Appendix E

2011 Court Reports

With Hourly Spill, Flow And TDG Graphs

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UNITED STATES DISTRICT COURT

DISTRICT OF OREGON

NATIONAL WILDLIFE FEDERATION, *et al.* Plaintiffs, v. NATIONAL MARINE FISHERIES SERVICE, *et al.* Defendants.	Civil No. 01-640-RE **NOTICE OF FEDERAL DEFENDANTS' FIRST 2011 SPILL IMPLEMENTATION STATUS REPORT**

In accordance with the Court's March 24, 2011 Order concerning 2011 spring spill

operations, Federal Defendants submit their first 2011 spill implementation status report. *See* Exhibit 1. This status report includes, among other things: the hourly flow through the powerhouse at each dam; the hourly flow over the spillway compared to the target spill for that hour; and the resultant 12-hour average total dissolved gas ("TDG") for the tailwater at each project and for the next project's forebay downstream. The report also provides written explanations of variances that occurred during the reporting period.

Respectfully submitted this 17th day of May, 2011.

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CERTIFICATE OF SERVICE

Pursuant to Local Rule Civil 100.13(c), and F.R. Civ. P. 5(d), I certify that on May 17, 2011, the foregoing will be electronically filed with the Court's electronic court filing system, which will generate automatic service upon on all Parties enrolled to receive such notice. The following will be manually served by overnight mail:

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FISH OPERATIONS PLAN IMPLEMENTATION REPORT
April 2011

Submitted by the U.S. Army Corps of Engineers
Northwestern Division
Portland, OR

Introduction:

The U.S. Army Corps of Engineers (Corps) is submitting this report in accordance with the U.S. District Court of Oregon March 24, 2011 Order adopting the 2011 Spring Fish Operations Plan (2011 Spring FOP). The 2011 Spring FOP describes the Corps' project operations for fish passage at its Federal Columbia River Power System (FCRPS) dams during the spring fish migration season, generally April through June.[1] To the extent Corps project operations are not specified in the 2011 Spring FOP, the FCRPS operations will be consistent with the 2010 NOAA Fisheries Biological Opinion (2010 BiOp), the USFWS 2000 and 2006 BiOps, and/or other operative documents, including the 2011 Water Management Plan (WMP), WMP seasonal updates, and the 2011 Fish Passage Plan (FPP).

The Corps' April 2011 lower Snake and Columbia River project and fish passage operations are contained in this report. In particular, information in this report includes the following:

- hourly flow through the powerhouse at each dam;
- hourly flow over the spillway compared to the spill target for that hour; and,
- resultant 12-hour average Total Dissolved Gas (%TDG) levels in the tailrace at each project and in the subsequent downstream project's forebay and the Camas-Washougal gauge below Bonneville Dam.

This report also provides information on issues presented and unanticipated or emergency situations that arose during implementation of the 2011 Spring FOP in April.

Data Reporting:

I. For each project providing fish passage operations, this report contains two graphs per operational week for April displaying the performance of the spill program as follows:

(A). Daily Average of the High 12 Hourly %TDG Values - described in the upper graph.
(B). Hourly Spill and Generation Flows - described in the lower graph.

The weekly graphs begin on March 28 and end on May 1 for the following lower Snake River and lower Columbia River projects: Lower Granite, Little Goose, Lower Monumental, Ice Harbor, McNary, John Day, The Dalles, and Bonneville dams.

[1] Operations are implemented from Monday through Sunday.

Each figure represents one week of operation for a project. The graphs start at 0000 hours (TDG graph) and 0100 hours (flow/spill graph) on March 28 for the lower Snake River projects, and start the same hours on April 4 for the lower Columbia River projects.

March 28 – April 3	Figures 1 – 4
April 4 – April 10	Figures 5 – 12
April 11 – April 17	Figures 13 – 20
April 18 – April 24	Figures 21 – 28
April 25 – May 1	Figures 29 – 36

A. Upper Graph: Shows the resultant daily average %TDG for the 12 highest hours. This is primarily a result of spill at dams. The objective is to operate each project up to the TDG limits without exceeding those limits to the extent practicable.

- The blue line on the graph represents the %TDG in the tailrace of the dam. 120 %TDG is the upper operating limit.
- The green line represents the TDG in the forebay of the next dam downstream. 115 %TDG is the upper operating limit.

B. Lower Graph: Shows the hourly flow and spill at the dam.

- The dotted blue line shows the flow through the powerhouse each hour, in thousand cubic feet per second (kcfs).
- The medium green line represents the average hourly total river flow through the project in kcfs.
- The heavy pink line represents the hourly flow through the spillway in kcfs.
- The thin black line represents the hourly spill level as defined in the 2011 Spring FOP.
- Each graph includes a heavy black line that represents the target spill. This is the hourly maximum spill level that is subject to the following conditions:

    - Spill percentage or discharge specified in the FOP;
    - Spill caps as set daily for TDG management;
    - Test spill levels for fish passage research;
    - Minimum generation for power system needs; and,
    - Minimum spill at Bonneville (50 kcfs) dam;
    - Minimum spill at John Day is 25 percent of project outflow;

The hourly target spill may vary as a function of quantity of river flow, forebay elevation and generating units available at a project.

II. A monthly %TDG Table is included at the end of the figures that shows the overall daily results of the average %TDG for the 12 highest hours for all projects. The numbers in red show exceedances of the TDG gas cap - 115 percent (forebay) or 120 percent (tailwater) for each project.

General Implementation Remarks:

For all projects that spill for fish passage, the target spill may be limited to a lesser quantity due to various conditions, as described below. When spill levels briefly deviate below or above the level specified in the 2011 Spring FOP, the heavy pink line will be below or above the heavy black line in the graphs. Actual operation deviations from the target operation during voluntary spill hours are described below. The April 2011 Spill Variance Table includes average hourly data; therefore, while spill may vary from target spill for only a portion of an hour, the April 2011 Spill Variance Table characterizes the reduction as a full hour. There are instances when the hourly spill levels are not achievable due to mechanical limitations in setting spill gates to implement the regionally coordinated spill pattern. The project operator sets the spill gate stops to most closely approximate the 2011 Spring FOP level of spill while also avoiding exceeding the %TDG spill cap.

"Low flow" operations at the lower Columbia and Snake projects are triggered when inflow is insufficient to provide both minimum generation and the specified spill levels. In these situations, the projects operate at minimum generation and spill the remainder of project inflow. As flows transition from higher flows to low flows, there may be situations when flows recede at a higher rate than forecasted. In addition, inflows provided by nonfederal projects upstream are variable and uncertain.

The combination of these factors may result in instances where unanticipated changes to inflow result in forebay elevations dropping to the low end of the Minimum Operating Pool (MOP). Since these projects have limited operating flexibility, maintaining minimum generation, MOP elevation, and the target spill may not be possible throughout every hour. During low flow periods at Little Goose Dam the volume of water released during navigational lockages appears to result in an overall project spill percentage reduction because the calculations do not account for this volume of water. However, the actual spill volume remains constant. When these variances occur, they are recorded in the monthly Spill Variance Table for Little Goose under the variance type "Navigation."

Also it is important to note that actual spill levels at Corp's projects may range from 1 to 2 kcfs (Bonneville Dam may range from 1 to 3 kcfs) lower or higher than specified in the 2011 Spring FOP and the RCC spill priority list, which defines the projects' %TDG spill caps. A number of factors influence this including hydraulic efficiency, exact gate opening calibration, spillway gate hoist cable stretch due to temperature changes, and forebay elevation (a higher forebay results in a greater volume of spill since more water can pass under the spill gate).

Additionally, the 2011 Spring FOP describes project operations during "Rapid Load Changes" (p. 6). For reporting purposes, the notation "Transmission Stability" in the April 2011 Spill Variance Report Table will replace "Rapid Load Changes" to identify instances when hourly spill levels were not met as a result of load swing hours and other related within-hour load variability issues. These "Transmission Stability" issues occur because projects must be available to respond to within-hour load variability to satisfy North American Electric Reliability Council (NERC) reserve requirements ("on response"). In addition to within-hour load variability, projects on response must be able to respond to within hour changes that result from

intermittent generation (such as wind generation). During periods of rapidly changing loads and intermittent generation, projects on response may have significant changes in turbine discharge within the hour while spill quantity remains the same within the hour. Under normal conditions, within-hour load changes occur mostly on hours immediately preceding and following the peak load hours, however, within-hour changes in intermittent generation can occur at any hour of the day. Sometimes several hours after peak load hours the project may be decreasing total outflow and generation faster than the corresponding spill decreases causing the percent spill to be slightly higher. Due to the high variability of within-hour load, these "Transmission Stability" hours may have a greater instance of reporting actual spill percentages that vary by more than the ±1 percent requirement or other ranges specified in the 2011 Spring FOP than other hours.

Occurrences which required an adjustment in operations and/or regional coordination are described in greater detail in the section below entitled "Operational Adjustments."

April Operations:

The month of April was characterized by above average flows for the lower Snake and the lower Columbia rivers. The NOAA River Forecast Center's (RFC) Runoff Processor indicates observed runoff for April 2011 at Lower Granite Dam was 129 percent of average, and observed runoff at The Dalles Dam was 109 percent of average. [2] In accordance with the 2011 Spring FOP, spring spill operations commenced on April 3 at 0001 hours for the Corps' lower Snake projects and on April 10 at 0001 hours for the lower Columbia projects.

The high flows resulted in instances of involuntary spill due to lack of turbine capability throughout the month. In some of these instances of involuntary spill, the resulting Daily Average of High 12 Hourly %TDG values exceeded the 115 percent forebay and 120 percent tailrace standards as shown in the corresponding %TDG graphs for the lower Columbia and Snake rivers.

During the April reporting period, the 2011 Spring FOP planned spill operations were as follows:

- Lower Granite Dam - The hourly target spill discharge was a fixed quantity 20 kcfs 24-hours/day.
- Little Goose Dam - The hourly target spill discharge was 30 percent of total river discharge for 24-hours/day.
- Lower Monumental Dam - The hourly target spill discharge was the %TDG spill cap 24-hours/day.
- Ice Harbor Dam - The hourly target spill discharge was 45 kcfs daytime and the %TDG spill cap nighttime through April 27. Beginning April 28, the hourly target spill alternated daily between 45 kcfs daytime and the %TDG spill cap nighttime, vs. 30 percent of total river discharge for 24-hours/day. Nighttime spill hours are 1800-0500.
- McNary Dam - The hourly target spill discharge was 40 percent of total river discharge for 24-hours/day.

[2] The April average is based on the RFC 30-year period of record (1971-2000).

- John Day Dam - The hourly target spill discharge was 30 percent of total river discharge for 24-hours/day through April 26. Beginning April 27, the hourly target spill alternated between 40 percent and 30 percent of total river discharge for 24-hours/day due to the two-day treatment spring spill test. Spill level changes occurred at 2000 hours.
- The Dalles Dam - The target spill discharge was 40 percent of total river discharge for 24/day.
- Bonneville Dam - The hourly target spill discharge was a fixed quantity 100 kcfs 24-hours/day.

***Operational Adjustments**:*

1. Modified Spill Priority List:

   On April 1 at 1638 hours, the Corps revised the spill priority list following coordination with TMT, and in response to SOR 2011-01 (Spill Priority List). The salmon managers requested a modified spill priority order be used April 1 to April 2 to prioritize involuntary spill to the Snake River prior to the start of voluntary spill. It was also requested that this spill priority order continue to be used for the fish passage season beginning April 3 and be re-visited as the season progresses. TMT members either supported or did not object to this operation.

2. Ice Harbor Dam:

   On April 1, from 0600 to 1000 hours, the Corps operated Unit 3 without the submersible traveling screens (STSs) installed. On March 29, during the installation of the STSs in Unit 1, the lifting beam jammed in the screen slot and delayed the installation of all STSs scheduled prior to April 1 as specified in the 2011 Fish Passage Plan (FPP). On April 1, the Corps operated Unit 3 during 0600 to 1000 hours to maintain system reliability. Prior to this period, from 0001 to 0559 hours, 0 MW was generated and the project spilled an average of 115 kcfs because system reliability was not required. Installation of all remaining STSs was completed by 1823 hours on April 1. The Corps coordinated this operation with FPOM via email on March 31 and April 1.

   After resuming normal operations at 1000 hours on April 1 with the STSs in place, the Corps realized that Unit 2, rather than Unit 3, should have been operated first according to the FPP unit operating priority. The Corps corrected the out of priority operation at 1600 hours and reported the incident to FPOM during the April 14 FPOM meeting.

3. Lower Granite Dam**:**

   - On April 6 from 0705 to 0726 hours, the Corps turned off spill through the spillway weir to remove a log. Spill was redistributed through the remaining spillbays during the removal. The Corps coordinated this operation with FPOM via email on April 5 and members either supported or did not object to this operation.

- On April 9 at 0100 hours, the Corps increased the Lower Granite Dam minimum operating pool (MOP) from the normal MOP range of 733.0 - 734.0 feet to MOP+1,734.0 - 735.0 feet due to concerns associated with navigation safety. The Corps increased MOP as a result of the request identified in System Operational Request (SOR) 2011-01 Lower Granite Pool Held at MOP Plus 2 Feet April Through August, submitted by the Columbia River Towboaters Association (CRTA) dated March 23, 2011.

  After a thorough examination of the information, the Corps proposed an alternative operation to address the navigation safety concerns and reduce the number of instances and the extent to which the Lower Granite pool would need to operate above MOP. The Corps proposed to operate the Lower Granite forebay in variable ranges between MOP and MOP+2 as a function of day average inflow measured at Lower Granite Dam as follows:

When day average inflow is...	Lower Granite forebay range is...
Greater than or equal to 120 kcfs:	MOP (or as needed for flood control)
Greater than or equal to 80 kcfs but less than 120 kcfs:	734.0-735.0 feet (MOP+1)
Greater than or equal to 50 kcfs but less than 80 kcfs:	734.5-735.5 feet (MOP+1.5)
Less than 50 kcfs:	735.0-736.0 feet (MOP+2)

  This operation was coordinated during TMT meetings on March 30 and April 1. TMT members either supported or did not object to this operation.

4. Little Goose Dam:

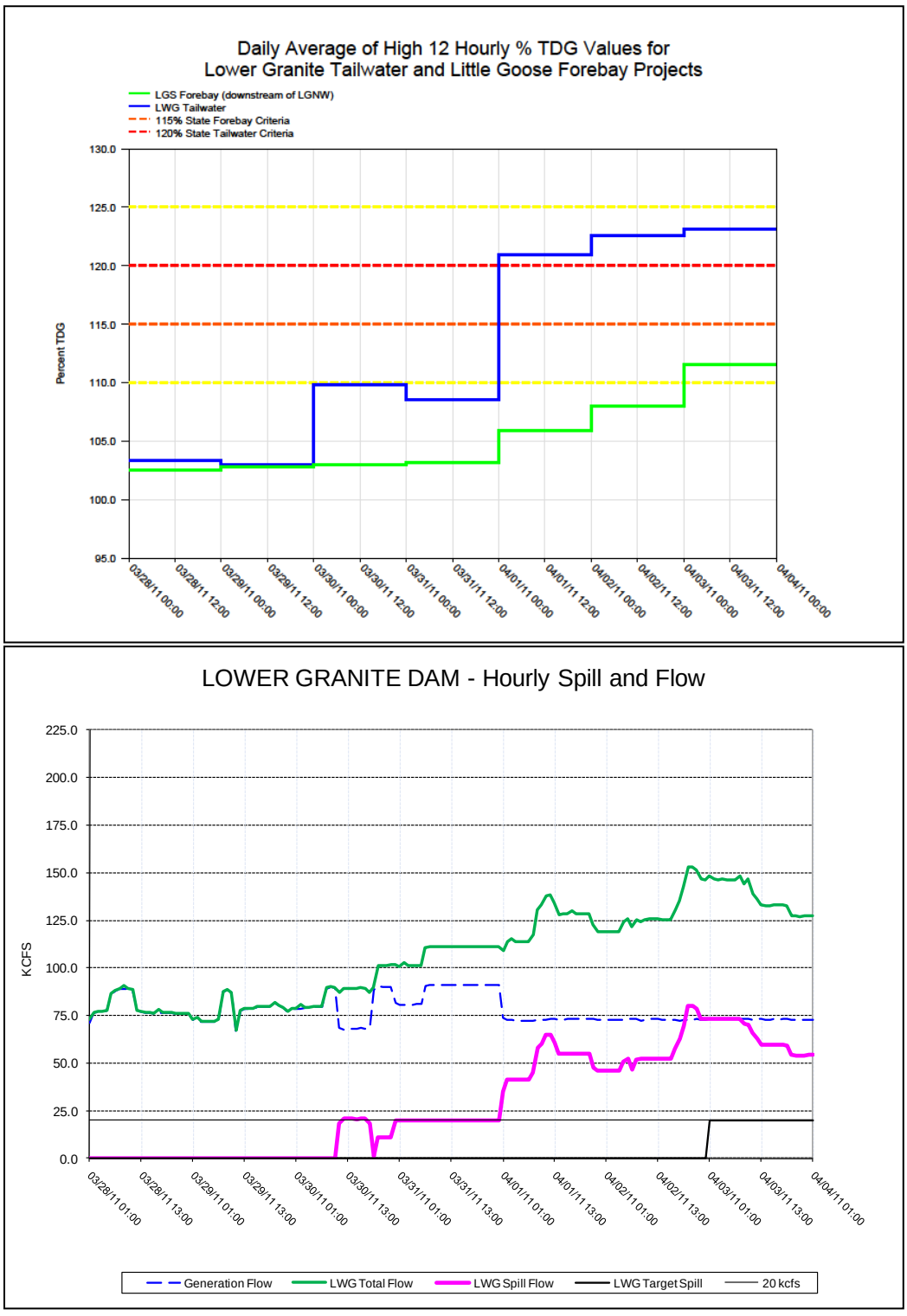
   On May 12, an incident occurred at Little Goose Dam that resulted in an estimated mortality of 70 yearling Chinook, 29 of which were ESA-listed fish.[3] While switching from directly loading fish into a barge to loading fish into a raceway, the biological technician inadvertently overlooked a closed sliding gate in the raceway loading flume. This closed sliding gate caused water to back up in the raceway loading flume and spill fish onto to the ground for approximately 10 - 15 minutes. Upon returning from the barge, the technician immediately noticed the problem and corrected it. A remediation plan has been put into place, including installing a new lighting system to ensure lighting is adequate in all areas with slide gates. The Corps notified FPOM of this incident at the May 12 FPOM meeting.

[3] NOAA Fisheries Memo (John Ferguson), November 9, 2010. NMFS has not yet published the 2011 Memo; therefore, the Corps is estimating the number of listed fish based on the best available information from the 2010 NOAA Fisheries Memo.

April 2011 Spill Variance Table

Project	Parameter	Date	Time	Hours	Type	Reason
Little Goose	Reduced % Spill	4/28/11	1500	1	Navigation	Hourly spill decreased to 28.9% (below 30.0% ± 1.0% range) due to volume of water needed to empty the navigation lock. See p. 3. 24-hr avg. spill was 30.0%.
Lower Monumental	Reduced Spill	4/12/2011	1500	1	Human/Program Error	Hourly spill decreased to 26.7 kcfs (below spill cap of 28 kcfs). Log book indicates request to increase spill cap to 28 kcfs at 1400, with change occurring later in the hour.
John Day	Additional % Spill	4/11/2011	0400	1	Transmission Stability	Hourly spill increased to 31.1% (above 30.0% ± 1.0% range). Project on response during rapidly changing load. See p. 3-4. 24-hr avg. spill was 29.9%.
The Dalles	Additional % Spill	4/11/2011	0400	1	Transmission Stability	Hourly spill increased to 41.4% (above 40.0% ± 1.0% range). Project on response during rapidly changing load. See p. 3-4. 24-hr avg. spill was 40.0%.
The Dalles	Reduced % Spill	4/16/2011	1900	1	Human/Program Error	Hourly spill decreased to 38.6% (below 40.0% ± 1.0% range). Log book indicates request to increase spill to 88 kcfs at 1800, with change occurring later in the hour. 24-hr avg. spill was 39.9%.

Figure 1


Daily Average of High 12 Hourly % TDG Values for
Lower Granite Tailwater and Little Goose Forebay Projects
LGS Forebay (downstream of LGNW)
LWG Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
03/28/11 00:00
03/28/11 12:00
03/29/11 00:00
03/29/11 12:00
03/30/11 00:00
03/30/11 12:00
03/31/11 00:00
03/31/11 12:00
04/01/11 00:00
04/01/11 12:00
04/02/11 00:00
04/02/11 12:00
04/03/11 00:00
04/03/11 12:00
04/04/11 00:00
LOWER GRANITE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
03/28/11 01:00
03/28/11 13:00
03/29/11 01:00
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03/31/11 01:00
03/31/11 13:00
04/01/11 01:00
04/01/11 13:00
04/02/11 01:00
04/02/11 13:00
04/03/11 01:00
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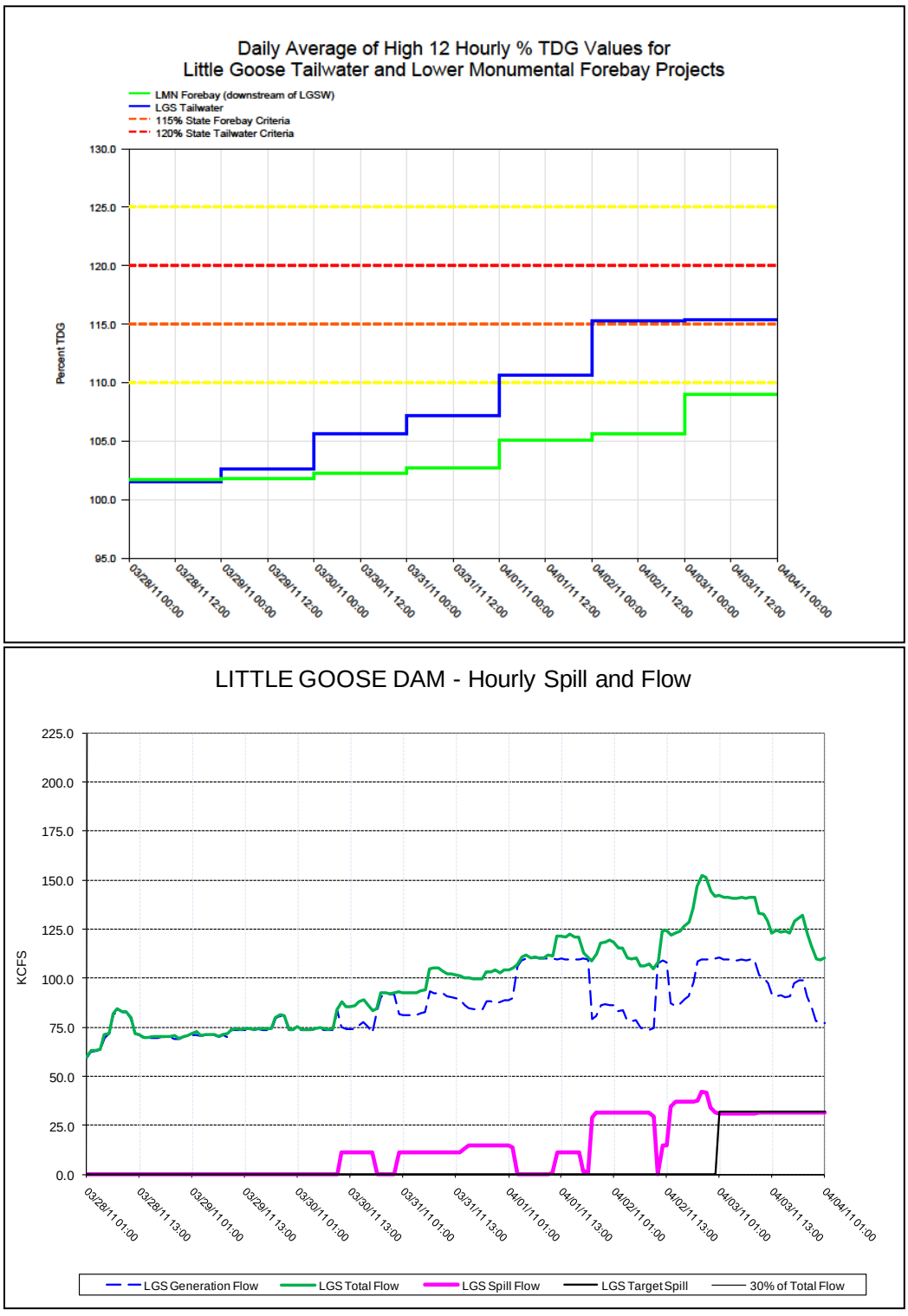
04/04/11 01:00
Generation Flow
LWG Total Flow
LWG Spill Flow
LWG Target Spill
20 kcfs

Figure 2


Daily Average of High 12 Hourly % TDG Values for
Little Goose Tailwater and Lower Monumental Forebay Projects
LMN Forebay (downstream of LGSW)
LGS Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
03/28/11 00:00
03/28/11 12:00
03/29/11 00:00
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03/30/11 12:00
03/31/11 00:00
03/31/11 12:00
04/01/11 00:00
04/01/11 12:00
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04/02/11 12:00
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04/03/11 12:00
04/04/11 00:00
LITTLE GOOSE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
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03/28/11 01:00
03/28/11 13:00
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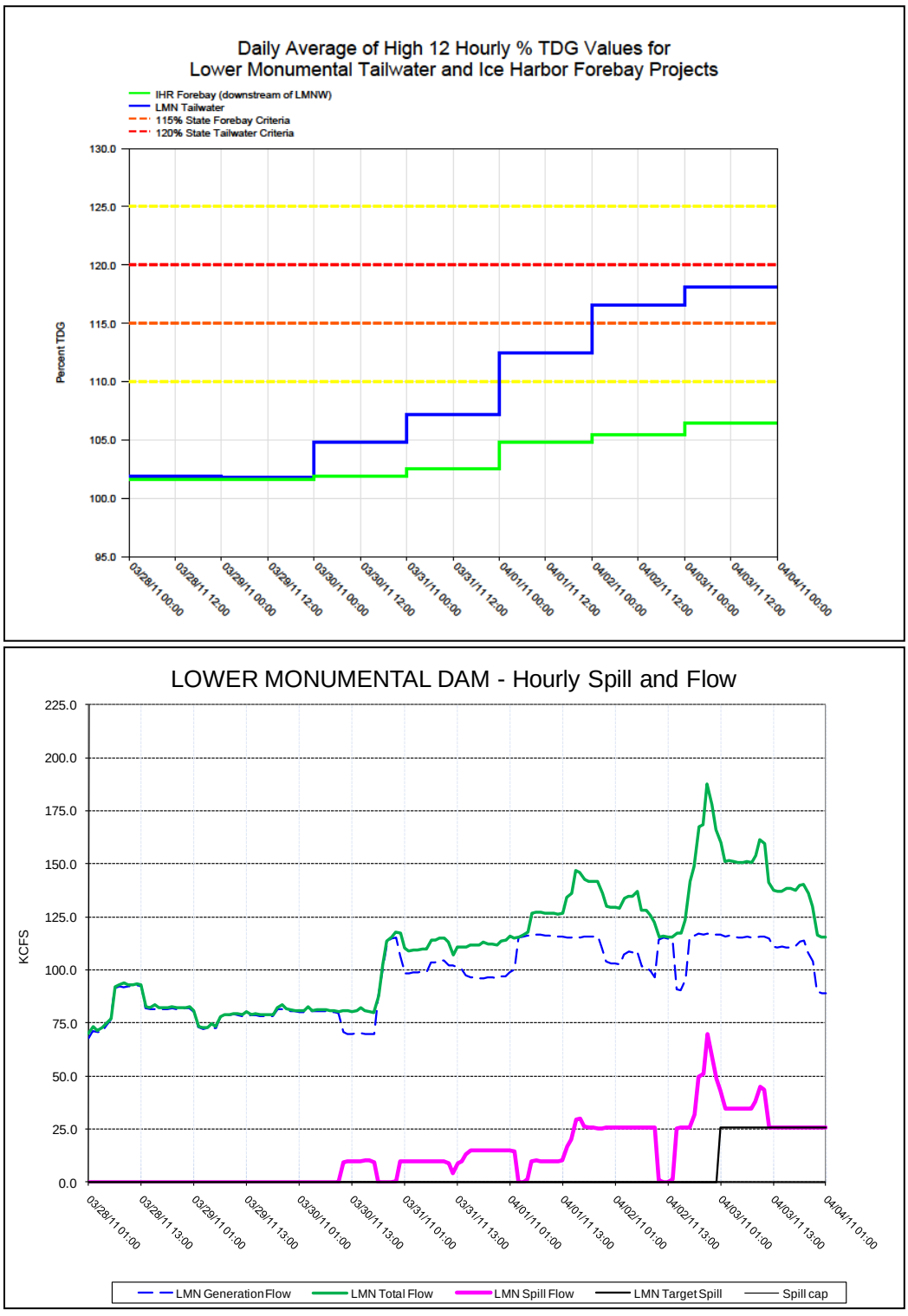
04/01/11 01:00
04/01/11 13:00
04/02/11 01:00
04/02/11 13:00
04/03/11 01:00
04/03/11 13:00
04/04/11 01:00
LGS Generation Flow
LGS Total Flow
LGS Spill Flow
LGS Target Spill
30% of Total Flow

Figure 3


Daily Average of High 12 Hourly % TDG Values for
Lower Monumental Tailwater and Ice Harbor Forebay Projects
IHR Forebay (downstream of LMNW)
LMN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
03/28/11 00:00
03/28/11 12:00
03/29/11 00:00
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04/02/11 00:00
04/02/11 12:00
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04/03/11 12:00
04/04/11 00:00
LOWER MONUMENTAL DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
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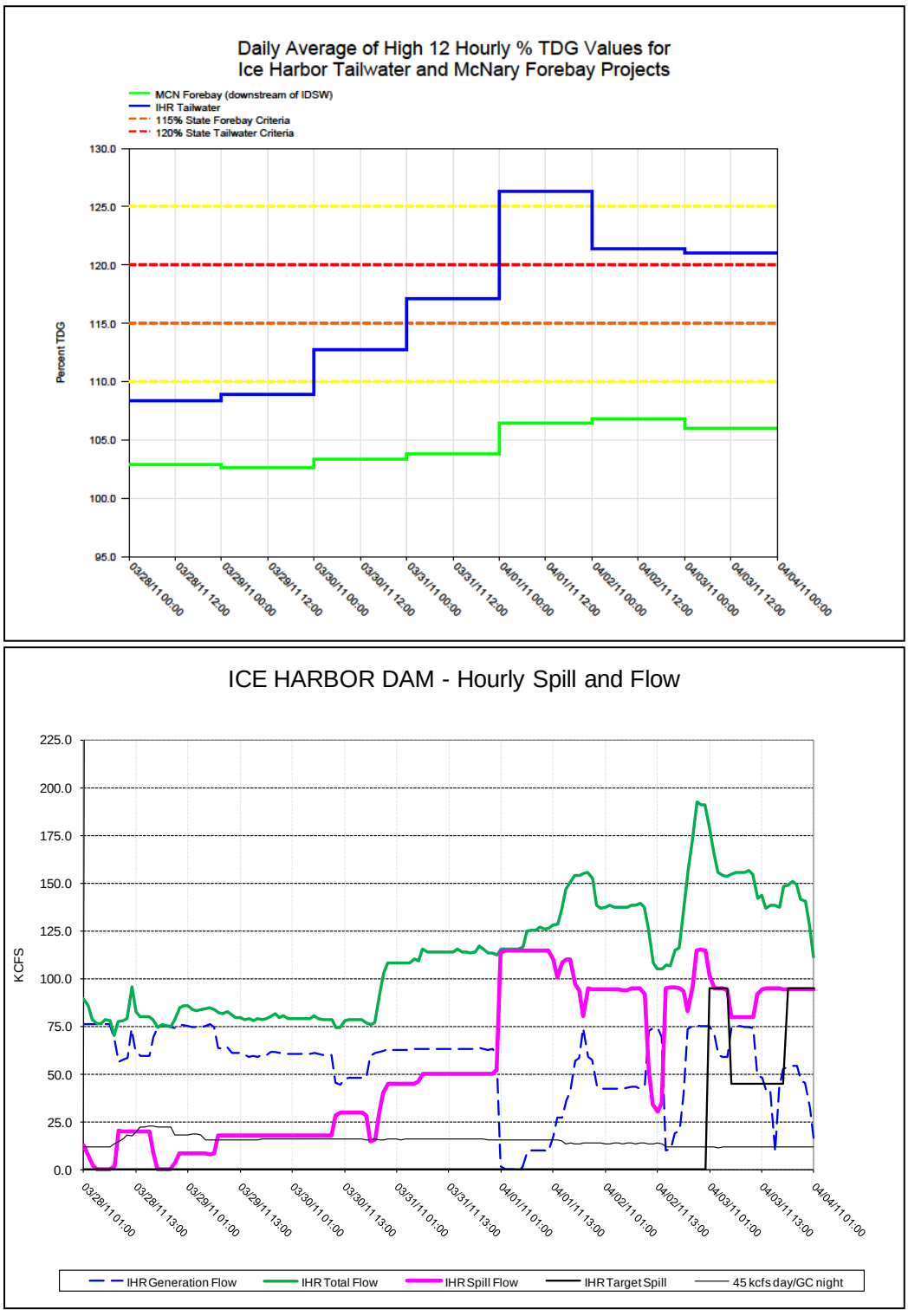
04/01/11 13:00
04/02/11 01:00
04/02/11 13:00
04/03/11 01:00
04/03/11 13:00
04/04/11 01:00
LMN Generation Flow
LMN Total Flow
LMN Spill Flow
LMN Target Spill
Spill cap

Figure 4


Daily Average of High 12 Hourly % TDG Values for
Ice Harbor Tailwater and McNary Forebay Projects
MCN Forebay (downstream of IDSW)
IHR Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
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03/28/11 00:00
03/28/11 12:00
03/29/11 00:00
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03/31/11 00:00
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ICE HARBOR DAM - Hourly Spill and Flow
KCFS
225.0
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175.0
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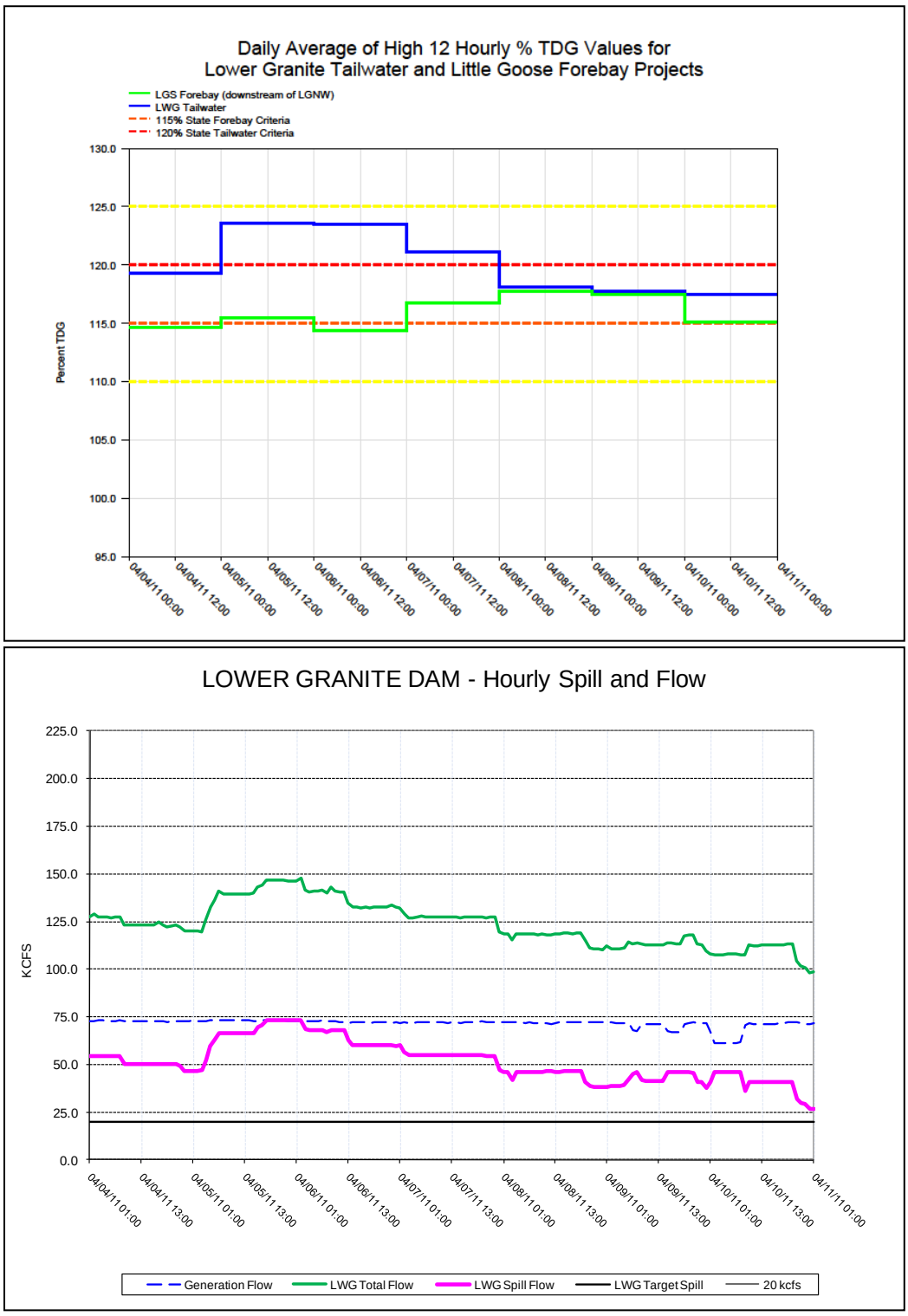
04/01/11 13:00
04/02/11 01:00
04/02/11 13:00
04/03/11 01:00
04/03/11 13:00
04/04/11 01:00
IHR Generation Flow
IHR Total Flow
IHR Spill Flow
IHR Target Spill
45 kcfs day/GC night

Figure 5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LGS Forebay (downstream of LGNW)
LWG Tailwater
115% State Forebay Criteria
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Percent TDG
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125.0
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115.0
110.0
105.0
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04/04/11 00:00
04/04/11 12:00
04/05/11 00:00
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04/06/11 00:00
04/06/11 12:00
04/07/11 00:00
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04/08/11 12:00
04/09/11 00:00
04/09/11 12:00
04/10/11 00:00
04/10/11 12:00
04/11/11 00:00
LOWER GRANITE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
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04/04/11 13:00
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04/09/11 01:00
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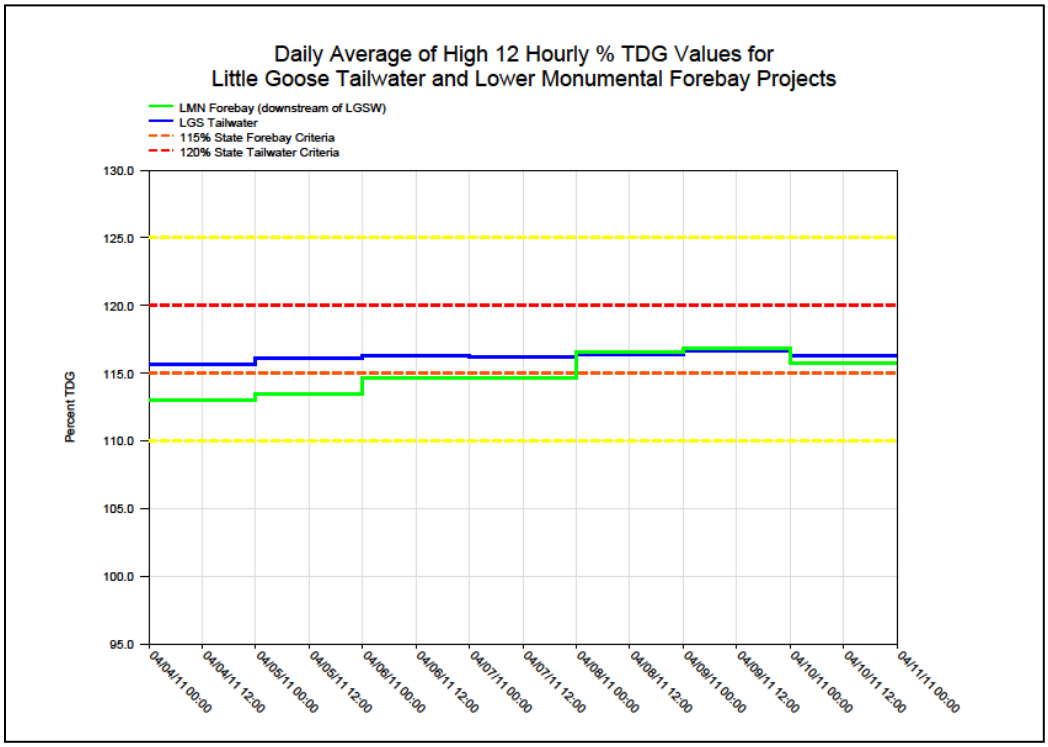
04/10/11 01:00
04/10/11 13:00
04/11/11 01:00
Generation Flow
LWG Total Flow
LWG Spill Flow
LWG Target Spill
20 kcfs

Figure 6


Daily Average of High 12 Hourly % TDG Values for
Little Goose Tailwater and Lower Monumental Forebay Projects
LMN Forebay (downstream of LGSW)
LGS Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/04/11 00:00
04/04/11 12:00
04/05/11 00:00
04/05/11 12:00
04/06/11 00:00
04/06/11 12:00
04/07/11 00:00
04/07/11 12:00
04/08/11 00:00
04/08/11 12:00
04/09/11 00:00
04/09/11 12:00
04/10/11 00:00
04/10/11 12:00
04/11/11 00:00

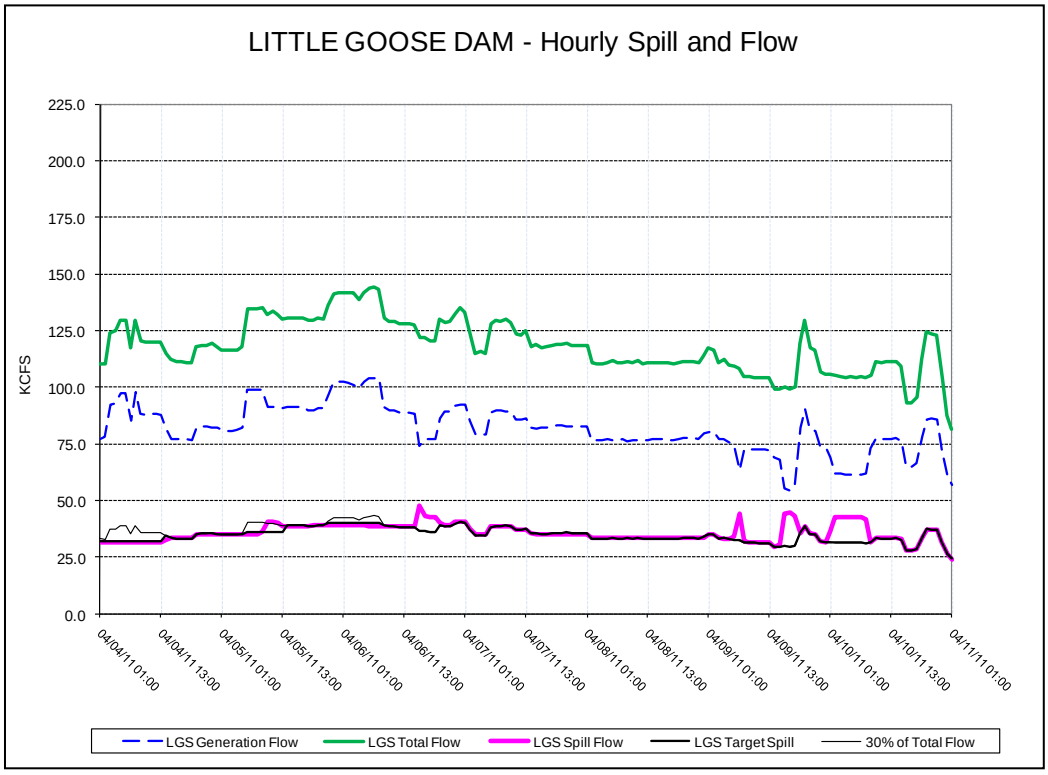
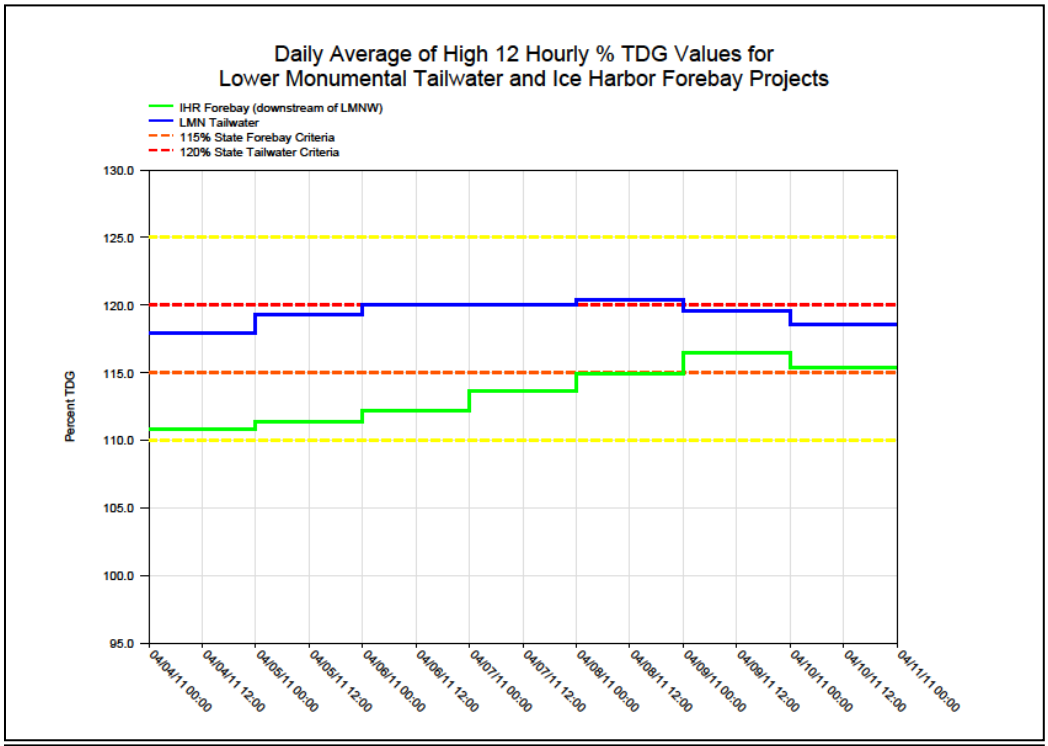

LITTLE GOOSE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
04/04/11 01:00
04/04/11 13:00
04/05/11 01:00
04/05/11 13:00
04/06/11 01:00
04/06/11 13:00
04/07/11 01:00
04/07/11 13:00
04/08/11 01:00
04/08/11 13:00
04/09/11 01:00
04/09/11 13:00
04/10/11 01:00
04/10/11 13:00
04/11/11 01:00
LGS Generation Flow
LGS Total Flow
LGS Spill Flow
LGS Target Spill
30% of Total Flow

Figure 7


Daily Average of High 12 Hourly % TDG Values for
Lower Monumental Tailwater and Ice Harbor Forebay Projects
IHR Forebay (downstream of LMNW)
LMN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/04/11 00:00
04/04/11 12:00
04/05/11 00:00
04/05/11 12:00
04/06/11 00:00
04/06/11 12:00
04/07/11 00:00
04/07/11 12:00
04/08/11 00:00
04/08/11 12:00
04/09/11 00:00
04/09/11 12:00
04/10/11 00:00
04/10/11 12:00
04/11/11 00:00

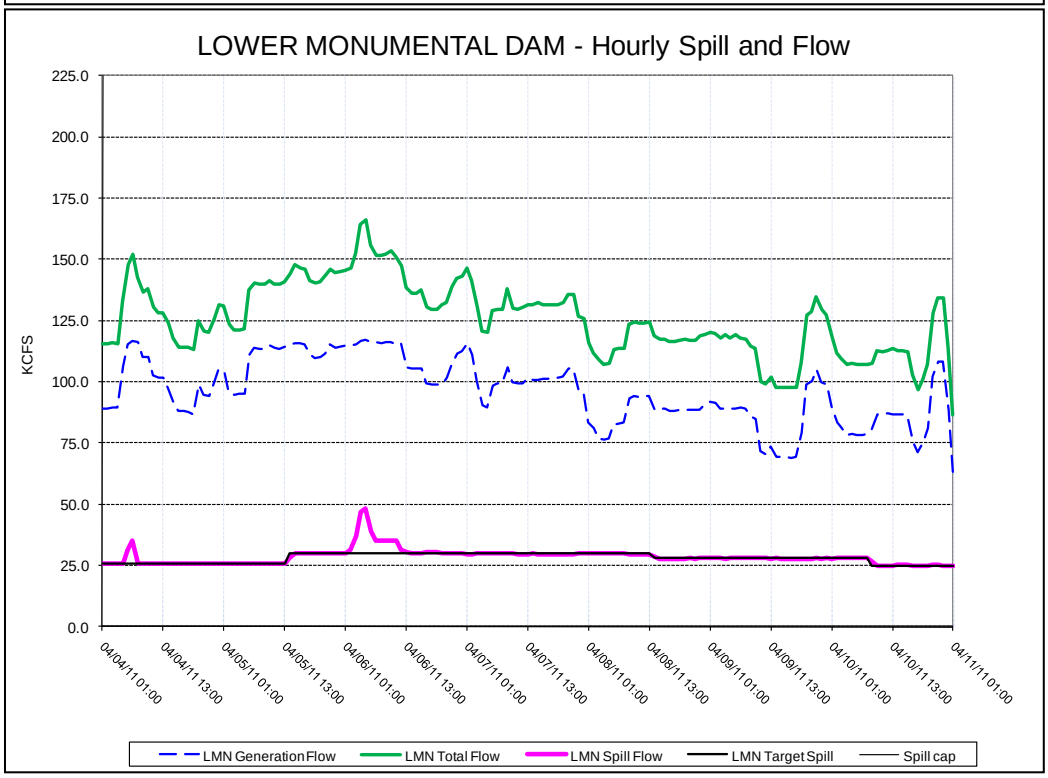

LOWER MONUMENTAL DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
04/04/11 01:00
04/04/11 13:00
04/05/11 01:00
04/05/11 13:00
04/06/11 01:00
04/06/11 13:00
04/07/11 01:00
04/07/11 13:00
04/08/11 01:00
04/08/11 13:00
04/09/11 01:00
04/09/11 13:00
04/10/11 01:00
04/10/11 13:00
04/11/11 01:00
LMN Generation Flow
LMN Total Flow
LMN Spill Flow
LMN Target Spill
Spill cap

Figure 8

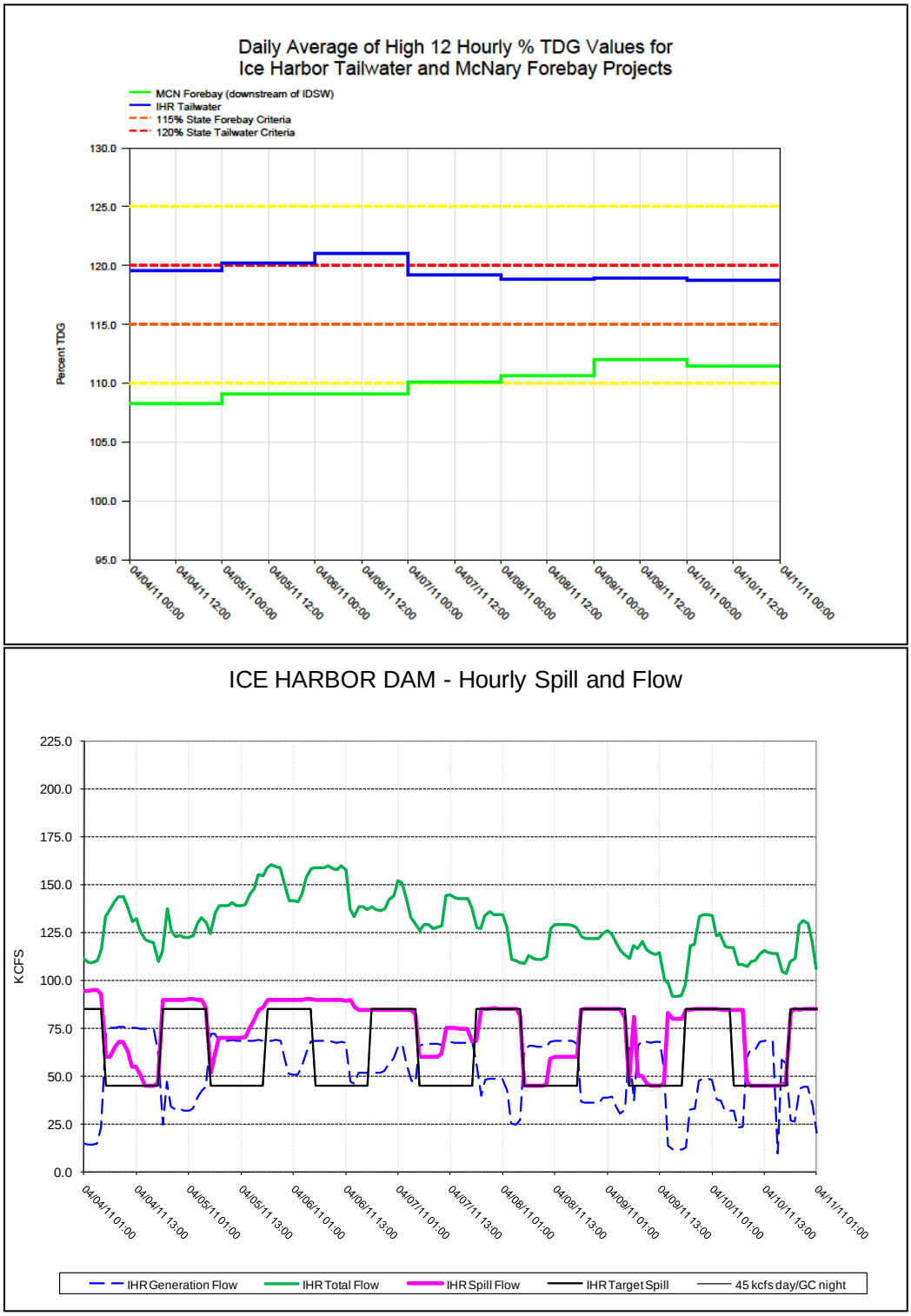
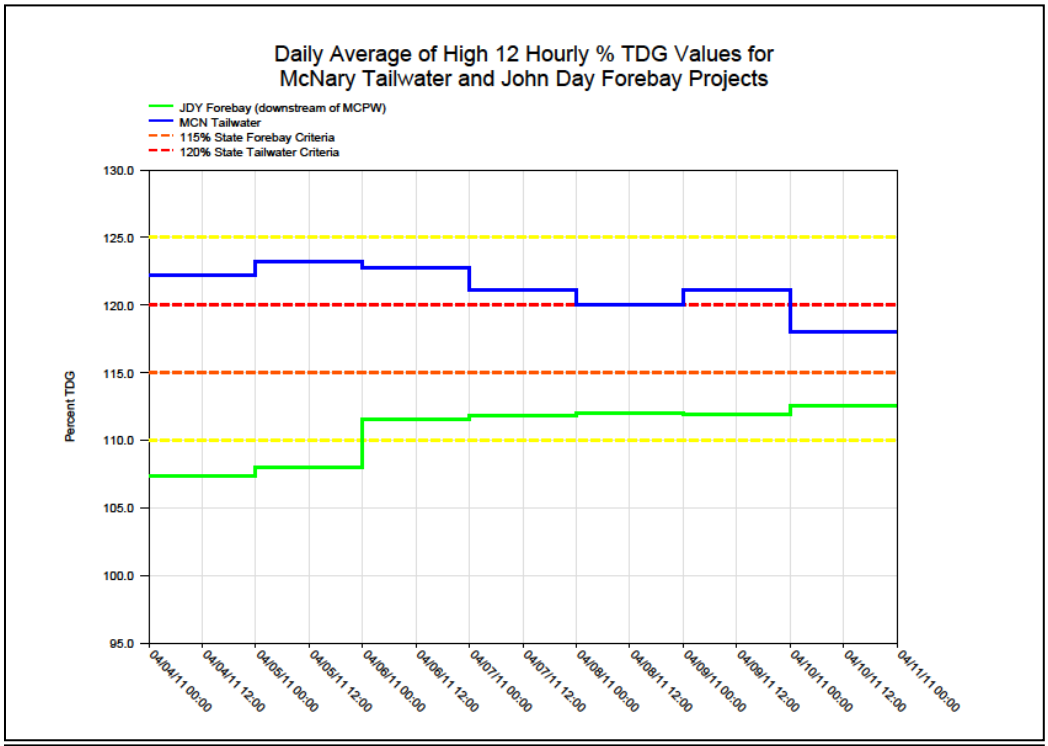

Daily Average of High 12 Hourly % TDG Values for
Ice Harbor Tailwater and McNary Forebay Projects
MCN Forebay (downstream of IDSW)
IHR Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/04/11 00:00
04/04/11 12:00
04/05/11 00:00
04/05/11 12:00
04/06/11 00:00
04/06/11 12:00
04/07/11 00:00
04/07/11 12:00
04/08/11 00:00
04/08/11 12:00
04/09/11 00:00
04/09/11 12:00
04/10/11 00:00
04/10/11 12:00
04/11/11 00:00
ICE HARBOR DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
04/04/11 01:00
04/04/11 13:00
04/05/11 01:00
04/05/11 13:00
04/06/11 01:00
04/06/11 13:00
04/07/11 01:00
04/07/11 13:00
04/08/11 01:00
04/08/11 13:00
04/09/11 01:00
04/09/11 13:00
04/10/11 01:00
04/10/11 13:00
04/11/11 01:00
IHR Generation Flow
IHR Total Flow
IHR Spill Flow
IHR Target Spill
45 kcfs day/GC night

Figure 9


Daily Average of High 12 Hourly % TDG Values for
McNary Tailwater and John Day Forebay Projects
JDY Forebay (downstream of MCPW)
MCN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/04/11 00:00
04/04/11 12:00
04/05/11 00:00
04/05/11 12:00
04/06/11 00:00
04/06/11 12:00
04/07/11 00:00
04/07/11 12:00
04/08/11 00:00
04/08/11 12:00
04/09/11 00:00
04/09/11 12:00
04/10/11 00:00
04/10/11 12:00
04/11/11 00:00

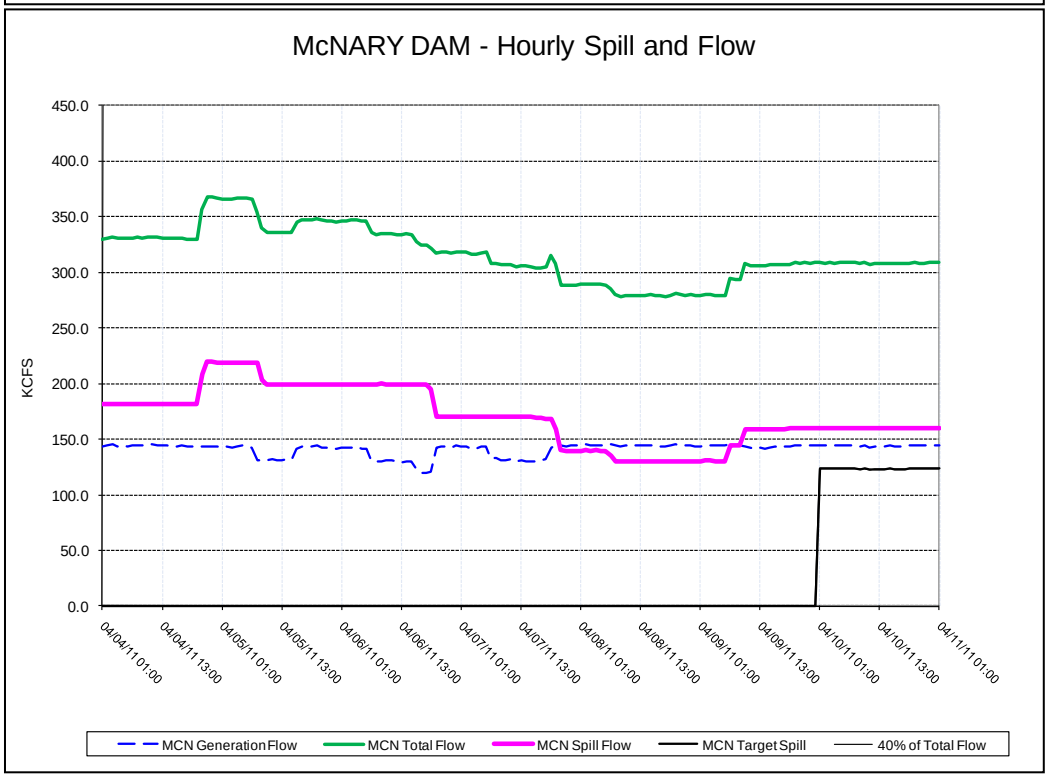
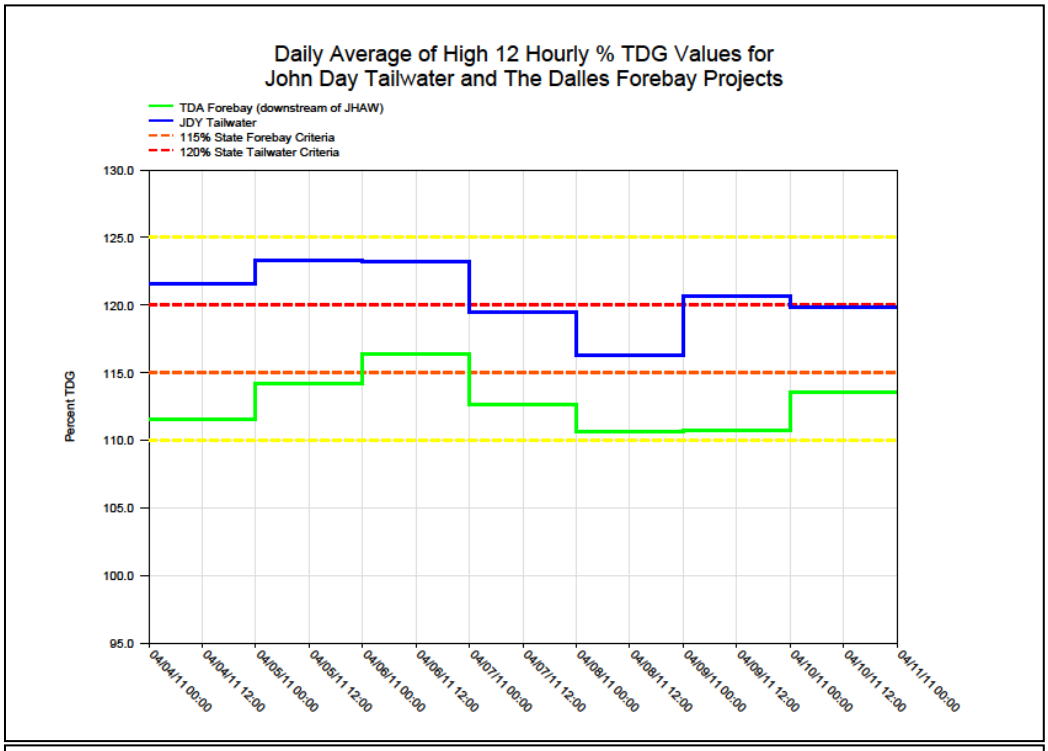

McNARY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
04/04/11 01:00
04/04/11 13:00
04/05/11 01:00
04/05/11 13:00
04/06/11 01:00
04/06/11 13:00
04/07/11 01:00
04/07/11 13:00
04/08/11 01:00
04/08/11 13:00
04/09/11 01:00
04/09/11 13:00
04/10/11 01:00
04/10/11 13:00
04/11/11 01:00
MCN Generation Flow
MCN Total Flow
MCN Spill Flow
MCN Target Spill
40% of Total Flow

Figure 10


Daily Average of High 12 Hourly % TDG Values for
John Day Tailwater and The Dalles Forebay Projects
TDA Forebay (downstream of JHAW)
JDY Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/04/11 00:00
04/04/11 12:00
04/05/11 00:00
04/05/11 12:00
04/06/11 00:00
04/06/11 12:00
04/07/11 00:00
04/07/11 12:00
04/08/11 00:00
04/08/11 12:00
04/09/11 00:00
04/09/11 12:00
04/10/11 00:00
04/10/11 12:00
04/11/11 00:00

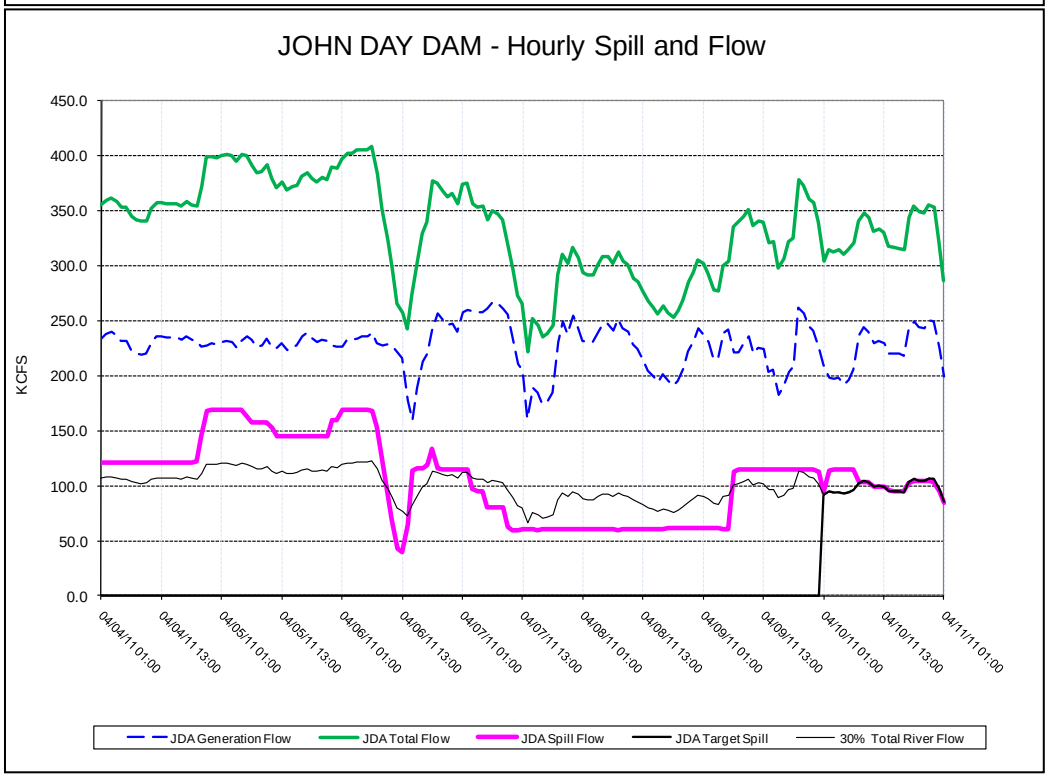
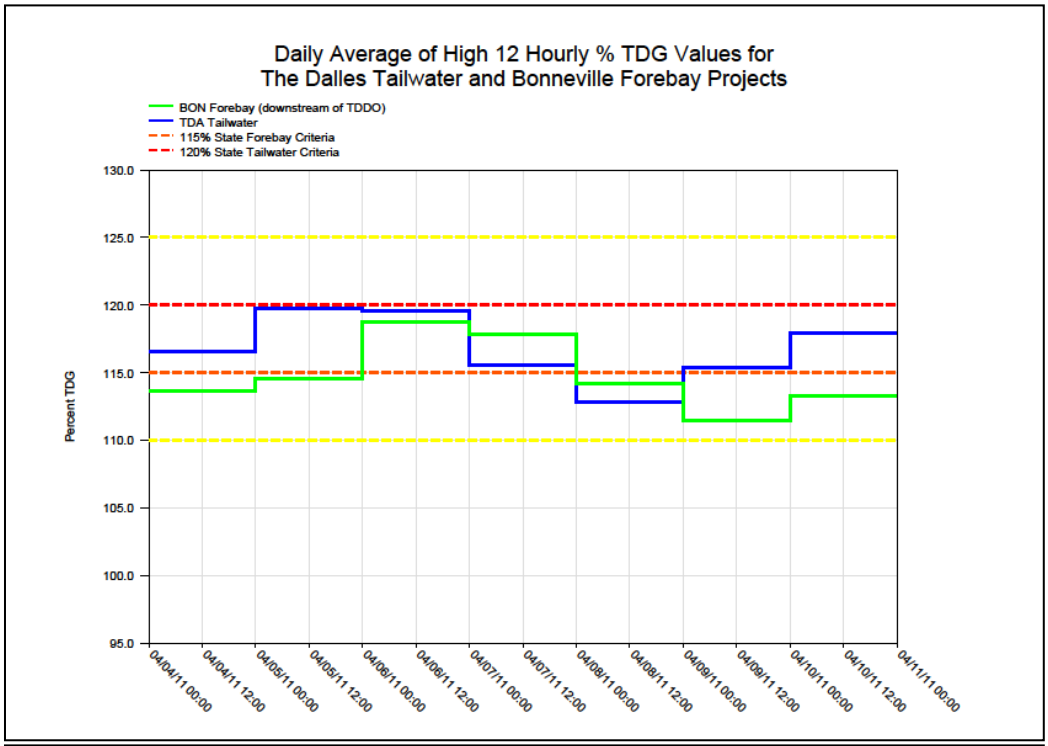

JOHN DAY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
04/04/11 01:00
04/04/11 13:00
04/05/11 01:00
04/05/11 13:00
04/06/11 01:00
04/06/11 13:00
04/07/11 01:00
04/07/11 13:00
04/08/11 01:00
04/08/11 13:00
04/09/11 01:00
04/09/11 13:00
04/10/11 01:00
04/10/11 13:00
04/11/11 01:00
JDA Generation Flow
JDA Total Flow
JDA Spill Flow
JDA Target Spill
30% Total River Flow

Figure 11


Daily Average of High 12 Hourly % TDG Values for
The Dalles Tailwater and Bonneville Forebay Projects
BON Forebay (downstream of TDDO)
TDA Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/04/11 00:00
04/04/11 12:00
04/05/11 00:00
04/05/11 12:00
04/06/11 00:00
04/06/11 12:00
04/07/11 00:00
04/07/11 12:00
04/08/11 00:00
04/08/11 12:00
04/09/11 00:00
04/09/11 12:00
04/10/11 00:00
04/10/11 12:00
04/11/11 00:00

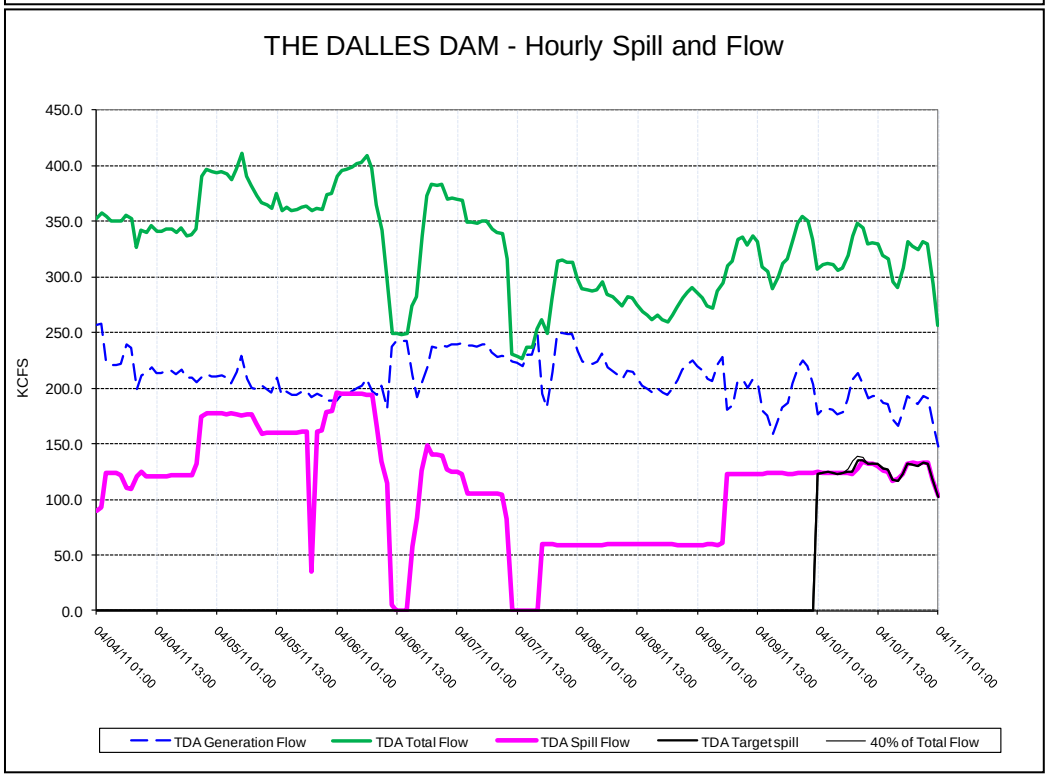
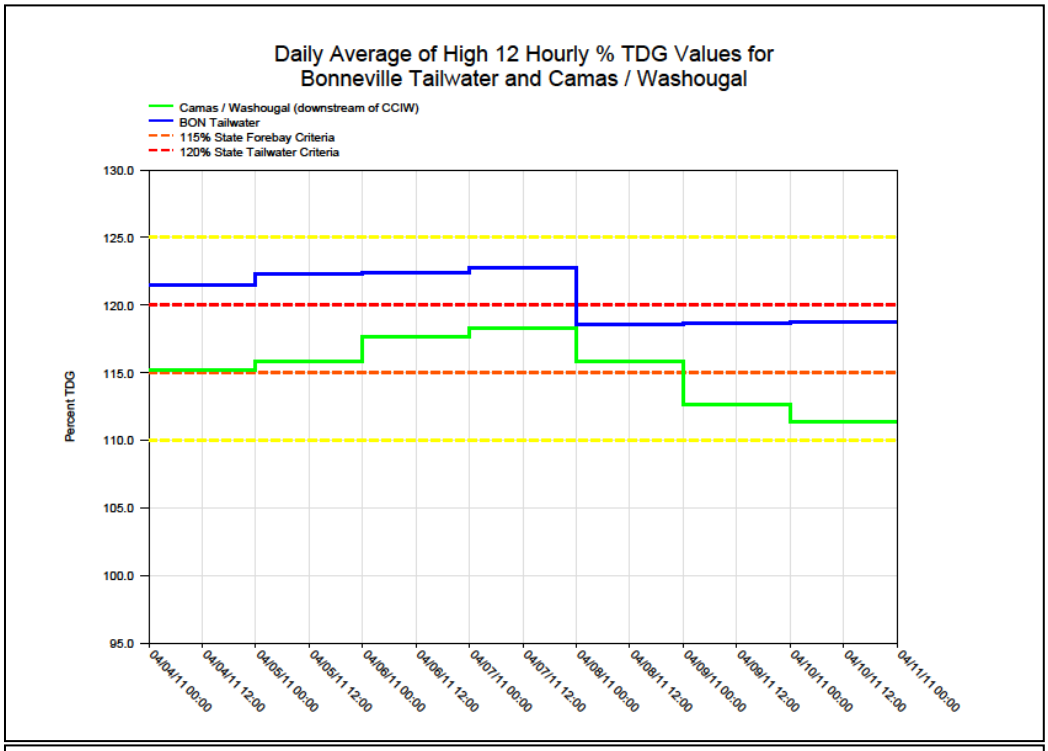

THE DALLES DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
04/04/11 01:00
04/04/11 13:00
04/05/11 01:00
04/05/11 13:00
04/06/11 01:00
04/06/11 13:00
04/07/11 01:00
04/07/11 13:00
04/08/11 01:00
04/08/11 13:00
04/09/11 01:00
04/09/11 13:00
04/10/11 01:00
04/10/11 13:00
04/11/11 01:00
TDA Generation Flow
TDA Total Flow
TDA Spill Flow
TDA Target spill
40% of Total Flow

Figure 12


Daily Average of High 12 Hourly % TDG Values for
Bonneville Tailwater and Camas / Washougal
Camas / Washougal (downstream of CCIW)
BON Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/04/11 00:00
04/04/11 12:00
04/05/11 00:00
04/05/11 12:00
04/06/11 00:00
04/06/11 12:00
04/07/11 00:00
04/07/11 12:00
04/08/11 00:00
04/08/11 12:00
04/09/11 00:00
04/09/11 12:00
04/10/11 00:00
04/10/11 12:00
04/11/11 00:00

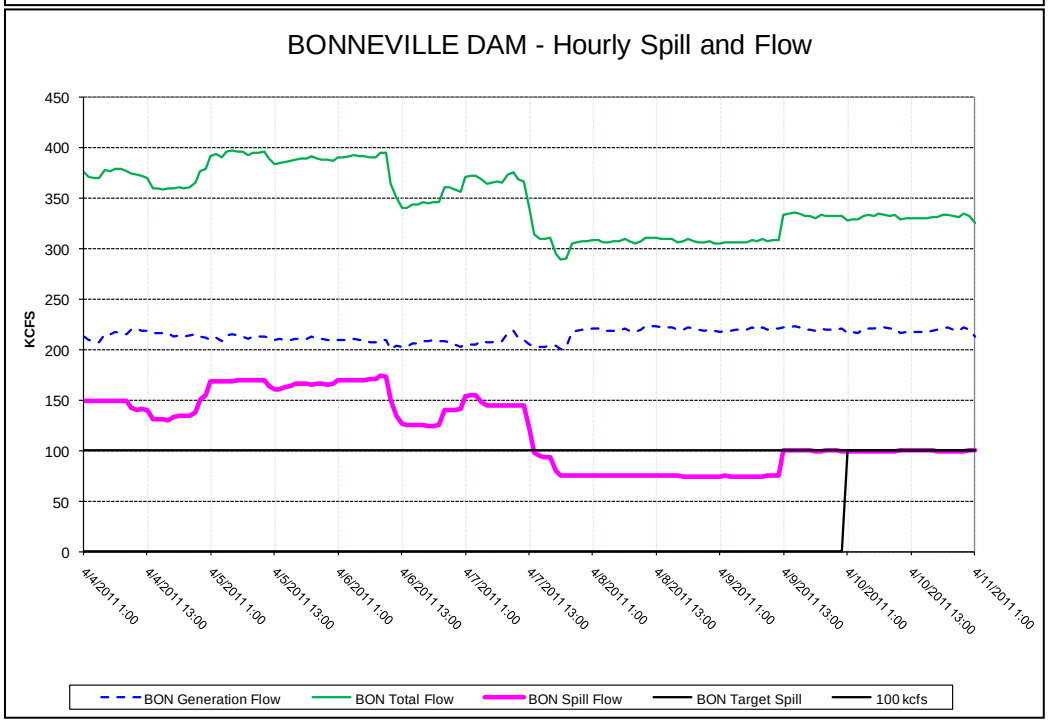
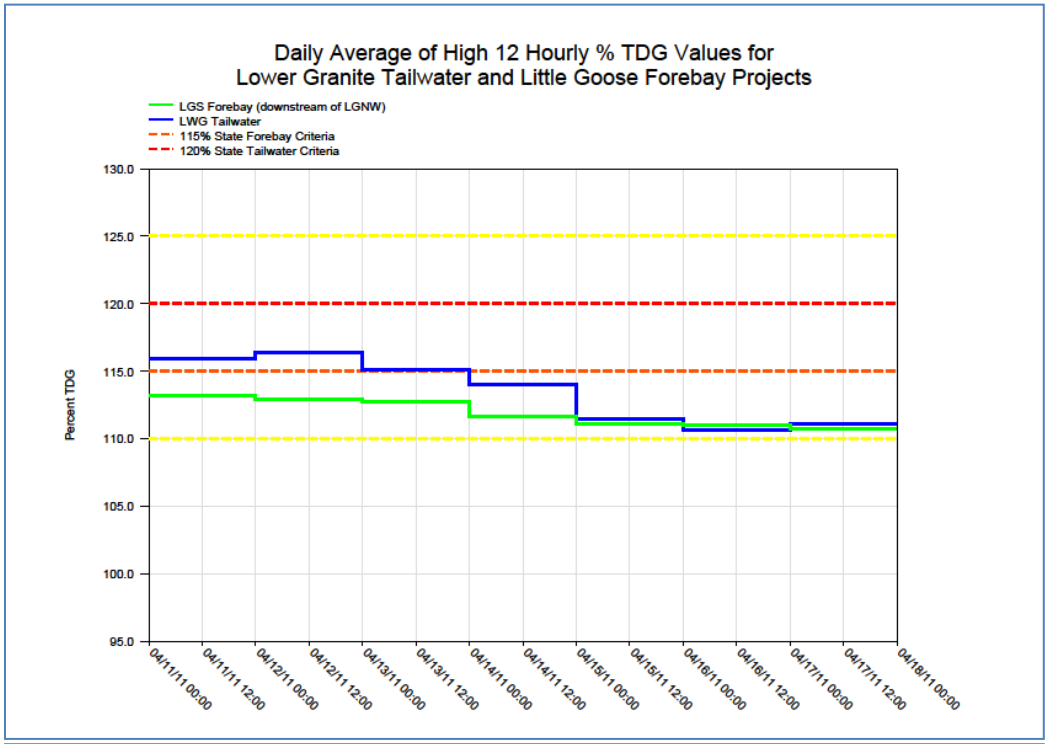

