictions necessary today No further predictions necessary today
1100	All	10.77	No further predictions necessary today
1200	All	9.59	No further predictions necessary today
1400	All	5.73	No further predictions necessary today
1500	All	4.11	No further predictions necessary today

Tair	21.11	Air Temp, Elkins WV - Degree C
CCF	64.00	Cloud Cover Factor, Elkins WV
T7	14.89	River Temp Sang Run @700
T9	0.00	River Temp Sang Run @900
T11	0.00	River Temp Sang Run @1100
T12	0.00	River Temp Sang Run @1200
T14	0.00	River Temp Sang Run @1400
T15	0.00	River Temp Sang Run @1500
Q	27.00	River Flow at Oakland

70  
SHWRS

Air Temp, Elkins WV - Degree F  
Cloud Cover, Elkins WV

UA = CFS River Flow at Oakland

July 25, 2004

Print Info for file

Time	Oakland Flow CFS	Predicted Maximum River Water Temperature Degree C	Deep Creek Action
0700	<30 <=30	21.74 21.54	No further predictions necessary today No further predictions necessary today
0900	> 30 <=30	3.45 3.25	No further predictions necessary today No further predictions necessary today
1100	All	10.77	No further predictions necessary today
1200	All	9.59	No further predictions necessary today
1400	All	5.73	No further predictions necessary today
1500	All	4.11	No further predictions necessary today

Tair	21.11	Air Temp, Elkins WV - Degree C
CCF	64.00	Cloud Cover Factor, Elkins WV
T7	14.89	River Temp Sang Run @700
T9	0.00	River Temp Sang Run @900
T11	0.00	River Temp Sang Run @1100
T12	0.00	River Temp Sang Run @1200
T14	0.00	River Temp Sang Run @1400
T15	0.00	River Temp Sang Run @1500
Q	25.00	River Flow at Oakland

70  
SHWRS

Air Temp, Elkins WV - Degree F  
Cloud Cover, Elkins WV

Time	Oakland Flow CFS	Predicted Maximum River Water Temperature Degree C	Deep Creek Action
0700	<30	24.92	Check again at 0900
	<=30	25.72	Check again at 0900
0900	> 30	25.28	Check again at 1100
	<=30	26.08	Release at 1100 for 2 hours
1100	All	-3.55	No further predictions necessary today
1200	All	2.50	No further predictions necessary today
1400	All	6.59	No further predictions necessary today
1500	All	4.52	No further predictions necessary today

Print Info for file

Tair	29.44	Air Temp, Elkins WV - Degree C
CCF	64.00	Cloud Cover Factor, Elkins WV
T7	19.31	River Temp Sang Run @700
T9	19.79	River Temp Sang Run @900
T11	0.00	River Temp Sang Run @1100
T12	0.00	River Temp Sang Run @1200
T14	0.00	River Temp Sang Run @1400
T15	0.00	River Temp Sang Run @1500
Q	50.00	River Flow at Oakland

85  
SHWRS

Air Temp, Elkins WV - Degree F  
Cloud Cover, Elkins WV



APPENDIX C  
FLOW BYPASS OPERATION RECORD

## **BYPASS FLOW OPERATION**



**Devine Tarbell & Associates, Inc.**  
Consulting Engineers, Scientists, & Regulatory Specialists

Principals:  
John J. Devine, P.E., President  
John C. Tarbell, P.E.  
James M. Lynch  
Edwin C. Luttrell, P.E.

**FEDERAL EXPRESS**

January 28, 2005

Mr. Matthew G. Pajerowski, Chief  
Water Rights Division  
Maryland Department of the Environment  
2500 Broening Highway  
Baltimore, MD 21224

**RE: *Water Appropriation and Use Permit No. GA92S009(03) 2004 Annual Report  
and 2004 Semi-annual Report***

Dear Mr. Pajerowski:

On behalf of Reliant Energy Maryland Holdings, LLC and in accordance with Condition 23 of Permit No. GA92S009(03), please find enclosed the annual and semi-annual reports for the Deep Creek Hydroelectric Station.

If you have any questions regarding this report, please direct them to the undersigned at (315) 641-1624.

Sincerely,

A handwritten signature in black ink that reads "Scott A. Jones". The signature is written in a cursive style with a large initial 'S' and a long horizontal stroke at the end.

