



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION III  
1650 Arch Street  
Philadelphia, Pennsylvania 19103-2029

Ellen Gilinsky, Ph.D.  
Director, Division of Water Quality Programs  
Virginia Department of Environmental Quality  
629 E. Main Street  
P.O. Box 1105  
Richmond, VA 23218

MAR 27 2008

*file*  
Dear Dr. Gilinsky:

The U.S. Environmental Protection Agency (EPA) is approving Virginia Department of Environmental Quality's (VADEQ) February 25, 2008, request to recategorize four waters that were listed on Virginia's 1998 Section 303(d) List, and one water that was listed on Virginia's 2002 Section 303(d) List. All five waters are considered Consent Decree waters with one listed as a "Plaintiff's water." With this recategorizing, the five water segments will no longer need a Total Maximum Daily Load (TMDL). Enclosure 1 provides a list of the water segments, including the segment identification number, stream name and impairment for which the stream was listed.

The James River (VAW-I18R and VAW-I24R) was listed on the 1998 Section 303(d) List for failing to attain its aquatic life use based on the method "Rapid Bioassessment Protocol II." The stream segments were reassessed over a five year time period, ranging from 2001 to 2006, using Virginia's Stream Condition Assessment protocol. Both water segments received a rating of "non-impaired" during the assessments. Based on the most recent biological assessments, EPA concurs with VADEQ that the aquatic life use impairment is no longer evidenced on these segments of the James River and may be removed from the Section 303(d) List.

A portion of the James River (VAC-H05R/VAC-H08R) was listed on Virginia's 2002 Section 303(d) List as not supporting the recreation use due to violations of the bacteria standard. Monitoring data dating from August 2003 to November 2006 provided evidence that the stream is no longer impaired and is now fully supporting the recreation use. Based on the last five years of bacteria monitoring data, EPA concurs with VADEQ that this segment of the James River may be removed from the Section 303(d) List.

A portion of the Roanoke River (VAC-L78R and VAC-L79R), formerly identified as VAP-L78R and VAP-L79R), was listed on the 1998 Section 303(d) List for failing to attain its aquatic life use due to violations of the Dissolved Oxygen (DO) standard. It has been determined that the DO violations are caused by the water released by the John H. Kerr Reservoir and Dam. To address the DO violations, the U.S. Army Corps of Engineers (ACOE) has agreed to install a

2

permanent DO System as part of a larger rehabilitation of the dam. The system will include naturally aspirating generator units on three out of six turbines being replaced. The turbine retrofit project is planned to be completed in 2010. Based on the ACOE and VADEQ's plans to address the DO violations by 2010, and VADEQ's commitment to continue monitoring downstream of the dam, EPA agrees that the Roanoke River segment can be restored within a reasonable period of time without the development of a TMDL. In addition, EPA understands that VADEQ has agreed to proceed with TMDL development if water quality is not restored. Therefore, EPA agrees that the segment of the Roanoke River can be removed from the Section 303(d) List and placed in Category 4B of the Section 305(b) report. Category 4B waters may be threatened or impaired for a designated use but do not require a TMDL because other pollutant control requirements are reasonably expected to result in attainment of the standard by the next reporting period.

If you have any questions or comments, please feel free to contact Ms. Helene Drago at 215-814-5796.

Sincerely,



John M. Capacasa, Director  
Water Protection Division

Enclosure

cc: Charles Martin, VADEQ

Enclosure 1- Delisting Summary

Segment ID	Stream Name	Impairment
VAW-I18R	James River	Biological
VAW-I24R	James River	Biological
VAC-H08R VAC-H05R	James River	Bacteria
VAC-L78R	Roanoke River	Dissolved Oxygen
VAC-L79R	Roanoke River	Dissolved Oxygen

**CATEGORY 4B DEMONSTRATION**

**Virginia Department of Environmental Quality – South Central Regional Office**

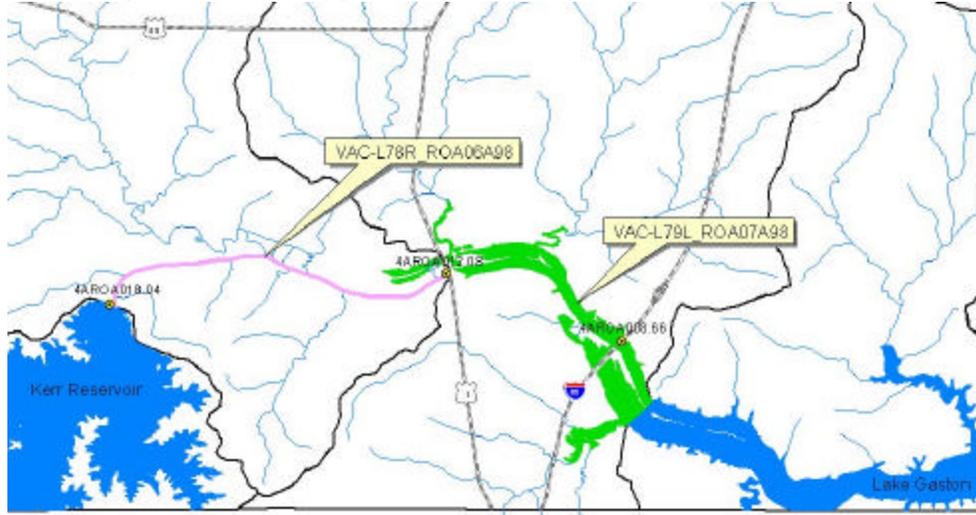
1. Identification of Segment and Statement of Problem Causing Impairment