BONNEVILLE DAM - Hourly Spill and Flow
KCFS
450
400
350
300
250
200
150
100
50
0
4/4/2011 1:00
4/4/2011 13:00
4/5/2011 1:00
4/5/2011 13:00
4/6/2011 1:00
4/6/2011 13:00
4/7/2011 1:00
4/7/2011 13:00
4/8/2011 1:00
4/8/2011 13:00
4/9/2011 1:00
4/9/2011 13:00
4/10/2011 1:00
4/10/2011 13:00
4/11/2011 1:00
BON Generation Flow
BON Total Flow
BON Spill Flow
BON Target Spill
100 kcfs

Figure 13


Daily Average of High 12 Hourly % TDG Values for
Lower Granite Tailwater and Little Goose Forebay Projects
LGS Forebay (downstream of LGNW)
LWG Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/11/11 00:00
04/11/11 12:00
04/12/11 00:00
04/12/11 12:00
04/13/11 00:00
04/13/11 12:00
04/14/11 00:00
04/14/11 12:00
04/15/11 00:00
04/15/11 12:00
04/16/11 00:00
04/16/11 12:00
04/17/11 00:00
04/17/11 12:00
04/18/11 00:00

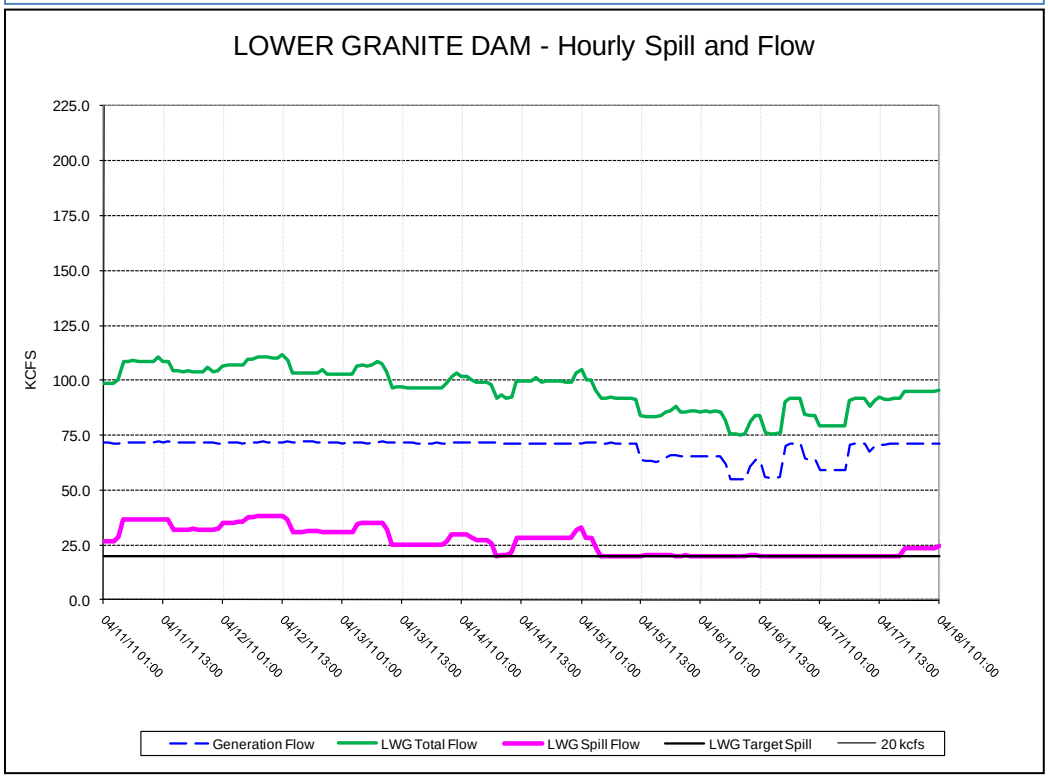
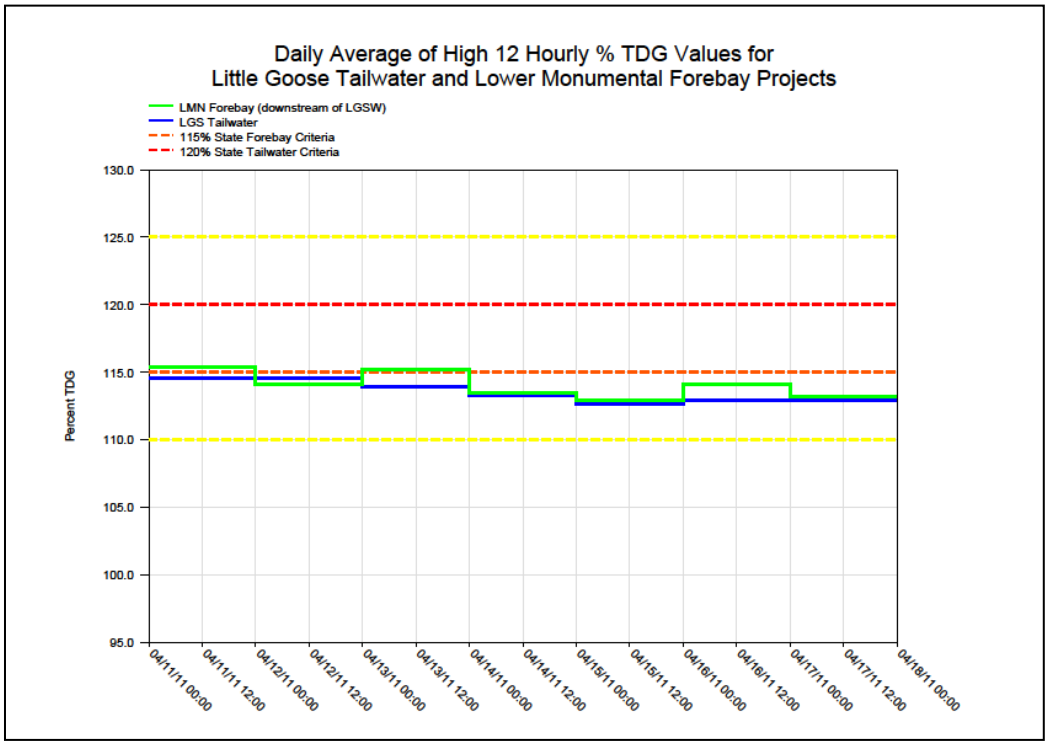

LOWER GRANITE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
04/11/11 01:00
04/11/11 13:00
04/12/11 01:00
04/12/11 13:00
04/13/11 01:00
04/13/11 13:00
04/14/11 01:00
04/14/11 13:00
04/15/11 01:00
04/15/11 13:00
04/16/11 01:00
04/16/11 13:00
04/17/11 01:00
04/17/11 13:00
04/18/11 01:00
Generation Flow
LWG Total Flow
LWG Spill Flow
LWG Target Spill
20 kcfs

Figure 14


Daily Average of High 12 Hourly % TDG Values for
Little Goose Tailwater and Lower Monumental Forebay Projects
LMN Forebay (downstream of LGSW)
LGS Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/11/11 00:00
04/11/11 12:00
04/12/11 00:00
04/12/11 12:00
04/13/11 00:00
04/13/11 12:00
04/14/11 00:00
04/14/11 12:00
04/15/11 00:00
04/15/11 12:00
04/16/11 00:00
04/16/11 12:00
04/17/11 00:00
04/17/11 12:00
04/18/11 00:00

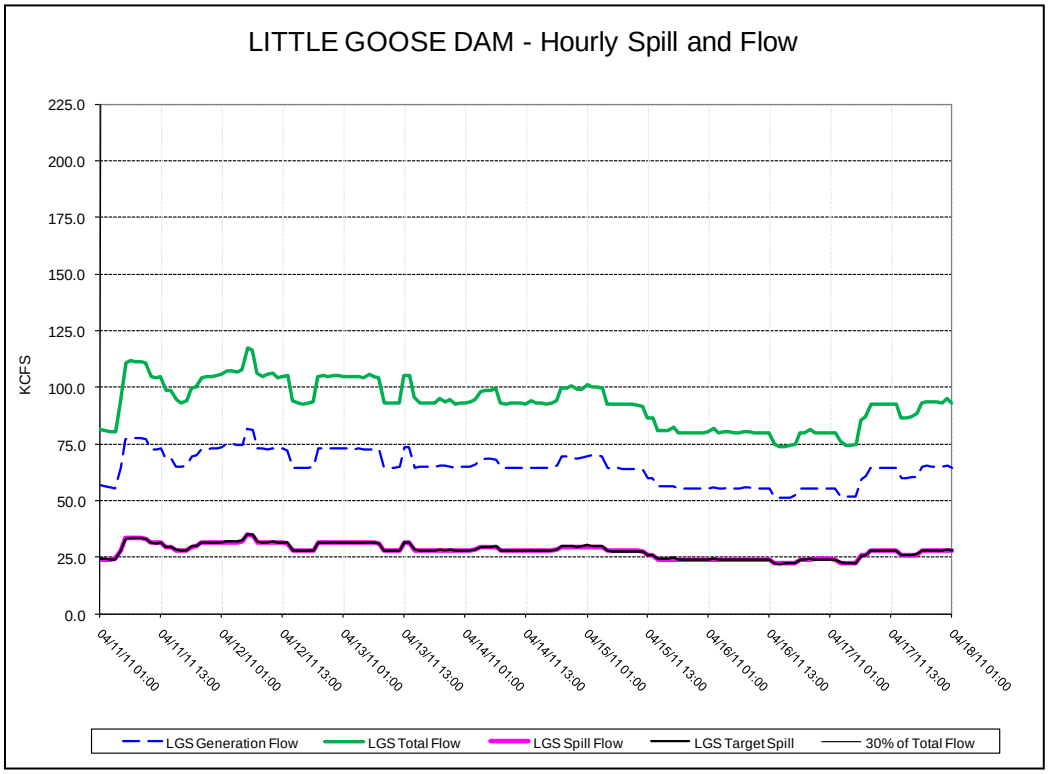
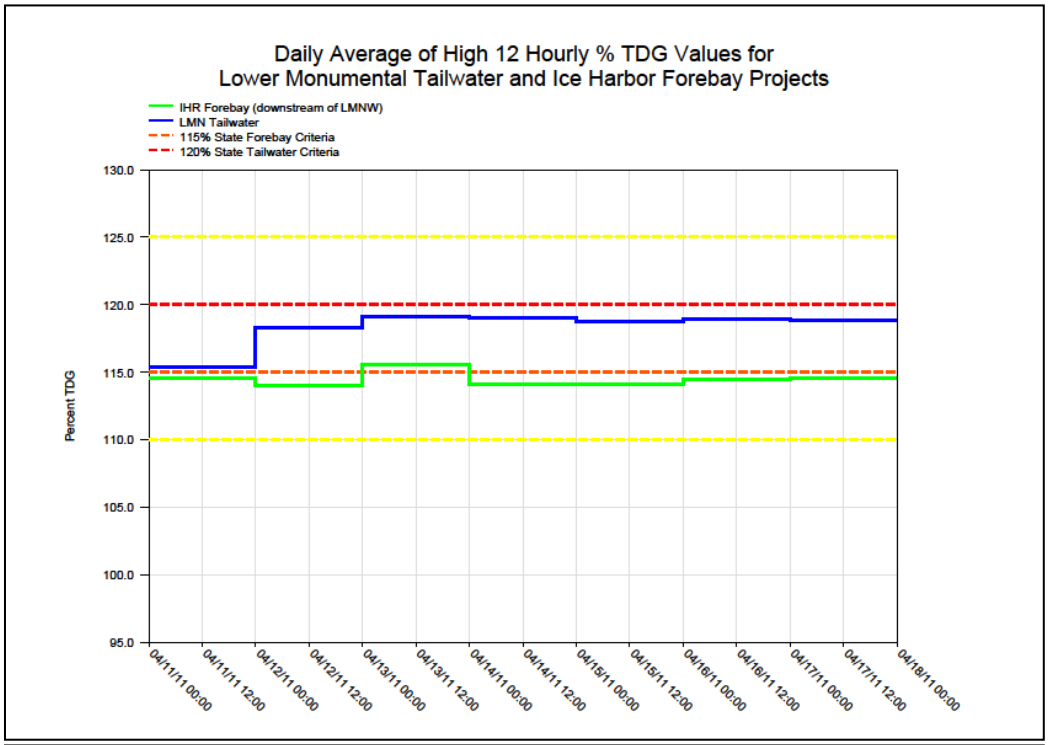

LITTLE GOOSE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
04/11/11 01:00
04/11/11 13:00
04/12/11 01:00
04/12/11 13:00
04/13/11 01:00
04/13/11 13:00
04/14/11 01:00
04/14/11 13:00
04/15/11 01:00
04/15/11 13:00
04/16/11 01:00
04/16/11 13:00
04/17/11 01:00
04/17/11 13:00
04/18/11 01:00
LGS Generation Flow
LGS Total Flow
LGS Spill Flow
LGS Target Spill
30% of Total Flow

Figure 15


Daily Average of High 12 Hourly % TDG Values for
Lower Monumental Tailwater and Ice Harbor Forebay Projects
IHR Forebay (downstream of LMNW)
LMN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/11/11 00:00
04/11/11 12:00
04/12/11 00:00
04/12/11 12:00
04/13/11 00:00
04/13/11 12:00
04/14/11 00:00
04/14/11 12:00
04/15/11 00:00
04/15/11 12:00
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04/16/11 12:00
04/17/11 00:00
04/17/11 12:00
04/18/11 00:00

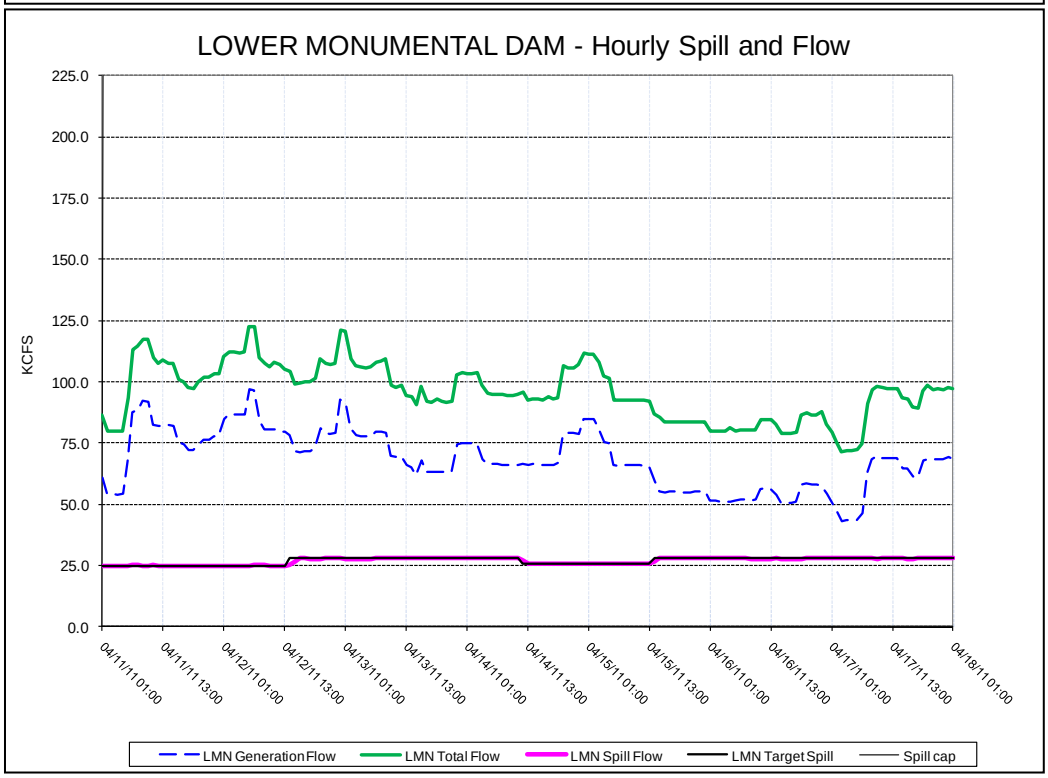
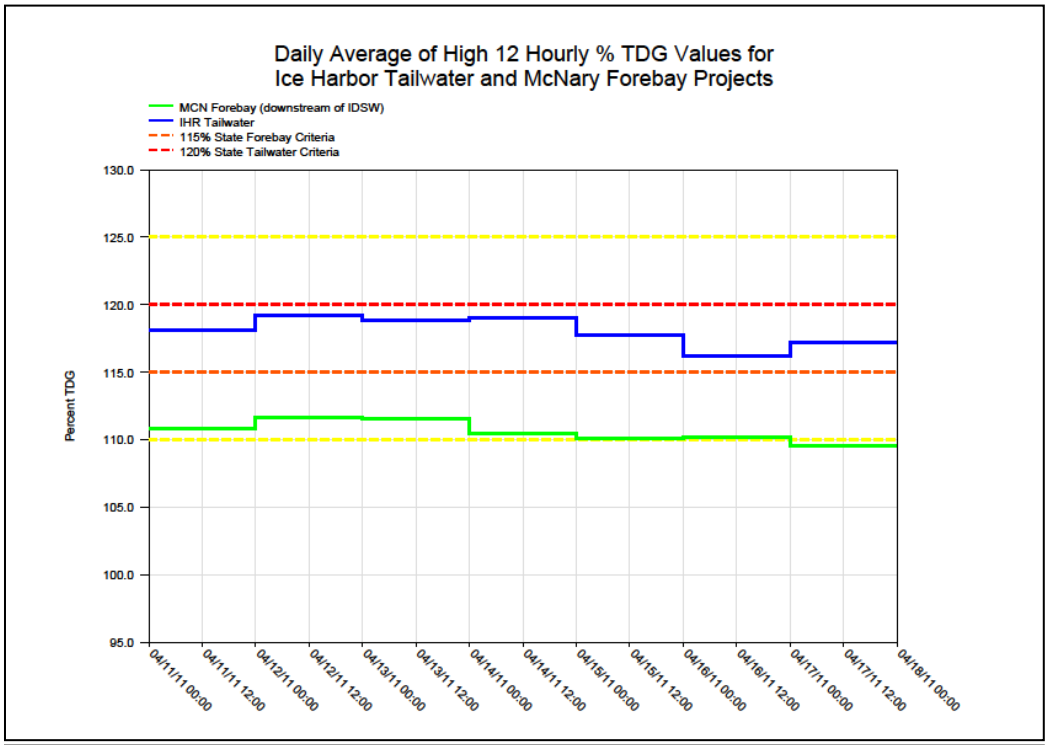

LOWER MONUMENTAL DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
04/11/11 01:00
04/11/11 13:00
04/12/11 01:00
04/12/11 13:00
04/13/11 01:00
04/13/11 13:00
04/14/11 01:00
04/14/11 13:00
04/15/11 01:00
04/15/11 13:00
04/16/11 01:00
04/16/11 13:00
04/17/11 01:00
04/17/11 13:00
04/18/11 01:00
LMN Generation Flow
LMN Total Flow
LMN Spill Flow
LMN Target Spill
Spill cap

Figure 16


Daily Average of High 12 Hourly % TDG Values for
Ice Harbor Tailwater and McNary Forebay Projects
MCN Forebay (downstream of IDSW)
IHR Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/11/11 00:00
04/11/11 12:00
04/12/11 00:00
04/12/11 12:00
04/13/11 00:00
04/13/11 12:00
04/14/11 00:00
04/14/11 12:00
04/15/11 00:00
04/15/11 12:00
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04/16/11 12:00
04/17/11 00:00
04/17/11 12:00
04/18/11 00:00

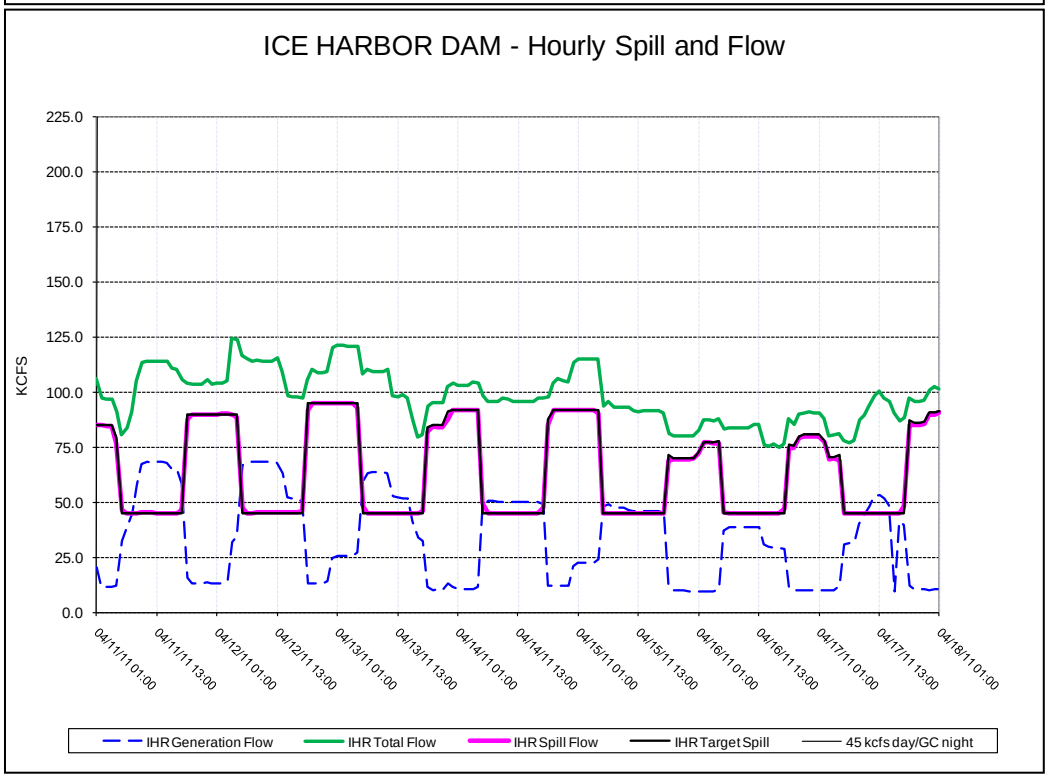
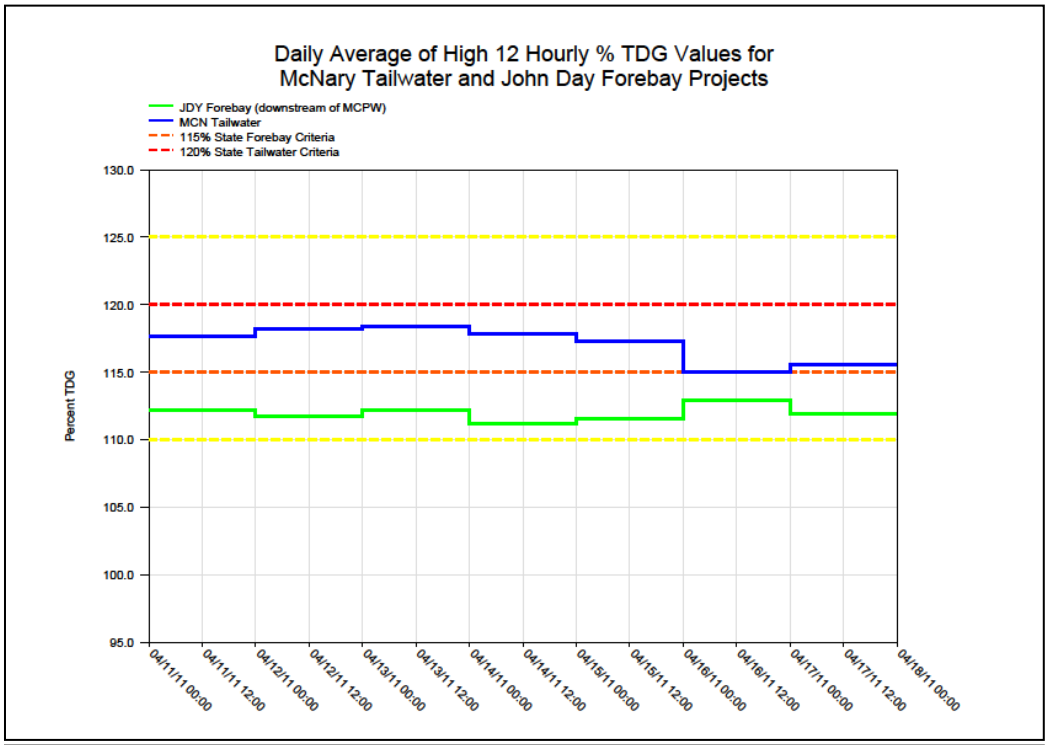

ICE HARBOR DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
04/11/11 01:00
04/11/11 13:00
04/12/11 01:00
04/12/11 13:00
04/13/11 01:00
04/13/11 13:00
04/14/11 01:00
04/14/11 13:00
04/15/11 01:00
04/15/11 13:00
04/16/11 01:00
04/16/11 13:00
04/17/11 01:00
04/17/11 13:00
04/18/11 01:00
IHR Generation Flow
IHR Total Flow
IHR Spill Flow
IHR Target Spill
45 kcfs day/GC night

Figure 17


Daily Average of High 12 Hourly % TDG Values for
McNary Tailwater and John Day Forebay Projects
JDY Forebay (downstream of MCPW)
MCN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/11/11 00:00
04/11/11 12:00
04/12/11 00:00
04/12/11 12:00
04/13/11 00:00
04/13/11 12:00
04/14/11 00:00
04/14/11 12:00
04/15/11 00:00
04/15/11 12:00
04/16/11 00:00
04/16/11 12:00
04/17/11 00:00
04/17/11 12:00
04/18/11 00:00

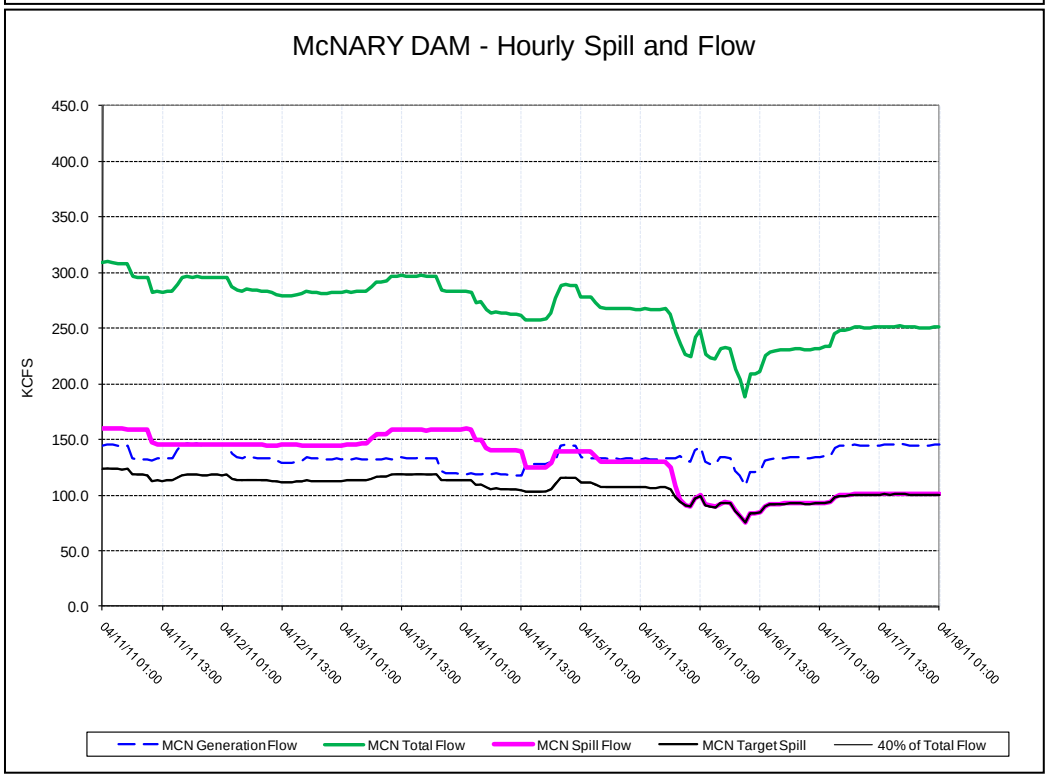
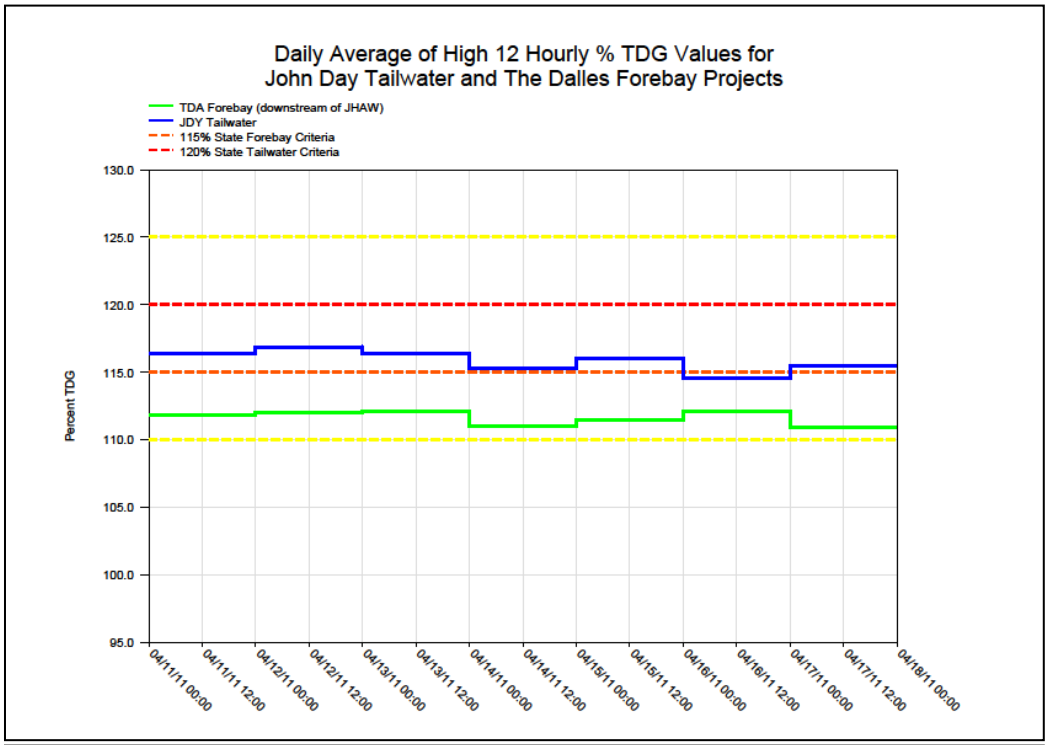

McNARY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
04/11/11 01:00
04/11/11 13:00
04/12/11 01:00
04/12/11 13:00
04/13/11 01:00
04/13/11 13:00
04/14/11 01:00
04/14/11 13:00
04/15/11 01:00
04/15/11 13:00
04/16/11 01:00
04/16/11 13:00
04/17/11 01:00
04/17/11 13:00
04/18/11 01:00
MCN Generation Flow
MCN Total Flow
MCN Spill Flow
MCN Target Spill
40% of Total Flow

Figure 18


Daily Average of High 12 Hourly % TDG Values for
John Day Tailwater and The Dalles Forebay Projects
TDA Forebay (downstream of JHAW)
JDY Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/11/11 00:00
04/11/11 12:00
04/12/11 00:00
04/12/11 12:00
04/13/11 00:00
04/13/11 12:00
04/14/11 00:00
04/14/11 12:00
04/15/11 00:00
04/15/11 12:00
04/16/11 00:00
04/16/11 12:00
04/17/11 00:00
04/17/11 12:00
04/18/11 00:00

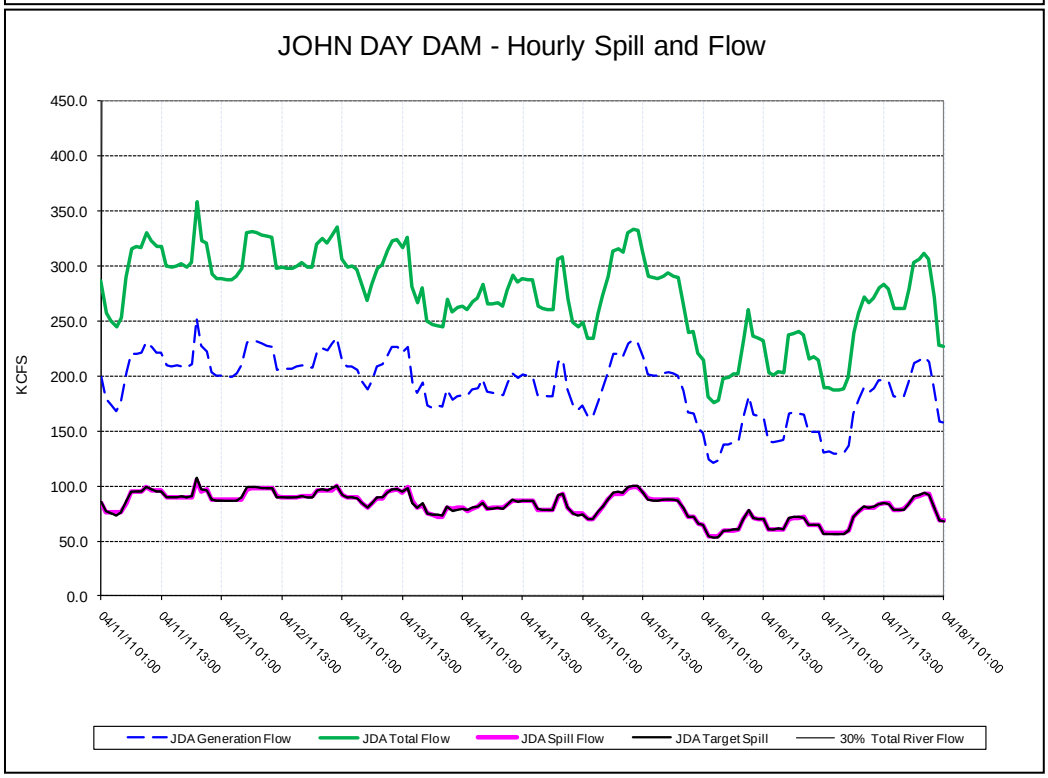
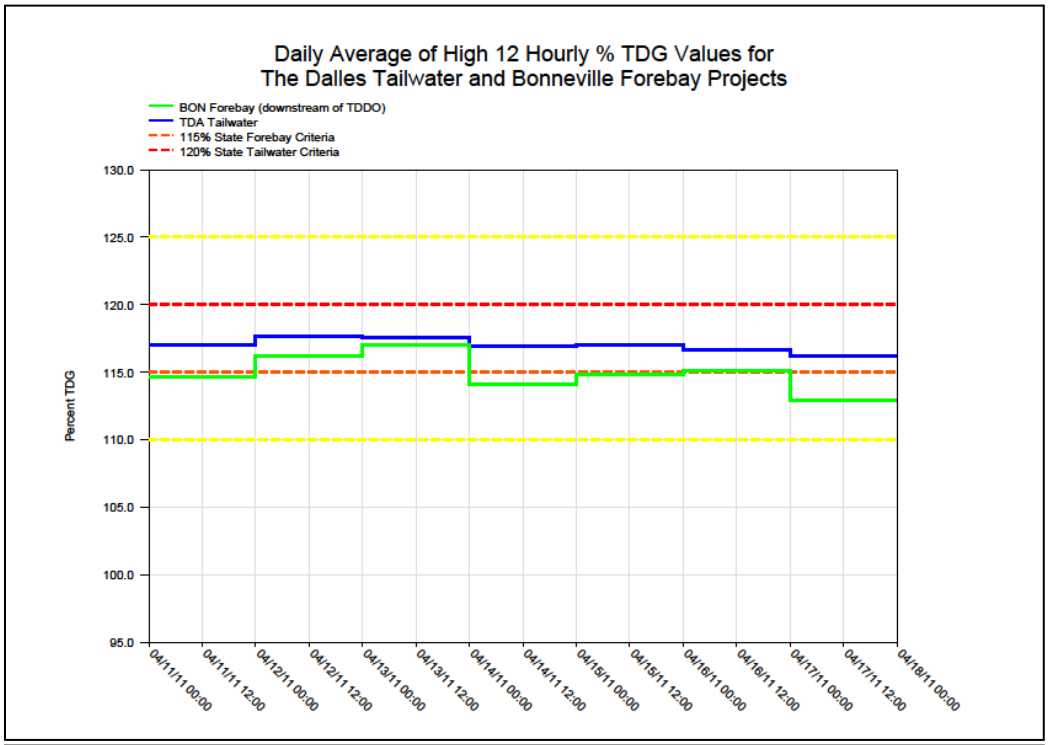

JOHN DAY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
04/11/11 01:00
04/11/11 13:00
04/12/11 01:00
04/12/11 13:00
04/13/11 01:00
04/13/11 13:00
04/14/11 01:00
04/14/11 13:00
04/15/11 01:00
04/15/11 13:00
04/16/11 01:00
04/16/11 13:00
04/17/11 01:00
04/17/11 13:00
04/18/11 01:00
JDA Generation Flow
JDA Total Flow
JDA Spill Flow
JDA Target Spill
30% Total River Flow

Figure 19


Daily Average of High 12 Hourly % TDG Values for
The Dalles Tailwater and Bonneville Forebay Projects
BON Forebay (downstream of TDDO)
TDA Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/11/11 00:00
04/11/11 12:00
04/12/11 00:00
04/12/11 12:00
04/13/11 00:00
04/13/11 12:00
04/14/11 00:00
04/14/11 12:00
04/15/11 00:00
04/15/11 12:00
04/16/11 00:00
04/16/11 12:00
04/17/11 00:00
04/17/11 12:00
04/18/11 00:00

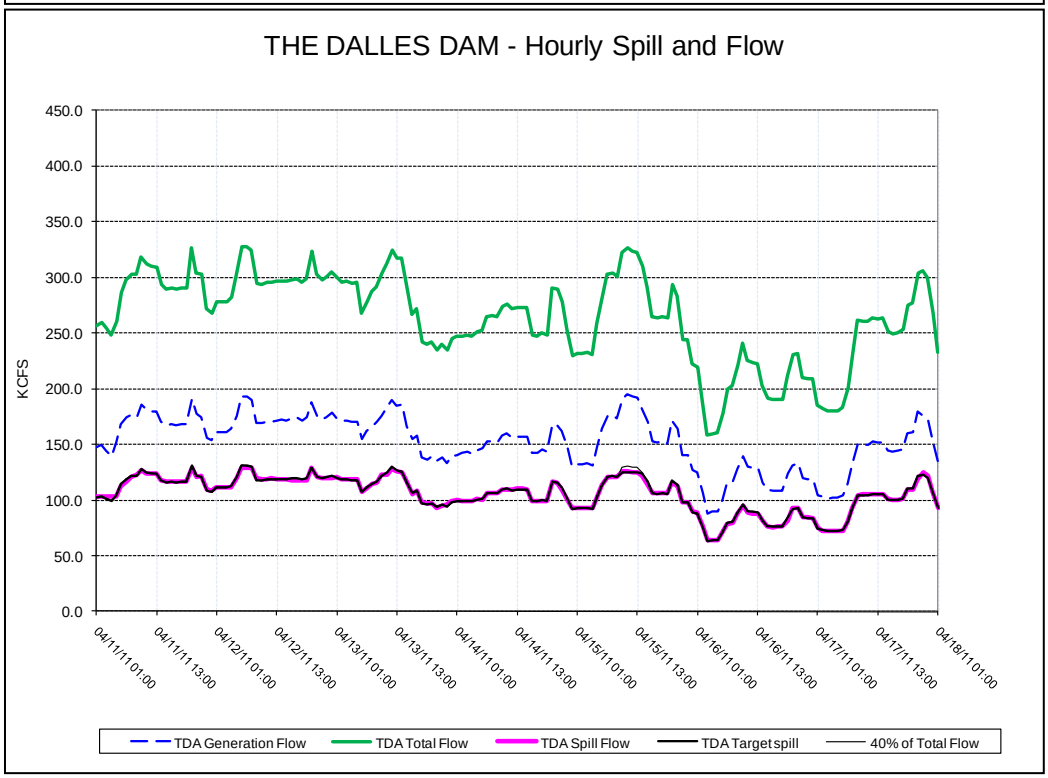
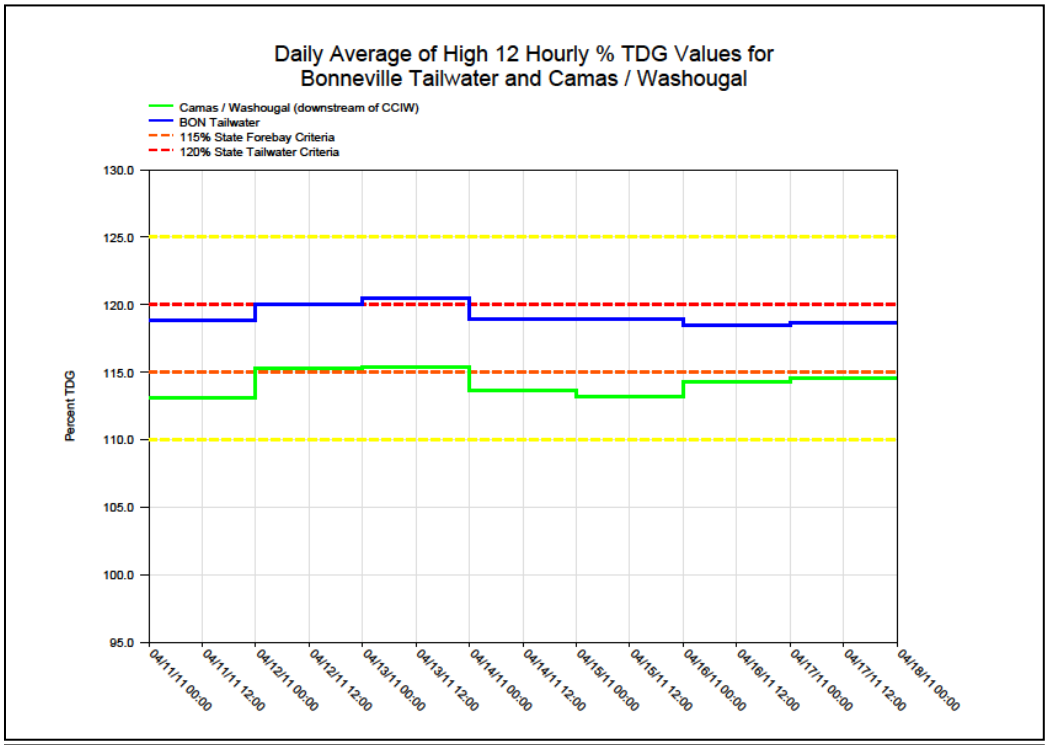

THE DALLES DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
04/11/11 01:00
04/11/11 13:00
04/12/11 01:00
04/12/11 13:00
04/13/11 01:00
04/13/11 13:00
04/14/11 01:00
04/14/11 13:00
04/15/11 01:00
04/15/11 13:00
04/16/11 01:00
04/16/11 13:00
04/17/11 01:00
04/17/11 13:00
04/18/11 01:00
TDA Generation Flow
TDA Total Flow
TDA Spill Flow
TDA Target spill
40% of Total Flow

Figure 20


Daily Average of High 12 Hourly % TDG Values for
Bonneville Tailwater and Camas / Washougal
Camas / Washougal (downstream of CCIW)
BON Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/11/11 00:00
04/11/11 12:00
04/12/11 00:00
04/12/11 12:00
04/13/11 00:00
04/13/11 12:00
04/14/11 00:00
04/14/11 12:00
04/15/11 00:00
04/15/11 12:00
04/16/11 00:00
04/16/11 12:00
04/17/11 00:00
04/17/11 12:00
04/18/11 00:00

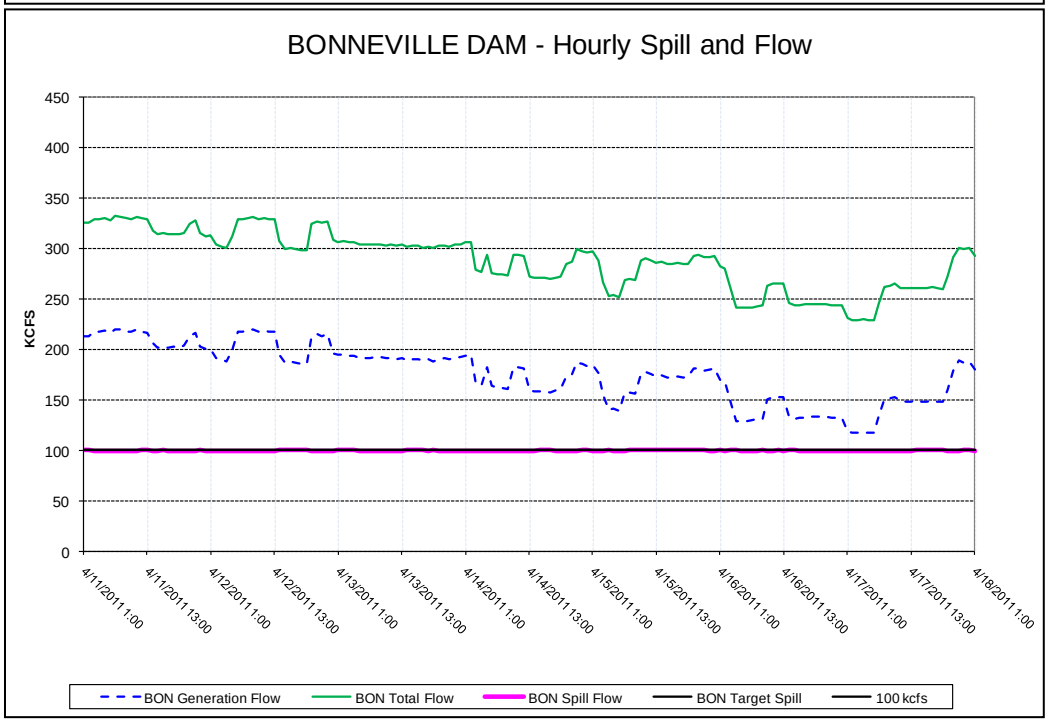

BONNEVILLE DAM - Hourly Spill and Flow
KCFS
450
400
350
300
250
200
150
100
50
0
4/11/2011 1:00
4/11/2011 13:00
4/12/2011 1:00
4/12/2011 13:00
4/13/2011 1:00
4/13/2011 13:00
4/14/2011 1:00
4/14/2011 13:00
4/15/2011 1:00
4/15/2011 13:00
4/16/2011 1:00
4/16/2011 13:00
4/17/2011 1:00
4/17/2011 13:00
4/18/2011 1:00
BON Generation Flow
BON Total Flow
BON Spill Flow
BON Target Spill
100 kcfs

Figure 21

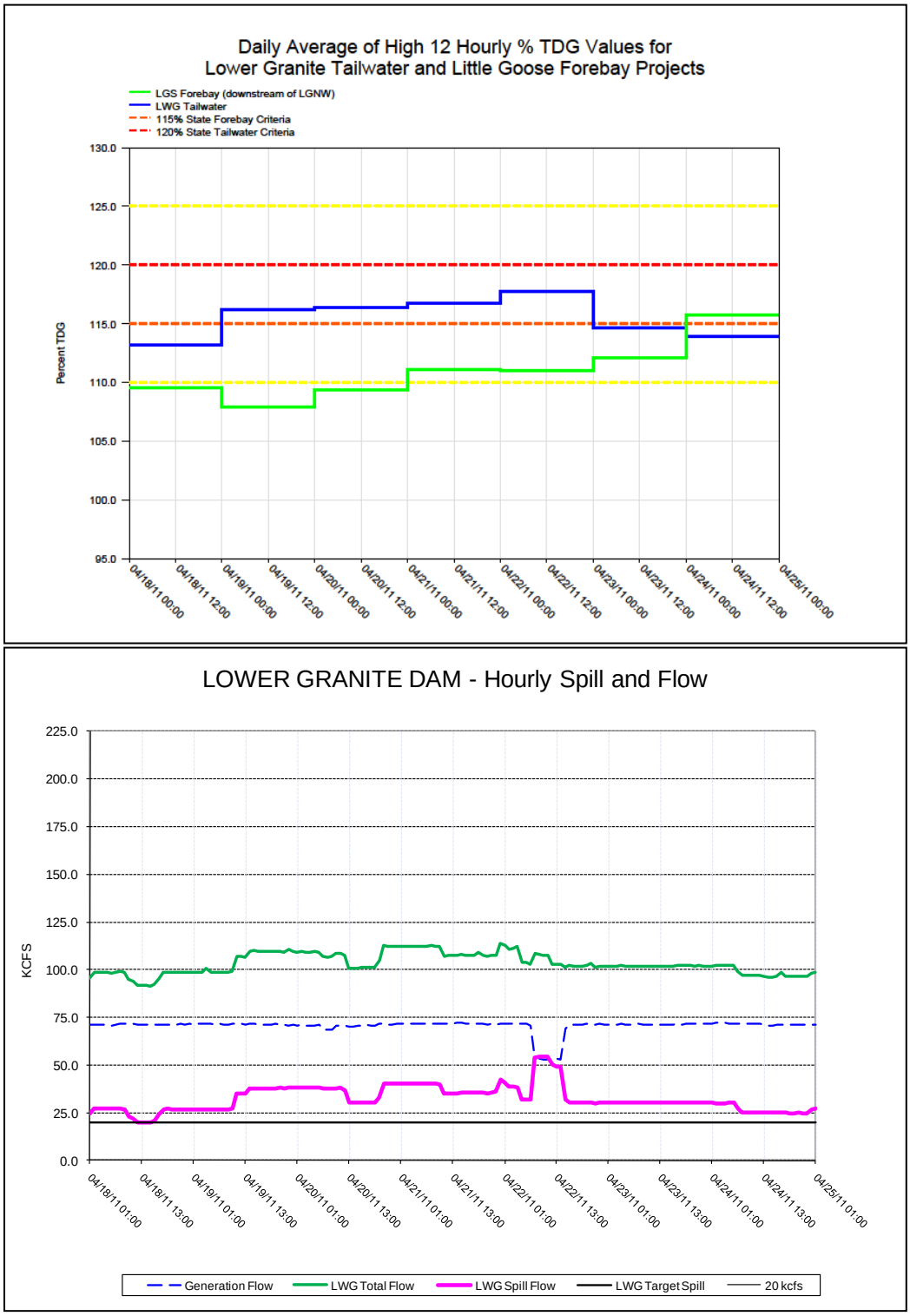
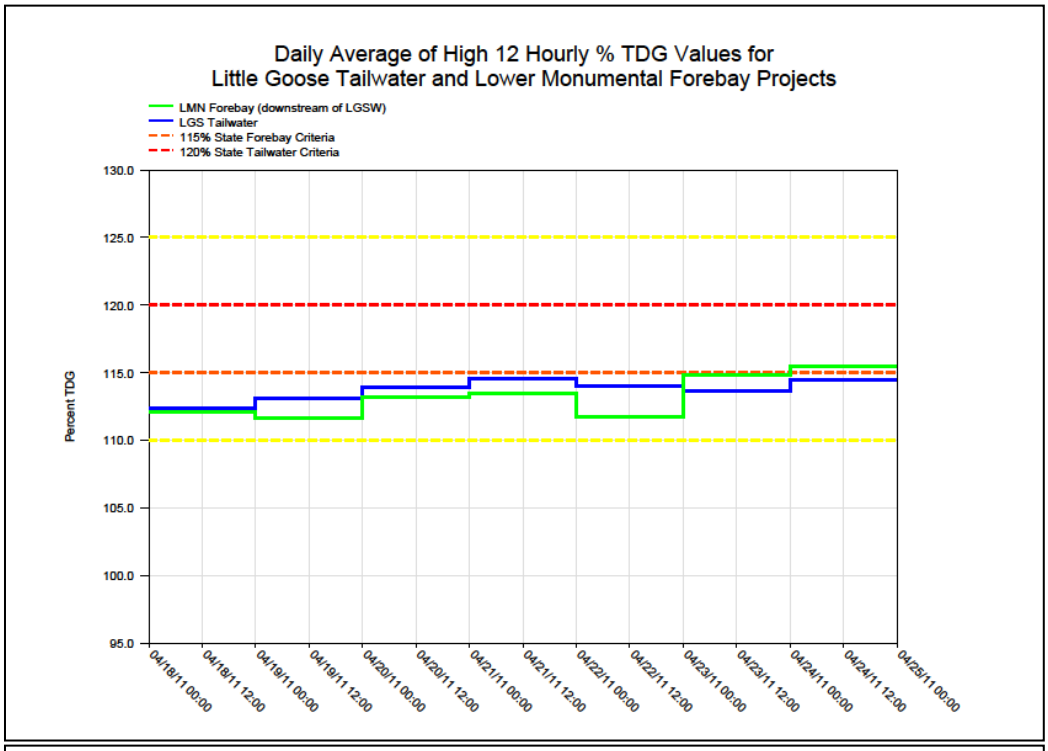

Daily Average of High 12 Hourly % TDG Values for
Lower Granite Tailwater and Little Goose Forebay Projects
LGS Forebay (downstream of LGNW)
LWG Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/18/11 00:00
04/18/11 12:00
04/19/11 00:00
04/19/11 12:00
04/20/11 00:00
04/20/11 12:00
04/21/11 00:00
04/21/11 12:00
04/22/11 00:00
04/22/11 12:00
04/23/11 00:00
04/23/11 12:00
04/24/11 00:00
04/24/11 12:00
04/25/11 00:00
LOWER GRANITE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
04/18/11 01:00
04/18/11 13:00
04/19/11 01:00
04/19/11 13:00
04/20/11 01:00
04/20/11 13:00
04/21/11 01:00
04/21/11 13:00
04/22/11 01:00
04/22/11 13:00
04/23/11 01:00
04/23/11 13:00
04/24/11 01:00
04/24/11 13:00
04/25/11 01:00
Generation Flow
LWG Total Flow
LWG Spill Flow
LWG Target Spill
20 kcfs

Figure 22


Daily Average of High 12 Hourly % TDG Values for
Little Goose Tailwater and Lower Monumental Forebay Projects
LMN Forebay (downstream of LGSW)
LGS Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/18/11 00:00
04/18/11 12:00
04/19/11 00:00
04/19/11 12:00
04/20/11 00:00
04/20/11 12:00
04/21/11 00:00
04/21/11 12:00
04/22/11 00:00
04/22/11 12:00
04/23/11 00:00
04/23/11 12:00
04/24/11 00:00
04/24/11 12:00
04/25/11 00:00

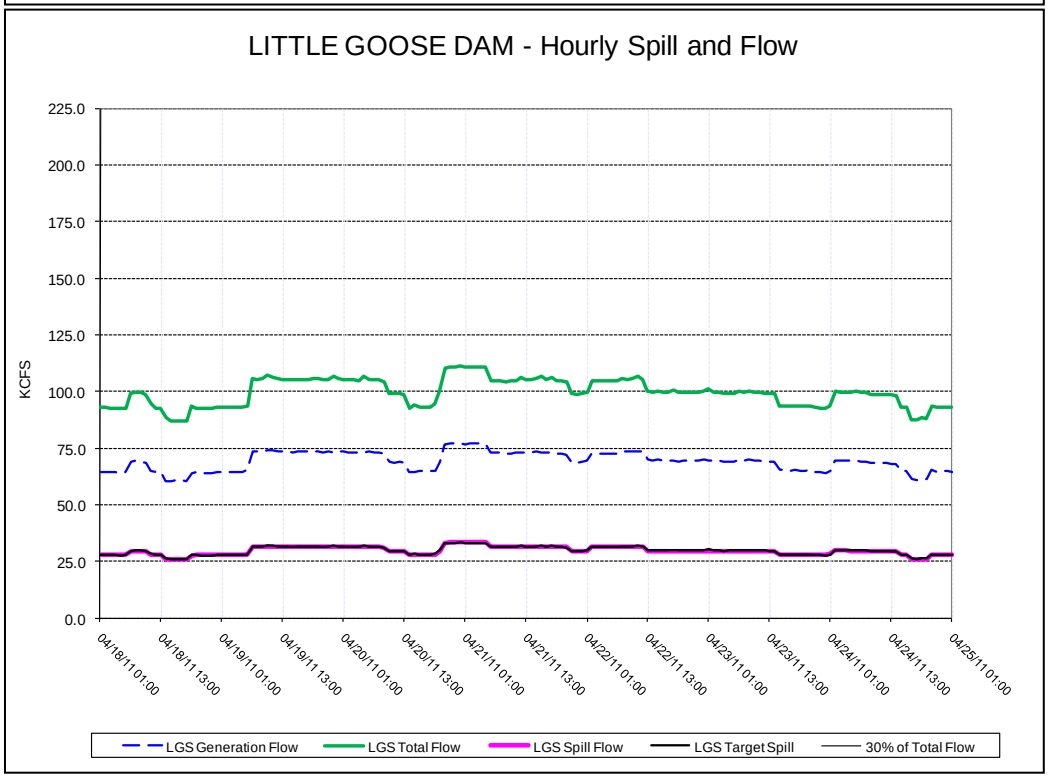
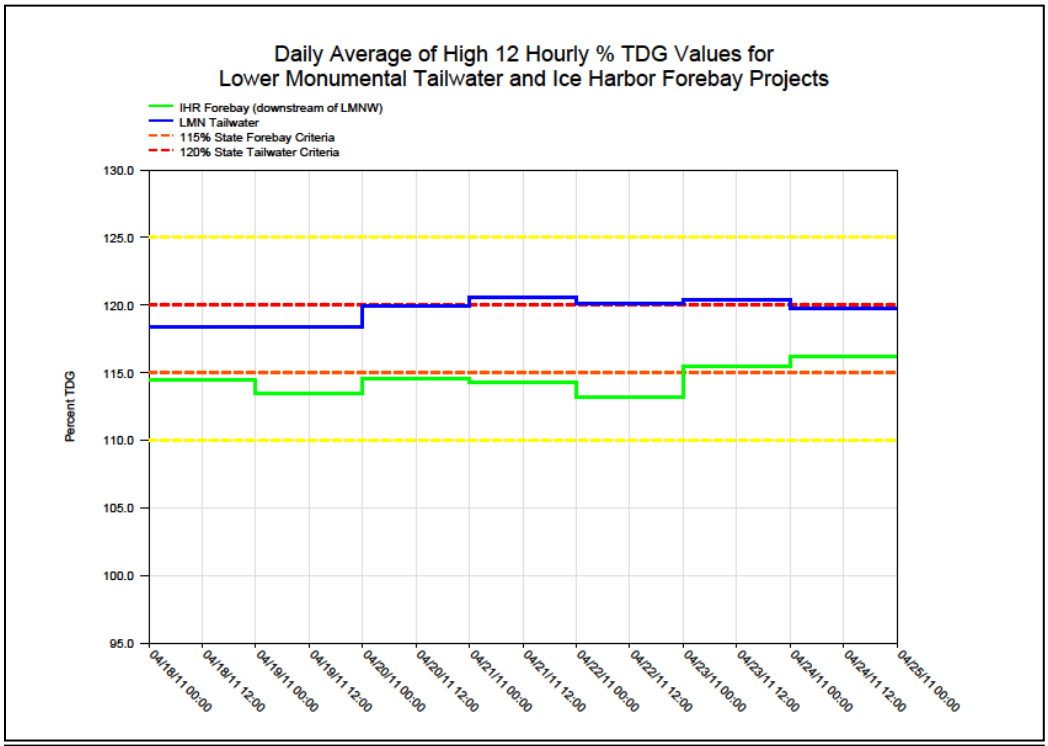

LITTLE GOOSE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
04/18/11 01:00
04/18/11 13:00
04/19/11 01:00
04/19/11 13:00
04/20/11 01:00
04/20/11 13:00
04/21/11 01:00
04/21/11 13:00
04/22/11 01:00
04/22/11 13:00
04/23/11 01:00
04/23/11 13:00
04/24/11 01:00
04/24/11 13:00
04/25/11 01:00
LGS Generation Flow
LGS Total Flow
LGS Spill Flow
LGS Target Spill
30% of Total Flow

Figure 23


Daily Average of High 12 Hourly % TDG Values for
Lower Monumental Tailwater and Ice Harbor Forebay Projects
IHR Forebay (downstream of LMNW)
LMN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/18/11 00:00
04/18/11 12:00
04/19/11 00:00
04/19/11 12:00
04/20/11 00:00
04/20/11 12:00
04/21/11 00:00
04/21/11 12:00
04/22/11 00:00
04/22/11 12:00
04/23/11 00:00
04/23/11 12:00
04/24/11 00:00
04/24/11 12:00
04/25/11 00:00

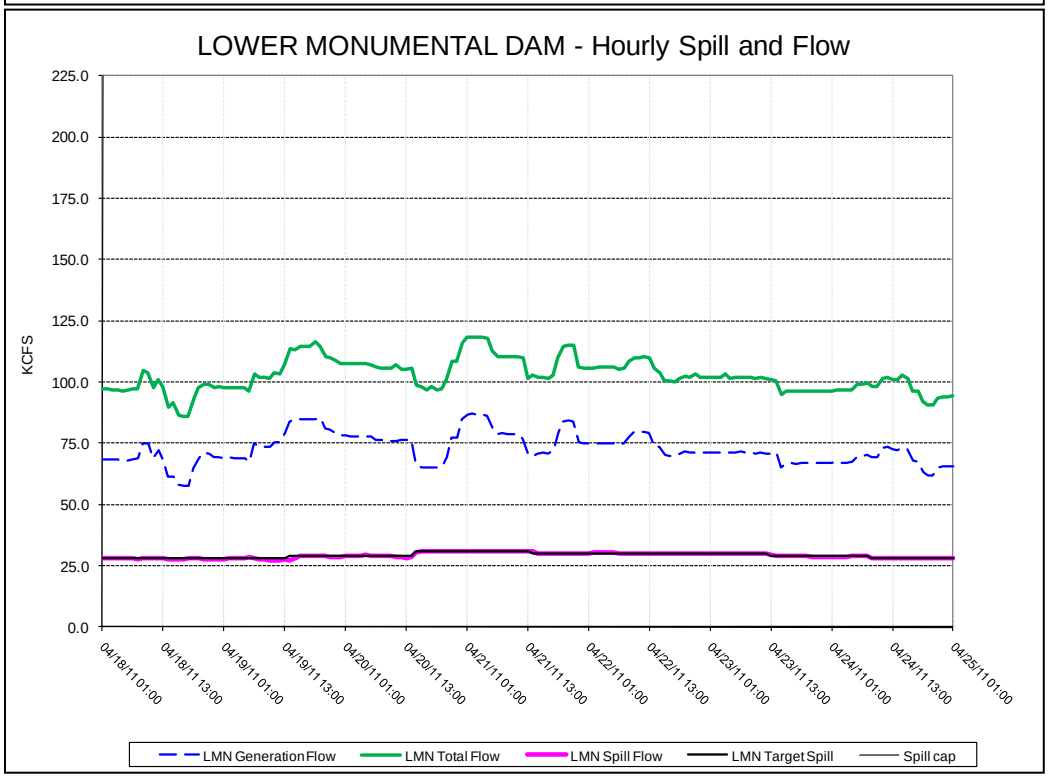

LOWER MONUMENTAL DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
04/18/11 01:00
04/18/11 13:00
04/19/11 01:00
04/19/11 13:00
04/20/11 01:00
04/20/11 13:00
04/21/11 01:00
04/21/11 13:00
04/22/11 01:00
04/22/11 13:00
04/23/11 01:00
04/23/11 13:00
04/24/11 01:00
04/24/11 13:00
04/25/11 01:00
LMN Generation Flow
LMN Total Flow
LMN Spill Flow
LMN Target Spill
Spill cap

Figure 24

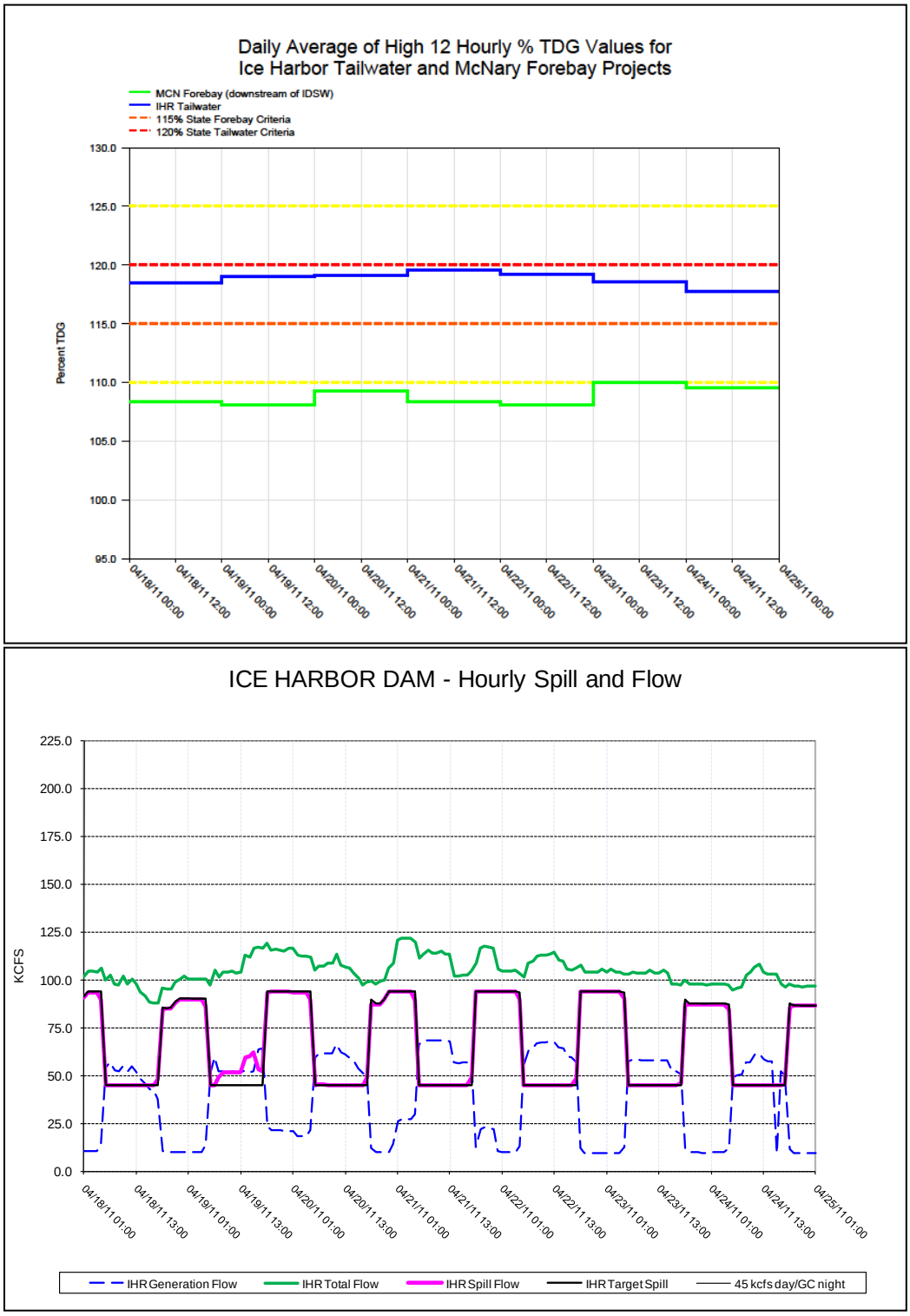
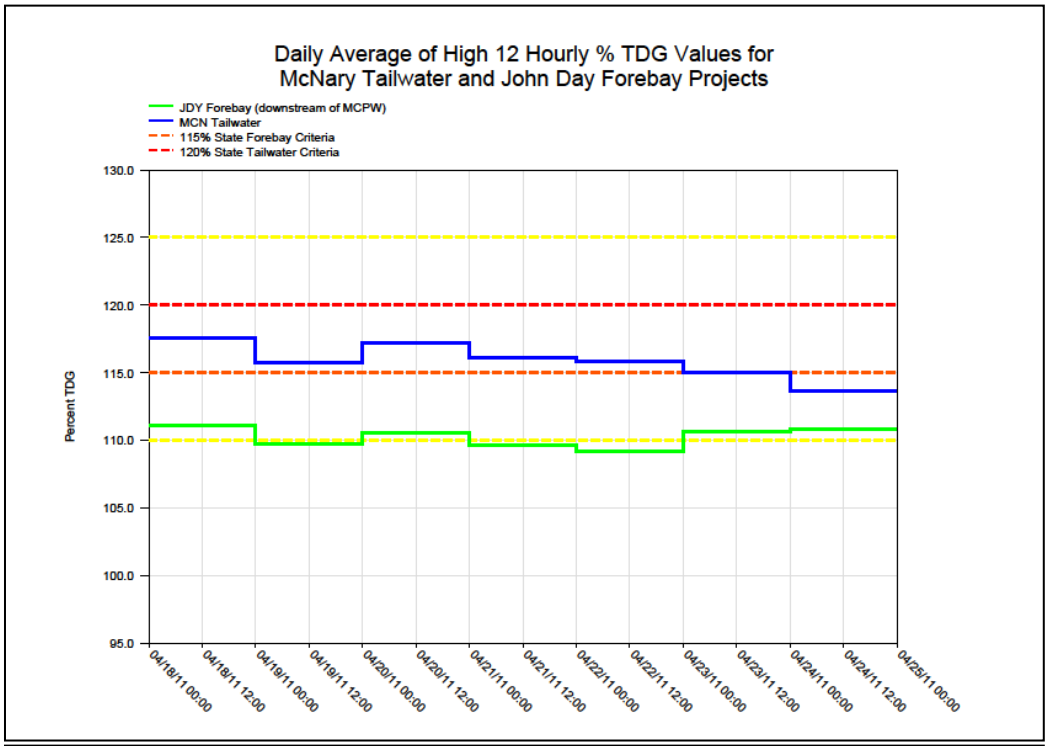

Daily Average of High 12 Hourly % TDG Values for
Ice Harbor Tailwater and McNary Forebay Projects
MCN Forebay (downstream of IDSW)
IHR Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/18/11 00:00
04/18/11 12:00
04/19/11 00:00
04/19/11 12:00
04/20/11 00:00
04/20/11 12:00
04/21/11 00:00
04/21/11 12:00
04/22/11 00:00
04/22/11 12:00
04/23/11 00:00
04/23/11 12:00
04/24/11 00:00
04/24/11 12:00
04/25/11 00:00
ICE HARBOR DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
04/18/11 01:00
04/18/11 13:00
04/19/11 01:00
04/19/11 13:00
04/20/11 01:00
04/20/11 13:00
04/21/11 01:00
04/21/11 13:00
04/22/11 01:00
04/22/11 13:00
04/23/11 01:00
04/23/11 13:00
04/24/11 01:00
04/24/11 13:00
04/25/11 01:00
IHR Generation Flow
IHR Total Flow
IHR Spill Flow
IHR Target Spill
45 kcfs day/GC night

Figure 25


Daily Average of High 12 Hourly % TDG Values for
McNary Tailwater and John Day Forebay Projects
JDY Forebay (downstream of MCPW)
MCN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/18/11 00:00
04/18/11 12:00
04/19/11 00:00
04/19/11 12:00
04/20/11 00:00
04/20/11 12:00
04/21/11 00:00
04/21/11 12:00
04/22/11 00:00
04/22/11 12:00
04/23/11 00:00
04/23/11 12:00
04/24/11 00:00
04/24/11 12:00
04/25/11 00:00

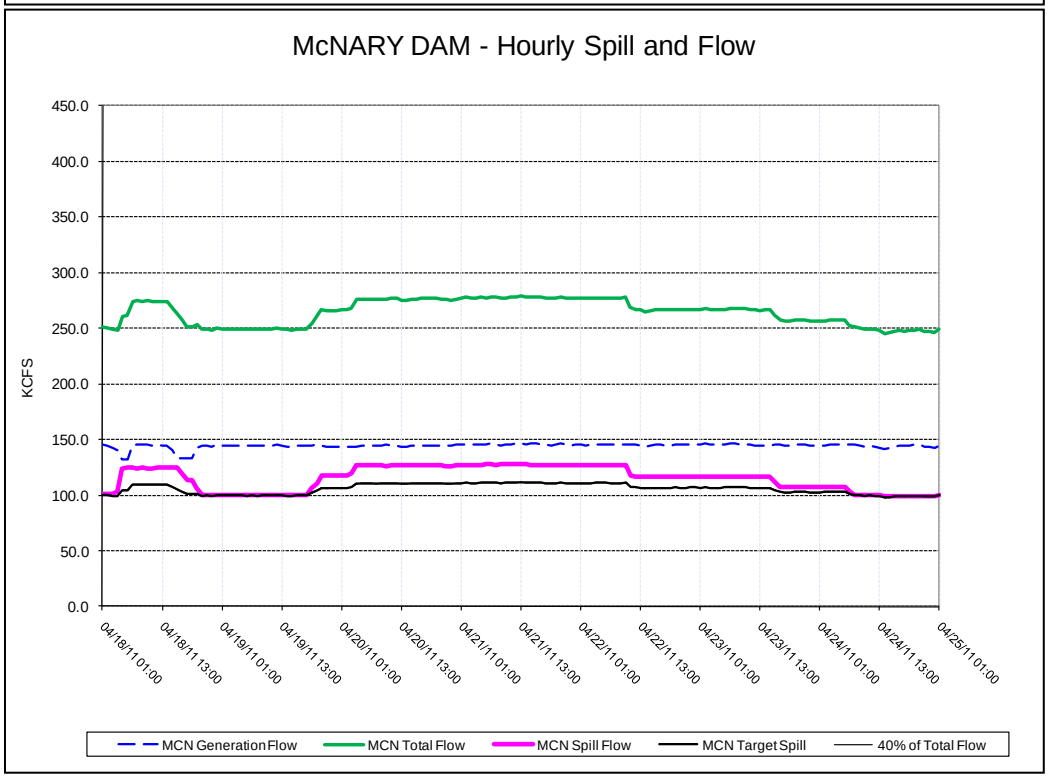

McNARY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
04/18/11 01:00
04/18/11 13:00
04/19/11 01:00
04/19/11 13:00
04/20/11 01:00
04/20/11 13:00
04/21/11 01:00
04/21/11 13:00
04/22/11 01:00
04/22/11 13:00
04/23/11 01:00
04/23/11 13:00
04/24/11 01:00
04/24/11 13:00
04/25/11 01:00
MCN Generation Flow
MCN Total Flow
MCN Spill Flow
MCN Target Spill
40% of Total Flow

Figure 26

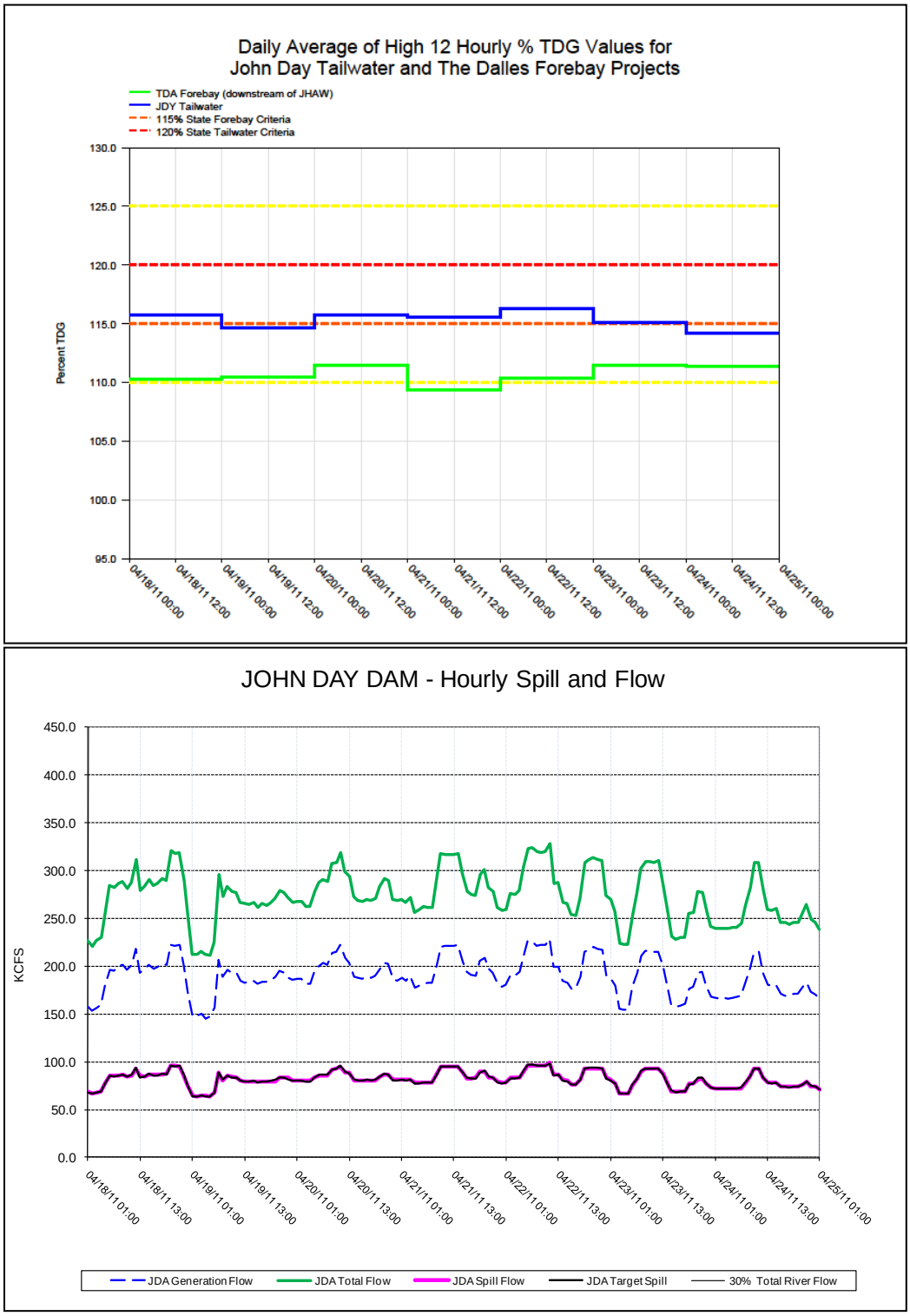
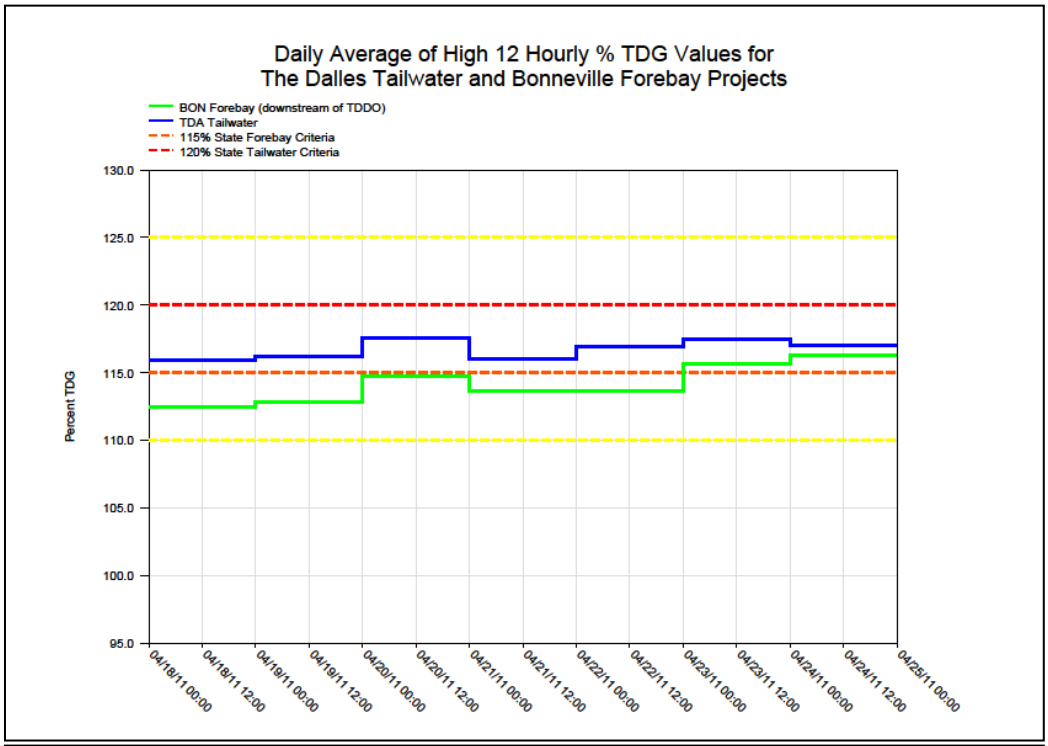