Scott A. Jones  
Regulatory Specialist/Biologist

Attachment

XC: **S. Schreiner (Versar)**  
R. McLean (MDE)  
T. Teitt (Reliant)  
G. Neiport (Reliant)  
C. Thomas (Reliant)  
J. Gibson (DTA)

---

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Bellingham, Washington  
360-671-1150/1152 (fax)

**DEEP CREEK STATION FLOW BYPASS OPERATION - 2004**

<b>MONTH</b>	<b>DAY</b>	<b>RIVER FLOW AT OAKLAND</b>	<b>BYPASS FLOW REQUIRED</b>	<b>PERCENT VALVE OPEN</b>
July	22	25	2	22
July	23	24	3	23
July	25	25	2	22
July	26	20	9	32
August	10	24	3	23
August	11	0	20	47
August	12	21	8	30

7 de 11

**USGS PROVISIONAL WATER DATA FOR THE OAKLAND GAGE**  
**GAGE NO. 03075500**  
**FOR WATER YEAR OCTOBER 2003 THROUGH SEPTEMBER 2004**

MONONGAHELA RIVER BASIN

03075300 YOUGHIOGHENY RIVER NEAR OAKLAND, MD

LOCATION.--Lat 39°25'17.9", long 79°25'29.6", Garrett County, Hydrologic Unit 05020006, on left bank 200 ft downstream from Baltimore and Ohio Railroad bridge, 250 ft downstream from Little Youghiogheny River, 1.2 mi northwest of Oakland, and 1.5 mi upstream from Dunkard Lick Run.

DRAINAGE AREA.--134 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1941 to current year.

REVISED RECORDS.--WSP 1113; 1947(M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 2,353.61 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 1, 1946, nonrecording gage at bridge 200 ft upstream at same datum.

REMARKS.--Records good except those for estimated daily discharges (ice effect), which are poor. Town of Oakland diverted an average of 0.4 ft<sup>3</sup>/s for water supply. The diversion is returned upstream from station as sewage. U.S. Army Corps of Engineers satellite collection platform at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1936 reached a stage of 15.3 ft. from floodmarks.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov 12	1515	4,230	7.07	Mar 4	1545	3,730	6.67
Nov 19	2015	2,810	5.86	Mar 6	1215	4,530	7.32
Jan 5	1615	2,180	5.25	Mar 21	0630	2,500	5.57
Feb 7	0400	*4,830	*7.53	Apr 13	2100	3,220	6.23
Mar 2	2245	2,640	5.70	Jun 12	0515	3,820	6.74

Minimum discharge, 24 ft<sup>3</sup>/s, July 26.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	459	229	e420	493	e85	384	421	201	315	69	165	193
2	370	208	e330	1,060	e84	1,410	720	192	262	61	89	126
3	284	188	e285	1,710	e82	1,890	828	253	265	55	66	95
4	350	171	e250	1,450	e160	2,860	1,100	179	215	53	56	76
5	364	362	e230	1,660	e240	2,370	862	169	217	54	72	72
6	270	765	e210	1,410	1,840	4,010	737	165	188	50	63	58
7	232	653	e195	914	3,940	2,760	766	142	159	44	43	33
8	200	486	193	718	e800	1,650	772	135	125	41	37	293
9	173	386	183	511	e460	1,080	678	110	106	38	33	1,160
10	153	312	199	391	e350	823	484	94	95	35	29	676
11	135	275	1,090	e300	e280	700	378	92	552	37	28	357
12	122	2,870	737	e240	e240	619	532	216	2,670	70	59	235
13	111	2,250	507	e217	e208	472	1,930	277	1,010	181	116	177
14	127	1,040	415	e195	e195	398	2,160	142	609	105	67	146
15	571	714	356	e170	e180	401	1,140	118	394	75	47	126
16	297	518	300	e157	e170	420	774	115	292	54	64	128
17	243	399	e270	e150	e155	564	562	92	382	42	51	189
18	280	313	e255	e145	e165	485	406	122	818	39	37	632
19	224	1,340	e243	e138	e195	956	321	767	498	42	151	281
20	205	1,800	e235	e132	215	829	274	416	357	61	113	195
21	212	962	e220	e126	864	2,000	234	323	264	34	378	154
22	201	670	208	e120	578	1,180	204	937	234	30	319	115
23	170	492	417	e113	393	809	189	526	222	31	160	99
24	146	405	1,150	e109	372	625	170	338	165	34	115	85
25	126	354	1,090	e103	320	493	158	248	135	28	91	76
26	136	276	749	e101	282	395	549	254	132	45	72	68
27	271	238	537	e97	249	360	516	231	116	221	61	64
28	324	453	407	e94	247	325	362	483	97	171	54	92
29	286	741	346	e91	294	267	278	388	93	89	97	124
30	306	519	654	e89	—	242	231	252	81	63	302	81
31	255	—	628	e87	—	255	—	255	—	77	586	—
TOTAL	7,603	20,391	13,309	13,291	13,643	32,032	18,736	8,232	11,062	2,029	3,621	6,226
MEAN	245	680	429	429	470	1,033	625	266	369	65.5	117	208
MAX	571	2,870	1,150	1,710	3,940	4,010	2,160	937	2,670	221	586	1,160
MIN	111	171	183	87	82	242	158	92	81	28	28	53
CFSM IN.	1.83	5.07	3.20	3.20	3.51	7.71	4.66	1.98	2.75	0.49	0.87	1.55
	2.11	5.66	3.69	3.69	3.79	8.89	5.20	2.29	3.07	0.56	1.01	1.73