**Segment Description**

**Stream Name: Roanoke River**

**Location Description: Southeast Mecklenburg County, North of the NC/VA State Line**

**Cause for Listing : Dissolved Oxygen (DO)**



**Impairment and Pollutant Causing Impairment**

Virginia Dissolved Oxygen Criteria for Class III Waters:

Minimum – 4.0 mg/L Instantaneous Standard

Minimum – 5.0 mg/L Daily Average

Assessment Cycle	Impaired Description	Length	Stations & Violation Rates	Associated IDs	Comments
1996*	Kerr Dam to Route 1	5.96 miles	DO violations at 4AROA018.04	TMDL ID: VAP-L78R	
1998	Kerr Dam to Route 85	9.46 miles	4AROA018.04 21/64 4AROA012.08 5/8	TMDL IDs: VAP-L78R VAP-L79R	A special study conducted in 1995 identified the Route 85 bridge as the approximate downstream limit of the impairment.
2002	Kerr Dam to Route 85	10.94 miles	4AROA018.04 19/64 4AROA012.08 13/38	Assessment Unit IDs: VAC-L78R_ROA06A98 VAC-L79R_ROA07A98	Extended mileage derived from GIS.
2004	Kerr Dam to the Smith Creek confluence	10.64 miles or 5.96 miles and 1379.57 acres	4AROA018.04 11/49 4AROA012.08 6/33 4AROA008.66 Above Thermocline 17/25 Below Thermocline 5/10	TMDL IDs: VAC-L78R-01 VAC-L79L-01	Extended segment derived from BPJ and information collected at station 4AROA008.66 in 2000.
2006	Kerr Dam to the Smith Creek confluence	10.64 miles or 5.96 miles and 1379.57 acres	4AROA018.04 10/48 4AROA012.08 39/79 4AROA008.66 Above Thermocline 17/25 Below Thermocline 5/10	USE IDs: VAC-L78R-01 VAC-L79L-01 Impairment IDs: 00501 00679	

\*Initial List Cycle

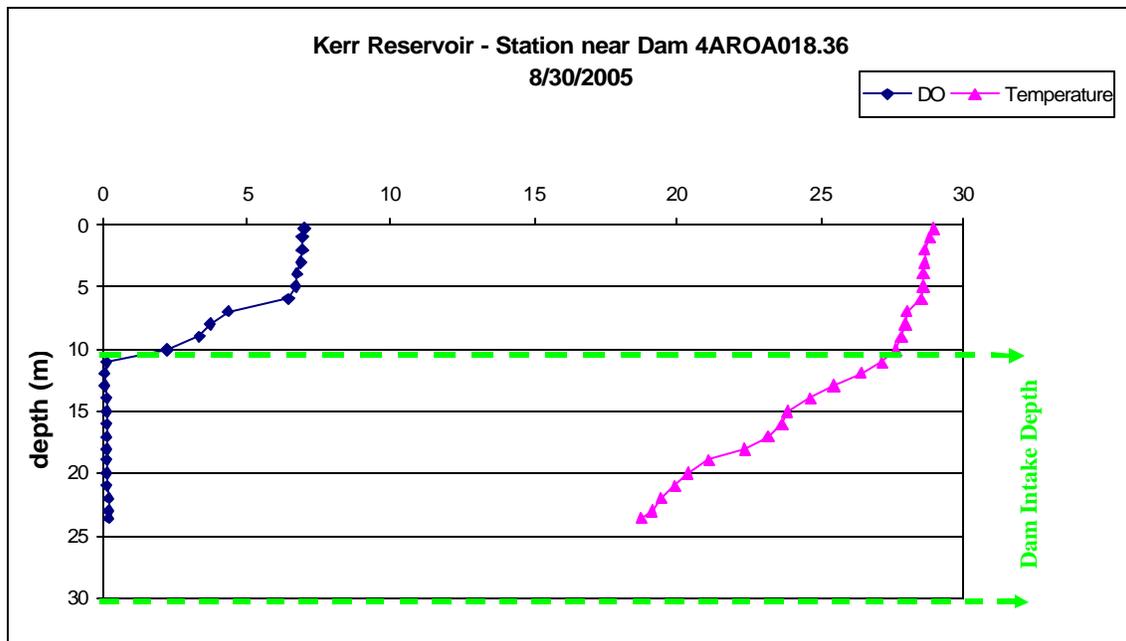
The segment is listed as part of the Virginia Consent Decree and scheduled for TMDL development by 2010.

### Sources of Pollutant Causing Impairment

The suspected source of the DO violations in the Roanoke River is the water released from the John H. Kerr Reservoir and Dam. The pass through water at the dam is pulled from the bottom of the reservoir. The violations only occur during the months when the reservoir is stratified. The data from the stations where the violations occur are provided in the supplemental information.

