

# **Appendix D**

## **2023 Summary of TDG Exceedance Tracking**

## INTRODUCTION

The U.S. Army Corps of Engineers (Corps) tracks the number of days when the percent TDG exceeds the Oregon (set by Oregon Department of Environmental Quality, ODEQ) and Washington (set by Washington Department of Ecology, WDOE) water quality standards (WQS). During spill for fish passage, April through August, WDOE's and ODEQ's WQSs use the same method for calculating a daily value of TDG: the average of the 12 highest hourly readings in a calendar day. This appendix provides the TDG tracking system results. A description of each table follows.

Table D- 1 provides a definition of TDG instances (including exceedance types, 7Q10 flows, and data quality events) with the associated format used to identify the type. Table D-2 through D-9 identify the daily TDG regulatory value (computed using the methods described in the previous paragraph) and exceedance type if applicable (as defined in Table D- 1) by project forebay and tailwater.

Table D- 7 and Table D-8 provide the total number of TDG exceedances by type for each project for the lower Snake River projects and lower Columbia River projects, respectively.

Oregon and Washington also specify that April through August, the maximum two consecutive hour TDG must not exceed 127 percent and 126 percent, respectively. Table D-9 through D-11 show the daily TDG two-hour regulatory values between April and June 2023. Table D- 12 breaks down the maximum two-hour consecutive TDG value, the number of days that exceed 126 percent Washington TDG standard, and the number of days that exceed the 127 percent Oregon TDG standard.

Table D- 13 provides a list of TDG gauges that malfunctioned during the 2023 spill season, which resulted in six hours or more of either missing or erroneous data. Malfunctioning gauge TDG instances are noted as data quality event in Table D-2 through Table D-9.

**Table D- 1: TDG instance definitions**

<b>Forced Spill Exceedance (FSE)</b>	<p>TDG WQS exceedance due to spill above the BiOp fish spill levels. This includes exceedances due to:</p> <ul style="list-style-type: none"> <li>• High runoff flows and flood risk management efforts.</li> <li>• Periods when BPA load requirements are lower than actual powerhouse capacity or project is carrying system-wide reserves.</li> <li>• Involuntary spill at Mid-Columbia River dams resulting in high TDG levels entering the lower Columbia River.</li> <li>• Involuntary spill at Snake River dams resulting in high TDG levels entering the lower Columbia River.</li> <li>• Planned and unplanned outages of hydro power equipment including generation unit, intertie line, or powerhouse outages.</li> </ul>
<b>Mechanical Exceedance (ME)</b>	<p>TDG WQS exceedance due to the operation or mechanical failure of non-generating equipment. This includes exceedances due to:</p> <ul style="list-style-type: none"> <li>• Spill gates stuck in open position or inadvertently left open.</li> <li>• Increased spill in a bulk spill operation to pass debris or other special operations.</li> <li>• Communication errors, such as teletype were transmitted but change was not timely made or misinterpretation of intent of teletype by Project operator.</li> </ul>
<b>Uncertainty Exceedance (UE)</b>	<p>TDG WQS exceedance due to uncertainties when using best professional judgment, SYSTDG model and forecasts. This includes exceedances due to:</p> <ul style="list-style-type: none"> <li>• Uncertainties when using best professional judgment to apply the spill guidance criteria, e.g., travel time, degassing, and spill patterns.</li> <li>• Uncertainties when using the SYSTDG model to predict the effects of various hydro system operations, temperature, degassing, and travel time.</li> <li>• Uncertainties when using forecasts for flows, temperature, and wind.</li> <li>• Unanticipated sharp rise in water temperature (greater than 1.5 degree F. per day).</li> </ul>
<b>Transition Exceedance (TE)</b>	<p>TDG WQS exceedance due to change in the WQS from spring spill to summer spill.</p> <ul style="list-style-type: none"> <li>• Because spring WQS are higher than summer WQS and travel time between projects can be greater than a week, there may be a transition period while the system degasses subsequent to the spring spill operation.</li> </ul>
<b>Exceedance Following GBT (GBT)</b>	<p>TDG WQS exceedance during spill reduction following GBT exceedance.</p> <ul style="list-style-type: none"> <li>• There may be a transition period while the system degasses.</li> <li>• Because there may be different WQS applied to projects in the same reach, a WQS may not be attainable at all gauge locations. For example, in 2023, Lower Granite remained at the 125% GC, while Little Goose, Lower Monumental, and Ice Harbor were reduced to the 115%/120% WQS.</li> </ul>
<b>Data Quality Event (-)</b>	Malfunctioning FMS gauge that resulted in missing or erroneous data. The TDG cannot be evaluated for these days.
<b>7Q10 Flow (*)</b>	TDG above the WQS during project flow higher than 7Q10 flows. These instances are not counted towards the total number of exceedances.
<b>Gauge Not Yet Installed (*)</b>	Data not collected at forebay gauges during the spring as the 125% TDG WQS applies only to the tailwater gauges.