c Estimated

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 2004, BY WATER YEAR (WY)

	115	246	397	427	499	620	457	335	215	171	132	99.8
MEAN	115	246	397	427	499	620	457	335	215	171	132	99.8
MAX (WY)	608 (1955)	1,152 (1986)	1,027 (1973)	973 (1996)	1,100 (1986)	1,477 (1963)	879 (1973)	995 (1996)	766 (2003)	629 (1978)	586 (1956)	900 (2003)
MIN (WY)	4.45 (1954)	7.08 (1954)	62.2 (1944)	63.2 (1977)	127 (1978)	168 (1990)	121 (1946)	76.0 (1982)	22.9 (1999)	10.3 (1953)	10.5 (1944)	5.99 (1953)

APPENDIX D

RECORD OF  
DISSOLVED OXYGEN MONITORING

DEEP CREEK STATION  
DISSOLVED OXYGEN MONITORING LOG

(Instrument Calibrated to 2000 ft. MSL)

DATE	INSTRUMENT CALIBRATION		DO MEASUREMENTS			NO. UNITS GENERATING	TIMES OF GENERATION	SLUICE GATE POSITION	NON-OPERATING TAILRACE ELEV	OPERATING TAILRACE ELEV	
	CAL. READINGS		DOWNSTREAM FROM WEIR		DO (mg/l)						
	TIME	TEMP °C	DO (mg/l)	TEMP °C							DO (mg/l)
1-04	13:20	21.7	7.97	13:30	12.5	8.97	2 @ 90%	13:00 To 15:30	All OPEN	2022.7	2028.1
2	—	—	—	—	—	—	—	NONE	"	2022.6	—
3	—	—	—	—	—	—	—	NONE	"	2022.5	—
4	10:10	22.5	7.71	10:40	12.4	8.89	2 @ 90%	10:00 To 15:00	"	2022.4	2028.1
5	—	STATION	—	UNATTENDED	—	—	2 @ 88%	10:00 To 13:00	"	—	2028.
6	—	—	—	—	—	—	—	NONE	"	—	—
7	10:25	21.5	8.01	10:35	13.4	9.03	2 @ 85%	10:00 To 14:15	"	2022.2	2027.8
8	13:40	24.8	7.51	13:50	13.2	8.96	2 @ 100%	13:15 To 19:00	"	2022.2	2028.1
9	13:15	25.9	7.39	13:25	13.4	8.72	2 @ 100%	12:50 To 18:00	"	2022.2	2028.
10	—	—	—	—	—	—	—	NONE	"	2022.1	—
11	10:20	25.0°	7.32	10:30	13.1	8.64	2 @ 85%	10:00 To 13:00	"	2022.0	2027.9
12	—	—	STATION	UNATTENDED	—	—	2 @ 85%	07:30 To 17:50	"	—	2028.1
13	—	—	—	—	—	—	—	NONE	"	—	—
6-14	10:25	25.4°	7.27	10:30	14.7	8.80	2 @ 88%	10:00 To 24:00	"	2023.2	2028.
6-15	08:25	23.9°	7.61	08:35	13.8	8.68	2 @ 85%	08:00 To 23:00	"	2022.8	2027.8
6-16	10:50	24.1°	7.52	11:00	13.9	8.71	2 @ 85%	10:30 To 21:30	"	2022.6	2027.6
6-17	—	—	—	—	—	—	—	NONE	"	2022.6	—
6-18	—	—	—	—	—	—	—	NONE	"	—	—
6-19	—	—	STATION	UNATTENDED	—	—	2 @ 80%	08:00 To 13:50	"	—	2028.1
6-20	—	—	STATION	UNATTENDED	—	—	—	NONE	"	—	—



