

# **Appendix A**

**2020 Total Dissolved Gas  
Fixed Monitoring Stations**

## Introduction

The Corps fixed monitoring station (FMS) system is composed of 28 gauges that collect hourly readings of total dissolved gas (TDG), barometric pressure, percent TDG saturation, and water temperature. This monitoring system is associated with 19 projects on the Columbia, Lower Snake, Clearwater, Kootenai, and Pend Oreille rivers as shown in Figure 1. Table 1 lists each FMS identifying the station name, station code, dates of operation, river name, project, FMS location, and maintenance and calibration responsibilities. More details, including photos, for each station can be found on pages A-4 through A-31.

**Table A- 1: Total Dissolved Gas (TDG) Monitoring Station Summary Data Sheet**

Station Name	Station Code	Years of Operation	Dates of Operation	River Name	River Mile	Bank	Latitude <sup>1</sup>	Longitude <sup>1</sup>	Project	Location Description	Maintenance Responsibility	Maintenance Sequence	Calibration Responsibility	Owner
Albeni Falls Forebay	ALFI	2004-Present	April 1-Sept 1	Pend Oreille River	87.0	Right Bank	48° 10' 40.2"	116° 59' 52.3"	Albani Falls Dam	Forebay	Columbia Basin Environmental	Two weeks	Columbia Basin Environmental	USACE, Seattle District
Albeni Falls Tailwater	ALQI	2005-Present	April 1-Sept 1	Pend Oreille River	86.8	Left Bank	48° 10' 40.1"	117° 00' 8.7"	Albeny Falls Dam	Tailwater	Columbia Basin Environmental	Two weeks	Columbia Basin Environmental	USACE, Seattle District
Anatone	ANQW	1999-Present	April 1-Sept 1	Snake River	167.5	Left Bank	46° 05' 50.8"	116° 58' 41.2"	None	River	USGS, Pasco Office	Three weeks	USGS, Pasco Office	USACE, Walla Walla District
Bonneville Forebay	BON	1986-Present	April 1-Sept 1	Columbia River	146.1	Right Bank	45° 38' 44.4"	121° 56' 24.3"	Bonneville Dam	Forebay	USGS, Portland Office	Three weeks	USGS, Portland Office	USACE, Portland District
Camas-Washougal	CWMW	1993-Present	April 1-Sept 1	Columbia River	121.7	Right Bank	45° 34' 38.4"	122° 22' 43.3"	None	River	USGS, Portland Office	Three weeks	USGS, Portland Office	USACE, Portland District
Cascades Island	CCIW	2004-Present	April 1-Sept 1	Columbia River	145.6	Right Bank	45° 38' 44.4"	121° 56' 44.3"	Bonneville Dam	Tailwater	USGS, Portland Office	Three weeks	USGS, Portland Office	USACE, Portland District
Chief Joseph Forebay	CHJ	1985-Present	April 1-Sept 1	Columbia River	545.1	Left Bank	47° 59' 38.7"	119° 38' 42.6"	Chief Joseph Dam	Forebay	Columbia Basin Environmental	Two weeks	Columbia Basin Environmental	USACE, Seattle District
Chief Joseph Tailwater	CHQW	1985-Present	April 1-Sept 1	Columbia River	543.8	Right Bank	48° 00' 17.2"	117° 39' 30.3"	Chief Joseph Dam	Tailwater	Columbia Basin Environmental	Two weeks	Columbia Basin Environmental	USACE, Seattle District
DWR Hatchery Collection Channel	DHCI	2017-Present	Year Round	North Fork, Clearwater River	0.5	Left Bank	46° 30' 55.3"	116° 19' 16.4"	Dworshak Dam	Hatchery Collection Channel	NWW District in an agreement with USFW	Three weeks	NWW District in an agreement with USFW	U.S. Fish and Wildlife
Dworshak Tailwater	DWQI	1993-Present	Year Round	North Fork, Clearwater River	0.5	Left Bank	46° 30' 11.6"	116° 19' 16.4"	Dworshak Dam	Tailwater	USGS, Pasco Office	Three weeks	USGS, Pasco Office	USACE, Walla Walla District
Ice Harbor Forebay	IHRA	2005-Present	April 1-Sept 1	Snake River	10	Right Bank	46° 15' 5.8"	118° 52' 39.0"	Ice Harbor Dam	Forebay	USGS, Pasco Office	Three weeks	USGS, Pasco Office	USACE, Walla Walla District
Ice Harbor Tailwater	IDSW	1994-Present	Year Round	Snake River	6.1	Right Bank	46° 14' 27.6"	118° 57' 13.7"	Ice Harbor Dam	Tailwater	USGS, Pasco Office	Three weeks	USGS, Pasco Office	USACE, Walla Walla District
John Day Forebay	JDY	2004-Present	April 1-Sept 1	Columbia River	215.7	Right Bank	45° 43' 13.4"	120° 41' 41.2"	John Day Dam	Forebay	USGS, Portland Office	Three weeks	USGS, Portland Office	USACE, Portland District
John Day Tailwater	JHAW	1995-Present	Year Round	Columbia River	214.7	Right Bank	45° 42' 48.4"	120° 42' 39.2"	John Day Dam	Tailwater	USGS, Portland Office	Three weeks	USGS, Portland Office	USACE, Portland District

1. Lat/Long coordinates using NAD-83 datum.

2. The seasonal gauges may be installed several weeks before April 1 and remain in operation several weeks after August 31.

Station Name	Station Code	Years of Operation	Dates of Operation	River Name	River Mile	Bank	Latitude <sup>1</sup>	Longitude <sup>1</sup>	Project	Location Description	Maintenance Responsibility	Maintenance Sequence	Calibration Responsibility	Owner
Libby Tailwater	LBQM	2004-Present	April 1-Sept 1	Kootenai River	221.5	Left Bank	48° 24' 2.4"	115° 19' 7.0"	Libby Dam	Tailwater	USGS, Pasco Office	Two weeks	USGS, Pasco Office	USACE, Walla Walla District
Little Goose Forebay	LGSA	2005-Present	April 1-Sept 1	Snake River	70.4	Left Bank	46° 34' 58.8"	118° 01' 29.2"	Little Goose Dam	Forebay	USGS, Pasco Office	Three weeks	USGS, Pasco Office	USACE, Walla Walla District
Little Goose Tailwater	LGSW	1995-Present	Year Round	Snake River	69.6	Right Bank	46° 35' 00.5"	118° 02' 37.4"	Little Goose Dam	Tailwater	USGS, Pasco Office	Three weeks	USGS, Pasco Office	USACE, Walla Walla District
Lower Granite Forebay	LWG	1985-Present	April 1-Sept 1	Snake River	107.5	Mid-River	46° 39' 34.2"	117° 25' 34.9"	Lower Granite Dam	Forebay	USGS, Pasco Office	Three weeks	USGS, Pasco Office	USACE, Walla Walla District
Lower Granite Tailwater	LGNW	1995-Present	Year Round	Snake River	106.7	Right Bank	46° 39' 58.1"	117° 26' 19.3"	Lower Granite Dam	Tailwater	USGS, Pasco Office	Three weeks	USGS, Pasco Office	USACE, Walla Walla District
Lower Monumental Forebay	LMNA	2005-Present	April 1-Sept 1	Snake River	41.7	Mid-River	46° 33' 45.2"	118° 32' 4.4"	Lower Monumental Dam	Forebay	USGS, Pasco Office	Three weeks	USGS, Pasco Office	USACE, Walla Walla District
Lower Monumental Tailwater	LMNW	1995-Present	Year Round	Snake River	40.4	Left Bank	46° 33' 4.5"	118° 32' 59.0"	Lower Monumental Dam	Tailwater	USGS, Pasco Office	Three weeks	USGS, Pasco Office	USACE, Walla Walla District
McNary Forebay	MCNA	2005-Present	April 1-Sept 1	Columbia River	292.3	Right Bank	45° 56' 28.8"	119° 17' 35.5"	McNary Dam	Forebay	USGS, Pasco Office	Three weeks	USGS, Pasco Office	USACE, Walla Walla District
McNary Tailwater	MCPW	1995-Present	Year Round	Columbia River	290.7	Right Bank	45° 56' 2.8"	119° 19' 35.5"	McNary Dam	Tailwater	USGS, Pasco Office	Three weeks	USGS, Pasco Office	USACE, Walla Walla District
Pasco	PAQW	1999-Present	April 1-Sept 1	Columbia River	329.1	Left Bank	46° 13' 26.3"	119° 06' 57.3"	McNary Dam	River	USGS, Pasco Office	Three weeks	USGS, Pasco Office	USACE, Walla Walla District
Peck	PEKI	1996-Present	April 1-Sept 1	Clearwater River	37.4	Left Bank	46° 30' 0.9"	116° 23' 32.4"	Dworshak Dam	River	USGS, Pasco Office	Three weeks	USGS, Pasco Office	USACE, Walla Walla District
The Dalles Forebay	TDA	1985-Present	April 1-Sept 1	Columbia River	192.4	Left Bank	45° 37' 11.5"	121° 07' 16.5"	The Dalles	Forebay	USGS	Three weeks	USGS	USACE, Portland District
The Dalles Tailwater	TDDO	1996-Present	Year Round	Columbia River	189.1	Left Bank	45° 36' 29.7"	121° 11' 23.8"	The Dalles	Tailwater	USGS	Three weeks	USGS	USACE, Portland District
Warrendale	WRNO	1985-Present	Year Round	Columbia River	140.3	Left Bank	45° 36' 29.1"	122° 02' 19.4"	Bonneville Dam	Tailwater	USGS	Three weeks	USGS	USACE, Portland District

1. Lat/Long coordinates using NAD-83 datum.

2. The seasonal gauges may be installed several weeks before April 1 and remain in operation several weeks after August 31.

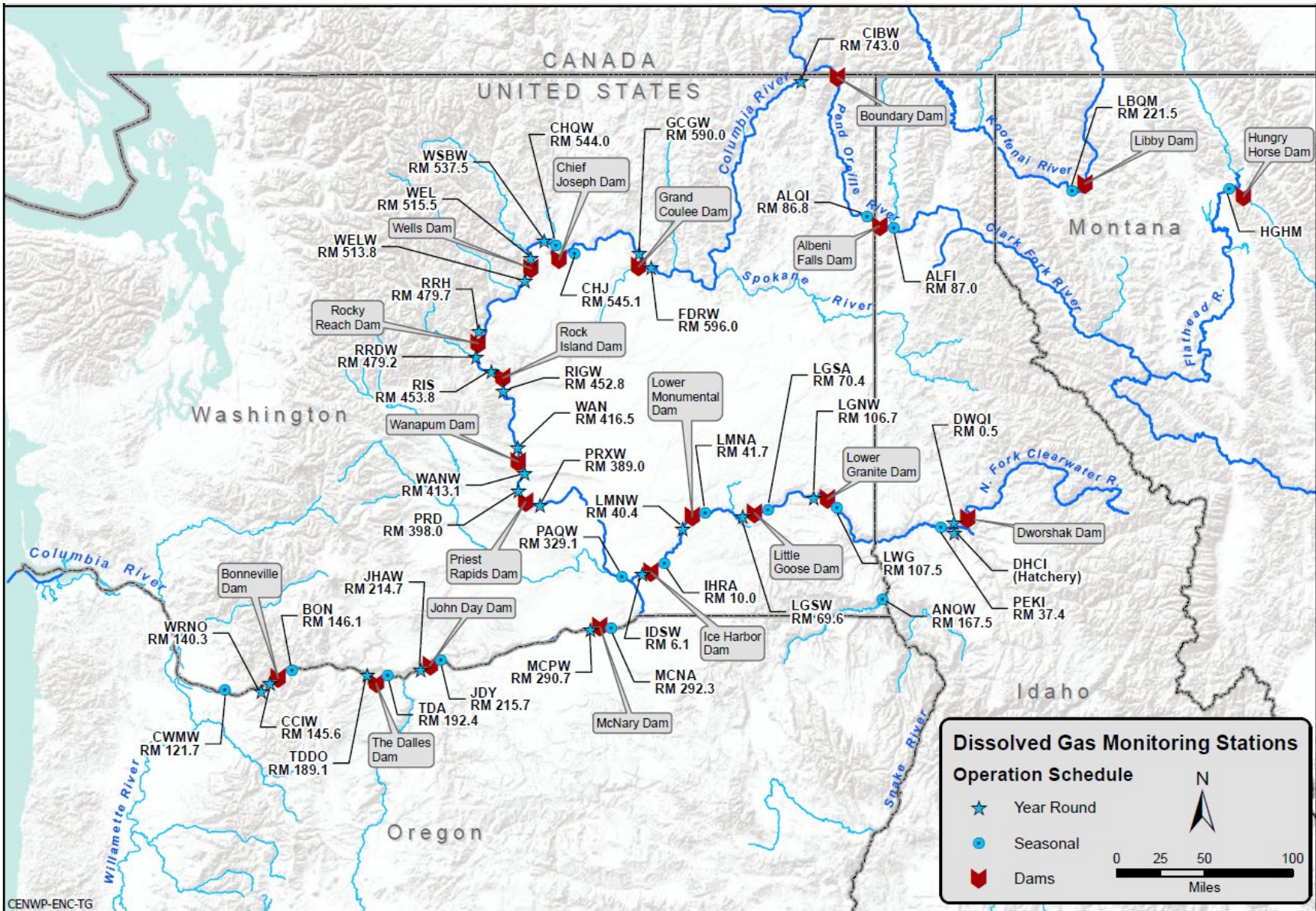


Figure A- 1: 2020 Total Dissolved Gas Fixed Monitoring Stations System

## 1. Albeni Falls Forebay TDG Monitoring Station (ALFI)

**Gage Elevation:** Fixed

**Latitude:** 48° 10' 40.2" N

**Longitude:** 116° 59' 52.3" W

**Distance from Dam:** --

**Datum:** NAD83

**River:** Pend Oreille

**River Mile:** 87.0

**USGS-ID:** --

**Owner:** U.S. Army Corps of Engineers-NWS

**Gauge Type:** Hydrosonde

**Data Transmission:** Radio Transmission

**Dates of Operation:** April 1– August 31\*

**Years of Operation:** 2004 – Present

**Water Conditions:** Mixed

**Location:** Attached to the railroad bridge pier on the southern shoreline of the Pend Oreille River

**This gage replaced:** N/A

**Reasons for replacement:** N/A

**Comments:** \* The seasonal gauges may go in several days before April 1 and remain in operation several days after August 31.