The size of the dam intake is 20 ft by 60 ft and located between 10 m and 30 m below the surface of the reservoir. The dam releases from the reservoir year round. During months that the reservoir is stratified, the DO levels below the thermocline are less than 1.0 mg/L as measured through the DEQ lake monitoring program.

The graph shows the temperature and DO profiles seen in August 2005 at the lake monitoring station closest to the dam. The depth at which the dam intakes water from the reservoir is noted to show the correlation between the low DO concentrations in the reservoir and those seen below the dam during the stratified months.



Monitoring data collected in Kerr Reservoir does not show any impairments for nutrients or other oxygen demanding pollutants in the history of the DO violations seen downstream of the dam. The 2008 nutrient assessment information for Kerr Reservoir is included in the supplemental information.

## *2. Description of Pollution Controls and How They Will Achieve Water Quality Standards*

### **Water Quality Target**

The water quality target is attainment of the Virginia Dissolved Oxygen Criteria at least 10.5% of the time over a six year assessment window.

### **Point and Non-point Source Loadings that when Implemented will Achieve WQS**

Since the Roanoke River downstream of the dam is not impaired due to nutrients or other oxygen demanding pollutants, the corrective actions must take place at the dam. An effective means of raising the DO concentration in the pass through water needs to be implemented in order to meet the water quality target.

### **Controls that will Achieve WQS**

The Corps is aware of the impact on water quality downstream of the dam. To this end, they voluntarily installed a system of baffles in 2000 to aerate pass through water at the dam. The DEQ monitoring data collected approximately a third of a mile downstream of the dam shows an overall increase in DO.

More recently, the Corps has entered into a contractual agreement with GE Hydro to install a Permanent Dissolved Oxygen System as part of a larger rehabilitation of the dam. The system will include naturally aspirating generator units on 3 of 6 turbines being replaced (units 2, 4 and 6). The new turbines are designed to aerate the water naturally as it passes through. The contract for the installation of these turbines specifies an increase of three milligrams per liter of dissolved oxygen in water passing from a single unit in operation versus water entering the unit. It is anticipated that, if the units perform as specified, this three milligram per liter increase will be sufficient to meet the State WQS.

### **Description of Requirements under which Pollution Controls will be Implemented**

DEQ contacted the Corps in early 2007 to discuss the DO problems downstream of the John H. Kerr Dam. Once it was determined that the rehabilitation of the dam was actively being pursued, a memo was sent to the Corps from DEQ asking for their assistance in moving the Roanoke River segment to Category 4B. A copy of the memo is included in the supplemental information.

A meeting was held on May 9, 2007 to discuss options of an agreement to install and operate the new turbines in a way that would increase DO levels downstream of the dam. DEQ proposed permit language to be included in the Corps VPDES Stormwater Industrial permit, as well as a Memorandum of Understanding to be signed both by DEQ and the Corps. The Corps felt these agreements would change the voluntary nature of the rehabilitation project and has instead provided an official letter describing the dam rehabilitation project to DEQ. A copy of the letter is included in the supplemental information.

### *3. Estimate or Projection of time when WQS Will Be Met*

The new DO system installed at the dam will show immediate results once completed. The contract is tentatively scheduled to be completed in 2010. The retrofitted turbines will be operated during the months when the reservoir is stratified in order to increase DO levels downstream of the dam. Since the contracted work is contingent on federal funding it is hard to project an exact date as to when the WQS will be met.

### *4. Schedule for Implementing Pollution Controls*

The first turbine is scheduled to be retrofitted by the end of 2007 and will go into service in January 2008. Since the violations are only seen during months when the reservoir is stratified, the system cannot be tested until August 2008. The additional units will be replaced approximately every six to eight months. The entire rehabilitation project is to be finished in 2010.

### *5. Monitoring Plan to Track Effectiveness of Pollution Controls*

DEQ will work with the Corps of Engineers to design a sampling plan to monitor the effectiveness of the rehabilitation project. In addition, DEQ monitors the two downstream stations every other month as part of the regional trend monitoring network. Surface DO measurements are taken at each visit. Any DO depth profiles are taken as part of the Lake Monitoring Program. Kerr Reservoir and Lake Gaston are slated to be monitored again April - October 2011.

### *6. Commitment to revise Pollution Controls, as Necessary*

If it is determined that progress towards meeting the water quality target is not being shown through controls implemented at Kerr dam, DEQ will proceed with TMDL development.

DEQ will periodically assess the monitoring data taken downstream, as well as follow up with the Corps once per year to inquire about the status of the turbine installations. DEQ will maintain a record of these conversations with the Corps.

DEQ and the Corps will partner to improve public awareness of and provide educational programs on the importance of restoring water quality in the Roanoke River downstream of the dam.