2004

DEEP CREEK STATION  
DISSOLVED OXYGEN MONITORING LOG

(Instrument Calibrated to 2000 ft. MSL)

DATE	INSTRUMENT CALIBRATION		DO MEASUREMENTS		NO. UNITS GENERATING	TIMES OF GENERATION	SLUICE GATE POSITION	NON-OPERATING TAILRACE ELEV	OPERATING TAILRACE ELEV		
	TIME	TEMP °C	DO (mg/l)	DOWNSTREAM FROM WEIR						TEMP °C	DO (mg/l)
21-04	10:20	21.1°	8.11	10:36	14.1°	8.42	2 @ 78%	10:00 To 13:00	All Open	2022.5	2027.5
22-04								NONE	"	2022.3	
23								NONE	"	2022.4	
24	11:45	23.5°	8.00	11:55	14.6°	8.73	1 @ 95%		"	2022.2	2024.5
25	10:30	23.0°	7.93	10:40	13.7°	8.48	2 @ 90%	10:00 To 13:00	"	2022.2	2028.1
26								NONE	"		
27								NONE	"		
28	10:25	22.5°	7.90	10:35	14.8°	8.02	2 @ 95%	10:00 To 13:00	"	2022.0	2028.1
29								NONE	"	2022.0	
30								NONE	"	2021.9	
1-1	10:30							NONE	"	2021.9	
1-2	10:30	22.9°	8.01	10:40	14.6°	7.99	2 @ 90%	10:00 To 13:00	"	2021.9	2028.
1-3				UNATTENDED				10:00 To 13:00	"		
1-4								NONE	"		
1-5							2 @ 90%	10:00 To 13:00	"	2021.7	2028.
6								NONE	"	2021.7	
7-7	14:30	26.0°	7.34	14:40	14.7°	7.45	2 @ 95%	14:00 To 17:00	"	2021.7	2028.
7-8								NONE	"	2021.7	
7-9	10:30	27.0°	7.25	10:40	14.8°	7.49	2 @ 90%	10:00 To 13:00	"	2021.7	2028.
7-10								NONE	"		

DEEP CREEK STATION  
DISSOLVED OXYGEN MONITORING LOG

(Instrument Calibrated to 2000 ft. MSL)

DATE	INSTRUMENT CALIBRATION		DO MEASUREMENTS		NO. UNITS GENERATING	TIMES OF GENERATION	SLUICE GATE POSITION	NON-OPERATING TAILRACE ELEV	OPERA. TAILR. ELEV
	TIME	TEMP °C	DO (mg/l)	DOWNSTREAM FROM WEIR					
-11-04	—	STATION	NOT ATTENDED	—	2 @ 90%	17:40 To 21:00	ALL OPEN	—	—
-12	08:50	24.5°	7.33	09:05	2 @ 85%	08:35 To 13:00	"	2021.7	2027.1
-13	13:55	25.3°	7.23	14:05	2 @ 90%	13:30 To 16:30	"	2022.3	2028.
-14	—	—	—	—	—	— NONE —	"	2022.1	—
-15	—	AWAY	FROM STATION	—	2 @ 85%	UNRECORDED 13:50 To 16:50	"	2022.0	—
-16	10:20	22.3°	7.89	10:35	2 @ 90%	10:00 To 13:00	"	2021.8	2028.
-17	—	STATION	UNATTENDED	—	—	13:00 To 16:00	"	—	—
-18	—	"	"	"	—	— NONE —	"	—	—
-19	10:25	20.9°	7.42	10:35	2 @ 90%	10:00 To 14:35	"	2021.8	2028.
-20	13:25	22.8°	7.27	13:35	2 @ 90%	13:00 To 18:00	"	2021.8	2028.
-21	13:40	24.7°	7.56	13:50	2 @ 95%	13:15 To 18:00	"	2021.7	2028.
-22	11:25	24.1°	7.39	11:35	2 @ 95%	11:00 To	"	2021.6	2028.
-23	10:30	26.7°	7.11	10:35	2 @ 95%	10:00 To 13:00	"	2021.6	2028.
-24	—	STATION	UNATTENDED	—	—	— NONE —	"	—	—
-25	—	—	—	—	2 @ 90%	21:15 To 22:20	"	—	—
-26	10:30	23.1°	7.10	10:35	2 @ 100%	10:00 To 13:00	"	2021.6	2028
-27	—	—	—	—	—	— NONE —	* CLOSED, 2 OPEN 6	2021.8	—
-28	—	—	—	—	—	— NONE —	"	2022.2	—
-29	—	—	—	—	—	— NONE —	"	2021.9	—
-30	09:20	23.5°	7.20	09:30	2 @ 90%	8:45 To 13:10	"	2021.9	2028.