## 2. Albeni Falls Tailwater TDG Monitoring Station (ALQI)

**Gage Elevation:** Fixed

**Latitude:** 48° 10' 40.1" N

**Longitude:** 117° 00' 8.7" W

**Distance from Dam:** 700 ft

**Datum:** NAD83

**River:** Pend Oreille

**River Mile:** 86.8

**USGS-ID:** --

**Owner:** U.S. Army Corps of Engineers-NWS

**Gauge Type:** Hydrosonde

**Data Transmission:** Radio Transmission

**Dates of Operation:** April 1 – August 31 \*

**Years of Operation:** 2005 - Present

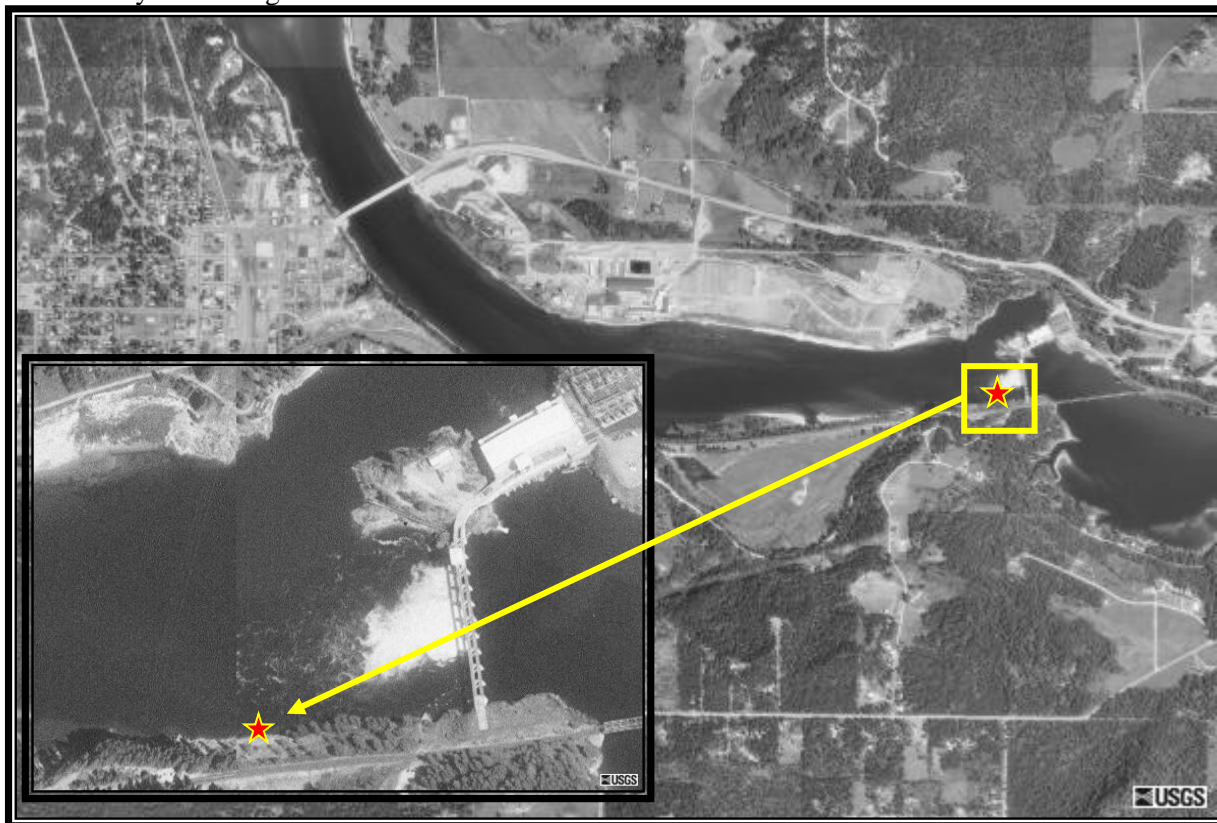
**Water Conditions:** Tailwater Monitor

**Location:** On the southern shoreline of the Pend Oreille River.

**This gauge replaced:** ALFW

**Reasons for replacement:** This gauge was initiated at this site on July 28, 2005 due to sediment burying the previous site several times. This newer location is immediately below the spillway aerated zone in deeper water which should minimize sedimentation problems.

**Comments:** \* The seasonal gauges may go in several days before April 1 and remain in operation several days after August 31.



### 3. Anatone TDG Monitoring Station on the Snake River (ANQW)

**Gage Elevation:** Fixed

**Latitude:** 46° 05' 50.8" N

**Longitude:** 116° 58' 41.2382" W

**Distance from Dam:** N/A

**Datum:** NAD83

**River:** Snake

**River Mile:** 167.5

**USGS-ID:** 13334300

**Owner:** U.S. Army Corps of Engineers-NWW

**Gauge Type:** Hydrosonde

**Data Transmission:** GOES Satellite

**Dates of Operation:** April 1 – Aug 31\*

**Years of Operation:** 1999 - Present

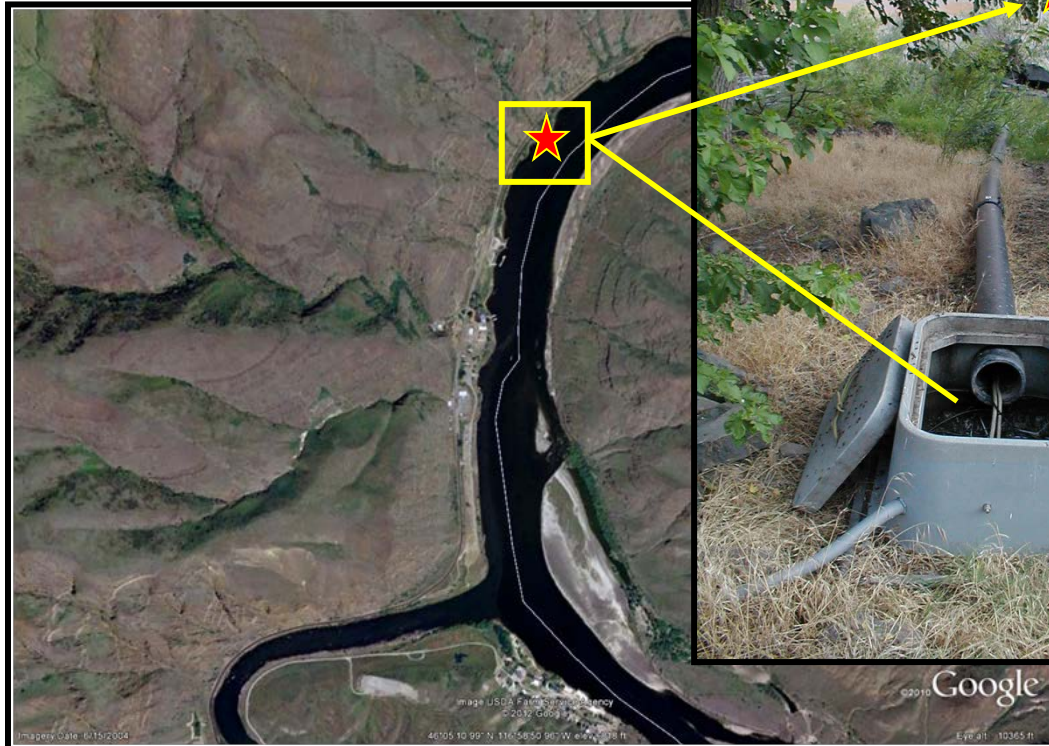
**Water Conditions:** Open River

**Location:** This gauge is located on the Washington shoreline of the Snake River approximately 1.3 miles downstream of the Grande Ronde River confluence. It is co-located with the USGS Anatone Stream gauge (ANAW).

**This gage replaced:** N/A

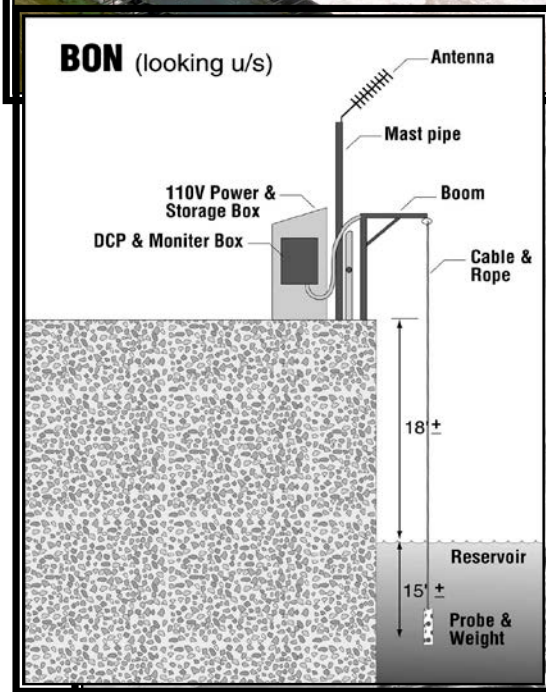
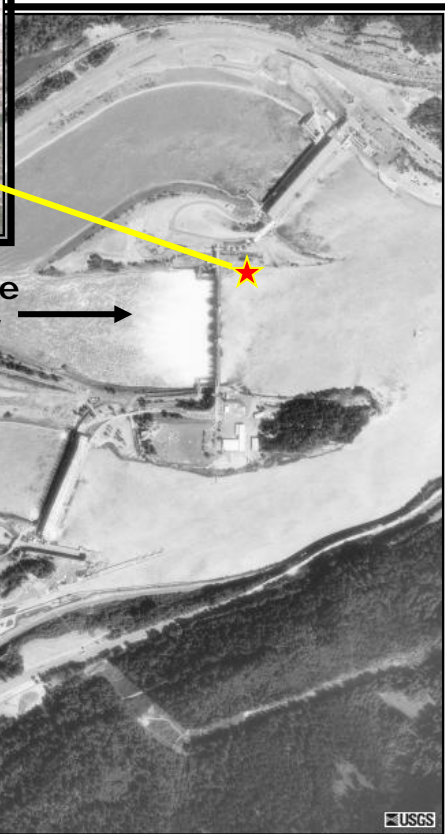
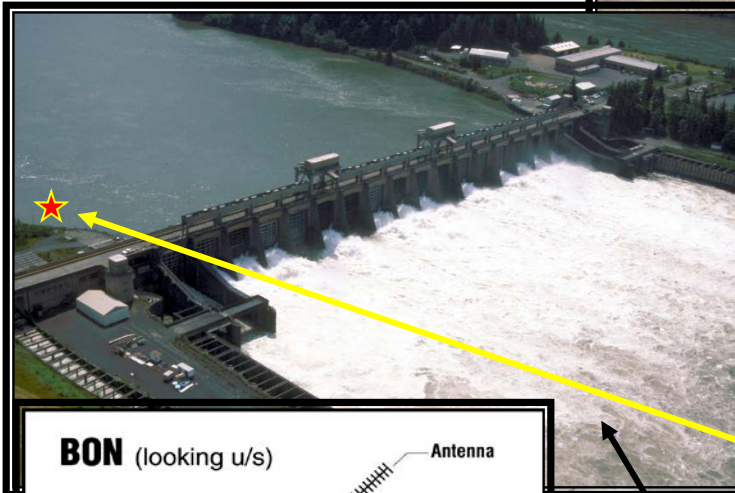
**Reasons for replacement:** N/A

**Comments:** \*The seasonal gauges may go in several days before April 1 and remain in operation several days after August 31.