**Supplemental Information**

**I. Dissolved Oxygen Graphs and Data**

**II. Improvement in DO at most upstream station since installation of baffles**

**III. Incident Report History**

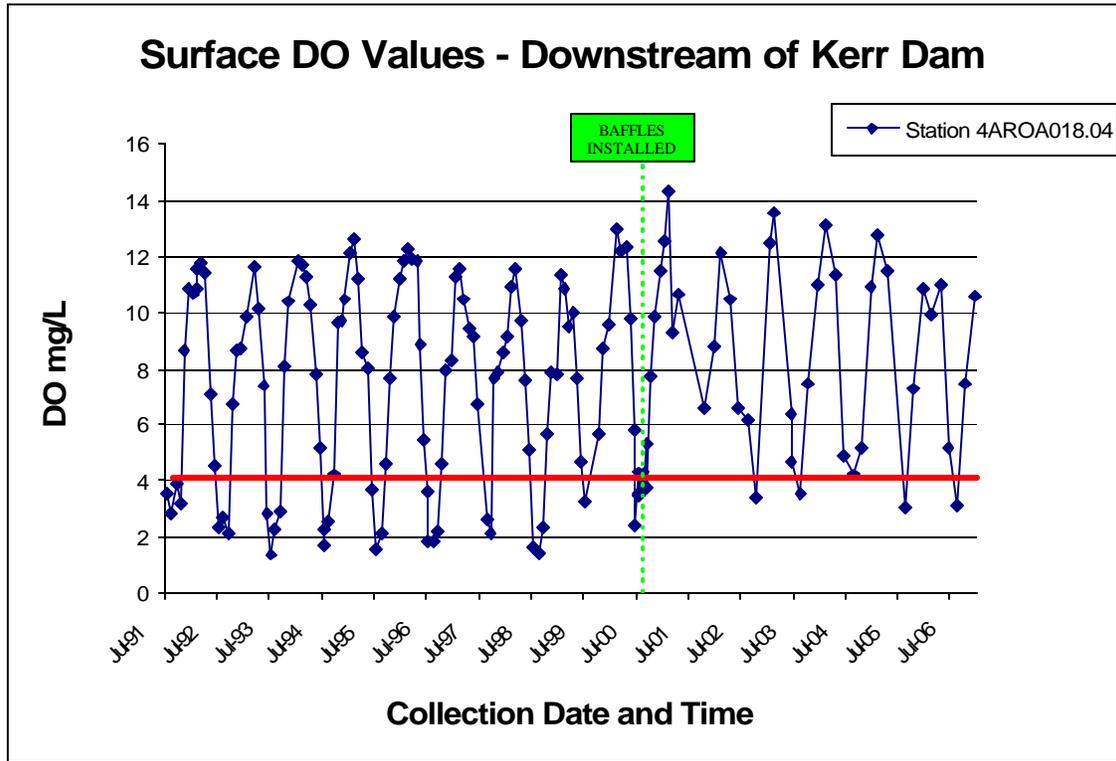
**IV. Projected 2008 Assessment Results**

**V. Photos**

**VI. Memo from DEQ to Corps**

**VII. Response Letter from Corps to DEQ**

**I. Dissolved Oxygen Graphs and Data**



Collection Date Time	Depth	Do Probe
7/22/1991 14:45	0.3	3.51
8/14/1991 12:35	0.3	2.84
9/9/1991 12:44	0.3	3.89
10/2/1991 15:00	0.3	3.21
11/5/1991 12:15	0.3	8.64
12/4/1991 12:45	0.3	10.89
1/15/1992 13:33	0.3	10.64
2/2/1992 12:33	0.3	10.84
2/24/1992 10:40	0.3	11.57
3/17/1992 11:05	0.3	11.8
4/15/1992 14:20	0.3	11.44
5/26/1992 12:55	0.3	7.06
6/16/1992 12:15	0.3	4.57
7/9/1992 14:34	0.3	2.36
8/19/1992 12:38	0.3	2.73
9/9/1992 13:29	0.3	2.18
10/6/1992 13:36	0.3	6.69
11/5/1992 12:07	0.3	8.67
12/3/1992 13:05	0.3	8.75
1/6/1993 12:30	0.3	9.82
3/4/1993 11:00	0.3	11.63
4/7/1993 14:00	0.3	10.11
5/12/1993 12:44	0.3	7.44
6/14/1993 11:25	0.3	2.82
7/13/1993 12:30	0.3	1.41
8/10/1993 12:45	0.3	2.3
9/16/1993 14:44	0.3	2.93
10/14/1993 14:04	0.3	8.09
11/8/1993 13:21	0.3	10.36
1/27/1994 11:22	0.3	11.84
2/22/1994 13:00	0.3	11.73
3/22/1994 11:00	0.3	11.26
4/6/1994 15:11	0.3	10.23
5/18/1994 14:33	0.3	7.85
6/15/1994 14:00	0.3	5.17
7/13/1994 13:14	0.3	1.76
7/26/1994 12:05	0.3	2.26
8/25/1994 16:35	0.3	2.54

