

2010 % TDG Instance Tracking System

The U.S. Army Corps of Engineers (Corps) tracks the number of instances that the percent TDG exceeds the 2007 Oregon and Washington water quality standards (WQS) and designates a cause for each instance during the spill for fish passage season, April 3 through August 31. Both Oregon and Washington states changed their water quality standards which would affect TDG instance tracking information provided in this appendix. The changes to the state WQS were not implemented in 2010 because of the NOAA Fisheries 2008 Biological Opinion litigation. Because of the litigation, the Corps operated consistent with the U.S. District Court of Oregon order, which means the previous TDG monitoring system with forebay gages and the method for calculating the 12 hour average used in 2007 continued through 2010. The 2007 Oregon and Washington specified method of calculating the “daily % TDG” is an average of the 12 highest hourly readings in a given day. This method of calculating the high 12 hour averages is called the Oregon/Washington method and is used for this appendix.

There are instances that occurred outside of the spill season, but they are not included in this report since they are not associated with spill for fish. The 2007 state WQS are 115 percent in the forebays and 120 percent in the tailwaters of the Columbia and Snake River dams, under the provisions of the state water quality exemptions granted by the states. The percent TDG instances are based on the daily high 12 hour average.

Table 1 provides a listing of the five causes (Types) that are designated to each percent TDG instances when the daily high 12 hour average is exceeded. These definitions of instance types have been evolving since 2003. From 2002 to 2008, 14 instance types were used and in 2009 the definitions were condensed to three main types and two sub-types, which included all the previous 14 instance types. Table 2 designates a specific instance type for all the instances at the Corps’ lower Columbia River and lower Snake River projects.

**TABLE 1
TYPES OF PERCENT TDG INSTANCE TRACKING**

Type 1 Condition	TDG levels exceed the TDG standard due to exceeding powerhouse capacity at run-of-river projects resulting in spill above the BiOp fish spill levels. This condition type includes:
	<ul style="list-style-type: none"> • High runoff flows and flood control efforts. • BPA load requirements are lower than actual powerhouse capacity. • Involuntary spill at Mid Columbia or lower Snake river dams resulting in high TDG levels entering the lower Columbia River.
Type 1a Condition	Planned and unplanned outages of hydro power equipment including generation unit, intertie line, or powerhouse outages.
Type 2 Exceedance	TDG exceedances due to the operation or mechanical failure of non-generating equipment. This exceedance type includes:
	<ul style="list-style-type: none"> • Flow deflectors unable to function for TDG abatement with tailwater elevations above 19 - 26 feet at Bonneville Dam. • Spill gates stuck in open position or inadvertently left open. • Increased spill in a bulk spill operation to pass debris. • Communication errors, such as teletype were transmitted but change was not timely made or misinterpretation of intent of teletype by Project operator.
Type 2a Exceedance	Malfunctioning FMS gauge, resulting in fewer TDG or temperature measurements when setting TDG spill caps.
Type 3 Exceedance	TDG exceedances due to uncertainties when using best professional judgment, SYSTDG model and forecasts. This exceedance type includes:
	<ul style="list-style-type: none"> • Uncertainties when using best professional judgment to apply the spill guidance criteria, e.g., travel time, degassing, and spill patterns. • Uncertainties when using the SYSTDG model to predict the effects of various hydro system operations, temperature, degassing, and travel time. • Uncertainties when using forecasts for flows, temperature and wind. • Unanticipated sharp rise in water temperature (a 1.5 degree F. or greater change in a day). • Bulk spill pattern being used which generated more TDG than expected.