#### 4. Bonneville Forebay TDG Monitoring Station (BON)

**Gage Elevation:** Fixed  
**Latitude:** 45° 38' 44.42147" N  
**Longitude:** 121° 56' 24.29279" W  
**Distance from Dam:** On face of dam  
**Datum:** NAD83  
**River:** Columbia  
**River Mile:** 146.1  
**USGS-ID:** 453845121562000  
**Owner:** U.S. Army Corps of Engineers-NWP  
**Gauge Type:** Hydrosonde  
**Data Transmission:** GOES Satellite  
**Dates of Operation:** April 1 – August 31\*  
**Years of Operation:** 1986 – Present  
**Water Conditions:** Mixed  
**Location:** On the northern side of the spillway channel on Cascade Island just upstream of Spillbay #1.  
**This gage replaced:** N/A  
**Reason for replacement:** N/A  
**Comments:** \*The seasonal gauges may go in several days before April 1 and remain in operation several days after August 31.

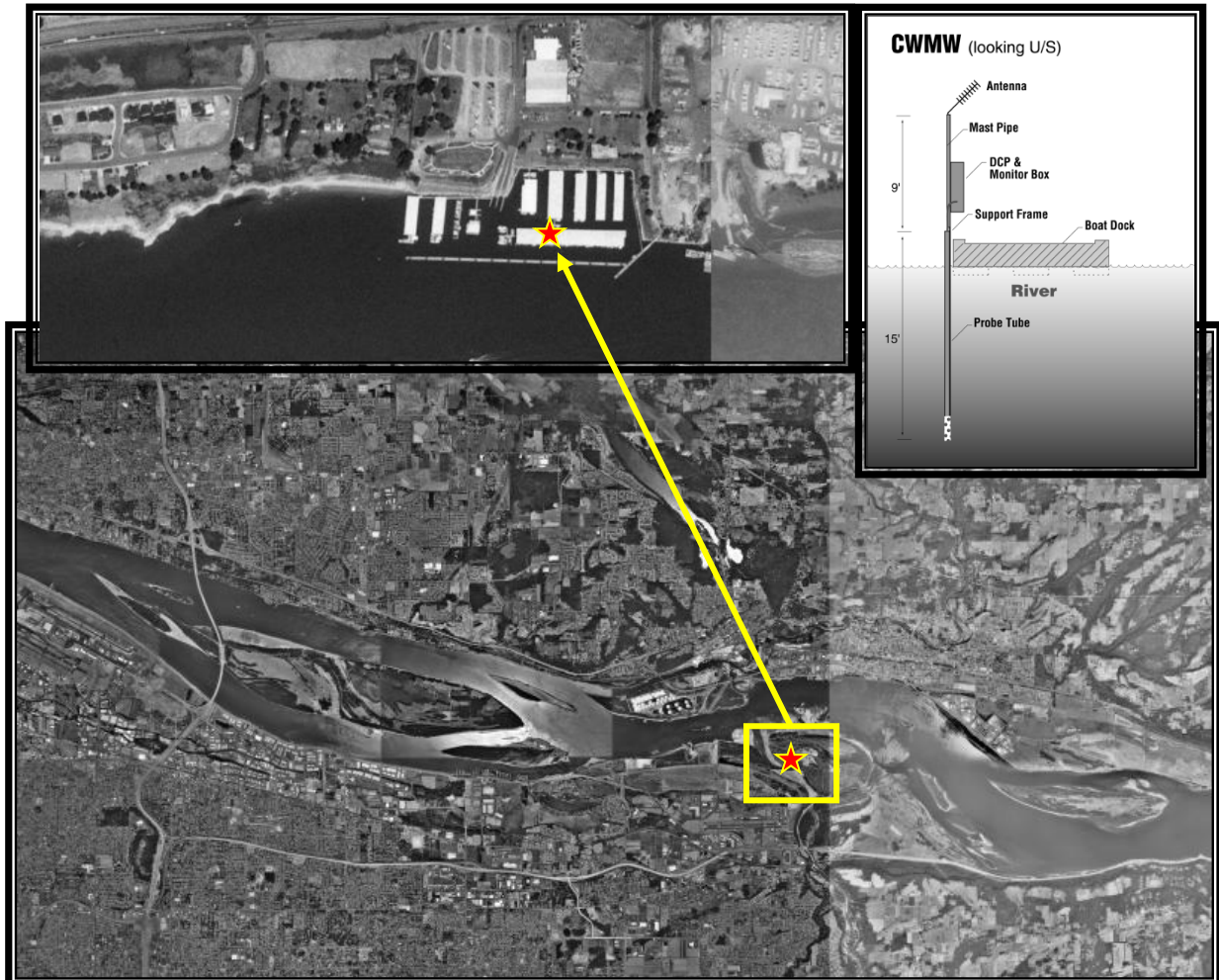


## 5. Camas-Washougal TDG Monitoring Station (CWMW)

**Gage Elevation:** Variable  
**Latitude:** 45° 34' 38.42788" N  
**Longitude:** 122° 22' 43.32961" W  
**Distance from Dam:** 24 miles downstream from Bonneville  
**Datum:** NAD83  
**River:** Columbia  
**River Mile:** 121.7  
**USGS-ID:** 453439122223900  
**Owner:** U.S. Army Corps of Engineers-NWP  
**Gauge Type:** Hydrosonde  
**Data Transmission:** GOES Satellite  
**Dates of Operation:** April 1 – August 31\*  
**Years of Operation:** 1993 – Present  
**Water Conditions:** Mixed  
**Location:** Attached to the boat dock at the outer edge of the harbor at the Port of Camas/Washougal, WA  
**This gage replaced:** N/A  
**Reason for replacement:** N/A  
**Comments:** This gauge is currently being utilized as a surrogate forebay gauge for the management of spill at Bonneville Dam.



\*The seasonal gauges may go in several days before April 1 and remain in operation several days after August 31.

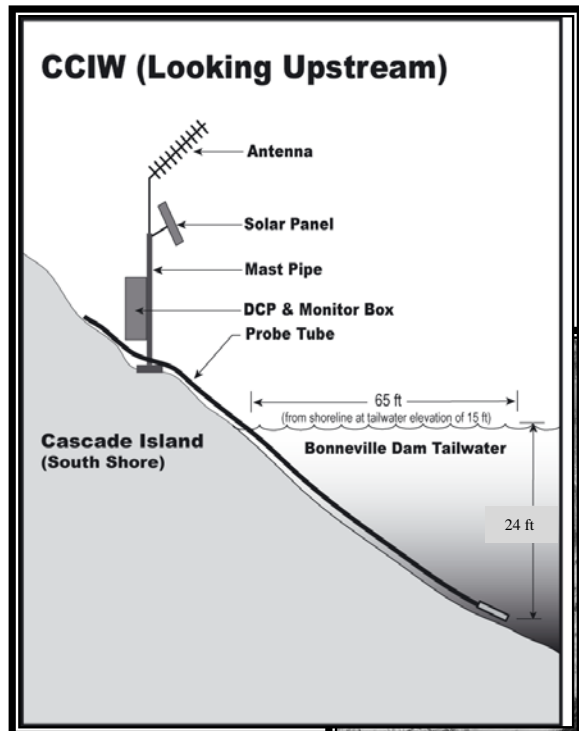


**6. Cascades Island TDG Monitoring Station (CCIW)**

**Gage Elevation:** Fixed  
**Latitude:** 45° 38' 44.42143" N  
**Longitude:** 121° 56' 44.29340" W  
**Distance from Dam:** 0.27 miles (1400 ft)  
**Datum:** NAD83  
**River:** Columbia  
**River Mile:** 145.6  
**USGS-ID:** 453845121564001  
**Owner:** U.S. Army Corps of Engineers-NWP  
**Gauge Type:** Hydrosonde  
**Data Transmission:** GOES Satellite  
**Dates of Operation:** April 1 – August 31\*  
**Years of Operation:** 2004 – Present  
**Water Conditions:** Spillway  
**Location:** Within the Bonneville Dam spillway channel on Cascade Island.  
**This gage replaced:** September 2011; **Probe pipes replaced:** March 2014.  
**Reason for replacement:** Old gage destroyed due to high velocity flows.  
**Comments:** Became the spill management gage as of 2004. Location of station moved to higher elevation.



\* The seasonal gauges may go in several days before April 1 and remain in operation several days after August 31.



## 7. Chief Joseph Forebay TDG Monitoring Station (CHJ)

**Gage Elevation:** Fixed

**Latitude:** 47° 59' 38.7" N

**Longitude:** 119° 38' 42.6" W

**Distance from Dam:** At Dam

**Datum:** NAD83

**River:** Columbia

**River Mile:** 545.1

**USGS-ID:**

**Owner:** U.S. Army Corps of Engineers-NWS

**Gauge Type:** Hydrosonde

**Data Transmission:** GOES Satellite

**Dates of Operation:** April 1 – Aug. 31\*

**Years of Operation:** 1985 - Present

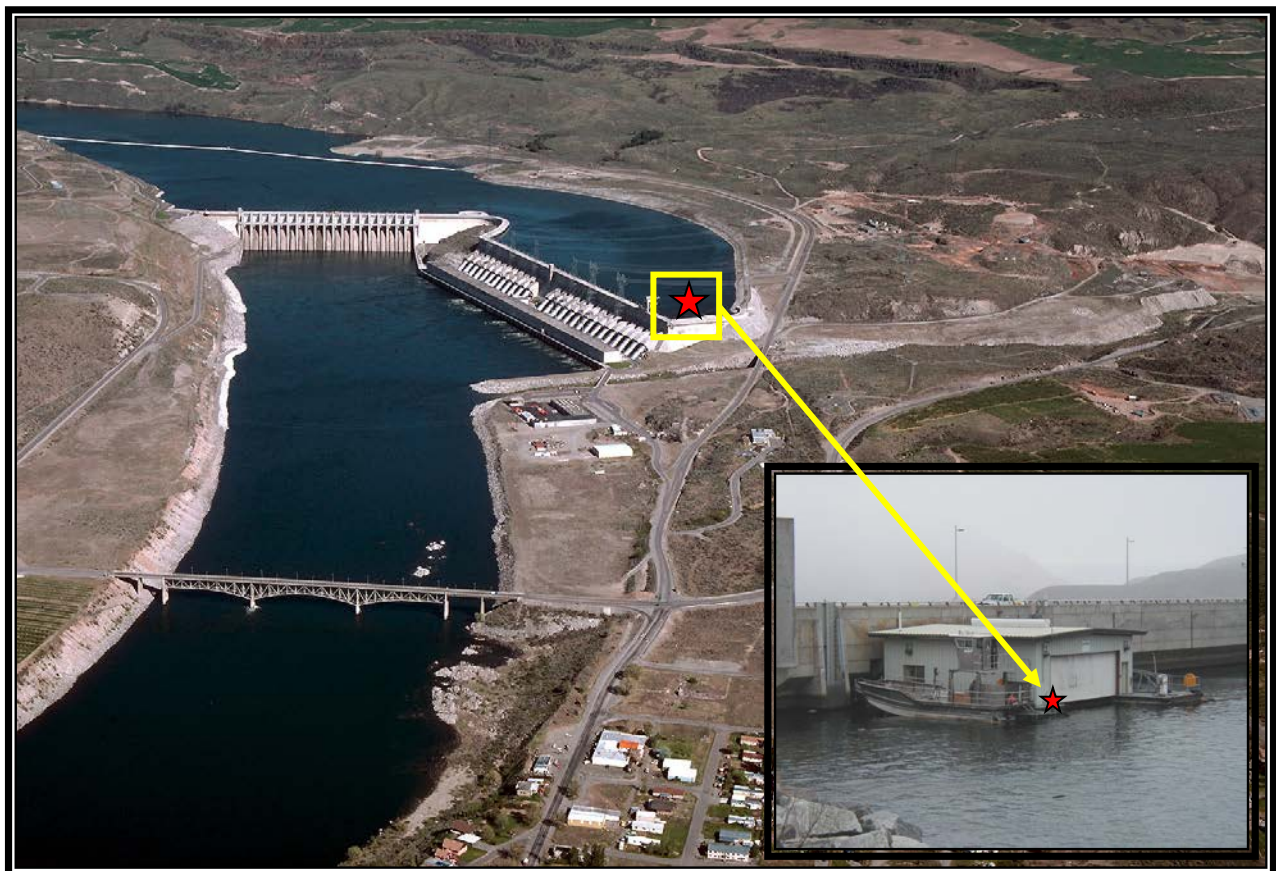
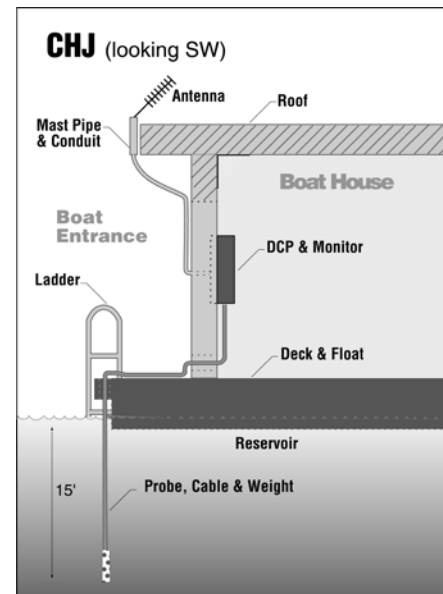
**Water Conditions:** Mixed

**Location:** Along the southern edge of Lake Rufus Woods  
(inside the boat house).

**This gage replaced:** N/A

**Reason for replacement:** N/A

**Comments:** \* The seasonal gauges may go in several days before April 1 and remain in operation several days after August 31.