**Table D- 2: Daily 12-hour Regulatory TDG Instances in April 2023**

<b>Station:</b>	<b>LWG</b>	<b>LGNW</b>	<b>LGSA</b>	<b>LGSW</b>	<b>LMNA</b>	<b>LMNW</b>	<b>IHRA</b>	<b>IDSW</b>	<b>MCN A</b>	<b>MCP W</b>	<b>JDY</b>	<b>JHAW</b>	<b>TDA</b>	<b>TDDO</b>	<b>BON</b>	<b>CCIW</b>
4/1/2023	104	102	106	104	106	106	105	105	106	105	•	103	•	104	•	•
4/2/2023	104	103	104	105	106	108	105	106	105	106	•	103	•	104	•	•
4/3/2023	103	109	104	111	105	113	105	113	104	104	•	102	•	103	•	•
4/4/2023	102	109	103	111	104	116	104	113	103	103	•	102	•	102	•	•
4/5/2023	101	111	103	112	103	116	104	113	104	105	•	102	•	103	104	111
4/6/2023	102	112	103	112	103	116	105	114	106	105	104	104	105	104	•	112
4/7/2023	103	112	104	113	104	116	109	114	108	108	104	104	105	104	105	113
4/8/2023	102	111	104	113	105	116	110	114	108	106	103	104	104	103	105	112
4/9/2023	102	112	105	112	108	116	111	114	108	109	104	104	104	103	106	113
4/10/2023	104	114	110	115	110	118	113	115	109	117	105	115	104	110	106	115
4/11/2023	102	116	110	117	111	117	113	116	108	116	104	114	109	111	105	117
4/12/2023	102	120	111	121	111	119	114	117	107	117	104	117	112	115	107	120
4/13/2023	103	119	111	120	114	118	114	116	107	115	105	117	113	115	111	120
4/14/2023	101	119	112	120	116	118	116	116	108	115	105	117	114	116	113	118
4/15/2023	101	117	114	119	118	117	116	116	110	116	105	116	114	116	114	117
4/16/2023	102	116	117	118	118	116	117	114	110	115	106	115	115	116	115	117
4/17/2023	103	118	117	119	119	117	117	116	110	116	107	115	113	116	114	118
4/18/2023	103	118	117	119	117	118	116	116	110	115	107	116	113	114	113	117
4/19/2023	102	118	115	119	115	117	113	116	108	115	107	115	112	114	113	117
4/20/2023	100	117	113	119	114	117	111	116	106	115	108	115	112	114	111	117
4/21/2023	100	117	113	119	115	117	112	116	106	115	108	114	114	115	111	117
4/22/2023	101	117	115	118	118	117	115	116	107	115	110	115	115	117	114	117
4/23/2023	103	117	118	118	120	117	117	115	109	115	111	115	117	117	115	117
4/24/2023	103	117	117	118	118	117	116	115	109	115	109	114	113	115	114	117
4/25/2023	102	117	117	120	116	118	114	116	111	115	108	114	112	114	113	117
4/26/2023	102	118	116	121	116	118	115	116	111	116	109	115	116	116	113	117
4/27/2023	101	118	116	120	119	119	116	116	112	116	110	117	115	116	115	118
4/28/2023	103	119	117	121	121	120	118	116	114	116	113	117	117	118	115	119
4/29/2023	103	121	118	122	123	121	119	116	114	118	115	118	117	118	118	121
4/30/2023	104	123	120	124	124	122	121	118	116	118	114	118	117	117	117	121
<b>Exceedances:</b>																
<b>DQE:</b>																