Daily Average of High 12 Hourly % TDG Values for
John Day Tailwater and The Dalles Forebay Projects
TDA Forebay (downstream of JHAW)
JDY Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/18/11 00:00
04/18/11 12:00
04/19/11 00:00
04/19/11 12:00
04/20/11 00:00
04/20/11 12:00
04/21/11 00:00
04/21/11 12:00
04/22/11 00:00
04/22/11 12:00
04/23/11 00:00
04/23/11 12:00
04/24/11 00:00
04/24/11 12:00
04/25/11 00:00
JOHN DAY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
04/18/11 01:00
04/18/11 13:00
04/19/11 01:00
04/19/11 13:00
04/20/11 01:00
04/20/11 13:00
04/21/11 01:00
04/21/11 13:00
04/22/11 01:00
04/22/11 13:00
04/23/11 01:00
04/23/11 13:00
04/24/11 01:00
04/24/11 13:00
04/25/11 01:00
JDA Generation Flow
JDA Total Flow
JDA Spill Flow
JDA Target Spill
30% Total River Flow

Figure 27


Daily Average of High 12 Hourly % TDG Values for
The Dalles Tailwater and Bonneville Forebay Projects
BON Forebay (downstream of TDDO)
TDA Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/18/11 00:00
04/18/11 12:00
04/19/11 00:00
04/19/11 12:00
04/20/11 00:00
04/20/11 12:00
04/21/11 00:00
04/21/11 12:00
04/22/11 00:00
04/22/11 12:00
04/23/11 00:00
04/23/11 12:00
04/24/11 00:00
04/24/11 12:00
04/25/11 00:00

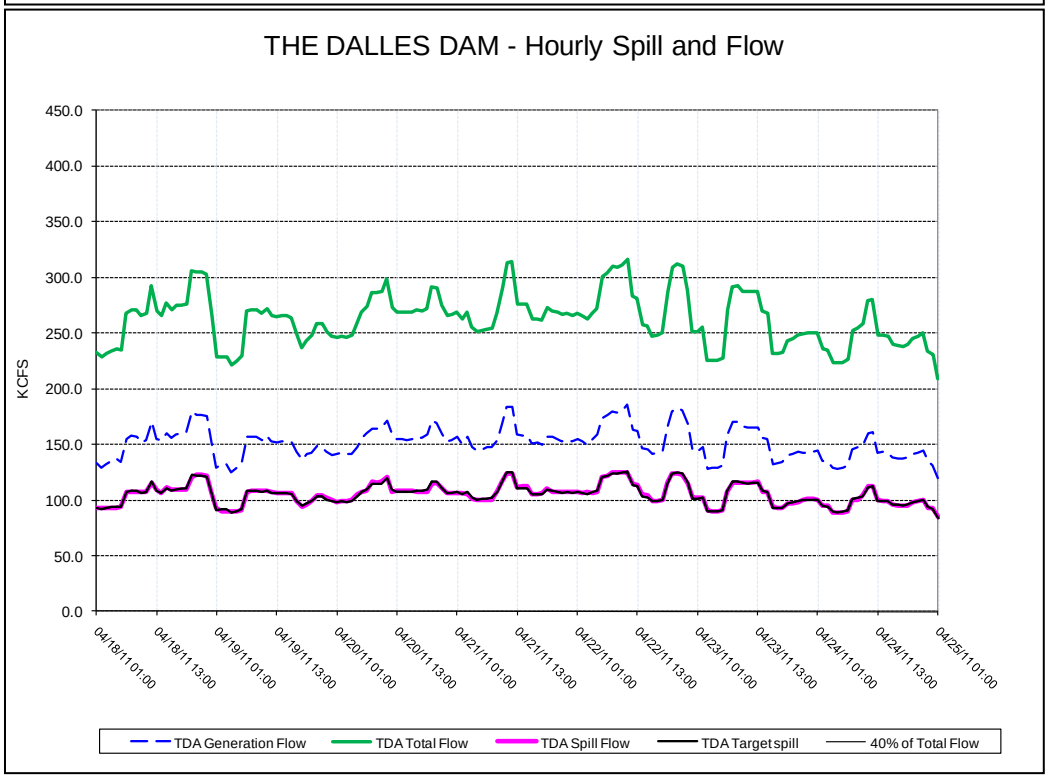
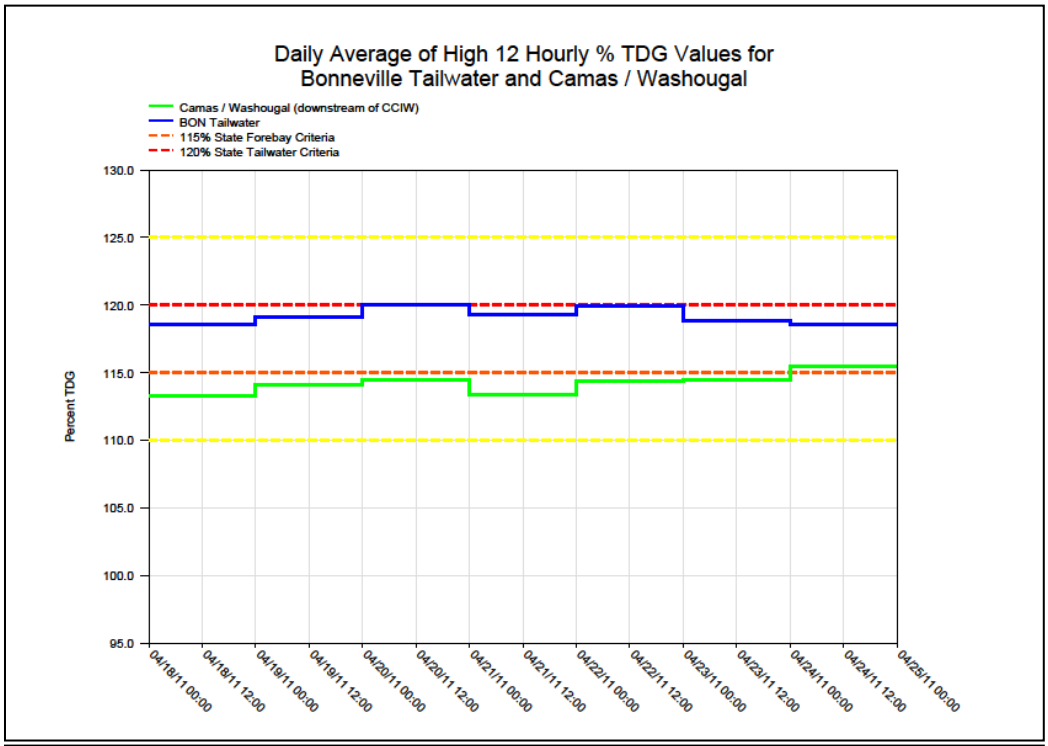

THE DALLES DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
04/18/11 01:00
04/18/11 13:00
04/19/11 01:00
04/19/11 13:00
04/20/11 01:00
04/20/11 13:00
04/21/11 01:00
04/21/11 13:00
04/22/11 01:00
04/22/11 13:00
04/23/11 01:00
04/23/11 13:00
04/24/11 01:00
04/24/11 13:00
04/25/11 01:00
TDA Generation Flow
TDA Total Flow
TDA Spill Flow
TDA Target spill
40% of Total Flow

Figure 28


Daily Average of High 12 Hourly % TDG Values for
Bonneville Tailwater and Camas / Washougal
Camas / Washougal (downstream of CCIW)
BON Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/18/11 00:00
04/18/11 12:00
04/19/11 00:00
04/19/11 12:00
04/20/11 00:00
04/20/11 12:00
04/21/11 00:00
04/21/11 12:00
04/22/11 00:00
04/22/11 12:00
04/23/11 00:00
04/23/11 12:00
04/24/11 00:00
04/24/11 12:00
04/25/11 00:00

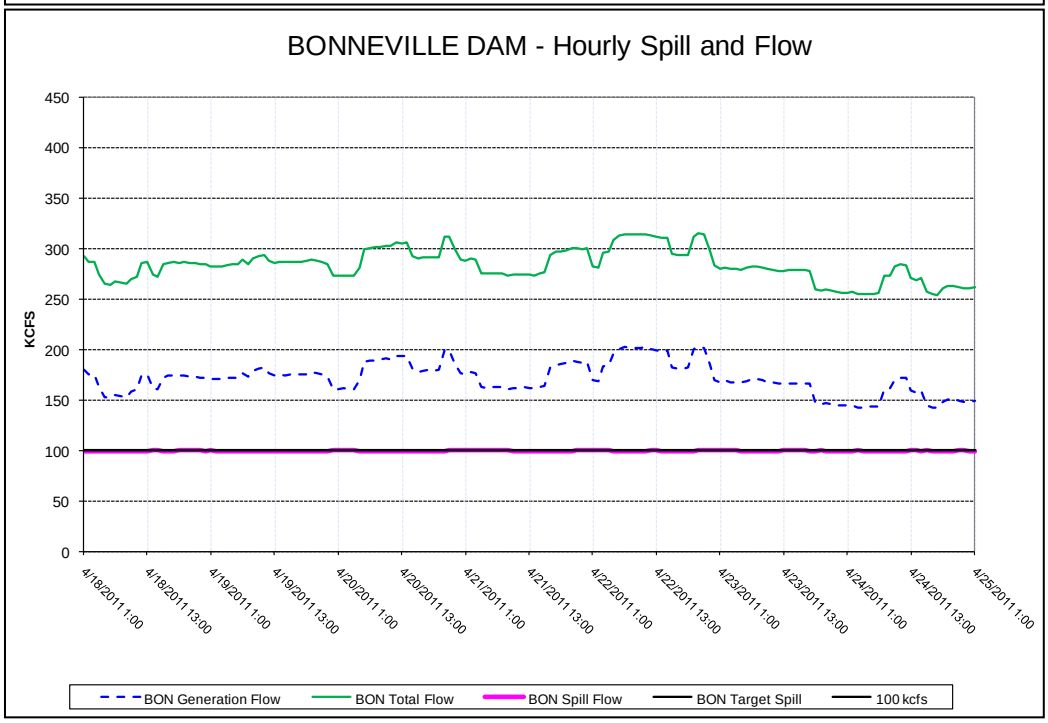

BONNEVILLE DAM - Hourly Spill and Flow
KCFS
450
400
350
300
250
200
150
100
50
0
4/18/2011 1:00
4/18/2011 13:00
4/19/2011 1:00
4/19/2011 13:00
4/20/2011 1:00
4/20/2011 13:00
4/21/2011 1:00
4/21/2011 13:00
4/22/2011 1:00
4/22/2011 13:00
4/23/2011 1:00
4/23/2011 13:00
4/24/2011 1:00
4/24/2011 13:00
4/25/2011 1:00
BON Generation Flow
BON Total Flow
BON Spill Flow
BON Target Spill
100 kcfs

Figure 29

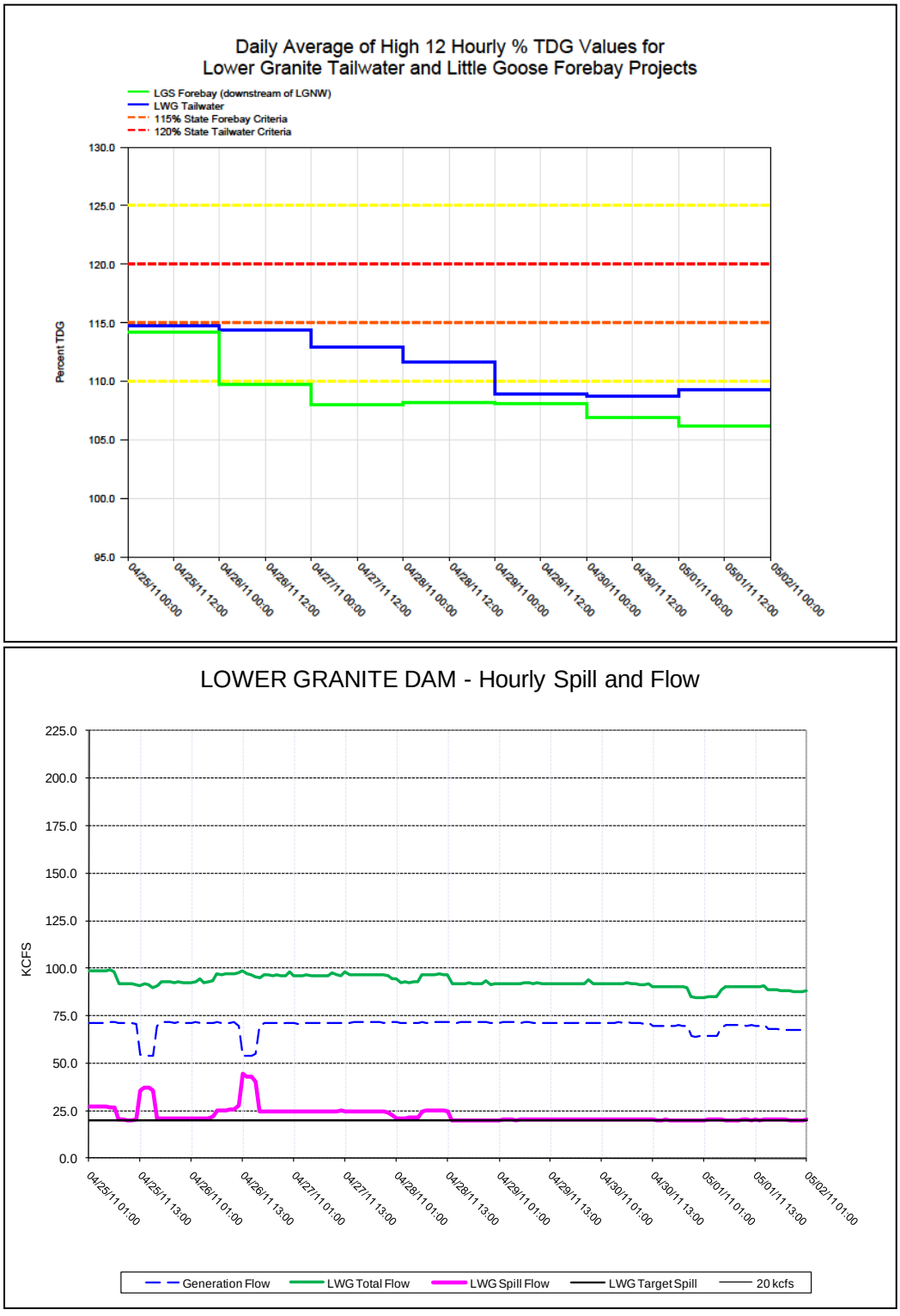
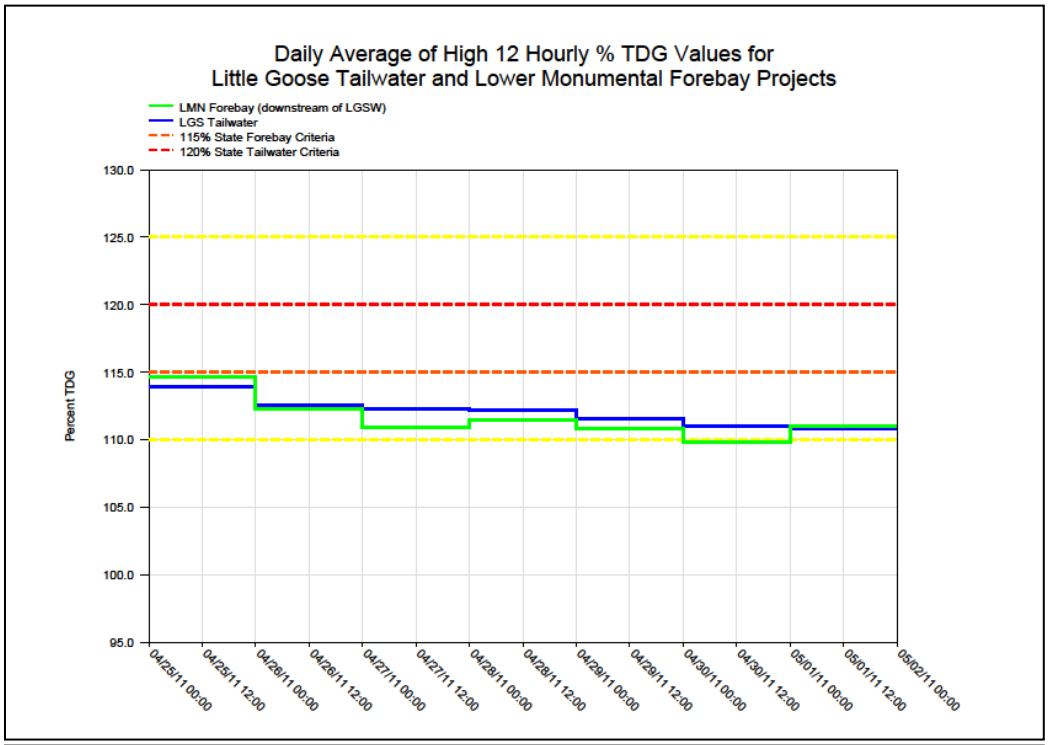

Daily Average of High 12 Hourly % TDG Values for
Lower Granite Tailwater and Little Goose Forebay Projects
LGS Forebay (downstream of LGNW)
LWG Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/25/11 00:00
04/25/11 12:00
04/26/11 00:00
04/26/11 12:00
04/27/11 00:00
04/27/11 12:00
04/28/11 00:00
04/28/11 12:00
04/29/11 00:00
04/29/11 12:00
04/30/11 00:00
04/30/11 12:00
05/01/11 00:00
05/01/11 12:00
05/02/11 00:00
LOWER GRANITE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
04/25/11 01:00
04/25/11 13:00
04/26/11 01:00
04/26/11 13:00
04/27/11 01:00
04/27/11 13:00
04/28/11 01:00
04/28/11 13:00
04/29/11 01:00
04/29/11 13:00
04/30/11 01:00
04/30/11 13:00
05/01/11 01:00
05/01/11 13:00
05/02/11 01:00
Generation Flow
LWG Total Flow
LWG Spill Flow
LWG Target Spill
20 kcfs

Figure 30


Daily Average of High 12 Hourly % TDG Values for
Little Goose Tailwater and Lower Monumental Forebay Projects
LMN Forebay (downstream of LGSW)
LGS Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/25/11 00:00
04/25/11 12:00
04/26/11 00:00
04/26/11 12:00
04/27/11 00:00
04/27/11 12:00
04/28/11 00:00
04/28/11 12:00
04/29/11 00:00
04/29/11 12:00
04/30/11 00:00
04/30/11 12:00
05/01/11 00:00
05/01/11 12:00
05/02/11 00:00

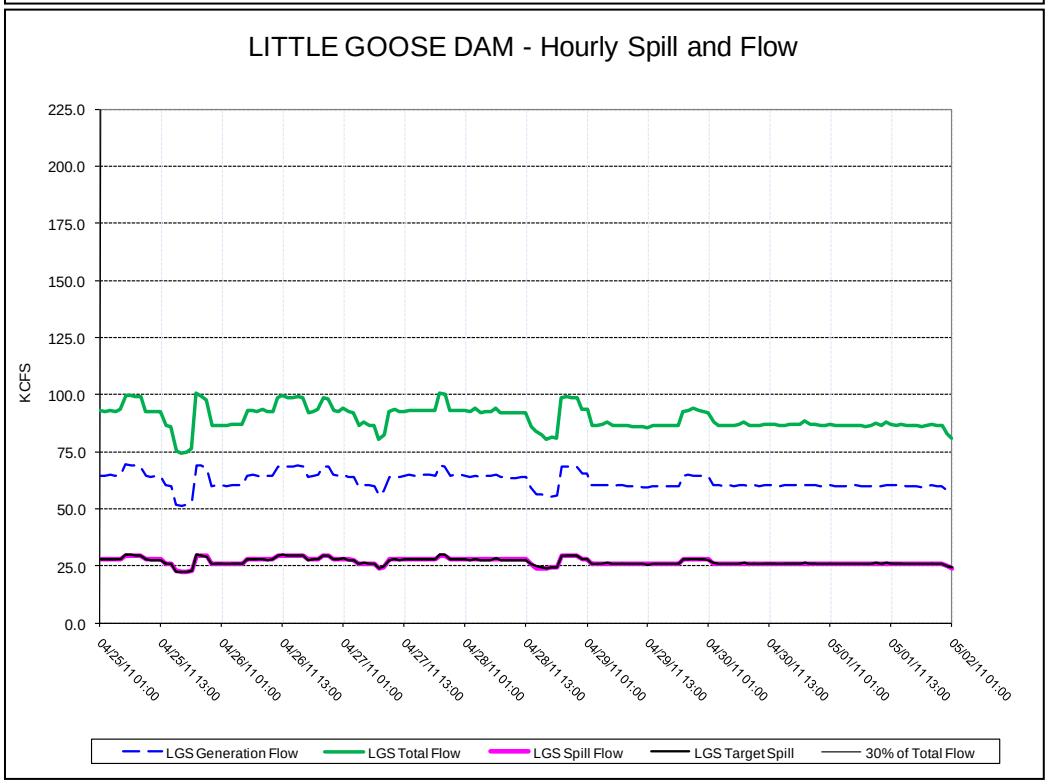
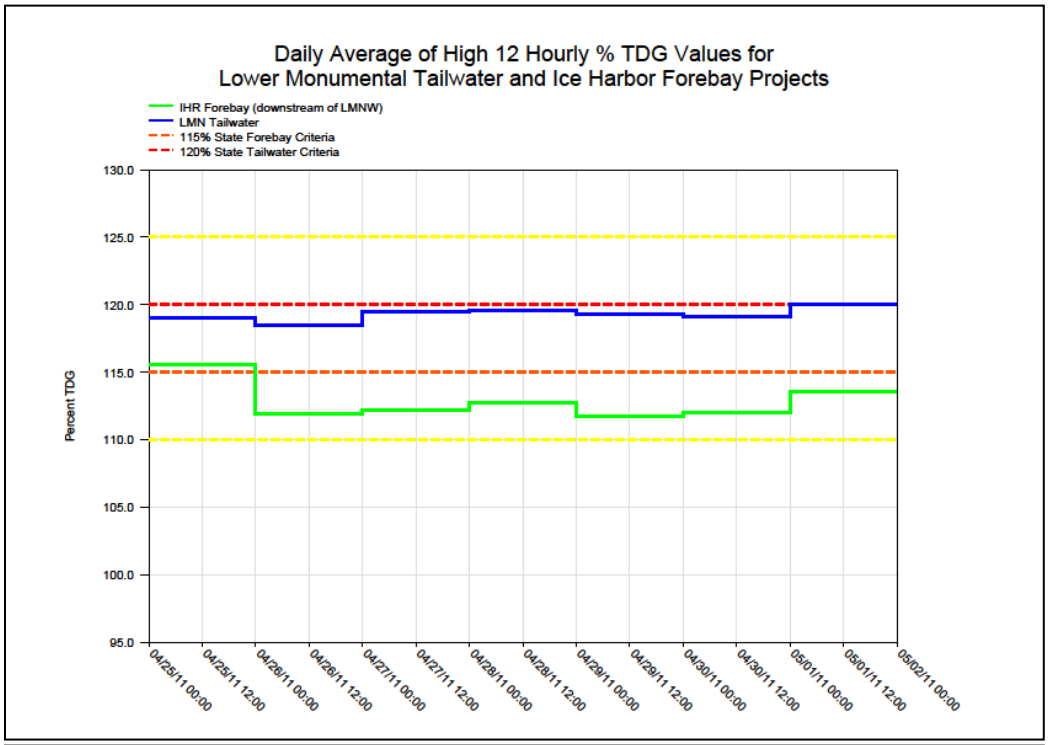

LITTLE GOOSE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
04/25/11 01:00
04/25/11 13:00
04/26/11 01:00
04/26/11 13:00
04/27/11 01:00
04/27/11 13:00
04/28/11 01:00
04/28/11 13:00
04/29/11 01:00
04/29/11 13:00
04/30/11 01:00
04/30/11 13:00
05/01/11 01:00
05/01/11 13:00
05/02/11 01:00
LGS Generation Flow
LGS Total Flow
LGS Spill Flow
LGS Target Spill
30% of Total Flow

Figure 31


Daily Average of High 12 Hourly % TDG Values for
Lower Monumental Tailwater and Ice Harbor Forebay Projects
IHR Forebay (downstream of LMNW)
LMN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/25/11 00:00
04/25/11 12:00
04/26/11 00:00
04/26/11 12:00
04/27/11 00:00
04/27/11 12:00
04/28/11 00:00
04/28/11 12:00
04/29/11 00:00
04/29/11 12:00
04/30/11 00:00
04/30/11 12:00
05/01/11 00:00
05/01/11 12:00
05/02/11 00:00

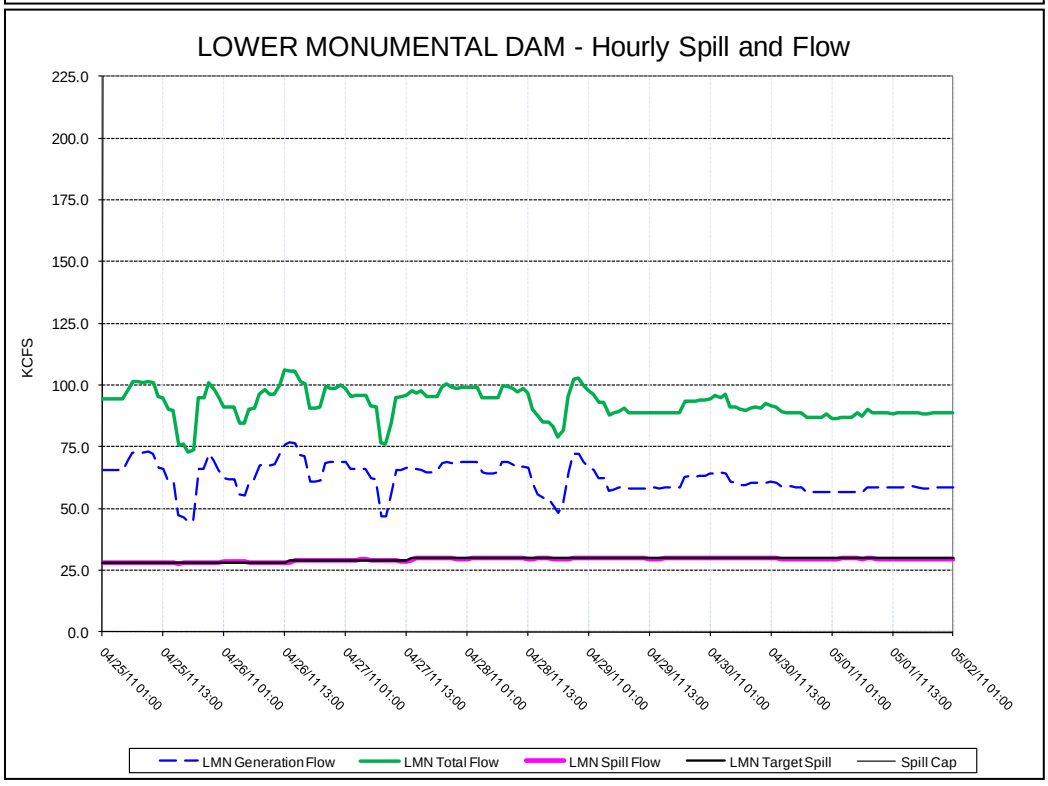
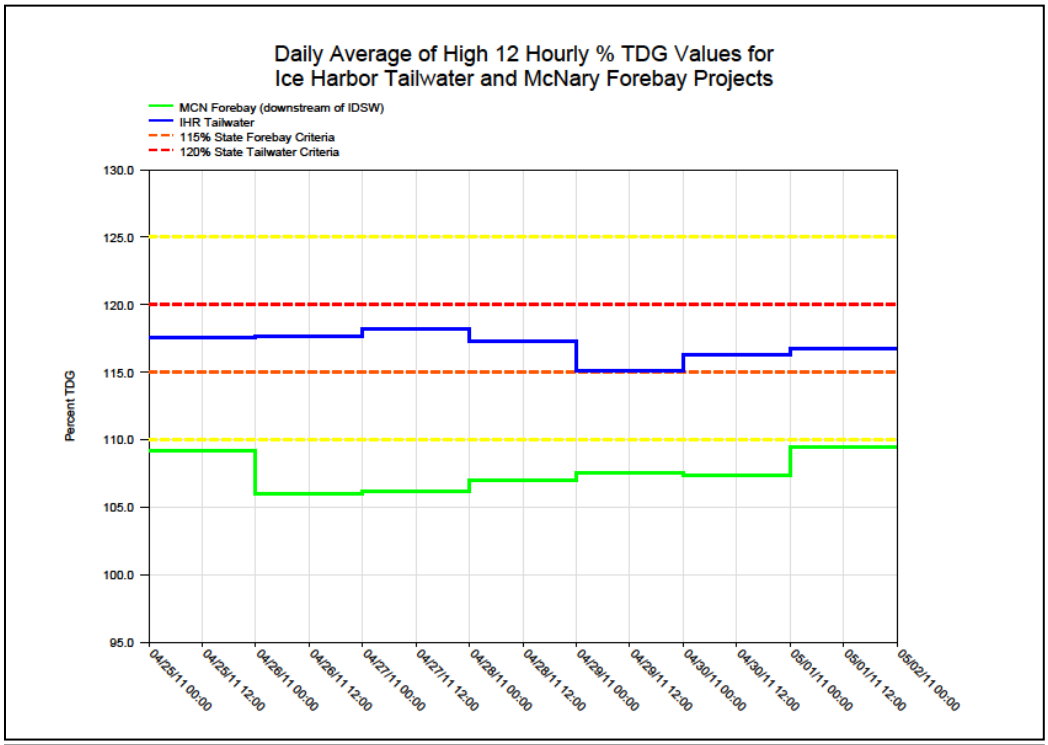

LOWER MONUMENTAL DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
04/25/11 01:00
04/25/11 13:00
04/26/11 01:00
04/26/11 13:00
04/27/11 01:00
04/27/11 13:00
04/28/11 01:00
04/28/11 13:00
04/29/11 01:00
04/29/11 13:00
04/30/11 01:00
04/30/11 13:00
05/01/11 01:00
05/01/11 13:00
05/02/11 01:00
LMN Generation Flow
LMN Total Flow
LMN Spill Flow
LMN Target Spill
Spill Cap

Figure 32


Daily Average of High 12 Hourly % TDG Values for
Ice Harbor Tailwater and McNary Forebay Projects
MCN Forebay (downstream of IDSW)
IHR Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/25/11 00:00
04/25/11 12:00
04/26/11 00:00
04/26/11 12:00
04/27/11 00:00
04/27/11 12:00
04/28/11 00:00
04/28/11 12:00
04/29/11 00:00
04/29/11 12:00
04/30/11 00:00
04/30/11 12:00
05/01/11 00:00
05/01/11 12:00
05/02/11 00:00

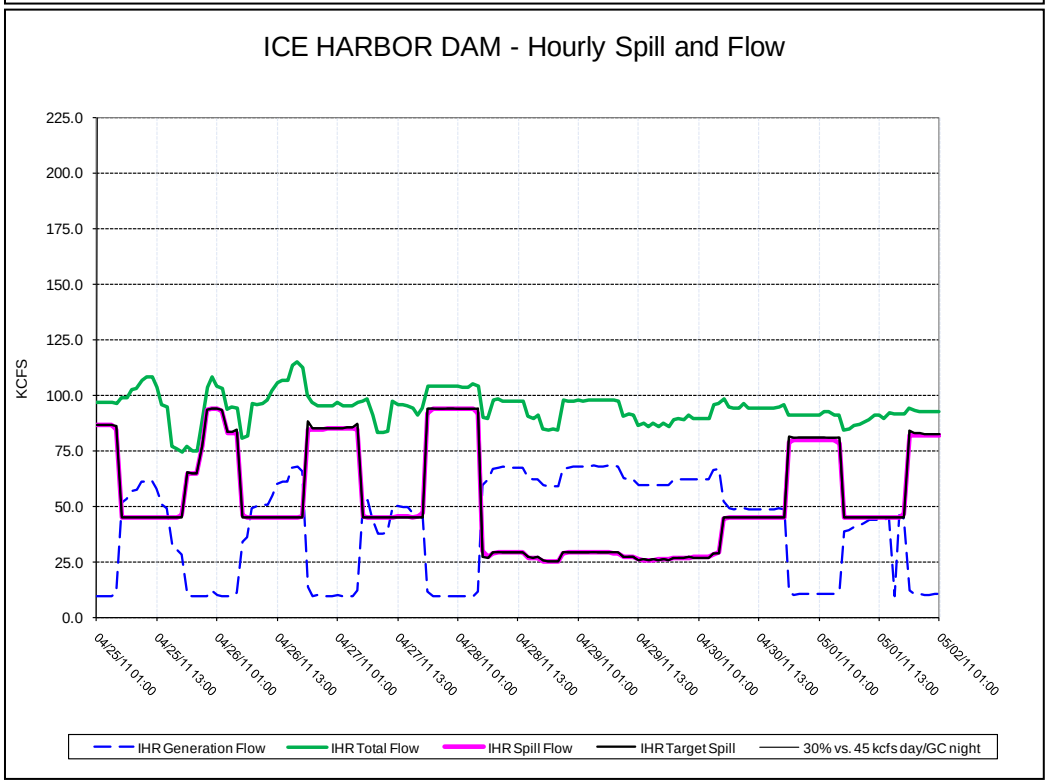
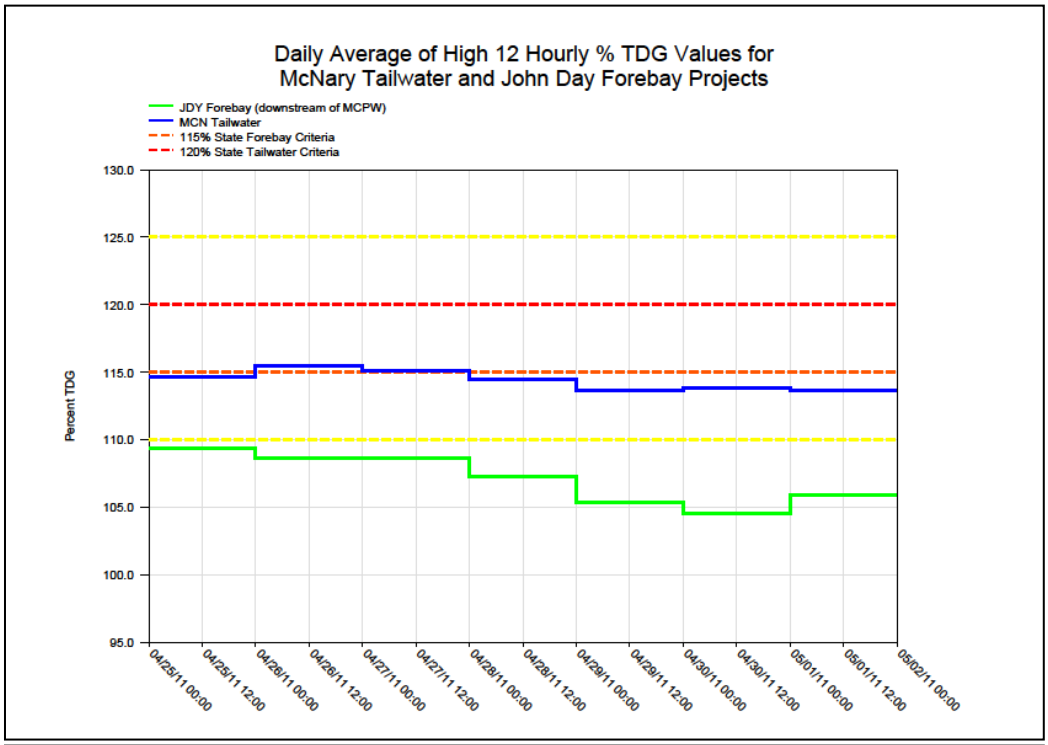

ICE HARBOR DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
04/25/11 01:00
04/25/11 13:00
04/26/11 01:00
04/26/11 13:00
04/27/11 01:00
04/27/11 13:00
04/28/11 01:00
04/28/11 13:00
04/29/11 01:00
04/29/11 13:00
04/30/11 01:00
04/30/11 13:00
05/01/11 01:00
05/01/11 13:00
05/02/11 01:00
IHR Generation Flow
IHR Total Flow
IHR Spill Flow
IHR Target Spill
30% vs. 45 kcfs day/GC night

Figure 33


Daily Average of High 12 Hourly % TDG Values for
McNary Tailwater and John Day Forebay Projects
JDY Forebay (downstream of MCPW)
MCN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/25/11 00:00
04/25/11 12:00
04/26/11 00:00
04/26/11 12:00
04/27/11 00:00
04/27/11 12:00
04/28/11 00:00
04/28/11 12:00
04/29/11 00:00
04/29/11 12:00
04/30/11 00:00
04/30/11 12:00
05/01/11 00:00
05/01/11 12:00
05/02/11 00:00

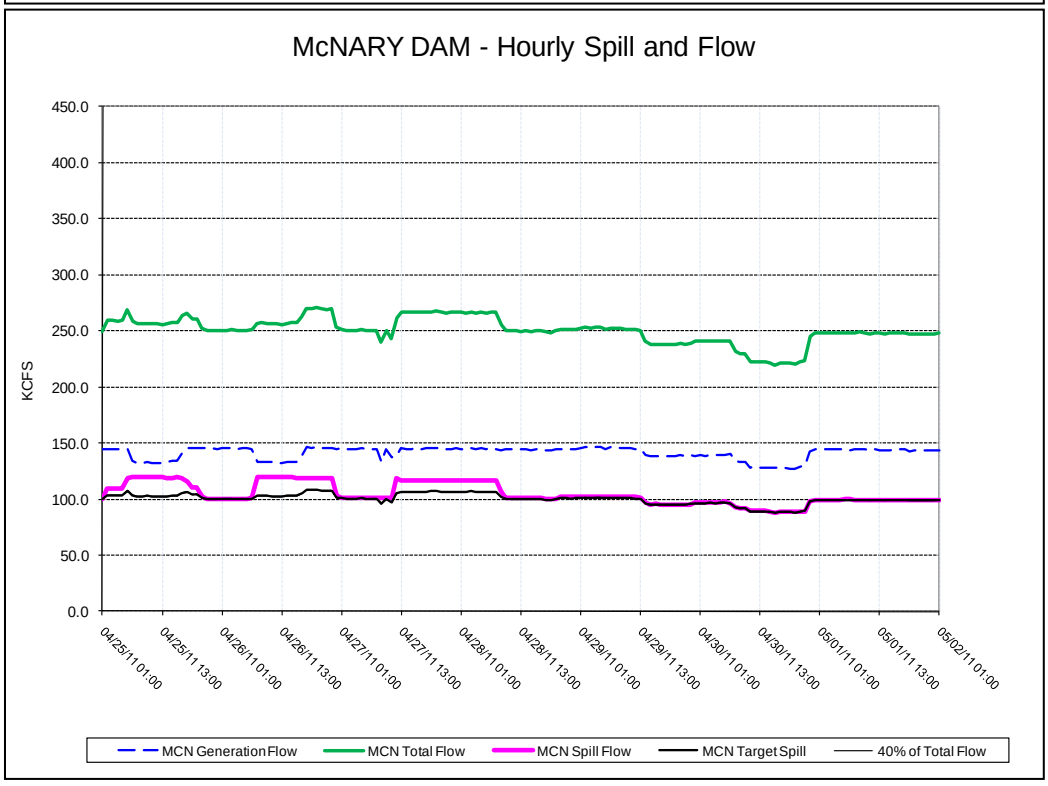
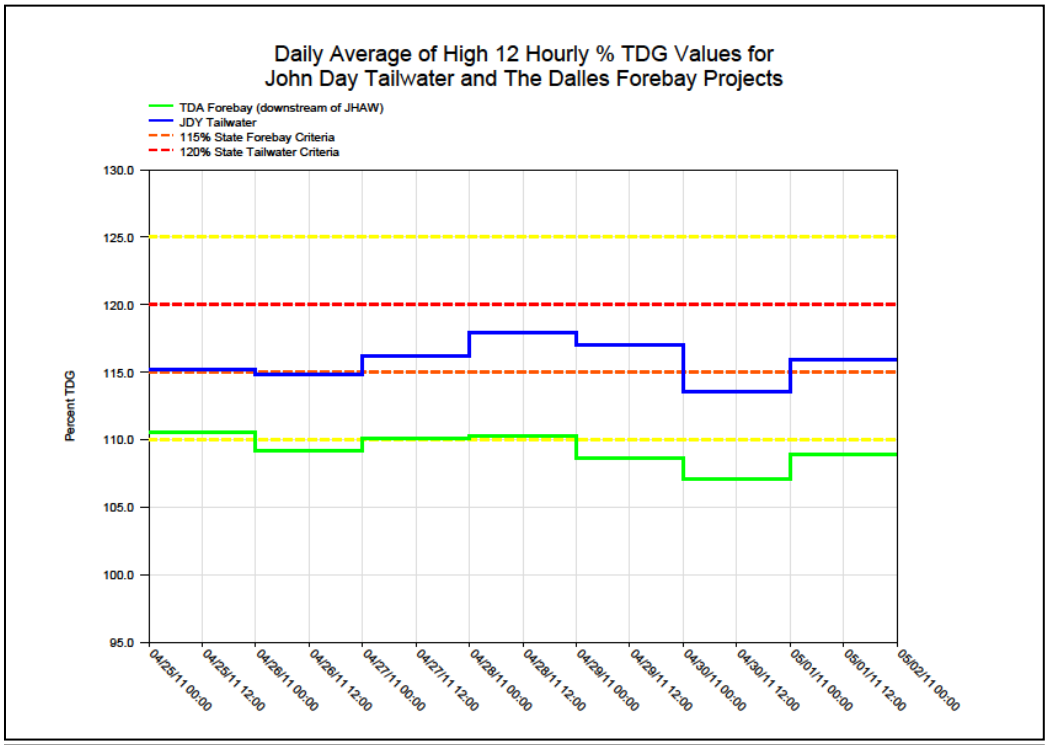

McNARY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
04/25/11 01:00
04/25/11 13:00
04/26/11 01:00
04/26/11 13:00
04/27/11 01:00
04/27/11 13:00
04/28/11 01:00
04/28/11 13:00
04/29/11 01:00
04/29/11 13:00
04/30/11 01:00
04/30/11 13:00
05/01/11 01:00
05/01/11 13:00
05/02/11 01:00
MCN Generation Flow
MCN Total Flow
MCN Spill Flow
MCN Target Spill
40% of Total Flow

Figure 34


Daily Average of High 12 Hourly % TDG Values for
John Day Tailwater and The Dalles Forebay Projects
TDA Forebay (downstream of JHAW)
JDY Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/25/11 00:00
04/25/11 12:00
04/26/11 00:00
04/26/11 12:00
04/27/11 00:00
04/27/11 12:00
04/28/11 00:00
04/28/11 12:00
04/29/11 00:00
04/29/11 12:00
04/30/11 00:00
04/30/11 12:00
05/01/11 00:00
05/01/11 12:00
05/02/11 00:00

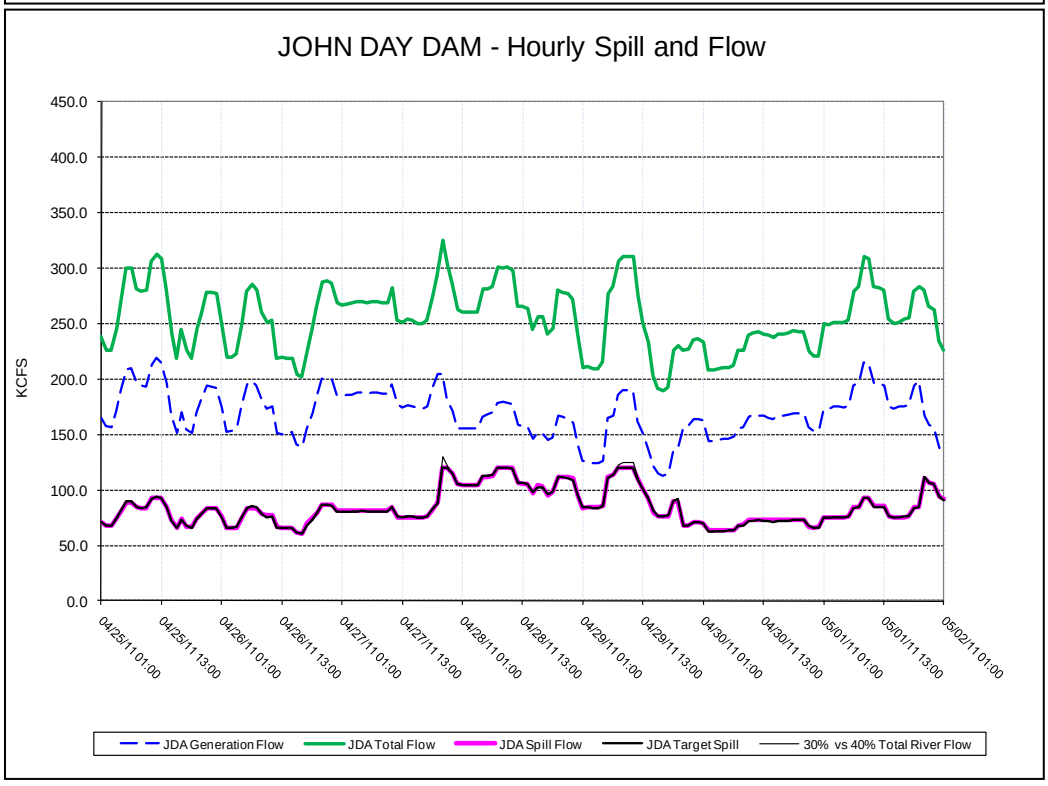
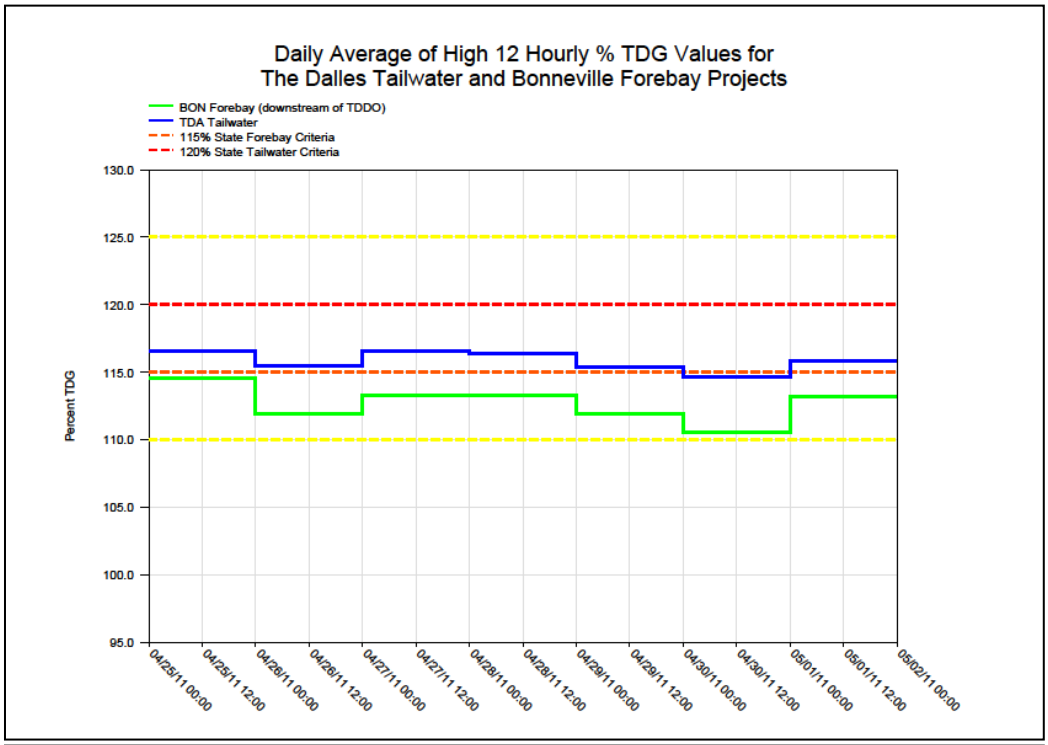

JOHN DAY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
04/25/11 01:00
04/25/11 13:00
04/26/11 01:00
04/26/11 13:00
04/27/11 01:00
04/27/11 13:00
04/28/11 01:00
04/28/11 13:00
04/29/11 01:00
04/29/11 13:00
04/30/11 01:00
04/30/11 13:00
05/01/11 01:00
05/01/11 13:00
05/02/11 01:00
JDA Generation Flow
JDA Total Flow
JDA Spill Flow
JDA Target Spill
30% vs 40% Total River Flow

Figure 35


Daily Average of High 12 Hourly % TDG Values for
The Dalles Tailwater and Bonneville Forebay Projects
BON Forebay (downstream of TDDO)
TDA Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/25/11 00:00
04/25/11 12:00
04/26/11 00:00
04/26/11 12:00
04/27/11 00:00
04/27/11 12:00
04/28/11 00:00
04/28/11 12:00
04/29/11 00:00
04/29/11 12:00
04/30/11 00:00
04/30/11 12:00
05/01/11 00:00
05/01/11 12:00
05/02/11 00:00

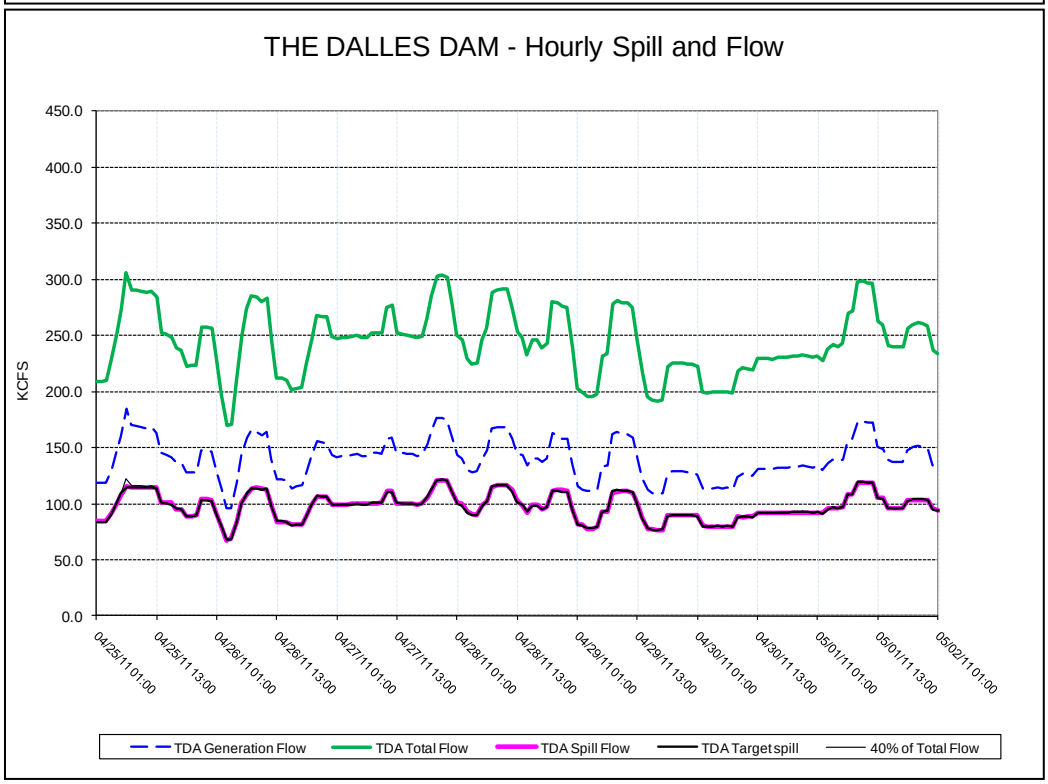
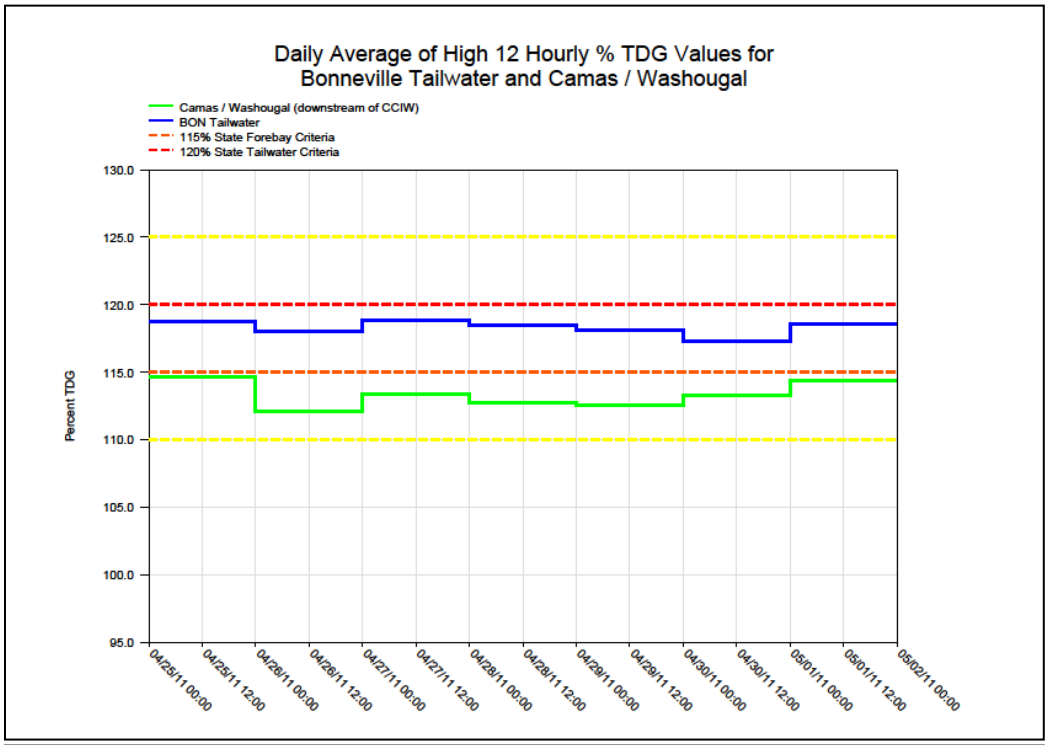

THE DALLES DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
04/25/11 01:00
04/25/11 13:00
04/26/11 01:00
04/26/11 13:00
04/27/11 01:00
04/27/11 13:00
04/28/11 01:00
04/28/11 13:00
04/29/11 01:00
04/29/11 13:00
04/30/11 01:00
04/30/11 13:00
05/01/11 01:00
05/01/11 13:00
05/02/11 01:00
TDA Generation Flow
TDA Total Flow
TDA Spill Flow
TDA Target spill
40% of Total Flow

Figure 36


Daily Average of High 12 Hourly % TDG Values for
Bonneville Tailwater and Camas / Washougal
Camas / Washougal (downstream of CCIW)
BON Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
04/25/11 00:00
04/25/11 12:00
04/26/11 00:00
04/26/11 12:00
04/27/11 00:00
04/27/11 12:00
04/28/11 00:00
04/28/11 12:00
04/29/11 00:00
04/29/11 12:00
04/30/11 00:00
04/30/11 12:00
05/01/11 00:00
05/01/11 12:00
05/02/11 00:00

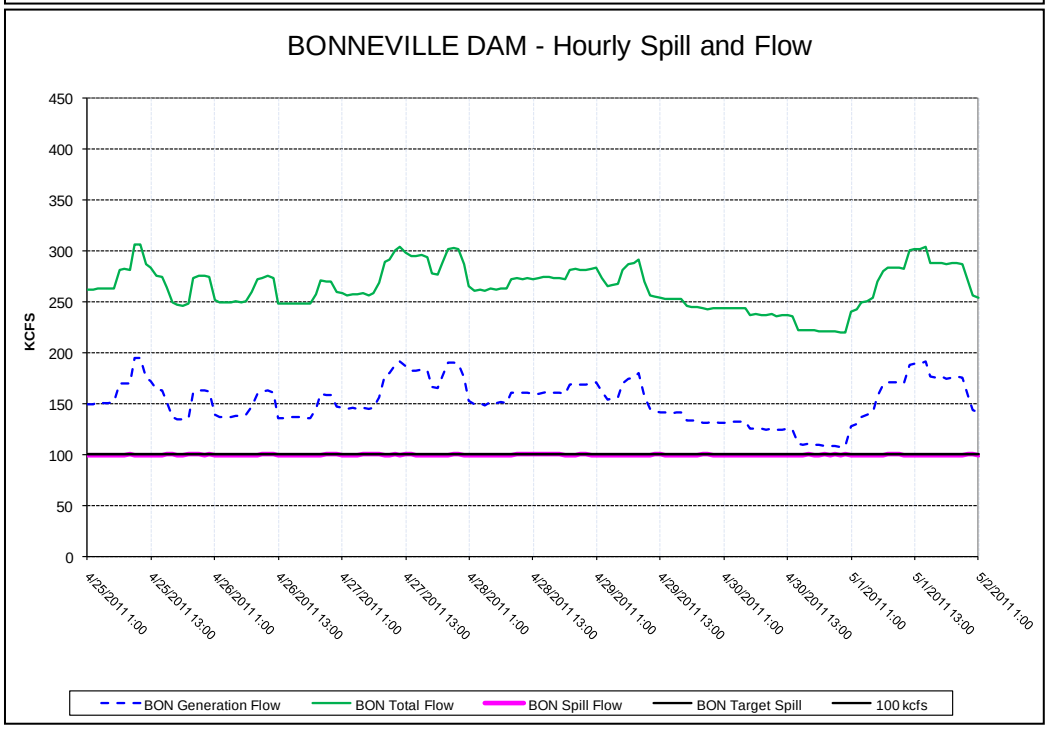

BONNEVILLE DAM - Hourly Spill and Flow
KCFS
450
400
350
300
250
200
150
100
50
0
4/25/2011 1:00
4/25/2011 13:00
4/26/2011 1:00
4/26/2011 13:00
4/27/2011 1:00
4/27/2011 13:00
4/28/2011 1:00
4/28/2011 13:00
4/29/2011 1:00
4/29/2011 13:00
4/30/2011 1:00
4/30/2011 13:00
5/1/2011 1:00
5/1/2011 13:00
5/2/2011 1:00
BON Generation Flow
BON Total Flow
BON Spill Flow
BON Target Spill
100 kcfs

Figure 37

Average Percent TDG for Highest 12-Hours: April 1 – May 1, 2011

Date	FIXED MONITORING STATIONS																
	LWG	LGNW	LGSA	LGSW	LMNA	LMNW	IHRA	IDSW	MCNA	MCPW	JDY	JHAW	TDA	TDDO	BON	CCIW	CWMW
Gas Cap %	115	120	115	120	115	120	115	120	115	120	115	120	115	120	115	120	115
4/1/2011	106	121	105.9	110.6	105	112.5	104.8	126.3	106.4	121.3	106.7	120.5	107.8	109.4	107.4	116.9	106.8
4/2/2011	106.5	122.5	108	115.3	105.7	116.5	105.4	121.4	106.8	121	105.8	120.1	110.2	114.3	106.9	118	108
4/3/2011	103.2	123.1	111.5	115.3	109	118.1	106.5	121	106	122.4	103.8	120.7	109.3	113.4	110	121.7	114.1
4/4/2011	103.4	119.3	114.6	115.6	113	117.9	110.8	119.6	108.3	122.2	107.4	121.6	111.6	116.6	113.6	121.5	115.2
4/5/2011	104.2	123.6	115.5	116.1	113.4	119.3	111.4	120.2	109.1	123.2	108	123.3	114.2	119.8	114.6	122.3	115.8
4/6/2011	104.5	123.5	114.4	116.2	114.6	120	112.2	121	109.1	122.8	111.5	123.2	116.4	119.5	118.7	122.4	117.7
4/7/2011	105	121.1	116.7	116.2	114.7	120	113.6	119.2	110.1	121.1	111.8	119.5	112.6	115.5	117.8	122.7	118.3
4/8/2011	105.3	118.1	117.7	116.4	116.6	120.4	114.9	118.8	110.6	120	112	116.3	110.6	112.9	114.2	118.6	115.8
4/9/2011	105.7	117.7	117.5	116.6	116.9	119.5	116.4	118.9	112	121.1	112	120.7	110.7	115.4	111.4	118.7	112.6
4/10/2011	105.5	117.4	115.1	116.3	115.8	118.5	115.3	118.8	111.5	118.1	112.6	119.8	113.6	117.9	113.3	118.7	111.4
4/11/2011	105.7	116	113.1	114.5	115.3	115.3	114.6	118.1	110.8	117.7	112.2	116.4	111.8	117	114.7	118.9	113.1
4/12/2011	106.2	116.4	112.9	114.5	114.1	118.3	114	119.2	111.6	118.2	111.7	116.9	112	117.6	116.2	120	115.3
4/13/2011	106.9	115.1	112.7	113.9	115.2	119.1	115.6	118.9	111.6	118.4	112.2	116.4	112.1	117.6	117	120.5	115.3
4/14/2011	106.6	114	111.7	113.3	113.5	119.1	114.1	119	110.4	117.8	111.2	115.2	111	116.9	114.1	119	113.7
4/15/2011	105.5	111.4	111	112.6	112.9	118.7	114.1	117.8	110.1	117.3	111.6	116	111.4	117	114.8	118.9	113.2
4/16/2011	106.9	110.7	111	112.9	114.1	118.9	114.4	116.2	110.1	115	112.9	114.6	112.1	116.6	115.1	118.5	114.3
4/17/2011	106.6	111.1	110.7	112.9	113.2	118.9	114.6	117.2	109.5	115.6	111.9	115.5	110.9	116.2	112.9	118.7	114.6
4/18/2011	105.6	113.2	109.6	112.3	112.1	118.4	114.5	118.5	108.3	117.5	111.1	115.7	110.3	115.9	112.4	118.5	113.3
4/19/2011	104	116.2	107.9	113.1	111.7	118.4	113.5	119	108.1	115.8	109.7	114.6	110.5	116.2	112.8	119.1	114.1
4/20/2011	104.5	116.4	109.4	113.9	113.2	119.9	114.6	119.1	109.3	117.2	110.5	115.7	111.4	117.5	114.7	120.1	114.5
4/21/2011	105.9	116.8	111.1	114.6	113.5	120.6	114.3	119.5	108.4	116.1	109.7	115.5	109.4	116	113.6	119.3	113.3
4/22/2011	105.1	117.8	111	114	111.7	120.1	113.2	119.2	108.1	115.8	109.2	116.3	110.4	116.9	113.6	119.9	114.3
4/23/2011	106.1	114.6	112.1	113.7	114.8	120.4	115.5	118.6	110	115	110.6	115.1	111.5	117.5	115.6	118.8	114.5
4/24/2011	107	113.9	115.8	114.4	115.5	119.7	116.2	117.8	109.6	113.7	110.8	114.2	111.3	117	116.3	118.6	115.5
4/25/2011	107.4	114.7	114.2	113.9	114.7	119.1	115.6	117.5	109.2	114.6	109.3	115.2	110.5	116.6	114.6	118.7	114.7
4/26/2011	105.3	114.4	109.7	112.5	112.3	118.4	111.9	117.6	106	115.4	108.6	114.8	109.2	115.4	111.9	118	112
4/27/2011	104	112.9	108	112.3	110.9	119.4	112.2	118.2	106.2	115.1	108.6	116.2	110.1	116.5	113.3	118.8	113.3
4/28/2011	104.8	111.6	108.2	112.2	111.5	119.6	112.7	117.3	107	114.5	107.2	117.9	110.3	116.4	113.3	118.5	112.7
4/29/2011	104.5	108.9	108.1	111.5	110.8	119.3	111.8	115.1	107.5	113.6	105.3	117	108.6	115.4	111.9	118.1	112.5
4/30/2011	103.5	108.7	106.9	111	109.8	119.1	112	116.3	107.4	113.9	104.5	113.5	107.1	114.6	110.5	117.2	113.3
5/1/2011	103.9	109.2	106.1	110.8	111	120	113.6	116.8	109.4	113.6	105.9	115.9	108.9	115.9	113.2	118.5	114.4

Generated: Sun May 1 23:29:00 2011

Number of hours of data used:

OR: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

Red text denotes exceedances.

• indicates No Data

Dates run from hour 1 to 24 (not 0 to 23).

The gas caps shown only apply when spilling to facilitate juvenile fish passage ("voluntary spill") between April 3rd and August 31st. At all other times, the gas cap is 110%.

Figure 38

Total Dissolved Gas Monitoring Stations

Code	Station Name
LWG	Lower Granite Forebay
LGNW	Lower Granite Tailwater
LGSA	Little Goose Forebay
LGSW	Little Goose Tailwater
LMNA	Lower Monumental Forebay
LMNW	Lower Monumental Tailwater
IHRA	Ice Harbor Forebay
IDSW	Ice Harbor Tailwater
MCNA	McNary Forebay
MCPW	McNary Tailwater
JDY	John Day Forebay
JHAW	John Day Tailwater
TDA	The Dalles Forebay
TDDO	The Dalles Tailwater
BON	Bonneville Forebay
CCIW	Bonneville Tailwater (Cascade Island)
CWMW	Camas / Washougal

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UNITED STATES DISTRICT COURT

DISTRICT OF OREGON

NATIONAL WILDLIFE FEDERATION, *et al.* Plaintiffs, v. NATIONAL MARINE FISHERIES SERVICE, *et al.* Defendants.	Civil No. 01-640-RE **NOTICE OF FEDERAL DEFENDANTS' SECOND 2011 SPILL IMPLEMENTATION STATUS REPORT**

In accordance with the Court's March 24, 2011 Order concerning 2011 spring spill

operations, Federal Defendants submit their second 2011 spill implementation status report. *See* Exhibit 1. This status report includes, among other things: the hourly flow through the powerhouse at each dam; the hourly flow over the spillway compared to the target spill for that hour; and the resultant 12-hour average total dissolved gas ("TDG") for the tailwater at each project and for the next project's forebay downstream. The report also provides written explanations of variances that occurred during the reporting period.

Respectfully submitted this 17th day of June, 2011.

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CERTIFICATE OF SERVICE

Pursuant to Local Rule Civil 100.13(c), and F.R. Civ. P. 5(d), I certify that on June 17, 2011, the foregoing will be electronically filed with the Court's electronic court filing system, which will generate automatic service upon on all Parties enrolled to receive such notice. The following will be manually served by overnight mail:

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FISH OPERATIONS PLAN IMPLEMENTATION REPORT
May 2011

Submitted by the U.S. Army Corps of Engineers
Northwestern Division
Portland, OR

Introduction:

The U.S. Army Corps of Engineers (Corps) is submitting this report in accordance with the U.S. District Court of Oregon March 24, 2011 Order adopting the 2011 Spring Fish Operations Plan (2011 Spring FOP). The 2011 Spring FOP describes the Corps' project operations for fish passage at its Federal Columbia River Power System (FCRPS) dams during the spring fish migration season, generally April through June.[1] To the extent Corps project operations are not specified in the 2011 Spring FOP, the FCRPS operations will be consistent with the 2010 NOAA Fisheries Biological Opinion (2010 BiOp), the USFWS 2000 and 2006 BiOps, and/or other operative documents, including the 2011 Water Management Plan (WMP), WMP seasonal updates, and the 2011 Fish Passage Plan (FPP).

The Corps' May 2011 lower Snake and Columbia River project and fish passage operations are contained in this report. In particular, information in this report includes the following:

- hourly flow through the powerhouse at each dam;
- hourly flow over the spillway compared to the spill target for that hour; and,
- resultant 12-hour average Total Dissolved Gas (%TDG) levels in the tailrace at each project and in the subsequent downstream project's forebay and the Camas-Washougal gauge below Bonneville Dam.

This report also provides information on issues presented and unanticipated or emergency situations that arose during implementation of the 2011 Spring FOP in May.

Data Reporting:

I. For each project providing fish passage operations, this report contains two graphs per operational week for May displaying the performance of the spill program as follows:

(A). Daily Average of the High 12 Hourly %TDG Values - described in the upper graph.
(B). Hourly Spill and Generation Flows - described in the lower graph[2].

[1] Operations are implemented from Monday through Sunday.
[2] To adequately display high flows levels, it was necessary to extend the vertical axis on the graphs for the last two weeks of May.

The weekly graphs begin on May 2 and end on May 29 for the following lower Snake River and lower Columbia River projects: Lower Granite, Little Goose, Lower Monumental, Ice Harbor, McNary, John Day, The Dalles, and Bonneville dams.

Each figure represents one week of operation for a project. The graphs start at 0000 hours (TDG graph) and 0100 hours (flow/spill graph) on May 2 for the lower Snake River and Lower Columbia River projects.

May 2 – May 8	Figures 1 – 8
May 9 – May 15	Figures 9 – 16
May 16 – May 22	Figures 17 – 24
May 23 – May 29	Figures 25 – 32

A. Upper Graph: Shows the resultant daily average %TDG for the 12 highest hours. This is primarily a result of spill at dams. The objective is to operate each project up to the TDG limits without exceeding those limits to the extent practicable.

- The blue line on the graph represents the %TDG in the tailrace of the dam. 120 %TDG is the upper operating limit.[3]
- The green line represents the TDG in the forebay of the next dam downstream. 115 %TDG is the upper operating limit.

B. Lower Graph: Shows the hourly flow and spill at the dam.

- The dotted blue line shows the flow through the powerhouse each hour, in thousand cubic feet per second (kcfs).
- The medium green line represents the average hourly total river flow through the project in kcfs.
- The heavy pink line represents the hourly flow through the spillway in kcfs.
- The thin black line represents the hourly spill level as defined in the 2011 Spring FOP.
- Each graph includes a heavy black line that represents the target spill. This is the hourly maximum spill level that is subject to the following conditions:
    - Spill percentage or discharge specified in the FOP;
    - Spill caps as set daily for TDG management;
    - Test spill levels for fish passage research;
    - Minimum generation for power system needs; and,
    - Minimum spill at Bonneville (50 kcfs) dam;
    - Minimum spill at John Day is 25 percent of project outflow;

[3] On May 18 at 1400, the Bonneville tailwater TDG gauge was overcome with water and no longer operated; therefore, the blue line on Figure 24 of Exhibit 2 ends on this date. It is estimated that the gauge will be back in operation when spill at Bonneville spill drops below 235 kcfs, which is forecasted to occur approximately in early July. To set the spill caps, the Corps uses an analog to calculate the Bonneville tailwater %TDG levels using the Warrendale TDG readings.

The hourly target spill may vary as a function of quantity of river flow, forebay elevation and generating units available at a project.

II. A monthly %TDG Table is included at the end of the figures that shows the overall daily results of the average %TDG for the 12 highest hours for all projects. The numbers in red show exceedances of the TDG gas cap - 115 percent (forebay) or 120 percent (tailwater) for each project.

General Implementation Remarks:

For all projects that spill for fish passage, the target spill may be limited to a lesser quantity due to various conditions as described below. When spill levels briefly deviate below or above the level specified in the 2011 Spring FOP, the heavy pink line will be below or above the heavy black line in the graphs. Actual operation deviations from the target operation during voluntary spill hours are described below. The May 2011 Spill Variance Table includes average hourly data; therefore, while spill may vary from target spill for only a portion of an hour, the May 2011 Spill Variance Table characterizes the reduction as a full hour. There are instances when the hourly spill levels are not achievable due to mechanical limitations in setting spill gates to implement the regionally coordinated spill pattern. The project operator sets the spill gate stops to most closely approximate the 2011 Spring FOP level of spill while also avoiding exceeding the %TDG spill cap to the extent practicable.

"Low flow" operations at the lower Columbia and Snake projects are triggered when inflow is insufficient to provide both minimum generation and the specified spill levels. In these situations, the projects operate at minimum generation and spill the remainder of project inflow. As flows transition from higher flows to low flows, there may be situations when flows recede at a higher rate than forecasted. In addition, inflows provided by nonfederal projects upstream are variable and uncertain.

The combination of these factors may result in instances where unanticipated changes to inflow result in forebay elevations dropping to the low end of the Minimum Operating Pool (MOP). Since these projects have limited operating flexibility, maintaining minimum generation, MOP elevation, and the target spill may not be possible throughout every hour. During low flow periods at Little Goose Dam, the overall project spill percentage appears to be reduced because the calculations do not account for the volume of water released during navigational lockages; however, the actual spill volume remains constant. When these variances occur, they are recorded in the monthly Spill Variance Table for Little Goose under the variance type "Navigation."

Actual spill levels at Corps projects may range from 1 to 2 kcfs (Bonneville Dam may range from 1 to 3 kcfs) lower or higher than specified in the 2011 Spring FOP and the RCC spill priority list (defines the projects' %TDG spill caps). A number of factors influence actual spill, including hydraulic efficiency, exact gate opening calibration, spillway gate hoist cable stretch due to temperature changes, and forebay elevation (a higher forebay results in a greater volume of spill since more water can pass under the spill gate).

The 2011 Spring FOP describes project operations during "Rapid Load Changes" (p. 6). For reporting purposes, the notation "Transmission Stability" in the May 2011 Spill Variance Report Table replaces "Rapid Load Changes," and identifies instances when hourly spill levels were not met as a result of load swing hours and other related within-hour load variability issues. "Transmission Stability" occurs because projects must be available to respond to within-hour load variability to satisfy North American Electric Reliability Council (NERC) reserve requirements ("on response"). In addition to within-hour load variability, projects on response must be responsive to within hour changes resulting from intermittent generation (such as wind generation). During periods of rapidly changing loads and intermittent generation, projects on response may have significant changes in turbine discharge within the hour while spill quantity remains the same within the hour. Under normal conditions, within-hour load changes primarily occur immediately preceding and following the peak load hours; however, within-hour changes in intermittent generation can occur at any hour of the day. Occasionally, several hours after peak load hours, the project may be decreasing total outflow and generation faster than the corresponding spill decreases causing the percent spill to be slightly higher. Due to the high variability of within-hour load, reporting actual spill percentages that vary by more than the ±1 percent requirement (or other ranges specified in the 2011 Spring FOP) may occur with greater frequency with "Transmission Stability" hours than other hours.

Occurrences requiring an adjustment in operations and/or regional coordination are described in greater detail in the "Operational Adjustments" section below.

May Operations:

The month of May was characterized by above average flows for the lower Snake and the lower Columbia rivers, caused by a combination of above normal rainfall and snow melt affecting the Snake and Columbia River basins. The NOAA River Forecast Center's Runoff Processor[4] indicates runoff was 136 percent of normal at Lower Granite Dam, and 121 percent of normal at The Dalles Dam for May 2011.

The high flow conditions in May resulted in instances of involuntary spill continuing through the month as flows exceeded powerhouse capacity. In most involuntary spill instances, the resulting Daily Average of High 12 Hourly %TDG values exceeded the 115 percent forebay and 120 percent tailrace standards,[5] as shown in the corresponding %TDG graphs for the lower Columbia and Snake rivers. In some instances of involuntary spill, the resulting hourly %TDG values exceeded the 122%, 125%, 127%, and 130% TDG spill priority list estimates.

During the May reporting period, the 2011 Spring FOP planned spill operations were as follows:

- Lower Granite Dam - The hourly target spill discharge was a fixed quantity 20 kcfs 24-hours/day.
- Little Goose Dam - The hourly target spill discharge was 30 percent of total river discharge for 24-hours/day.

[4] The May percent of average is relative to the RFC 30-year period of record.
[5] As provided for in the 2011 Spring FOP (*see* pp. 2-3)

- Lower Monumental Dam - The hourly target spill discharge was the %TDG spill cap 24-hours/day.
- Ice Harbor Dam - The hourly target spill alternated daily between 45 kcfs daytime and the %TDG spill cap nighttime, vs. 30 percent of total river discharge for 24-hours/day. Nighttime spill hours are 1800-0500.
- McNary Dam - The hourly target spill discharge was 40 percent of total river discharge for 24-hours/day.
- John Day Dam - The hourly target spill alternated between 40 percent vs. 30 percent of total river discharge for 24-hours/day due to the two-day treatment spring spill test. Spill level changes occurred at 2000 hours.
- The Dalles Dam - The target spill discharge was 40 percent of total river discharge for 24/day.
- Bonneville Dam - The hourly target spill discharge was a fixed quantity 100 kcfs 24-hours/day.

***Operational Adjustments**:*

1. Lower Granite Dam:

   On May 17 between 1000 and 1108 hours, spill was diverted from the spillway weir and redistributed to the remaining spillbays in order to maintain the 2011 Spring FOP spill levels while conducting a forebay debris removal operation. This operation was coordinated with FPOM via email on May 17.

2. Little Goose Dam:

   - On May 20 from 0700 to 1700 hours, generating units 1-4 were out of service for emergency repair and investigation of the transformer T1 high voltage bushing. During this period, the project spilled all inflow with the exception of 5 kcfs to maintain station service. In order to complete all necessary repairs, an additional powerhouse outage was scheduled for May 24 – June 1. The powerhouse was out of service from 0600 hours May 24 through 1500 hours June 1. During this period, the project again spilled all inflow with the exception of 5 kcfs to maintain station service. After completion of this maintenance, the project resumed normal operations as described in the 2011 Spring FOP This operation was coordinated with FPOM via email on May 19, 20, 25, 26, and June 1; via email with TMT on May 20, 27, June 1; and during the TMT meeting on May 25 and June 1. TMT/FPOM members either supported or did not object to this operation.

   - On May 24 at 0700 hour, the Little Goose forebay elevation dropped below MOP (633 feet) for six hours. This was related to the total powerhouse outage discussed above. The calibration of the spill gates appears to be in error and is more pronounced at high spill levels. This resulted in higher amounts of spill than recorded, and the pool was drafted below MOP. Once the problem was recognized, flow adjustments were made to continue operations in the MOP range.