9/19/1994 12:34	0.3	4.21
10/19/1994 13:51	0.3	9.61
11/7/1994 13:44	0.3	9.67
12/12/1994 14:00	0.3	10.44
1/11/1995 14:00	0.3	12.14
2/24/1995 12:31	0.3	12.6
3/20/1995 11:25	0.3	11.23
4/24/1995 8:30	0.3	8.58
5/22/1995 13:33	0.3	8.05
6/26/1995 14:12	0.3	3.64
7/26/1995 11:41	0.3	1.57
8/24/1995 12:40	0.3	2.13
9/26/1995 11:00	0.3	4.63
10/30/1995 12:49	0.3	7.7
11/28/1995 10:40	0.3	9.84
12/20/1995 12:00	0.3	11.21
1/23/1996 12:50	0.3	11.87
2/22/1996 10:30	0.3	12.23
3/26/1996 12:12	0.3	11.9
4/16/1996 14:04	0.3	11.87
5/7/1996 13:00	0.3	8.87
6/5/1996 13:00	0.3	5.49
7/2/1996 12:00	0.3	3.6
7/8/1996 14:00	0.3	1.87
8/8/1996 13:34	0.3	1.88
9/5/1996 14:00	0.3	2.21
10/2/1996 12:22	0.3	4.62
11/6/1996 14:00	0.3	7.94
12/2/1996 12:30	0.3	8.3
1/6/1997 12:00	0.3	11.3
2/3/1997 13:22	0.3	11.6
3/24/1997 9:54	0.3	10.44
4/15/1997 11:00	0.3	9.42
5/7/1997 13:00	0.3	9.12
6/10/1997 11:34	0.3	6.69
8/14/1997 13:00	0.3	2.65
9/2/1997 13:34	0.3	2.18
10/6/1997 15:00	0.3	7.69
11/3/1997 13:45	0.3	7.92

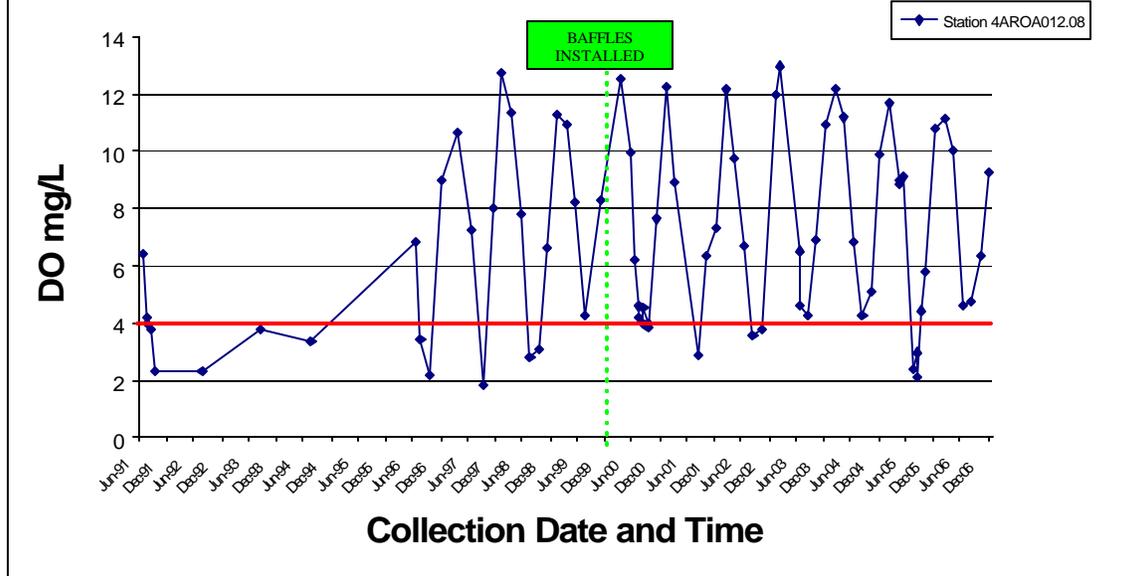
12/1/1997 15:00	0.3	8.62
1/5/1998 10:20	0.3	9.11
2/2/1998 13:30	0.3	10.92
3/2/1998 11:15	0.3	11.54
4/1/1998 12:55	0.3	9.67
5/4/1998 12:30	0.3	7.63
6/1/1998 13:20	0.3	5.11
7/1/1998 11:30	0.3	1.64
8/3/1998 11:10	0.3	1.47
9/1/1998 9:30	0.3	2.34
10/1/1998 11:50	0.3	5.66
11/5/1998 11:45	0.3	7.9
12/10/1998 7:15	0.3	7.85
1/14/1999 12:20	0.3	11.37
2/10/1999 6:55	0.3	10.88
3/10/1999 12:10	0.3	9.48
4/14/1999 15:25	0.3	9.97
5/17/1999 15:15	0.3	7.66
6/14/1999 16:22	0.3	4.74
7/26/1999 13:22	0.3	3.26
10/6/1999 16:30	0.3	5.71
11/8/1999 16:26	0.3	8.7
12/6/1999 15:45	0.3	9.53
2/2/2000 15:50	0.3	12.92
3/2/2000 14:00	0.3	12.17
4/5/2000 16:15	0.3	12.3
5/3/2000 14:45	0.3	9.76
6/7/2000 12:15	0.3	5.8
6/29/2000 15:50	0.3	2.43
7/5/2000 13:30	0.3	4.3
7/17/2000 12:20	0.3	3.49
7/20/2000 12:15	0.3	3.5
8/3/2000 15:30	0.3	3.9
8/14/2000 14:30	0.3	3.7
8/16/2000 14:15	0.3	4.3
9/11/2000 13:00	0.3	5.3
9/12/2000 12:50	0.3	3.72
10/19/2000 13:50	0.3	7.79
11/6/2000 12:20	0.3	9.86