Table D- 3: Daily 12-hour Regulatory TDG Instances in May 2023

Station:	LWG	LGNW	LGSA	LGSW	LMNA	LMNW	IHRA	IDSW	MCNA	MCPW	JDY	JHAW	TDA	TDDO	BON	CCIW
5/1/2023	104	125	119	125	123	123	119	125	115	120	111	119	114	115	113	121
5/2/2023	103	126	118	125	124	124	121	124	113	123	113	121	119	120	113	121
5/3/2023	104	126	120	125	127	126	123	125	115	125	114	122	122	123	116	122
5/4/2023	106	125	121	127	127	126	124	125	115	125	112	124	119	122	117	123
5/5/2023	105	124	118	126	124	127	120	125	113	124	111	125	121	122	114	123
5/6/2023	104	124	116	125	124	126	121	125	111	124	113	124	122	124	119	124
5/7/2023	104	125	118	125	124	125	121	125	113	124	111	124	122	123	120	124
5/8/2023	105	125	118	124	124	124	121	125	115	126	113	123	123	124	121	124
5/9/2023	104	-	118	124	125	123	121	125	115	125	115	124	122	123	120	124
5/10/2023	104	122	118	122	125	122	121	123	115	125	118	124	124	125	122	124
5/11/2023	104	121	118	117	125	119	122	120	116	125	122	124	126	126	123	124
5/12/2023	104	124	118	117	120	119	120	120	116	124	123	125	126	126	124	123
5/13/2023	104	124	117	117	119	119	119	120	117	124	124	123	128	127	124	123
5/14/2023	105	125	119	118	119	119	118	120	116	125	124	124	128	128	126	123
5/15/2023	105	125	121	119	119	120	118	121	117	125	124	123	127	127	126	124
5/16/2023	105	126	120	122	120	121	118	124	117	124	123	124	124	126	125	124
5/17/2023	105	126	120	125	122	124	119	125	119	125	126	125	125	127	127	125
5/18/2023	106	125	122	126	124	125	121	125	119	125	125	124	125	127	126	128
5/19/2023	106	124	120	126	127	124	122	125	120	125	125	124	124	126	124	125
5/20/2023	106	124	121	127	130	125	123	125	120	125	124	125	124	126	123	124
5/21/2023	107	125	121	127	130	125	124	124	119	124	122	125	120	123	120	124
5/22/2023	106	127	118	127	127	125	121	125	114	127	116	125	117	122	116	124
5/23/2023	107	126	117	128	130	125	122	129	114	127	113	125	119	124	119	124
5/24/2023	108	125	121	126	131	124	125	124	117	125	112	122	118	124	122	123
5/25/2023	107	123	121	124	130	124	126	125	119	125	118	122	122	125	123	125
5/26/2023	107	123	122	125	127	124	125	125	118	125	124	122	124	125	123	124
5/27/2023	106	124	121	125	126	123	124	125	119	125	123	122	121	123	121	122
5/28/2023	106	124	121	125	125	124	123	124	118	125	121	122	121	123	116	122
5/29/2023	105	124	121	125	126	122	123	125	117	125	121	122	122	123	115	122
5/30/2023	105	124	120	125	126	122	123	122	116	123	118	123	120	122	115	122
5/31/2023	105	125	118	122	123	121	122	122	114	122	115	123	117	120	112	121
<b>Exceedances:</b>		<b>6</b>		<b>11</b>	<b>8</b>	<b>7</b>	<b>8</b>	<b>5</b>	<b>6</b>	<b>3</b>				<b>10</b>		<b>1</b>
<b>DQE:</b>		<b>1</b>														

Table D- 4: Daily 12-hour Regulatory TDG Instances in June 2023

Station:	LWG	LGNW	LGSA	LGSW	LMNA	LMNW	IHRA	IDSW	MCNA	MCPW	JDY	JHAW	TDA	TDDO	BON	CCIW
6/1/2023	104	125	117	117	122	119	121	121	111	121	113	121	120	121	112	121
6/2/2023	104	125	117	117	119	118	119	120	112	119	113	119	120	122	114	121
6/3/2023	105	125	119	117	118	116	119	120	113	120	113	119	119	120	116	121
6/4/2023	105	125	119	117	118	116	118	120	113	119	113	118	118	120	113	120
6/5/2023	105	124	120	117	119	116	118	119	114	119	116	119	119	120	114	120
6/6/2023	106	124	120	117	119	116	119	119	115	120	119	119	122	122	117	121
6/7/2023	105	123	121	122	119	119	119	118	115	119	120	120	122	122	120	121
6/8/2023	105	123	119	124	119	121	118	118	113	118	119	120	119	121	115	120
6/9/2023	104	123	118	124	122	121	118	117	113	118	118	119	117	120	112	120
6/10/2023	103	122	118	122	122	121	119	117	110	116	115	118	114	118	111	120
6/11/2023	103	121	118	122	123	120	120	116	111	116	114	117	115	118	112	120
6/12/2023	104	121	118	123	123	121	121	117	112	116	114	117	116	119	113	119
6/13/2023	105	121	118	122	123	120	121	117	113	116	113	117	114	117	112	121
6/14/2023	103	120	115	122	120	118	119	116	111	116	109	118	108	114	108	120
6/15/2023	102	120	112	122	116	120	114	117	108	117	107	118	111	115	106	120
6/16/2023	102	119	111	121	116	118	114	117	108	117	107	114	115	118	109	117
6/17/2023	102	118	112	119	119	117	116	115	110	117	107	113	109	115	109	117
6/18/2023	102	118	112	118	118	117	116	115	109	116	105	113	107	113	109	117
6/19/2023	102	119	111	120	116	118	114	114	107	116	104	114	106	112	107	117
6/20/2023	100	118	108	120	112	117	110	115	105	117	102	114	105	112	106	117
6/21/2023	99	109	108	113	112	118	110	113	104	118	104	114	108	114	109	117
6/22/2023	101	110	110	112	116	119	113	115	108	117	105	114	110	116	112	117
6/23/2023	103	110	112	113	118	119	115	114	109	116	105	114	110	115	113	117
6/24/2023	104	111	113	114	115	117	115	114	110	117	104	115	108	114	112	117
6/25/2023	105	111	114	114	113	117	115	113	111	117	104	115	108	114	110	117
6/26/2023	104	112	111	113	113	118	116	113	111	117	106	115	109	115	109	117
6/27/2023	103	112	110	113	114	117	116	115	111	116	109	116	109	115	108	117
6/28/2023	103	112	111	113	114	117	116	114	111	115	110	116	109	115	108	117
6/29/2023	103	111	112	114	113	115	115	113	110	115	111	116	111	116	109	117
6/30/2023	103	111	111	113	113	114	115	115	111	115	110	116	111	116	110	117
<b>Exceedances:</b>					<b>8</b>		<b>9</b>	<b>1</b>								
<b>DQE:</b>																