3. Lower Monumental Dam:

   To minimize TDG production on May 17 at 2055 hours, the Corps switched the spill pattern from the bulk spill pattern specified in the FPP to the uniform spill pattern. Switching from the bulk to uniform spill pattern reduces TDG when inflows are in excess of approximately 140 kcfs. The uniform spill pattern will be used when river flow is approximately 140 kcfs or greater, or when lack of demand spill occurs. This alternative operation was proposed by the Corps in response to SOR 2011-02, and was discussed at TMT meetings on April 13, 20 and 22. The State of Oregon requested the operation as written in SOR 2011-02 be further considered by the Regional Implementation and Oversight Group (RIOG). The RIOG met on May 4 to consider whether to recommend implementing SOR 2011-02 as written or adopt the Corps alternative. The RIOG did not unanimously support implementation of SOR 2011-02, and supported the Corps' alternative operation. The alternative operation was discussed and coordinated with TMT on May 11, and TMT members either supported or did not object to this operation.

4. McNary Dam:

   On May 23 at 1700 hours, the Corps closed spillbay 1 due to significant vibration and spill was redistributed to the other spillbays. FPOM was notified of this operation via email on May 24 as this operation was a departure from Table MCN-8 identified in the FPP. The Corps inspected the gate on June 8 and determined the gate seal was partially detached. The gate is expected to return to service once repairs to the gate seal are completed by June 30.

5. John Day Dam:

   - On May 13 at 2000 hours, the Corps adjusted the research treatment schedule to 30% spill for the BiOp juvenile performance standard test. Previously a 40% treatment was scheduled for May 13, but due to high inflow forecasts there was a limited opportunity to maintain the 30% spill level. Following this treatment swap, the project resumed an alternating treatment schedule on May 15 for the remainder of the test period. This operation was coordinated with TMT via email on May 11 and 12. TMT members either supported or did not object to this operation.

   - On May 17 at 1045 hours, the Corps limited the operation of spillbay 20 to a maximum opening of 3 stops and spill was distributed to other spillbays. Operating spillbay 20 above 3 stops was causing flooding of the powerhouse deck and gallery equipment due to wind and high inflows. The spill pattern identified in the FPP designates the number of stops based on the amount of spill. Due to continuing high flow conditions, the Corps will continue this operation until further notice. This operation was coordinated with FPOM on May 17 via email and FPOM members either supported or did not object to this operation.

   - Due to system flood control requirements, the John Day pool was operated above the planned range of 262.5 – 264.0 feet (RPA Action 5). The storage operation, necessary to

maintain the Vancouver gage below flood stage, was a 4-day flood control operation ending on May 20. The pool reached a high of 265.0 feet on May 17. TMT was informed of this operation by email on May 20. During this period, involuntary spill was occurring at John Day Dam with spill levels above those identified in the 2011 Spring FOP.

6. The Dalles Dam:

On May 24 at 1045 hours, the Corps closed the navigation lock to replace a faulty bearing on the downstream lock gate. The navigation lock repairs were completed May 26 at 0940 hours. The TMT discussed whether collection and transport of fish should be suspended until the navigation lock was repaired, or whether collection and transport should continue with the release of transported fish in The Dalles forebay. After consideration of these options, the Corps suspended transport at the lower Snake River collector projects until May 26 at 0940 hours when the navigation lock repair was completed. This operation was discussed with TMT members during meetings on May 20, 25, and via email on May 19 and 25. TMT members either supported or did not object to this operation.

7. Bonneville Dam:

On May 19 at 0714 hours, the Corps switched to a Powerhouse 1 (PH1) priority. In accordance with the FPP, Powerhouse 2 (PH2) is the priority powerhouse this time of year, but excessive debris associated with high flows has been clogging the vertical barrier screens (VBSs) of PH2. The project will maintain PH1 priority until debris issues are no longer a concern. From May 19-21, use of the PH2 VBSs and submersible traveling screens (STSs) was suspended on units 14, 15, and 16. From May 24-26, use of the remaining PH2 VBSs on units 12, 13, 17, 18 was discontinued. This operation was coordinated with FPOM at the May 18 meeting, and via email coordination on May 18. FPOM members either supported or did not object to this operation.

8. Transportation of Juveniles:

From May 16 through May 18, juvenile transportation at Lower Granite and Lower Monumental dams was suspended due to high inflows. Fish already collected for transport on May 16 were released into the tailraces of these projects. At Lower Granite, high inflows cause hazardous conditions at the juvenile transportation barge loading dock. During high flow events at Lower Monumental, the Corps is unable to provide the short term spill curtailment needed for the fish barge to safely traverse the tailrace. Transport of juveniles at Little Goose Dam continued during this period. This operation was coordinated with FPOM via email on May 16.

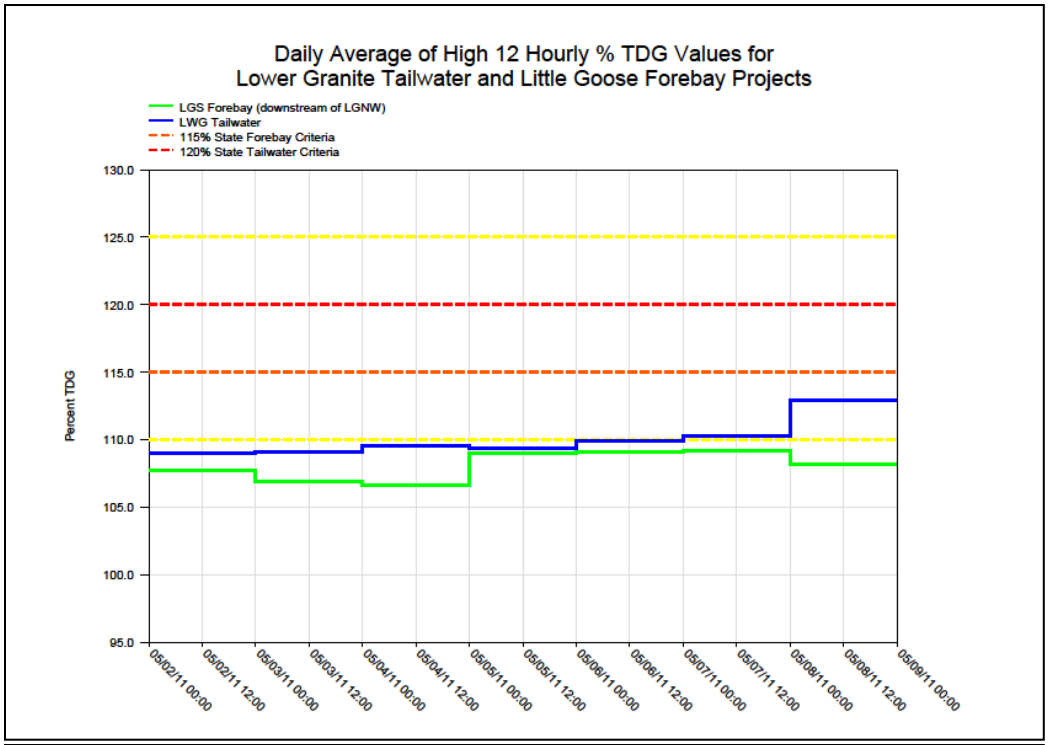
May 2011 Spill Variance Table

Project	Parameter	Date	Time	Hours	Type	Reason
Little Goose	Additional % Spill	5/10/11	1200-1700	6	Maintenance	Hourly spill increased to 92.8% (above 30.0% ± 1.0% range). Unplanned outage requiring generation stoppage and spill excess outflow. 24-hr avg. spill was 42.8%
Little Goose	Additional % Spill	5/20/2011	0700-1600	10	Maintenance	Hourly spill increased to 96.2% (above 30.0% ± 1.0% range); involuntary spill remaining hours. Unplanned outage requiring generation stoppage and spill excess outflow. 24-hr avg. spill was 71.0%
Little Goose	Additional % Spill	5/24/2011 – 6/1/11	0600-1500	202	Maintenance	Hourly spill increased to 97.4% (above 30.0% ± 1.0% range); involuntary spill for 8 days. Outage requiring generation stoppage and spill excess outflow to perform repairs as a result of the 5/20/11 investigation.
Lower Monumental	Reduced Spill	5/9/11	1800-2000	3	Navigation	Hourly spill decreased ranging between 9.1 to 25.8 kcfs (below 29 kcfs spill cap). Reduced spill for safe passage of fish barge.

Lower Monumental	Reduced Spill	5/10/11	1900-2000	2	Navigation	Hourly spill decreased ranging between 11.9 to 15.2 kcfs (below 30 kcfs spill cap). Reduced spill for safe passage of fish barge.
Lower Monumental	Reduced Spill	5/11/11	1800-2000	3	Navigation	Hourly spill decreased ranging between 9.3 to 22.1 kcfs (below 29 kcfs spill cap). Reduced spill for safe passage of fish barge.
Lower Monumental	Reduced Spill	5/12/11	1800-2000	3	Navigation	Hourly spill decreased ranging between 8.9 to 19.9 kcfs (below 29 kcfs spill cap). Reduced spill for safe passage of fish barge.
Lower Monumental	Reduced Spill	5/13/11	1800-2000	3	Navigation	Hourly spill decreased ranging between 6.2 to 18.1 kcfs (below 29 kcfs spill cap). Reduced spill for safe passage of fish barge.
Lower Monumental	Reduced Spill	5/14/11	1800-2000	3	Navigation	Hourly spill decreased ranging between 11.6 to 16.3 kcfs (below 28 kcfs spill cap). Reduced spill for safe passage of fish barge.
Lower Monumental	Reduced Spill	5/20/11	1700	1	Navigation	Hourly spill decreased to 23.3 kcfs (below 28 kcfs spill cap). Reduced spill for safe passage of fish barge.
Lower Monumental	Reduced Spill	5/21/11	2000	1	Navigation	Hourly spill decreased to 21.3 kcfs (below 28 kcfs spill cap). Reduced spill for safe passage of fish barge.

Lower Monumental	Reduced Spill	5/22/11	1800	1	Navigation	Hourly spill decreased to 24.3 kcfs (below 28 kcfs spill cap). Reduced spill for safe passage of fish barge.
Ice Harbor	Additional % Spill	5/6/11	0100	1	Navigation	Hourly spill increased to 31.7% (above 30.0% ± 1.0% range) due to volume of water needed to empty the navigation lock. See p. 3.
John Day	Reduced % Spill.	5/5/2011	1300	1	Transmission Stability	Hourly spill decreased to 28.7% (below 30.0% ± 1.0% range). To assure system reliability as a result of an intertie problem John Day was allocated more load for part of the hour. See p. 3-4. 24-hr avg. spill was 31.7%.
John Day	Additional % Spill	5/7/11	1600	1	Transmission Stability	Hourly spill increased to 41.1% (above 40.0% ± 1.0% range). Project on response during rapidly changing load. See p. 3-4. 24-hr avg. spill was 38.2%.
The Dalles	Additional % Spill	5/3/2011	0900	1	Human/Program Error	Hourly spill increased to 41.2% (above 40.0% ± 1.0% range). There was a gap in GDACS data, resulting in erroneous generation and % spill values. 24-hr avg. spill was 40.0%.

Figure 1


Daily Average of High 12 Hourly % TDG Values for
Lower Granite Tailwater and Little Goose Forebay Projects
LGS Forebay (downstream of LGNW)
LWG Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/02/11 00:00
05/02/11 12:00
05/03/11 00:00
05/03/11 12:00
05/04/11 00:00
05/04/11 12:00
05/05/11 00:00
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05/07/11 12:00
05/08/11 00:00
05/08/11 12:00
05/09/11 00:00

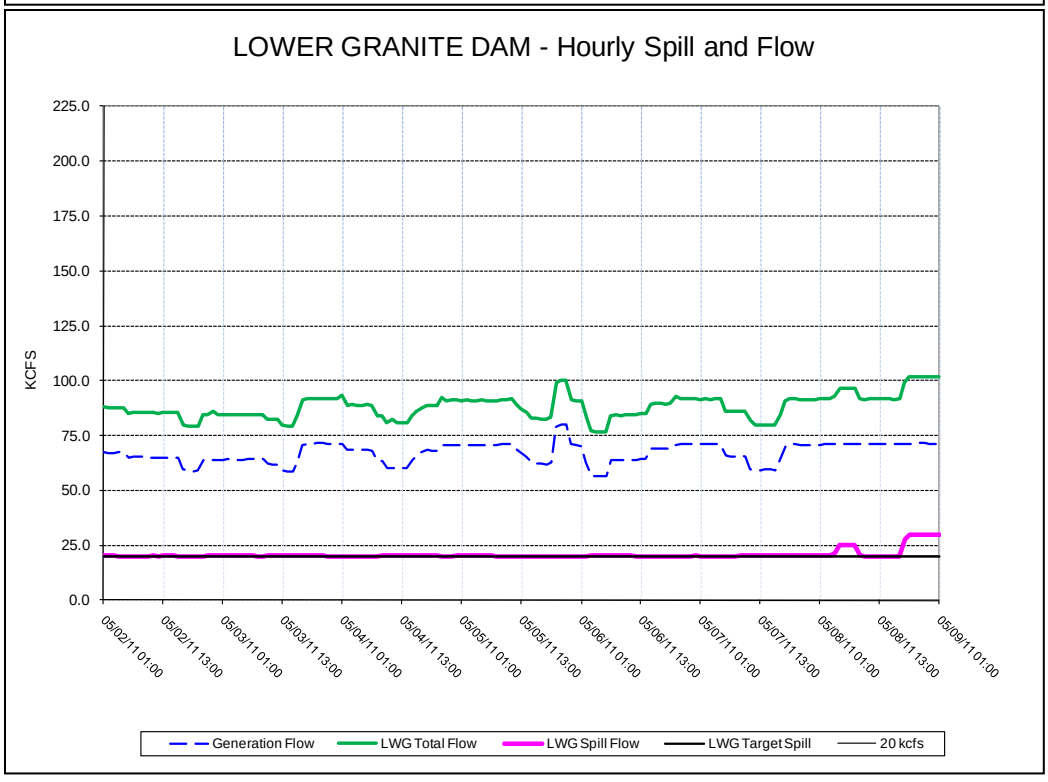

LOWER GRANITE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
05/02/11 01:00
05/02/11 13:00
05/03/11 01:00
05/03/11 13:00
05/04/11 01:00
05/04/11 13:00
05/05/11 01:00
05/05/11 13:00
05/06/11 01:00
05/06/11 13:00
05/07/11 01:00
05/07/11 13:00
05/08/11 01:00
05/08/11 13:00
05/09/11 01:00
Generation Flow
LWG Total Flow
LWG Spill Flow
LWG Target Spill
20 kcfs

Figure 2

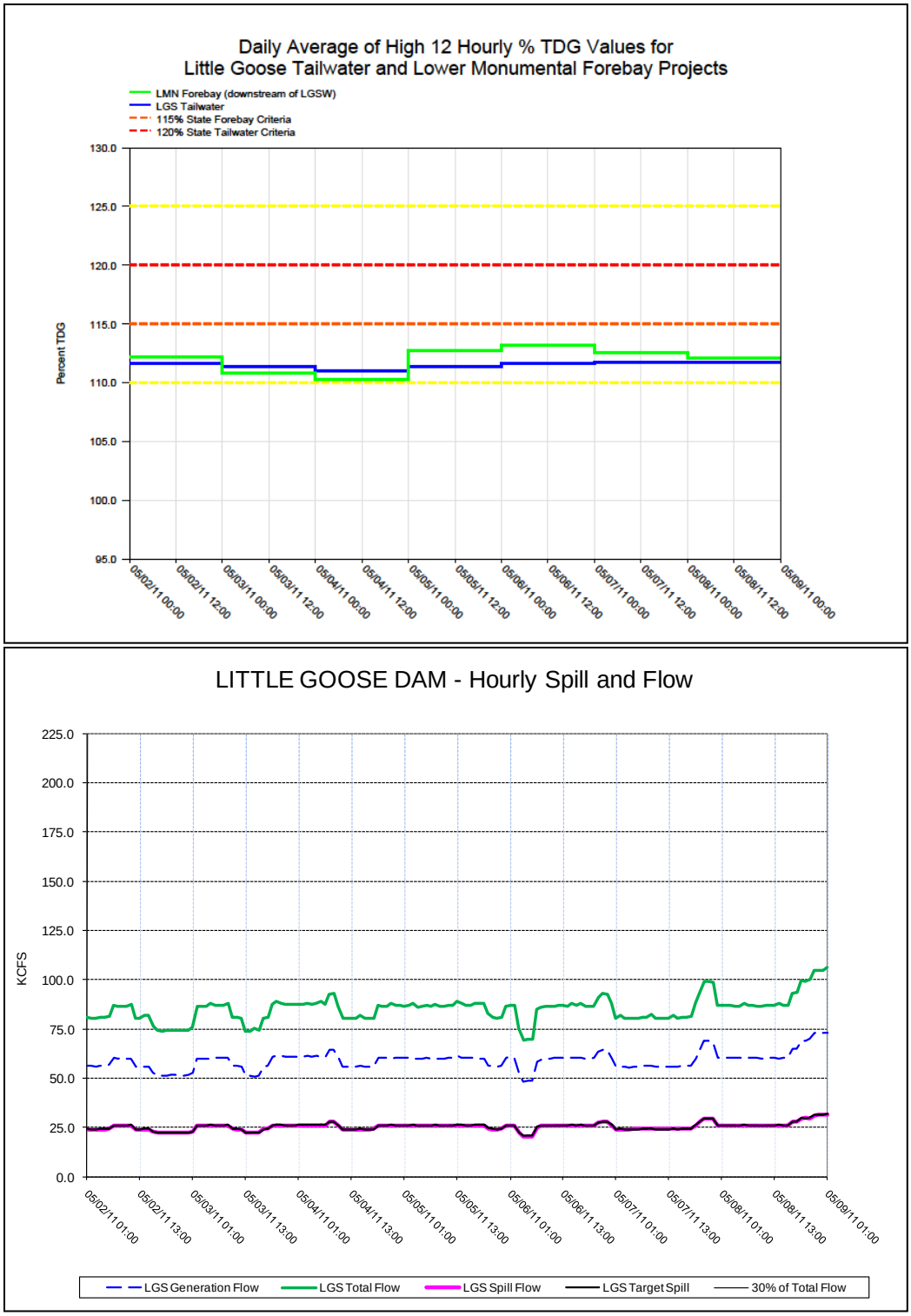
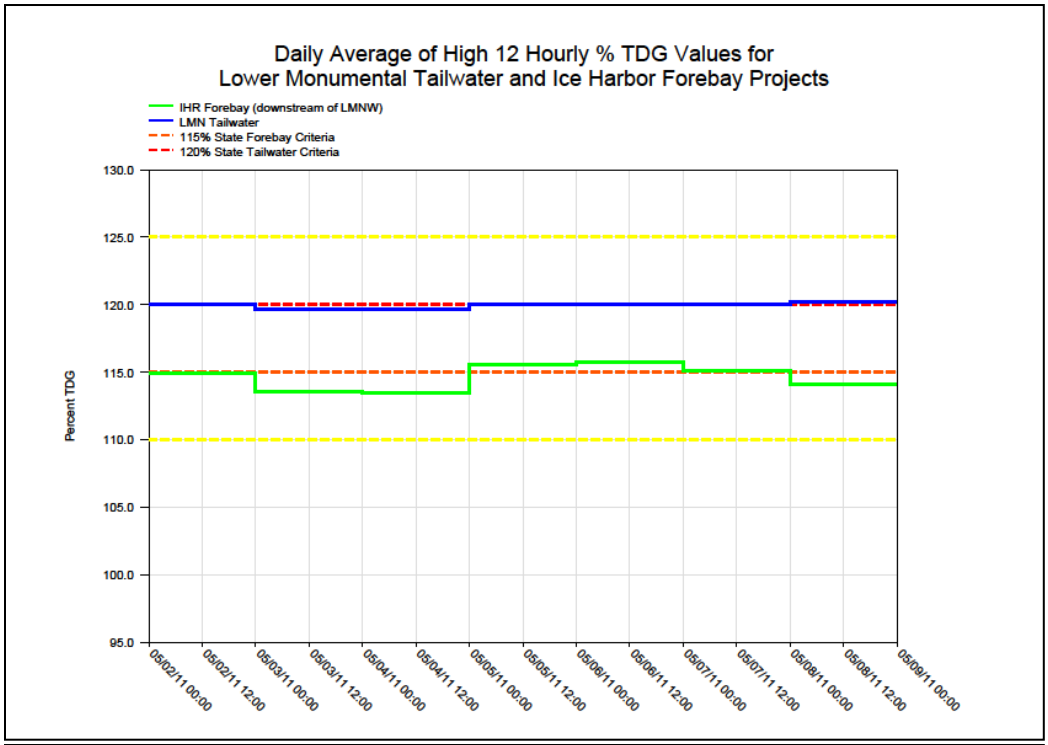

Daily Average of High 12 Hourly % TDG Values for
Little Goose Tailwater and Lower Monumental Forebay Projects
LMN Forebay (downstream of LGSW)
LGS Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/02/11 00:00
05/02/11 12:00
05/03/11 00:00
05/03/11 12:00
05/04/11 00:00
05/04/11 12:00
05/05/11 00:00
05/05/11 12:00
05/06/11 00:00
05/06/11 12:00
05/07/11 00:00
05/07/11 12:00
05/08/11 00:00
05/08/11 12:00
05/09/11 00:00
LITTLE GOOSE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
05/02/11 01:00
05/02/11 13:00
05/03/11 01:00
05/03/11 13:00
05/04/11 01:00
05/04/11 13:00
05/05/11 01:00
05/05/11 13:00
05/06/11 01:00
05/06/11 13:00
05/07/11 01:00
05/07/11 13:00
05/08/11 01:00
05/08/11 13:00
05/09/11 01:00
LGS Generation Flow
LGS Total Flow
LGS Spill Flow
LGS Target Spill
30% of Total Flow

Figure 3


Daily Average of High 12 Hourly % TDG Values for
Lower Monumental Tailwater and Ice Harbor Forebay Projects
IHR Forebay (downstream of LMNW)
LMN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/02/11 00:00
05/02/11 12:00
05/03/11 00:00
05/03/11 12:00
05/04/11 00:00
05/04/11 12:00
05/05/11 00:00
05/05/11 12:00
05/06/11 00:00
05/06/11 12:00
05/07/11 00:00
05/07/11 12:00
05/08/11 00:00
05/08/11 12:00
05/09/11 00:00

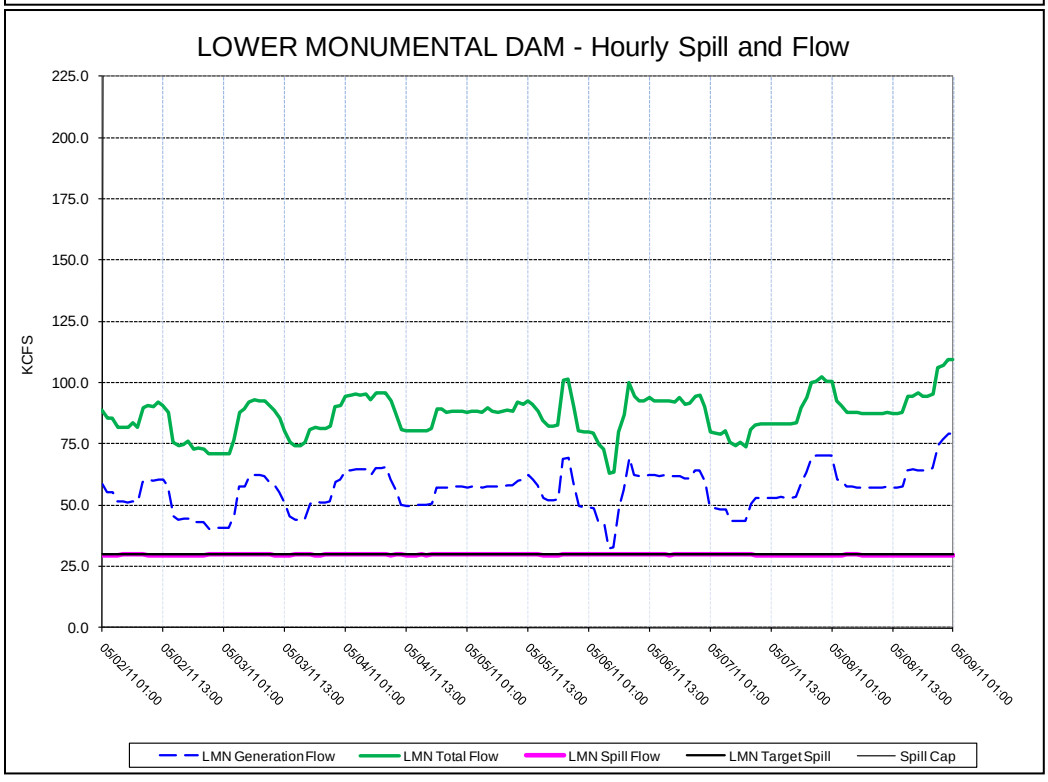
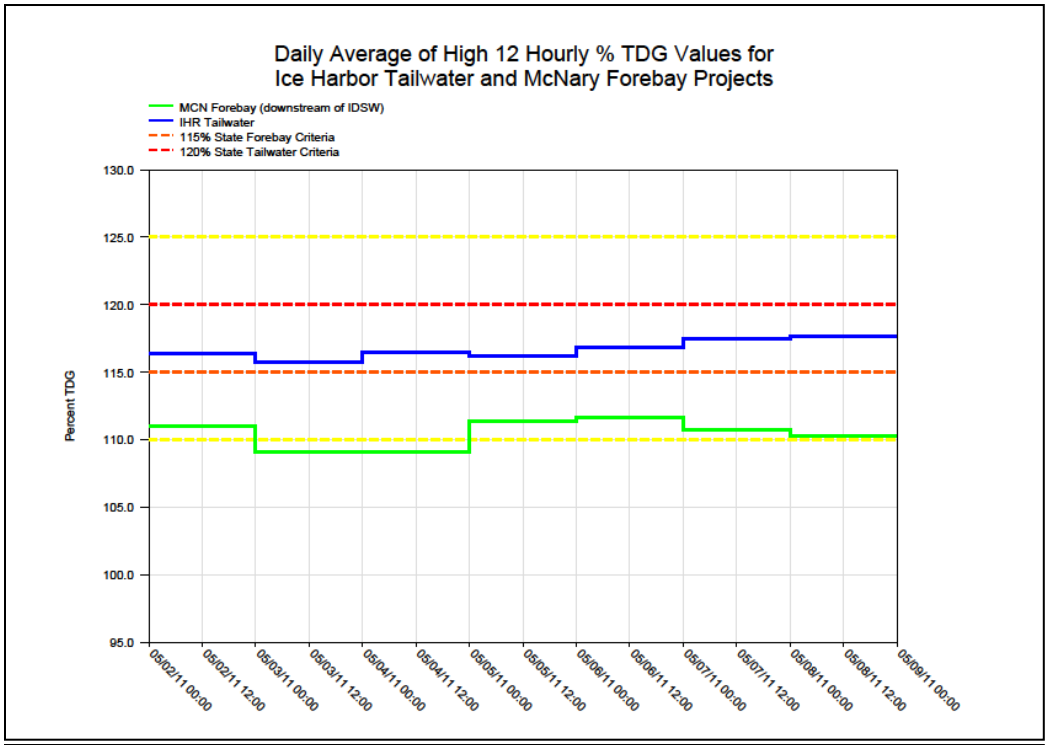

LOWER MONUMENTAL DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
05/02/11 01:00
05/02/11 13:00
05/03/11 01:00
05/03/11 13:00
05/04/11 01:00
05/04/11 13:00
05/05/11 01:00
05/05/11 13:00
05/06/11 01:00
05/06/11 13:00
05/07/11 01:00
05/07/11 13:00
05/08/11 01:00
05/08/11 13:00
05/09/11 01:00
LMN Generation Flow
LMN Total Flow
LMN Spill Flow
LMN Target Spill
Spill Cap

Figure 4


Daily Average of High 12 Hourly % TDG Values for
Ice Harbor Tailwater and McNary Forebay Projects
MCN Forebay (downstream of IDSW)
IHR Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/02/11 00:00
05/02/11 12:00
05/03/11 00:00
05/03/11 12:00
05/04/11 00:00
05/04/11 12:00
05/05/11 00:00
05/05/11 12:00
05/06/11 00:00
05/06/11 12:00
05/07/11 00:00
05/07/11 12:00
05/08/11 00:00
05/08/11 12:00
05/09/11 00:00

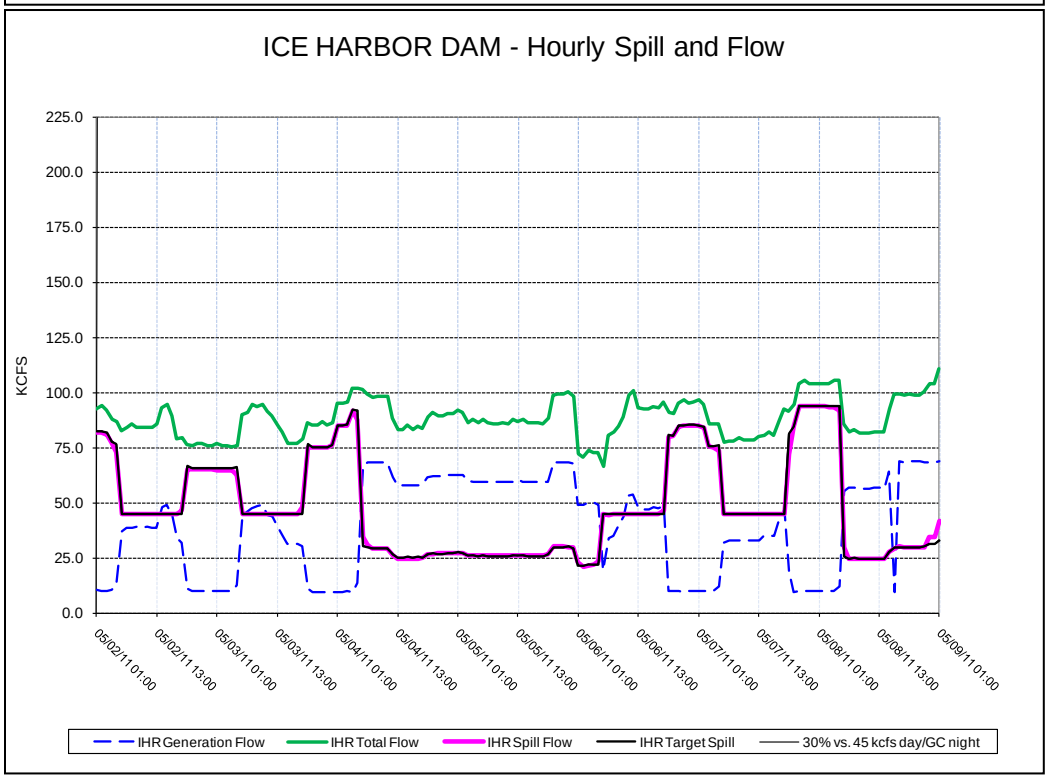
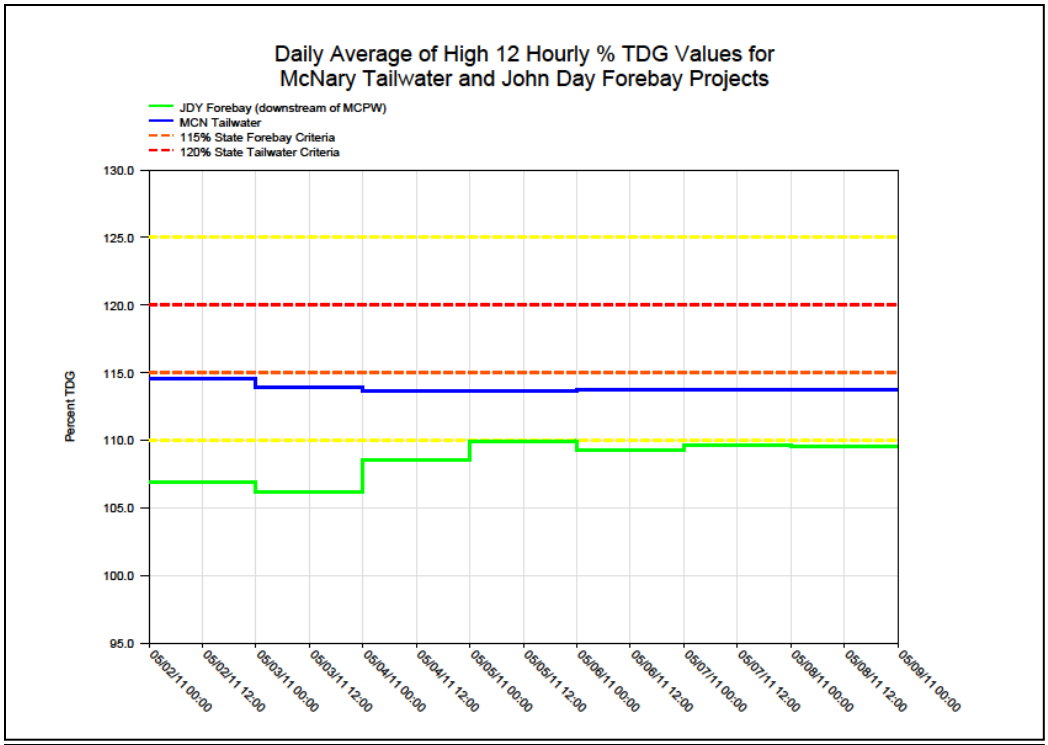

ICE HARBOR DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
05/02/11 01:00
05/02/11 13:00
05/03/11 01:00
05/03/11 13:00
05/04/11 01:00
05/04/11 13:00
05/05/11 01:00
05/05/11 13:00
05/06/11 01:00
05/06/11 13:00
05/07/11 01:00
05/07/11 13:00
05/08/11 01:00
05/08/11 13:00
05/09/11 01:00
IHR Generation Flow
IHR Total Flow
IHR Spill Flow
IHR Target Spill
30% vs. 45 kcfs day/GC night

Figure 5


Daily Average of High 12 Hourly % TDG Values for
McNary Tailwater and John Day Forebay Projects
JDY Forebay (downstream of MCPW)
MCN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/02/11 00:00
05/02/11 12:00
05/03/11 00:00
05/03/11 12:00
05/04/11 00:00
05/04/11 12:00
05/05/11 00:00
05/05/11 12:00
05/06/11 00:00
05/06/11 12:00
05/07/11 00:00
05/07/11 12:00
05/08/11 00:00
05/08/11 12:00
05/09/11 00:00

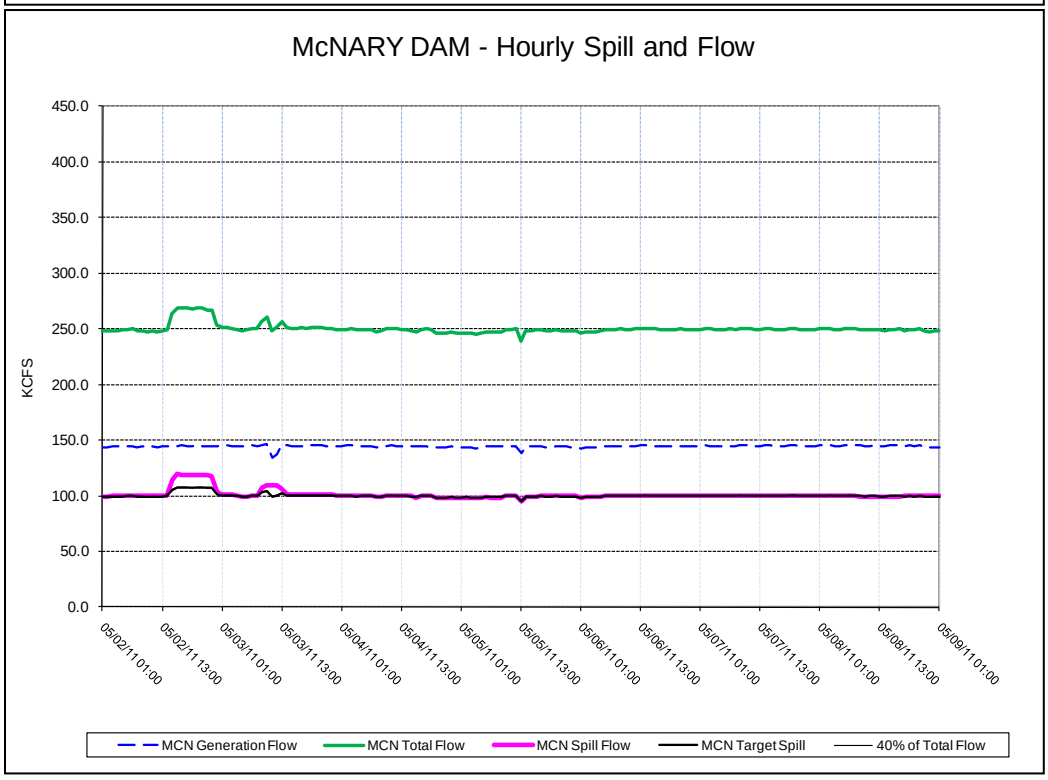
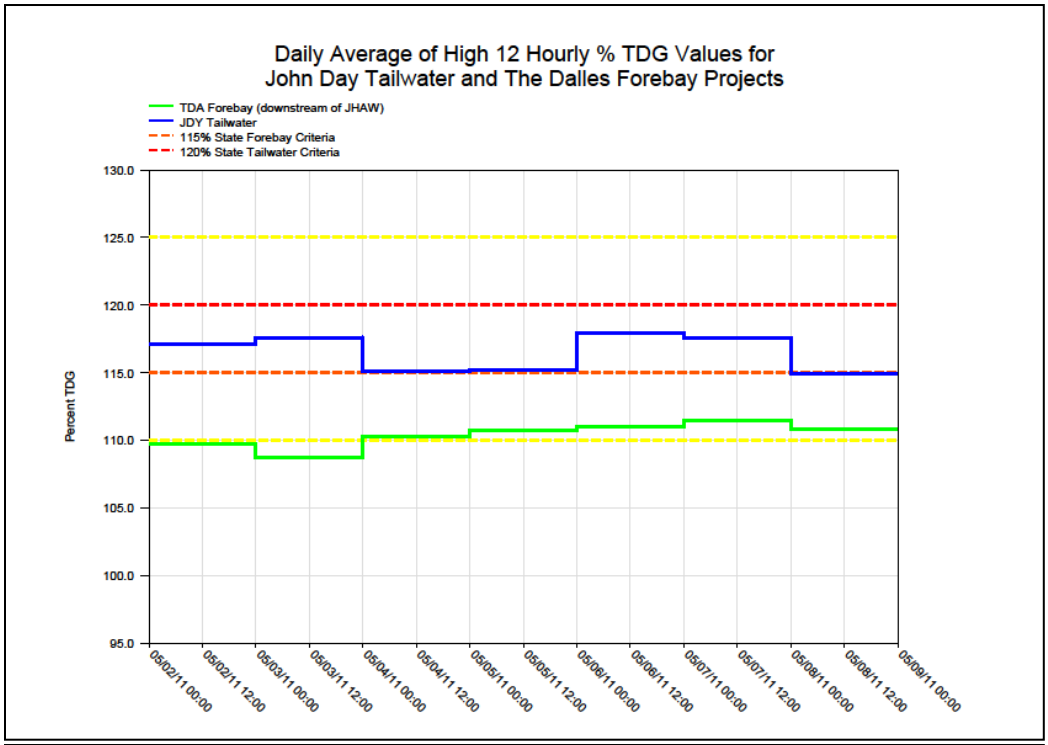

McNARY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
05/02/11 01:00
05/02/11 13:00
05/03/11 01:00
05/03/11 13:00
05/04/11 01:00
05/04/11 13:00
05/05/11 01:00
05/05/11 13:00
05/06/11 01:00
05/06/11 13:00
05/07/11 01:00
05/07/11 13:00
05/08/11 01:00
05/08/11 13:00
05/09/11 01:00
MCN Generation Flow
MCN Total Flow
MCN Spill Flow
MCN Target Spill
40% of Total Flow

Figure 6


Daily Average of High 12 Hourly % TDG Values for
John Day Tailwater and The Dalles Forebay Projects
TDA Forebay (downstream of JHAW)
JDY Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/02/11 00:00
05/02/11 12:00
05/03/11 00:00
05/03/11 12:00
05/04/11 00:00
05/04/11 12:00
05/05/11 00:00
05/05/11 12:00
05/06/11 00:00
05/06/11 12:00
05/07/11 00:00
05/07/11 12:00
05/08/11 00:00
05/08/11 12:00
05/09/11 00:00

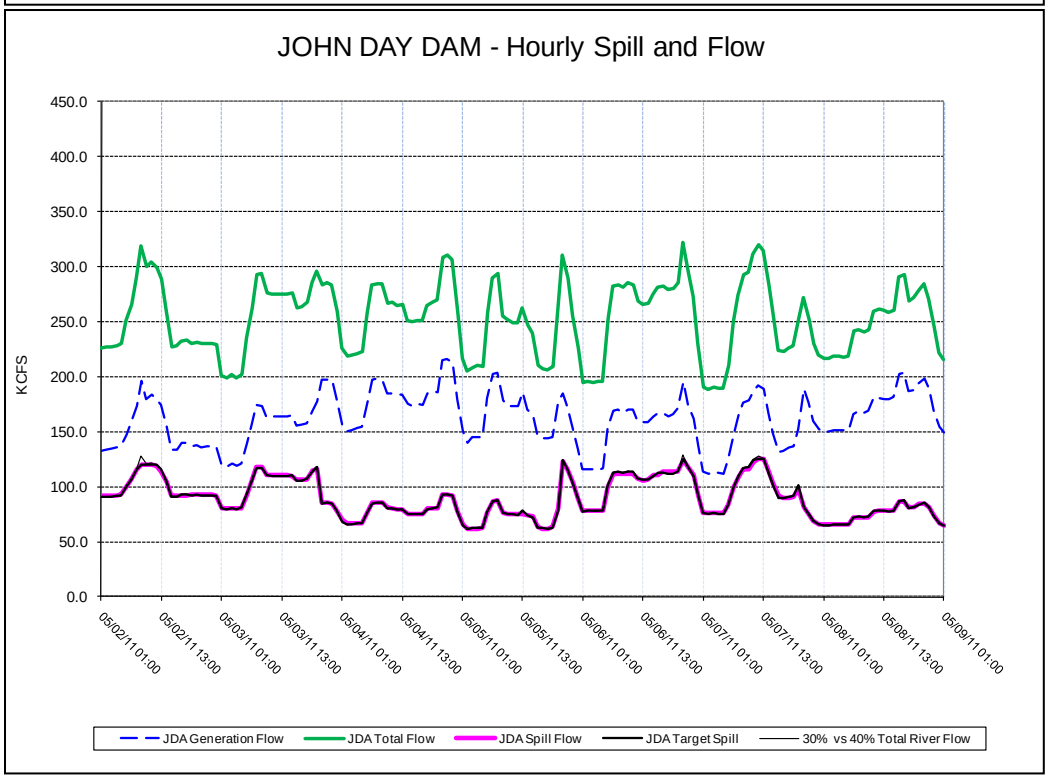
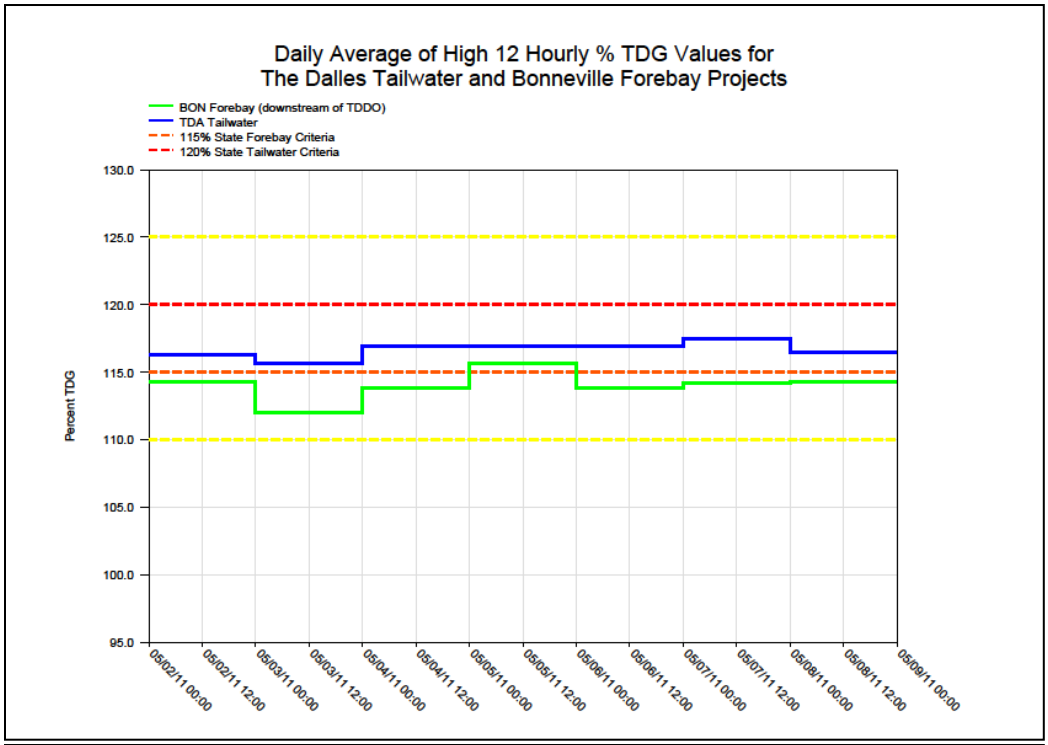

JOHN DAY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
05/02/11 01:00
05/02/11 13:00
05/03/11 01:00
05/03/11 13:00
05/04/11 01:00
05/04/11 13:00
05/05/11 01:00
05/05/11 13:00
05/06/11 01:00
05/06/11 13:00
05/07/11 01:00
05/07/11 13:00
05/08/11 01:00
05/08/11 13:00
05/09/11 01:00
JDA Generation Flow
JDA Total Flow
JDA Spill Flow
JDA Target Spill
30% vs 40% Total River Flow

Figure 7


Daily Average of High 12 Hourly % TDG Values for
The Dalles Tailwater and Bonneville Forebay Projects
BON Forebay (downstream of TDDO)
TDA Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/02/11 00:00
05/02/11 12:00
05/03/11 00:00
05/03/11 12:00
05/04/11 00:00
05/04/11 12:00
05/05/11 00:00
05/05/11 12:00
05/06/11 00:00
05/06/11 12:00
05/07/11 00:00
05/07/11 12:00
05/08/11 00:00
05/08/11 12:00
05/09/11 00:00

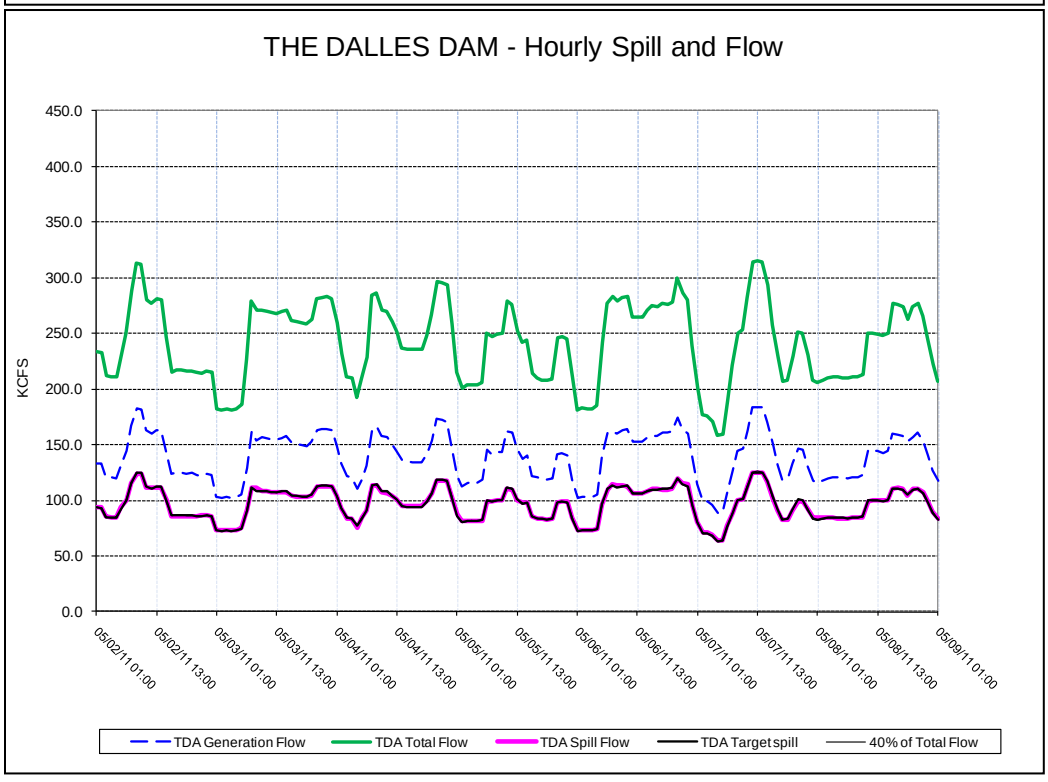
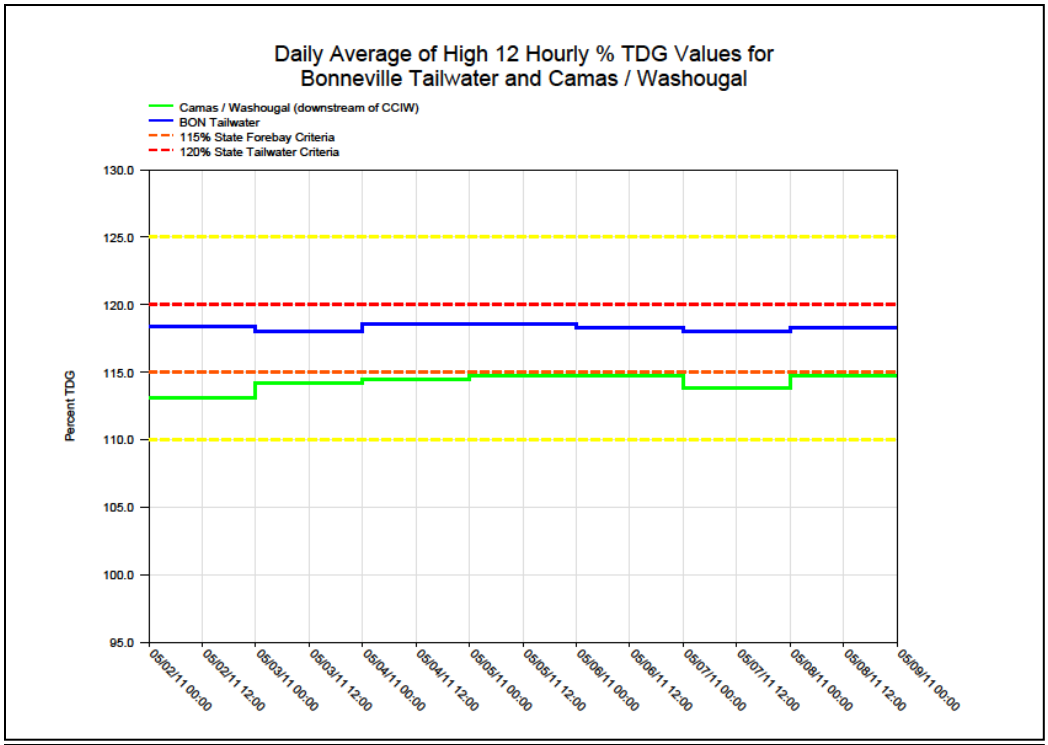

THE DALLES DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
05/02/11 01:00
05/02/11 13:00
05/03/11 01:00
05/03/11 13:00
05/04/11 01:00
05/04/11 13:00
05/05/11 01:00
05/05/11 13:00
05/06/11 01:00
05/06/11 13:00
05/07/11 01:00
05/07/11 13:00
05/08/11 01:00
05/08/11 13:00
05/09/11 01:00
TDA Generation Flow
TDA Total Flow
TDA Spill Flow
TDA Target spill
40% of Total Flow

Figure 8


Daily Average of High 12 Hourly % TDG Values for
Bonneville Tailwater and Camas / Washougal
Camas / Washougal (downstream of CCIW)
BON Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/02/11 00:00
05/02/11 12:00
05/03/11 00:00
05/03/11 12:00
05/04/11 00:00
05/04/11 12:00
05/05/11 00:00
05/05/11 12:00
05/06/11 00:00
05/06/11 12:00
05/07/11 00:00
05/07/11 12:00
05/08/11 00:00
05/08/11 12:00
05/09/11 00:00

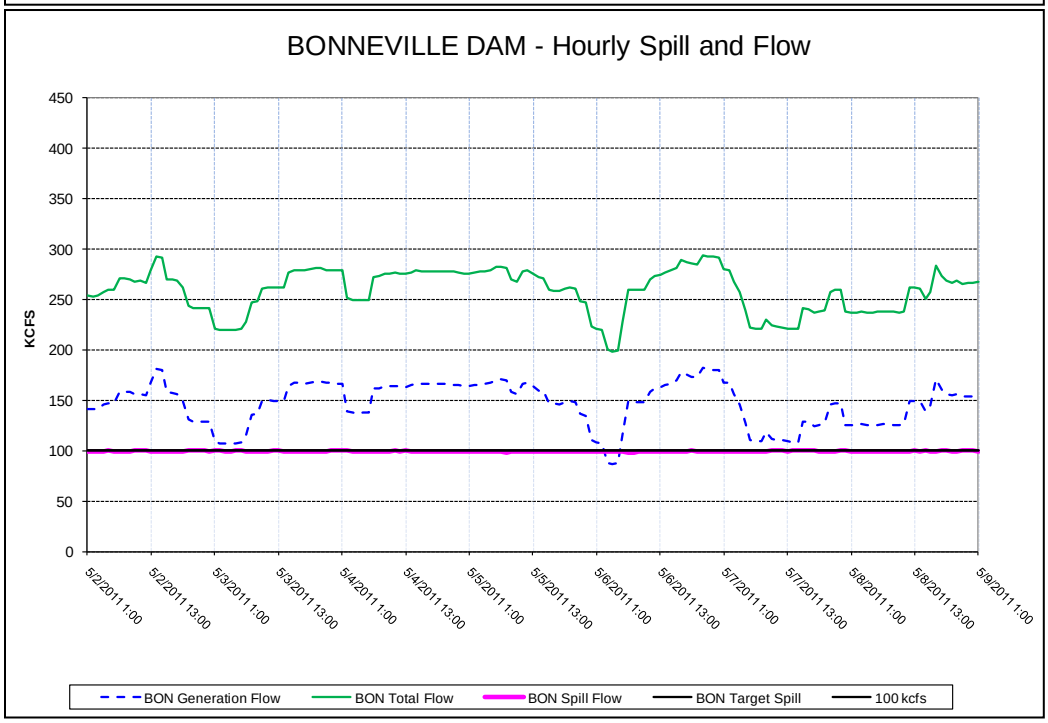
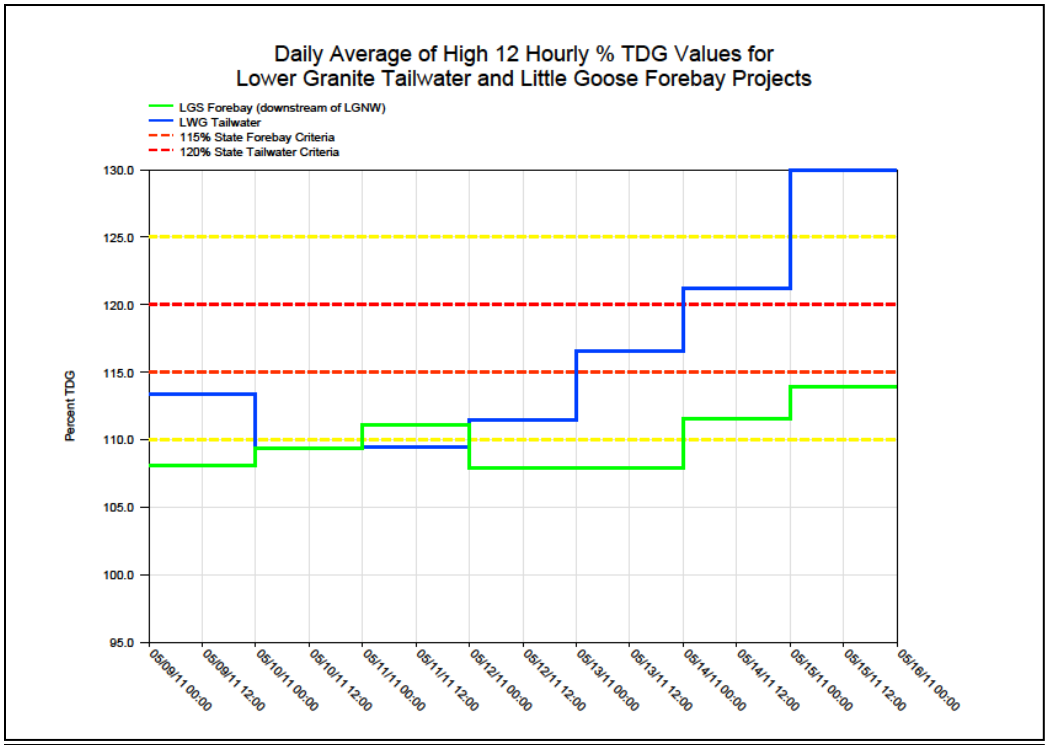

BONNEVILLE DAM - Hourly Spill and Flow
KCFS
450
400
350
300
250
200
150
100
50
0
5/2/2011 1:00
5/2/2011 13:00
5/3/2011 1:00
5/3/2011 13:00
5/4/2011 1:00
5/4/2011 13:00
5/5/2011 1:00
5/5/2011 13:00
5/6/2011 1:00
5/6/2011 13:00
5/7/2011 1:00
5/7/2011 13:00
5/8/2011 1:00
5/8/2011 13:00
5/9/2011 1:00
BON Generation Flow
BON Total Flow
BON Spill Flow
BON Target Spill
100 kcfs

Figure 9


Daily Average of High 12 Hourly % TDG Values for
Lower Granite Tailwater and Little Goose Forebay Projects
LGS Forebay (downstream of LGNW)
LWG Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/09/11 00:00
05/09/11 12:00
05/10/11 00:00
05/10/11 12:00
05/11/11 00:00
05/11/11 12:00
05/12/11 00:00
05/12/11 12:00
05/13/11 00:00
05/13/11 12:00
05/14/11 00:00
05/14/11 12:00
05/15/11 00:00
05/15/11 12:00
05/16/11 00:00

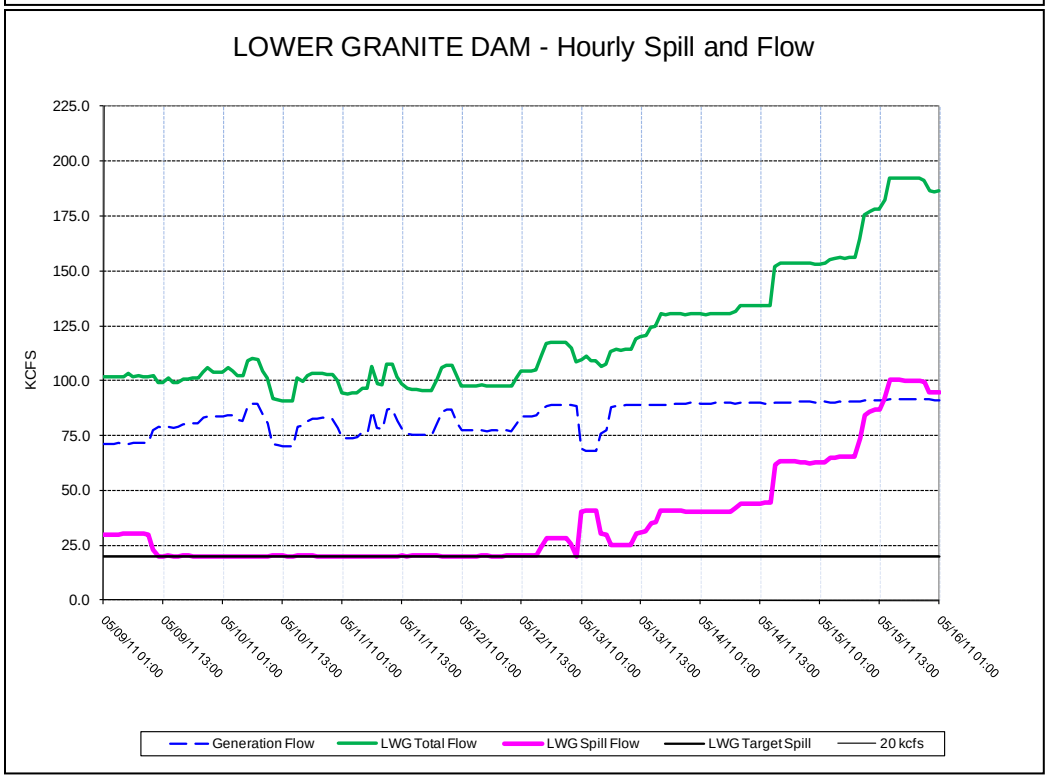
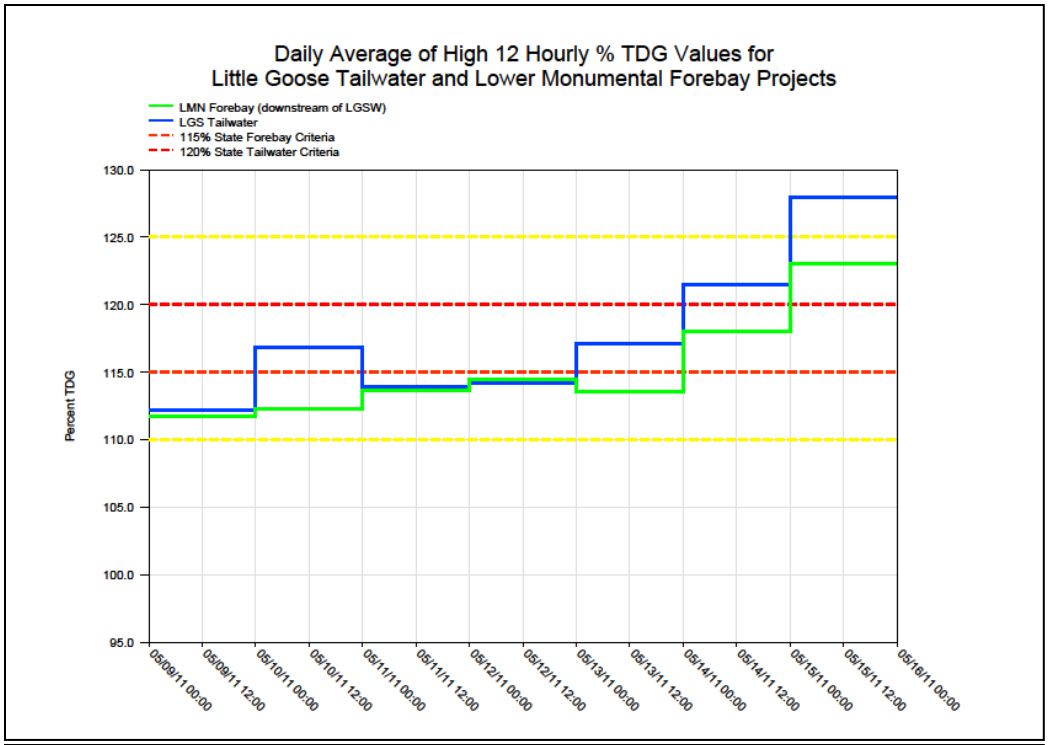

LOWER GRANITE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
05/09/11 01:00
05/09/11 13:00
05/10/11 01:00
05/10/11 13:00
05/11/11 01:00
05/11/11 13:00
05/12/11 01:00
05/12/11 13:00
05/13/11 01:00
05/13/11 13:00
05/14/11 01:00
05/14/11 13:00
05/15/11 01:00
05/15/11 13:00
05/16/11 01:00
Generation Flow
LWG Total Flow
LWG Spill Flow
LWG Target Spill
20 kcfs

Figure 10


Daily Average of High 12 Hourly % TDG Values for
Little Goose Tailwater and Lower Monumental Forebay Projects
LMN Forebay (downstream of LGSW)
LGS Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/09/11 00:00
05/09/11 12:00
05/10/11 00:00
05/10/11 12:00
05/11/11 00:00
05/11/11 12:00
05/12/11 00:00
05/12/11 12:00
05/13/11 00:00
05/13/11 12:00
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05/14/11 12:00
05/15/11 00:00
05/15/11 12:00
05/16/11 00:00

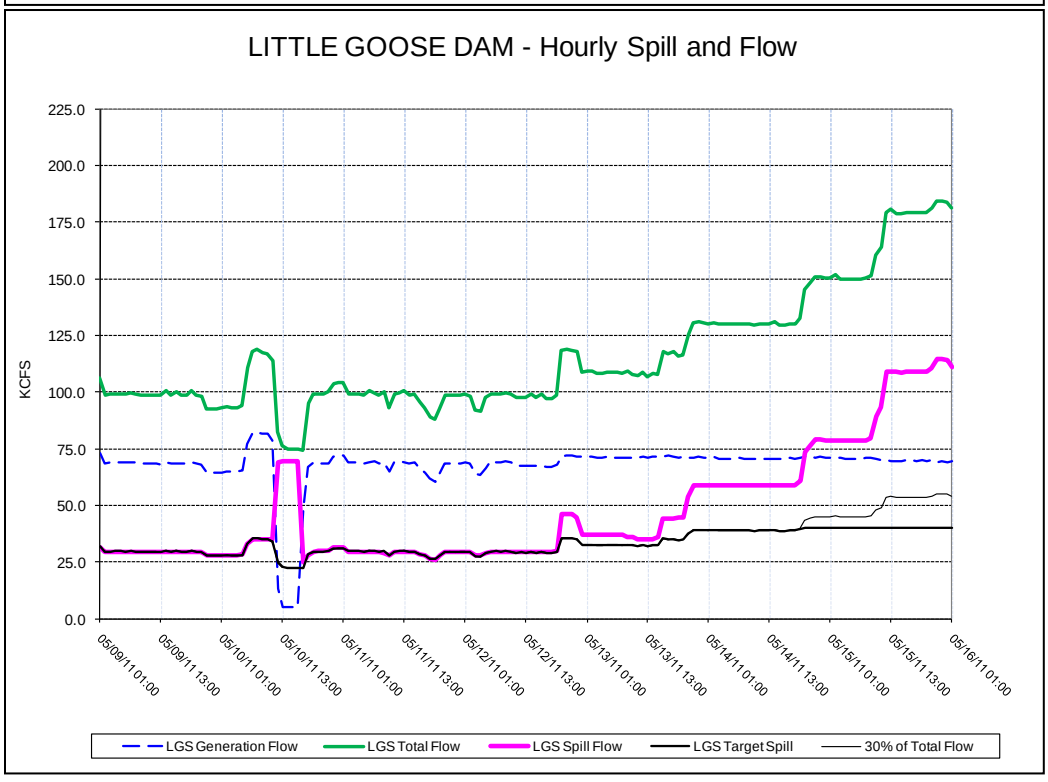
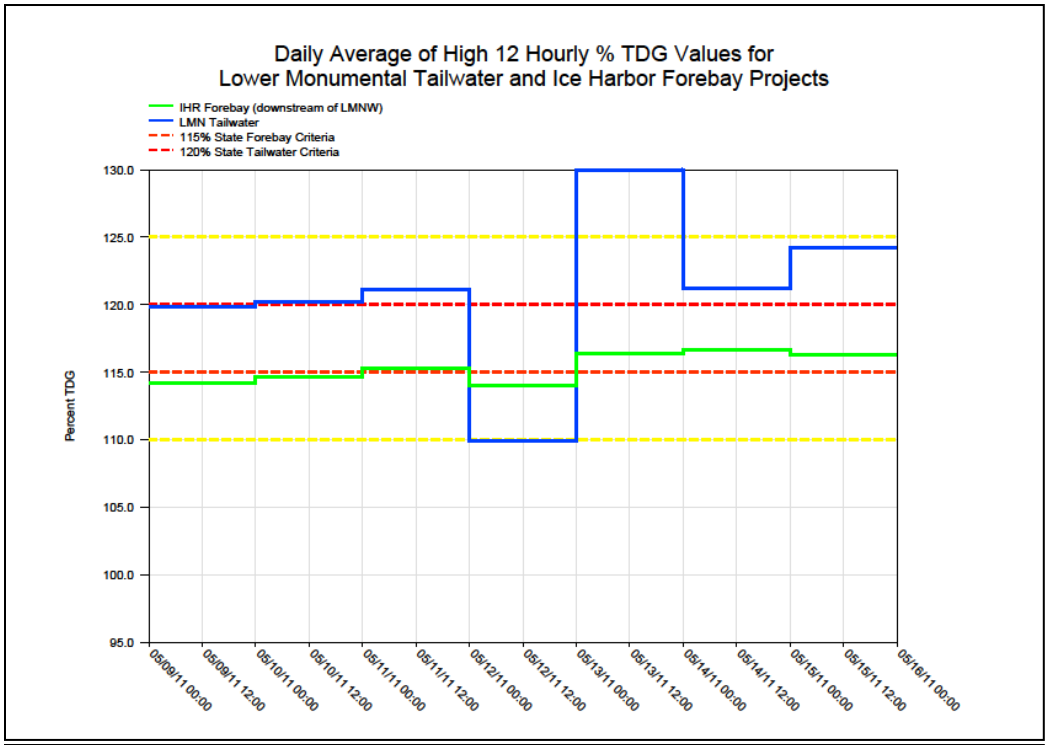

LITTLE GOOSE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
05/09/11 01:00
05/09/11 13:00
05/10/11 01:00
05/10/11 13:00
05/11/11 01:00
05/11/11 13:00
05/12/11 01:00
05/12/11 13:00
05/13/11 01:00
05/13/11 13:00
05/14/11 01:00
05/14/11 13:00
05/15/11 01:00
05/15/11 13:00
05/16/11 01:00
LGS Generation Flow
LGS Total Flow
LGS Spill Flow
LGS Target Spill
30% of Total Flow

Figure 11


Daily Average of High 12 Hourly % TDG Values for
Lower Monumental Tailwater and Ice Harbor Forebay Projects
IHR Forebay (downstream of LMNW)
LMN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/09/11 00:00
05/09/11 12:00
05/10/11 00:00
05/10/11 12:00
05/11/11 00:00
05/11/11 12:00
05/12/11 00:00
05/12/11 12:00
05/13/11 00:00
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05/15/11 00:00
05/15/11 12:00
05/16/11 00:00

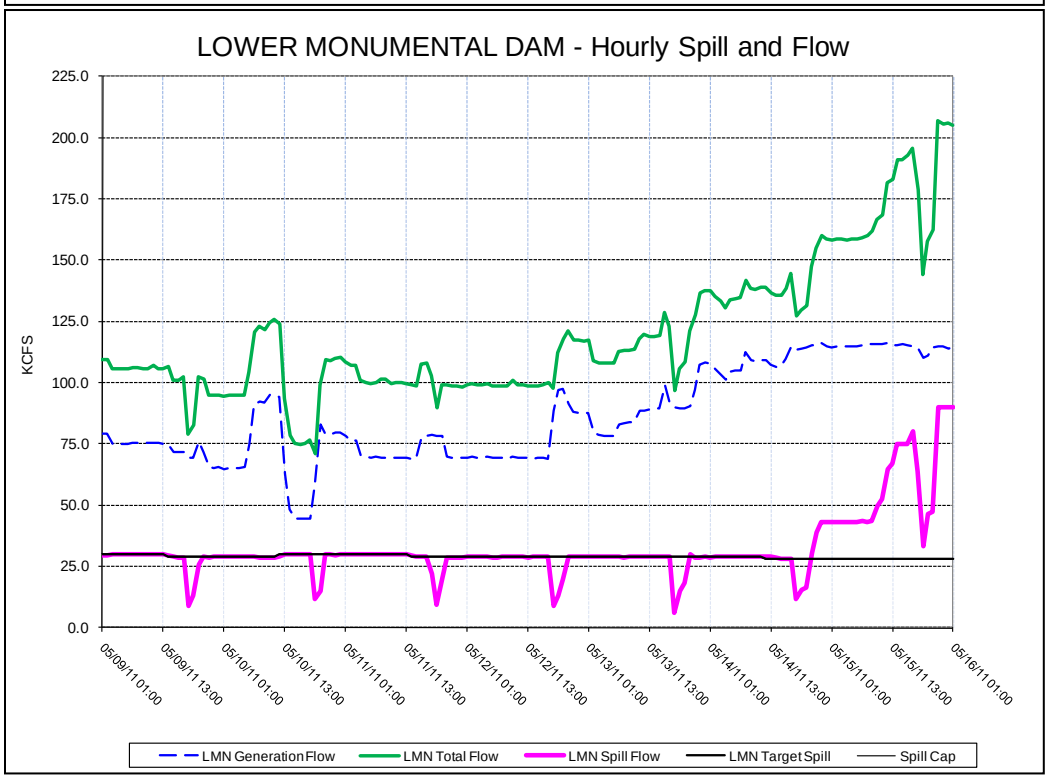
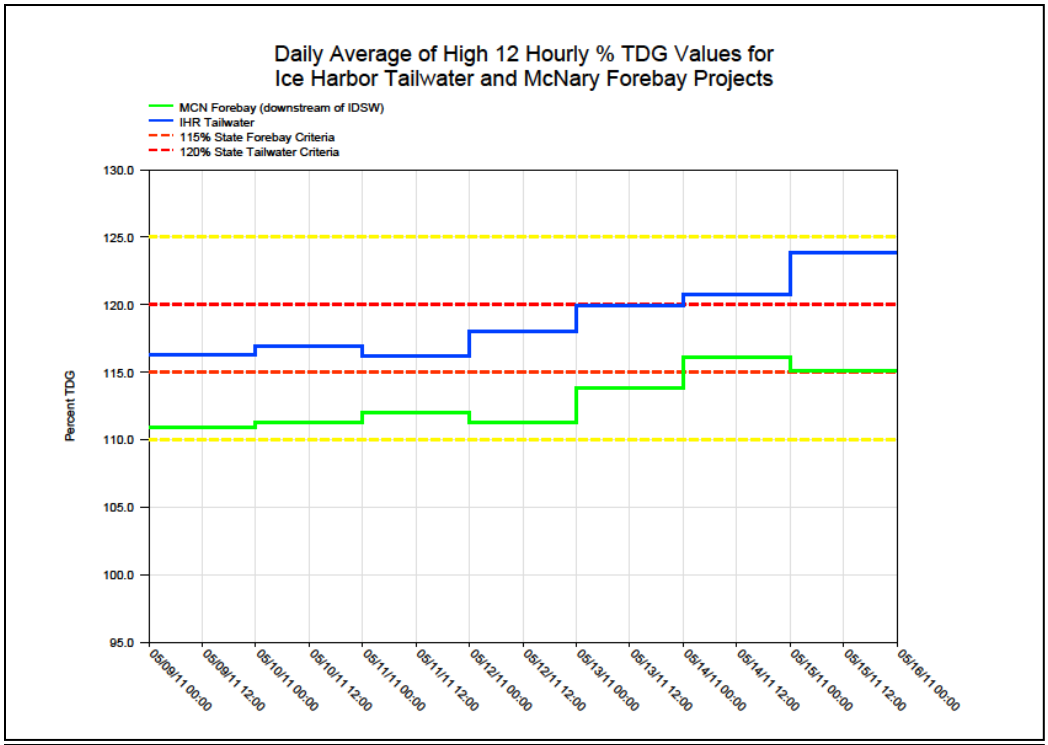

LOWER MONUMENTAL DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
05/09/11 01:00
05/09/11 13:00
05/10/11 01:00
05/10/11 13:00
05/11/11 01:00
05/11/11 13:00
05/12/11 01:00
05/12/11 13:00
05/13/11 01:00
05/13/11 13:00
05/14/11 01:00
05/14/11 13:00
05/15/11 01:00
05/15/11 13:00
05/16/11 01:00
LMN Generation Flow
LMN Total Flow
LMN Spill Flow
LMN Target Spill
Spill Cap

Figure 12


Daily Average of High 12 Hourly % TDG Values for
Ice Harbor Tailwater and McNary Forebay Projects
MCN Forebay (downstream of IDSW)
IHR Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/09/11 00:00
05/09/11 12:00
05/10/11 00:00
05/10/11 12:00
05/11/11 00:00
05/11/11 12:00
05/12/11 00:00
05/12/11 12:00
05/13/11 00:00
05/13/11 12:00
05/14/11 00:00
05/14/11 12:00
05/15/11 00:00
05/15/11 12:00
05/16/11 00:00

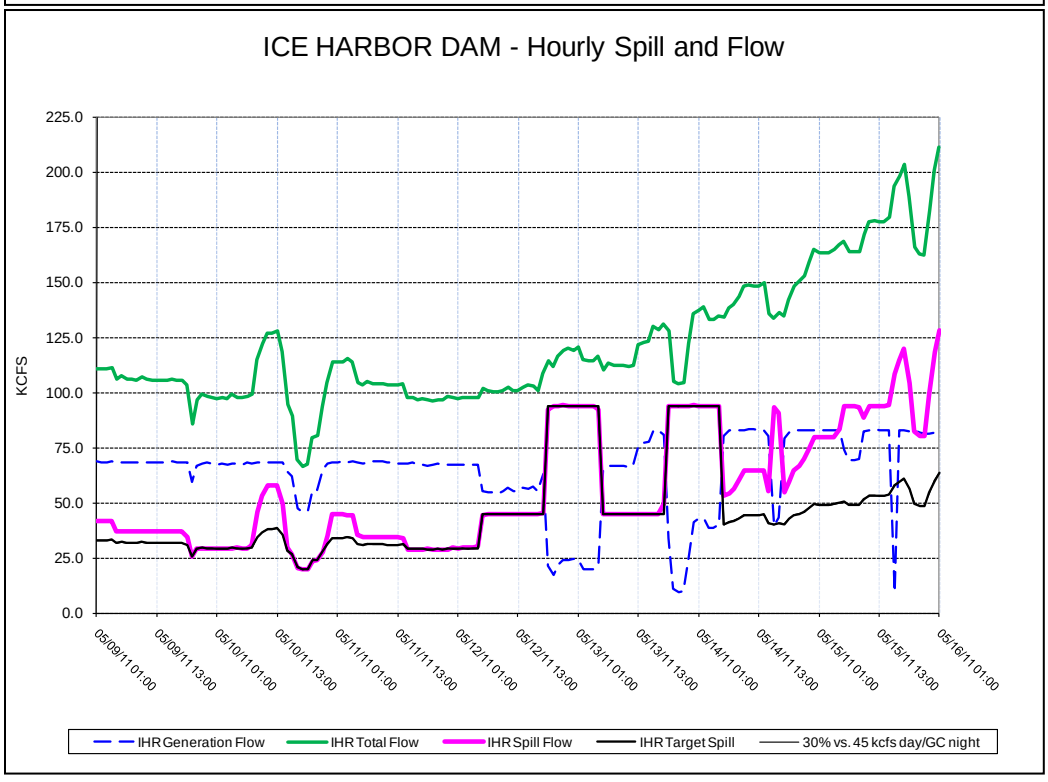

ICE HARBOR DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
05/09/11 01:00
05/09/11 13:00
05/10/11 01:00
05/10/11 13:00
05/11/11 01:00
05/11/11 13:00
05/12/11 01:00
05/12/11 13:00
05/13/11 01:00
05/13/11 13:00
05/14/11 01:00
05/14/11 13:00
05/15/11 01:00
05/15/11 13:00
05/16/11 01:00
IHR Generation Flow
IHR Total Flow
IHR Spill Flow
IHR Target Spill
30% vs. 45 kcfs day/GC night