## 8. Chief Joseph Tailwater TDG Monitoring Station (CHQW)

**Gage Elevation:** Fixed

**Latitude:** 48° 00' 17.2" N

**Longitude:** 119° 39' 30.3" W

**Distance from Dam:** 1 mile

**Datum:** NAD83

**River:** Columbia

**River Mile:** 543.8

**USGS-ID:** --

**Owner:** U.S. Army Corps of Engineers-NWS

**Gauge Type:** Hydrosonde

**Data Transmission:** GOES Satellite

**Dates of Operation:** April 1 – Aug 31\*

**Years of Operation:** 1985 – Present

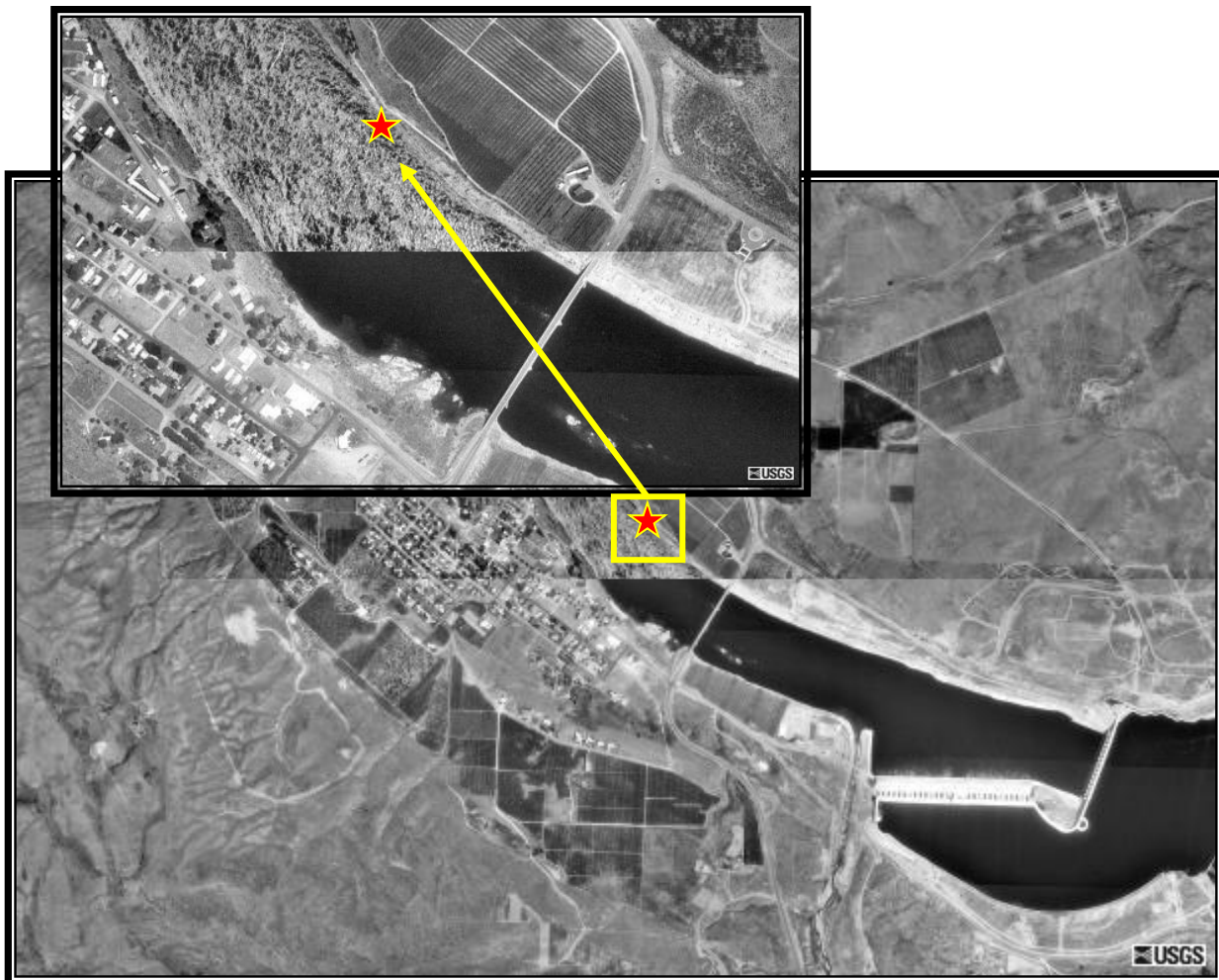
**Water Conditions:** Spillway

**Location:** North bank of the river, just downstream of the Highway 17 Bridge.

**This gage replaced:** N/A

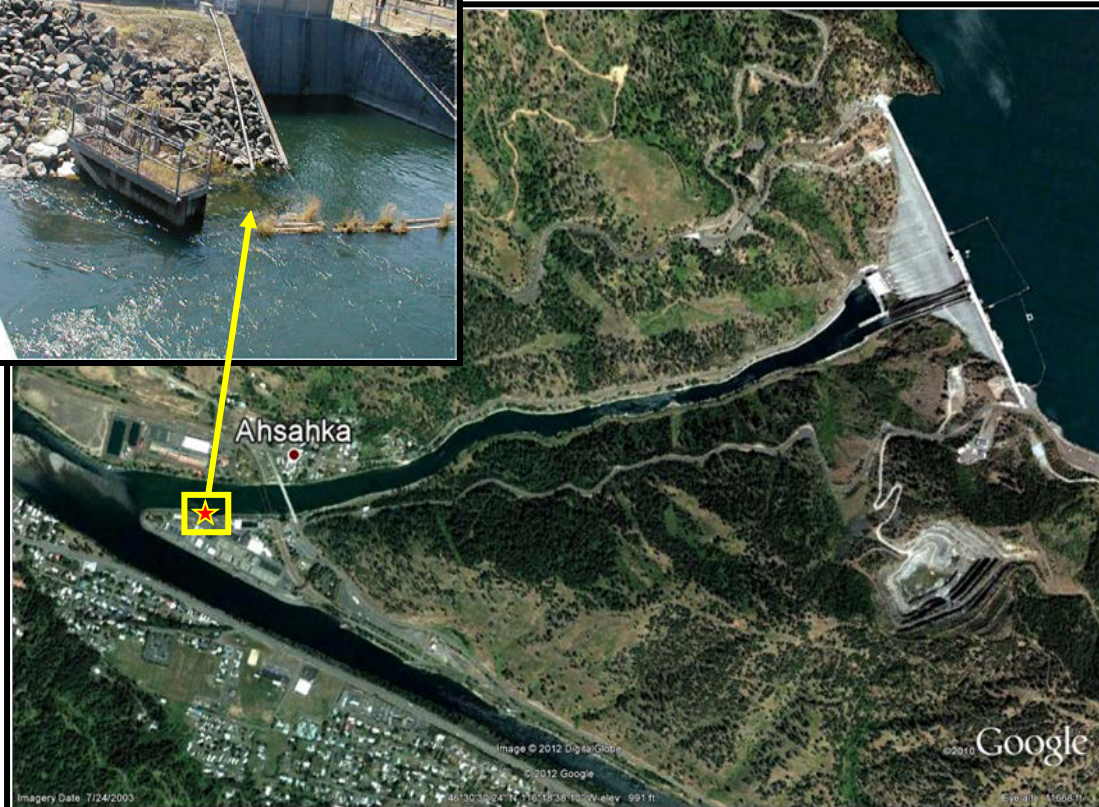
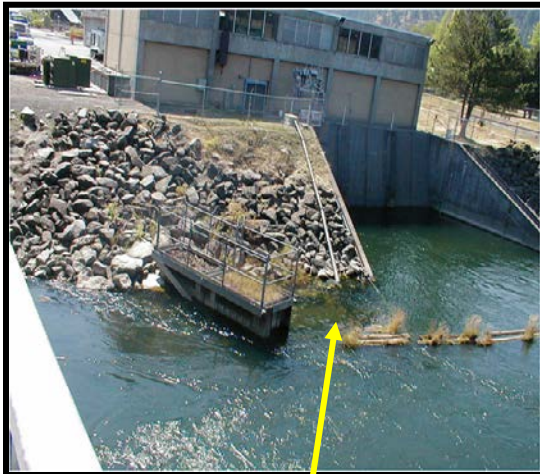
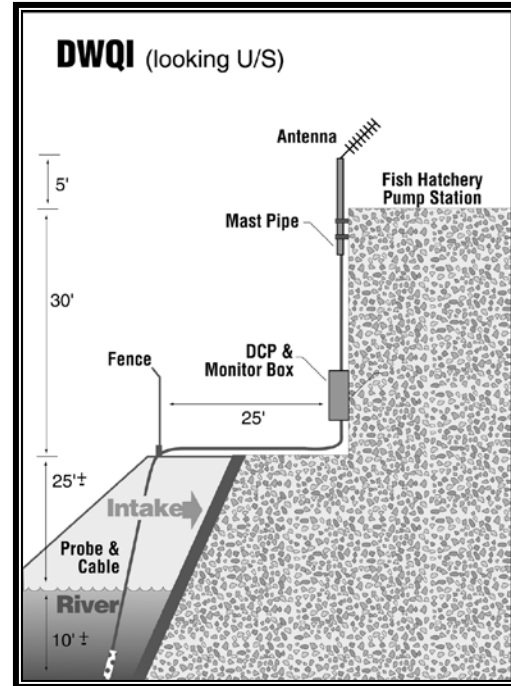
**Reason for gage replacement:** N/A

**Comments:** \*The seasonal gauges may go in several days before April 1 and remain in operation several days after August 31.



## 9. Dworshak TDG Monitoring Station (DWQI)

**Gage Elevation:** Fixed  
**Latitude:** 46° 30' 11.6464" N  
**Longitude:** 116° 19' 16.4090" W  
**Distance from Dam:** 1.5 miles  
**Datum:** NAD83  
**River:** North Fork, Clearwater River  
**River Mile:** 0.5  
**USGS-ID:** 13341000  
**Owner:** U.S. Army Corps of Engineers-NWW  
**Gauge Type:** Hydrosonde  
**Data Transmission:** GOES Satellite  
**Dates of Operation:** Year round  
**Years of Operation:** 1993 - Present  
**Water Conditions:** Mixed  
**Location:** On the southern bank of the North Fork, Clearwater River between the bridge and the U.S. Fish and Wildlife Service Fish Hatchery outflow pipe.  
**This gage replaced:** N/A  
**Reason for replacement:** N/A  
**Comments:** --



## 10. Dworshak Hatchery Collection Channel TDG Monitoring Station (DHCI)

**Gage Elevation:** Fixed

**Latitude:** 46° 30' 55.332" N

**Longitude:** 116° 19' 16.392" W

**Distance from Dam:** 1.5 miles downstream from Dworshak Dam, and 325 feet inland from the river.

**Datum:** NAD83

**River:** North Fork, Clearwater River

**River Mile:** 0.5

**USGS-ID:** None

**Owner:** U.S. Fish and Wildlife Service

**Gauge Type:** Hydrosonde

**Data Transmission:** GOES Satellite

**Dates of Operation:** Year round

**Years of Operation:** 2017 – Present

**Water Conditions:** Mixed, treated.

**Location:** Gauge is located in a collection channel of the U.S. Fish and Wildlife Service Dworshak National Fish Hatchery.

**This gage replaced:** N/A

**Reason for replacement:** N/A

**Comments:** This gauge is used to assess the TDG levels at Dworshak National Fish Hatchery during Dworshak Dam spill. The water being measured has been treated by the hatchery's vacuum degassers.