Table D- 5: Daily 12-hour Regulatory TDG Instances in July 2023

Station:	LWG	LGNW	LGSA	LGSW	LMNA	LMNW	IHRA	IDSW	MCNA	MCPW	JDY	JHAW	TDA	TDDO	BON	CCIW
7/1/2023	102	111	111	113	113	114	115	113	110	114	110	115	109	114	108	117
7/2/2023	102	112	112	114	113	115	115	113	110	115	109	116	109	114	108	117
7/3/2023	103	112	112	114	113	114	114	113	111	114	109	116	112	116	109	117
7/4/2023	102	112	112	113	112	114	114	112	111	114	110	116	113	116	111	117
7/5/2023	101	112	111	113	113	115	114	-	111	115	111	116	113	117	114	117
7/6/2023	102	111	112	113	115	114	115	-	111	115	112	116	113	117	114	117
7/7/2023	102	111	113	113	115	114	115	114	113	116	111	116	111	115	111	117
7/8/2023	104	111	114	114	115	115	116	113	113	115	110	116	109	114	107	117
7/9/2023	104	112	113	113	115	115	115	114	113	115	109	115	108	114	105	117
7/10/2023	104	112	112	113	114	114	114	113	111	115	108	115	107	112	104	117
7/11/2023	105	112	110	113	113	114	113	113	109	116	106	115	106	112	105	115
7/12/2023	105	112	111	113	112	116	113	113	109	115	106	114	108	114	105	117
7/13/2023	104	112	109	112	111	117	112	113	107	117	105	114	108	113	107	117
7/14/2023	104	-	110	111	111	117	112	113	108	117	105	115	108	115	109	117
7/15/2023	104	-	109	111	111	-	112	113	109	117	105	115	109	115	111	117
7/16/2023	104	113	110	111	111	-	113	113	110	117	105	115	109	114	110	117
7/17/2023	103	112	111	111	111	-	113	113	110	115	104	114	107	113	107	117
7/18/2023	102	112	109	111	110	117	114	114	109	117	105	115	106	113	108	117
7/19/2023	103	112	109	110	110	117	114	113	108	116	107	115	110	116	110	117
7/20/2023	103	113	108	107	110	117	113	113	108	115	108	115	111	116	110	117
7/21/2023	102	112	109	109	111	117	112	112	109	115	107	114	109	114	108	117
7/22/2023	101	112	108	110	111	117	113	112	109	115	107	115	108	114	108	114
7/23/2023	102	112	108	108	111	117	114	113	109	115	107	115	109	114	109	114
7/24/2023	102	112	109	113	111	118	113	112	109	115	106	115	108	113	107	115
7/25/2023	102	112	109	114	110	118	112	112	108	116	105	116	107	113	107	116
7/26/2023	102	113	108	114	108	-	111	112	107	115	106	115	108	114	107	117
7/27/2023	102	-	108	114	108	119	111	112	107	116	105	115	109	114	107	117
7/28/2023	102	112	108	113	109	118	110	112	107	117	105	115	107	114	107	116
7/29/2023	102	112	108	114	110	119	110	112	108	117	105	115	107	113	106	117
7/30/2023	102	112	108	113	110	118	112	112	108	116	104	115	106	112	106	117
7/31/2023	103	112	109	117	110	117	112	113	107	116	104	114	107	113	106	117
<b>Exceedances:</b>							<b>1</b>									
<b>DQE:</b>		<b>3</b>				<b>4</b>		<b>2</b>								