12/19/2000 13:30	0.3	11.5
1/31/2001 12:25	0.3	12.56
2/27/2001 13:40	0.3	14.35
3/22/2001 12:40	0.3	9.25
4/19/2001 13:46	0.3	10.65
10/9/2001 14:45	0.3	6.61
12/4/2001 14:25	0.3	8.78
2/13/2002 14:00	0.3	12.12
4/18/2002 12:55	0.3	10.44
6/26/2002 14:30	0.3	6.58
8/6/2002 13:45	0.3	6.16
10/15/2002 14:00	0.3	3.36
1/2/2003 14:00	0.3	12.47
2/4/2003 13:30	0.3	13.61
6/4/2003 14:00	0.3	6.34
6/30/2003 14:16	0.3	4.74
8/27/2003 13:30	0.3	3.56
10/6/2003 12:50	0.3	7.49
12/18/2003 12:40	0.3	11.02
2/9/2004 12:45	0.3	13.08
4/7/2004 15:00	0.3	11.39
6/22/2004 13:00	0.3	4.94
8/17/2004 14:10	0.3	4.25
10/12/2004 12:35	0.3	5.22
12/15/2004 13:35	0.3	10.94
2/14/2005 13:40	0.3	12.75
4/28/2005 13:25	0.3	11.51
8/11/2005 15:30	0.3	3.02
10/17/2005 14:50	0.3	7.3
12/19/2005 14:40	0.3	10.88
2/6/2006 14:45	0.3	9.89
4/6/2006 14:30	0.3	11
6/19/2006 14:35	0.3	5.2
8/8/2006 13:15	0.3	3.1
10/10/06 13:20	0.3	7.5
12/14/06 13:15	0.3	10.6

### Baffles Installed

1990 – 2006 surface violation rate = 37/152 (24%)

## Surface DO Values - Downstream of Kerr Dam



Collection Date Time	Depth	Do Probe
6/24/1991 12:05	0.3	6.4
7/11/1991 12:30	0.3	3.97
7/22/1991 14:15	0.3	4.2
8/6/1991 13:25	0.3	3.8
9/3/1991 12:01	0.3	2.28
7/21/1992 13:10	0.3	2.32
8/3/1993 11:30	0.3	3.72
7/26/1994 12:30	0.3	3.35
6/5/1996 12:00	0.3	6.84
7/2/1996 13:00	0.3	3.4
9/5/1996 14:30	0.3	2.19
12/2/1996 12:00	0.3	8.97
3/24/1997 9:22	0.3	10.65
6/10/1997 11:11	0.3	7.26
9/2/1997 14:45	0.3	1.81
11/3/1997 15:15	0.3	8
1/5/1998 11:15	0.3	12.75
3/2/1998 12:00	0.3	11.35
5/4/1998 13:40	0.3	7.78

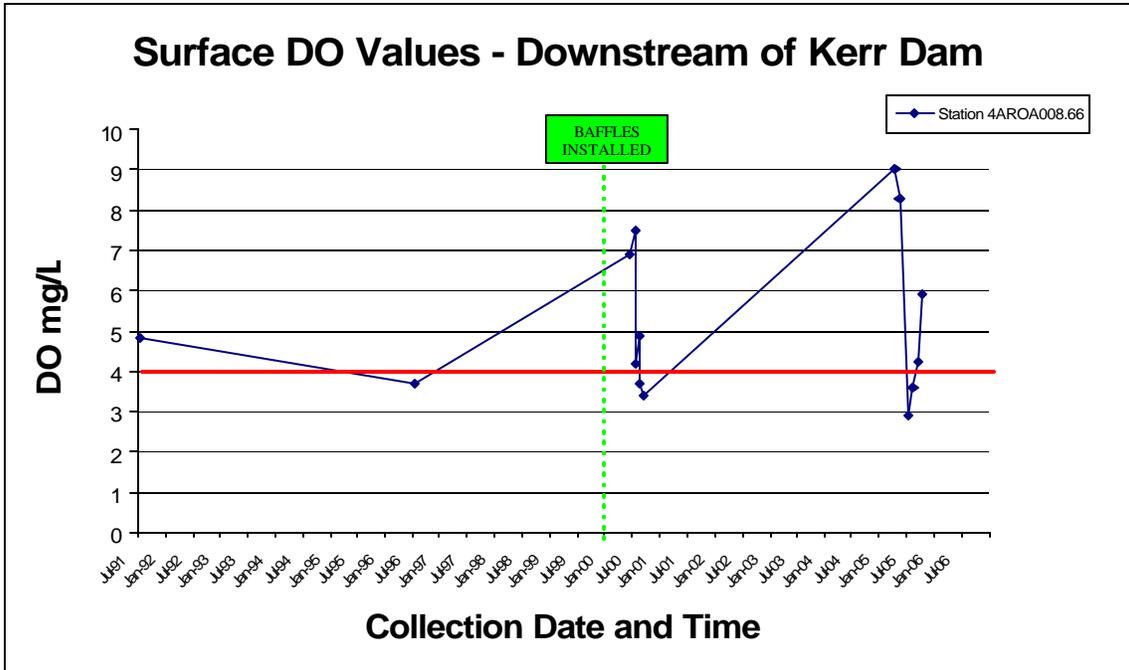
7/1/1998 12:45	0.3	2.82
9/1/1998 10:20	0.3	3.06
11/15/1998 12:20	0.3	6.6
1/14/1999 13:00	0.3	11.3
3/10/1999 12:50	0.3	10.96
5/17/1999 16:20	0.3	8.21
7/26/1999 14:14	0.3	4.29
8/8/1999 17:37	0.3	8.3
3/2/2000 15:00	0.3	12.52
5/3/2000 15:30	0.3	9.96
6/7/2000 13:45	0.3	6.2
7/5/2000 13:40	0.3	4.6
7/17/2000 13:00	0.3	4.59
7/20/2000 13:30	0.3	4.2
8/3/2000 15:00	0.3	4
8/16/2000 14:45	0.3	4.5
9/11/2000 14:00	0.3	4
9/12/2000 13:50	0.3	3.83
11/6/2000 13:15	0.3	7.62
1/31/2001 13:10	0.3	12.27