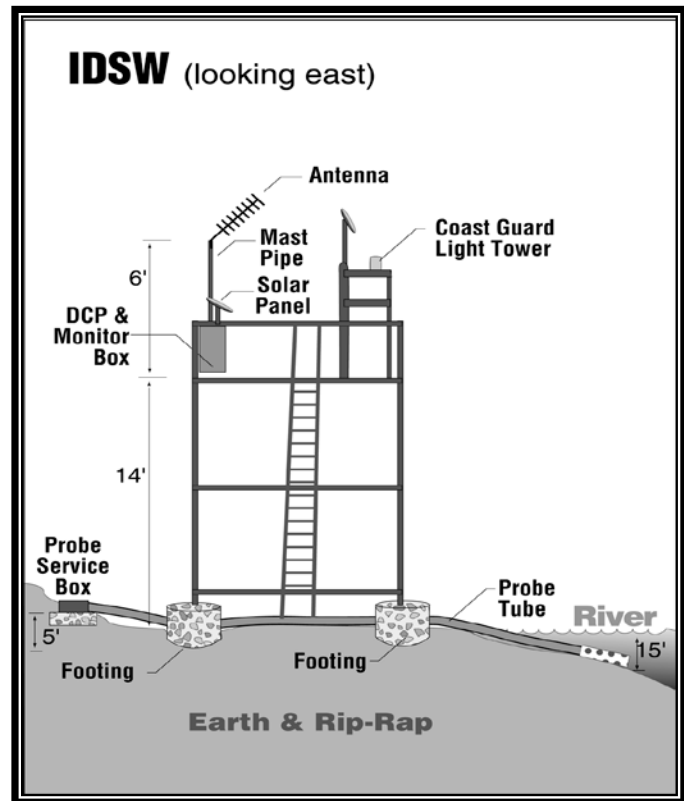
## 11. Ice Harbor Forebay TDG Monitoring Station (IHRA)

**Gage Elevation:** Fixed  
**Latitude:** 46° 15' 5.2792" N  
**Longitude:** 118° 52' 43.0096" W  
**Distance from Dam:** 695 ft  
**Datum:** NAD83  
**River:** Snake  
**River Mile:** 10.0  
**USGS-ID:** 13352950  
**Owner:** U.S. Army Corps of Engineers-NWW  
**Gauge Type:** Hydrosonde  
**Data Transmission:** GOES Satellite  
**Dates of Operation:** Was year round prior to 2006, now seasonal (April 1 – Aug. 31\*).  
**Years of Operation:** 2005 – Present.  
**Water Conditions:** Mixed  
**Location:** At the upstream end of the navigation lock guidewall.  
**This gage replaced:** IHR  
**Reason for replacement:** Moved due to thermal influences and lowered from 15 ft to 45 ft.  
**Comments:** \*The seasonal gauges may go in several days before April 1 and remain in operation several days after August 31.



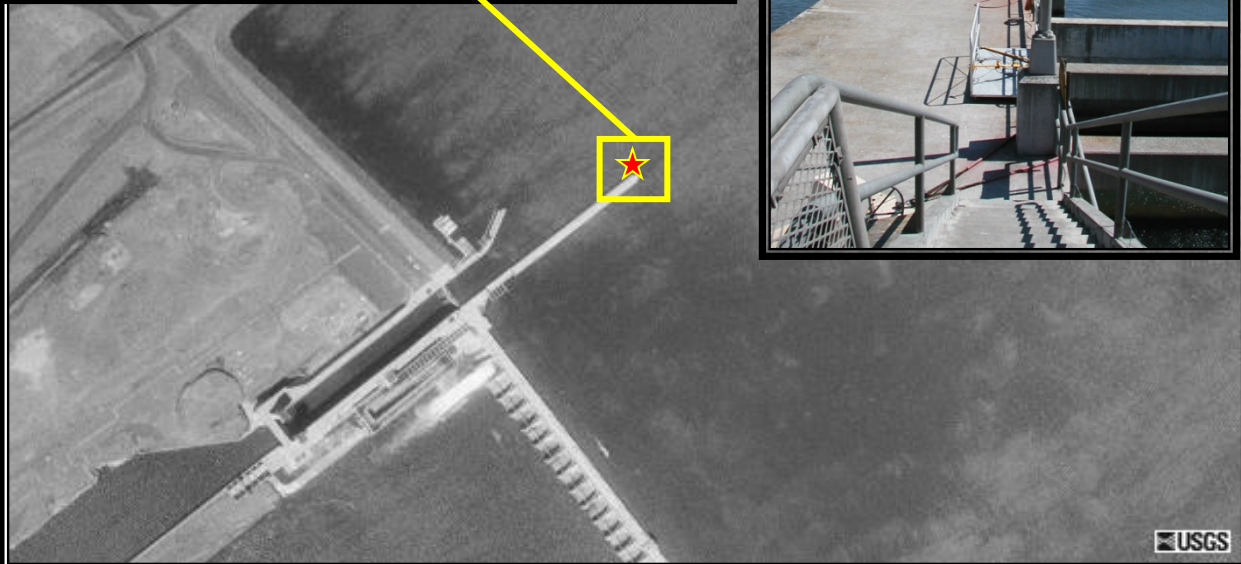
## 12. Ice Harbor Tailwater TDG Monitoring Station (IDSW)

**Gage Elevation:** Fixed  
**Latitude:** 46° 14' 27.5868" N  
**Longitude:** 118° 57' 13.7130" W  
**Distance from Dam:** 3.6 miles  
**Datum:** NAD83  
**River:** Snake  
**River Mile:** 6.1  
**USGS-ID:** 13353010  
**Owner:** U.S. Army Corps of Engineers-NWW  
**Gauge Type:** Hydrosonde  
**Data Transmission:** GOES Satellite  
**Dates of Operation:** Was seasonal prior to 2006, now year round.  
**Years of Operation:** 1994 – Present.  
**Water Conditions:** Mixed & spillway  
**Location:** On the northern shore of the Snake River  
**This gage replaced:** N/A  
**Reason for replacement:** N/A  
**Comments:** --



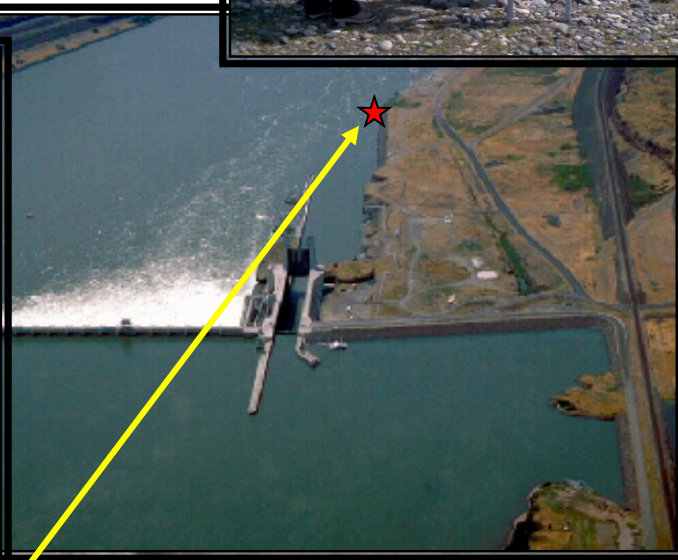
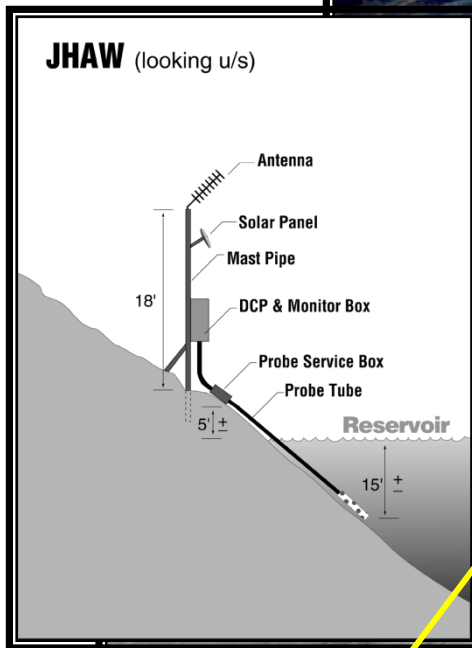
### 13. John Day Forebay TDG Monitoring Station (JDY)

**Gage Elevation:** Variable  
**Latitude:** 45° 43' 13.44908" N  
**Longitude:** 120° 41' 41.21307" W  
**Distance from Dam:** On extended guidewall from dam  
**Datum:** NAD83  
**River:** Columbia  
**River Mile:** 215.7  
**USGS-ID:** 453439122223900  
**Owner:** U.S. Army Corps of Engineers-NWP  
**Gauge Type:** Hydrosonde  
**Data Transmission:** GOES Satellite  
**Dates of Operation:** April 1 – August 31\*  
**Years of Operation:** 2004 – Present  
**Water Conditions:** Mixed  
**Location:** At upstream end of the navigation lock guidewall.  
**This gage replaced:** JDA  
**Reason for replacement:** Moved due to thermal influences and lowered from 15 ft to 45 ft.  
**Comments:** \*The seasonal gauges may go in several days before April 1 and remain in operation several days after August 31.



#### 14. John Day Tailwater TDG Monitoring Station (JHAW)

**Gage Elevation:** Fixed  
**Latitude:** 45° 42' 48.44859" N  
**Longitude:** 120° 42' 39.21477" W  
**Distance from Dam:** 0.8 miles  
**Datum:** NAD83  
**River:** Columbia  
**River Mile:** 214.7  
**USGS-ID:** 454249120423500  
**Owner:** U.S. Army Corps of Engineers-NWP  
**Gauge Type:** Hydrosonde  
**Data Transmission:** GOES Satellite  
**Dates of Operation:** Was seasonal prior to 2006, now year round.  
**Years of Operation:** 1995 – Present  
**Water Conditions:** Spillway  
**Location:** Other Washington shore.  
**This gage replaced:** N/A  
**Reason for replacement:** Rising flows  
**Comments:** Location of station moved about 12 feet higher elevation from shore, further up the hill.



## 15. Libby Tailwater TDG Monitoring Station (LBQM)

**Gage Elevation:** Fixed

**Latitude:** 48° 24' 2.4" N

**Longitude:** 115° 19' 7.0" W

**Distance from Dam:** --

**Datum:** NAD83

**River:** Kootenai

**River Mile:** 221.5

**USGS-ID:**

**Owner:** U.S. Army Corps of Engineers-NWS

**Gauge Type:** Hydrosonde

**Data Transmission:** GOES Satellite and Radio Transmission

**Dates of Operation:** April 1 – Aug 31\*

**Years of Operation:** 2004 – Present

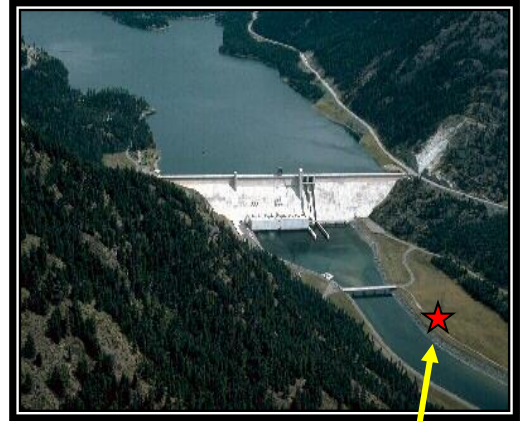
**Water Conditions:** Open River

**Location:** This gauge is located on the eastern shore of the Kootenai River approximately 750 feet downstream of the Libby Dam access road bridge.

**This gage replaced:** N/A

**Reason for replacement:** N/A

**Comments:** \*The seasonal gauges may go in several days before April 1 and remain in operation several days after August 31.