**Table D- 6: Daily 12-hour Regulatory TDG Instances in August 2023**

<b>Station:</b>	<b>LWG</b>	<b>LGNW</b>	<b>LGSA</b>	<b>LGSW</b>	<b>LMNA</b>	<b>LMNW</b>	<b>IHRA</b>	<b>IDSW</b>	<b>MCNA</b>	<b>MCPW</b>	<b>JDY</b>	<b>JHAW</b>	<b>TDA</b>	<b>TDDO</b>	<b>BON</b>	<b>CCIW</b>
8/1/2023	102	113	108	118	110	115	113	111	108	118	104	114	108	113	107	117
8/2/2023	102	113	109	116	110	117	112	109	108	116	105	115	108	113	107	115
8/3/2023	102	116	109	114	110	116	112	109	108	116	105	114	107	112	107	114
8/4/2023	102	113	109	113	110	112	112	108	108	115	104	114	106	112	106	114
8/5/2023	102	113	108	109	110	112	112	109	107	116	105	116	109	113	107	114
8/6/2023	102	115	108	109	109	113	111	108	107	117	105	115	108	-	107	116
8/7/2023	102	114	109	112	109	112	111	108	106	116	106	115	107	-	106	115
8/8/2023	101	112	110	114	108	112	111	109	106	115	107	115	110	-	107	116
8/9/2023	101	115	109	114	109	112	110	108	107	116	107	115	110	-	107	116
8/10/2023	100	115	109	114	108	113	109	108	107	115	106	115	107	-	106	116
8/11/2023	100	111	108	108	108	114	109	108	107	116	105	116	107	-	106	116
8/12/2023	100	112	107	108	108	113	108	108	107	118	105	116	107	114	106	116
8/13/2023	99	112	107	108	107	113	108	108	107	117	106	115	109	-	108	116
8/14/2023	100	112	107	111	108	113	109	108	109	117	108	115	112	-	111	117
8/15/2023	100	111	109	110	108	111	109	108	109	112	108	114	112	-	113	113
8/16/2023	100	109	109	110	108	109	111	108	109	111	108	114	110	114	113	114
8/17/2023	101	109	109	109	109	110	112	108	110	112	108	115	109	113	111	113
8/18/2023	101	109	109	109	108	109	112	108	109	110	109	115	107	-	108	113
8/19/2023	101	110	108	109	108	110	112	108	107	110	109	115	107	-	105	113
8/20/2023	101	105	107	109	107	109	110	108	104	109	110	115	110	-	106	113
8/21/2023	101	110	107	108	107	108	109	107	103	109	109	115	110	-	108	113
8/22/2023	100	110	106	107	105	108	106	107	103	108	106	113	107	-	106	113
8/23/2023	99	110	103	107	103	108	104	107	102	109	104	112	106	-	105	113
8/24/2023	99	108	104	107	104	108	104	107	103	109	104	112	107	-	105	113
8/25/2023	99	108	105	107	104	108	104	107	101	109	104	-	108	-	107	113
8/26/2023	99	108	104	108	103	108	104	107	102	108	103	-	108	-	108	113
8/27/2023	100	108	103	108	103	108	103	107	103	109	103	-	108	-	109	113
8/28/2023	100	109	103	107	104	109	104	107	105	109	103	-	108	-	108	113
8/29/2023	100	109	104	107	104	108	105	106	103	109	102	-	105	109	104	112
8/30/2023	100	109	103	107	104	109	104	107	102	108	101	-	102	108	102	112
8/31/2023	100	109	105	107	104	109	104	107	102	108	101	111	104	110	104	113
<b>Exceedances:</b>																
<b>DQE</b>												<b>6</b>		<b>20</b>		

**Table D-7<sup>1</sup>: Total juvenile fish passage season exceedances by project and type for the Lower Snake River**

<b>TDG Exceedance Type</b>	<b>LWG</b>	<b>LGNW</b>	<b>LGSA</b>	<b>LGSW</b>	<b>LMNA</b>	<b>LMNW</b>	<b>IHRA</b>	<b>IDSW</b>	<b>Total</b>
<b>FSE</b>	0	2	0	7	0	0	0	1	<b>10</b>
<b>ME</b>	0	0	0	0	0	0	0	0	<b>0</b>
<b>UE</b>	0	4	0	2	0	4	4	0	<b>14</b>
<b>TE</b>	0	0	0	0	2	0	0	0	<b>2</b>
<b>GBT</b>	0	0	0	2	14	3	14	5	<b>38</b>
<b>Grand Total</b>	0	6	0	11	16	7	18	6	<b>64</b>