3/22/2001 13:30	0.3	8.92
8/27/2001 14:05	0.3	2.86
10/9/2001 13:45	0.3	6.33
12/4/2001 13:00	0.3	7.32
2/13/2002 12:45	0.3	12.13
4/18/2002 11:45	0.3	9.7
6/26/2002 13:30	0.3	6.71
8/6/2002 12:30	0.3	3.53
10/15/2002 12:40	0.3	3.81
1/2/2003 12:45	0.3	11.94
2/4/2003 12:30	0.3	12.99
6/4/2003 13:05	0.3	6.52
6/30/2003 13:26	0.3	4.61
8/27/2003 13:00	0.3	4.24
10/6/2003 13:15	0.3	6.88
12/18/2003 13:00	0.3	10.95
2/9/2004 13:05	0.3	12.18
4/7/2004 13:35	0.3	11.17
6/22/2004 13:20	0.3	6.81
8/17/2004 13:45	0.3	4.24

10/12/2004 13:00	0.3	5.09
12/15/2004 13:55	0.3	9.85
2/14/2005 14:00	0.3	11.68
4/27/2005 13:10	0.3	8.97
4/28/2005 13:55	0.3	8.87
5/17/2005 14:00	0.3	9.07
7/20/2005 15:00	0.3	2.4
8/11/2005 14:50	0.3	2.97
8/29/2005 14:05	0.3	2.1
9/21/2005 14:35	0.3	4.44
10/18/2005 15:15	0.3	5.8
12/19/2005 13:55	0.3	10.8
2/6/2006 14:05	0.3	11.12
4/6/2006 14:00	0.3	10
6/19/2006 13:55	0.3	4.6
8/8/2006 12:40	0.3	4.7
10/10/2006	0.3	6.3
12/14/2006	0.3	9.3

### Baffles Installed

1990 – 2006 surface violation rate = 18/77 (23%)

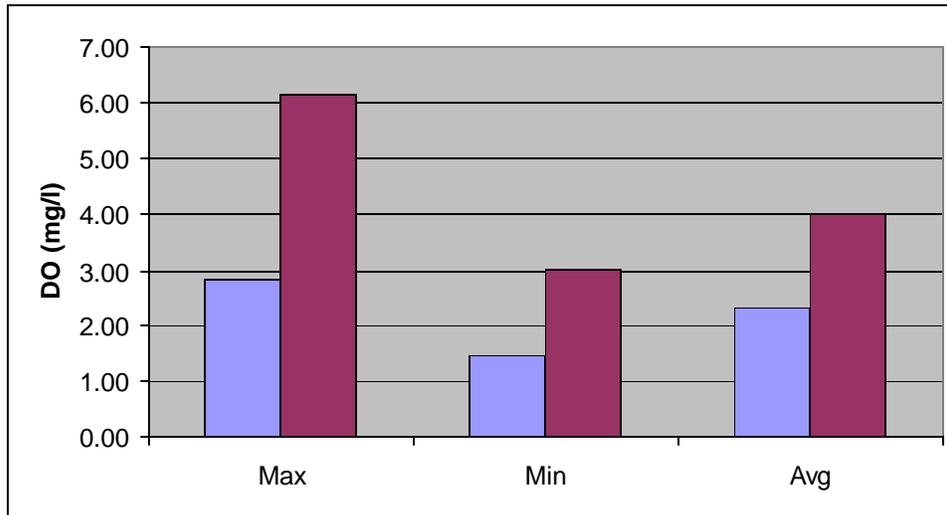
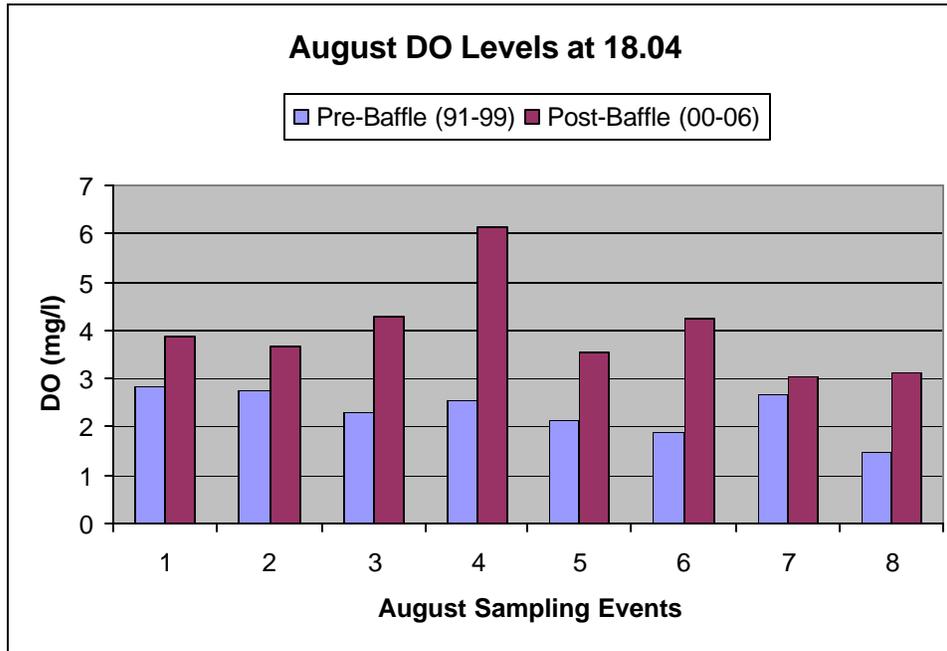