## 16. Little Goose Forebay TDG Monitoring Station (LGSA)

**Gage Elevation:** Variable (15 m depth)

**Latitude:** 46° 34' 58.3188" N

**Longitude:** 118° 01' 32.9831" W

**Distance from Dam:** 422 ft

**Datum:** NAD83

**River:** Snake

**River Mile:** 70.4

**USGS-ID:** 13343855

**Owner:** U.S. Army Corps of Engineers-NWW

**Gauge Type:** Hydrosonde

**Data Transmission:** GOES Satellite

**Dates of Operation:** April 1 – Aug. 31\*

**Years of Operation:** 2005 – Present.

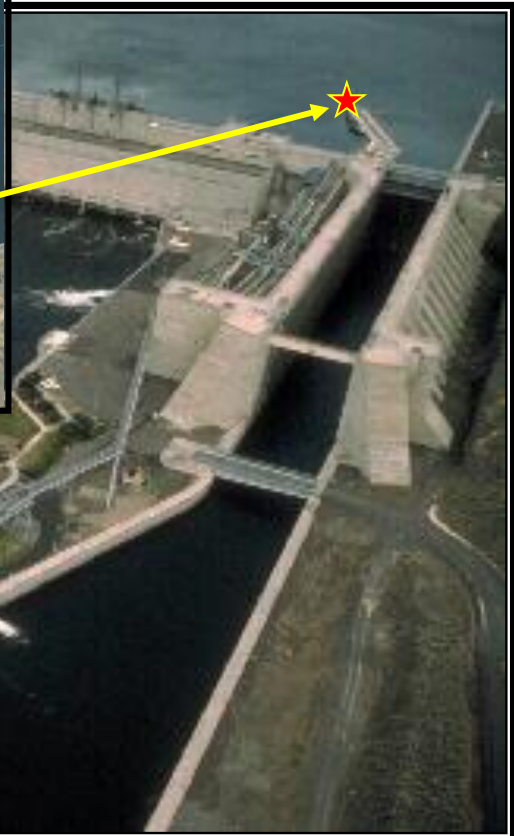
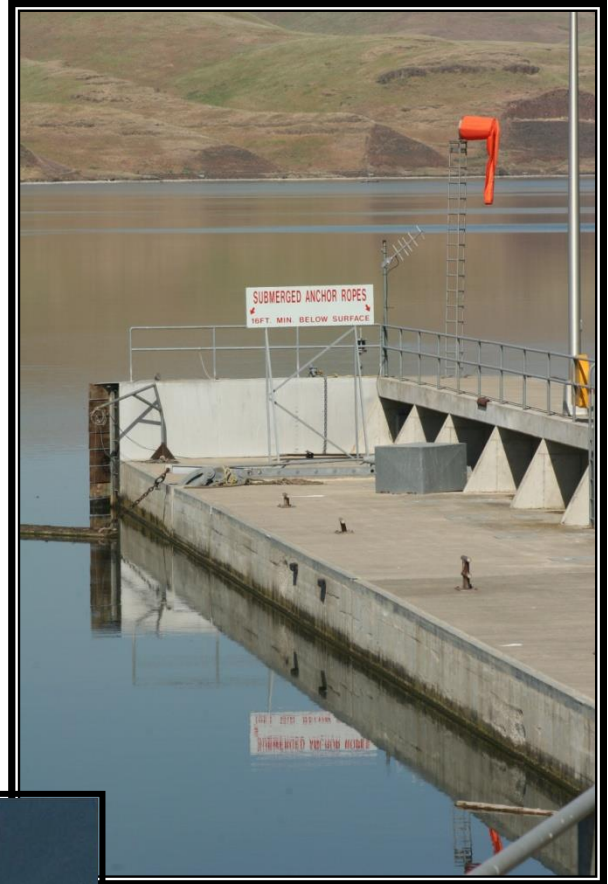
**Water Conditions:** Mixed

**Location:** At the upstream end of the navigation lock guidewall.

**This gage replaced:** LGS

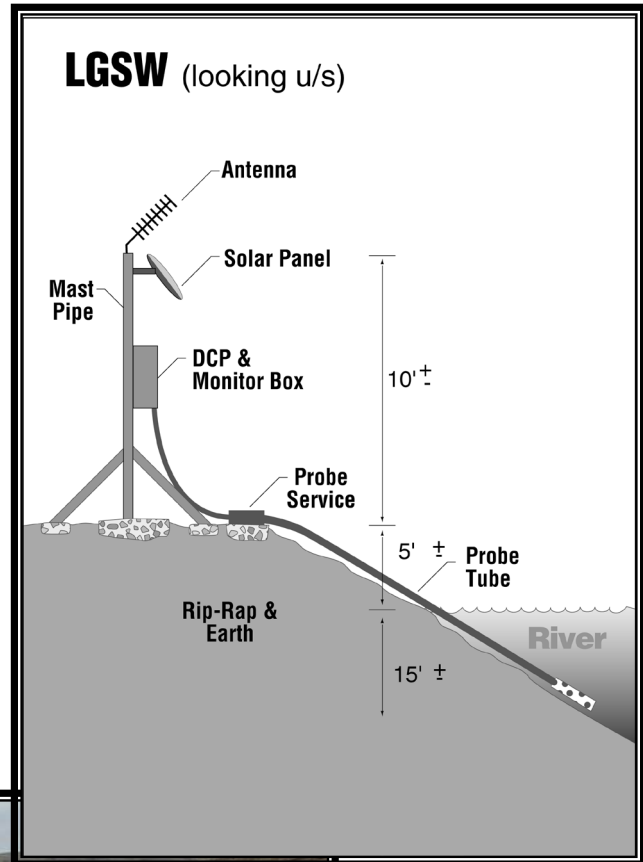
**Reason for replacement:** Move due to thermal influences and lowered from 15 ft to 45 ft.

**Comments:** \*The seasonal gauges may go in several days before April 1 and remain in operation several days after August 31.



## 17. Little Goose Tailwater TDG Monitoring Station (LGSW)

**Gage Elevation:** Fixed  
**Latitude:** 46° 35' 00.5280" N  
**Longitude:** 118° 02' 37.4186" W  
**Distance from Dam:** 0.7 miles  
**Datum:** NAD83  
**River:** Snake  
**River Mile:** 69.6  
**USGS-ID:** 13343860  
**Owner:** U.S. Army Corps of Engineers-NWW  
**Gauge Type:** Hydrosonde  
**Data Transmission:** GOES Satellite  
**Dates of Operation:** Was seasonal prior to 2006, now year round.  
**Years of Operation:** 1995 – Present.  
**Water Conditions:** Switches between mixed & spillway  
**Location:** On the northern shore of the Snake River  
**This gage replaced:** N/A  
**Reason for replacement:** N/A  
**Comments:** --



## 18. Lower Granite Forebay TDG Monitoring Station (LWG)

**Gage Elevation:** Fixed

**Latitude:** 46° 39' 34.1727" N

**Longitude:** 117° 25' 34.8564" W

**Distance from Dam:** 640 ft

**Datum:** NAD83

**River:** Snake

**River Mile:** 107.5

**USGS-ID:** 13343590

**Owner:** U.S. Army Corps of Engineers-NWW

**Gauge Type:** Hydrosonde

**Data Transmission:** GOES Satellite

**Dates of Operation:** Was year round prior to 2006, now seasonal (April 1 – Aug. 31\*)

**Years of Operation:** 1985 – Present.

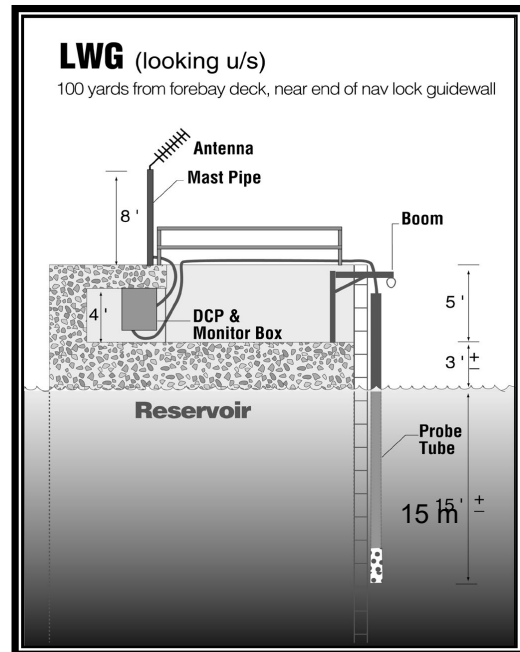
**Water Conditions:** Mixed

**Location:** At the upstream end of the navigation lock guidewall.

**This gage replaced:** N/A

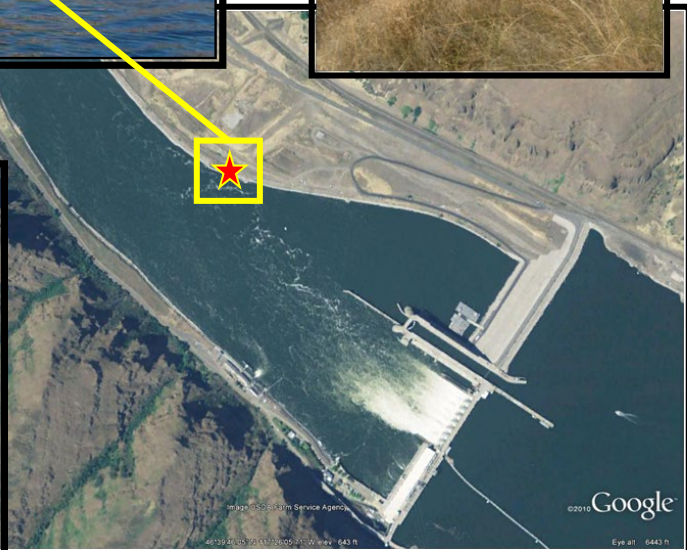
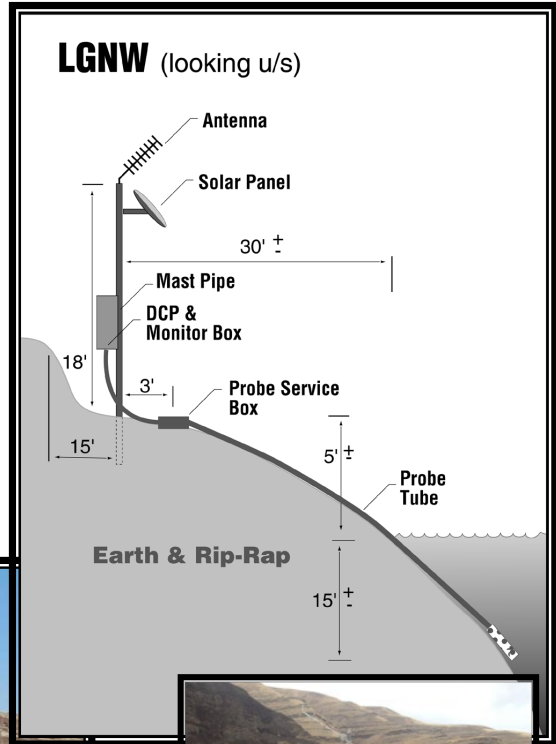
**Reason for replacement:** In March, 2005, this gauge was moved from a depth of 15 ft to 45 ft to avoid thermal influences. The geographic location of the gauge was not changed.

**Comments:** \* The seasonal gauges may go in several days before April 1 and remain in operation several days after August 31.



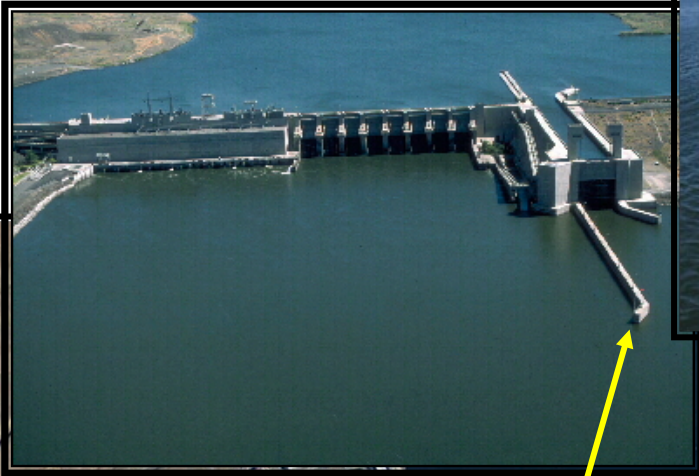
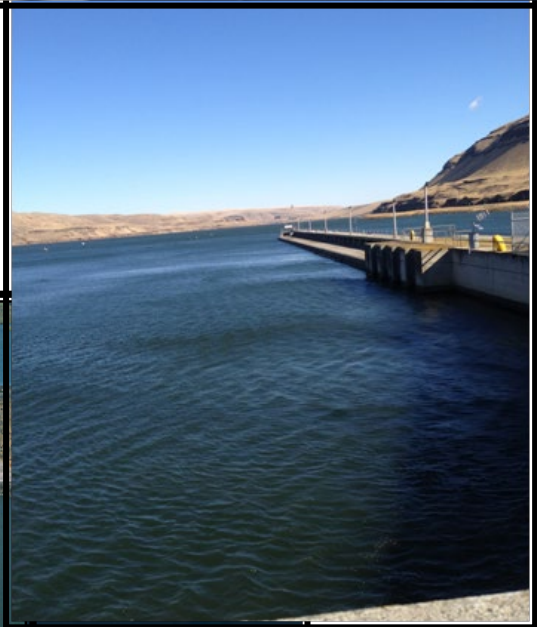
**19. Lower Granite Tailwater TDG Monitoring Station (LGNW)**

**Gage Elevation:** Fixed  
**Latitude:** 46° 39' 58.0726" N  
**Longitude:** 117° 26' 19.2595" W  
**Distance from Dam:** 0.8 miles  
**Datum:** NAD83  
**River:** Snake  
**River Mile:** 106.7  
**USGS-ID:** 13343595  
**Owner:** U.S. Army Corps of Engineers-NWW  
**Gauge Type:** Hydrosonde  
**Data Transmission:** GOES Satellite  
**Dates of Operation:** Year around  
**Years of Operation:** 1995 – Present.  
**Water Conditions:** Switches between mixed & spillway  
**Location:** On the northeastern shore of the Snake River.  
**This gage replaced:** N/A  
**Reason for replacement:** N/A  
**Comments:** --