**Table D-8: Total juvenile fish passage season TDG exceedances by project and type for the Lower Columbia River**

<b>TDG Exceedance Type</b>	<b>MCNA</b>	<b>MCPW</b>	<b>JDY</b>	<b>JHAW</b>	<b>TDA</b>	<b>TDDO</b>	<b>BON</b>	<b>CCIW</b>	<b>Total</b>
<b>FSE</b>	0	2	0	0	0	4	0	1	<b>7</b>
<b>ME</b>	0	1	0	0	0	0	0	0	<b>1</b>
<b>UE</b>	0	0	0	0	0	6	0	0	<b>6</b>
<b>TE</b>	0	0	0	0	0	0	0	0	<b>0</b>
<b>GBT</b>	6	0	0	0	0	0	0	0	<b>6</b>
<b>Grand Total</b>	<b>6</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>1</b>	<b>20</b>

<sup>1</sup> TDG thresholds are 125% Tailwater during Spring Spill and 115% Forebay; 120% Tailwater during Summer Spill and in response to GBT exceedances

**Table D- 9: Daily 2-hour Regulatory TDG Instances in April 2023**

<b>Station:</b>	<b>LWG</b>	<b>LGNW</b>	<b>LGSA</b>	<b>LGSW</b>	<b>LMNA</b>	<b>LMNW</b>	<b>IHRA</b>	<b>IDSW</b>	<b>MCNA</b>	<b>MCPW</b>	<b>JDY</b>	<b>JHAW</b>	<b>TDA</b>	<b>TDDO</b>	<b>BON</b>	<b>CCIW</b>
4/1/2023	104	102	106	104	107	106	105	105	106	106	-	103	-	104	-	-
4/2/2023	104	104	105	106	106	111	106	108	105	108	-	104	-	104	-	-
4/3/2023	103	109	104	111	106	113	105	114	105	104	-	103	-	104	-	-
4/4/2023	102	110	103	112	105	116	104	114	104	104	-	102	-	103	-	-
4/5/2023	101	112	103	112	103	116	104	113	105	107	-	102	-	103	-	-
4/6/2023	102	112	103	113	103	116	106	114	106	105	-	105	-	105	-	-
4/7/2023	103	112	105	114	104	116	109	115	108	109	-	105	-	105	-	-
4/8/2023	102	111	105	113	105	118	110	114	108	107	104	104	104	104	106	114
4/9/2023	102	112	106	112	108	116	111	114	108	110	104	104	104	104	106	114
4/10/2023	104	115	112	115	111	119	114	115	109	117	105	116	104	110	106	117
4/11/2023	103	117	110	118	111	117	113	116	109	117	104	115	110	113	106	117
4/12/2023	103	121	111	122	112	119	114	117	108	118	104	118	113	115	108	120
4/13/2023	103	119	111	122	114	118	115	117	108	116	105	118	114	115	111	120
4/14/2023	101	119	112	120	118	118	116	116	108	116	105	117	115	116	113	120
4/15/2023	101	117	115	120	118	117	116	117	110	116	106	116	115	116	114	118
4/16/2023	102	116	118	118	118	116	117	115	111	116	106	116	115	117	115	117
4/17/2023	103	118	117	120	119	117	117	116	111	116	107	116	114	116	114	118
4/18/2023	103	118	118	120	118	118	117	116	110	115	107	116	113	115	114	118
4/19/2023	102	118	115	119	115	117	113	116	109	115	107	115	112	115	113	117
4/20/2023	100	118	114	119	115	118	111	116	106	115	108	115	113	115	111	117
4/21/2023	100	117	114	119	116	117	112	116	106	115	109	115	114	115	111	117
4/22/2023	102	117	116	118	118	117	116	116	108	116	112	115	116	117	115	117
4/23/2023	104	117	119	118	121	117	117	115	110	115	112	116	117	117	116	117
4/24/2023	103	117	118	119	118	117	117	115	109	115	110	115	114	116	115	117
4/25/2023	102	117	117	120	117	118	115	116	111	115	108	115	113	114	113	117
4/26/2023	102	118	117	122	117	118	115	117	112	116	109	116	116	116	114	117
4/27/2023	102	119	117	121	120	120	116	116	112	116	110	118	115	117	115	118
4/28/2023	103	119	117	122	122	120	118	117	114	116	115	118	118	118	115	119
4/29/2023	104	121	118	122	123	121	120	117	115	118	115	118	118	118	118	121
4/30/2023	104	124	120	124	124	123	121	121	116	118	114	119	117	118	118	121
<b>Washington</b>																
<b>Oregon</b>																