DEEP CREEK STATION  
DISSOLVED OXYGEN MONITORING LOG

(Instrument Calibrated to 2000 ft. MSL)

DATE	INSTRUMENT CALIBRATION		DO MEASUREMENTS		NO. UNITS GENERATING	TIMES OF GENERATION	SLUICE GATE POSITION	NON-OPERATING TAILRACE ELEV	OPERATING TAILRACE ELEV
	TIME	TEMP °C	DO (mg/l)	DOWNSTREAM FROM WEIR					
3-31			STATION	UNATTENDED	2 @ 95%	10:00 To 16:00	2 CLOSED 2 OPEN 6"		2028.1
3-1			"	"		NONE	"		
3-2	10:25	23.3°	7.81	10:35	2 @ 90%	10:00 To 16:00	"	2021.9	2028.1
3-3	10:55	24.6°	7.63	11:10	2 @ 80%	10:35 To 20:00	"	2021.8	2028.1
3-4	11:40	24.5°	7.65	11:50	2 @ 78%	11:15 To 14:10	"	2021.7	2028.1
3-5						NONE	"	2021.9	
3-6	10:25	17.8°	8.52	10:35	2 @ 78%	10:00 To 13:00	"	2021.8	2028.1
3-7			STATION	UNATTENDED	2 @ 80%	10:00 To 13:00	"		2028.1
3-8			"	"		NONE	"		
3-9	10:30	20.4°	8.33	10:35	2 @ 76%	10:00 To 13:00	"	2021.7	2028.1
3-10						NONE	"	2021.7	
3-11	08:50	21.6°	7.78	08:55	2 @ 95%	08:25 To 10:30	"	2021.7	2028.1
3-12						NONE	"	2021.7	
3-13							"	2022.2	2028.1
3-14			STATION	UNATTENDED		NONE	"		
3-15			"	"		NONE	"		
3-16	10:30	19.7°	7.70	10:35	6.52	10:00 To 13:22	"	2021.8	2028.1
3-17						NONE	"	2021.9	
3-18						NONE	"	2021.8	
3-19						NONE	"	2021.8	

DEEP CREEK STATION  
DISSOLVED OXYGEN MONITORING LOG

(Instrument Calibrated to 2000 ft. MSL)

DATE	INSTRUMENT CALIBRATION		DO MEASUREMENTS		NO. UNITS GENERATING	TIMES OF GENERATION	SLUICE GATE POSITION	NON-OPERATING TAILRAVE ELEV	OPERAT TAILRAVE ELEV		
	TIME	TEMP °C	DO (mg/l)	DOWNSTREAM FROM WEIR						DO (mg/l)	
20-04	10:30	22.4°	7.64	10:35	17.1°	6.48	2 @ 100%	10:00 To 13:00	2 CLOSED 2 OPEN 6"	2022.3	2028.2
21	—	—	—	STATION	UNATTENDED	—	—	NONE	"	—	—
22	—	—	—	—	—	—	—	NONE	"	—	—
23	10:30	18.8°	7.85	10:35	17.7°	6.31	2 @ 100%	10:00 To 13:10	"	2022.4	2028.2
24	—	—	—	—	—	—	—	NONE	"	2022.1	—
25	—	—	—	—	—	—	—	NONE	"	2021.9	—
26	—	—	—	—	—	—	—	NONE	"	2021.9	—
8-27	10:30	21.8°	7.42	10:35	17.0°	6.49	2 @ 85%	10:00 To 20:00	"	2021.8	2028.1
8-28	—	—	—	STATION	UNATTENDED	—	2	11:00 To 14:30	"	—	2028.1
8-29	—	—	—	"	—	—	2	09:30 To 12:30	"	—	2028.1
8-30	08:45	22.1°	7.72	08:50	17.5°	6.21	2 @ 90%	08:10 To 14:10	"	2022.0	2028.1
8-31	—	—	—	—	—	—	—	NONE	"	2023.5	—
9-1	—	—	—	—	—	—	—	NONE	"	2022.5	—
9-2	—	No One	As	STATION	—	—	2 @ 90%	15:00 To 18:00	"	2022.2	2028.1
9-3	—	—	—	"	—	—	2 @ 90%	10:00 To 18:00	"	2022.2	2028.1
9-4	—	—	—	STATION	UNATTENDED	—	2	10:00 To 15:03	"	—	2028.1
9-5	—	—	—	"	—	—	—	—	"	—	—
9-6	—	—	—	"	—	—	2	10:10 To 13:12	"	—	2028.1
9-7	13:20	23.6°	7.49	13:25	19.8°	7.09	2 @ 95%	12:45 To 16:30	"	2021.8	2028.1
9-8	—	—	—	INCREMENT	WEATHER	—	2 @ 95%	10:00 To 14:10	"	2021.9	2028.1