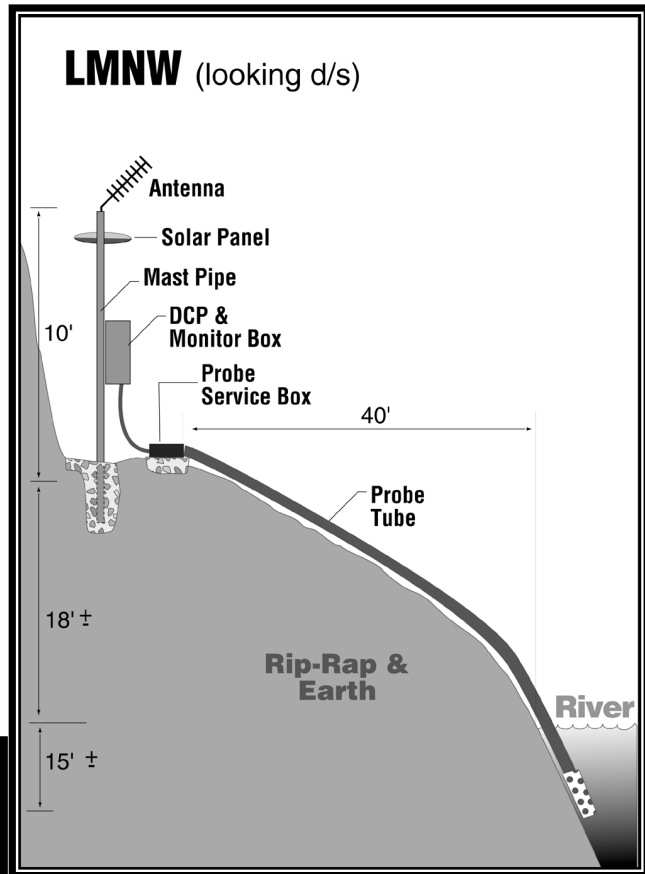
## 20. Lower Monumental Forebay TDG Monitoring Station (LMNA)

**Gage Elevation:** Fixed  
**Latitude:** 46° 33' 44.6559" N  
**Longitude:** 118° 32' 08.3477" W  
**Distance from Dam:** 700 ft  
**Datum:** NAD83  
**River:** Snake  
**River Mile:** 41.7  
**USGS-ID:** 13352595  
**Owner:** U.S. Army Corps of Engineers-NWW  
**Gauge Type:** Hydrosonde  
**Data Transmission:** GOES Satellite  
**Dates of Operation:** April 1-Aug. 31\*  
**Years of Operation:** 2005 – Present  
**Water Conditions:** Mixed  
**Location:** At the upstream end of the navigation lock guidewall.  
**This gage replaced:** Replaced LMN in 2005  
**Reason for replacement:** Moved due to thermal influences and lowered from 15 ft to 45 ft.  
**Comments:** \* The seasonal gauges may go in several days before April 1 and remain in operation several days after August 31.



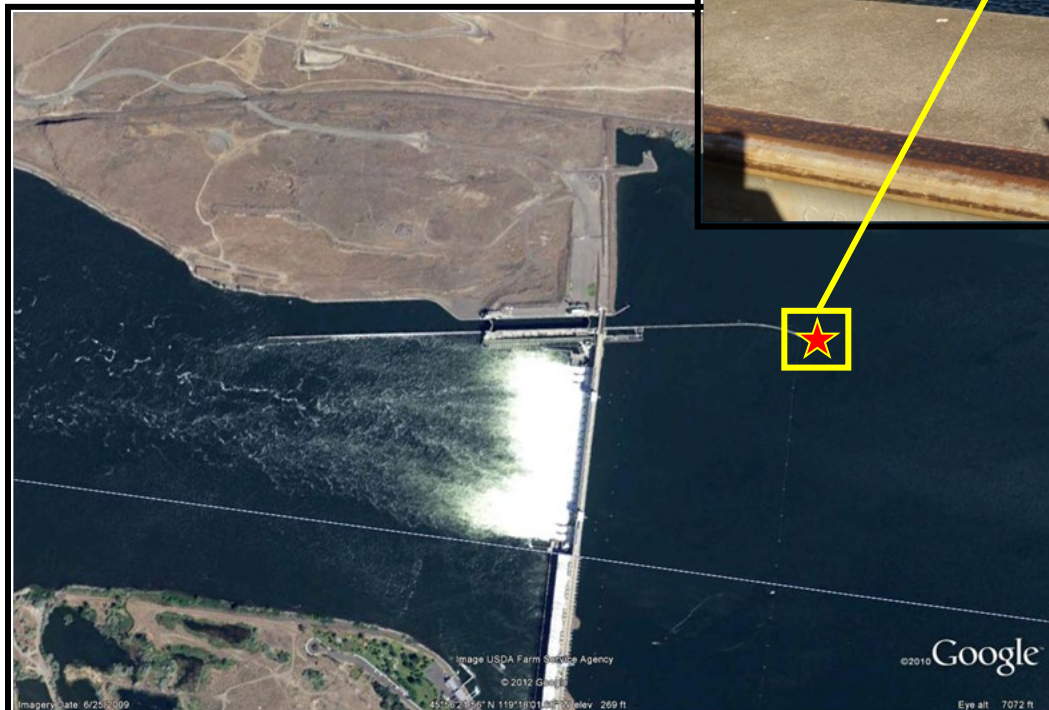
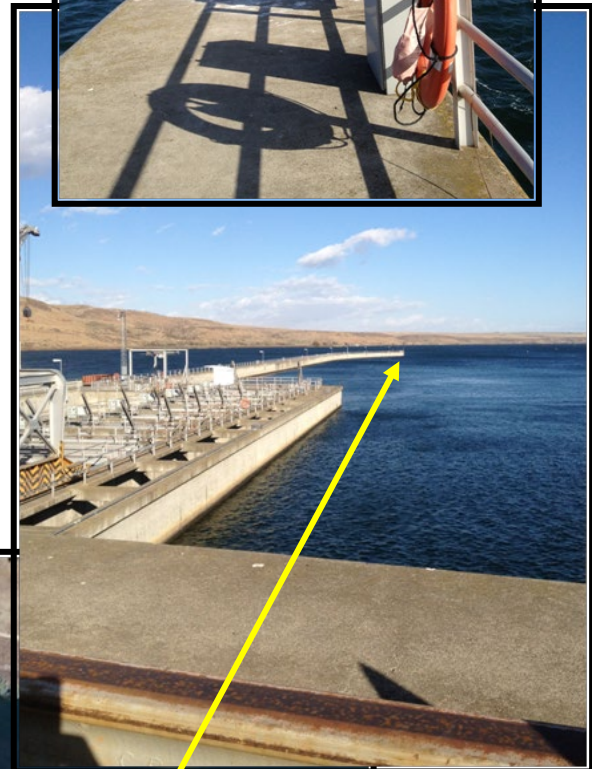
## 21. Lower Monumental Tailwater TDG Monitoring Station (LMNW)

**Gage Elevation:** Fixed  
**Latitude:** 46° 33' 04.5051" N  
**Longitude:** 118° 32' 58.9500" W  
**Distance from Dam:** 1 mile  
**Datum:** NAD83  
**River:** Snake  
**River Mile:** 40.4  
**USGS-ID:** 13352600  
**Owner:** U.S. Army Corps of Engineers-NWW  
**Gauge Type:** Hydrosonde  
**Data Transmission:** GOES Satellite  
**Dates of Operation:** Was seasonal prior to 2006, now year around.  
**Years of Operation:** 1995 – Present  
**Water Conditions:** Switches between mixed & spillway.  
**Location:** On the southeastern shore of the Snake River.  
**This gage replaced:** N/A  
**Reason for replacement:** N/A  
**Comments:** --



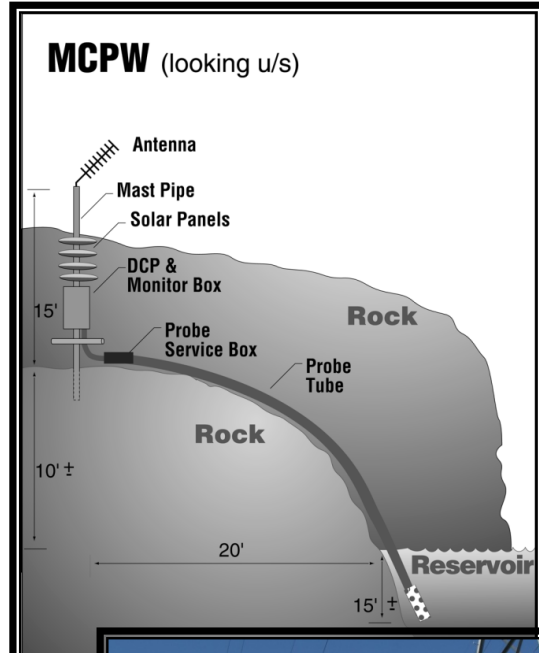
## 22. McNary Forebay TDG Monitoring Station (MCNA)

**Gage Elevation:** Variable  
**Latitude:** 45° 56' 28.92" N  
**Longitude:** 119° 17' 35.44" W  
**Distance from Dam:** 1,460 ft  
**Datum:** NAD83  
**River:** Columbia  
**River Mile:** 292.3  
**USGS-ID:** 14019220  
**Owner:** U.S. Army Corps of Engineers-NWW  
**Gauge Type:** Hydrosonde  
**Data Transmission:** GOES Satellite  
**Dates of Operation:** April 1 – Aug. 31\*  
**Years of Operation:** 2005 – Present  
**Water Conditions:** Mixed  
**Location:** At the end of the navigation lock guidewall near the Washington shoreline.  
**This gage replaced:** MCQW (Washington side) and MCQO (Oregon side)  
**Reason for replacement:** Moved due to thermal influences and lowered from 15 ft to 45 ft.  
**Comments:** \*The seasonal gauges may go in operation several days before April 1 and remain in operation several days after August 31.



### 23. McNary Tailwater TDG Monitoring Station (MCPW)

**Gage Elevation:** Fixed  
**Latitude:** 45° 56' 02.7775" N  
**Longitude:** 119° 19' 35.4628" W  
**Distance from Dam:** 1.3 miles  
**Datum:** NAD83  
**River:** Columbia  
**River Mile:** 290.7  
**USGS-ID:** 14019240  
**Owner:** U.S. Army Corps of Engineers-NWW  
**Gauge Type:** Hydrosonde  
**Data Transmission:** GOES Satellite  
**Dates of Operation:** Year around  
**Years of Operation:** 1995 - Present  
**Water Conditions:** Spillway  
**Location:** On a rocky outcrop on the Washington shore and just upstream of the Highway 395 Bridge.  
**This gage replaced:** N/A  
**Reason for replacement:** N/A  
**Comments:** --