Table D- 10: Daily 2-hour Regulatory TDG Instances in May 2023

Station:	LWG	LGNW	LGSA	LGSW	LMNA	LMNW	IHRA	IDSW	MCNA	MCPW	JDY	JHAW	TDA	TDDO	BON	CCIW
5/1/2023	104	126	119	125	123	124	120	125	116	120	112	120	114	116	114	121
5/2/2023	103	126	118	125	126	125	121	125	114	123	-	122	121	121	114	122
5/3/2023	105	127	121	126	128	126	125	125	116	126	115	123	125	125	117	123
5/4/2023	106	126	122	127	128	126	125	125	115	125	113	125	122	123	119	123
5/5/2023	106	125	118	127	126	128	122	125	114	125	111	126	122	123	115	123
5/6/2023	104	124	117	125	125	128	122	125	112	124	113	125	123	124	120	124
5/7/2023	104	125	118	125	125	126	122	125	114	125	112	124	123	124	120	124
5/8/2023	105	125	119	125	125	124	122	125	116	127	114	124	125	125	121	124
5/9/2023	105	-	119	124	126	124	121	125	115	126	116	124	124	124	121	124
5/10/2023	104	124	120	124	125	124	121	124	116	126	119	124	125	126	123	124
5/11/2023	104	124	120	118	125	119	122	120	117	125	122	124	128	127	123	124
5/12/2023	104	125	119	117	122	119	121	120	117	124	124	125	127	127	125	124
5/13/2023	105	125	118	117	120	120	119	120	118	124	125	123	128	127	125	123
5/14/2023	105	126	120	118	119	119	118	120	117	125	124	124	128	128	126	124
5/15/2023	105	125	122	120	119	120	118	121	118	125	124	124	128	128	126	124
5/16/2023	105	126	122	124	121	122	118	127	118	125	123	124	124	127	126	124
5/17/2023	106	126	121	125	124	126	120	127	119	125	126	126	126	128	128	126
5/18/2023	106	125	122	126	126	125	122	125	120	125	126	124	126	128	128	128
5/19/2023	106	124	121	127	128	125	122	125	121	125	125	124	125	126	125	126
5/20/2023	107	124	122	127	130	125	124	125	121	125	124	125	124	126	123	124
5/21/2023	107	128	121	127	130	125	124	125	119	124	123	125	121	124	121	124
5/22/2023	107	128	120	129	128	126	122	125	115	128	118	125	117	122	117	124
5/23/2023	107	128	118	129	131	126	122	130	114	127	113	125	120	125	119	124
5/24/2023	108	125	121	127	131	125	126	125	118	125	112	123	119	125	122	123
5/25/2023	108	125	122	125	130	125	126	125	119	125	119	123	123	125	124	125
5/26/2023	108	124	122	125	127	125	126	125	119	126	124	123	124	125	124	125
5/27/2023	107	124	121	125	127	124	124	126	119	125	123	123	124	125	123	123
5/28/2023	106	125	121	125	126	125	123	125	119	126	122	122	121	123	118	122
5/29/2023	106	124	121	125	126	123	124	125	118	126	121	122	122	123	115	122
5/30/2023	106	125	121	125	126	123	124	124	116	124	120	123	122	123	116	122
5/31/2023	106	126	119	124	124	123	122	122	114	122	116	123	118	121	113	121
Washington		4		8		2		3		3				8		1
Oregon										1				4		1