DEEP CREEK STATION  
DISSOLVED OXYGEN MONITORING LOG

(Instrument Calibrated to 2000 ft. MSL)

DATE	INSTRUMENT CALIBRATION			DO MEASUREMENTS			NO. UNITS GENERATING	TIMES OF GENERATION	SLUICE GATE POSITION	NON-OPERATING TAILRACE ELEV	OPERATING TAILRACE ELEV
	CAL. READINGS			DOWNSTREAM FROM WEIR							
	TIME	TEMP °C	DO (mg/l)	TIME	TEMP °C	DO (mg/l)					
9-04	—	No ONE	7.76	Station	—	—	2	20:24 To 24:00	2 Closed 2 Open 6"	2024.2	—
9-10	13:30	20.8°	7.76	13:35	18.0°	6.27	2 @ 95%	13:00 To 18:00	"	2023.4	2028.5
9-11	—	No ONE	At Station	At Station	—	—	2	10:00 To 20:00	"	—	2028.5
9-12	—	"	"	"	"	—	2	11:00 To 21:00	"	—	2028.2
9-13	10:30	19.5°	7.73	10:35	18.4°	6.40	2 @ 100%	10:00 To 19:00	"	2022.4	2028.2
9-14	11:30	18.4°	7.85	11:40	18.9°	6.79	2 @ 100%	11:00 To 18:00	"	2022.2	2028.2
9-15	12:30	20.3°	7.78	12:35	19.2°	7.22	2 @ 100%	12:00 To 18:00	"	2022.2	2028.2
9-16	12:30	21.1°	7.69	12:35	19.1°	7.73	2 @ 100%	12:00 To 19:00	"	2022.0	2028.2
9-17	—	INCREMENT	WEATHER	WEATHER	—	—	2 @ 100%	10:00 To 13:00	"	2022.3	2028.2
9-18	—	No ONE	At Station	At Station	—	—	2	11:00 To 22:00	"	—	2028.5
9-19	—	"	"	"	"	—	2	15:00 To 21:00	"	—	2028.2
9-20	10:35	16.2°	8.27	10:40	18.5°	6.78	2 @ 100%	10:00 To 13:00	"	2022.6	2028.2
9-21	10:10	17.3°	7.94	10:25	18.7°	6.88	2 @ 100%	09:50 To 13:00	"	2022.4	2028.2
9-22	10:25	16.7°	8.66	10:35	18.4°	7.03	2 @ 100%	10:00 To 15:00	"	2022.3	2028.2
9-23	10:20	16.9°	8.30	10:30	18.2°	6.99	2 @ 100%	10:00 To 15:00	"	2022.2	2028.2
9-24	10:20	16.5°	8.29	10:30	18.5°	7.05	2 @ 100%	10:00 To 16:00	"	2022.2	2028.2
9-25	—	No ONE	At Station	At Station	—	—	2	10:00 To 16:00	"	—	2028.2
9-26	—	"	"	"	"	—	2	15:00 To 21:10	"	—	2028.5
9-27	10:30	21.5	8.16	10:35	18.6°	7.21	2 @ 100%	10:00 To 16:15	"	2022.1	2028.2
9-28	—	INCREMENT	WEATHER	WEATHER	—	—	2 @ 100%	10:00 To 14:00	"	2022.1	2028.2