## 24. Pasco TDG Monitoring Station (PAQW)

**Gage Elevation:** Fixed

**Latitude:** 46° 13' 26.2851" N

**Longitude:** 119° 06' 57.3388" W

**Distance from Dam:** N/A

**Datum:** NAD83

**River:** Columbia

**River Mile:** 329.1

**USGS-ID:** 12514400

**Owner:** U.S. Army Corps of Engineers-NWW

**Gauge Type:** Hydrosonde

**Data Transmission:** GOES Satellite

**Dates of Operation:** April 1 – Aug. 31\*

**Years of Operation:** 1999 – Present

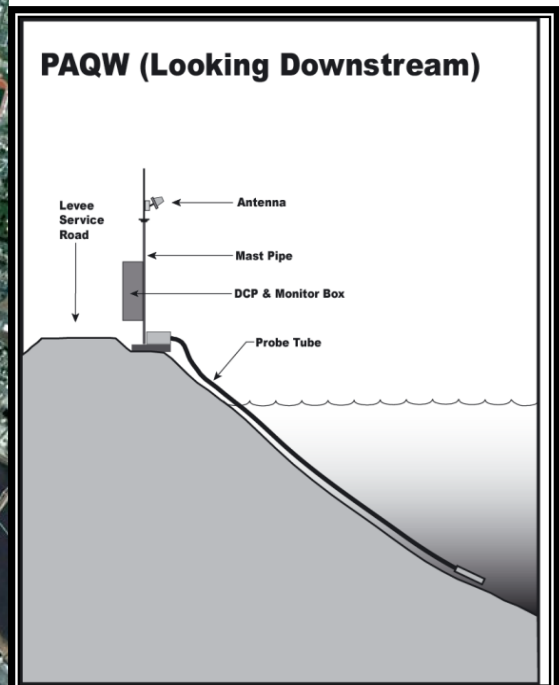
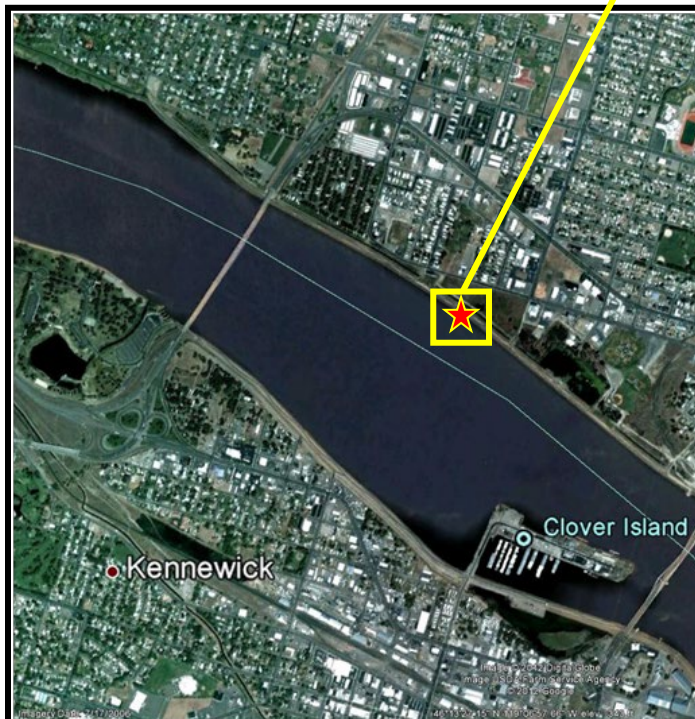
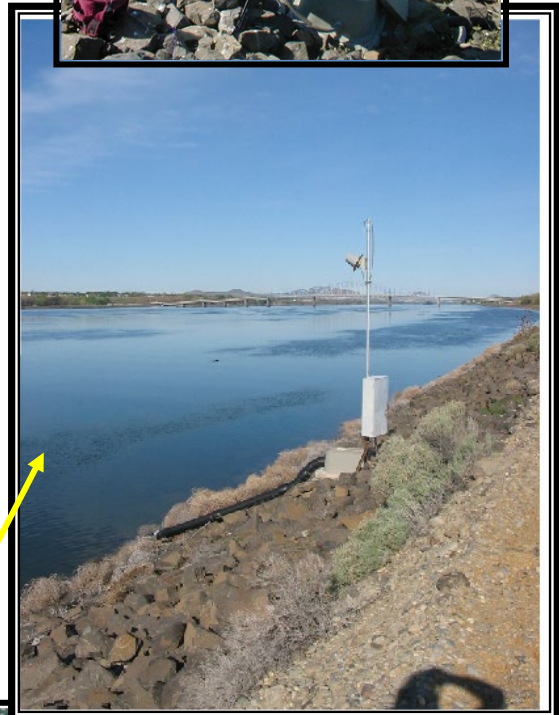
**Water Conditions:** Open River

**Location:** On the northern shore of the Columbia River between the S. 10<sup>th</sup> Avenue Bridge and the Highway 395 Bridge in Pasco, WA. It is on the levee adjacent to a wetland area near the Pasco Youth Baseball Complex. The site is within Lake Wallula approximately 5 miles upstream of the Snake River confluence.

**This gage replaced:** N/A

**Reason for replacement:** N/A

**Comments:** \* The seasonal gauges may go in several days before April 1 and remain in operation several days after August 31.



## 25. Peck TDG Monitoring Station (PEKI)

**Gage Elevation:** Fixed

**Latitude:** 46° 30' 00.9396"

**Longitude:** 116° 23' 32.4163"

**Distance from Dam:** N/A

**Datum:** NAD83

**River:** Clearwater

**River Mile:** 37.4

**USGS-ID:** 13341050

**Owner:** U.S. Army Corps of Engineers - NWW

**Gauge Type:** Hydrosonde

**Data Transmission:** GOES Satellite

**Dates of Operation:** April 1 – Aug. 31\*

**Years of Operation:** 1996 – Present

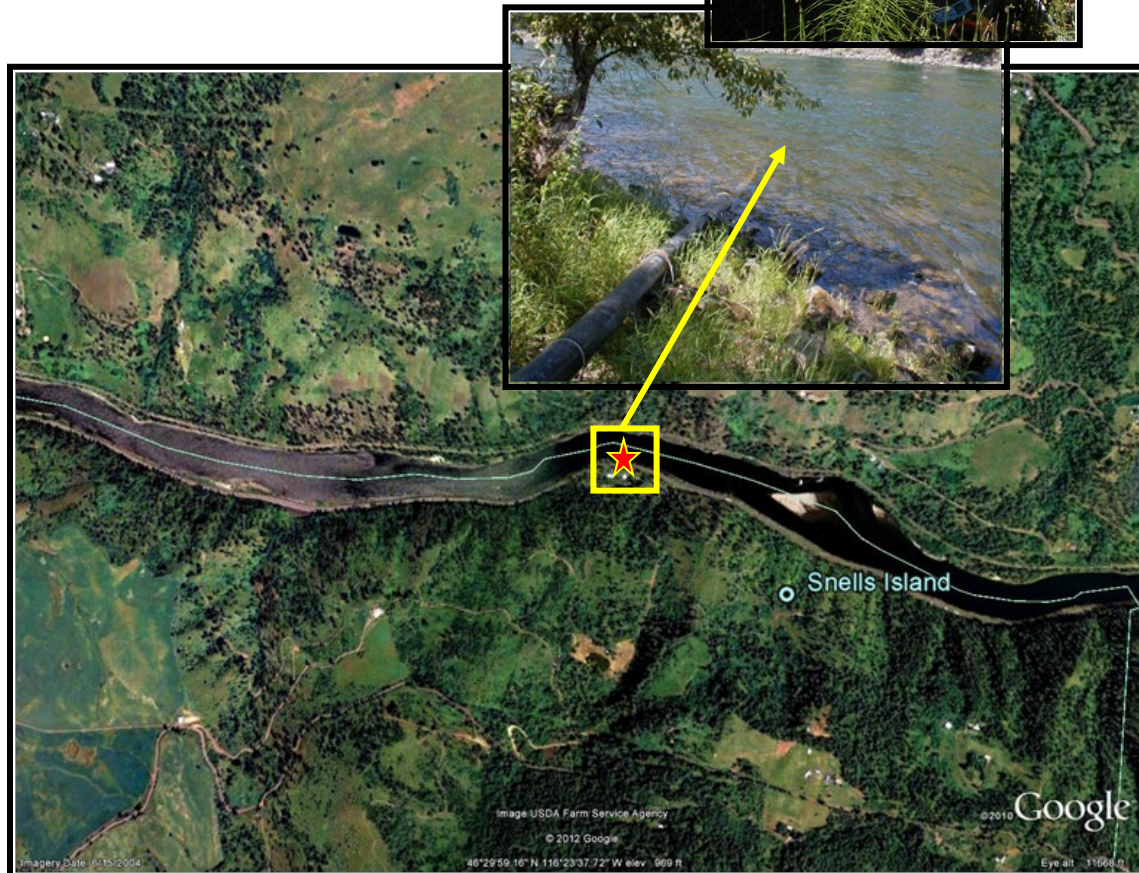
**Water Conditions:** Open River

**Location:** On the southern shore of the Clearwater River approximately 3.5 miles downstream of the North Fork Clearwater River confluence.

**This gage replaced:** N/A

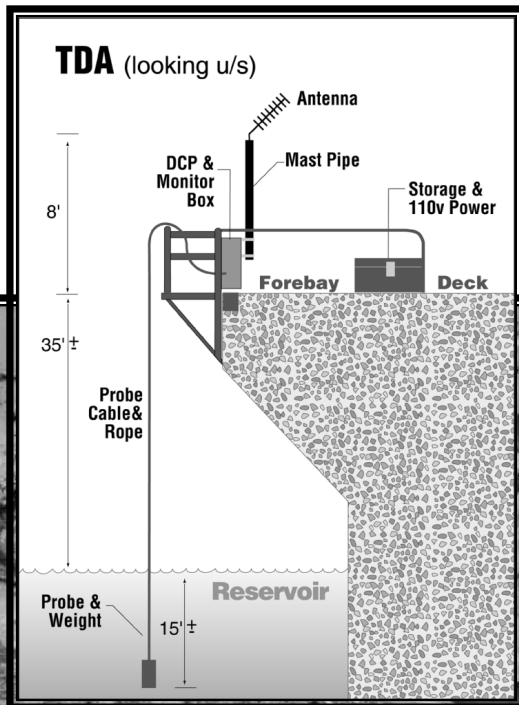
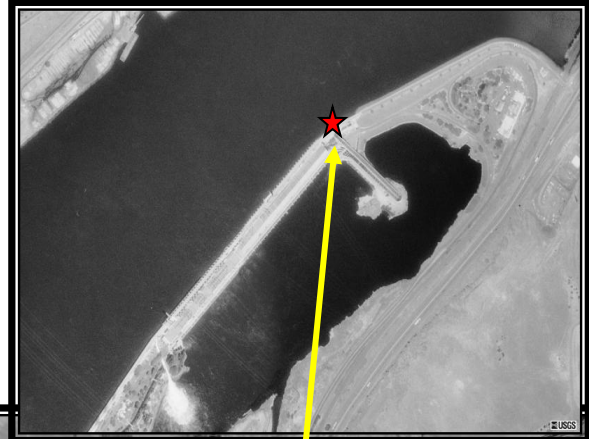
**Reason for replacement:** N/A

**Comments:** \*The seasonal gauges may go in several days before April 1 and remain in operation several days after August 31.



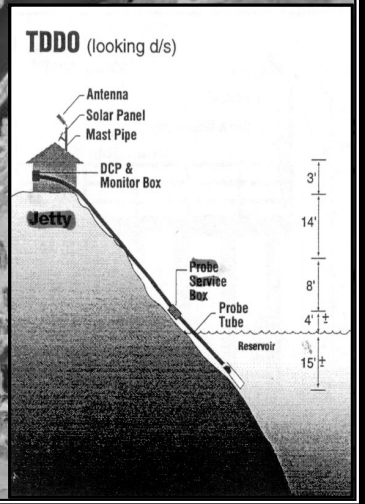
## 26. The Dalles Forebay TDG Monitoring Station (TDA)

**Gage Elevation:** Fixed  
**Latitude:** 45° 37' 11.43618" N  
**Longitude:** 121° 07' 16.25220" W  
**Distance from Dam:** On part of dam  
**Datum:** NAD83  
**River:** Columbia  
**River Mile:** 192.4  
**USGS-ID:** 453712121071200  
**Owner:** U.S. Army Corps of Engineers-NWP  
**Gauge Type:** Hydrosonde  
**Data Transmission:** GOES Satellite  
**Dates of Operation:** April 1 – August 31\*  
**Years of Operation:** 1985 – Present  
**Water Conditions:** Mixed  
**Location:** In forebay of dam near the end of Powerhouse Unit 22.  
**This gage replaced:** N/A  
**Reason for replacement:** N/A  
**Comments:** \* The seasonal gauges may go in several days before April 1 and remain in operation several days after August 31.



**27. The Dalles Tailwater TDG Monitoring Station (TDDO)**

**Gage Elevation:** Fixed (107.6 ft)  
**Latitude:** 45° 36' 26.43330" N  
**Longitude:** 121° 10' 24.25569" W  
**Distance from Dam:** 2.5 miles  
**Datum:** NAD83  
**River:** Columbia  
**River Mile:** 189.1  
**USGS-ID:** 14105700  
**Owner:** U.S. Army Corps of Engineers-NWP  
**Gauge Type:** Hydrosonde  
**Data Transmission:** GOES Satellite  
**Dates of Operation:** Was seasonal prior to 2006, now year around  
**Years of Operation:** 1996 – Present  
**Water Conditions:** Mixed  
**Location:** Off Bargeway Road from Webber Street, near industrial complex.  
**This gage replaced:** N/A  
**Reason for replacement:** N/A  
**Comments:** --



## 28. Warrendale TDG Monitoring Station (WRNO)

**Gage Elevation:** Variable  
**Latitude:** 45° 36' 29.42299" N  
**Longitude:** 122° 02' 18.30278" W  
**Distance from Dam:** Approximately 6 miles downstream of dam  
**Datum:** NAD83  
**River:** Columbia  
**River Mile:** 140.3  
**USGS-ID:** 453630122021400  
**Owner:** U.S. Army Corps of Engineers-NWP  
**Gauge Type:** Hydrosonde  
**Data Transmission:** GOES Satellite  
**Dates of Operation:** Year around  
**Years of Operation:** 1985 – Present  
**Water Conditions:** Mixed  
**Location:** This gauge is fixed to the boat dock at “The Fishery” off NE Enquist Pl in Dodson, Oregon (Near Warrendale) approximately 6 miles downstream of Bonneville Dam.  
**This gage replaced:** N/A  
**Reason for replacement:** N/A  
**Comment:** Up until the 2004 spill season, this gauge was used as the BON tailwater gauge for spill management and was operated year around. Currently, this gauge is being used as a fall, winter, and spring TDG monitor for Chum spawning.