Collection Date Time	Depth	Do Probe
7/22/1991 13:50	0.3	4.83
7/2/1996 13:40	0.3	3.7
6/7/2000 14:15	0.3	6.9
7/5/2000 14:00	0.3	7.5
7/20/2000 14:00	0.3	4.2
8/3/2000 14:40	0.3	4.9
8/16/2000 14:30	0.3	3.7
9/11/2000 14:30	0.3	3.4
4/27/2005 12:50	0.3	9.02
5/17/2005 13:30	0.3	8.29
7/20/2005 14:40	0.3	2.9
8/29/2005 13:45	0.3	3.6
9/21/2005 14:15	0.3	4.25
10/18/2005 15:00	0.3	5.9

**Baffles Installed**

1990 – 2006 surface violation rate = 5/14 (36%)

## II. Improvement in DO at most upstream station since installation of baffles



### III. Incident Report History

August 29, 2005 – Observed 20-30 dead 1 year old striped bass and several bivalves floating on the surface upstream of the Route 1 bridge. No cause was ever determined. The local office of the Virginia Department of Game and Inland Fisheries has attributed it to pass through at the dam.

### IV. Projected 2008 Assessment Results

January 2001 - December 2006

#### Station 4AROA018.04 (Boat Ramp downstream of Kerr dam)

Trend Monitoring – every other month through assessment window

- DO violation rate = 4/35 (11%)
- Nutrients – No exceedances of the Total Phosphorous or Chlorophyll A screening values for freshwater flowing waters

#### Station 4AROA012.08 (Route 1 Bridge)

Lake Monitoring – April – October 2005 (some depth profiles not taken due to strong current)

- No stratification evident with profiles
- Combined DO violation rate = 7/59 (12%)
- Surface DO violation rate = 6/39 (15%)

Trend Monitoring – every other month through assessment window

- Nutrients - No exceedances of the Total Phosphorous or Chlorophyll A screening values for freshwater flowing waters

#### Station 4AROA008.66 (Route 85 Bridge)

Lake Monitoring – April – October 2005 (some depth profiles not taken due to strong current)

- No stratification evident with profiles
- Combined DO violation rate = 7/25 (28%)
- Surface DO violation rate = 2/6 (33%)
- Nutrients - No exceedances of the Total Phosphorous or Chlorophyll A screening values for freshwater flowing waters

#### Lake Gaston TSI Calculations – Sample Year 2005

Station ID: 4AROA000.00

Stratified Months: June-August

Final Assessment: Non-Impaired (Mesotrophic)

Chlorophyll a	Mean	TSI	TP	Mean	TSI	Secchi	Mean	TSI
0.5	3.58	43.08075	10	20	47.36966	1.6	1.7	52.34465
4.4			30			1.8		
5.84			20					

Station ID: 4AROA004.54

Stratified Months: July-August

Final Assessment: Non-Impaired (Mesotrophic)

Chlorophyll a	Mean	TSI	TP	Mean	TSI	Secchi	Mean	TSI
4.18	6.155	48.39698	20	25	50.58894	1.4	1.525	53.91191
8.13			30			1.65		

## **Nutrient Assessment (Criteria not Approved by EPA)**

### ***Kerr Reservoir***

Lacustrine Stations: 4AROA032.42, 4AROA028.04, 4AROA022.52, 4AROA018.36

\*\*Only sampled in 2005

Chlorophyll a Criterion = 25 ug/L

90<sup>th</sup> Percentile = 6.14 ug/L

Data pooled from Epilimnion or Top Third of all Sampling Stations

DO Criterion = 4 mg/L

Total Samples = 323

Violation Rate = 25/323 (7.7%)

### ***Lake Gaston***

No Lacustrine Stations in VA

Riverine Stations: 4AROA004.54, 4AROA000.00

\*\*Only sampled in 2005

Data pooled from Epilimnion or Top Third of all Sampling Stations

DO Criterion = 4 mg/L

Total Samples = 56

Violation Rate = 3/56 (5.3%)

**V. Photos**  
**Station 4AROA018.04**  
**Looking upstream**



**Looking downstream**



**Station 4AROA012.08**  
**Looking upstream**



**Looking downstream**