**TABLE 2
PERCENT TDG INSTANCE TYPE TRACKING
APRIL 2010**

DATE	Lower	Lower	Little	Little	Lower	Lower	Ice	Ice	McNary	McNary	John	John	The	The	Bonn	Bonn	Camas
	Granite	Granite	Goose	Goose	Monum.	Monum.	Harbor	Harbor			Day	Day	Dalles	Dalles			
	Forebay	Tailrace	Forebay														
4/3/10	Spill Begins																
4/4/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/5/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/6/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/7/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/8/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/9/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/10/10	---	---	---	---	---	---	---	---	Spill Begins								
4/11/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
4/12/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/13/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
4/14/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
4/15/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
4/16/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
4/17/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
4/18/10	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	3
4/19/10	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	3
4/20/10	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	3
4/21/10	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---
4/22/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/23/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/24/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/25/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/26/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/27/10	---	---	---	---	---	---	3	---	---	---	---	---	---	---	3	---	3
4/28/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/29/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/30/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
APRIL GRAND TOTAL = 16																	

TABLE 2
PERCENT TDG INSTANCE TYPE TRACKING
MAY 2010

DATE	Lower	Lower	Little	Little	Lower	Lower	Ice	Ice	McNary	McNary	John	John	The	The	Bon	Bon	Camas
	Granite Forebay	Granite Tailrace	Goose Forebay	Goose Tailrace	Monum. Forebay	Monum. Tailrace	Harbor Forebay	Harbor Tailrace	Forebay	Tailrace	Forebay	Tailrace	Dalles Forebay	Dalles Tailrace	Forebay	Tailrace	Forebay
5/1/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/2/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/3/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/4/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/5/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/6/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
5/7/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/8/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
5/9/2010	---	---	---	---	---	---	3	---	---	---	---	---	---	---	3	---	3
5/10/2010	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	3
5/11/2010	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---
5/12/2010	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---
5/13/2010	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---
5/14/2010	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	3
5/15/2010	---	---	---	---	---	---	3	---	---	---	---	---	---	---	3	---	3
5/16/2010	---	---	3	---	---	---	3	---	---	---	---	---	---	---	3	---	3
5/17/2010	---	---	3	---	3	---	3	---	---	---	---	---	---	---	3	---	3
5/18/2010	---	---	---	---	3	---	3	---	---	---	---	---	---	---	---	---	---
5/19/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/20/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/21/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/22/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/23/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/24/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/25/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/26/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/27/2010	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	3
5/28/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/29/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/30/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/31/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MAY GRAND TOTAL = 28																	

**TABLE 2
PERCENT TDG INSTANCE TYPE TRACKING
JUNE 2010**

DATE	Lower Granite	Lower Granite	Little Goose	Little Goose	Lower Monum.	Lower Monum.	Ice Harbor	Ice Harbor	McNary	McNary	John Day	John Day	The Dalles	The Dalles	Bon	Bon	Camas
	Forebay	Tailrace	Forebay	Tailrace	Forebay	Tailrace	Forebay	Tailrace	Forebay	Tailrace	Forebay	Tailrace	Forebay	Tailrace	Forebay	Tailrace	Forebay
6/1/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
6/2/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/3/2010	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/4/2010	---	1	---	---	---	---	---	1	---	---	---	---	---	---	---	1	---
6/5/2010	---	1	1	1	1	1	1	1	---	1	---	---	---	---	---	1	---
6/6/2010	---	1	1	1	1	1	1	1	---	1	---	---	---	---	1	1	1
6/7/2010	---	1	1	1	1	1	1	1	1	---	---	---	---	---	---	1	1
6/8/2010	---	1	1	1	1	1	1	1	1	1	---	---	---	---	---	1	1
6/9/2010	---	1	1	1	1	1	1	1	1	1	---	---	---	---	1	1	1
6/10/2010	---	1	1	1	1	1	1	1	---	1	---	---	---	---	---	1	1
6/11/2010	---	1	1	1	1	1	1	1	---	1	---	---	---	---	---	1	1
6/12/2010	---	1	1	---	1	1	1	1	---	1	---	---	---	---	1	1	1
6/13/2010	---	1	1	---	1	---	1	1	1	---	---	---	---	---	1	1	1
6/14/2010	---	1	1	---	1	---	1	---	1	---	1	---	---	---	---	---	---
6/15/2010	---	1	1	---	1	1	1	---	---	---	---	---	---	---	---	1	---
6/16/2010	---	1	1	---	1	1	1	---	---	1	---	---	---	---	---	1	---
6/17/2010	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	1	1
6/18/2010	---	1	---	---	---	---	---	---	---	1	---	---	---	---	---	1	1
6/19/2010	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	1	1
6/20/2010	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---
6/21/2010	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	1	---
6/22/2010	---	---	---	---	---	---	---	---	---	1	---	---	---	---	---	1	---
6/23/2010	---	---	---	---	---	---	---	---	---	1	---	---	---	---	1	1	1
6/24/2010	---	---	---	---	---	---	1	---	1	1	---	---	---	---	1	1	1
6/25/2010	---	---	---	---	---	---	1	---	1	1	---	---	---	---	---	1	1
6/26/2010	---	---	---	---	---	---	---	---	1	1	---	---	---	---	---	1	1
6/27/2010	---	---	---	---	---	---	---	---	1	1	---	---	---	---	---	1	1
6/28/2010	---	---	---	---	---	---	1	---	1	1	---	---	---	---	1	1	1
6/29/2010	---	---	---	---	---	---	---	---	1	1	---	---	---	---	---	1	---
6/30/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	1
JUNE GRAND TOTAL = 165																	