# Zebra Mussel Monitoring Report

(official use only - leave blank)  
ZM Monitoring Network #:

- 1.) Carroll Thomas  
(COLLECTOR'S NAME)
- 2.) Reliant Energy 3.) 301-387-6616  
(COMPANY OR AFFILIATION) (PHONE NUMBER)
- 4.) 14 River View Terrace  
(ADDRESS)
- 5.) Deep Creek Power Plant  
(NAME OF STATION)

## Physical / Chemical / and Biological Data

- 6.) \_\_\_\_\_ 7.) \_\_\_\_\_ 8.) \_\_\_\_\_  
(STATION LATITUDE) (STATION LONGITUDE) (RIVER MILE INDEX)

9.) Date and time this data was collected (circle year, month, day, & hour)

Year: '98 '99 '00 '01 04

Month: 01 02 03 04 05 06 07 08 09 10 11 12

Day: 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

Hour: \_\_\_\_\_ (if before 7am) 07 08 09 10 11 12 (noon) 13 (1pm) 14 (2pm) 15 (3pm) 16 (4pm) 17 18 \_\_\_\_\_ (if after 6pm)

- 10.) 73° F 11.) \_\_\_\_\_ 12.) \_\_\_\_\_ 13.) \_\_\_\_\_  
(TEMPERATURE °C) (pH) (DISSOLVED OXYGEN mg/l) (CONDUCTIVITY umhos/cm<sup>2</sup>)

- 14.) \_\_\_\_\_ 15.) \_\_\_\_\_ 16.) \_\_\_\_\_ 17.) \_\_\_\_\_  
(TOTAL CALCIUM mg/l) (SECCHI DEPTH meters) (CURRENT VELOCITY meters/sec) (WATER DEPTH meters)

18.) How far above the natural substrate is the sampler? (in meters) \_\_\_\_\_

19.) How many days was the sampler exposed to the water prior to collecting this data? 168

20.) Are zebra mussels present at this site? ( NO) ( YES) - if yes, comment below and notify the Zebra Mussel Monitoring Coordinator immediately.

21.) Other organisms observed on the sampler / site? (please list) \_\_\_\_\_

Pulled SAMPLER for year

22.) Comments (if more space is needed, continue on the back of this form): \_\_\_\_\_

MARYLAND DEPARTMENT OF THE ENVIRONMENT  
WATER MANAGEMENT ADMINISTRATION  
SOURCE PROTECTION AND APPROPRIATION DIV  
1800 WASHINGTON BOULEVARD  
BALTIMORE, MARYLAND 21230

RECEIVED  
JAN 27 2005

January 2005

Regarding Water Appropriation and Use Permit GA1992S009(03)

Make Name/Address Changes Below

RELIANT ENERGY  
ATTN: WILLIAM FRIERS  
225 GREENFIELD PARKWAY STE. 201  
LIVERPOOL, NY 13088

Dear Permittee:

As a condition of your Maryland Water Appropriation and Use Permit you are required to report your water withdrawal every six months. Complete and return this form no later than 30 days after the date on which it is received.

If you have any questions concerning this form, please telephone the Water Supply Program at (410) 537-3590.

2004 SEMI-ANNUAL SURFACE WATER WITHDRAWAL REPORT

1. Check the method used to determine your withdrawal amounts:  
( ) Flow Meter ( ) Elapsed Time Indicator  
(x) Other (Explain)

2. Enter the number of gallons of water withdrawn for each month.  
- If you have multiple intakes under this permit, please add together the monthly totals for all intakes.  
- Do not list continuous meter readings, hours pumped, or gallons in mgd.  
- Indicate a "0" for each month with no withdrawal.

July	2004	<u>950 mg</u>	October	2004	<u>1,204.5 mg</u>
August	2004	<u>1,273.8 mg</u>	November	2004	<u>2,201.6 mg</u>
September	2004	<u>2,751.1 mg</u>	December	2004	<u>3,960.4 mg</u>
Total: <u>12,341.5 mg (million gallons)</u>					

3. Please sign and date this form.

Submitted By: \_\_\_\_\_ Date: 1/28/05

Title: Reg Specialist/Biologist Telephone Number: (315) 641-1624

4. Make address corrections on the top of this form.  
Please contact this office if ownership has changed.