Figure 13

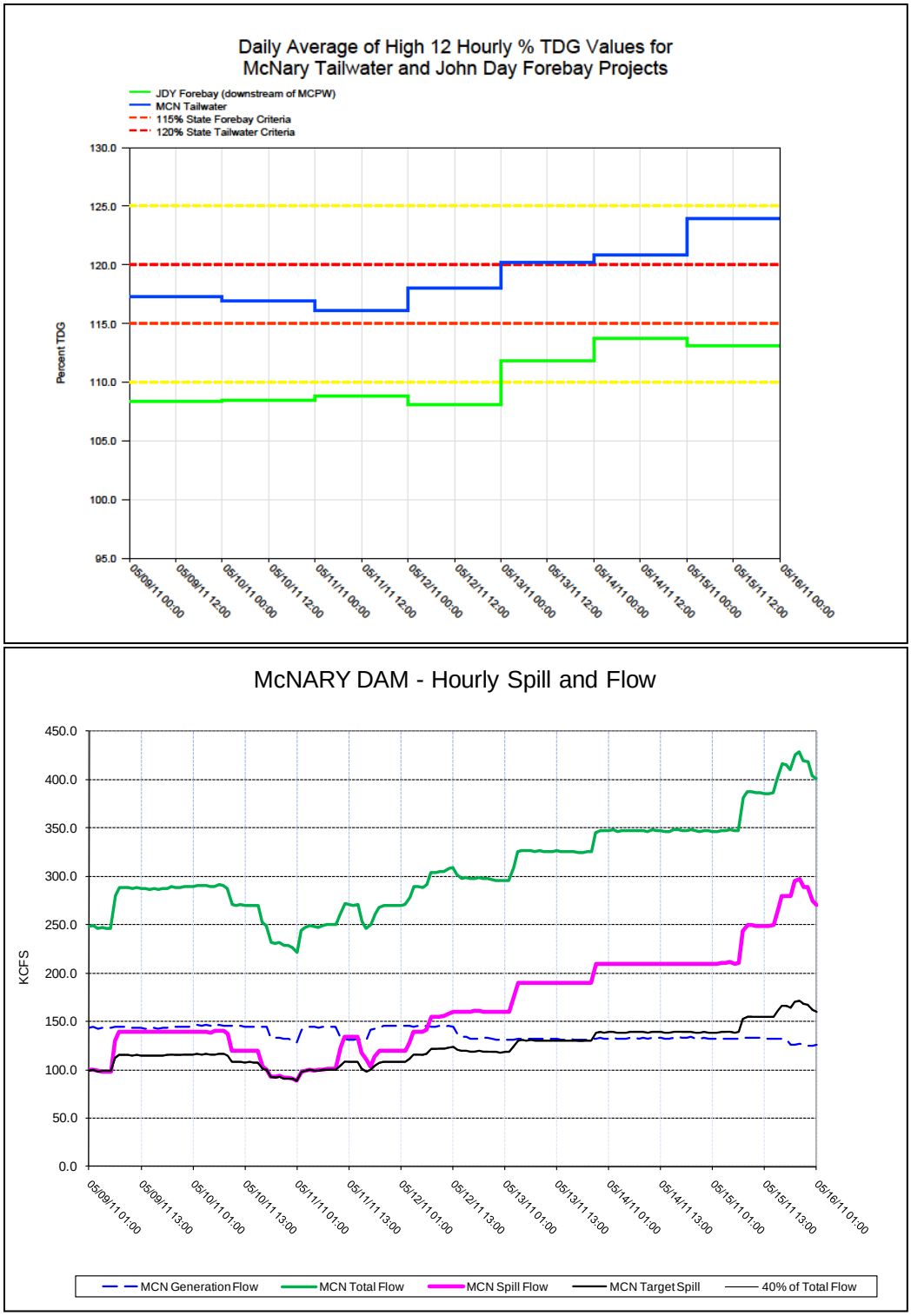
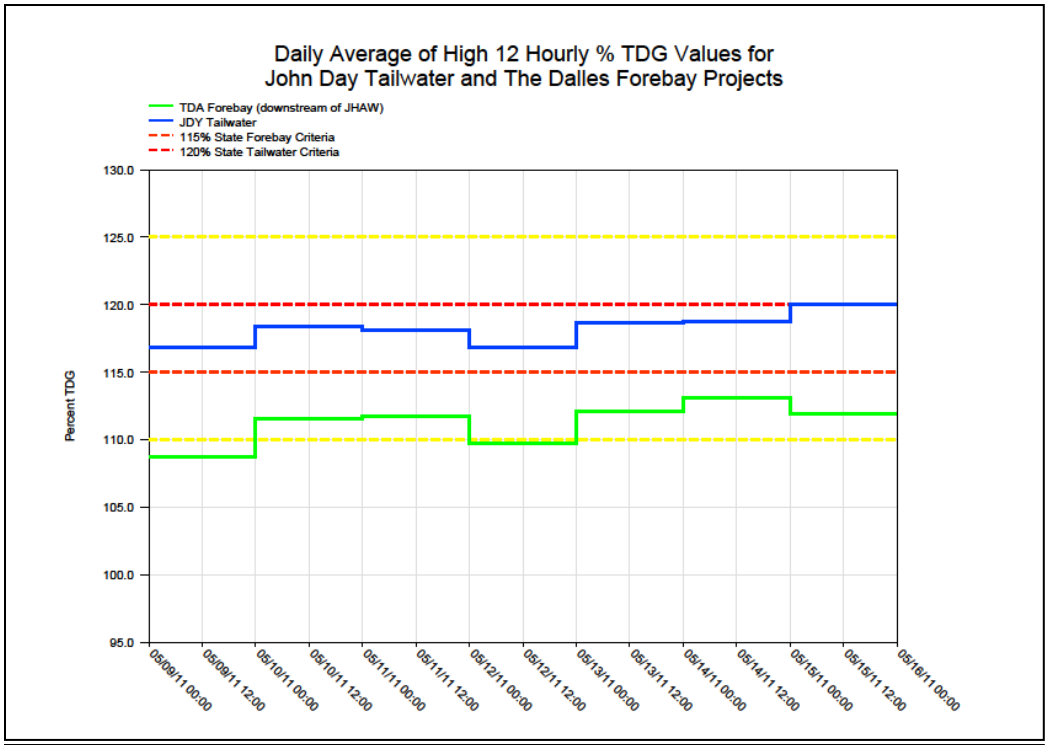

Daily Average of High 12 Hourly % TDG Values for
McNary Tailwater and John Day Forebay Projects
JDY Forebay (downstream of MCPW)
MCN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/09/11 00:00
05/09/11 12:00
05/10/11 00:00
05/10/11 12:00
05/11/11 00:00
05/11/11 12:00
05/12/11 00:00
05/12/11 12:00
05/13/11 00:00
05/13/11 12:00
05/14/11 00:00
05/14/11 12:00
05/15/11 00:00
05/15/11 12:00
05/16/11 00:00
McNARY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
05/09/11 01:00
05/09/11 13:00
05/10/11 01:00
05/10/11 13:00
05/11/11 01:00
05/11/11 13:00
05/12/11 01:00
05/12/11 13:00
05/13/11 01:00
05/13/11 13:00
05/14/11 01:00
05/14/11 13:00
05/15/11 01:00
05/15/11 13:00
05/16/11 01:00
MCN Generation Flow
MCN Total Flow
MCN Spill Flow
MCN Target Spill
40% of Total Flow

Figure 14


Daily Average of High 12 Hourly % TDG Values for
John Day Tailwater and The Dalles Forebay Projects
TDA Forebay (downstream of JHAW)
JDY Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/09/11 00:00
05/09/11 12:00
05/10/11 00:00
05/10/11 12:00
05/11/11 00:00
05/11/11 12:00
05/12/11 00:00
05/12/11 12:00
05/13/11 00:00
05/13/11 12:00
05/14/11 00:00
05/14/11 12:00
05/15/11 00:00
05/15/11 12:00
05/16/11 00:00

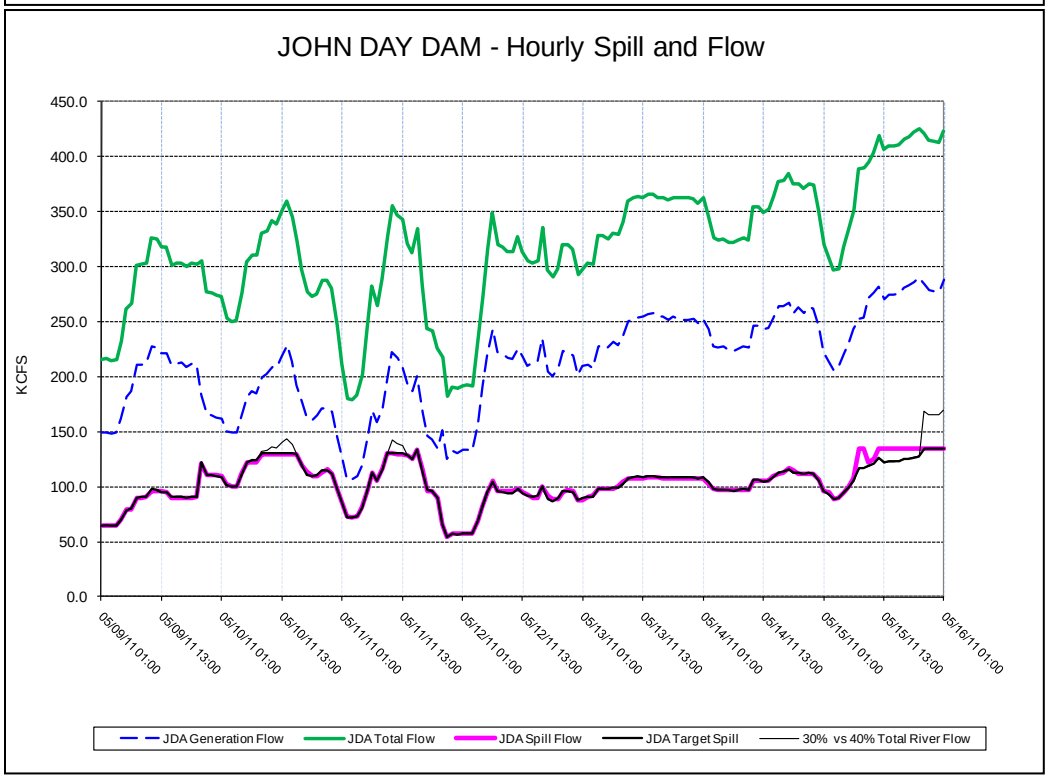

JOHN DAY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
05/09/11 01:00
05/09/11 13:00
05/10/11 01:00
05/10/11 13:00
05/11/11 01:00
05/11/11 13:00
05/12/11 01:00
05/12/11 13:00
05/13/11 01:00
05/13/11 13:00
05/14/11 01:00
05/14/11 13:00
05/15/11 01:00
05/15/11 13:00
05/16/11 01:00
JDA Generation Flow
JDA Total Flow
JDA Spill Flow
JDA Target Spill
30% vs 40% Total River Flow

Figure 15

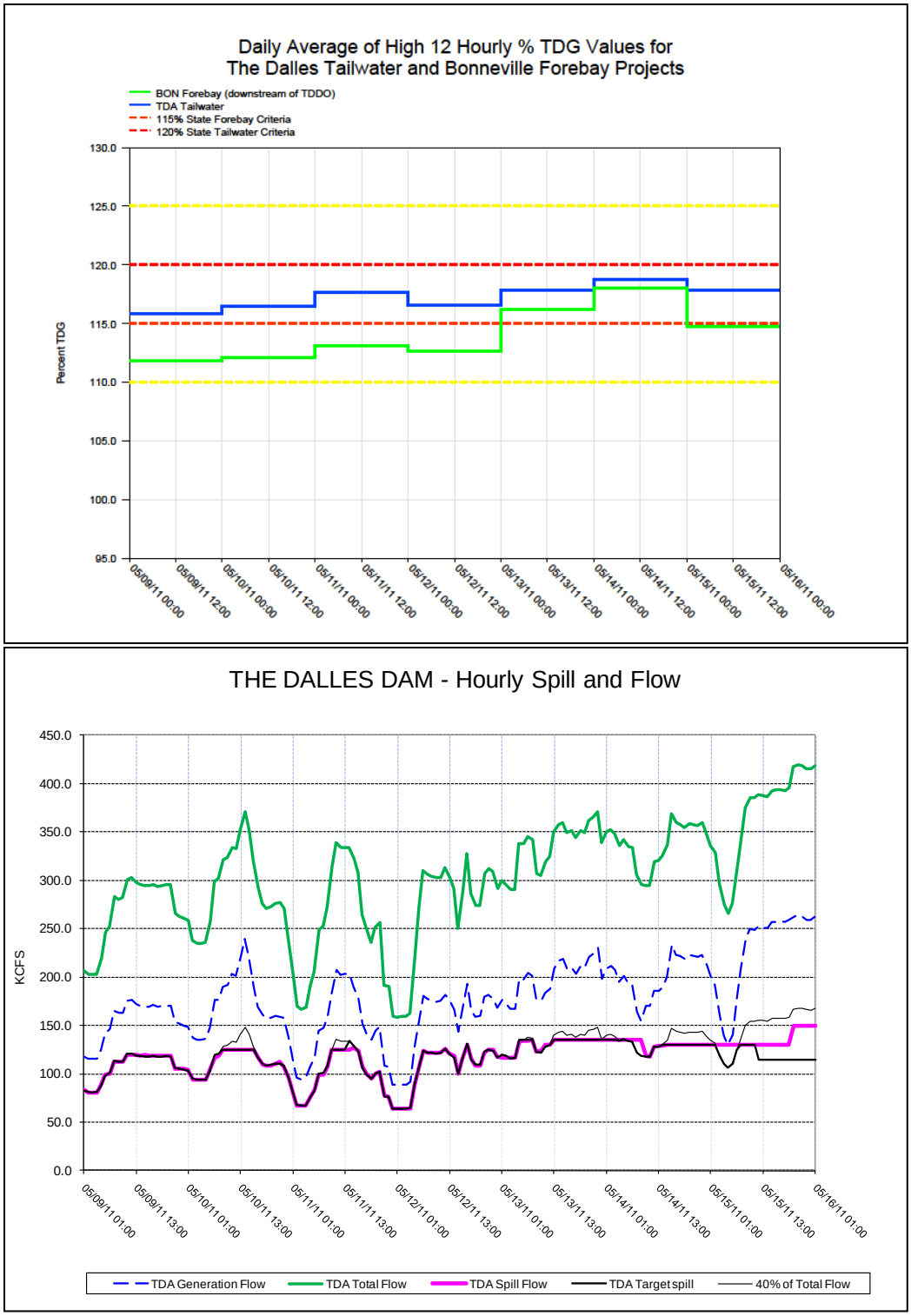
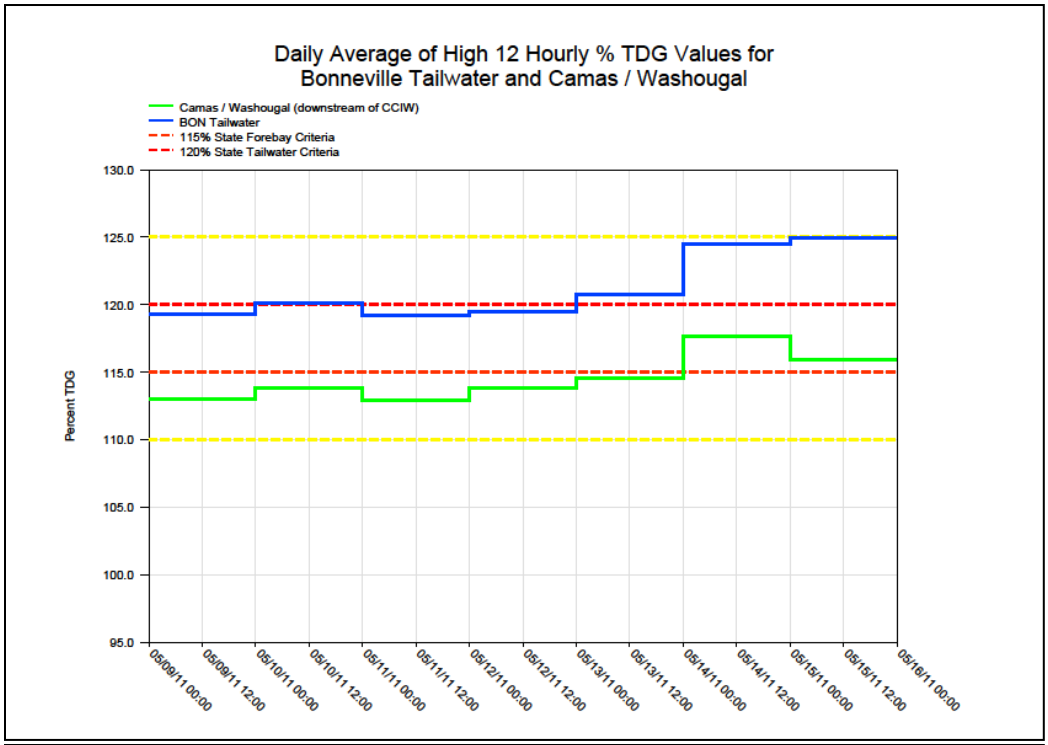

Daily Average of High 12 Hourly % TDG Values for
The Dalles Tailwater and Bonneville Forebay Projects
BON Forebay (downstream of TDDO)
TDA Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/09/11 00:00
05/09/11 12:00
05/10/11 00:00
05/10/11 12:00
05/11/11 00:00
05/11/11 12:00
05/12/11 00:00
05/12/11 12:00
05/13/11 00:00
05/13/11 12:00
05/14/11 00:00
05/14/11 12:00
05/15/11 00:00
05/15/11 12:00
05/16/11 00:00
THE DALLES DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
05/09/11 01:00
05/09/11 13:00
05/10/11 01:00
05/10/11 13:00
05/11/11 01:00
05/11/11 13:00
05/12/11 01:00
05/12/11 13:00
05/13/11 01:00
05/13/11 13:00
05/14/11 01:00
05/14/11 13:00
05/15/11 01:00
05/15/11 13:00
05/16/11 01:00
TDA Generation Flow
TDA Total Flow
TDA Spill Flow
TDA Target spill
40% of Total Flow

Figure 16


Daily Average of High 12 Hourly % TDG Values for
Bonneville Tailwater and Camas / Washougal
Camas / Washougal (downstream of CCIW)
BON Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/09/11 00:00
05/09/11 12:00
05/10/11 00:00
05/10/11 12:00
05/11/11 00:00
05/11/11 12:00
05/12/11 00:00
05/12/11 12:00
05/13/11 00:00
05/13/11 12:00
05/14/11 00:00
05/14/11 12:00
05/15/11 00:00
05/15/11 12:00
05/16/11 00:00

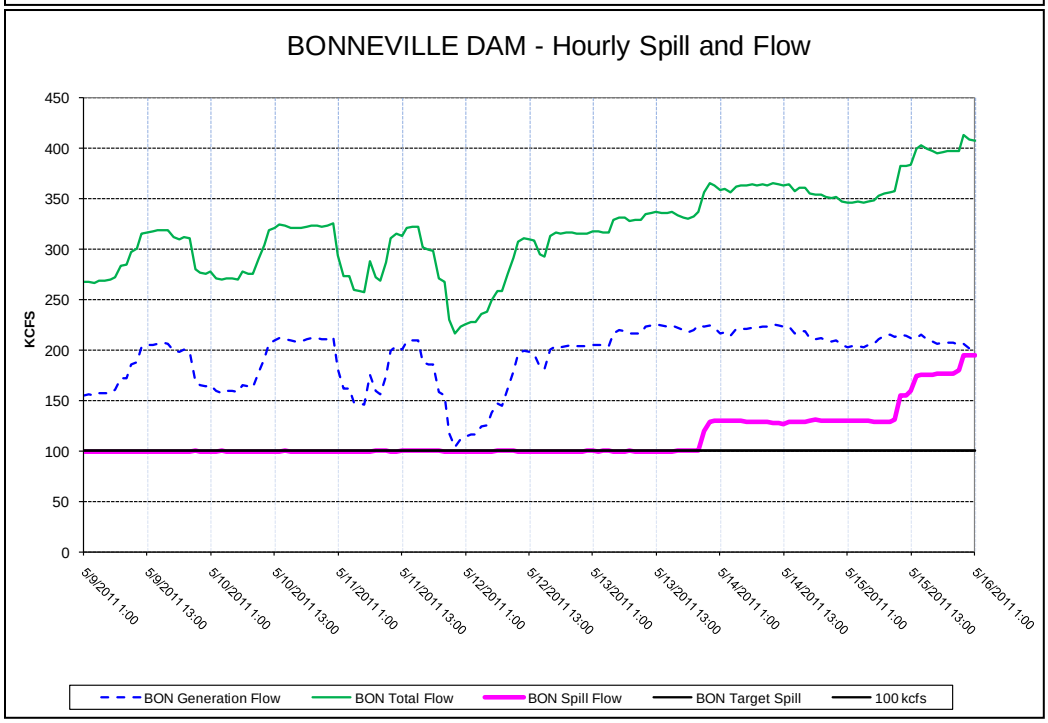

BONNEVILLE DAM - Hourly Spill and Flow
KCFS
450
400
350
300
250
200
150
100
50
0
5/9/2011 1:00
5/9/2011 13:00
5/10/2011 1:00
5/10/2011 13:00
5/11/2011 1:00
5/11/2011 13:00
5/12/2011 1:00
5/12/2011 13:00
5/13/2011 1:00
5/13/2011 13:00
5/14/2011 1:00
5/14/2011 13:00
5/15/2011 1:00
5/15/2011 13:00
5/16/2011 1:00
BON Generation Flow
BON Total Flow
BON Spill Flow
BON Target Spill
100 kcfs

Figure 17

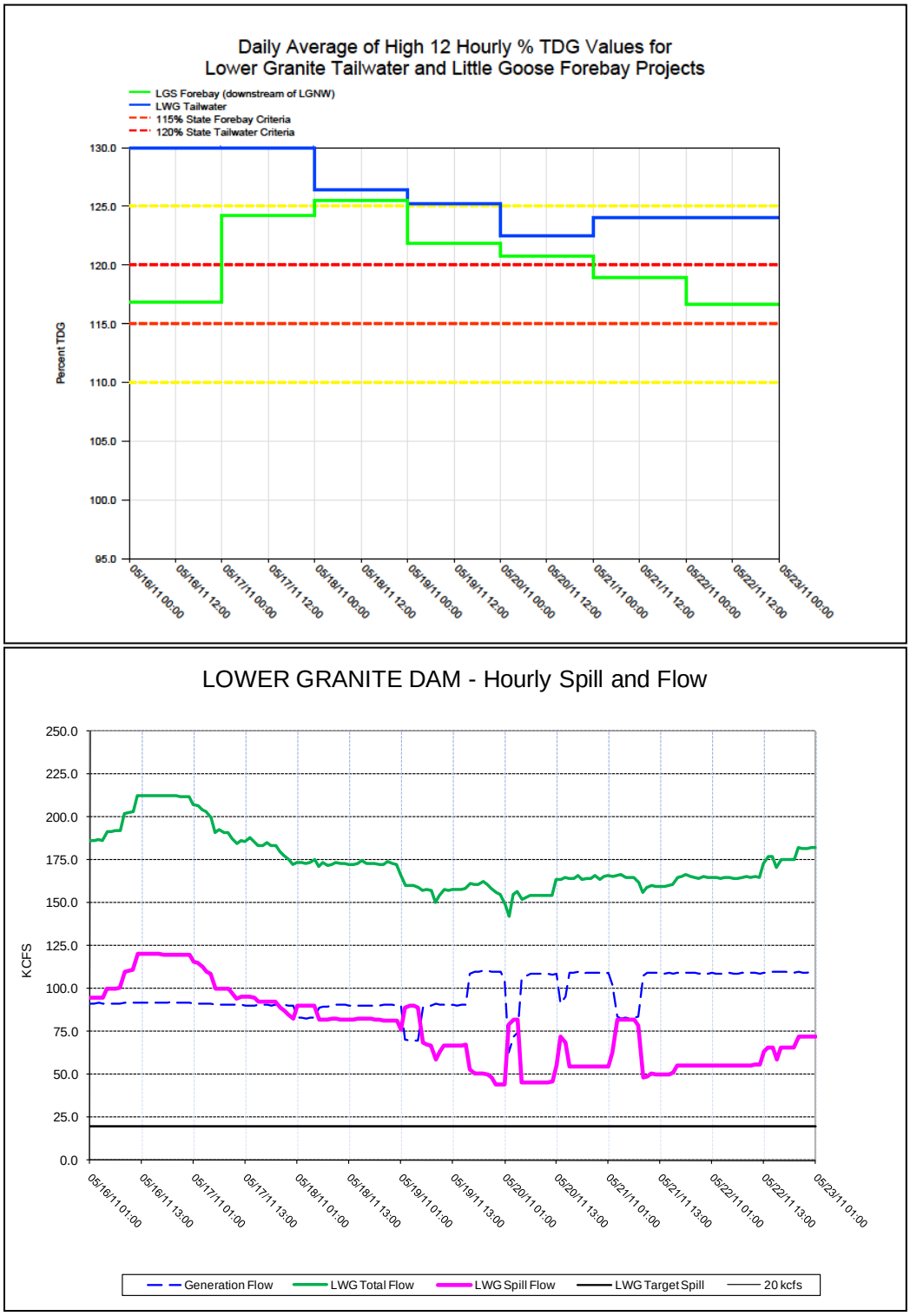
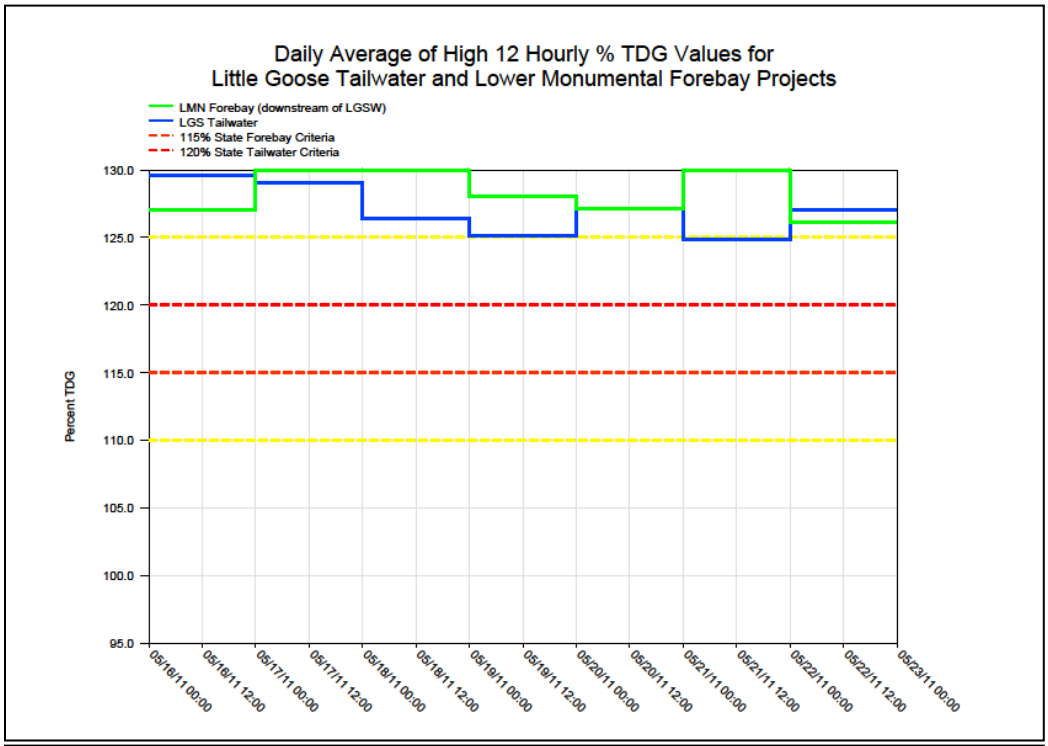

Daily Average of High 12 Hourly % TDG Values for
Lower Granite Tailwater and Little Goose Forebay Projects
LGS Forebay (downstream of LGNW)
LWG Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/16/11 00:00
05/16/11 12:00
05/17/11 00:00
05/17/11 12:00
05/18/11 00:00
05/18/11 12:00
05/19/11 00:00
05/19/11 12:00
05/20/11 00:00
05/20/11 12:00
05/21/11 00:00
05/21/11 12:00
05/22/11 00:00
05/22/11 12:00
05/23/11 00:00
LOWER GRANITE DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
05/16/11 01:00
05/16/11 13:00
05/17/11 01:00
05/17/11 13:00
05/18/11 01:00
05/18/11 13:00
05/19/11 01:00
05/19/11 13:00
05/20/11 01:00
05/20/11 13:00
05/21/11 01:00
05/21/11 13:00
05/22/11 01:00
05/22/11 13:00
05/23/11 01:00
Generation Flow
LWG Total Flow
LWG Spill Flow
LWG Target Spill
20 kcfs

Figure 18


Daily Average of High 12 Hourly % TDG Values for
Little Goose Tailwater and Lower Monumental Forebay Projects
LMN Forebay (downstream of LGSW)
LGS Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/16/11 00:00
05/16/11 12:00
05/17/11 00:00
05/17/11 12:00
05/18/11 00:00
05/18/11 12:00
05/19/11 00:00
05/19/11 12:00
05/20/11 00:00
05/20/11 12:00
05/21/11 00:00
05/21/11 12:00
05/22/11 00:00
05/22/11 12:00
05/23/11 00:00

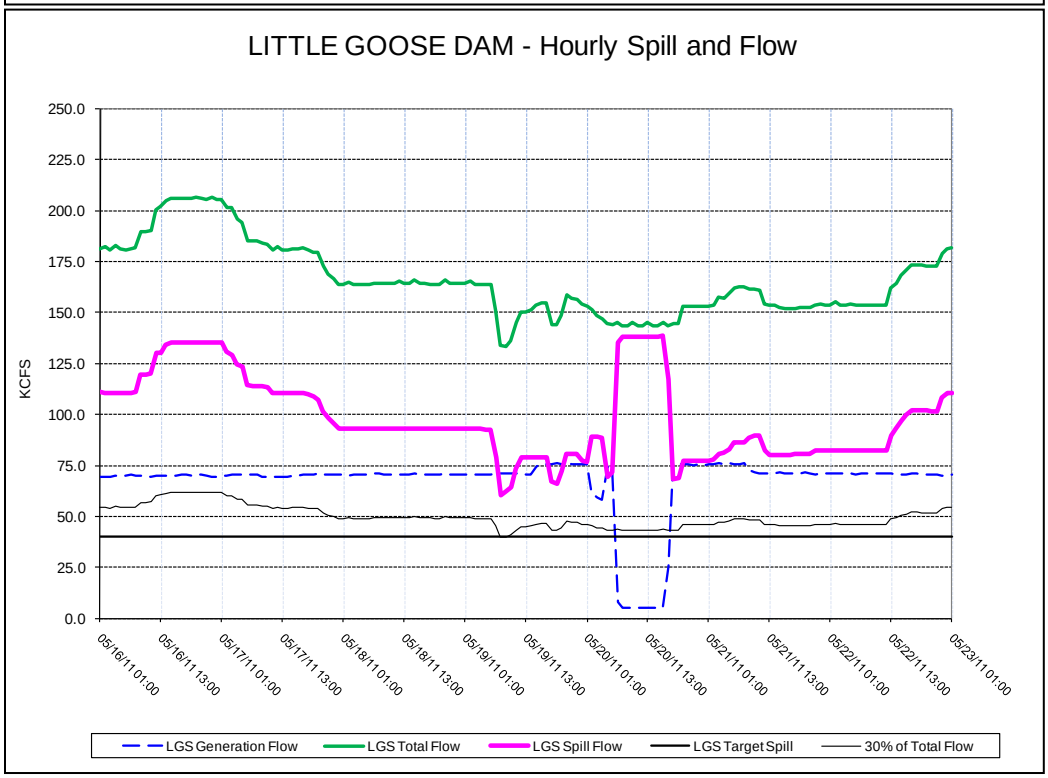
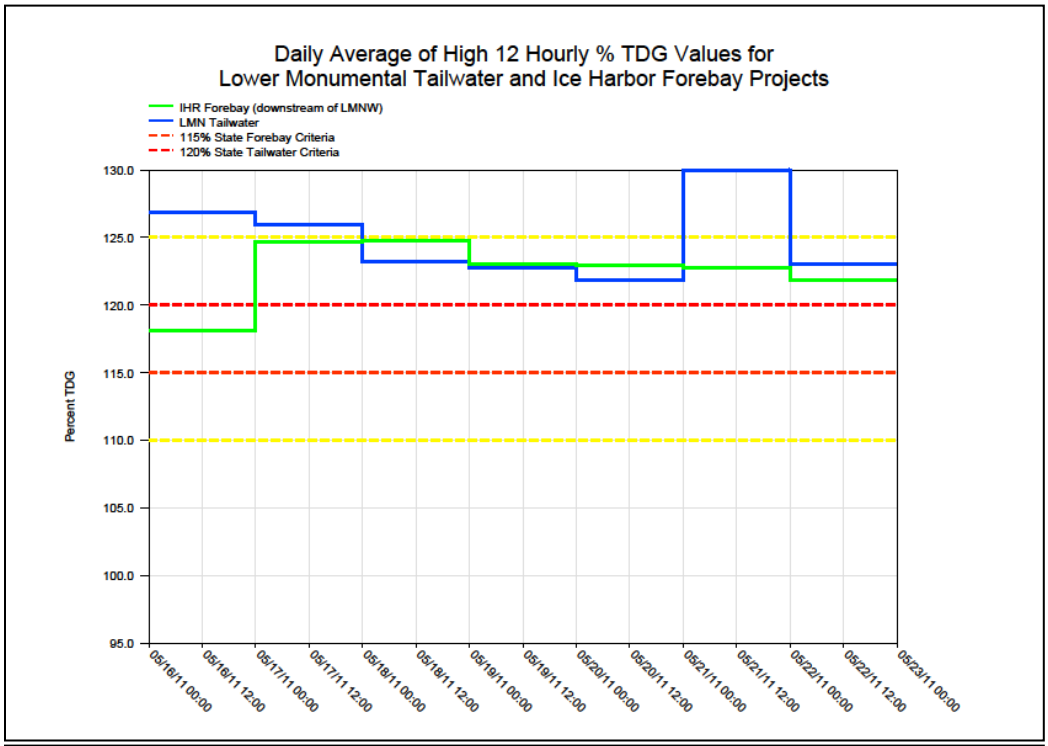

LITTLE GOOSE DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
05/16/11 01:00
05/16/11 13:00
05/17/11 01:00
05/17/11 13:00
05/18/11 01:00
05/18/11 13:00
05/19/11 01:00
05/19/11 13:00
05/20/11 01:00
05/20/11 13:00
05/21/11 01:00
05/21/11 13:00
05/22/11 01:00
05/22/11 13:00
05/23/11 01:00
LGS Generation Flow
LGS Total Flow
LGS Spill Flow
LGS Target Spill
30% of Total Flow

Figure 19


Daily Average of High 12 Hourly % TDG Values for
Lower Monumental Tailwater and Ice Harbor Forebay Projects
IHR Forebay (downstream of LMNW)
LMN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/16/11 00:00
05/16/11 12:00
05/17/11 00:00
05/17/11 12:00
05/18/11 00:00
05/18/11 12:00
05/19/11 00:00
05/19/11 12:00
05/20/11 00:00
05/20/11 12:00
05/21/11 00:00
05/21/11 12:00
05/22/11 00:00
05/22/11 12:00
05/23/11 00:00

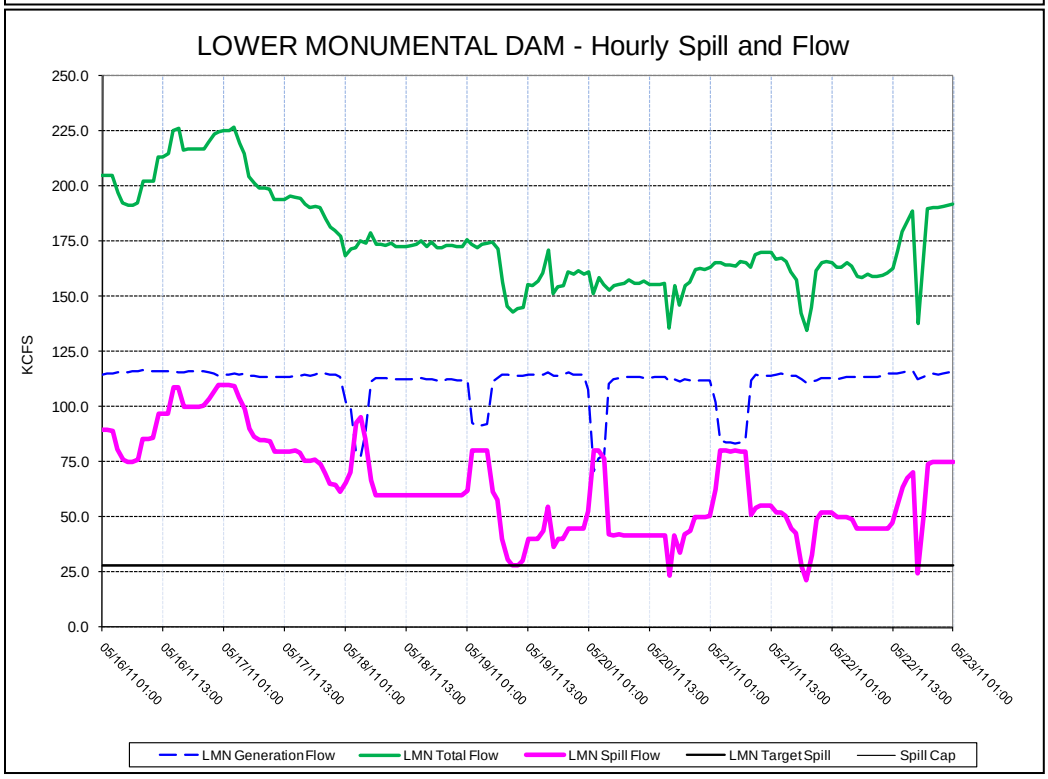
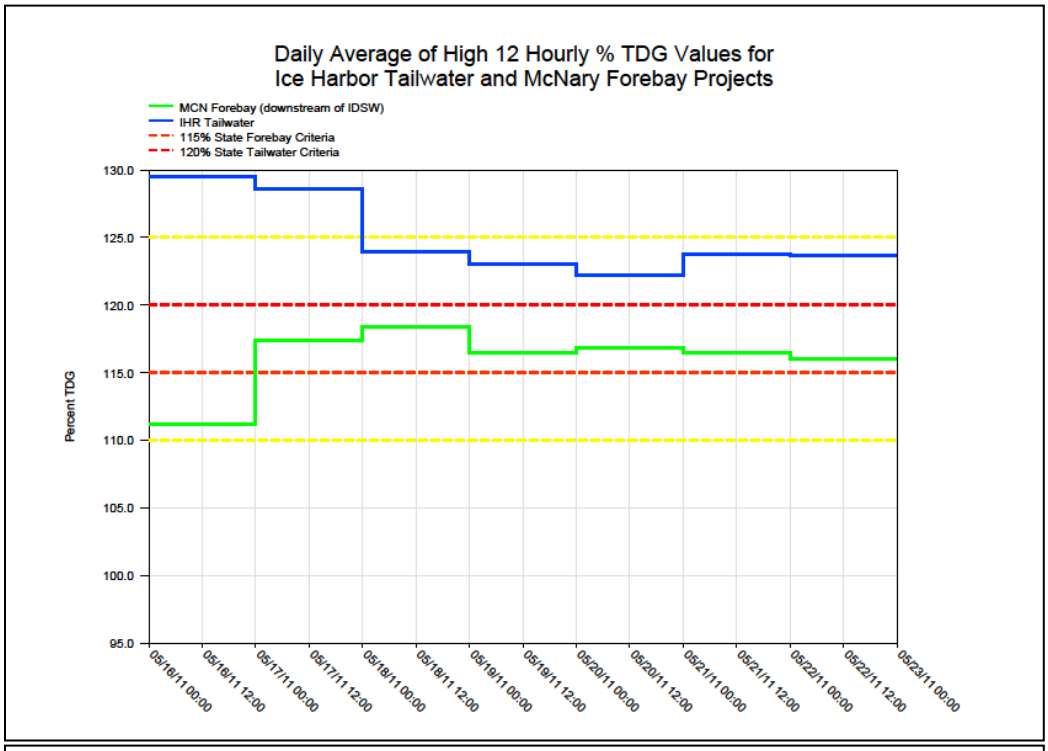

LOWER MONUMENTAL DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
05/16/11 01:00
05/16/11 13:00
05/17/11 01:00
05/17/11 13:00
05/18/11 01:00
05/18/11 13:00
05/19/11 01:00
05/19/11 13:00
05/20/11 01:00
05/20/11 13:00
05/21/11 01:00
05/21/11 13:00
05/22/11 01:00
05/22/11 13:00
05/23/11 01:00
LMN Generation Flow
LMN Total Flow
LMN Spill Flow
LMN Target Spill
Spill Cap

Figure 20


Daily Average of High 12 Hourly % TDG Values for
Ice Harbor Tailwater and McNary Forebay Projects
MCN Forebay (downstream of IDSW)
IHR Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/16/11 00:00
05/16/11 12:00
05/17/11 00:00
05/17/11 12:00
05/18/11 00:00
05/18/11 12:00
05/19/11 00:00
05/19/11 12:00
05/20/11 00:00
05/20/11 12:00
05/21/11 00:00
05/21/11 12:00
05/22/11 00:00
05/22/11 12:00
05/23/11 00:00

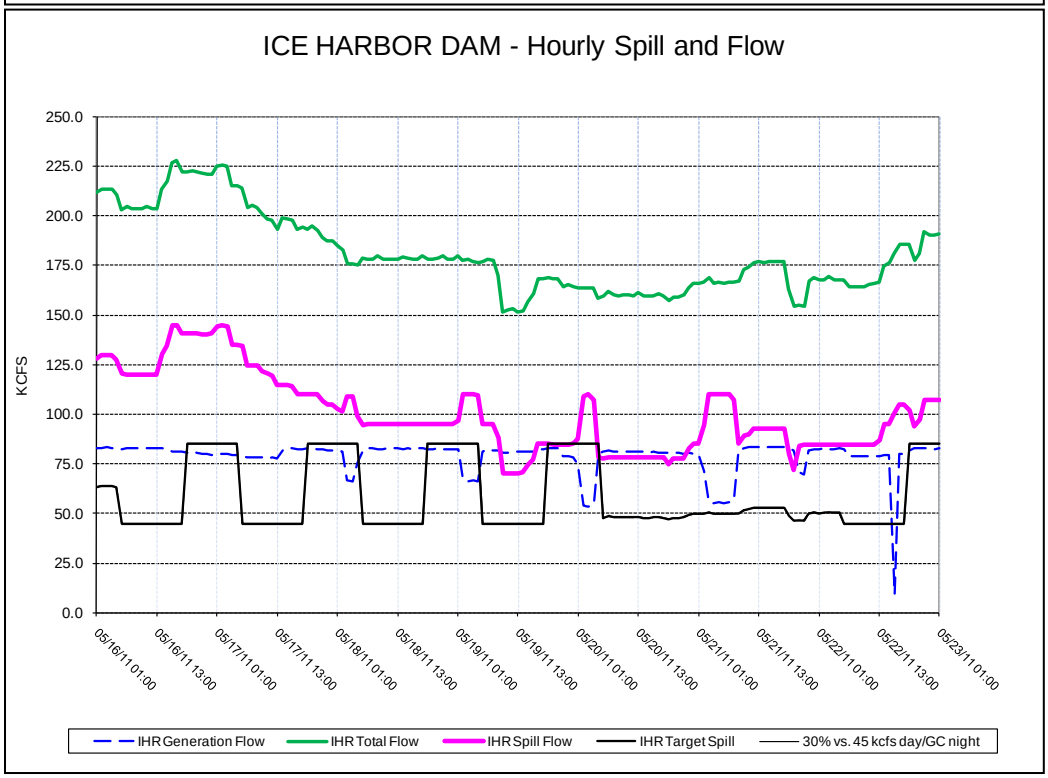
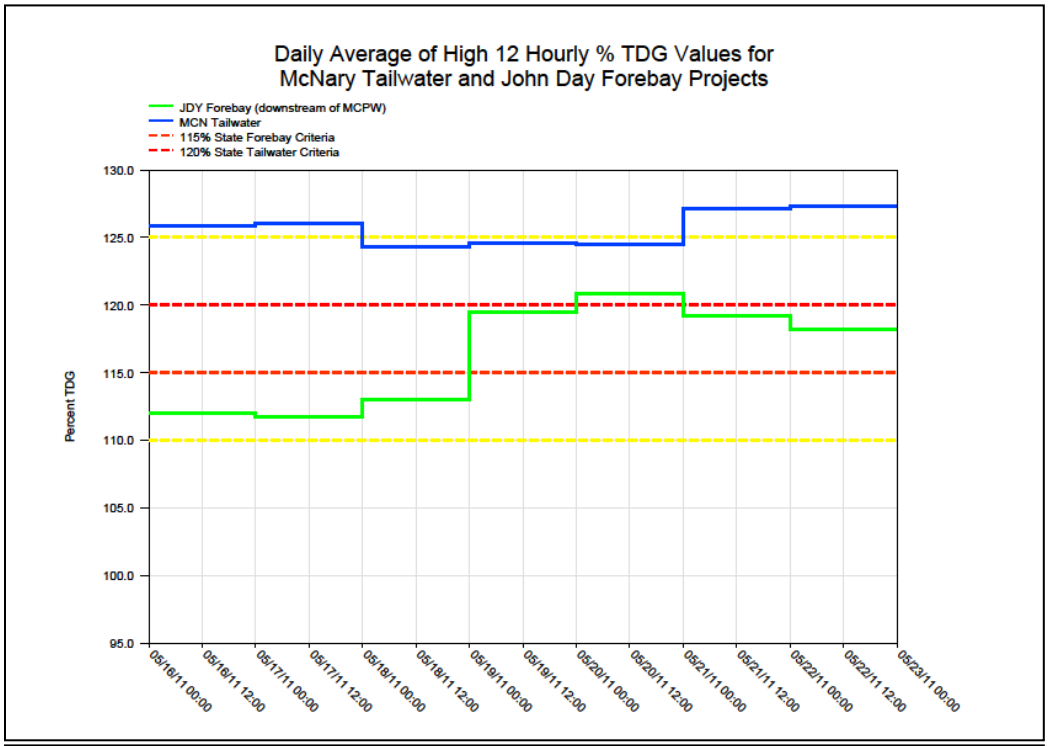

ICE HARBOR DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
05/16/11 01:00
05/16/11 13:00
05/17/11 01:00
05/17/11 13:00
05/18/11 01:00
05/18/11 13:00
05/19/11 01:00
05/19/11 13:00
05/20/11 01:00
05/20/11 13:00
05/21/11 01:00
05/21/11 13:00
05/22/11 01:00
05/22/11 13:00
05/23/11 01:00
IHR Generation Flow
IHR Total Flow
IHR Spill Flow
IHR Target Spill
30% vs. 45 kcfs day/GC night

Figure 21


Daily Average of High 12 Hourly % TDG Values for
McNary Tailwater and John Day Forebay Projects
JDY Forebay (downstream of MCPW)
MCN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/16/11 00:00
05/16/11 12:00
05/17/11 00:00
05/17/11 12:00
05/18/11 00:00
05/18/11 12:00
05/19/11 00:00
05/19/11 12:00
05/20/11 00:00
05/20/11 12:00
05/21/11 00:00
05/21/11 12:00
05/22/11 00:00
05/22/11 12:00
05/23/11 00:00

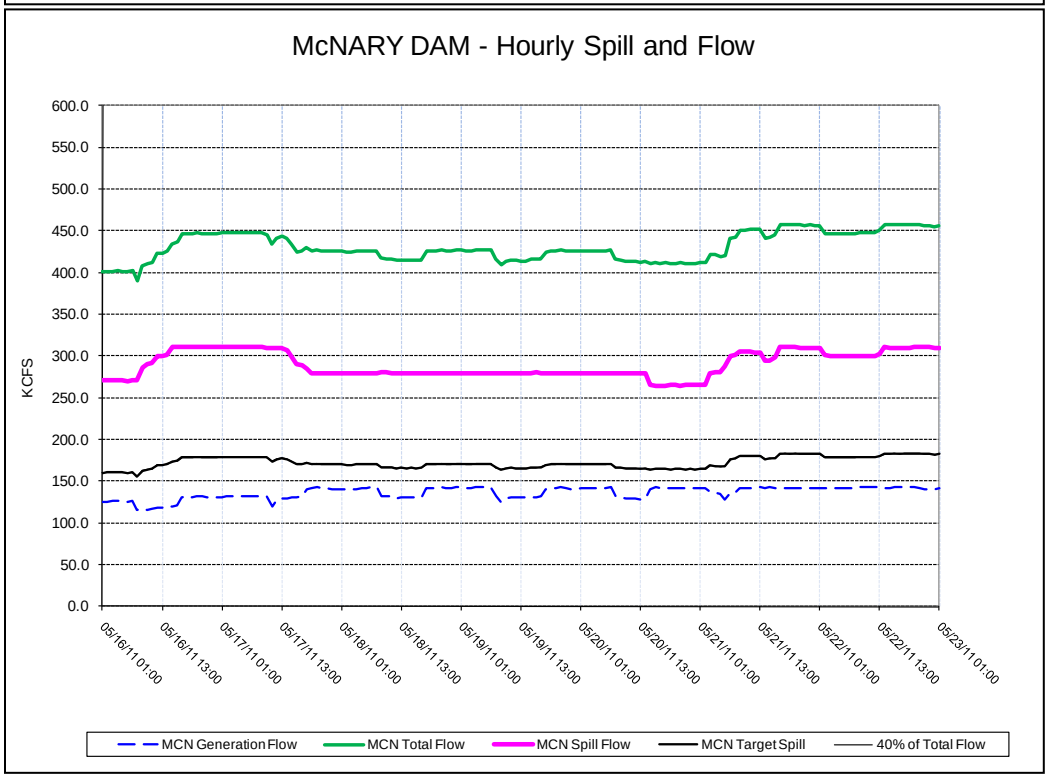
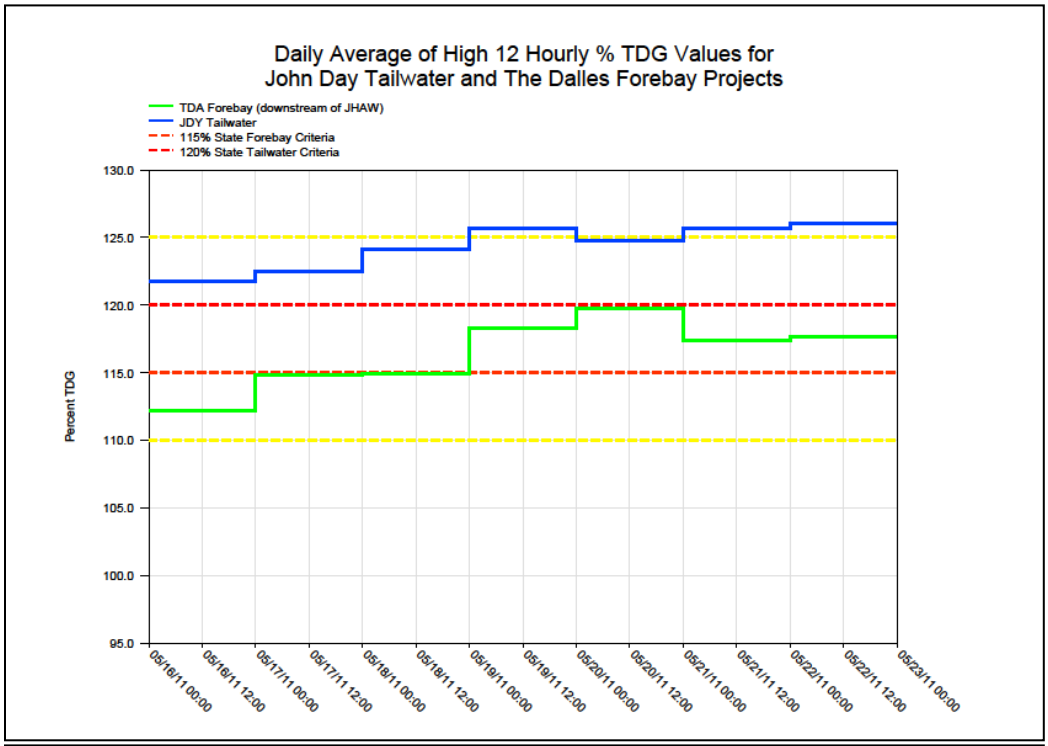

McNARY DAM - Hourly Spill and Flow
KCFS
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
05/16/11 01:00
05/16/11 13:00
05/17/11 01:00
05/17/11 13:00
05/18/11 01:00
05/18/11 13:00
05/19/11 01:00
05/19/11 13:00
05/20/11 01:00
05/20/11 13:00
05/21/11 01:00
05/21/11 13:00
05/22/11 01:00
05/22/11 13:00
05/23/11 01:00
MCN Generation Flow
MCN Total Flow
MCN Spill Flow
MCN Target Spill
40% of Total Flow

Figure 22


Daily Average of High 12 Hourly % TDG Values for
John Day Tailwater and The Dalles Forebay Projects
TDA Forebay (downstream of JHAW)
JDY Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/16/11 00:00
05/16/11 12:00
05/17/11 00:00
05/17/11 12:00
05/18/11 00:00
05/18/11 12:00
05/19/11 00:00
05/19/11 12:00
05/20/11 00:00
05/20/11 12:00
05/21/11 00:00
05/21/11 12:00
05/22/11 00:00
05/22/11 12:00
05/23/11 00:00

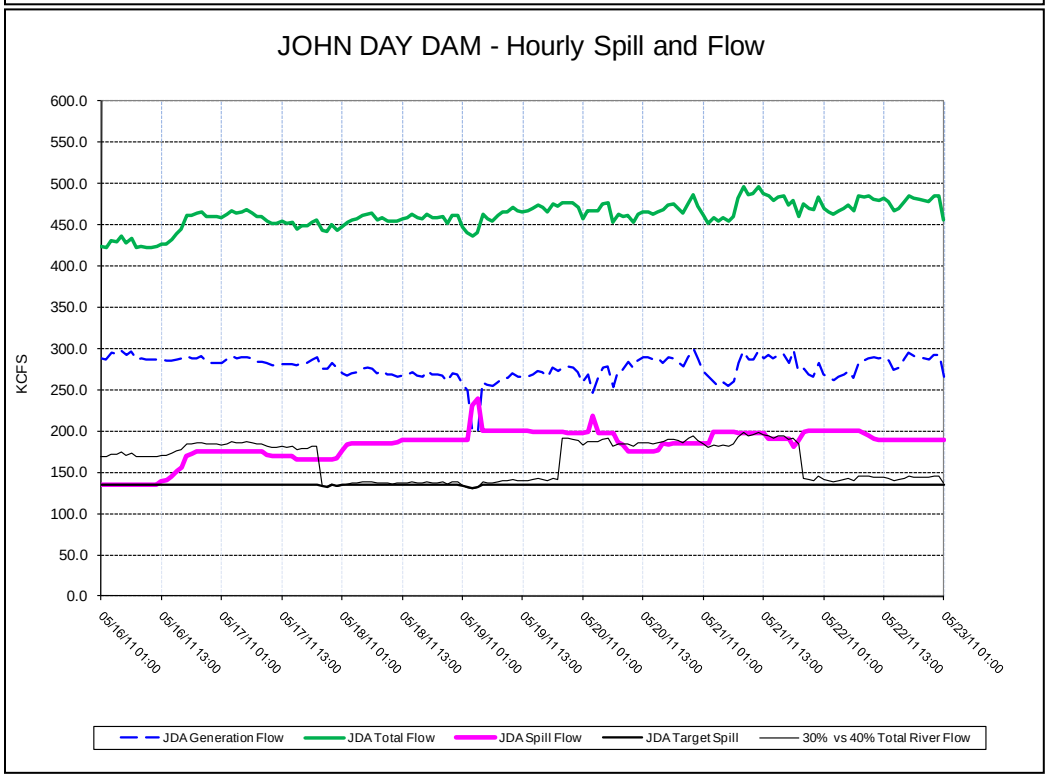
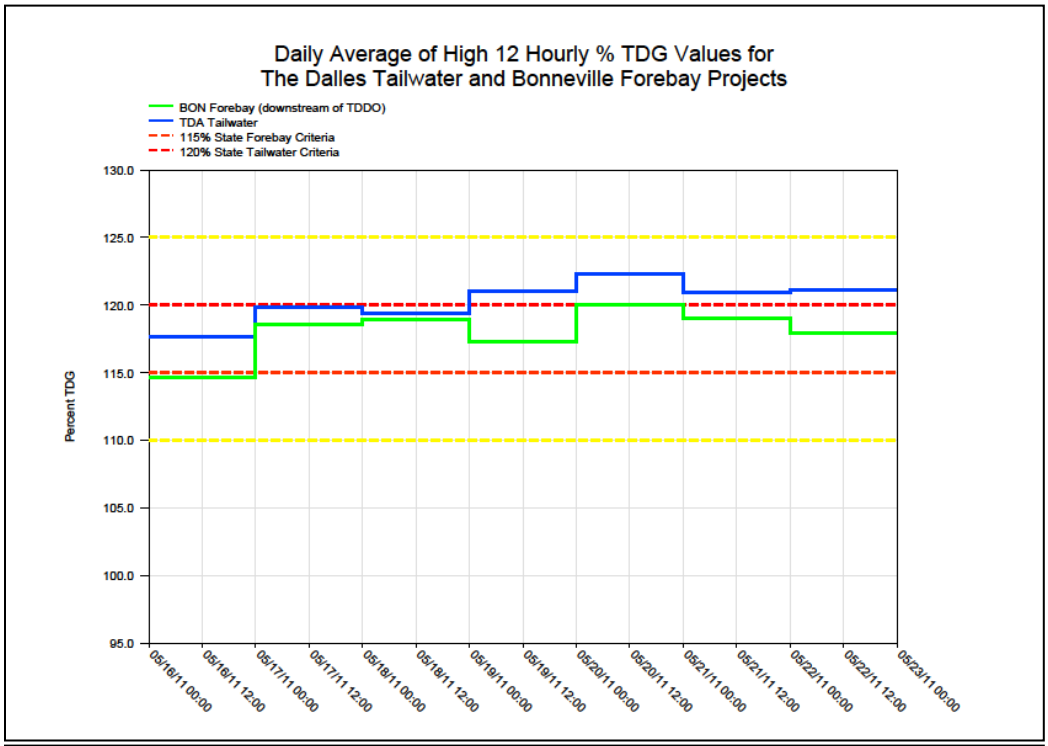

JOHN DAY DAM - Hourly Spill and Flow
KCFS
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
05/16/11 01:00
05/16/11 13:00
05/17/11 01:00
05/17/11 13:00
05/18/11 01:00
05/18/11 13:00
05/19/11 01:00
05/19/11 13:00
05/20/11 01:00
05/20/11 13:00
05/21/11 01:00
05/21/11 13:00
05/22/11 01:00
05/22/11 13:00
05/23/11 01:00
JDA Generation Flow
JDA Total Flow
JDA Spill Flow
JDA Target Spill
30% vs 40% Total River Flow

Figure 23


Daily Average of High 12 Hourly % TDG Values for
The Dalles Tailwater and Bonneville Forebay Projects
BON Forebay (downstream of TDDO)
TDA Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/16/11 00:00
05/16/11 12:00
05/17/11 00:00
05/17/11 12:00
05/18/11 00:00
05/18/11 12:00
05/19/11 00:00
05/19/11 12:00
05/20/11 00:00
05/20/11 12:00
05/21/11 00:00
05/21/11 12:00
05/22/11 00:00
05/22/11 12:00
05/23/11 00:00

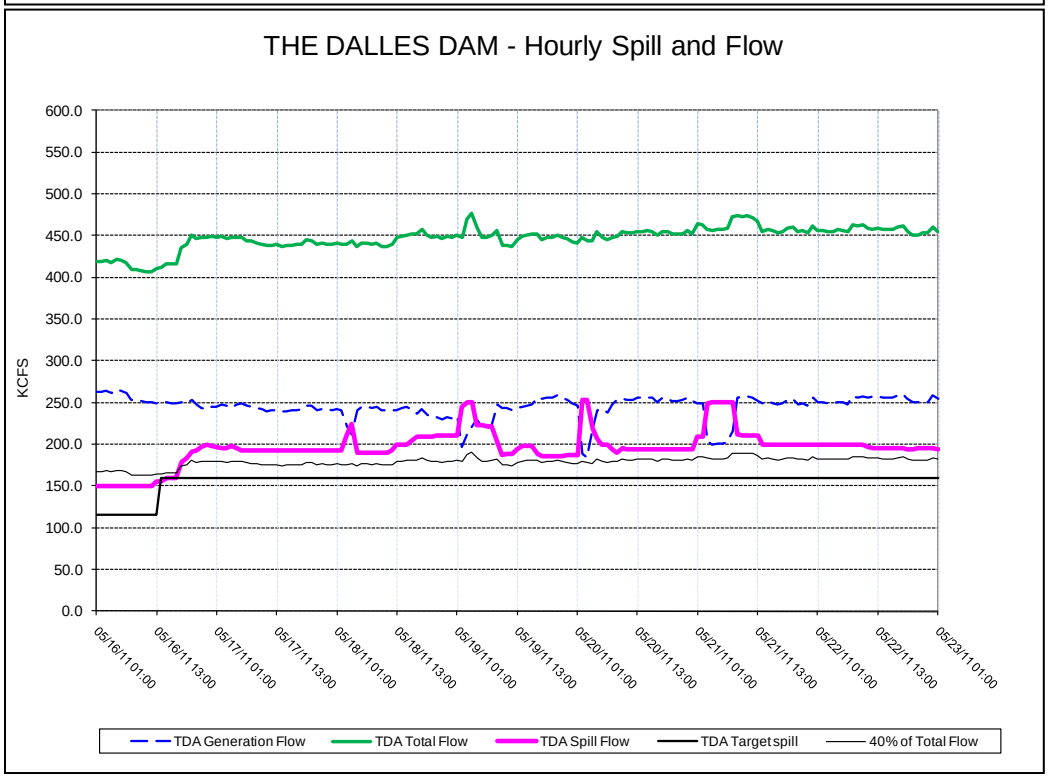
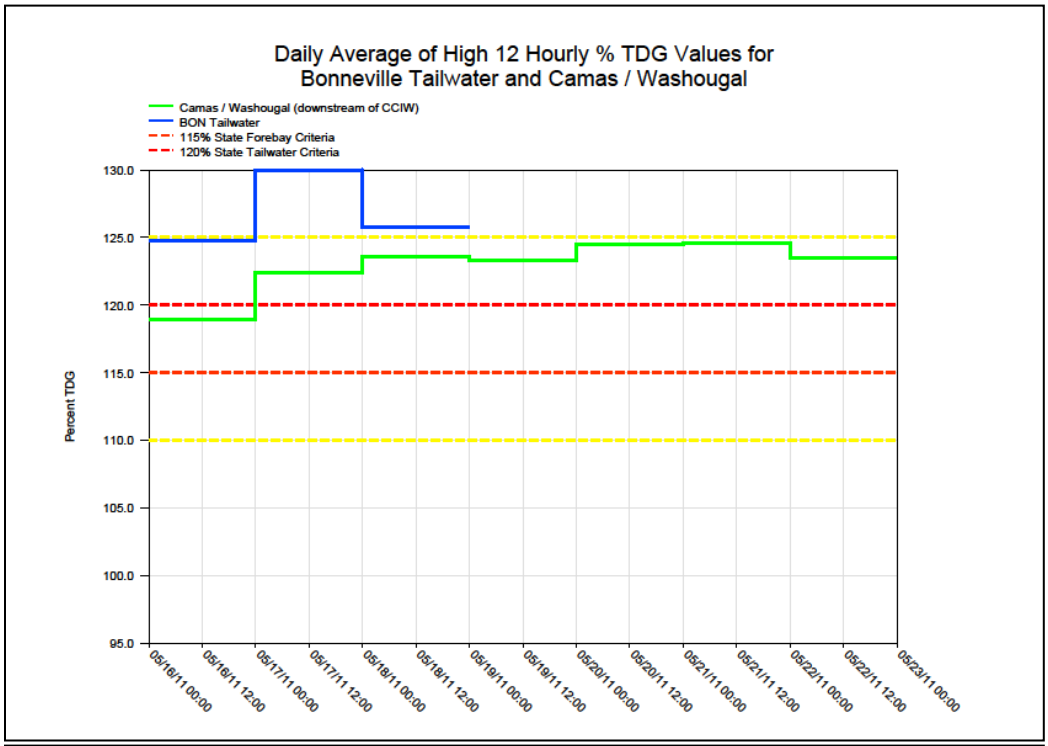

THE DALLES DAM - Hourly Spill and Flow
KCFS
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
05/16/11 01:00
05/16/11 13:00
05/17/11 01:00
05/17/11 13:00
05/18/11 01:00
05/18/11 13:00
05/19/11 01:00
05/19/11 13:00
05/20/11 01:00
05/20/11 13:00
05/21/11 01:00
05/21/11 13:00
05/22/11 01:00
05/22/11 13:00
05/23/11 01:00
TDA Generation Flow
TDA Total Flow
TDA Spill Flow
TDA Target spill
40% of Total Flow

Figure 24


Daily Average of High 12 Hourly % TDG Values for
Bonneville Tailwater and Camas / Washougal
Camas / Washougal (downstream of CCIW)
BON Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/16/11 00:00
05/16/11 12:00
05/17/11 00:00
05/17/11 12:00
05/18/11 00:00
05/18/11 12:00
05/19/11 00:00
05/19/11 12:00
05/20/11 00:00
05/20/11 12:00
05/21/11 00:00
05/21/11 12:00
05/22/11 00:00
05/22/11 12:00
05/23/11 00:00

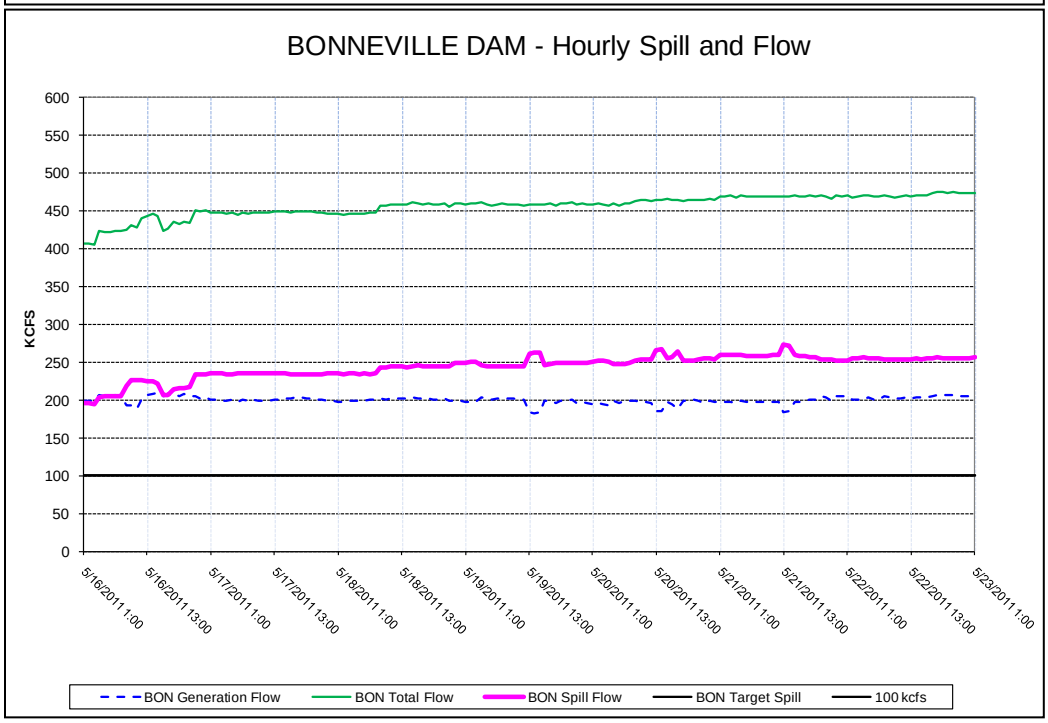
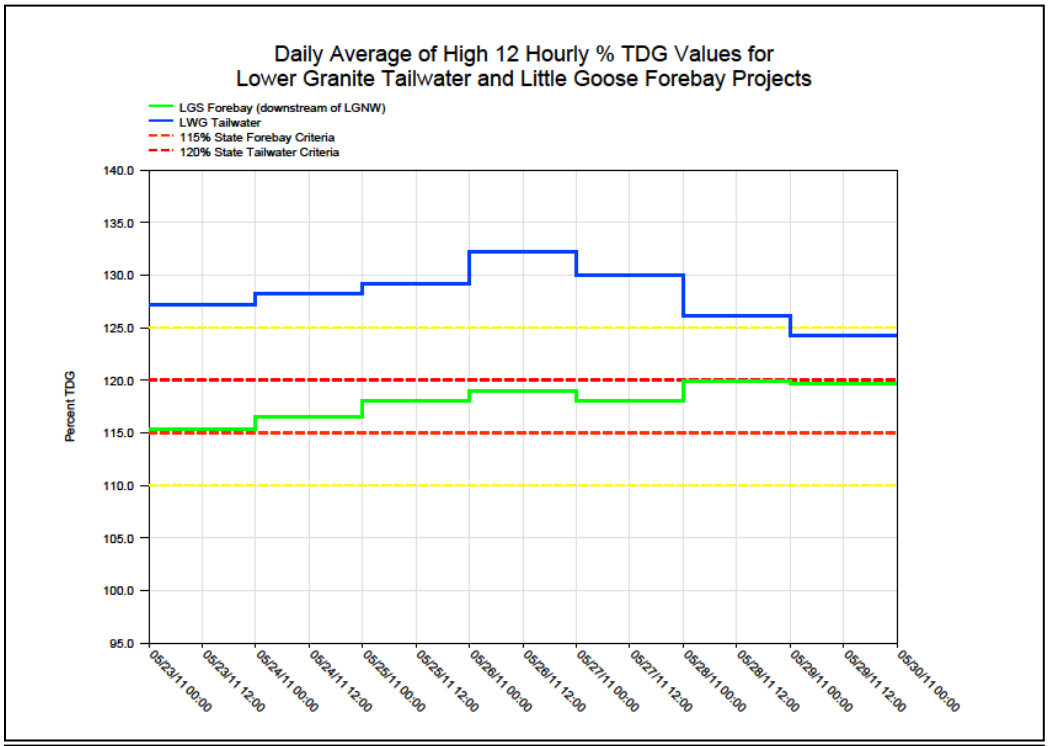

BONNEVILLE DAM - Hourly Spill and Flow
KCFS
600
550
500
450
400
350
300
250
200
150
100
50
0
5/16/2011 1:00
5/16/2011 13:00
5/17/2011 1:00
5/17/2011 13:00
5/18/2011 1:00
5/18/2011 13:00
5/19/2011 1:00
5/19/2011 13:00
5/20/2011 1:00
5/20/2011 13:00
5/21/2011 1:00
5/21/2011 13:00
5/22/2011 1:00
5/22/2011 13:00
5/23/2011 1:00
BON Generation Flow
BON Total Flow
BON Spill Flow
BON Target Spill
100 kcfs

Figure 25


Daily Average of High 12 Hourly % TDG Values for
Lower Granite Tailwater and Little Goose Forebay Projects
LGS Forebay (downstream of LGNW)
LWG Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/23/11 00:00
05/23/11 12:00
05/24/11 00:00
05/24/11 12:00
05/25/11 00:00
05/25/11 12:00
05/26/11 00:00
05/26/11 12:00
05/27/11 00:00
05/27/11 12:00
05/28/11 00:00
05/28/11 12:00
05/29/11 00:00
05/29/11 12:00
05/30/11 00:00

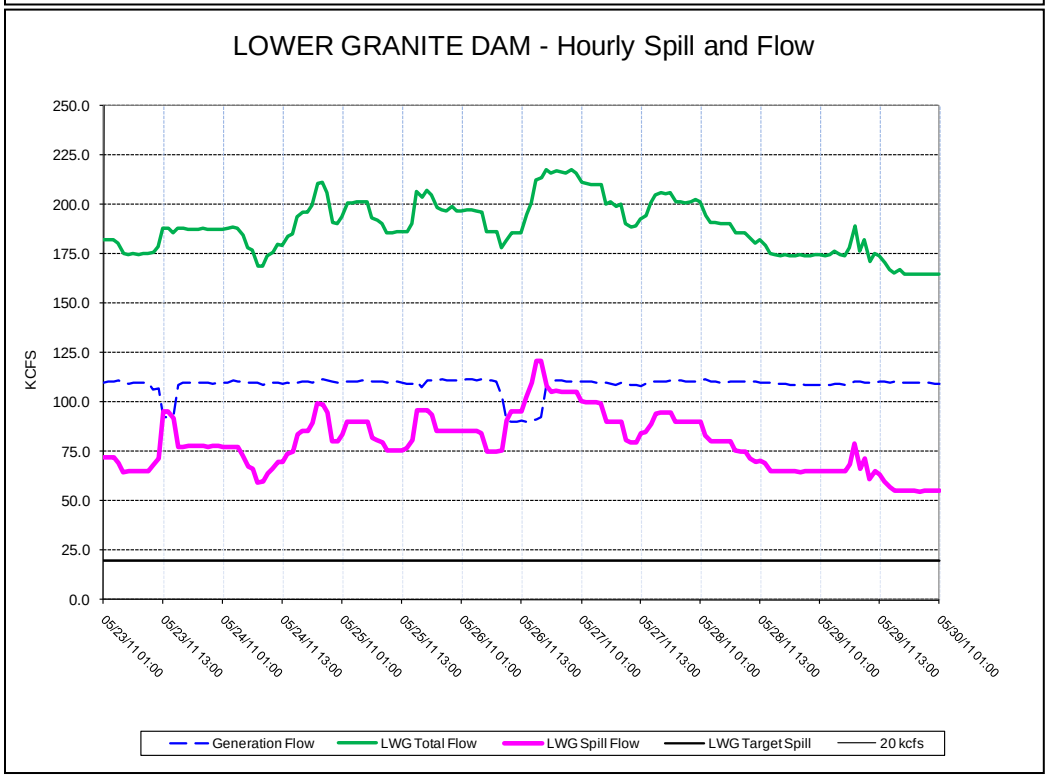
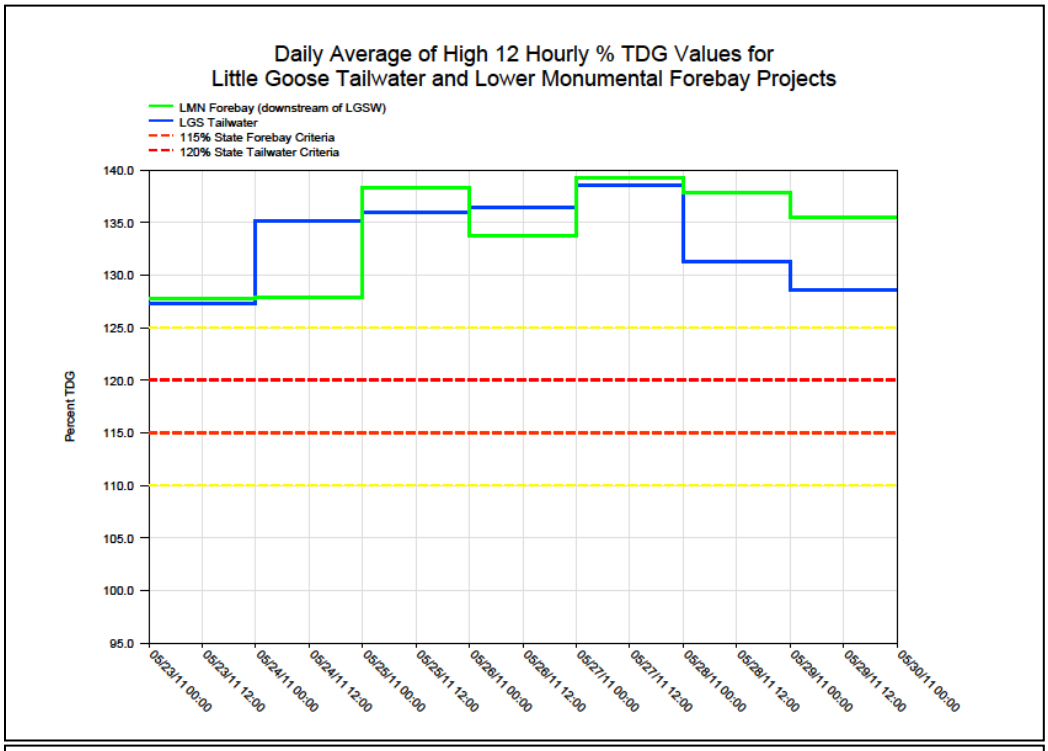

LOWER GRANITE DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
05/23/11 01:00
05/23/11 13:00
05/24/11 01:00
05/24/11 13:00
05/25/11 01:00
05/25/11 13:00
05/26/11 01:00
05/26/11 13:00
05/27/11 01:00
05/27/11 13:00
05/28/11 01:00
05/28/11 13:00
05/29/11 01:00
05/29/11 13:00
05/30/11 01:00
Generation Flow
LWG Total Flow
LWG Spill Flow
LWG Target Spill
20 kcfs

Figure 26


Daily Average of High 12 Hourly % TDG Values for
Little Goose Tailwater and Lower Monumental Forebay Projects
LMN Forebay (downstream of LGSW)
LGS Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/23/11 00:00
05/23/11 12:00
05/24/11 00:00
05/24/11 12:00
05/25/11 00:00
05/25/11 12:00
05/26/11 00:00
05/26/11 12:00
05/27/11 00:00
05/27/11 12:00
05/28/11 00:00
05/28/11 12:00
05/29/11 00:00
05/29/11 12:00
05/30/11 00:00