**TABLE 2
PERCENT TDG INSTANCE TYPE TRACKING
JULY 2010**

DATE	Lower	Lower	Little	Little	Lower	Lower	Ice	Ice	McNary	McNary	John	John	The	The	Bon	Bon	Camas
	Granite Forebay	Granite Tailrace	Goose Forebay	Goose Tailrace	Monum. Forebay	Monum. Tailrace	Harbor Forebay	Harbor Tailrace	Forebay	Tailrace	Forebay	Day Tailrace	Dalles Forebay	Dalles Tailrace	Forebay	Tailrace	Forebay
7/1/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	1
7/2/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/3/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/4/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/5/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/6/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/7/2010	---	---	---	---	---	2a	---	---	---	2a	---	---	---	---	---	---	---
7/8/2010	---	---	---	---	---	2a	---	---	---	2a	---	---	---	---	3	---	3
7/9/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	---	3
7/10/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
7/11/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/12/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/13/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/14/2010	---	---	---	---	---	---	---	2a	---	---	---	---	---	---	---	---	---
7/15/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
7/16/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/17/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/18/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/19/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/20/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/21/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/22/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/23/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
7/24/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
7/25/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
7/26/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
7/27/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2a	3
7/28/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/29/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/30/2010	---	---	---	---	---	1a	---	---	---	---	---	---	---	---	---	---	---
7/31/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
JULY GRAND TOTAL = 20																	

**TABLE F-2
PERCENT TDG INSTANCE TYPE TRACKING
AUGUST 2010**

DATE	Lower Granite	Lower Granite	Little Goose	Little Goose	Lower Monum.	Lower Monum.	Ice Harbor	Ice Harbor	McNary	McNary	John Day	John Day	The Dalles	The Dalles	Bon	Bon	Camas
	Forebay	Tailrace	Forebay	Tailrace	Forebay	Tailrace	Forebay	Tailrace	Forebay	Tailrace	Forebay	Tailrace	Forebay	Tailrace	Forebay	Tailrace	Forebay
8/1/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
8/2/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
8/3/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/4/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/5/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/6/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/7/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/8/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/9/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/10/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/11/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/12/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/13/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/14/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/15/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/16/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
8/17/2010	---	---	---	---	---	2a	---	---	---	---	---	---	---	---	---	---	3
8/18/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/19/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/20/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/21/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/22/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/23/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/24/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/25/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/26/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/27/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/28/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/29/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/30/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8/31/2010	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
AUGUST GRAND TOTAL = 5																	
Total	0	15	14	7	14	14	31	11	11	23	1	0	0	0	14	27	52
GRAND TOTAL	234																