Table D- 11: : Daily 2-hour Regulatory TDG Instances in June 2023

Station:	LWG	LGNW	LGSA	LGSW	LMNA	LMNW	IHRA	IDSW	MCNA	MCPW	JDY	JHAW	TDA	TDDO	BON	CCIW
6/1/2023	104	125	117	117	120	118	120	120	111	120	113	119	123	122	112	121
6/2/2023	104	126	118	116	118	116	119	120	112	119	112	118	118	120	113	120
6/3/2023	104	125	119	117	118	116	119	120	113	119	112	118	120	121	113	121
6/4/2023	105	125	119	117	119	116	119	120	114	119	112	118	117	119	113	120
6/5/2023	105	124	119	116	119	116	118	119	115	119	117	118	121	121	114	120
6/6/2023	105	124	119	117	119	116	119	117	116	119	120	119	122	122	118	121
6/7/2023	105	124	119	124	119	120	119	118	113	118	120	120	121	122	118	121
6/8/2023	105	122	118	124	119	120	118	117	113	118	119	119	118	119	113	120
6/9/2023	104	122	116	123	121	121	118	117	111	115	116	118	115	118	111	120
6/10/2023	103	122	118	122	122	120	119	116	110	116	114	117	113	116	112	120
6/11/2023	103	121	118	122	124	119	120	116	110	116	115	117	115	118	112	120
6/12/2023	105	121	118	122	124	119	121	116	113	118	114	117	115	119	113	121
6/13/2023	104	121	118	121	122	120	120	116	112	115	110	117	110	115	109	120
6/14/2023	103	120	113	122	118	118	116	116	109	115	108	118	108	113	106	120
6/15/2023	101	119	111	121	115	118	114	116	107	117	107	117	113	116	107	121
6/16/2023	102	119	111	120	119	117	114	116	108	116	107	113	111	116	109	117
6/17/2023	102	118	112	118	119	117	117	114	110	115	106	113	107	114	109	117
6/18/2023	102	117	111	118	116	115	115	114	108	115	104	113	105	113	107	117
6/19/2023	101	119	109	121	113	118	112	115	106	115	103	113	105	112	106	117
6/20/2023	99	118	107	120	110	117	109	114	104	116	102	113	105	112	106	117
6/21/2023	99	108	108	111	112	117	110	113	105	116	104	114	108	114	109	117
6/22/2023	101	110	110	112	116	118	114	115	109	116	105	113	109	115	112	117
6/23/2023	103	110	111	113	117	117	115	112	108	116	103	114	108	114	112	117
6/24/2023	104	111	114	113	113	117	114	112	110	117	104	114	108	114	111	117
6/25/2023	104	111	111	112	112	117	115	112	111	116	105	115	108	114	110	117
6/26/2023	103	111	110	112	113	118	116	113	111	115	107	115	109	114	108	117
6/27/2023	103	111	110	112	114	117	116	115	111	115	109	115	109	114	108	117
6/28/2023	103	111	111	113	114	114	115	112	111	114	110	116	109	115	108	117
6/29/2023	102	111	111	113	112	114	115	111	110	114	110	115	110	116	109	117
6/30/2023	103	111	111	113	113	114	116	114	111	114	110	115	110	115	109	117
Washington:																
Oregon:																

**Table D- 12<sup>2</sup>: Maximum two consecutive hour TDG, number of days with two consecutive hour TDG above 126%, number of days with two consecutive hour TDG above 127% at project tailwaters**

<b>Station</b>	<b>Gauge ID</b>	<b>Maximum two consecutive hour % TDG</b>	<b>126% Exceedance Days (WA)</b>	<b>127% Exceedance Days (OR)</b>
<b>Lower Granite Tailwater</b>	LGNW	128.0	4	
<b>Little Goose Tailwater</b>	LGSW	129.0	8	
<b>Lower Monumental Tailwater</b>	LMNW	128.0	2	
<b>Ice Harbor Tailwater</b>	IDSW	130.0	3	
<b>McNary Tailwater</b>	MCPW	128.0	3	1
<b>John Day Tailwater</b>	JHAW	126.0	0	0
<b>The Dalles Tailwater</b>	TDDO	128.0	8	4
<b>Bonneville Tailwater</b>	CCIW	128.0	1	1
		<b>Total</b>	<b>29</b>	<b>6</b>

<sup>2</sup> April through August were assessed for TDG values greater than 126%. TDG instances were not included when project flow exceeded 7Q10 flows.

**Table D- 13<sup>3</sup>: Malfunctioning TDG gauges from April through August 2023**

<b>Project</b>	<b>Gauge ID</b>	<b>Dates</b>	<b>Days of Missing or Erroneous Data</b>	<b>Reason for Erroneous Data</b>
<b>Lower Granite Tailwater</b>	LGNW	5/9/2023	1	Missed transmission
<b>Lower Granite Tailwater</b>	LGNW	7/14-7/15	2	Defective membrane
<b>Lower Granite Tailwater</b>	LGNW	7/27/2023	1	Defective membrane
<b>Lower Monumental Tailwater</b>	LMNW	7/15-7/17	3	Defective membrane
<b>Lower Monumental Tailwater</b>	LMNW	7/26	1	Defective membrane
<b>Ice Harbor Tailwater</b>	IDSW	7/5-7/6	2	Cable Failure
<b>John Day Tailwater</b>	JHAW	8/24-8/30	6	Defective membrane
<b>The Dalles Tailwater</b>	TDDO	8/6-8/11	6	Defective membrane
<b>The Dalles Tailwater</b>	TDDO	8/13-8/15	3	Defective membrane
<b>The Dalles Tailwater</b>	TDDO	8/18-8/28	11	Faulty instrument cable

<sup>3</sup> Table D-5 includes only days when there is 6 hours or more of either missing or erroneous gauge data.