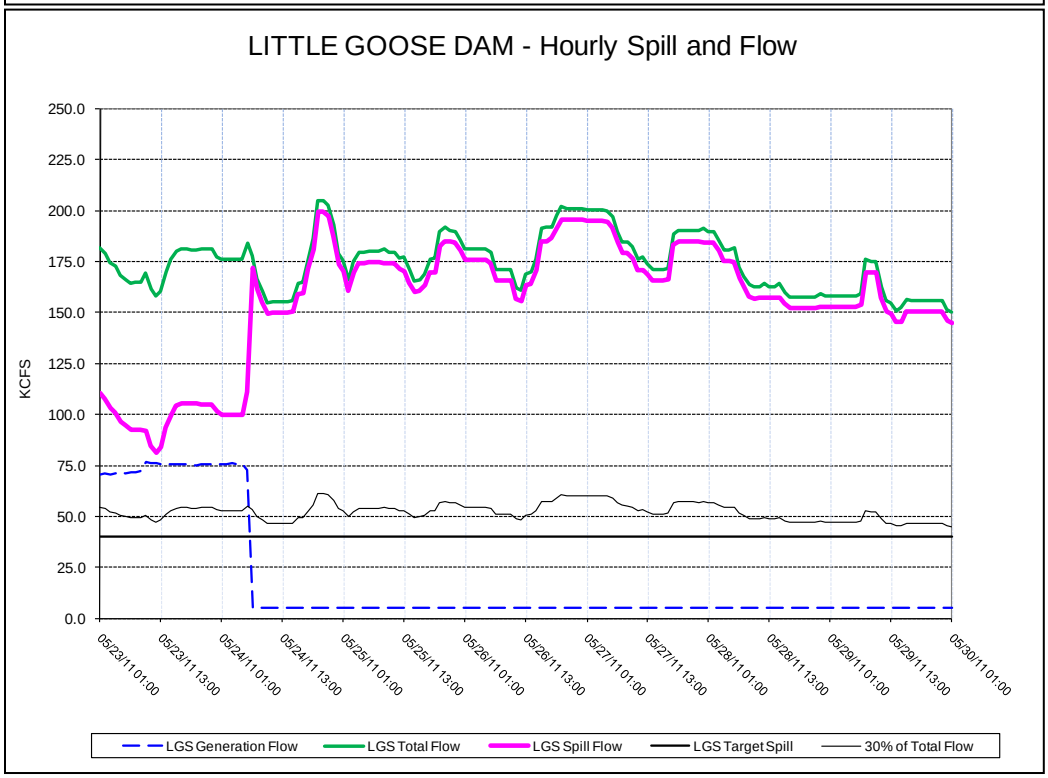
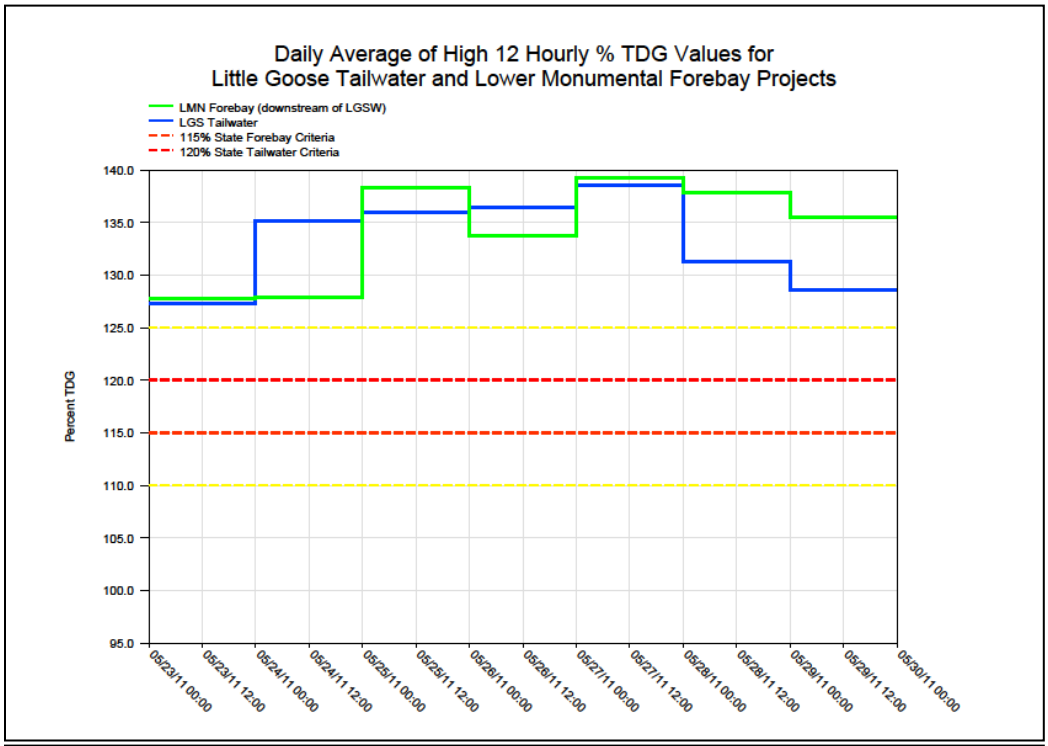

LITTLE GOOSE DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
05/23/11 01:00
05/23/11 13:00
05/24/11 01:00
05/24/11 13:00
05/25/11 01:00
05/25/11 13:00
05/26/11 01:00
05/26/11 13:00
05/27/11 01:00
05/27/11 13:00
05/28/11 01:00
05/28/11 13:00
05/29/11 01:00
05/29/11 13:00
05/30/11 01:00
LGS Generation Flow
LGS Total Flow
LGS Spill Flow
LGS Target Spill
30% of Total Flow

Figure 27


Daily Average of High 12 Hourly % TDG Values for
Little Goose Tailwater and Lower Monumental Forebay Projects
LMN Forebay (downstream of LGSW)
LGS Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/23/11 00:00
05/23/11 12:00
05/24/11 00:00
05/24/11 12:00
05/25/11 00:00
05/25/11 12:00
05/26/11 00:00
05/26/11 12:00
05/27/11 00:00
05/27/11 12:00
05/28/11 00:00
05/28/11 12:00
05/29/11 00:00
05/29/11 12:00
05/30/11 00:00

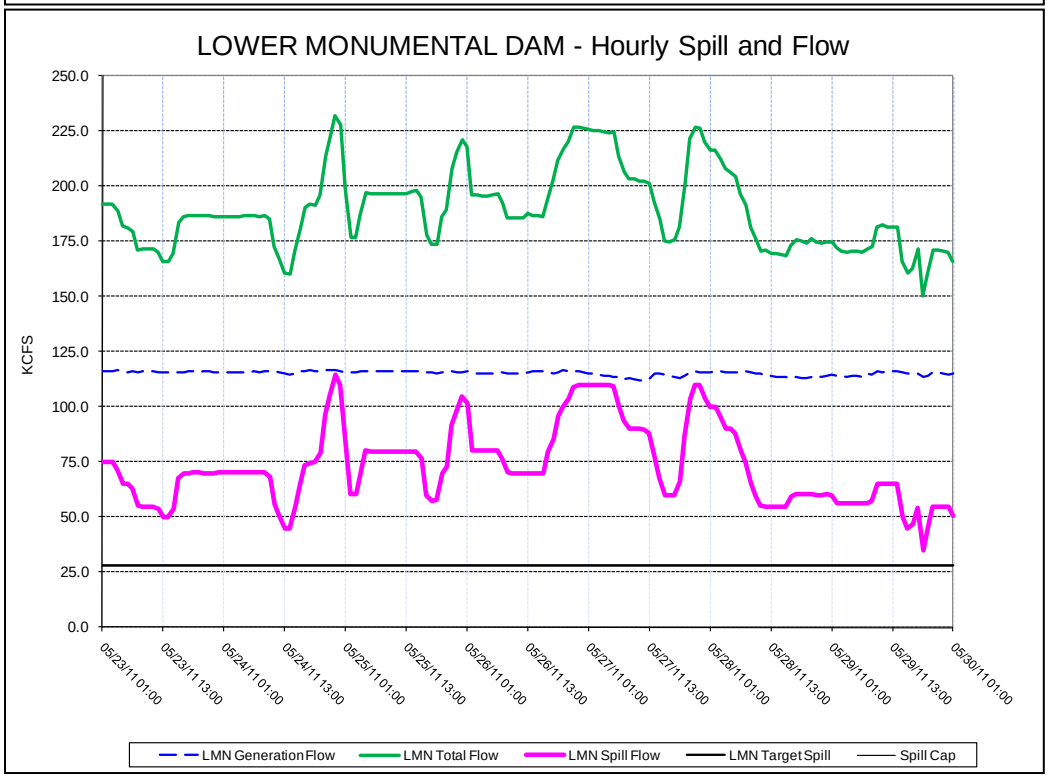
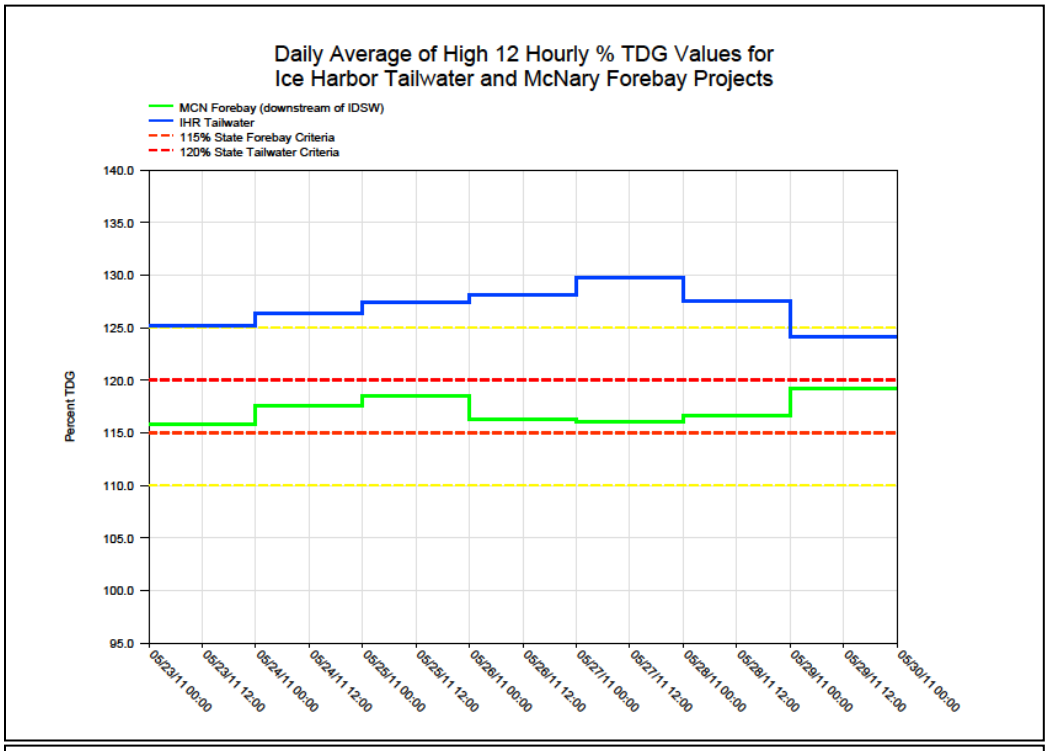

LOWER MONUMENTAL DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
05/23/11 01:00
05/23/11 13:00
05/24/11 01:00
05/24/11 13:00
05/25/11 01:00
05/25/11 13:00
05/26/11 01:00
05/26/11 13:00
05/27/11 01:00
05/27/11 13:00
05/28/11 01:00
05/28/11 13:00
05/29/11 01:00
05/29/11 13:00
05/30/11 01:00
LMN Generation Flow
LMN Total Flow
LMN Spill Flow
LMN Target Spill
Spill Cap

Figure 28


Daily Average of High 12 Hourly % TDG Values for
Ice Harbor Tailwater and McNary Forebay Projects
MCN Forebay (downstream of IDSW)
IHR Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/23/11 00:00
05/23/11 12:00
05/24/11 00:00
05/24/11 12:00
05/25/11 00:00
05/25/11 12:00
05/26/11 00:00
05/26/11 12:00
05/27/11 00:00
05/27/11 12:00
05/28/11 00:00
05/28/11 12:00
05/29/11 00:00
05/29/11 12:00
05/30/11 00:00

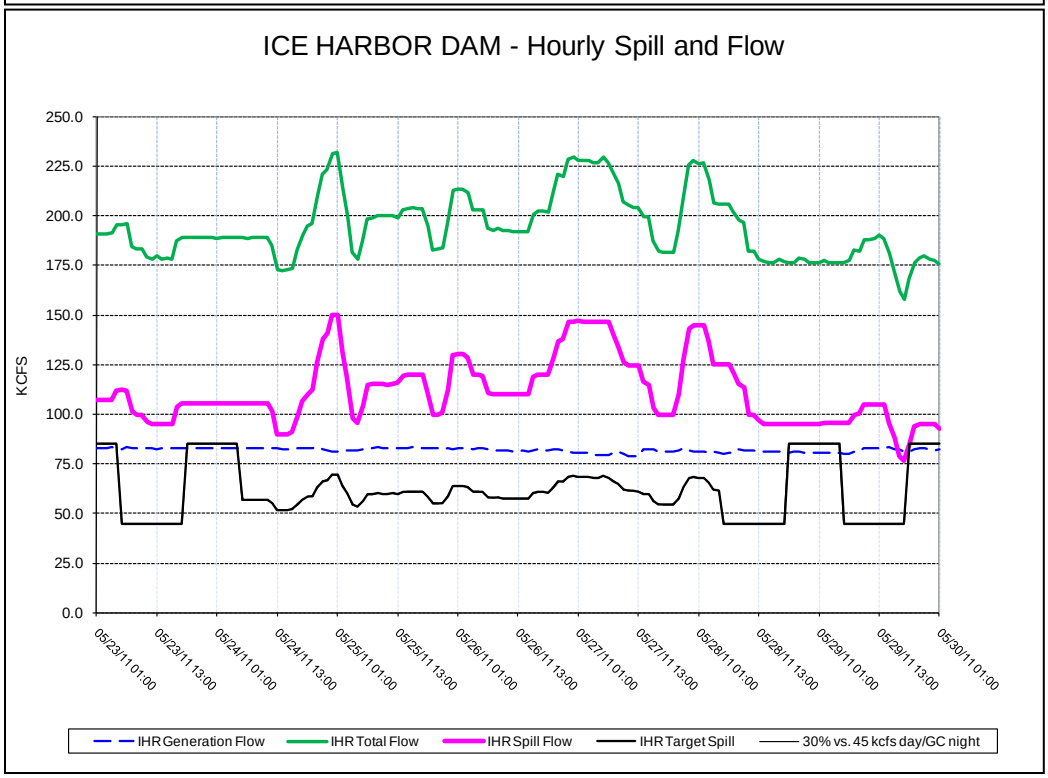
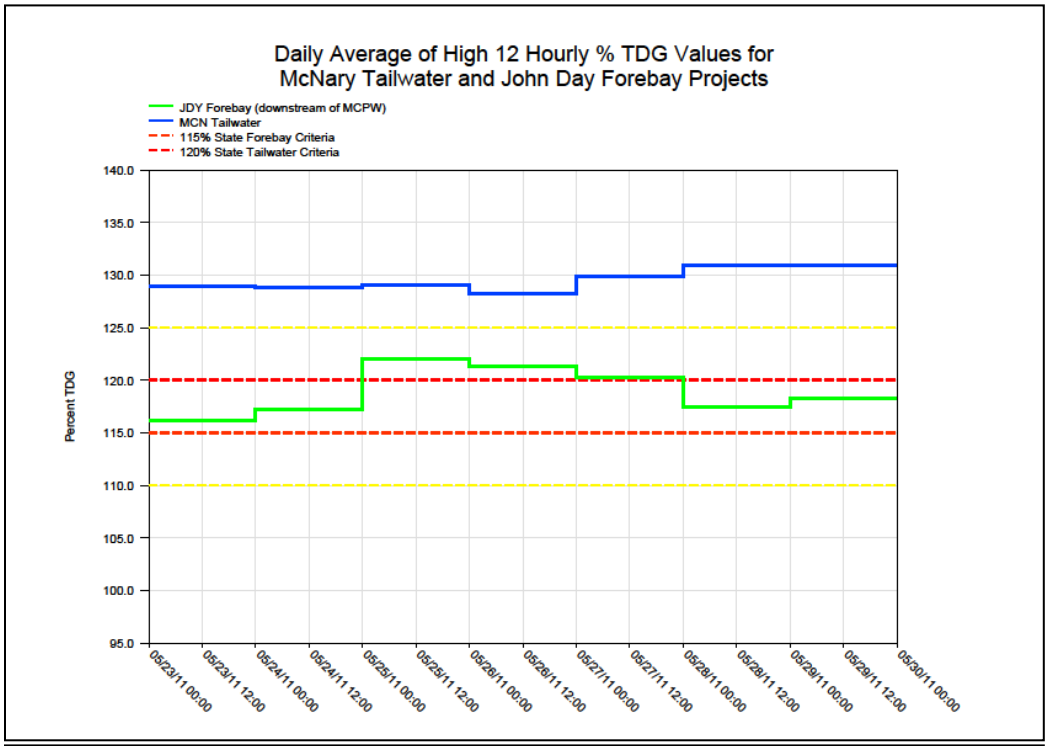

ICE HARBOR DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
05/23/11 01:00
05/23/11 13:00
05/24/11 01:00
05/24/11 13:00
05/25/11 01:00
05/25/11 13:00
05/26/11 01:00
05/26/11 13:00
05/27/11 01:00
05/27/11 13:00
05/28/11 01:00
05/28/11 13:00
05/29/11 01:00
05/29/11 13:00
05/30/11 01:00
IHR Generation Flow
IHR Total Flow
IHR Spill Flow
IHR Target Spill
30% vs. 45 kcfs day/GC night

Figure 29


Daily Average of High 12 Hourly % TDG Values for
McNary Tailwater and John Day Forebay Projects
JDY Forebay (downstream of MCPW)
MCN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/23/11 00:00
05/23/11 12:00
05/24/11 00:00
05/24/11 12:00
05/25/11 00:00
05/25/11 12:00
05/26/11 00:00
05/26/11 12:00
05/27/11 00:00
05/27/11 12:00
05/28/11 00:00
05/28/11 12:00
05/29/11 00:00
05/29/11 12:00
05/30/11 00:00

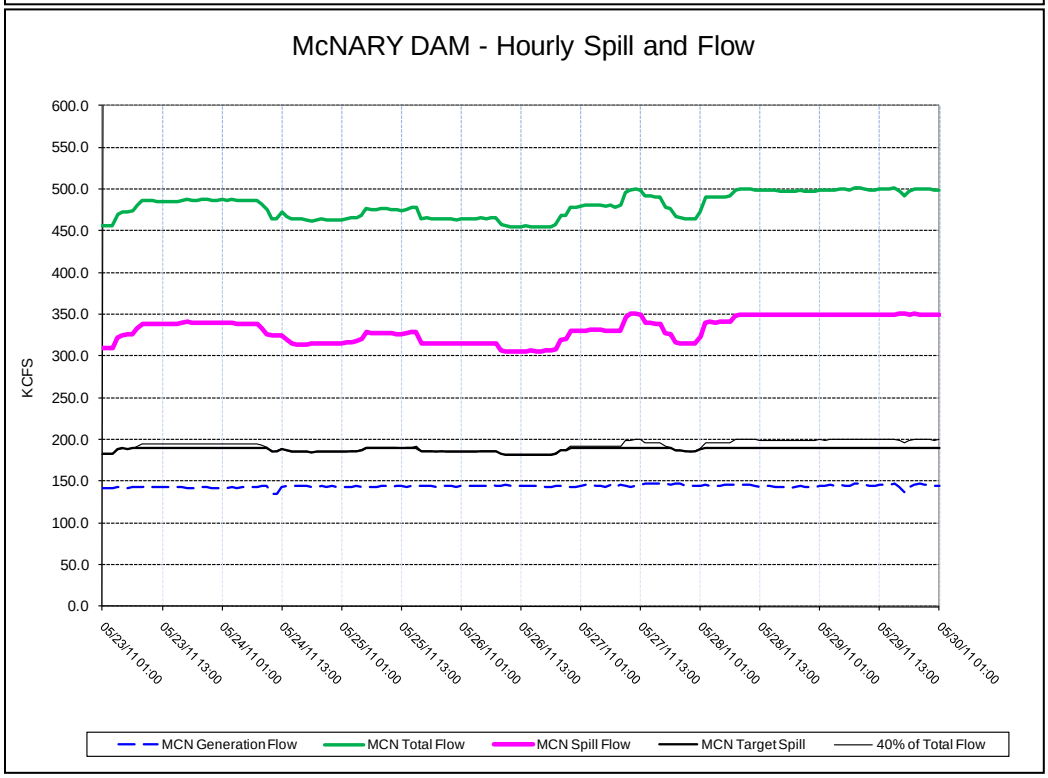
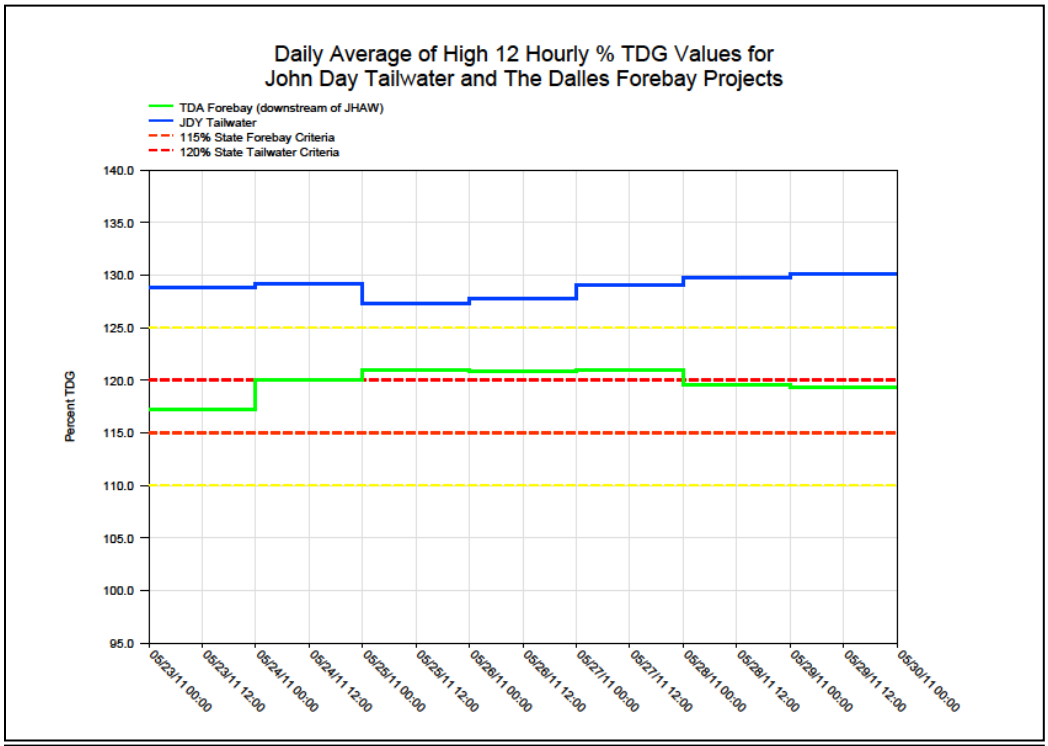

McNARY DAM - Hourly Spill and Flow
KCFS
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
05/23/11 01:00
05/23/11 13:00
05/24/11 01:00
05/24/11 13:00
05/25/11 01:00
05/25/11 13:00
05/26/11 01:00
05/26/11 13:00
05/27/11 01:00
05/27/11 13:00
05/28/11 01:00
05/28/11 13:00
05/29/11 01:00
05/29/11 13:00
05/30/11 01:00
MCN Generation Flow
MCN Total Flow
MCN Spill Flow
MCN Target Spill
40% of Total Flow

Figure 30


Daily Average of High 12 Hourly % TDG Values for
John Day Tailwater and The Dalles Forebay Projects
TDA Forebay (downstream of JHAW)
JDY Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/23/11 00:00
05/23/11 12:00
05/24/11 00:00
05/24/11 12:00
05/25/11 00:00
05/25/11 12:00
05/26/11 00:00
05/26/11 12:00
05/27/11 00:00
05/27/11 12:00
05/28/11 00:00
05/28/11 12:00
05/29/11 00:00
05/29/11 12:00
05/30/11 00:00

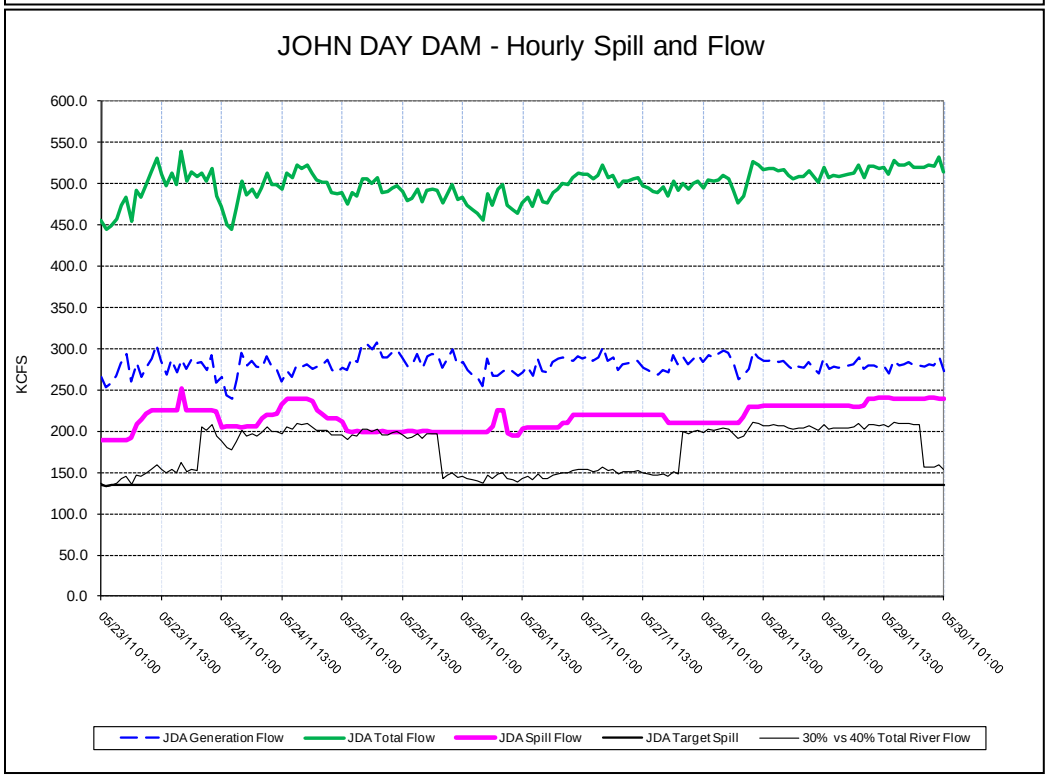

JOHN DAY DAM - Hourly Spill and Flow
KCFS
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
05/23/11 01:00
05/23/11 13:00
05/24/11 01:00
05/24/11 13:00
05/25/11 01:00
05/25/11 13:00
05/26/11 01:00
05/26/11 13:00
05/27/11 01:00
05/27/11 13:00
05/28/11 01:00
05/28/11 13:00
05/29/11 01:00
05/29/11 13:00
05/30/11 01:00
JDA Generation Flow
JDA Total Flow
JDA Spill Flow
JDA Target Spill
30% vs 40% Total River Flow

Figure 31

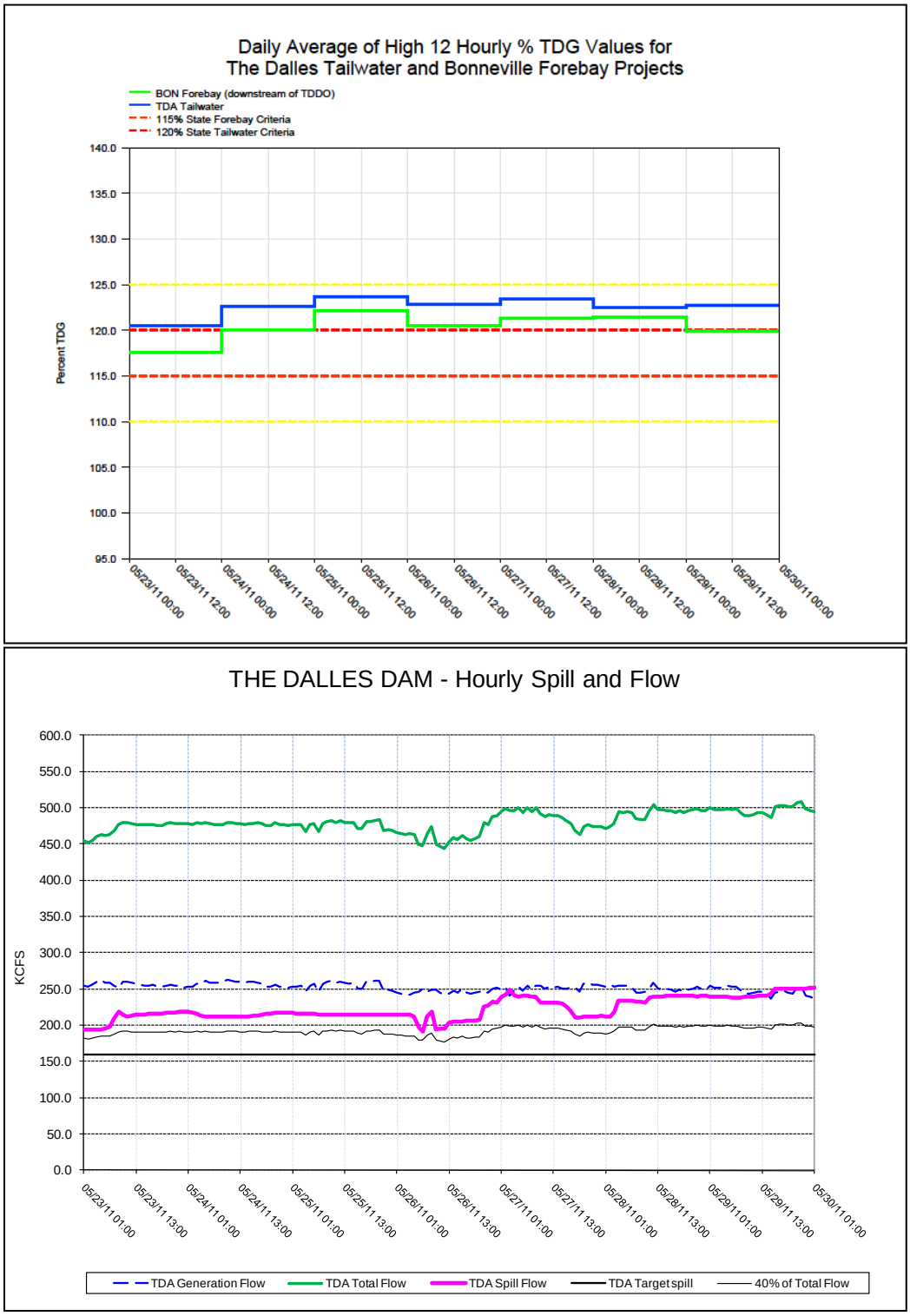
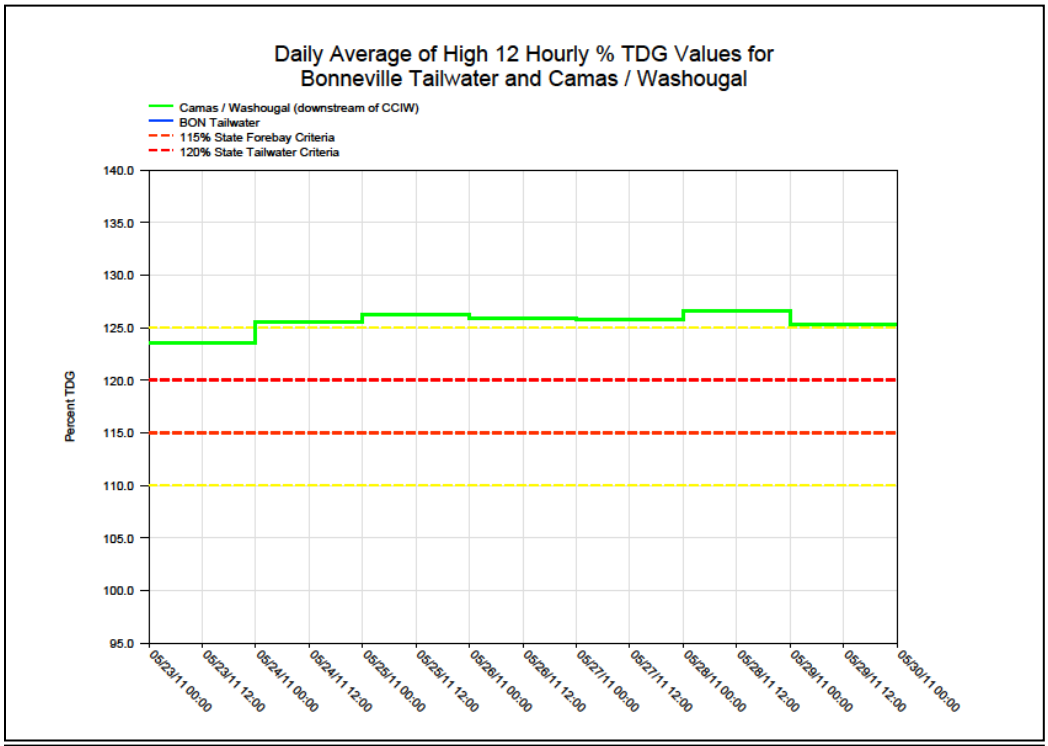

Daily Average of High 12 Hourly % TDG Values for
The Dalles Tailwater and Bonneville Forebay Projects
BON Forebay (downstream of TDDO)
TDA Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/23/11 00:00
05/23/11 12:00
05/24/11 00:00
05/24/11 12:00
05/25/11 00:00
05/25/11 12:00
05/26/11 00:00
05/26/11 12:00
05/27/11 00:00
05/27/11 12:00
05/28/11 00:00
05/28/11 12:00
05/29/11 00:00
05/29/11 12:00
05/30/11 00:00
THE DALLES DAM - Hourly Spill and Flow
KCFS
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
05/23/11 01:00
05/23/11 13:00
05/24/11 01:00
05/24/11 13:00
05/25/11 01:00
05/25/11 13:00
05/26/11 01:00
05/26/11 13:00
05/27/11 01:00
05/27/11 13:00
05/28/11 01:00
05/28/11 13:00
05/29/11 01:00
05/29/11 13:00
05/30/11 01:00
TDA Generation Flow
TDA Total Flow
TDA Spill Flow
TDA Target spill
40% of Total Flow

Figure 32


Daily Average of High 12 Hourly % TDG Values for
Bonneville Tailwater and Camas / Washougal
Camas / Washougal (downstream of CCIW)
BON Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
05/23/11 00:00
05/23/11 12:00
05/24/11 00:00
05/24/11 12:00
05/25/11 00:00
05/25/11 12:00
05/26/11 00:00
05/26/11 12:00
05/27/11 00:00
05/27/11 12:00
05/28/11 00:00
05/28/11 12:00
05/29/11 00:00
05/29/11 12:00
05/30/11 00:00

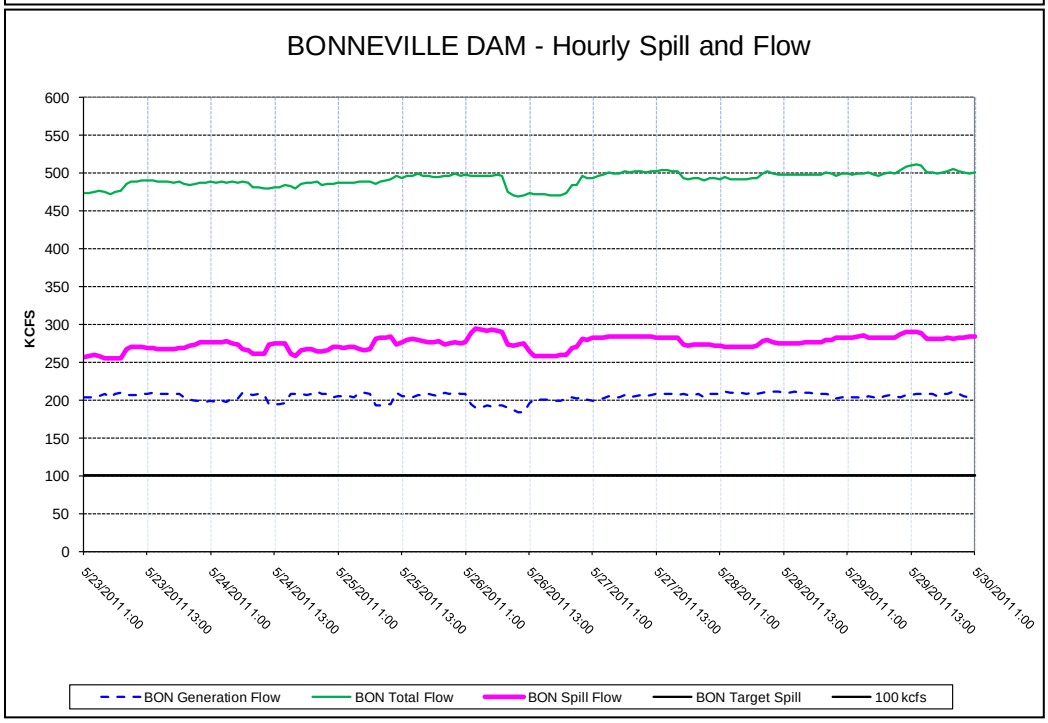

BONNEVILLE DAM - Hourly Spill and Flow
KCFS
600
550
500
450
400
350
300
250
200
150
100
50
0
5/23/2011 1:00
5/23/2011 13:00
5/24/2011 1:00
5/24/2011 13:00
5/25/2011 1:00
5/25/2011 13:00
5/26/2011 1:00
5/26/2011 13:00
5/27/2011 1:00
5/27/2011 13:00
5/28/2011 1:00
5/28/2011 13:00
5/29/2011 1:00
5/29/2011 13:00
5/30/2011 1:00
BON Generation Flow
BON Total Flow
BON Spill Flow
BON Target Spill
100 kcfs

Figure 33

Average Percent TDG for Highest 12-Hours: May 2 – May 29, 2011

Date	FIXED MONITORING STATIONS																
	LWG	LGNW	LGSA	LGSW	LMNA	LMNW	IHRA	IDSW	MCNA	MCPW	JDY	JHAW	TDA	TDDO	BON	CCIW	CWMW
Gas Cap %	115	120	115	120	115	120	115	120	115	120	115	120	115	120	115	120	115
5/2/2011	105.5	109	107.7	111.6	112.2	120.1	114.9	116.4	111	114.5	106.9	117.1	109.7	116.3	114.3	118.4	113.1
5/3/2011	105	109.1	106.9	111.3	110.8	119.6	113.6	115.7	109.1	113.9	106.1	117.6	108.7	115.6	112	118	114.1
5/4/2011	104.5	109.6	106.6	111	110.2	119.6	113.5	116.4	109.1	113.6	108.5	115.1	110.3	116.9	113.9	118.5	114.5
5/5/2011	105.9	109.3	109	111.4	112.7	120	115.6	116.2	111.3	113.6	109.9	115.2	110.7	116.9	115.7	118.5	114.7
5/6/2011	107.1	109.9	109.1	111.7	113.2	120	115.7	116.9	111.6	113.8	109.2	118	111	116.9	113.8	118.3	114.8
5/7/2011	106.7	110.2	109.2	111.7	112.6	120	115.1	117.4	110.7	113.7	109.6	117.6	111.5	117.5	114.2	118	113.8
5/8/2011	105.9	113	108.2	111.7	112	120.2	114.1	117.6	110.3	113.8	109.6	114.9	110.8	116.4	114.2	118.3	114.8
5/9/2011	104.7	113.4	108.1	112.2	111.7	119.8	114.2	116.3	110.9	117.3	108.4	116.8	108.8	115.8	111.8	119.3	113
5/10/2011	104.1	109.4	109.4	116.8	112.3	120.2	114.7	117	111.3	116.9	108.4	118.4	111.5	116.4	112.1	120.1	113.8
5/11/2011	104.6	109.4	111.1	113.9	113.6	121.1	115.3	116.2	112	116.1	108.8	118.1	111.8	117.7	113.1	119.2	112.9
5/12/2011	104.1	111.5	107.9	114.2	114.5	119.3	114	118	111.3	118.1	108	116.8	109.7	116.6	112.7	119.5	113.8
5/13/2011	104.1	116.5	107.9	117.1	113.5	120	116.4	120	113.8	120.2	111.8	118.6	112.1	117.9	116.2	120.8	114.5
5/14/2011	106.5	121.2	111.6	121.4	118	121.2	116.7	120.8	116.1	120.8	113.7	118.7	113.1	118.7	118	124.4	117.7
5/15/2011	107	130.5	113.9	128	123	124.3	116.3	123.8	115.1	123.9	113.1	120	111.9	117.8	114.7	125	115.9
5/16/2011	104.8	130.6	116.8	129.6	127.1	126.8	118.1	129.5	111.1	125.9	112	121.8	112.2	117.7	114.7	124.7	119
5/17/2011	106.6	130.8	124.2	129	132.7	126	124.7	128.6	117.4	126	111.8	122.5	114.9	119.9	118.6	125.6	122.4
5/18/2011	106.8	126.4	125.5	126.4	130.9	123.2	124.8	124	118.3	124.3	113	124.2	114.9	119.4	118.9	125.8	123.6
5/19/2011	106.1	125.3	121.9	125.1	128.1	122.7	123.1	123	116.5	124.5	119.5	125.7	118.3	121	117.3	---	123.3
5/20/2011	106.7	122.5	120.7	129.6	127.2	121.9	123	122.2	116.8	124.5	120.8	124.7	119.7	122.3	120.1	---	124.5
5/21/2011	107.4	124	118.9	124.9	130.6	122.9	122.7	123.7	116.4	127.1	119.2	125.6	117.3	121	119	---	124.5
5/22/2011	107	124.1	116.6	127	126.1	123.1	121.8	123.6	116	127.3	118.2	126	117.7	121.1	117.9	---	123.5
5/23/2011	106.6	127.1	115.3	127.3	127.8	123.6	121	125.2	115.8	128.9	116.2	128.8	117.3	120.5	117.5	---	123.6
5/24/2011	106.4	128.3	116.5	135.1	127.9	124.9	121.3	126.3	117.6	128.8	117.2	129.1	120	122.6	120.1	---	125.5
5/25/2011	107.1	129.2	118	135.9	138.3	125.4	123.5	127.4	118.4	129	122	127.2	120.9	123.7	122.1	---	126.2
5/26/2011	106.8	132.2	118.9	136.4	133.7	126.4	122.6	128.1	116.3	128.3	121.3	127.7	120.8	122.8	120.5	---	125.9
5/27/2011	106.5	130	118	138.6	139.3	127.7	123.4	129.7	116	129.9	120.3	129	121	123.5	121.4	---	125.7
5/28/2011	107.2	126.1	119.9	131.3	137.8	124.9	126.3	127.5	116.7	130.9	117.5	129.8	119.6	122.5	121.4	---	126.6
5/29/2011	107.7	124.2	119.7	128.5	135.5	123	126.7	124.1	119.2	131	118.3	130.1	119.3	122.7	119.9	---	125.3

Generated: Wed Jun 1 23:26:05 2011

Number of hours of data used:

OR: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

Red text denotes exceedances.
• indicates No Data
Dates run from hour 1 to 24 (not 0 to 23).
The gas caps shown only apply when spilling to facilitate juvenile fish passage ("voluntary spill") between April 3rd and August 31st. At all other times, the gas cap is 110%.

Figure 34

Total Dissolved Gas Monitoring Stations

Code	Station Name
LWG	Lower Granite Forebay
LGNW	Lower Granite Tailwater
LGSA	Little Goose Forebay
LGSW	Little Goose Tailwater
LMNA	Lower Monumental Forebay
LMNW	Lower Monumental Tailwater
IHRA	Ice Harbor Forebay
IDSW	Ice Harbor Tailwater
MCNA	McNary Forebay
MCPW	McNary Tailwater
JDY	John Day Forebay
JHAW	John Day Tailwater
TDA	The Dalles Forebay
TDDO	The Dalles Tailwater
BON	Bonneville Forebay
CCIW	Bonneville Tailwater (Cascade Island)
CWMW	Camas / Washougal

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UNITED STATES DISTRICT COURT

DISTRICT OF OREGON

NATIONAL WILDLIFE FEDERATION, *et al.* Plaintiffs, v. NATIONAL MARINE FISHERIES SERVICE, *et al.* Defendants.	Civil No. 01-640-RE **NOTICE OF FEDERAL DEFENDANTS' THIRD 2011 SPILL IMPLEMENTATION STATUS REPORT**

In accordance with the Court's March 24, 2011 Order concerning 2011 spring spill

operations, Federal Defendants submit their third 2011 spill implementation status report. *See* Exhibit 1. This status report includes, among other things: the hourly flow through the powerhouse at each dam; the hourly flow over the spillway compared to the target spill for that hour; and the resultant 12-hour average total dissolved gas ("TDG") for the tailwater at each project and for the next project's forebay downstream. The report also provides written explanations of variances that occurred during the reporting period.

Respectfully submitted this 15th day of July, 2011.

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CERTIFICATE OF SERVICE

Pursuant to Local Rule Civil 100.13(c), and F.R. Civ. P. 5(d), I certify that on July 15, 2011, the foregoing will be electronically filed with the Court's electronic court filing system, which will generate automatic service upon on all Parties enrolled to receive such notice. The following will be manually served by overnight mail:

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FISH OPERATIONS PLAN IMPLEMENTATION REPORT
June 2011

Submitted by the U.S. Army Corps of Engineers
Northwestern Division
Portland, OR

Introduction:

The U.S. Army Corps of Engineers (Corps) is submitting this report in accordance with the U.S. District Court of Oregon March 24, 2011 Order adopting the 2011 Spring Fish Operations Plan (2011 Spring FOP), and the June 14, 2011 Order adopting the 2011 Summer Fish Operations Plan (2011 Summer FOP). The 2011 Spring FOP and the 2011 Summer FOP describe the Corps' project operations for fish passage at its Federal Columbia River Power System (FCRPS) dams during the spring and summer fish migration season, generally April through August.[1] To the extent Corps project operations are not specified in the 2011 Spring FOP or the 2011 Summer FOP, the FCRPS operations will be consistent with the 2010 NOAA Fisheries Biological Opinion (2010 BiOp), the USFWS 2000 and 2006 BiOps, and/or other operative documents, including the 2011 Water Management Plan (WMP), WMP seasonal updates, and the 2011 Fish Passage Plan (FPP).

The Corps' June 2011 lower Snake and Columbia River project and fish passage operations are contained in this report. In particular, information in this report includes the following:

- hourly flow through the powerhouse at each dam;
- hourly flow over the spillway compared to the spill target for that hour; and,
- resultant 12-hour average percent Total Dissolved Gas (%TDG) levels in the tailrace at each project and in the subsequent downstream project's forebay and the Camas-Washougal gauge below Bonneville Dam.

This report also provides information on presented issues and unanticipated or emergency situations that arose during implementation of the 2011 Spring FOP or 2011 Summer FOP in June.

Data Reporting:

I. For each project providing fish passage operations, this report contains two graphs per operational week[2] in June displaying the performance of the spill program as follows:

(A). Daily Average of the High 12 Hourly %TDG Values - described in the upper graph.

[1] The 2011 Summer FOP identified various projects in which spill operations transitioned from spring operations to summer operations during the month of June. John Day and The Dalles dams transitioned to summer operations on July 1.
[2] Operations are implemented from Monday through Sunday.

(B). Hourly Spill and Generation Flows - described in the lower graph[3].

The weekly graphs begin on May 30 and end on July 3 for the following lower Snake River and lower Columbia River projects: Lower Granite, Little Goose, Lower Monumental, Ice Harbor, McNary, John Day, The Dalles, and Bonneville.

Each figure represents one week of operation for a project. The graphs start at 0000 hours (%TDG graphs) and 0100 hours (flow/spill graphs) on May 30 for the lower Snake River and Lower Columbia River projects.

May 30 –June 5	Figures 1 – 8
June 6 –June 12	Figures 9 – 16
June 13 –June 19	Figures 17 – 24
June 20 – June 26	Figures 25 – 32
June 27 – July 3	Figures 33 - 40

A. Upper Graph: Shows the resultant daily average %TDG for the 12 highest hours. This is primarily a result of spill at dams. The objective is to operate each project up to the TDG limits without exceeding those limits to the extent practicable.

- The blue line represents the %TDG in the tailrace of the dam. 120% TDG is the upper operating limit.[4]
- The green line represents the %TDG in the forebay of the next dam downstream. 115% TDG is the upper operating limit.

B. Lower Graph: Shows the hourly flow and spill at the dam.

- The dotted blue line shows the flow through the powerhouse each hour, in thousand cubic feet per second (kcfs).
- The medium green line represents the average hourly total river flow through the project in kcfs.
- The heavy pink line represents the average hourly flow through the spillway in kcfs.
- The thin black line represents the hourly spill level as defined in the 2011 Spring FOP or 2011 Summer FOP.
- The heavy black line represents the target spill. This is the hourly maximum spill level. The hourly target spill may vary as a function of total river flow, forebay elevation and generator capacity, subject to the following conditions:
    - spill percentage or discharge specified in the FOP;
    - spill caps as set daily for TDG management;

[3] To adequately display high flows levels, it was necessary to extend the vertical axis on the graphs for the June reporting period.

[4] On May 18 at 1400, the Bonneville tailwater TDG gauge was destroyed by high flows and debris; therefore, the blue line on Figure 24 of Exhibit 2 ends on this date. USGS is in the process of rebuilding the fixed monitoring station and estimates it will be operable by early August. To set the spill caps, the Corps uses an analog to calculate the Bonneville tailwater %TDG levels using the Warrendale TDG gauge readings.

- test spill levels for fish passage research;
- minimum generation for power system needs;
- minimum spill at Bonneville (50 kcfs) dam;
- minimum spill at John Day is 25 percent of project outflow.

II. A table is included at the end of the figures that lists the average daily %TDG for the 12 highest hours for all projects. The numbers in red indicate the project exceeded the %TDG gas cap - 115 percent (forebay of the next downstream dam) or 120 percent (tailwater) for each project.

General Implementation Remarks:

For all projects that spill for fish passage, the target spill may be limited to a lesser quantity due to various conditions as described below. When spill levels briefly deviate below or above the level specified in the 2011 Spring FOP or 2011 Summer FOP, the heavy pink line will be below or above the heavy black line in the graphs. Actual operation deviations from the target operation during voluntary spill hours are described below. The June 2011 Spill Variance Table includes average hourly data; therefore, while spill may vary from target spill for only a portion of an hour, the June 2011 Spill Variance Table characterizes the reduction as a full hour. There are instances when the hourly spill levels are not achievable due to mechanical limitations in setting spill gates to implement the regionally coordinated spill pattern. The project operator sets the spill gate stops to most closely approximate the 2011 Spring FOP or 2011 Summer FOP level of spill while also avoiding exceeding the %TDG spill cap to the extent practicable.

"Low flow" operations at the lower Columbia and Snake projects are triggered when inflow is insufficient to provide both minimum generation and the specified spill levels. In these situations, the projects operate at minimum generation and spill the remainder of project inflow. As flows transition from higher flows to low flows, there may be situations when flows recede at a higher rate than forecasted. In addition, inflows provided by nonfederal projects upstream are variable and uncertain.

The combination of these factors may result in instances where unanticipated changes to inflow result in forebay elevations dropping to the low end of the Minimum Operating Pool (MOP). Since these projects have limited operating flexibility, maintaining minimum generation, MOP elevation, and the target spill may not be possible throughout every hour. During low flow periods at Little Goose Dam, the overall project spill percentage appears to be reduced because the calculations do not account for the volume of water released during navigational lockages; however, the actual spill volume remains constant. When these variances occur, they are recorded in the monthly Spill Variance Table for Little Goose under the variance type "Navigation."

Actual spill levels at Corps projects may range from 1 to 2 kcfs (Bonneville Dam may range from 1 to 3 kcfs) lower or higher than specified in the 2011 Spring FOP, 2011 Summer FOP and the RCC spill priority list (defines the projects' %TDG spill caps). A number of factors influence actual spill, including hydraulic efficiency, exact gate opening calibration, spillway

gate hoist cable stretch due to temperature changes, and forebay elevation (e.g., a higher forebay results in a greater volume of spill since more water can pass under the spill gate).

The 2011 Spring FOP or 2011 Summer FOP describes project operations during "Rapid Load Changes" (p. 6). For reporting purposes, the notation "Transmission Stability" in the June 2011 Spill Variance Report Table replaces "Rapid Load Changes," and identifies instances when hourly spill levels were not met as a result of load swing hours and other related within-hour load variability issues. "Transmission Stability" occurs because projects must be available to respond to within-hour load variability to satisfy North American Electric Reliability Council (NERC) reserve requirements ("on response"). In addition to within-hour load variability, projects on response must be responsive to within hour changes resulting from intermittent generation (such as wind generation). During periods of rapidly changing loads and intermittent generation, projects on response may have significant changes in turbine discharge within the hour while spill quantity remains the same within the hour. Under normal conditions, within-hour load changes primarily occur immediately preceding and following the peak load hours; however, within-hour changes in intermittent generation can occur at any hour of the day. Occasionally, several hours after peak load hours, the project may be decreasing total outflow and generation faster than the corresponding spill decreases causing the percent spill to be slightly higher. Due to the high variability of within-hour load, reporting actual spill percentages that vary by more than the ±1 percent requirement (or other ranges specified in the 2011 Spring FOP or 2011 Summer FOP) may occur with greater frequency with "Transmission Stability" hours than other hours.

Occurrences requiring an adjustment in operations and/or regional coordination are described in greater detail in the "Operational Adjustments" section below.

June Operations:

The month of June was characterized by above average flows for the lower Snake and the lower Columbia Rivers caused by a combination of above normal rainfall and snow melt. The NOAA Northwest River Forecast Center's Runoff Processor indicates June 2011 runoff was above the 30 year average (1971-2000) at Lower Granite Dam (173 percent of average) and at The Dalles Dam (154 percent of average).

The high flow conditions resulted in instances of involuntary spill continuing through the month as flows exceeded powerhouse capacity. In most involuntary spill instances, the resulting Daily Average of High 12 Hourly %TDG values exceeded the 115 percent forebay and 120 percent tailrace standards[5] as shown in the corresponding %TDG graphs for the lower Columbia and Snake River projects. In some instances of involuntary spill, the hourly %TDG values observed exceeded 130 %TDG.

During the June reporting period, planned spill operations according to the 2011 Spring FOP and the 2011 Summer FOP were as follows:

[5] As provided for in the 2011 Spring FOP or 2011 Summer FOP (*see* pp. 2-3).

- Lower Granite Dam - The hourly target spill discharge was 20 kcfs 24-hours/day up to June20 in accordance with the 2011 Spring FOP, and 18 kcfs 24-hours/day beginning June 21 in accordance with the 2011 Summer FOP.
- Little Goose Dam - The hourly target spill discharge was 30 percent of total river discharge 24-hours/day in accordance with the 2011 Spring and Summer FOPs.
- Lower Monumental Dam - The hourly target spill discharge was the %TDG spill cap 24-hours/day up to June 20 in accordance with the 2011 Spring FOP, and 17 kcfs 24-hours /day beginning June 21in accordance with the 2011 Summer FOP.
- Ice Harbor Dam - The hourly target spill alternated daily every two days between 45 kcfs daytime (0500-1800) and the %TDG spill cap nighttime vs. 30 percent of total river discharge 24-hours/day in accordance with the 2011 Spring and Summer FOPs.
- McNary Dam - The hourly target spill discharge was 40 percent of total river discharge for 24-hours/day up to June 19 in accordance with the 2011 Spring FOP, and 50 percent of total flow for 24-hours/day beginning June 20 in accordance with the 2011 Summer FOP.
- John Day Dam - The hourly target spill alternated between 40 percent vs. 30 percent of total river discharge for 24-hours/day due to the two-day treatment spring and summer spill tests in accordance with the 2011 Spring and Summer FOPs. Spill level changes occurred at 2000 hours.
- The Dalles Dam - The target spill discharge was 40 percent of total river discharge for 24/day in accordance with the 2011 Spring and Summer FOPs.
- Bonneville Dam - The hourly target spill discharge was 100 kcfs 24-hours/day up to June 15 in accordance with the Spring FOP and alternating every two days between 95 kcfs 24-hours/day vs. 85 kcfs daytime/121 kcfs nighttime beginning June 16 in accordance with the 2011 Summer FOP.

Operational Adjustments*:*

1. Lower Granite Dam:

    - On June 7 from 1200-1600 hours, the adult fish ladder auxiliary water supply (AWS) pumps were turned off and spillbay 8 was shutdown to facilitate repair of the North Shore Entrance (NSE) – 1 fishway weir gate. During the gate repair, the fishway remained in service, but did not meet the specified water depth criteria identified in the FPP. In addition, the closure of spillbay 8 resulted in a modification to the FPP spill pattern such that FOP spill levels were redistributed through the remaining spillbays. Once the weir gate repair was complete, the AWS pumps and spillbay 8 were returned to service. This operation was coordinated with FPOM via email on May 31 and June 6, and FPOM members either supported or did not object to this operation.

    - On June 14 from 1300-1500 hours, a debris spill operation was conducted to pass debris and numerous logs that were lodged in front of spillbays 2 through 5. A modified spill pattern was used to pass the logs, while maintaining spill through the spillway weir. Once the operation was complete, the project reverted to the FPP spill pattern. FOP spill levels were unchanged during this maintenance operation. This modification was coordinated with FPOM via email on June 14, and FPOM members either supported or did not object to this operation.

2. Little Goose Dam:

   On June 21, two short duration full powerhouse outages (turbine units 1-6) and one longer duration single turbine outage (turbine unit 5) occurred while the Corps made required repairs to turbine unit 6. All turbine units were out of service between 0700 – 0715 hours and between 2100 – 2115 hours. Turbine unit 5 was out of service between 0700 – 2200 hours. Normal operations resumed through all turbine units (1-6) at 2200 hours. This operation was coordinated with FPOM via email on June 1 and June 20, and FPOM members either supported or did not object to this operation.

3. John Day Dam:

   Between May 19 and June 14, maintenance difficulties and associated juvenile mortalities occurred at John Day Dam. Due to above normal river flows, excessive debris accumulation not commonly seen at this project occurred on turbine unit intake trash racks, in gatewells, and in orifices – features that fish pass as they move through the juvenile fish bypass system. The Corps estimates that 2,334 juvenile salmon mortalities may have occurred due to the debris accumulation in Unit 2, of which 166 were estimated to be ESA-listed fish. Additionally, the Corps estimates that 660 juvenile salmon (67 ESA-listed) and 4 adult salmon mortalities may have occurred either in the forebay or in gatewells as a result of debris accumulation during this time. The Corps implemented the following measures to prevent this from occurring in the future: (1) Reviewed applicable FPP requirements with all appropriate staff responsible for complying with these criteria; (2) Portland District Commander visited with JDA staff and all Portland District Columbia River Operations Project Managers to emphasize adherence to FPP criteria, and that corrective actions must be taken immediately; (3) increased the frequency of gatewell drawdown measurements from weekly, as specified in the FPP, to daily; (4) project staff are available 7 days per week to remove debris if necessary; and, (5) improved procedures to remove debris from trash racks have been implemented. FPOM was notified of this incident during the June 9 FPOM meeting and via email communication on June 13. The Court was notified of this situation on June 24, 2011.

4. The Dalles Dam:

   On June 22, a modification to the FPP spill pattern was implemented due to damaged research equipment (trolley pipe) in spillbay 12. Spill was redistributed to the next available spillbay (bay 14) and FOP spill levels were not affected. Repair of spillbay 12 is currently planned for the 2011 – 2012 winter maintenance period. This operation was coordinated with FPOM via email on June 22, and FPOM members either supported or

5. High System-wide TDG:

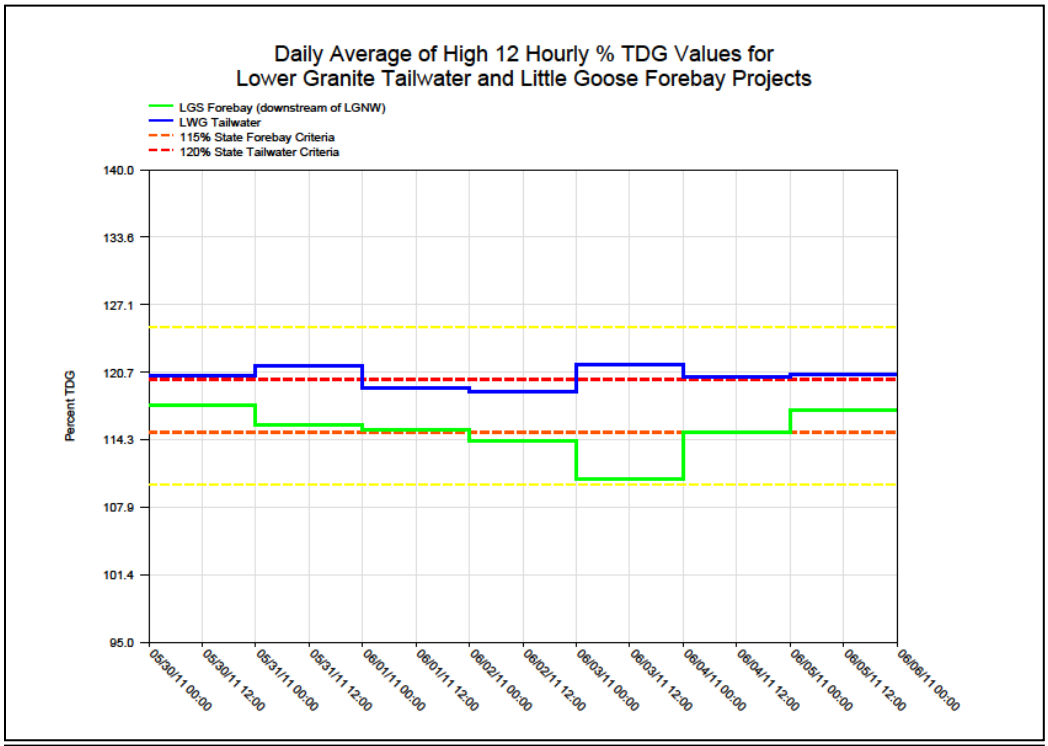
Throughout the duration of operations covered in this monthly report, spill exceeded target spill levels specified in both the 2011 Spring and Summer FOPs at each project due to high river flow conditions. As a result of the high spill levels at each project, TDG production was correspondingly high system-wide. On June 29, the Corps modified the spill priority list to improve the management of system-wide TDG levels relating to high flow conditions, and to minimize the "fallback" of adult salmon through the spillway at Snake River dams due to high levels of spill. This modification utilizes Chief Joseph Dam spill to better manage high TDG levels occurring in the lower Snake and lower Columbia rivers. The duration of this change is expected to last through July, but the Corps will be monitoring river conditions and, in coordination with TMT, making adjustments as necessary. This action was coordinated with TMT during meetings on June 22, 24, and 29, and members either supported or did not object to this operation.

June 2011 Spill Variance Table

Project	Parameter	Date	Time[6]	Hours	Type	Reason
Little Goose	Additional % Spill	6/21/11	0700-2200	16	Maintenance	Hourly spill increased ranging from 49.1-82.9% (above 30.0% ± 1% range). Spill of excess outflow was required in order to take the line out of service for maintenance. 24-hr avg. spill was 48.8%.
Little Goose	Additional % Spill	6/21/11	0700-2200	16	Maintenance	Hourly spill increased ranging from 49.1-82.9% (above 30.0% ± 1% range). Spill of excess outflow was required in order to take the line out of service for maintenance. 24-hr avg. spill was 48.8%.
Little Goose	Reduced % Spill	7/2/11	0300-0600	4	Human/Program Error	Hourly spill decreased to 24.5% (below the spill cap of 40 kcfs and 30.0% ± 1% range). A request to decrease to 35 kcfs was made, and was not corrected until the 0600 hour. 24-hr avg. spill was 28.1%.
Lower Monumental	Reduced Spill	6/4/11	2000	1	Navigation	Hourly spill decreased to 24.7 kcfs (below 28 kcfs spill cap). Reduced spill for safe passage of fish barge.
Lower Monumental	Reduced Spill	6/18/11	1800-1900	2	Navigation	Hourly spill decreased to 22 kcfs (below 28 kcfs spill cap). Reduced spill for safe passage of fish barge.
Lower Monumental	Reduced Spill	6/20/11	1700	1	Navigation	Hourly spill decreased to 15.4 kcfs (below 28 kcfs spill cap). Reduced spill for safe passage of fish barge.

[6] Data collected for reporting spill variances is reported using hourly-averaged data. Therefore, while spill may be increased or decreased for only a portion of an hour, when the hourly-averaged data is out of defined FOP spill levels then it is included in the Spill Variance Table.

Figure 1


Daily Average of High 12 Hourly % TDG Values for
Lower Granite Tailwater and Little Goose Forebay Projects
LGS Forebay (downstream of LGNW)
LWG Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
133.6
127.1
120.7
114.3
107.9
101.4
95.0
05/30/11 00:00
05/30/11 12:00
05/31/11 00:00
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06/01/11 00:00
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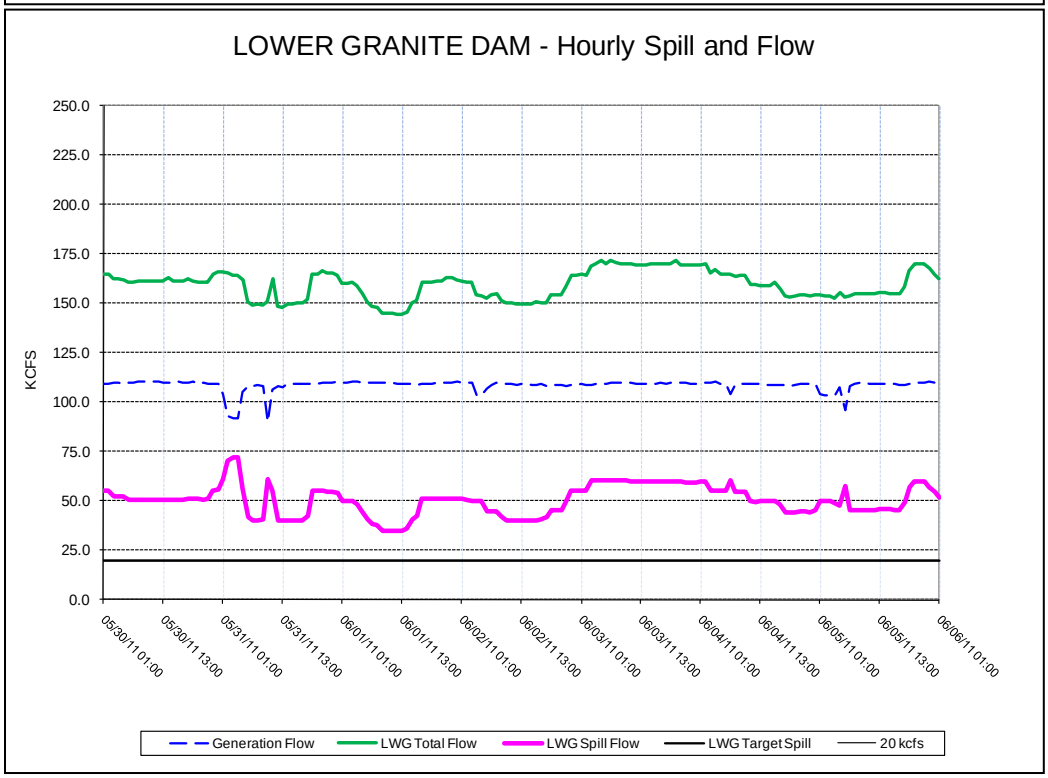
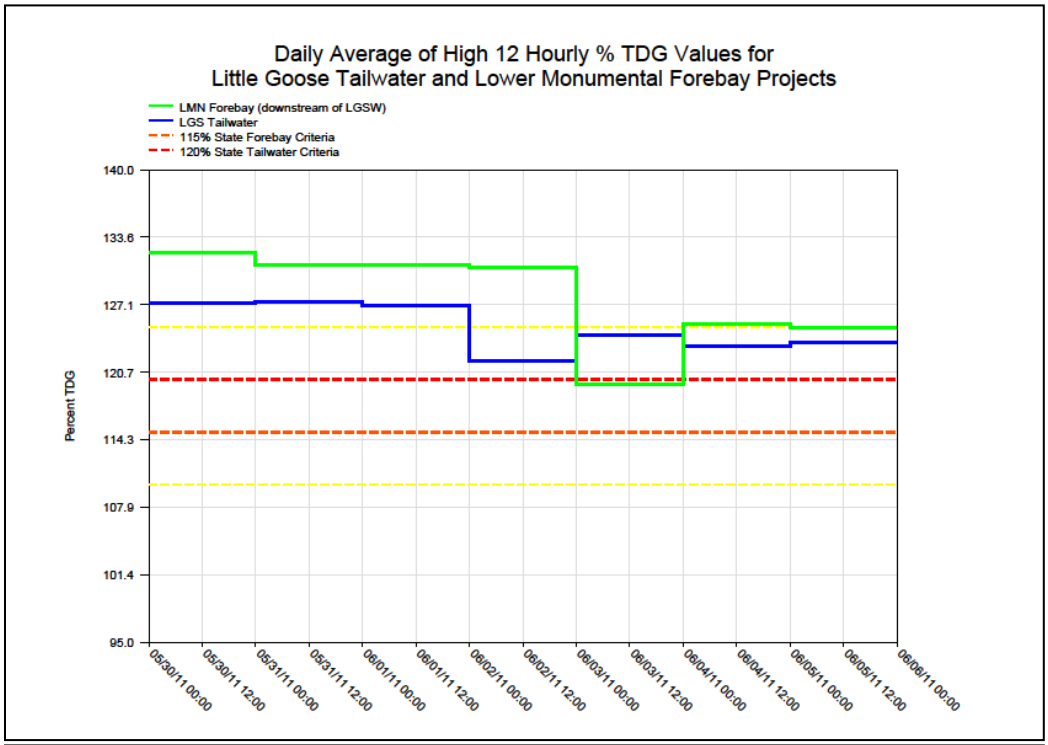

LOWER GRANITE DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
05/30/11 01:00
05/30/11 13:00
05/31/11 01:00
05/31/11 13:00
06/01/11 01:00
06/01/11 13:00
06/02/11 01:00
06/02/11 13:00
06/03/11 01:00
06/03/11 13:00
06/04/11 01:00
06/04/11 13:00
06/05/11 01:00
06/05/11 13:00
06/06/11 01:00
Generation Flow
LWG Total Flow
LWG Spill Flow
LWG Target Spill
20 kcfs

Figure 2


Daily Average of High 12 Hourly % TDG Values for
Little Goose Tailwater and Lower Monumental Forebay Projects
LMN Forebay (downstream of LGSW)
LGS Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
133.6
127.1
120.7
114.3
107.9
101.4
95.0
05/30/11 00:00
05/30/11 12:00
05/31/11 00:00
05/31/11 12:00
06/01/11 00:00
06/01/11 12:00
06/02/11 00:00
06/02/11 12:00
06/03/11 00:00
06/03/11 12:00
06/04/11 00:00
06/04/11 12:00
06/05/11 00:00
06/05/11 12:00
06/06/11 00:00

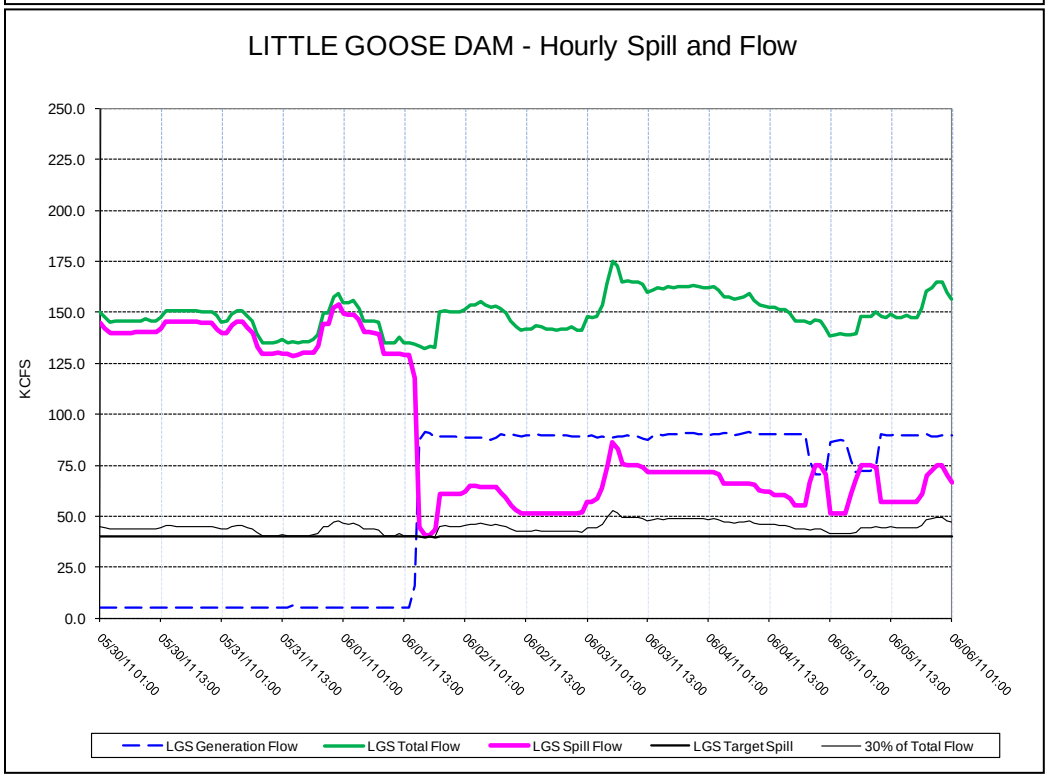
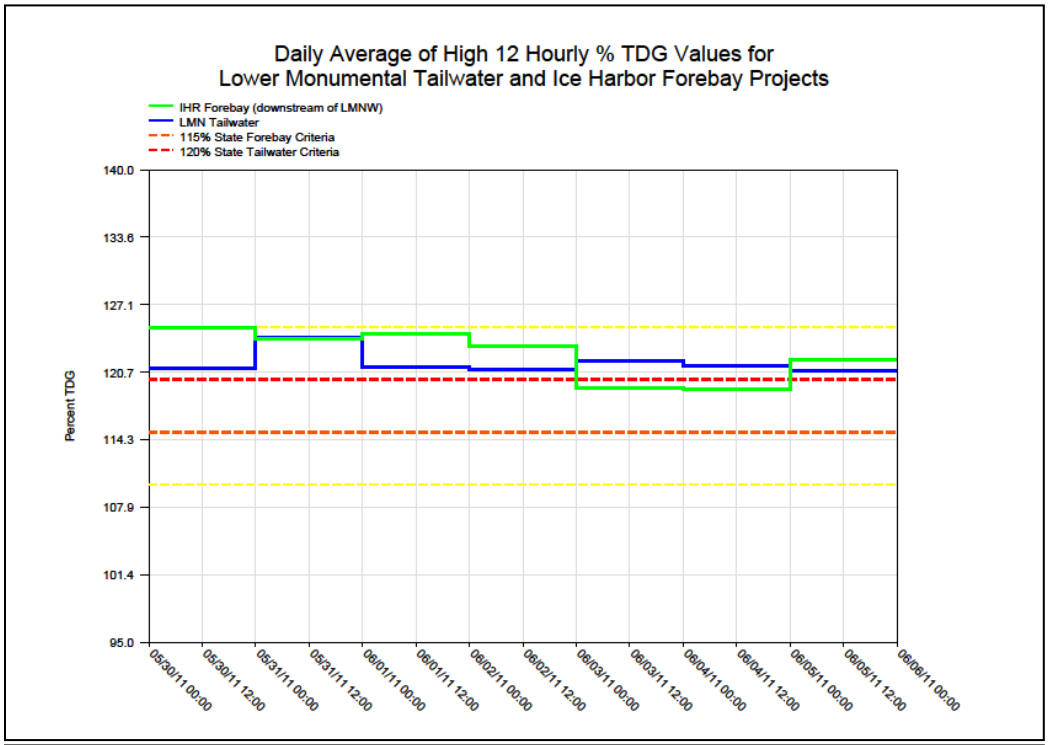

LITTLE GOOSE DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
05/30/11 01:00
05/30/11 13:00
05/31/11 01:00
05/31/11 13:00
06/01/11 01:00
06/01/11 13:00
06/02/11 01:00
06/02/11 13:00
06/03/11 01:00
06/03/11 13:00
06/04/11 01:00
06/04/11 13:00
06/05/11 01:00
06/05/11 13:00
06/06/11 01:00
LGS Generation Flow
LGS Total Flow
LGS Spill Flow
LGS Target Spill
30% of Total Flow

Figure 3


Daily Average of High 12 Hourly % TDG Values for
Lower Monumental Tailwater and Ice Harbor Forebay Projects
IHR Forebay (downstream of LMNW)
LMN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
133.6
127.1
120.7
114.3
107.9
101.4
95.0
05/30/11 00:00
05/30/11 12:00
05/31/11 00:00
05/31/11 12:00
06/01/11 00:00
06/01/11 12:00
06/02/11 00:00
06/02/11 12:00
06/03/11 00:00
06/03/11 12:00
06/04/11 00:00
06/04/11 12:00
06/05/11 00:00
06/05/11 12:00
06/06/11 00:00

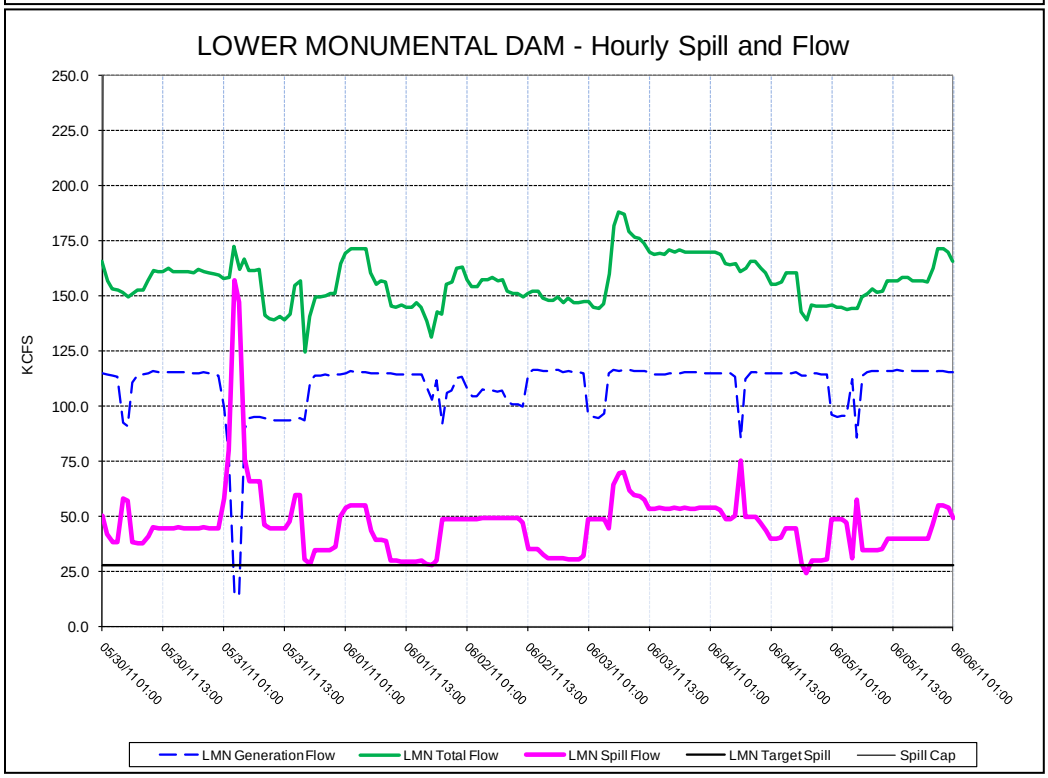
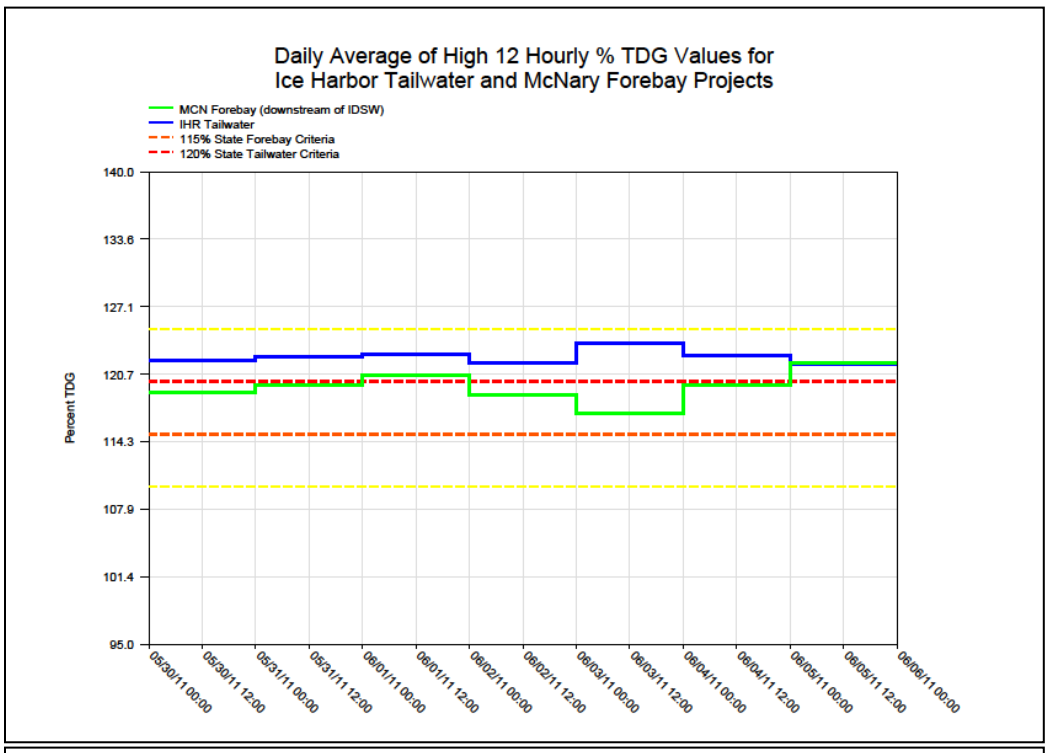

LOWER MONUMENTAL DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
05/30/11 01:00
05/30/11 13:00
05/31/11 01:00
05/31/11 13:00
06/01/11 01:00
06/01/11 13:00
06/02/11 01:00
06/02/11 13:00
06/03/11 01:00
06/03/11 13:00
06/04/11 01:00
06/04/11 13:00
06/05/11 01:00
06/05/11 13:00
06/06/11 01:00
LMN Generation Flow
LMN Total Flow
LMN Spill Flow
LMN Target Spill
Spill Cap

Figure 4


Daily Average of High 12 Hourly % TDG Values for
Ice Harbor Tailwater and McNary Forebay Projects
MCN Forebay (downstream of IDSW)
IHR Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
133.6
127.1
120.7
114.3
107.9
101.4
95.0
05/30/11 00:00
05/30/11 12:00
05/31/11 00:00
05/31/11 12:00
06/01/11 00:00
06/01/11 12:00
06/02/11 00:00
06/02/11 12:00
06/03/11 00:00
06/03/11 12:00
06/04/11 00:00
06/04/11 12:00
06/05/11 00:00
06/05/11 12:00
06/06/11 00:00

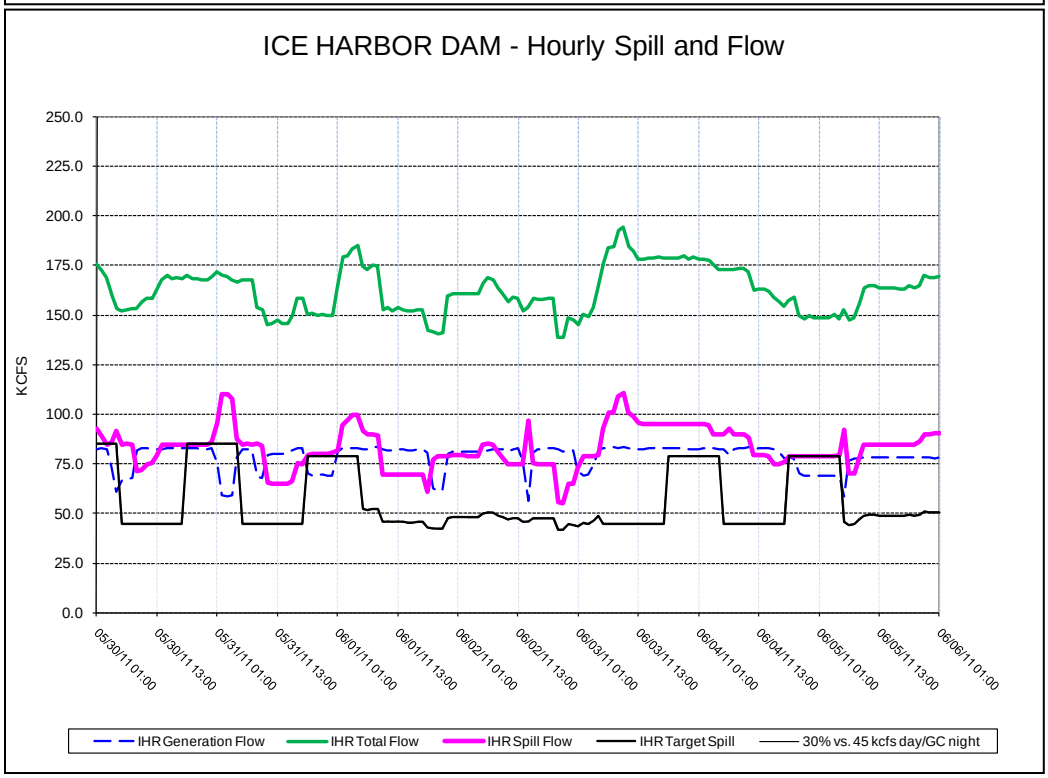
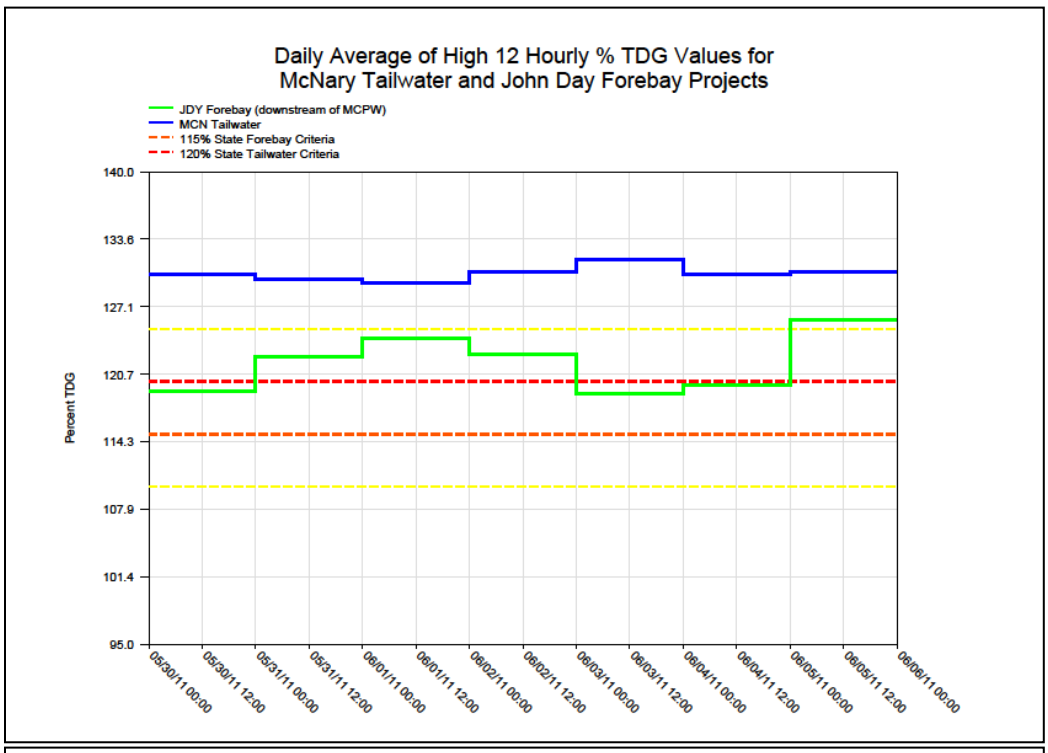

ICE HARBOR DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
05/30/11 01:00
05/30/11 13:00
05/31/11 01:00
05/31/11 13:00
06/01/11 01:00
06/01/11 13:00
06/02/11 01:00
06/02/11 13:00
06/03/11 01:00
06/03/11 13:00
06/04/11 01:00
06/04/11 13:00
06/05/11 01:00
06/05/11 13:00
06/06/11 01:00
IHR Generation Flow
IHR Total Flow
IHR Spill Flow
IHR Target Spill
30% vs. 45 kcfs day/GC night

Figure 5


Daily Average of High 12 Hourly % TDG Values for
McNary Tailwater and John Day Forebay Projects
JDY Forebay (downstream of MCPW)
MCN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
133.6
127.1
120.7
114.3
107.9
101.4
95.0
05/30/11 00:00
05/30/11 12:00
05/31/11 00:00
05/31/11 12:00
06/01/11 00:00
06/01/11 12:00
06/02/11 00:00
06/02/11 12:00
06/03/11 00:00
06/03/11 12:00
06/04/11 00:00
06/04/11 12:00
06/05/11 00:00
06/05/11 12:00
06/06/11 00:00

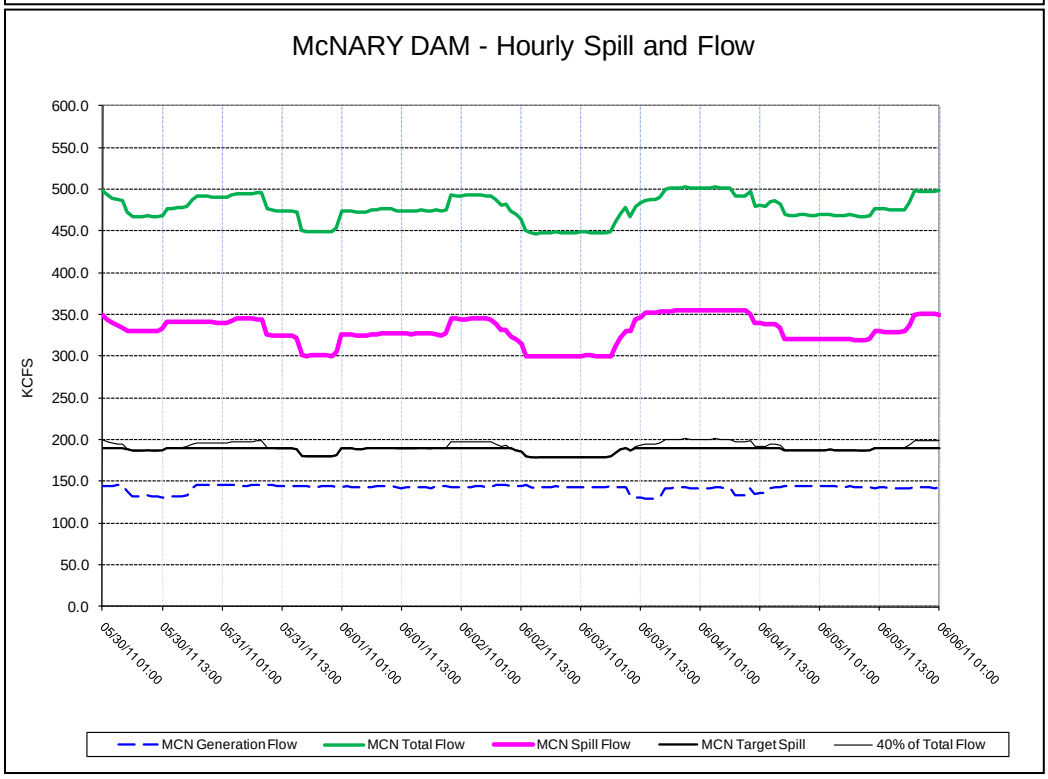
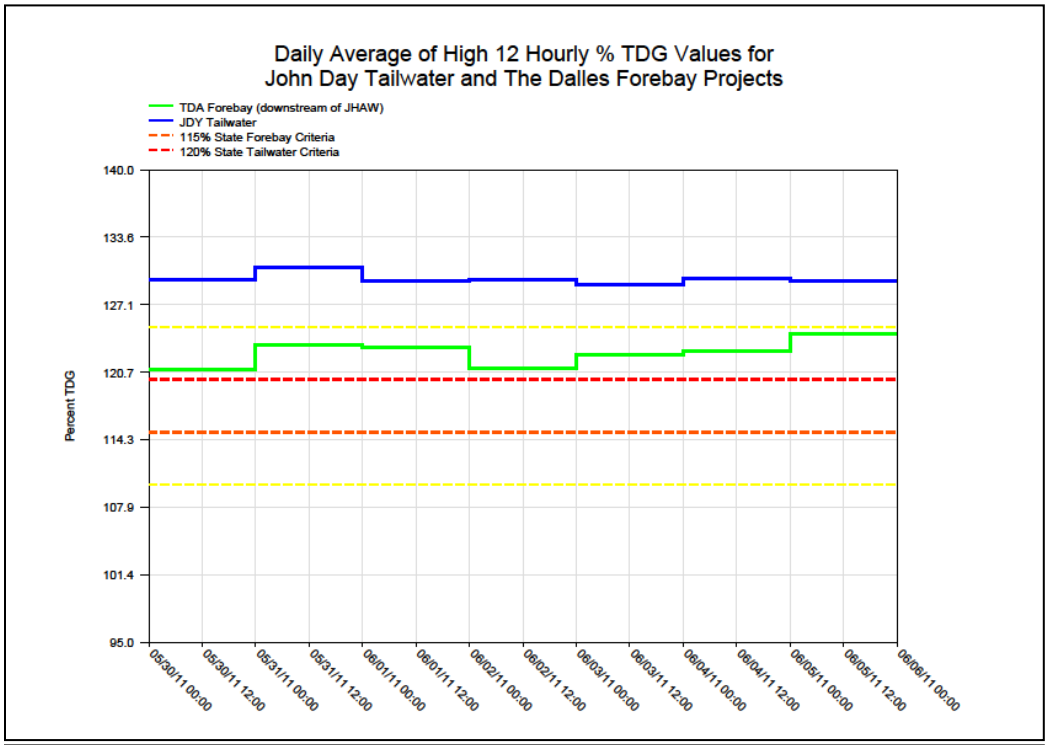

McNARY DAM - Hourly Spill and Flow
KCFS
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
05/30/11 01:00
05/30/11 13:00
05/31/11 01:00
05/31/11 13:00
06/01/11 01:00
06/01/11 13:00
06/02/11 01:00
06/02/11 13:00
06/03/11 01:00
06/03/11 13:00
06/04/11 01:00
06/04/11 13:00
06/05/11 01:00
06/05/11 13:00
06/06/11 01:00
MCN Generation Flow
MCN Total Flow
MCN Spill Flow
MCN Target Spill
40% of Total Flow

Figure 6


Daily Average of High 12 Hourly % TDG Values for
John Day Tailwater and The Dalles Forebay Projects
TDA Forebay (downstream of JHAW)
JDY Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
133.6
127.1
120.7
114.3
107.9
101.4
95.0
05/30/11 00:00
05/30/11 12:00
05/31/11 00:00
05/31/11 12:00
06/01/11 00:00
06/01/11 12:00
06/02/11 00:00
06/02/11 12:00
06/03/11 00:00
06/03/11 12:00
06/04/11 00:00
06/04/11 12:00
06/05/11 00:00
06/05/11 12:00
06/06/11 00:00

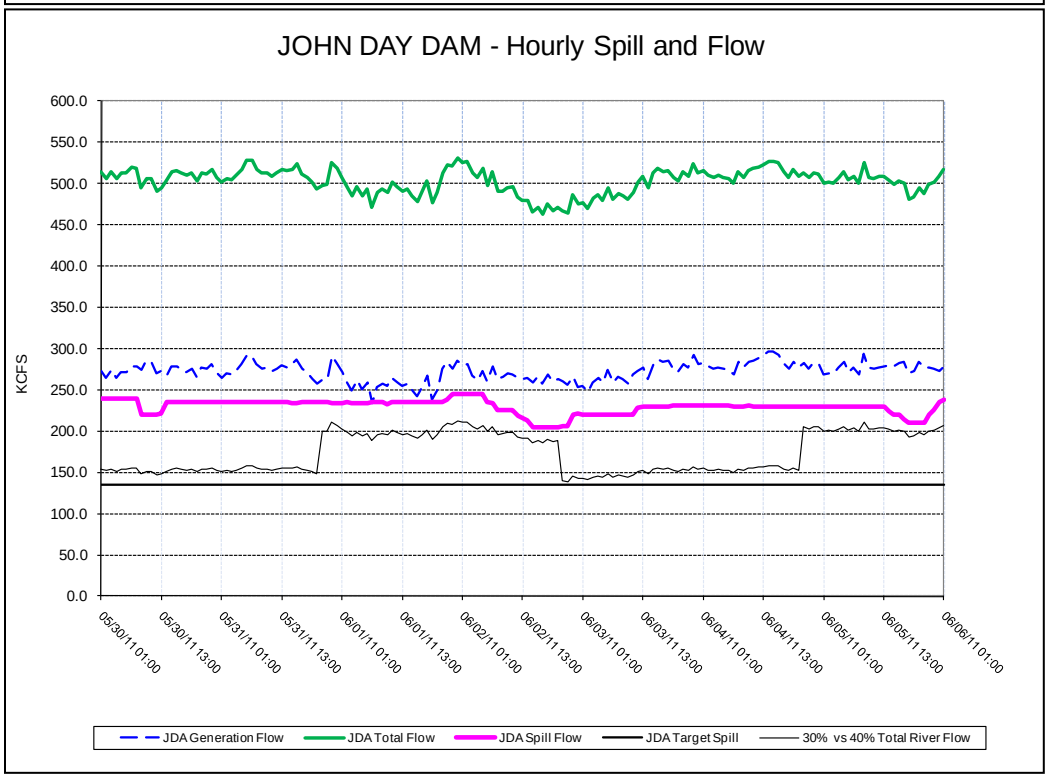
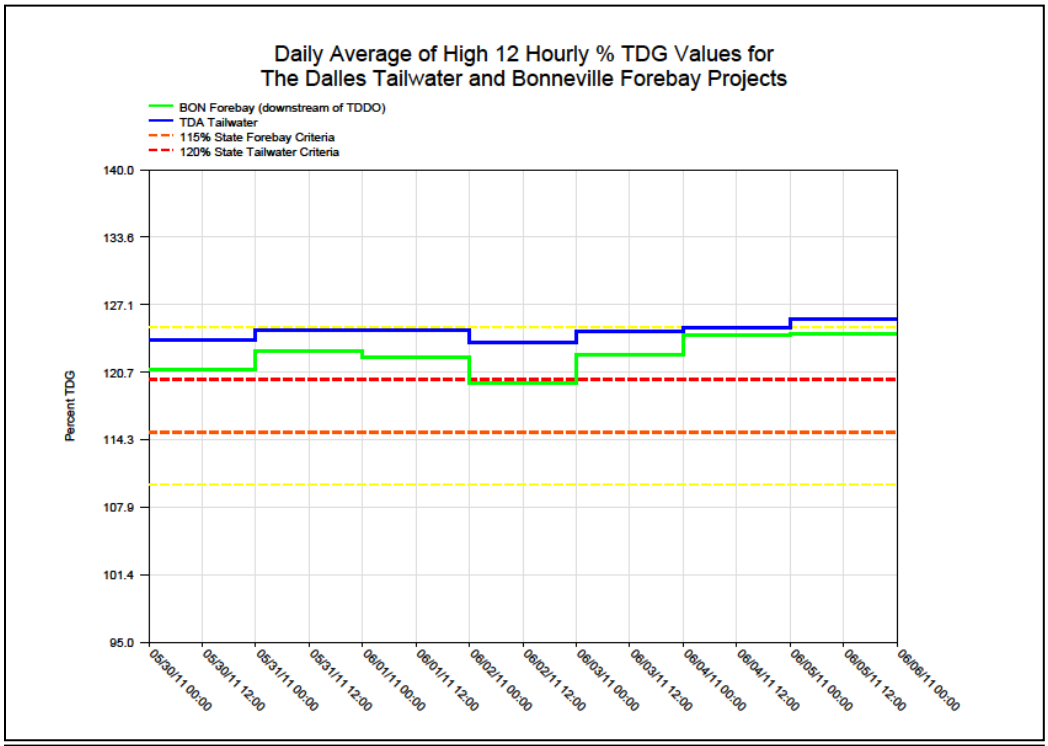

JOHN DAY DAM - Hourly Spill and Flow
KCFS
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
05/30/11 01:00
05/30/11 13:00
05/31/11 01:00
05/31/11 13:00
06/01/11 01:00
06/01/11 13:00
06/02/11 01:00
06/02/11 13:00
06/03/11 01:00
06/03/11 13:00
06/04/11 01:00
06/04/11 13:00
06/05/11 01:00
06/05/11 13:00
06/06/11 01:00
JDA Generation Flow
JDA Total Flow
JDA Spill Flow
JDA Target Spill
30% vs 40% Total River Flow

Figure 7


Daily Average of High 12 Hourly % TDG Values for
The Dalles Tailwater and Bonneville Forebay Projects
BON Forebay (downstream of TDDO)
TDA Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
133.6
127.1
120.7
114.3
107.9
101.4
95.0
05/30/11 00:00
05/30/11 12:00
05/31/11 00:00
05/31/11 12:00
06/01/11 00:00
06/01/11 12:00
06/02/11 00:00
06/02/11 12:00
06/03/11 00:00
06/03/11 12:00
06/04/11 00:00
06/04/11 12:00
06/05/11 00:00
06/05/11 12:00
06/06/11 00:00

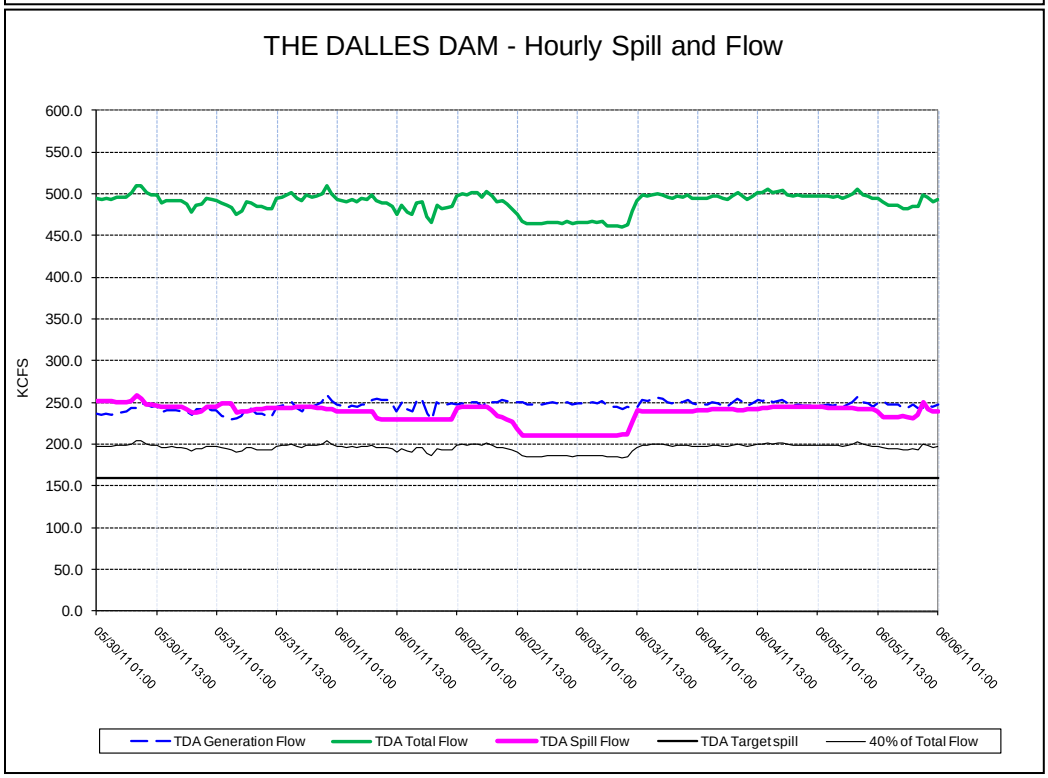
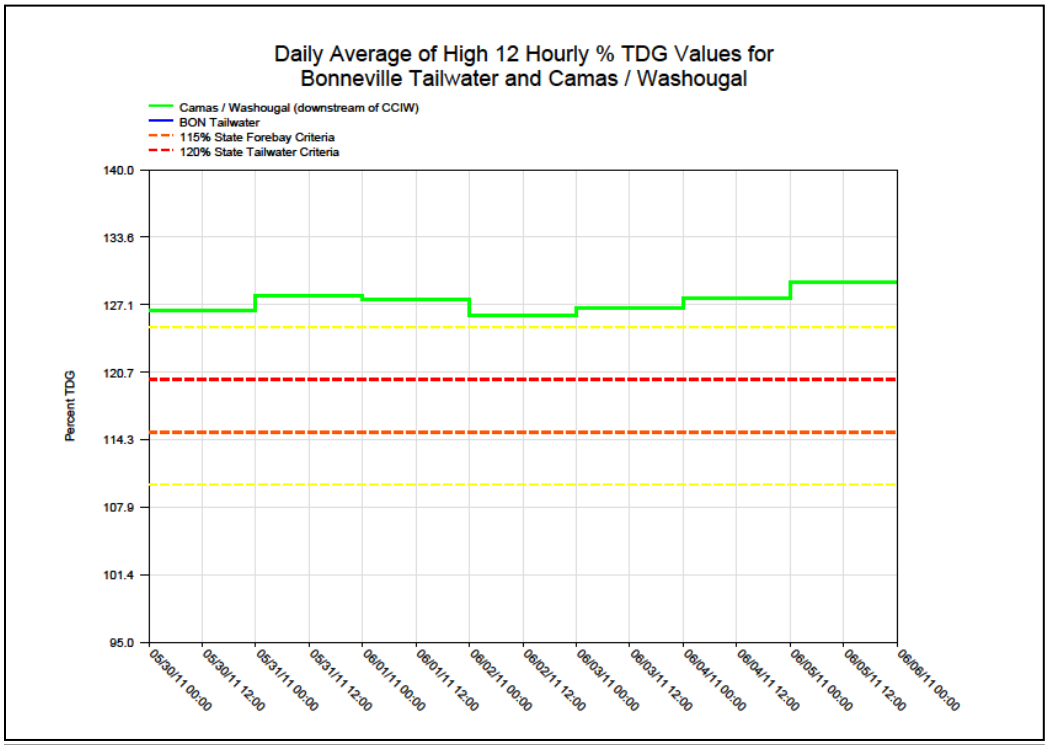

THE DALLES DAM - Hourly Spill and Flow
KCFS
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
05/30/11 01:00
05/30/11 13:00
05/31/11 01:00
05/31/11 13:00
06/01/11 01:00
06/01/11 13:00
06/02/11 01:00
06/02/11 13:00
06/03/11 01:00
06/03/11 13:00
06/04/11 01:00
06/04/11 13:00
06/05/11 01:00
06/05/11 13:00
06/06/11 01:00
TDA Generation Flow
TDA Total Flow
TDA Spill Flow
TDA Target spill
40% of Total Flow

Figure 8


Daily Average of High 12 Hourly % TDG Values for
Bonneville Tailwater and Camas / Washougal
Camas / Washougal (downstream of CCIW)
BON Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
133.6
127.1
120.7
114.3
107.9
101.4
95.0
05/30/11 00:00
05/30/11 12:00
05/31/11 00:00
05/31/11 12:00
06/01/11 00:00
06/01/11 12:00
06/02/11 00:00
06/02/11 12:00
06/03/11 00:00
06/03/11 12:00
06/04/11 00:00
06/04/11 12:00
06/05/11 00:00
06/05/11 12:00
06/06/11 00:00

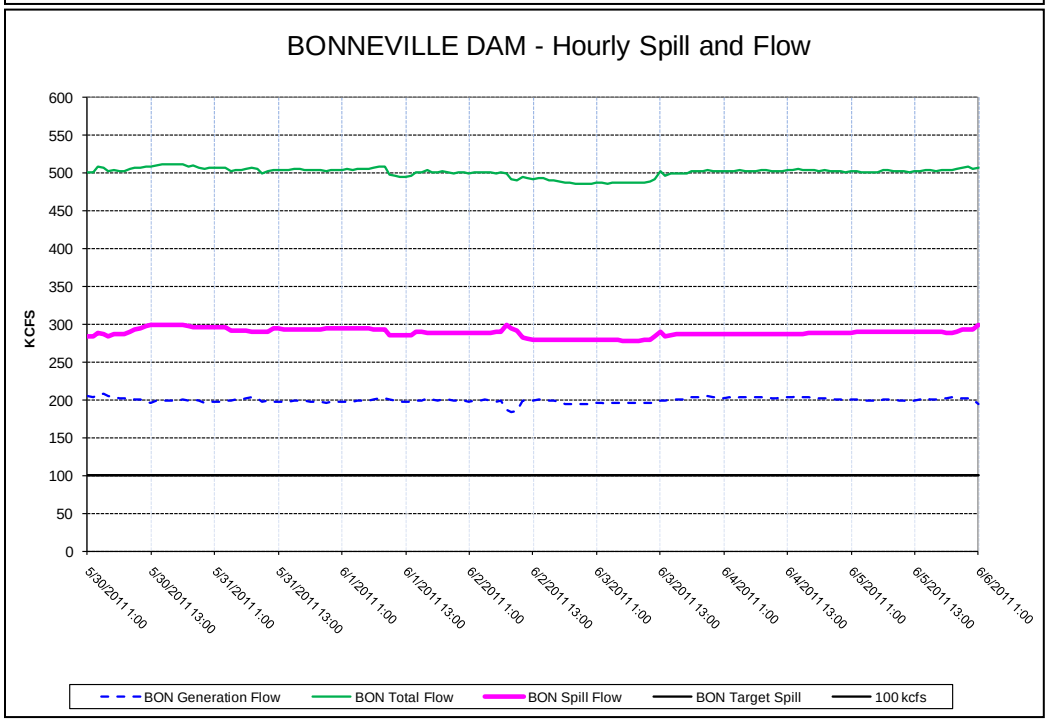
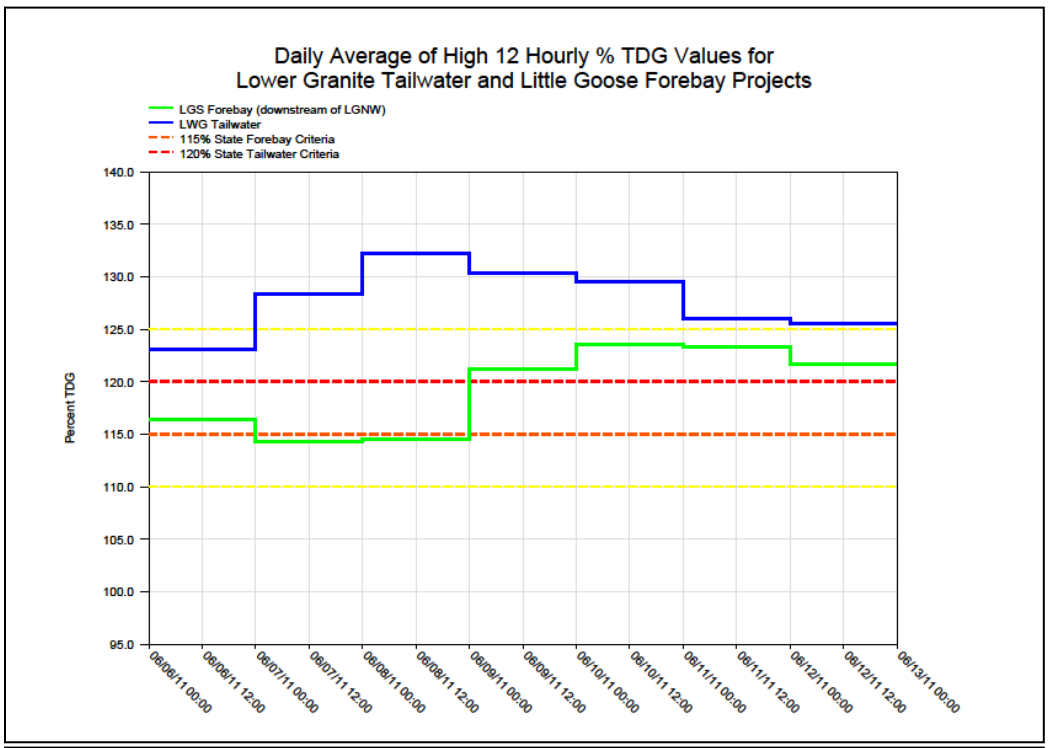

BONNEVILLE DAM - Hourly Spill and Flow
KCFS
600
550
500
450
400
350
300
250
200
150
100
50
0
5/30/2011 1:00
5/30/2011 13:00
5/31/2011 1:00
5/31/2011 13:00
6/1/2011 1:00
6/1/2011 13:00
6/2/2011 1:00
6/2/2011 13:00
6/3/2011 1:00
6/3/2011 13:00
6/4/2011 1:00
6/4/2011 13:00
6/5/2011 1:00
6/5/2011 13:00
6/6/2011 1:00
BON Generation Flow
BON Total Flow
BON Spill Flow
BON Target Spill
100 kcfs

Figure 9


Daily Average of High 12 Hourly % TDG Values for
Lower Granite Tailwater and Little Goose Forebay Projects
LGS Forebay (downstream of LGNW)
LWG Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/06/11 00:00
06/06/11 12:00
06/07/11 00:00
06/07/11 12:00
06/08/11 00:00
06/08/11 12:00
06/09/11 00:00
06/09/11 12:00
06/10/11 00:00
06/10/11 12:00
06/11/11 00:00
06/11/11 12:00
06/12/11 00:00
06/12/11 12:00
06/13/11 00:00

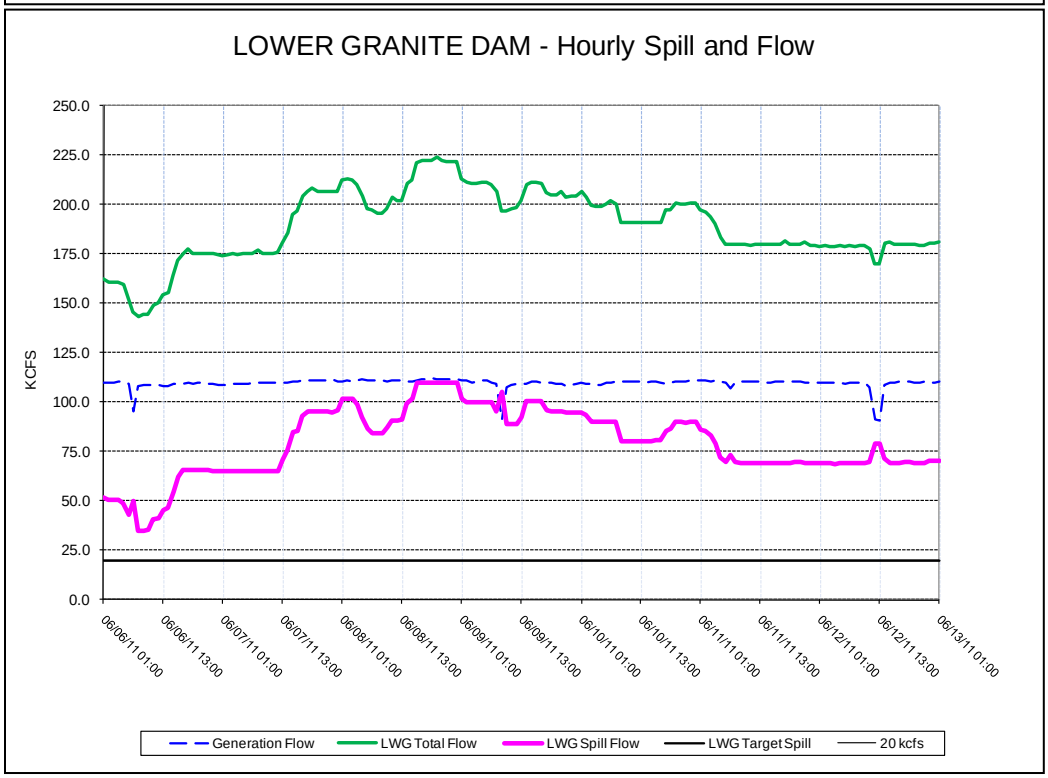
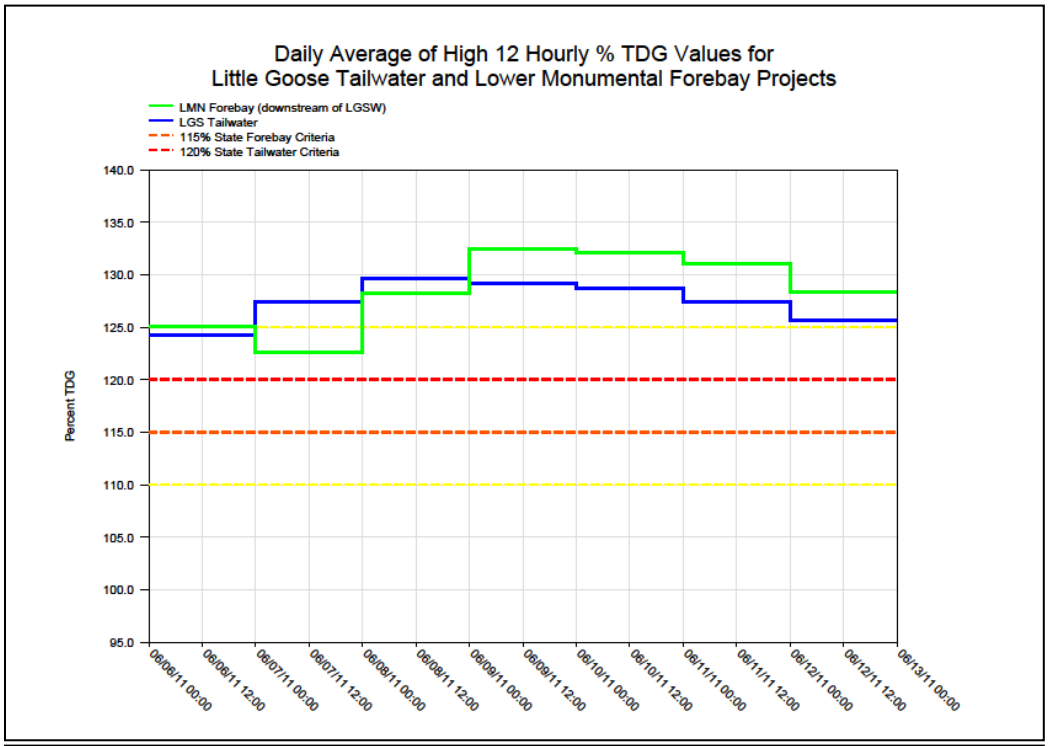

LOWER GRANITE DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
06/06/11 01:00
06/06/11 13:00
06/07/11 01:00
06/07/11 13:00
06/08/11 01:00
06/08/11 13:00
06/09/11 01:00
06/09/11 13:00
06/10/11 01:00
06/10/11 13:00
06/11/11 01:00
06/11/11 13:00
06/12/11 01:00
06/12/11 13:00
06/13/11 01:00
Generation Flow
LWG Total Flow
LWG Spill Flow
LWG Target Spill
20 kcfs

Figure 10


Daily Average of High 12 Hourly % TDG Values for
Little Goose Tailwater and Lower Monumental Forebay Projects
LMN Forebay (downstream of LGSW)
LGS Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/06/11 00:00
06/06/11 12:00
06/07/11 00:00
06/07/11 12:00
06/08/11 00:00
06/08/11 12:00
06/09/11 00:00
06/09/11 12:00
06/10/11 00:00
06/10/11 12:00
06/11/11 00:00
06/11/11 12:00
06/12/11 00:00
06/12/11 12:00
06/13/11 00:00

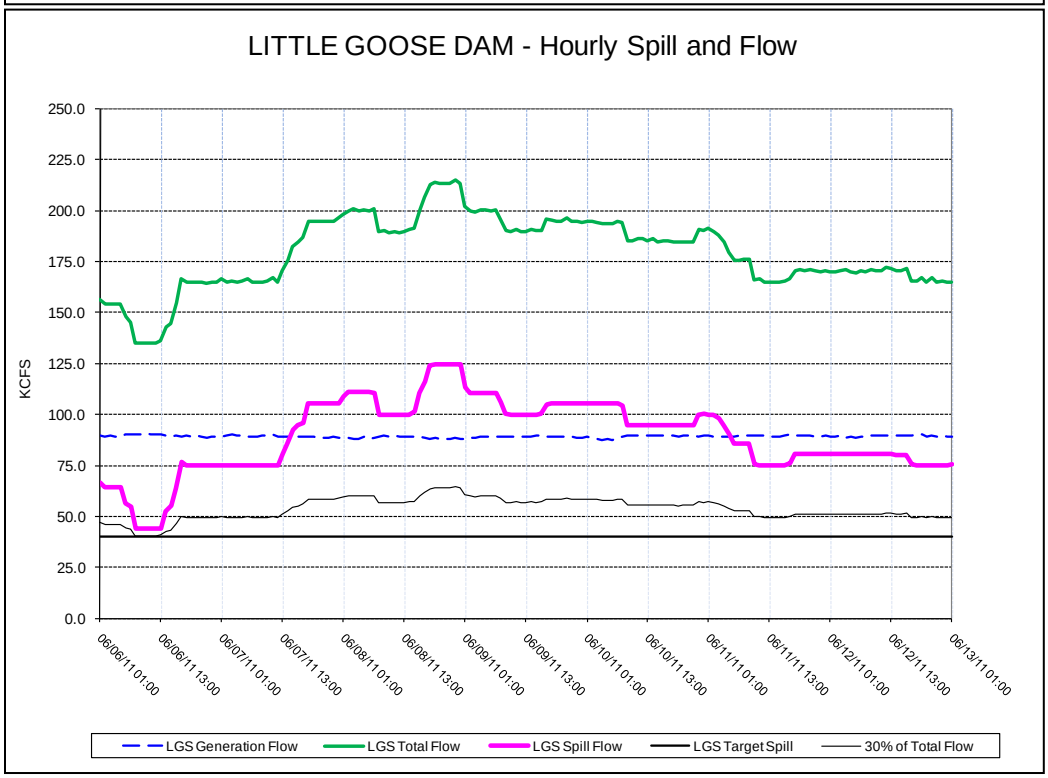
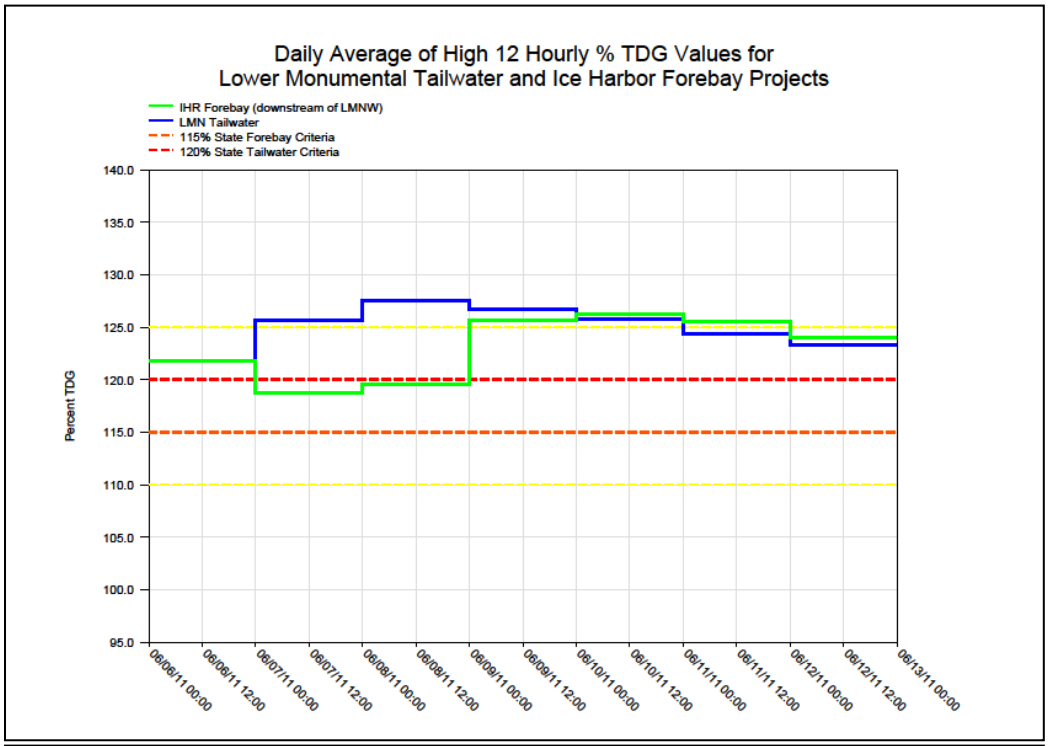

LITTLE GOOSE DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
06/06/11 01:00
06/06/11 13:00
06/07/11 01:00
06/07/11 13:00
06/08/11 01:00
06/08/11 13:00
06/09/11 01:00
06/09/11 13:00
06/10/11 01:00
06/10/11 13:00
06/11/11 01:00
06/11/11 13:00
06/12/11 01:00
06/12/11 13:00
06/13/11 01:00
LGS Generation Flow
LGS Total Flow
LGS Spill Flow
LGS Target Spill
30% of Total Flow

Figure 11


Daily Average of High 12 Hourly % TDG Values for
Lower Monumental Tailwater and Ice Harbor Forebay Projects
IHR Forebay (downstream of LMNW)
LMN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/06/11 00:00
06/06/11 12:00
06/07/11 00:00
06/07/11 12:00
06/08/11 00:00
06/08/11 12:00
06/09/11 00:00
06/09/11 12:00
06/10/11 00:00
06/10/11 12:00
06/11/11 00:00
06/11/11 12:00
06/12/11 00:00
06/12/11 12:00
06/13/11 00:00

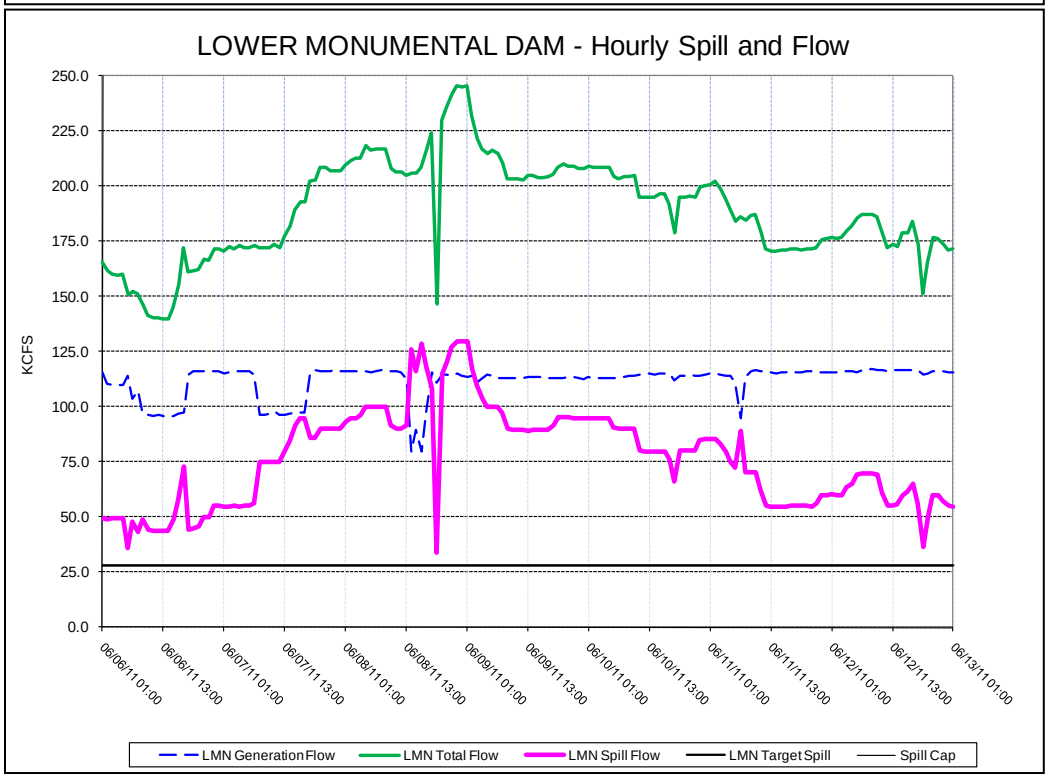
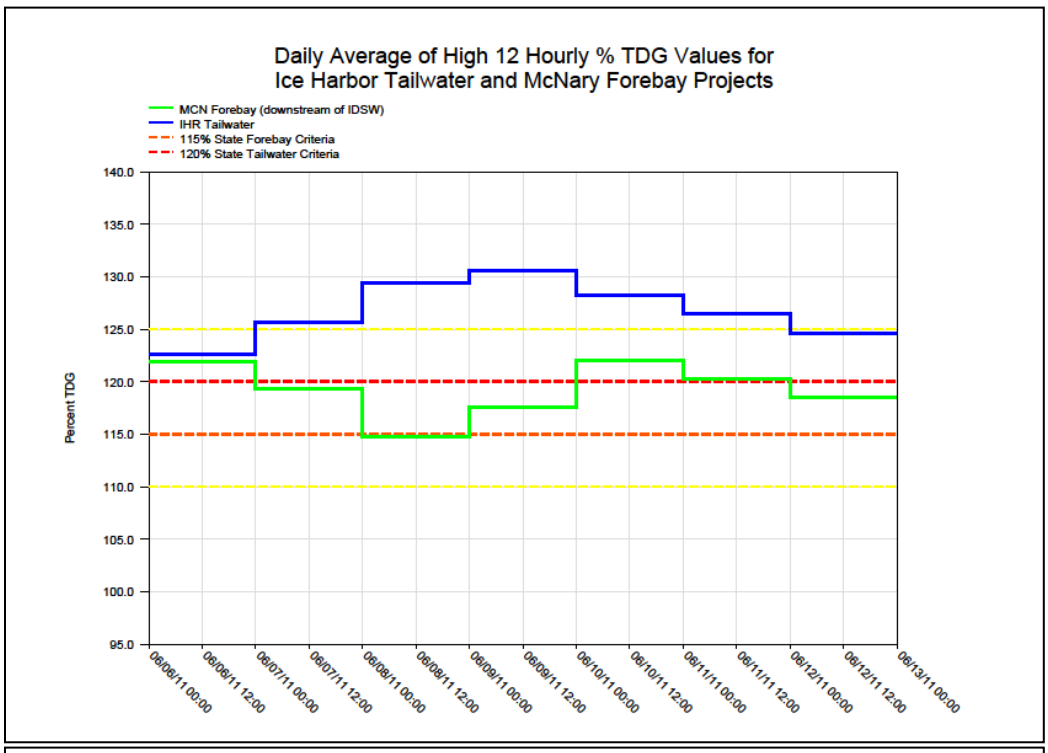

LOWER MONUMENTAL DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
06/06/11 01:00
06/06/11 13:00
06/07/11 01:00
06/07/11 13:00
06/08/11 01:00
06/08/11 13:00
06/09/11 01:00
06/09/11 13:00
06/10/11 01:00
06/10/11 13:00
06/11/11 01:00
06/11/11 13:00
06/12/11 01:00
06/12/11 13:00
06/13/11 01:00
LMN Generation Flow
LMN Total Flow
LMN Spill Flow
LMN Target Spill
Spill Cap

Figure 12


Daily Average of High 12 Hourly % TDG Values for
Ice Harbor Tailwater and McNary Forebay Projects
MCN Forebay (downstream of IDSW)
IHR Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/06/11 00:00
06/06/11 12:00
06/07/11 00:00
06/07/11 12:00
06/08/11 00:00
06/08/11 12:00
06/09/11 00:00
06/09/11 12:00
06/10/11 00:00
06/10/11 12:00
06/11/11 00:00
06/11/11 12:00
06/12/11 00:00
06/12/11 12:00
06/13/11 00:00

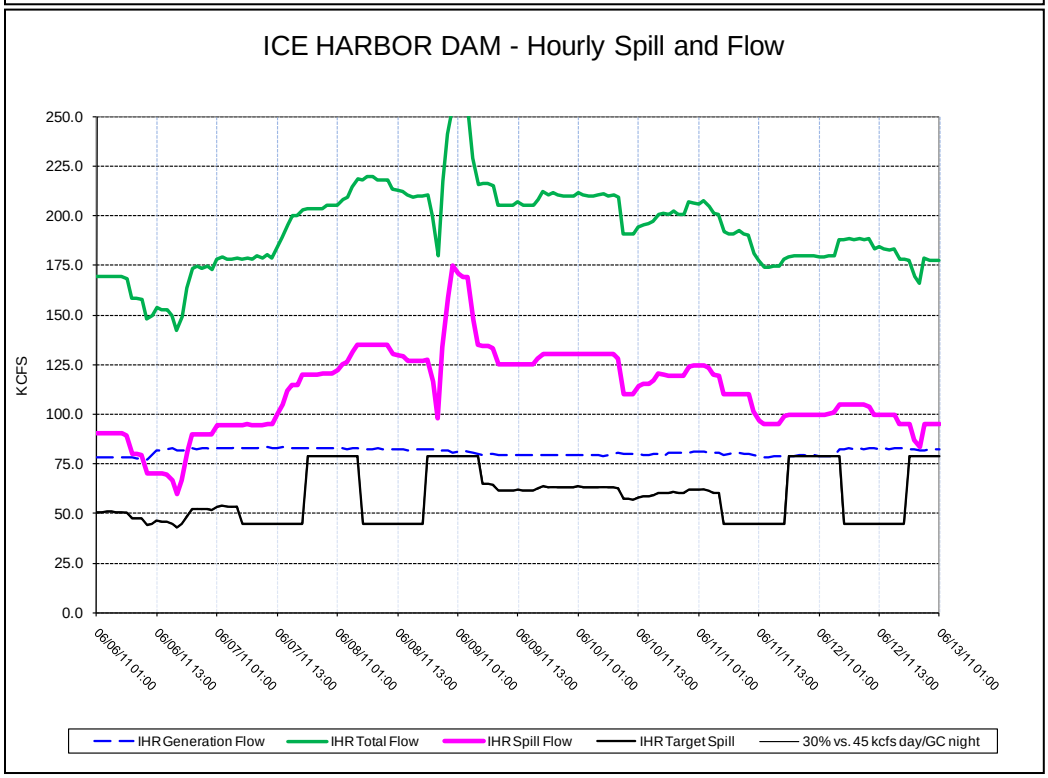
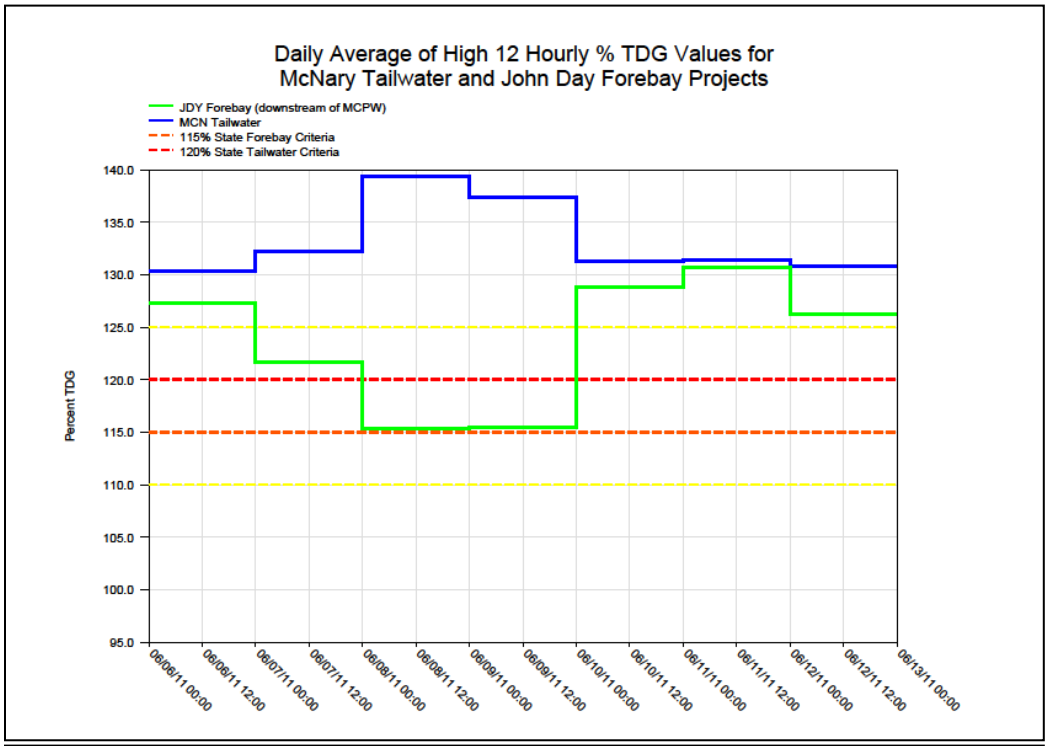

ICE HARBOR DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
06/06/11 01:00
06/06/11 13:00
06/07/11 01:00
06/07/11 13:00
06/08/11 01:00
06/08/11 13:00
06/09/11 01:00
06/09/11 13:00
06/10/11 01:00
06/10/11 13:00
06/11/11 01:00
06/11/11 13:00
06/12/11 01:00
06/12/11 13:00
06/13/11 01:00
IHR Generation Flow
IHR Total Flow
IHR Spill Flow
IHR Target Spill
30% vs. 45 kcfs day/GC night

Figure 13


Daily Average of High 12 Hourly % TDG Values for
McNary Tailwater and John Day Forebay Projects
JDY Forebay (downstream of MCPW)
MCN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/06/11 00:00
06/06/11 12:00
06/07/11 00:00
06/07/11 12:00
06/08/11 00:00
06/08/11 12:00
06/09/11 00:00
06/09/11 12:00
06/10/11 00:00
06/10/11 12:00
06/11/11 00:00
06/11/11 12:00
06/12/11 00:00
06/12/11 12:00
06/13/11 00:00

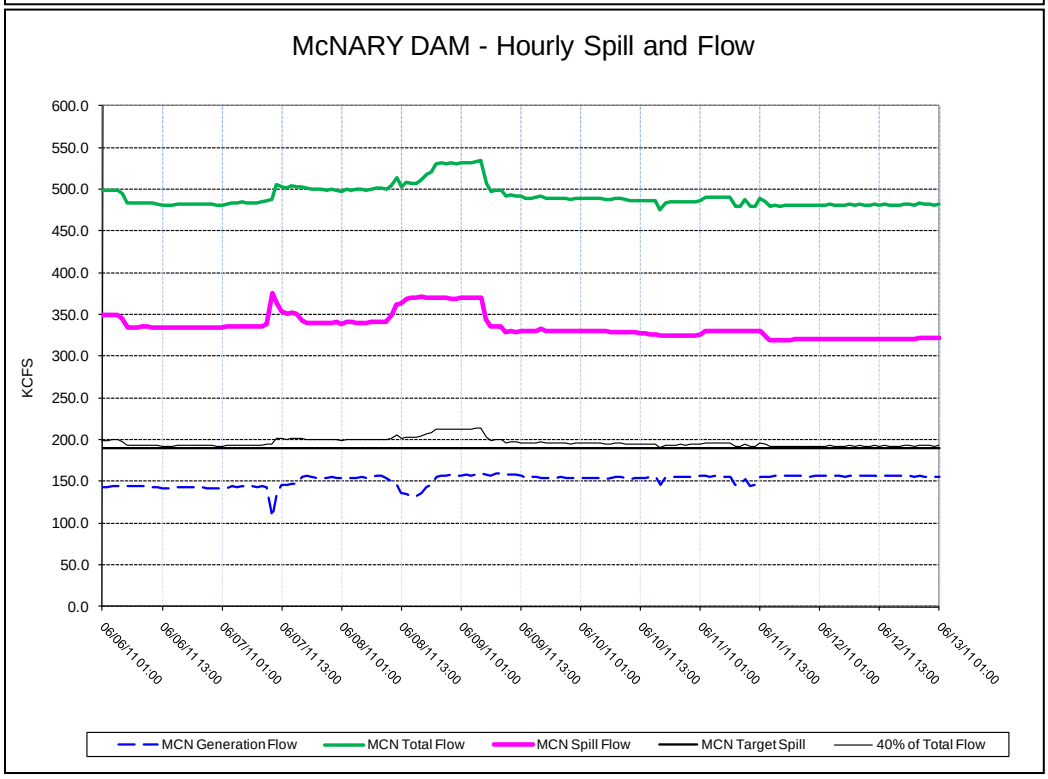
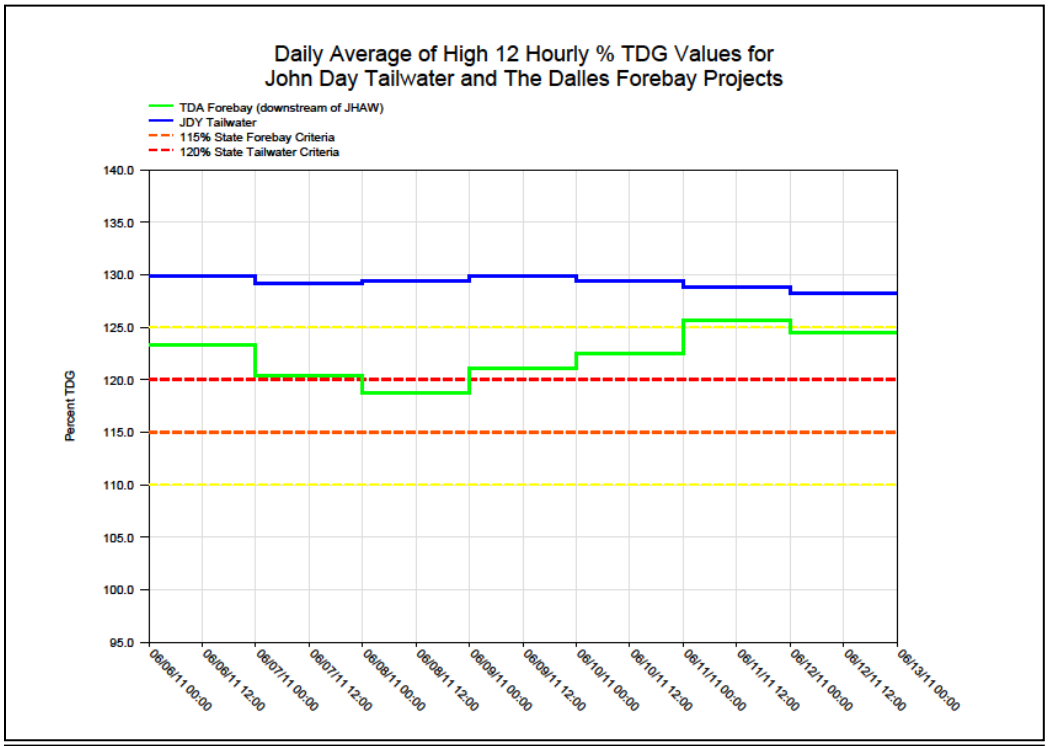

McNARY DAM - Hourly Spill and Flow
KCFS
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
06/06/11 01:00
06/06/11 13:00
06/07/11 01:00
06/07/11 13:00
06/08/11 01:00
06/08/11 13:00
06/09/11 01:00
06/09/11 13:00
06/10/11 01:00
06/10/11 13:00
06/11/11 01:00
06/11/11 13:00
06/12/11 01:00
06/12/11 13:00
06/13/11 01:00
MCN Generation Flow
MCN Total Flow
MCN Spill Flow
MCN Target Spill
40% of Total Flow

Figure 14


Daily Average of High 12 Hourly % TDG Values for
John Day Tailwater and The Dalles Forebay Projects
TDA Forebay (downstream of JHAW)
JDY Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/06/11 00:00
06/06/11 12:00
06/07/11 00:00
06/07/11 12:00
06/08/11 00:00
06/08/11 12:00
06/09/11 00:00
06/09/11 12:00
06/10/11 00:00
06/10/11 12:00
06/11/11 00:00
06/11/11 12:00
06/12/11 00:00
06/12/11 12:00
06/13/11 00:00

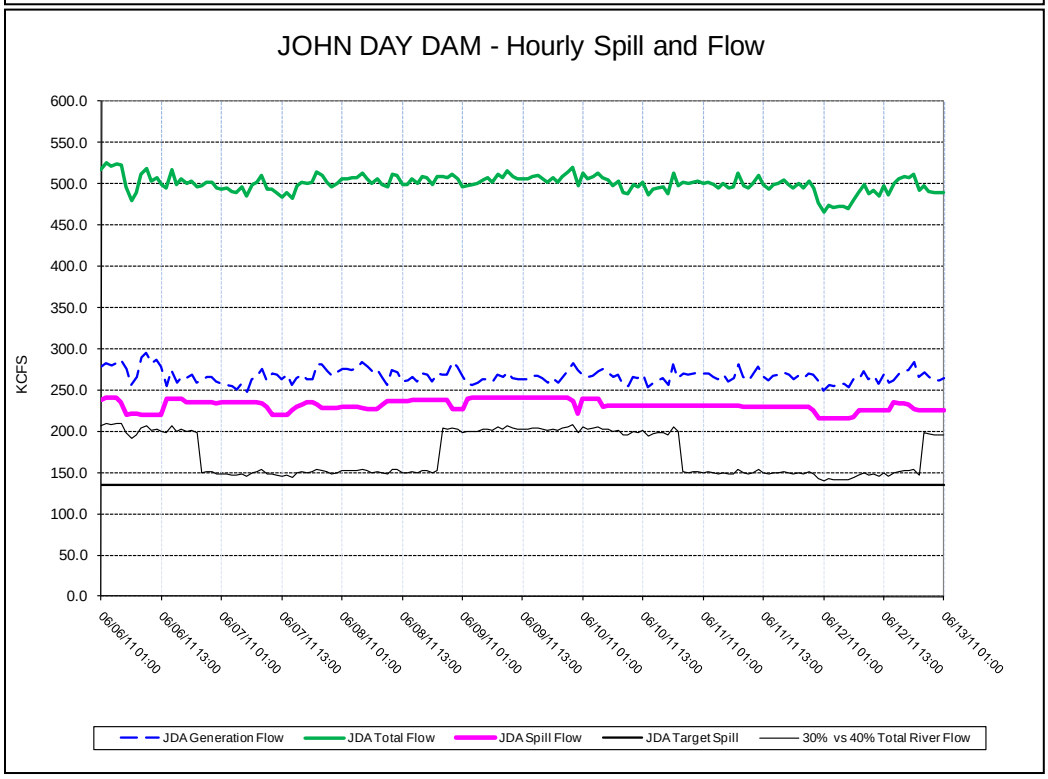
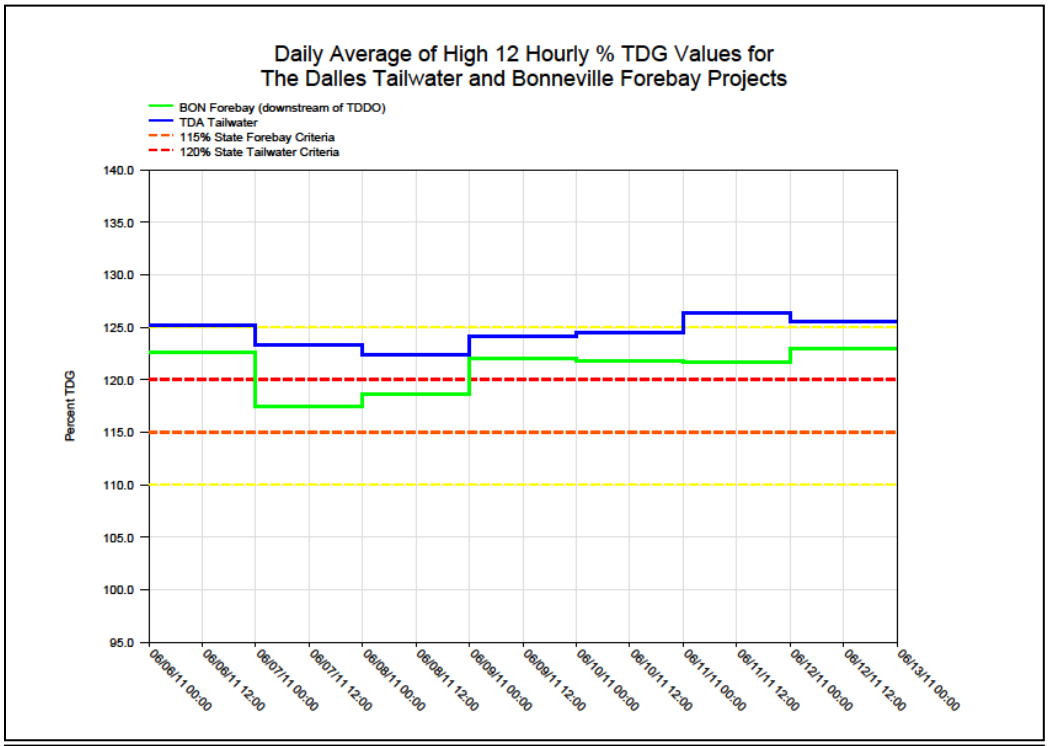

JOHN DAY DAM - Hourly Spill and Flow
KCFS
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
06/06/11 01:00
06/06/11 13:00
06/07/11 01:00
06/07/11 13:00
06/08/11 01:00
06/08/11 13:00
06/09/11 01:00
06/09/11 13:00
06/10/11 01:00
06/10/11 13:00
06/11/11 01:00
06/11/11 13:00
06/12/11 01:00
06/12/11 13:00
06/13/11 01:00
JDA Generation Flow
JDA Total Flow
JDA Spill Flow
JDA Target Spill
30% vs 40% Total River Flow

Figure 15


Daily Average of High 12 Hourly % TDG Values for
The Dalles Tailwater and Bonneville Forebay Projects
BON Forebay (downstream of TDDO)
TDA Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/06/11 00:00
06/06/11 12:00
06/07/11 00:00
06/07/11 12:00
06/08/11 00:00
06/08/11 12:00
06/09/11 00:00
06/09/11 12:00
06/10/11 00:00
06/10/11 12:00
06/11/11 00:00
06/11/11 12:00
06/12/11 00:00
06/12/11 12:00
06/13/11 00:00

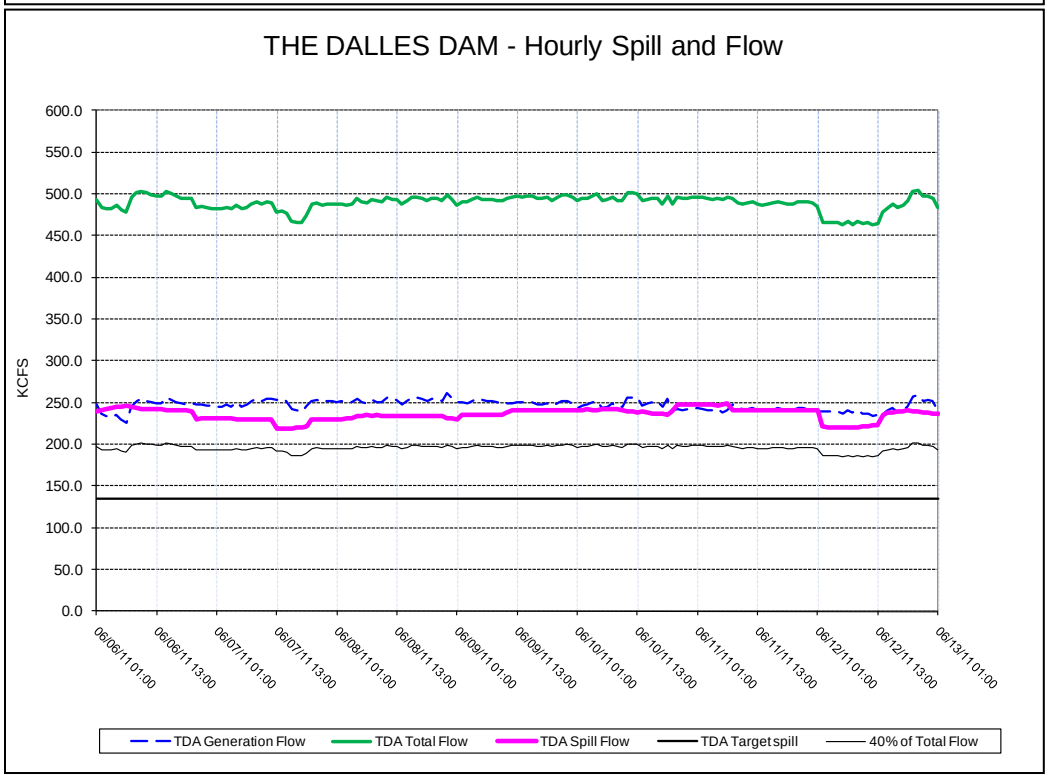
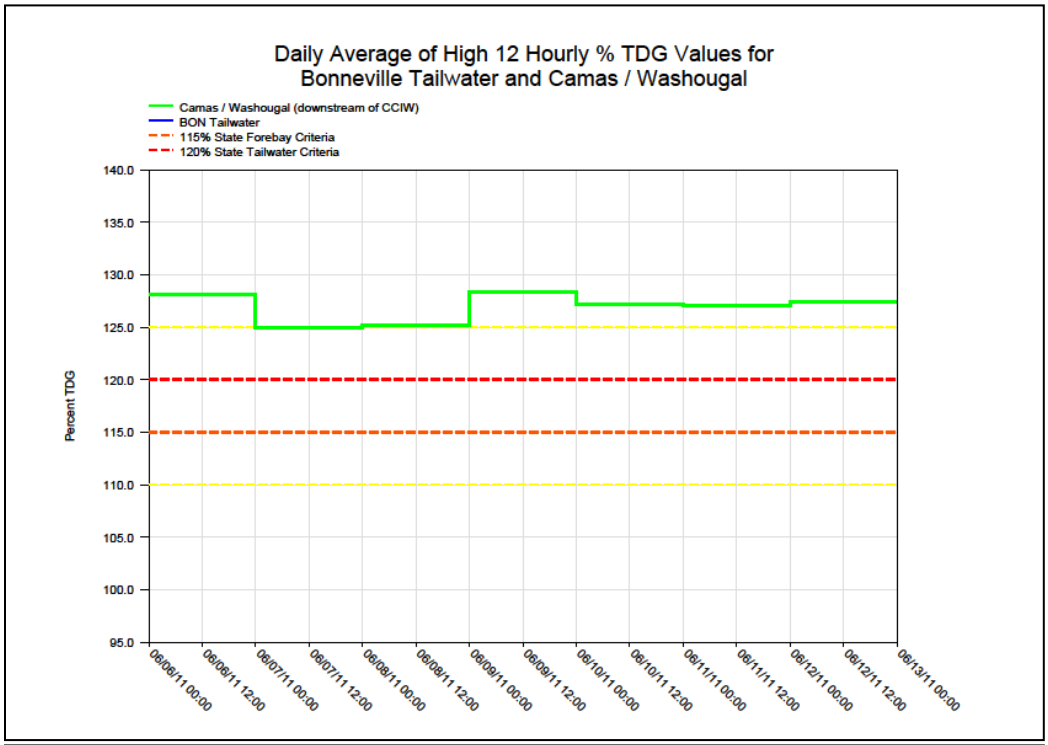

THE DALLES DAM - Hourly Spill and Flow
KCFS
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
06/06/11 01:00
06/06/11 13:00
06/07/11 01:00
06/07/11 13:00
06/08/11 01:00
06/08/11 13:00
06/09/11 01:00
06/09/11 13:00
06/10/11 01:00
06/10/11 13:00
06/11/11 01:00
06/11/11 13:00
06/12/11 01:00
06/12/11 13:00
06/13/11 01:00
TDA Generation Flow
TDA Total Flow
TDA Spill Flow
TDA Target spill
40% of Total Flow

Figure 16


Daily Average of High 12 Hourly % TDG Values for
Bonneville Tailwater and Camas / Washougal
Camas / Washougal (downstream of CCIW)
BON Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/06/11 00:00
06/06/11 12:00
06/07/11 00:00
06/07/11 12:00
06/08/11 00:00
06/08/11 12:00
06/09/11 00:00
06/09/11 12:00
06/10/11 00:00
06/10/11 12:00
06/11/11 00:00
06/11/11 12:00
06/12/11 00:00
06/12/11 12:00
06/13/11 00:00

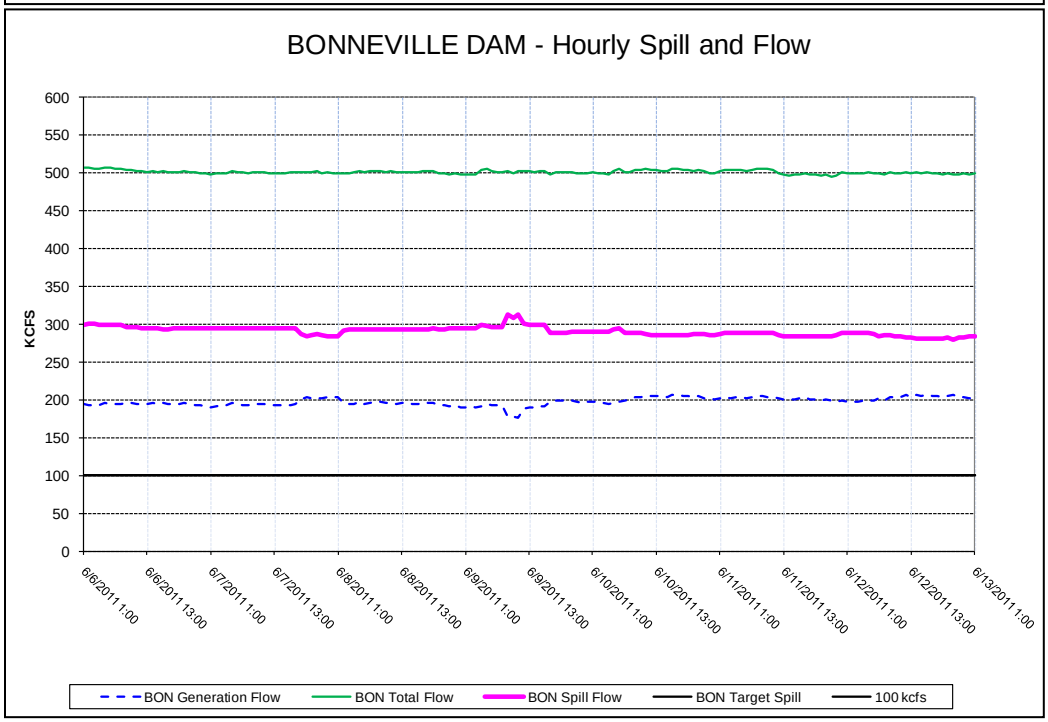
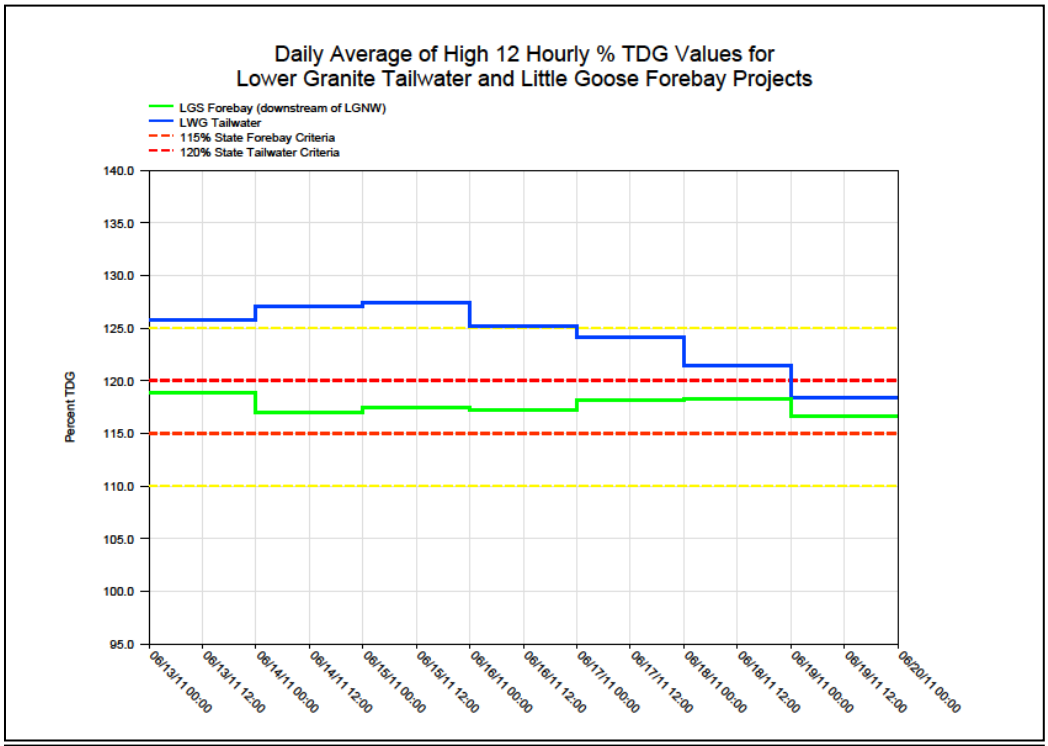

BONNEVILLE DAM - Hourly Spill and Flow
KCFS
600
550
500
450
400
350
300
250
200
150
100
50
0
6/6/2011 1:00
6/6/2011 13:00
6/7/2011 1:00
6/7/2011 13:00
6/8/2011 1:00
6/8/2011 13:00
6/9/2011 1:00
6/9/2011 13:00
6/10/2011 1:00
6/10/2011 13:00
6/11/2011 1:00
6/11/2011 13:00
6/12/2011 1:00
6/12/2011 13:00
6/13/2011 1:00
BON Generation Flow
BON Total Flow
BON Spill Flow
BON Target Spill
100 kcfs

Figure 17


Daily Average of High 12 Hourly % TDG Values for
Lower Granite Tailwater and Little Goose Forebay Projects
LGS Forebay (downstream of LGNW)
LWG Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/13/11 00:00
06/13/11 12:00
06/14/11 00:00
06/14/11 12:00
06/15/11 00:00
06/15/11 12:00
06/16/11 00:00
06/16/11 12:00
06/17/11 00:00
06/17/11 12:00
06/18/11 00:00
06/18/11 12:00
06/19/11 00:00
06/19/11 12:00
06/20/11 00:00

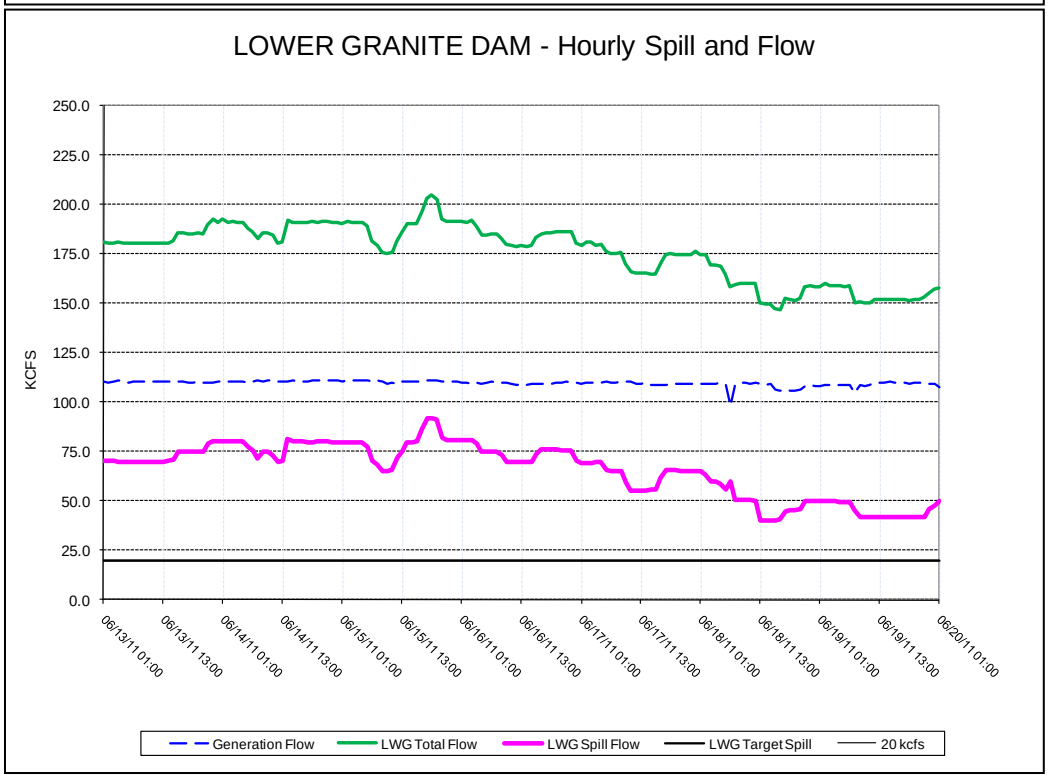
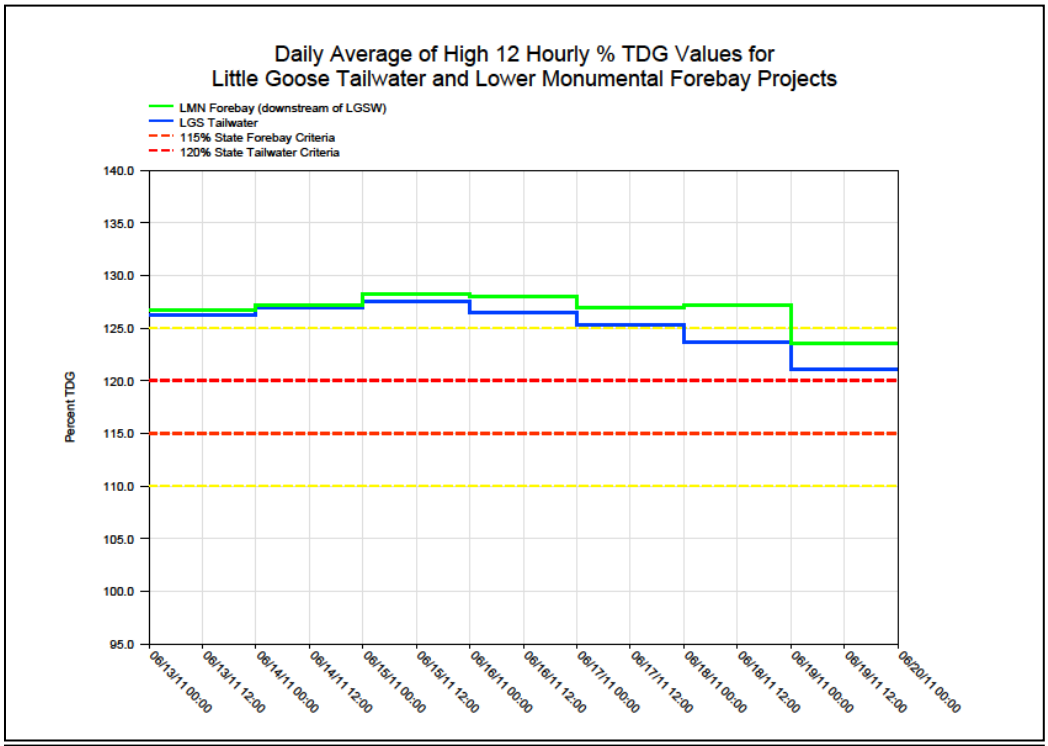

LOWER GRANITE DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
06/13/11 01:00
06/13/11 13:00
06/14/11 01:00
06/14/11 13:00
06/15/11 01:00
06/15/11 13:00
06/16/11 01:00
06/16/11 13:00
06/17/11 01:00
06/17/11 13:00
06/18/11 01:00
06/18/11 13:00
06/19/11 01:00
06/19/11 13:00
06/20/11 01:00
Generation Flow
LWG Total Flow
LWG Spill Flow
LWG Target Spill
20 kcfs

Figure 18


Daily Average of High 12 Hourly % TDG Values for
Little Goose Tailwater and Lower Monumental Forebay Projects
LMN Forebay (downstream of LGSW)
LGS Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/13/11 00:00
06/13/11 12:00
06/14/11 00:00
06/14/11 12:00
06/15/11 00:00
06/15/11 12:00
06/16/11 00:00
06/16/11 12:00
06/17/11 00:00
06/17/11 12:00
06/18/11 00:00
06/18/11 12:00
06/19/11 00:00
06/19/11 12:00
06/20/11 00:00

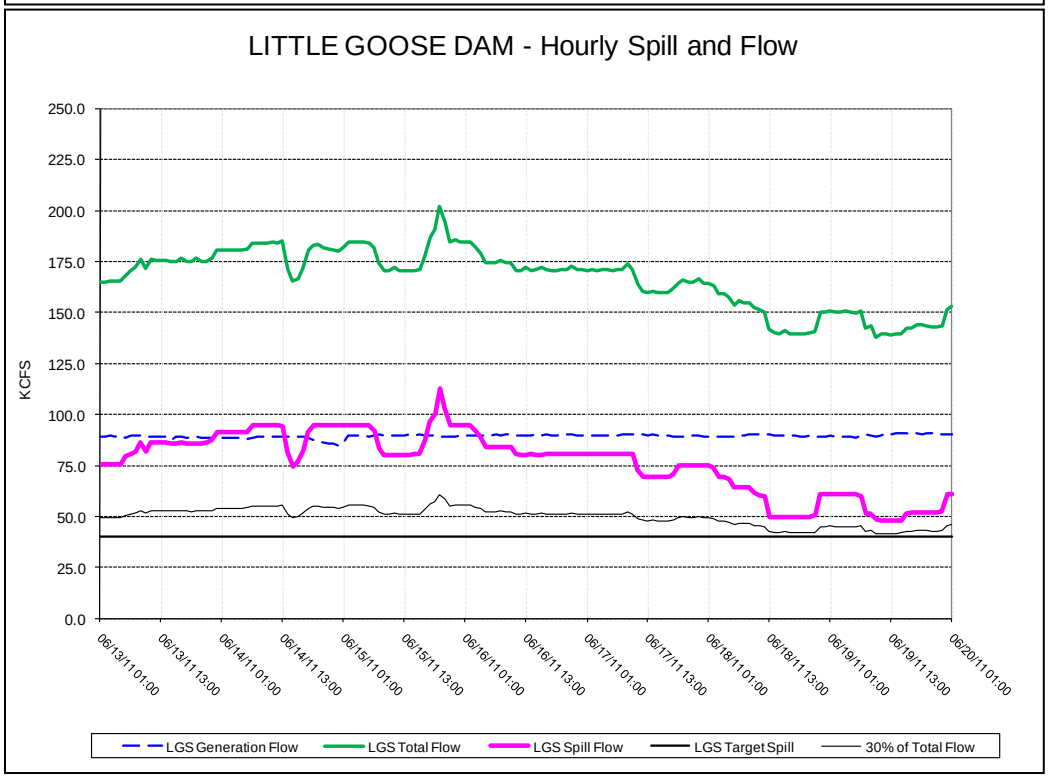
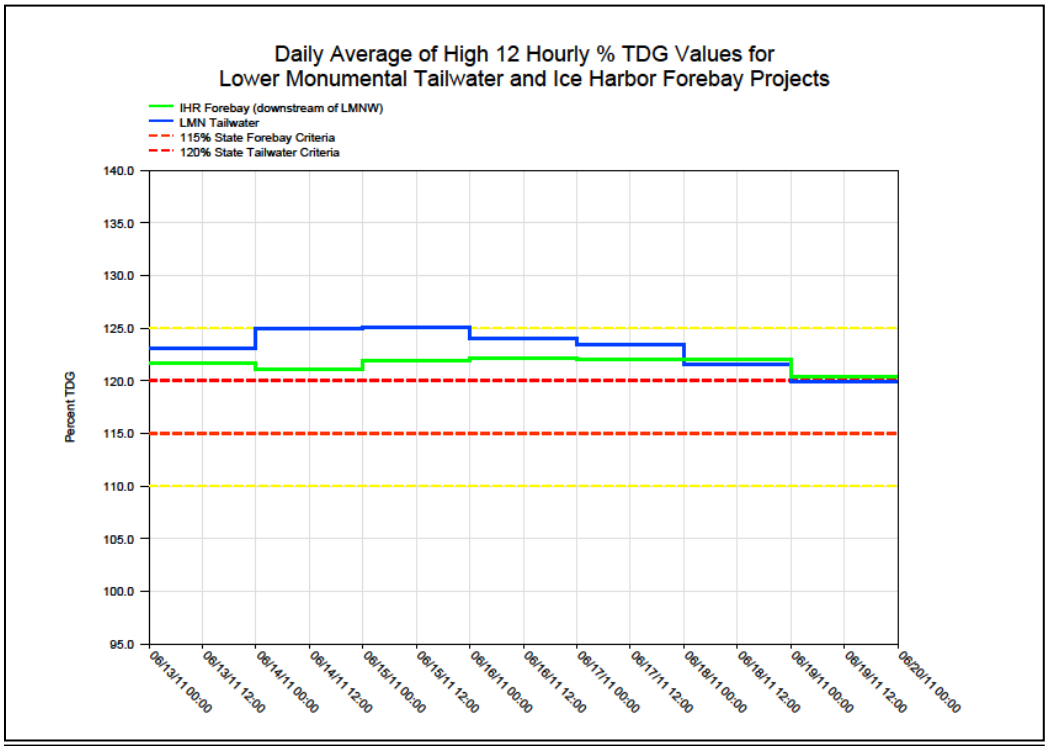

LITTLE GOOSE DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
06/13/11 01:00
06/13/11 13:00
06/14/11 01:00
06/14/11 13:00
06/15/11 01:00
06/15/11 13:00
06/16/11 01:00
06/16/11 13:00
06/17/11 01:00
06/17/11 13:00
06/18/11 01:00
06/18/11 13:00
06/19/11 01:00
06/19/11 13:00
06/20/11 01:00
LGS Generation Flow
LGS Total Flow
LGS Spill Flow
LGS Target Spill
30% of Total Flow

Figure 19


Daily Average of High 12 Hourly % TDG Values for
Lower Monumental Tailwater and Ice Harbor Forebay Projects
IHR Forebay (downstream of LMNW)
LMN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/13/11 00:00
06/13/11 12:00
06/14/11 00:00
06/14/11 12:00
06/15/11 00:00
06/15/11 12:00
06/16/11 00:00
06/16/11 12:00
06/17/11 00:00
06/17/11 12:00
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06/18/11 12:00
06/19/11 00:00
06/19/11 12:00
06/20/11 00:00

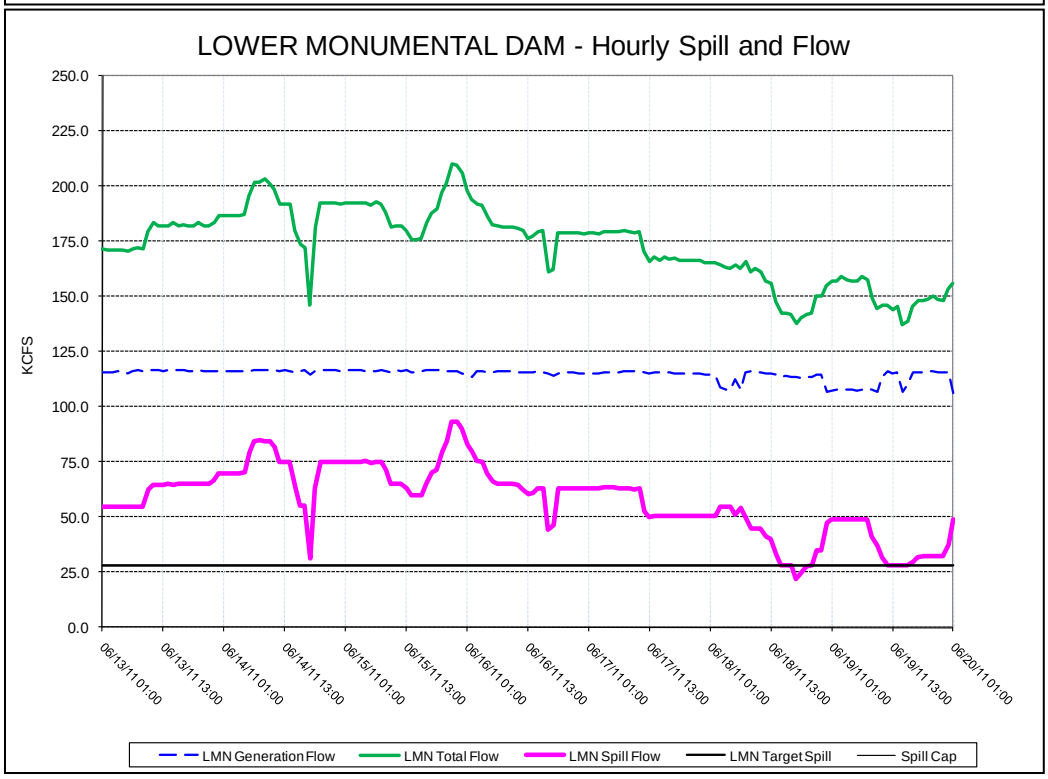
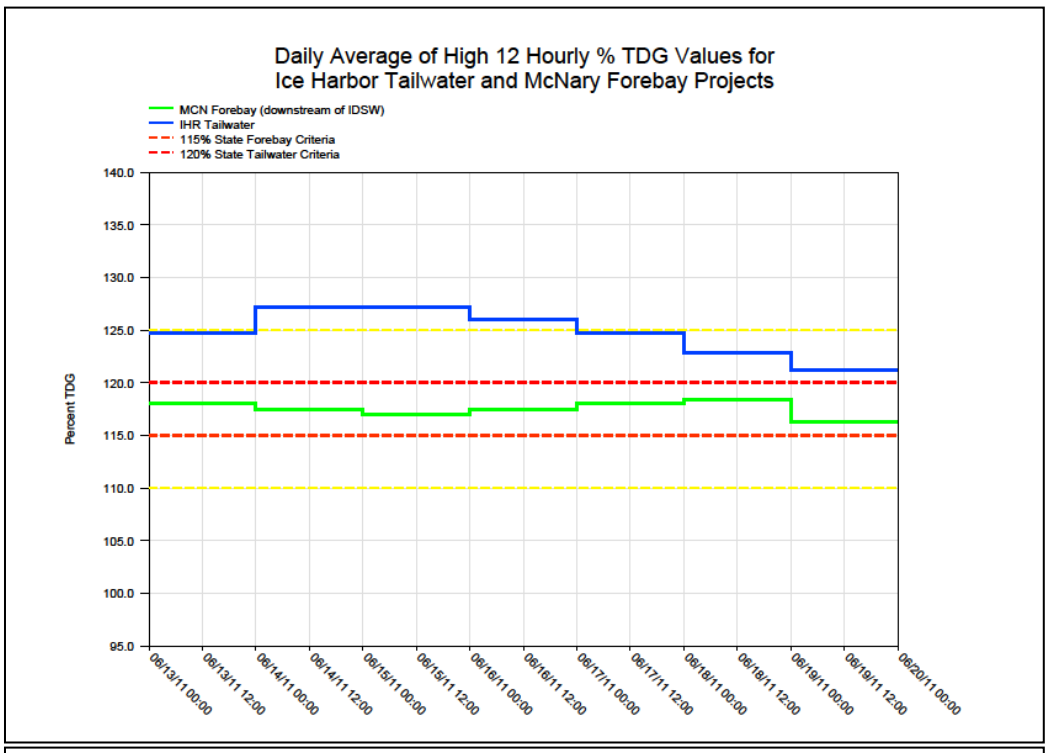

LOWER MONUMENTAL DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
06/13/11 01:00
06/13/11 13:00
06/14/11 01:00
06/14/11 13:00
06/15/11 01:00
06/15/11 13:00
06/16/11 01:00
06/16/11 13:00
06/17/11 01:00
06/17/11 13:00
06/18/11 01:00
06/18/11 13:00
06/19/11 01:00
06/19/11 13:00
06/20/11 01:00
LMN Generation Flow
LMN Total Flow
LMN Spill Flow
LMN Target Spill
Spill Cap

Figure 20


Daily Average of High 12 Hourly % TDG Values for
Ice Harbor Tailwater and McNary Forebay Projects
MCN Forebay (downstream of IDSW)
IHR Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/13/11 00:00
06/13/11 12:00
06/14/11 00:00
06/14/11 12:00
06/15/11 00:00
06/15/11 12:00
06/16/11 00:00
06/16/11 12:00
06/17/11 00:00
06/17/11 12:00
06/18/11 00:00
06/18/11 12:00
06/19/11 00:00
06/19/11 12:00
06/20/11 00:00

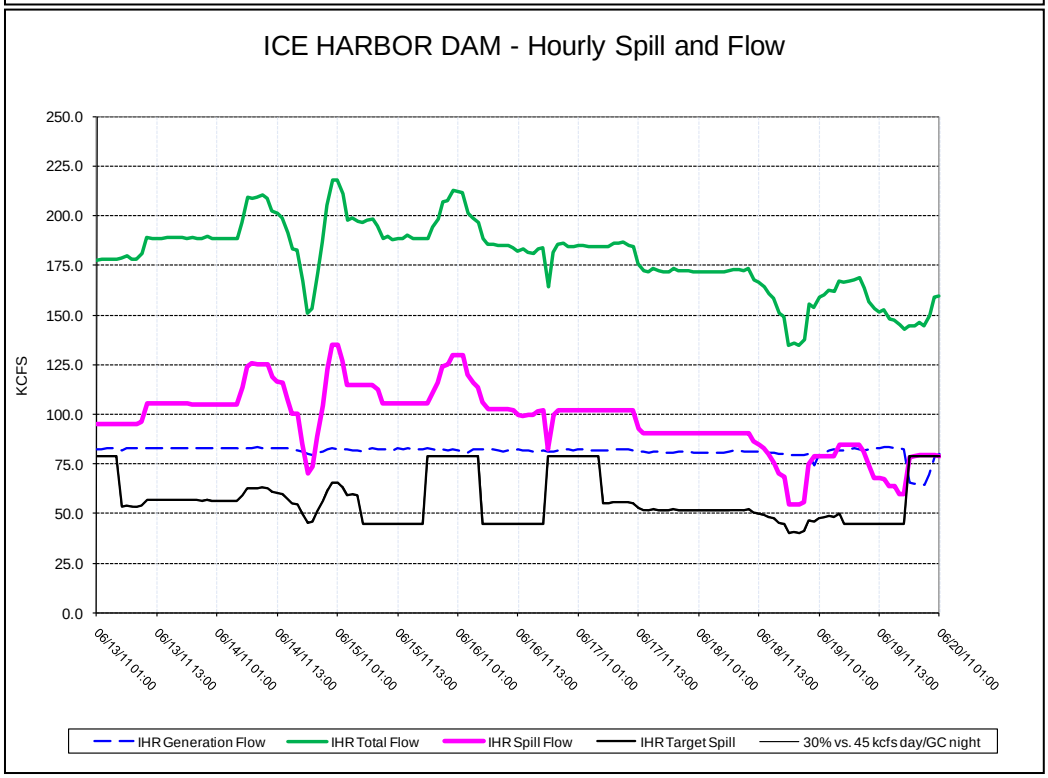
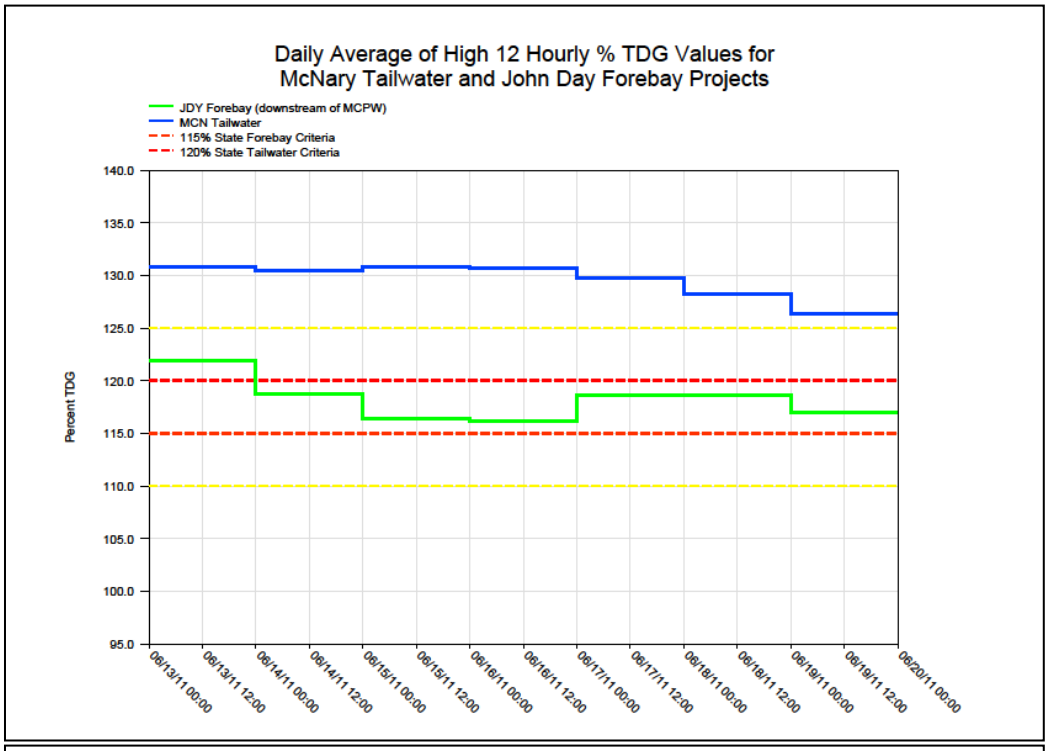

ICE HARBOR DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
06/13/11 01:00
06/13/11 13:00
06/14/11 01:00
06/14/11 13:00
06/15/11 01:00
06/15/11 13:00
06/16/11 01:00
06/16/11 13:00
06/17/11 01:00
06/17/11 13:00
06/18/11 01:00
06/18/11 13:00
06/19/11 01:00
06/19/11 13:00
06/20/11 01:00
IHR Generation Flow
IHR Total Flow
IHR Spill Flow
IHR Target Spill
30% vs. 45 kcfs day/GC night

Figure 21


Daily Average of High 12 Hourly % TDG Values for
McNary Tailwater and John Day Forebay Projects
JDY Forebay (downstream of MCPW)
MCN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/13/11 00:00
06/13/11 12:00
06/14/11 00:00
06/14/11 12:00
06/15/11 00:00
06/15/11 12:00
06/16/11 00:00
06/16/11 12:00
06/17/11 00:00
06/17/11 12:00
06/18/11 00:00
06/18/11 12:00
06/19/11 00:00
06/19/11 12:00
06/20/11 00:00

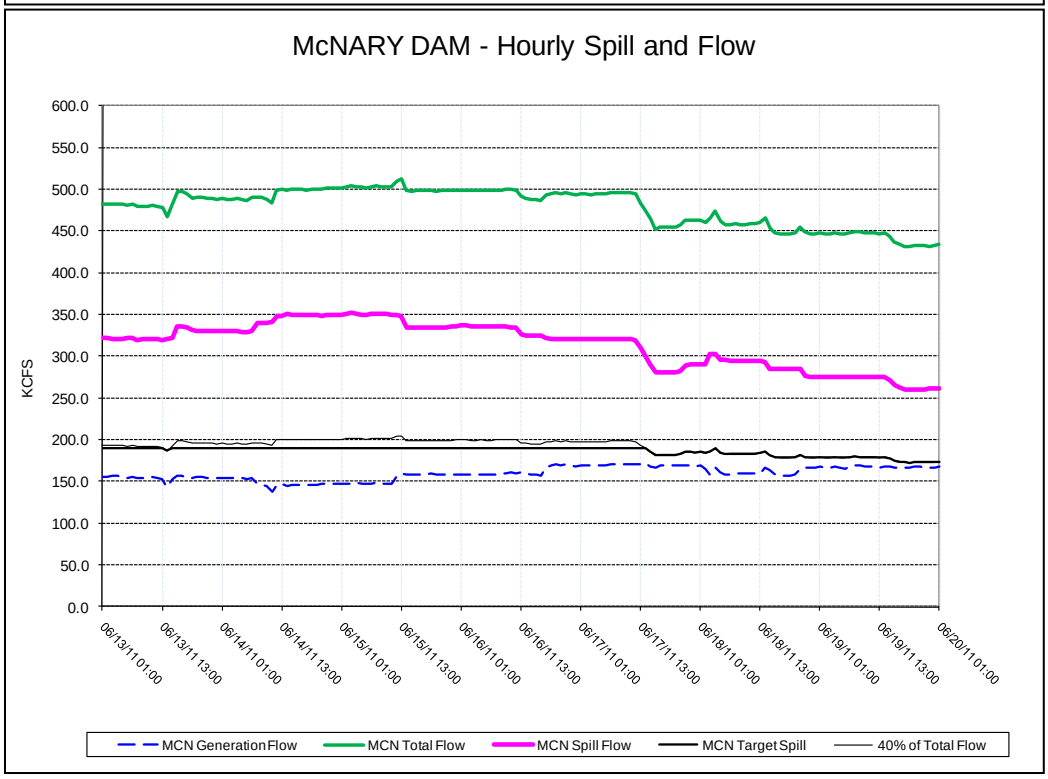
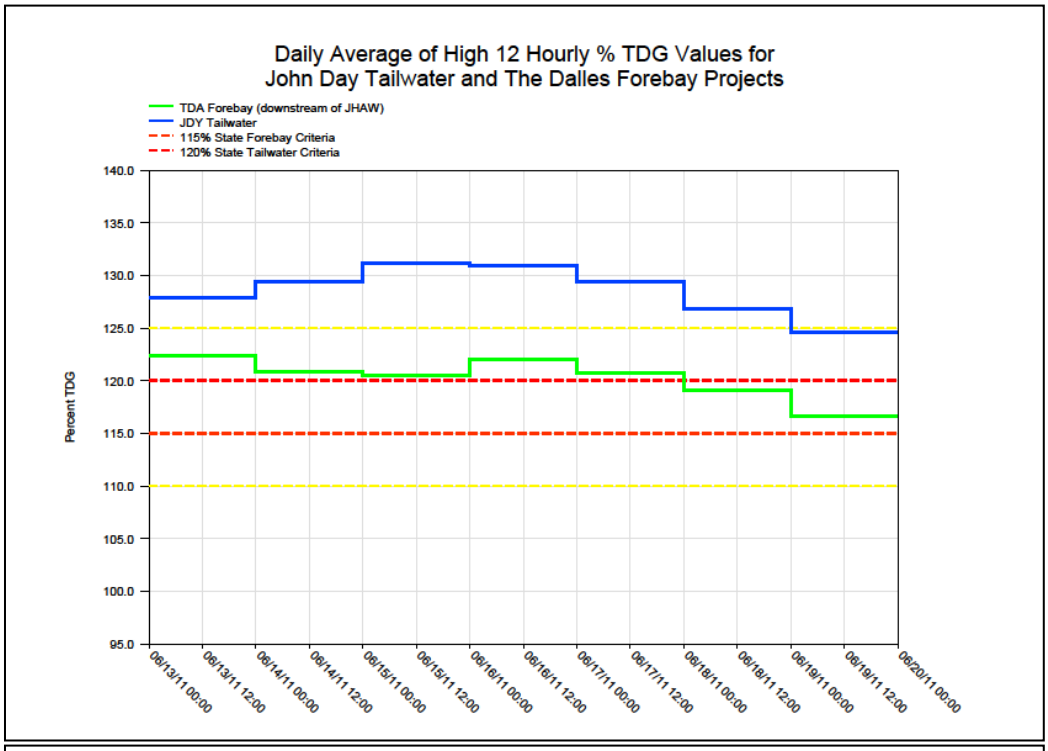

McNARY DAM - Hourly Spill and Flow
KCFS
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
06/13/11 01:00
06/13/11 13:00
06/14/11 01:00
06/14/11 13:00
06/15/11 01:00
06/15/11 13:00
06/16/11 01:00
06/16/11 13:00
06/17/11 01:00
06/17/11 13:00
06/18/11 01:00
06/18/11 13:00
06/19/11 01:00
06/19/11 13:00
06/20/11 01:00
MCN Generation Flow
MCN Total Flow
MCN Spill Flow
MCN Target Spill
40% of Total Flow

Figure 22


Daily Average of High 12 Hourly % TDG Values for
John Day Tailwater and The Dalles Forebay Projects
TDA Forebay (downstream of JHAW)
JDY Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/13/11 00:00
06/13/11 12:00
06/14/11 00:00
06/14/11 12:00
06/15/11 00:00
06/15/11 12:00
06/16/11 00:00
06/16/11 12:00
06/17/11 00:00
06/17/11 12:00
06/18/11 00:00
06/18/11 12:00
06/19/11 00:00
06/19/11 12:00
06/20/11 00:00

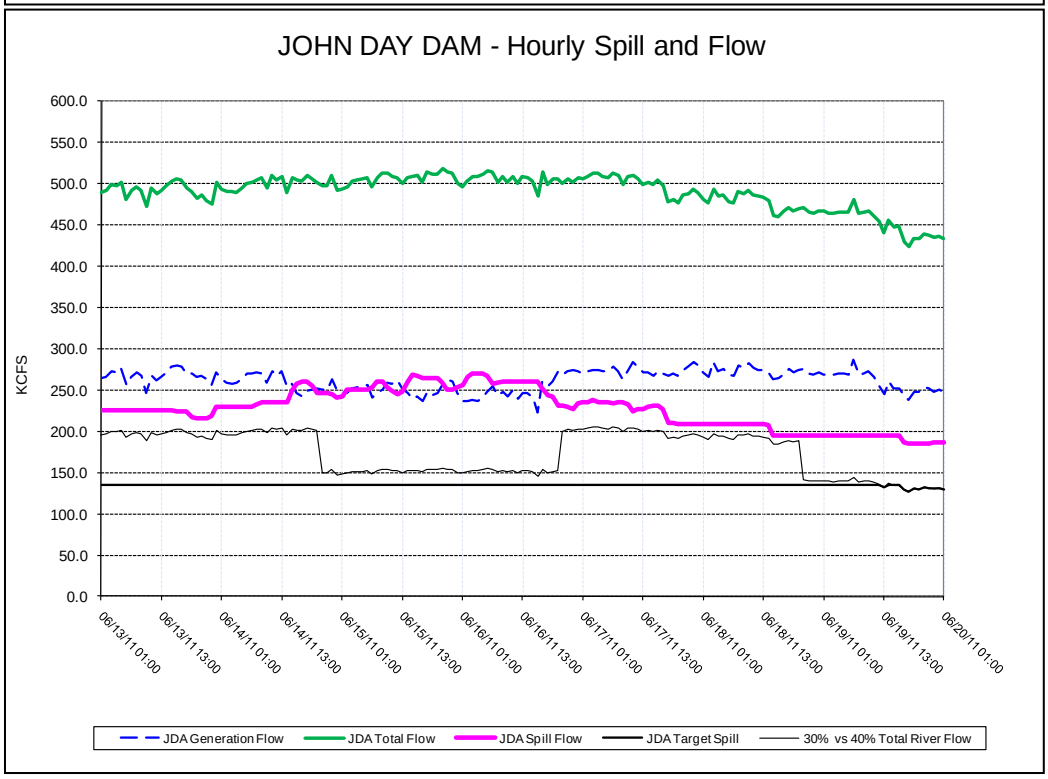

JOHN DAY DAM - Hourly Spill and Flow
KCFS
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
06/13/11 01:00
06/13/11 13:00
06/14/11 01:00
06/14/11 13:00
06/15/11 01:00
06/15/11 13:00
06/16/11 01:00
06/16/11 13:00
06/17/11 01:00
06/17/11 13:00
06/18/11 01:00
06/18/11 13:00
06/19/11 01:00
06/19/11 13:00
06/20/11 01:00
JDA Generation Flow
JDA Total Flow
JDA Spill Flow
JDA Target Spill
30% vs 40% Total River Flow

Figure 23

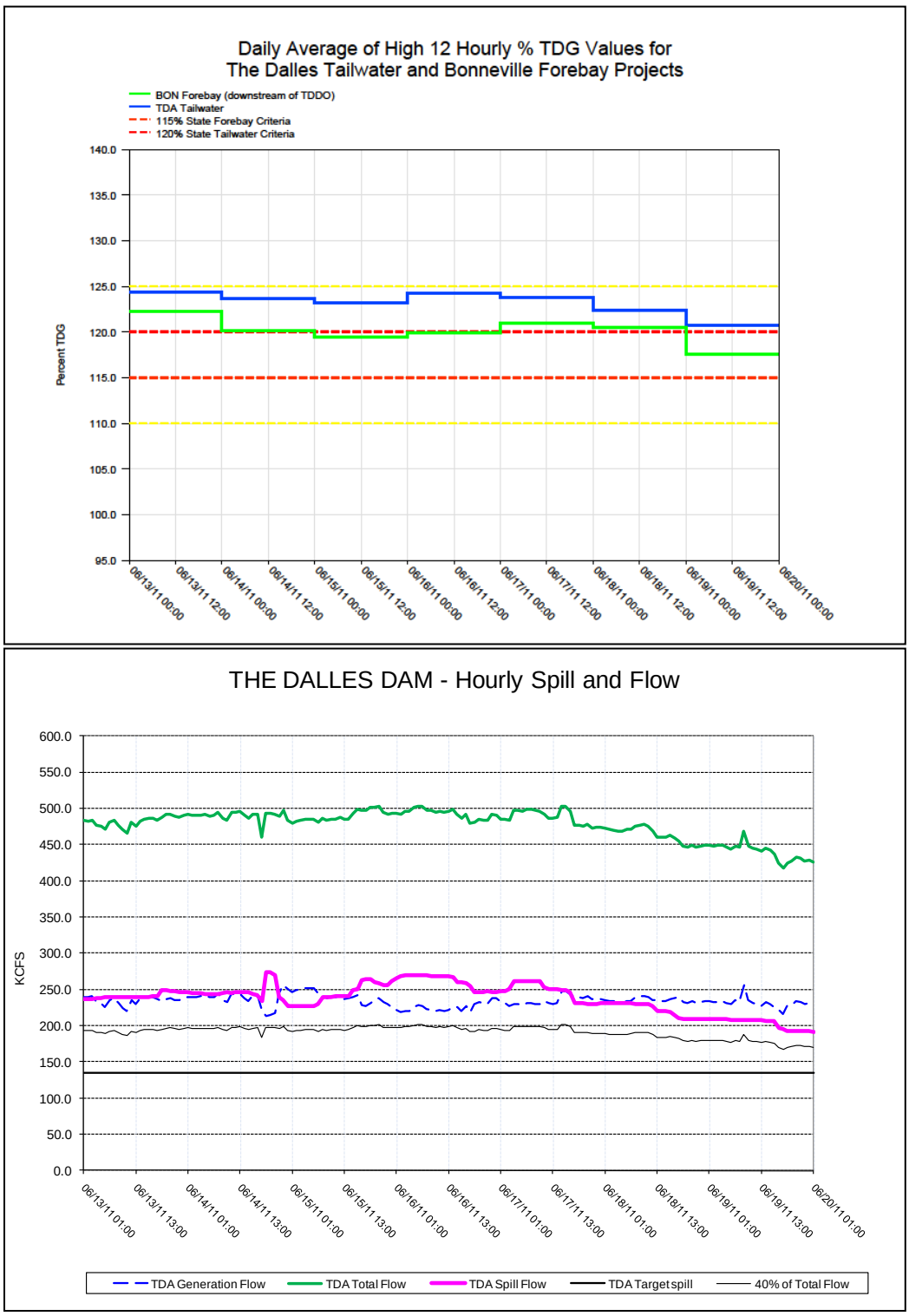
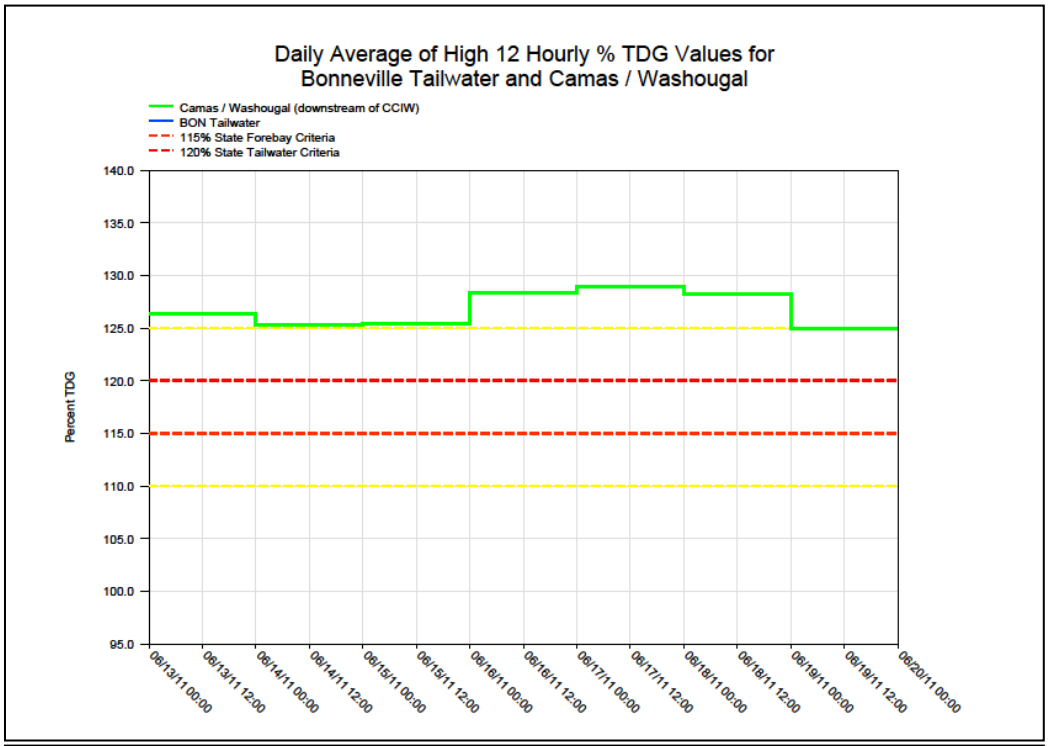

Daily Average of High 12 Hourly % TDG Values for
The Dalles Tailwater and Bonneville Forebay Projects
BON Forebay (downstream of TDDO)
TDA Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/13/11 00:00
06/13/11 12:00
06/14/11 00:00
06/14/11 12:00
06/15/11 00:00
06/15/11 12:00
06/16/11 00:00
06/16/11 12:00
06/17/11 00:00
06/17/11 12:00
06/18/11 00:00
06/18/11 12:00
06/19/11 00:00
06/19/11 12:00
06/20/11 00:00
THE DALLES DAM - Hourly Spill and Flow
KCFS
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
06/13/11 01:00
06/13/11 13:00
06/14/11 01:00
06/14/11 13:00
06/15/11 01:00
06/15/11 13:00
06/16/11 01:00
06/16/11 13:00
06/17/11 01:00
06/17/11 13:00
06/18/11 01:00
06/18/11 13:00
06/19/11 01:00
06/19/11 13:00
06/20/11 01:00
TDA Generation Flow
TDA Total Flow
TDA Spill Flow
TDA Target spill
40% of Total Flow

Figure 24


Daily Average of High 12 Hourly % TDG Values for
Bonneville Tailwater and Camas / Washougal
Camas / Washougal (downstream of CCIW)
BON Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/13/11 00:00
06/13/11 12:00
06/14/11 00:00
06/14/11 12:00
06/15/11 00:00
06/15/11 12:00
06/16/11 00:00
06/16/11 12:00
06/17/11 00:00
06/17/11 12:00
06/18/11 00:00
06/18/11 12:00
06/19/11 00:00
06/19/11 12:00
06/20/11 00:00

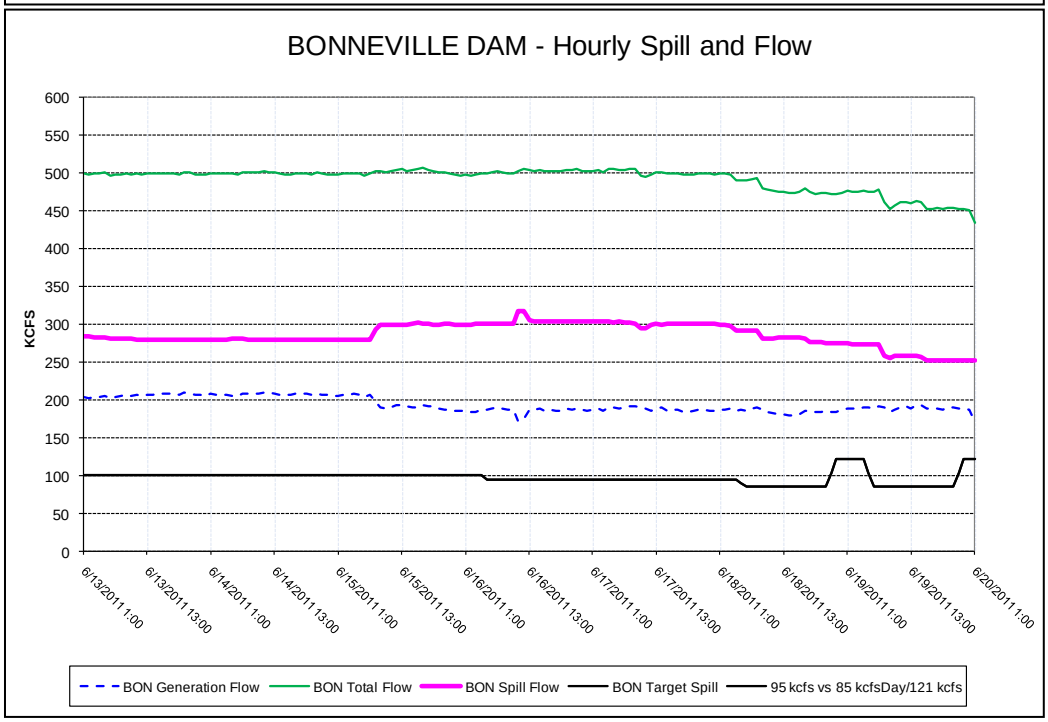
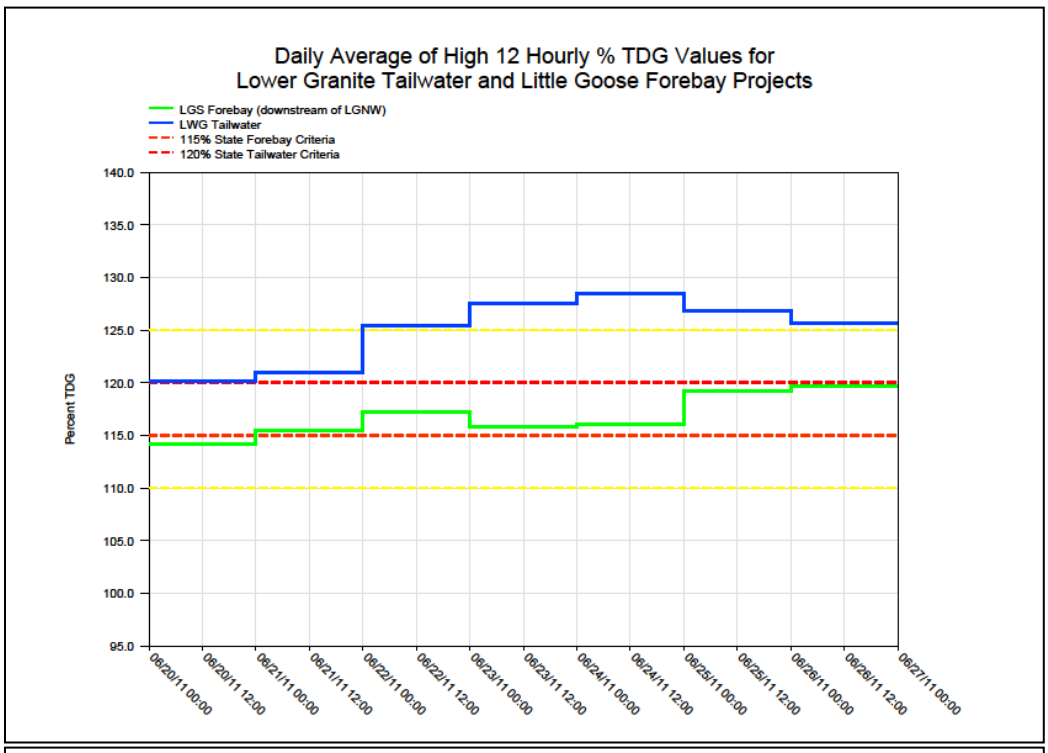

BONNEVILLE DAM - Hourly Spill and Flow
KCFS
600
550
500
450
400
350
300
250
200
150
100
50
0
6/13/2011 1:00
6/13/2011 13:00
6/14/2011 1:00
6/14/2011 13:00
6/15/2011 1:00
6/15/2011 13:00
6/16/2011 1:00
6/16/2011 13:00
6/17/2011 1:00
6/17/2011 13:00
6/18/2011 1:00
6/18/2011 13:00
6/19/2011 1:00
6/19/2011 13:00
6/20/2011 1:00
BON Generation Flow
BON Total Flow
BON Spill Flow
BON Target Spill
95 kcfs vs 85 kcfsDay/121 kcfs

Figure 25


Daily Average of High 12 Hourly % TDG Values for
Lower Granite Tailwater and Little Goose Forebay Projects
LGS Forebay (downstream of LGNW)
LWG Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/20/11 00:00
06/20/11 12:00
06/21/11 00:00
06/21/11 12:00
06/22/11 00:00
06/22/11 12:00
06/23/11 00:00
06/23/11 12:00
06/24/11 00:00
06/24/11 12:00
06/25/11 00:00
06/25/11 12:00
06/26/11 00:00
06/26/11 12:00
06/27/11 00:00

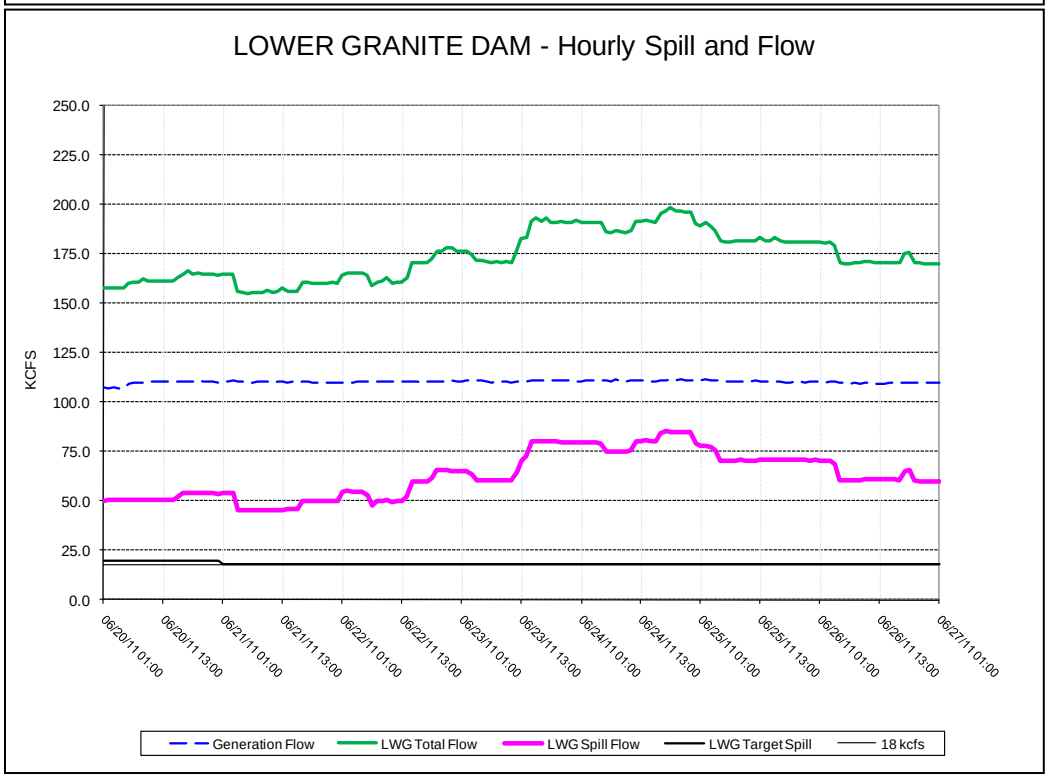
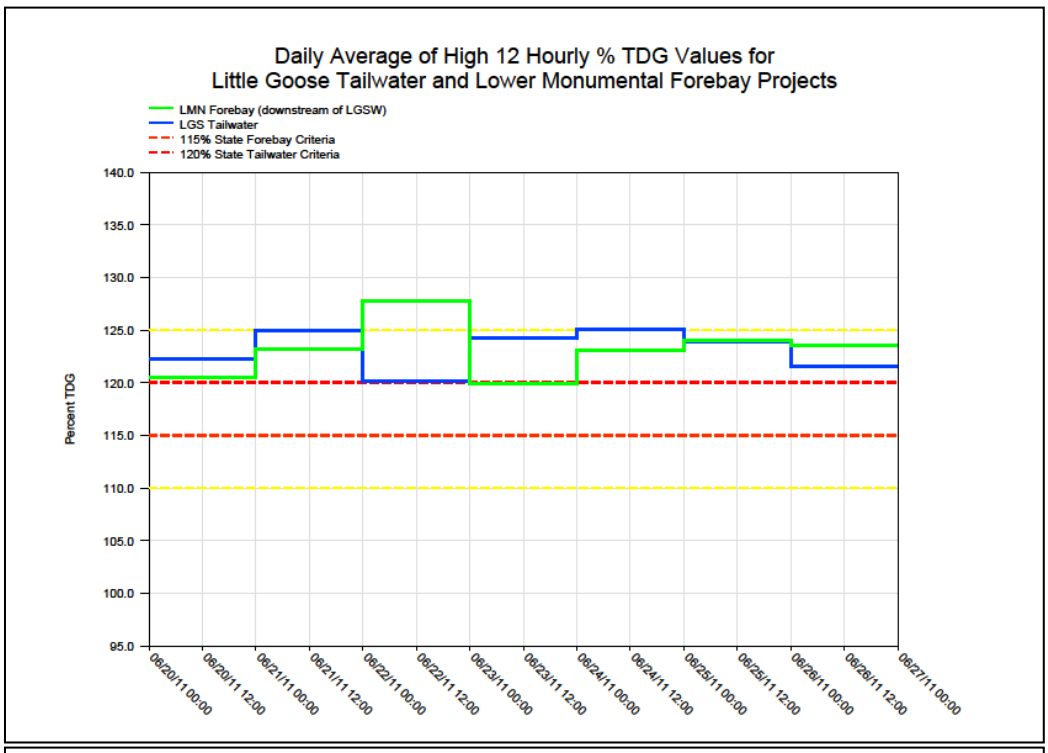

LOWER GRANITE DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
06/20/11 01:00
06/20/11 13:00
06/21/11 01:00
06/21/11 13:00
06/22/11 01:00
06/22/11 13:00
06/23/11 01:00
06/23/11 13:00
06/24/11 01:00
06/24/11 13:00
06/25/11 01:00
06/25/11 13:00
06/26/11 01:00
06/26/11 13:00
06/27/11 01:00
Generation Flow
LWG Total Flow
LWG Spill Flow
LWG Target Spill
18 kcfs

Figure 26


Daily Average of High 12 Hourly % TDG Values for
Little Goose Tailwater and Lower Monumental Forebay Projects
LMN Forebay (downstream of LGSW)
LGS Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/20/11 00:00
06/20/11 12:00
06/21/11 00:00
06/21/11 12:00
06/22/11 00:00
06/22/11 12:00
06/23/11 00:00
06/23/11 12:00
06/24/11 00:00
06/24/11 12:00
06/25/11 00:00
06/25/11 12:00
06/26/11 00:00
06/26/11 12:00
06/27/11 00:00

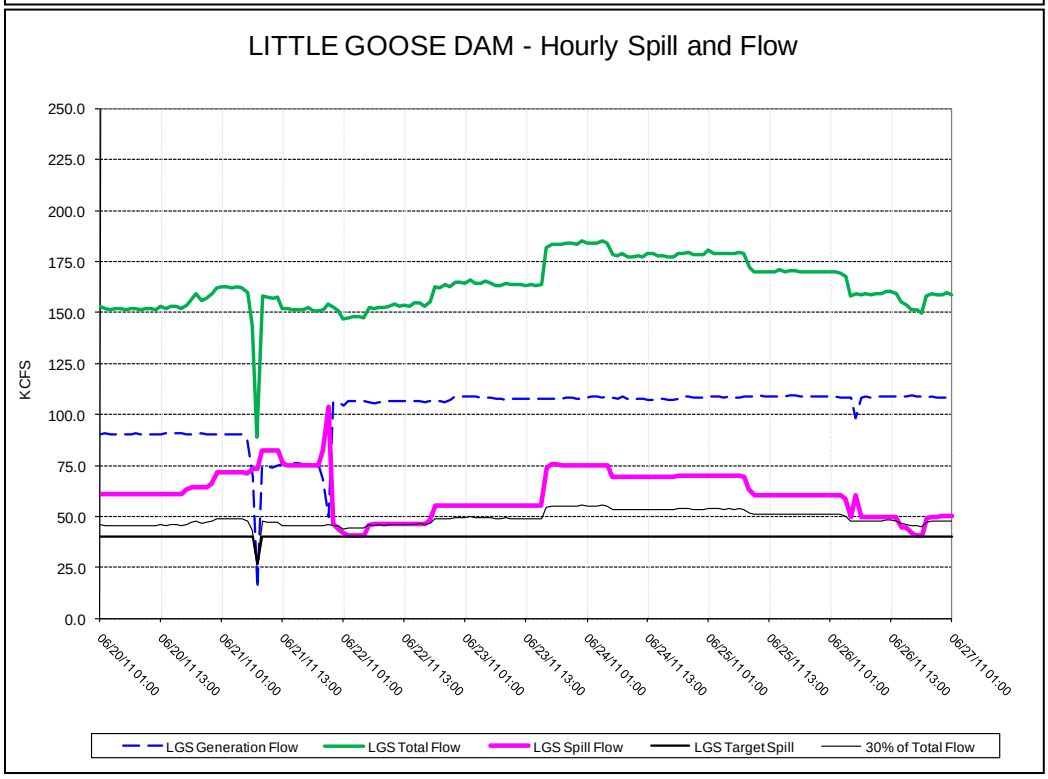
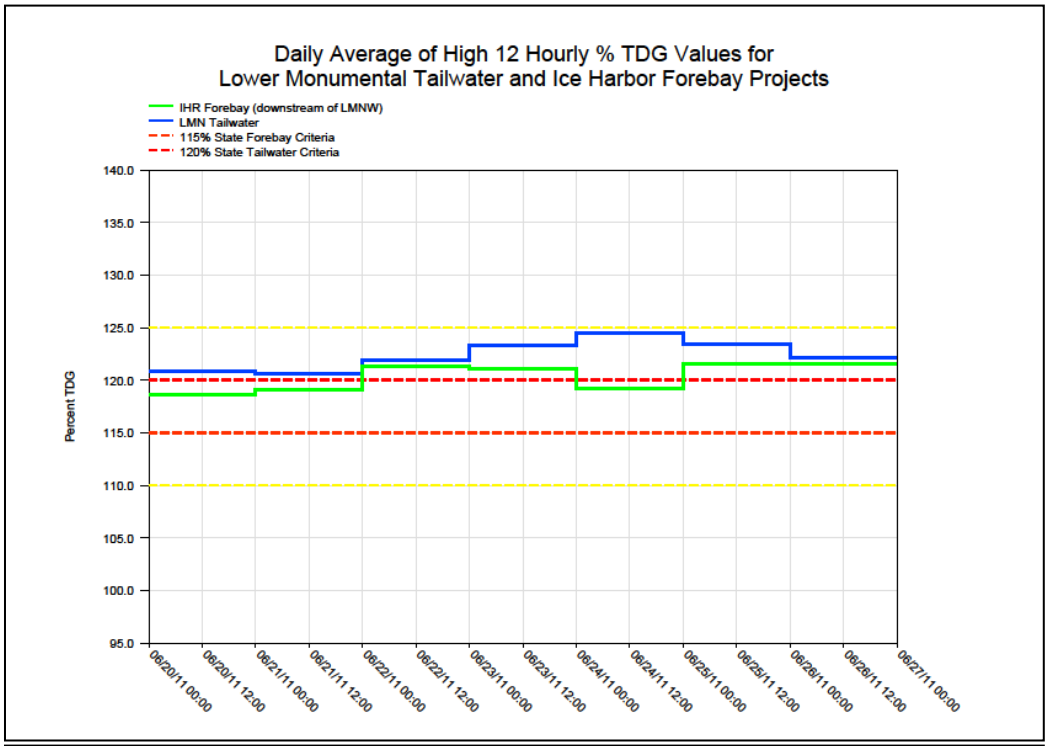

LITTLE GOOSE DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
06/20/11 01:00
06/20/11 13:00
06/21/11 01:00
06/21/11 13:00
06/22/11 01:00
06/22/11 13:00
06/23/11 01:00
06/23/11 13:00
06/24/11 01:00
06/24/11 13:00
06/25/11 01:00
06/25/11 13:00
06/26/11 01:00
06/26/11 13:00
06/27/11 01:00
LGS Generation Flow
LGS Total Flow
LGS Spill Flow
LGS Target Spill
30% of Total Flow

Figure 27


Daily Average of High 12 Hourly % TDG Values for
Lower Monumental Tailwater and Ice Harbor Forebay Projects
IHR Forebay (downstream of LMNW)
LMN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/20/11 00:00
06/20/11 12:00
06/21/11 00:00
06/21/11 12:00
06/22/11 00:00
06/22/11 12:00
06/23/11 00:00
06/23/11 12:00
06/24/11 00:00
06/24/11 12:00
06/25/11 00:00
06/25/11 12:00
06/26/11 00:00
06/26/11 12:00
06/27/11 00:00

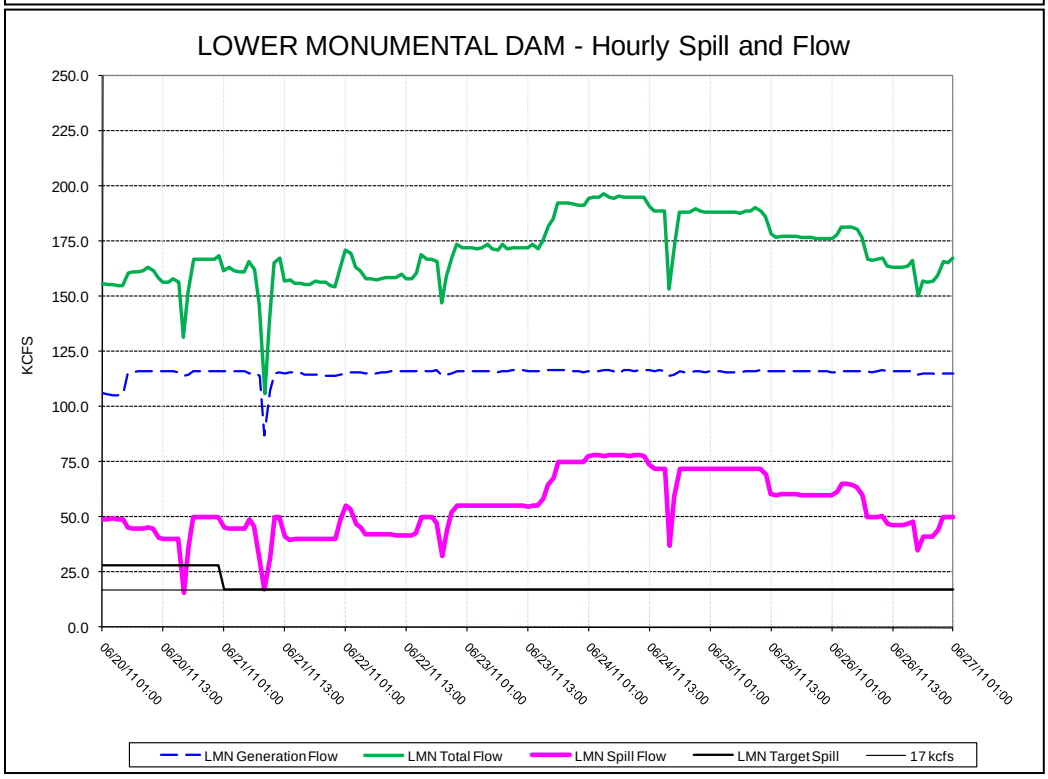
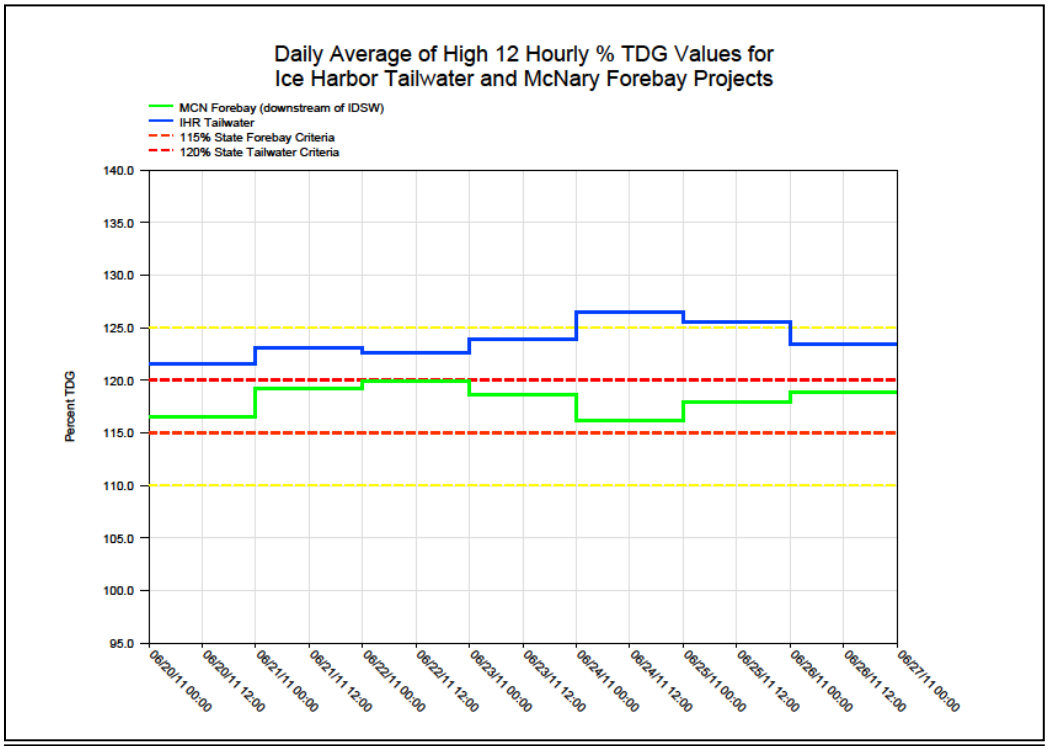

LOWER MONUMENTAL DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
06/20/11 01:00
06/20/11 13:00
06/21/11 01:00
06/21/11 13:00
06/22/11 01:00
06/22/11 13:00
06/23/11 01:00
06/23/11 13:00
06/24/11 01:00
06/24/11 13:00
06/25/11 01:00
06/25/11 13:00
06/26/11 01:00
06/26/11 13:00
06/27/11 01:00
LMN Generation Flow
LMN Total Flow
LMN Spill Flow
LMN Target Spill
17 kcfs

Figure 28


Daily Average of High 12 Hourly % TDG Values for
Ice Harbor Tailwater and McNary Forebay Projects
MCN Forebay (downstream of IDSW)
IHR Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/20/11 00:00
06/20/11 12:00
06/21/11 00:00
06/21/11 12:00
06/22/11 00:00
06/22/11 12:00
06/23/11 00:00
06/23/11 12:00
06/24/11 00:00
06/24/11 12:00
06/25/11 00:00
06/25/11 12:00
06/26/11 00:00
06/26/11 12:00
06/27/11 00:00

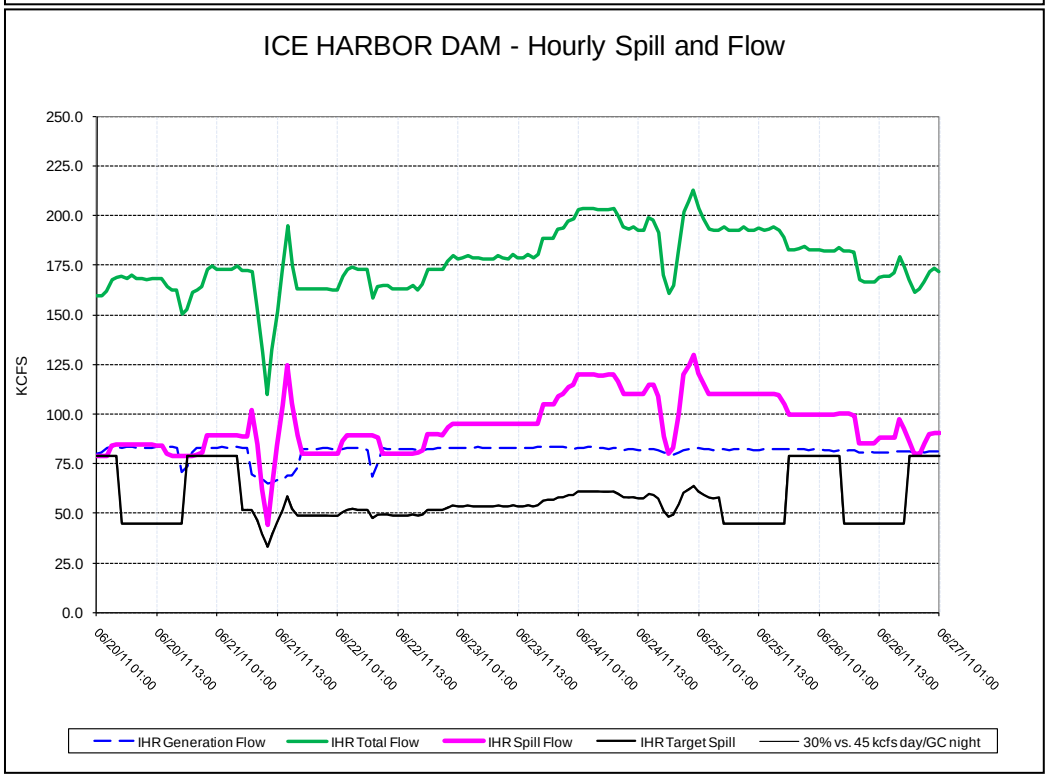
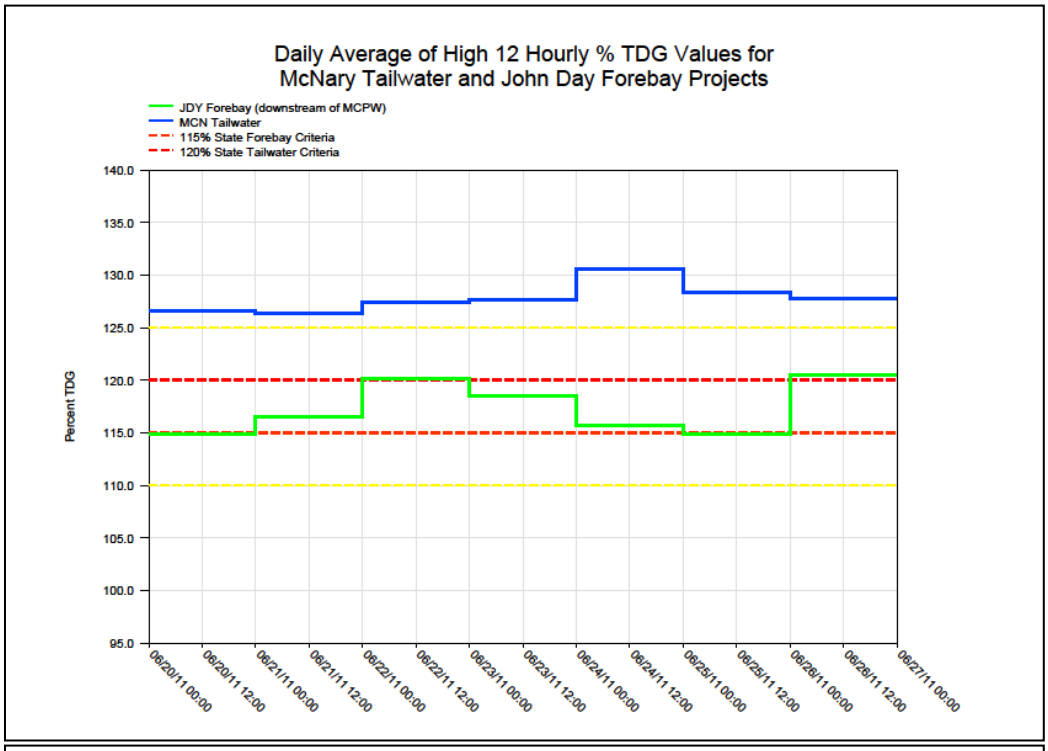

ICE HARBOR DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
06/20/11 01:00
06/20/11 13:00
06/21/11 01:00
06/21/11 13:00
06/22/11 01:00
06/22/11 13:00
06/23/11 01:00
06/23/11 13:00
06/24/11 01:00
06/24/11 13:00
06/25/11 01:00
06/25/11 13:00
06/26/11 01:00
06/26/11 13:00
06/27/11 01:00
IHR Generation Flow
IHR Total Flow
IHR Spill Flow
IHR Target Spill
30% vs. 45 kcfs day/GC night

Figure 29


Daily Average of High 12 Hourly % TDG Values for
McNary Tailwater and John Day Forebay Projects
JDY Forebay (downstream of MCPW)
MCN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/20/11 00:00
06/20/11 12:00
06/21/11 00:00
06/21/11 12:00
06/22/11 00:00
06/22/11 12:00
06/23/11 00:00
06/23/11 12:00
06/24/11 00:00
06/24/11 12:00
06/25/11 00:00
06/25/11 12:00
06/26/11 00:00
06/26/11 12:00
06/27/11 00:00

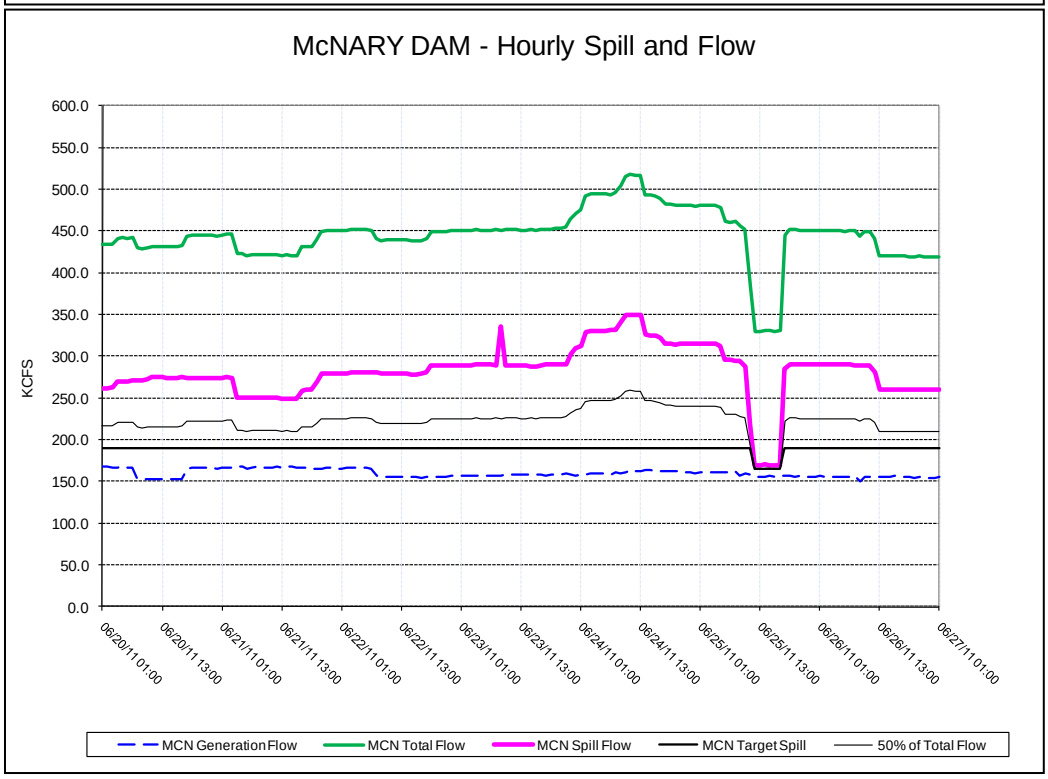
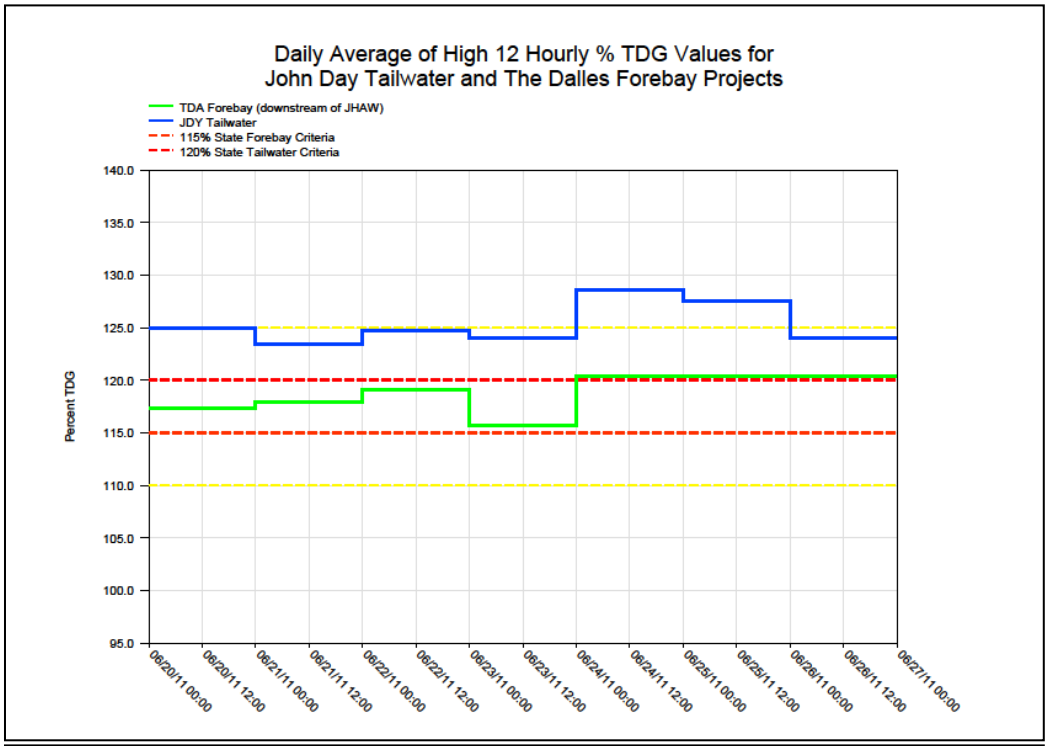

McNARY DAM - Hourly Spill and Flow
KCFS
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
06/20/11 01:00
06/20/11 13:00
06/21/11 01:00
06/21/11 13:00
06/22/11 01:00
06/22/11 13:00
06/23/11 01:00
06/23/11 13:00
06/24/11 01:00
06/24/11 13:00
06/25/11 01:00
06/25/11 13:00
06/26/11 01:00
06/26/11 13:00
06/27/11 01:00
MCN Generation Flow
MCN Total Flow
MCN Spill Flow
MCN Target Spill
50% of Total Flow

Figure 30


Daily Average of High 12 Hourly % TDG Values for
John Day Tailwater and The Dalles Forebay Projects
TDA Forebay (downstream of JHAW)
JDY Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/20/11 00:00
06/20/11 12:00
06/21/11 00:00
06/21/11 12:00
06/22/11 00:00
06/22/11 12:00
06/23/11 00:00
06/23/11 12:00
06/24/11 00:00
06/24/11 12:00
06/25/11 00:00
06/25/11 12:00
06/26/11 00:00
06/26/11 12:00
06/27/11 00:00

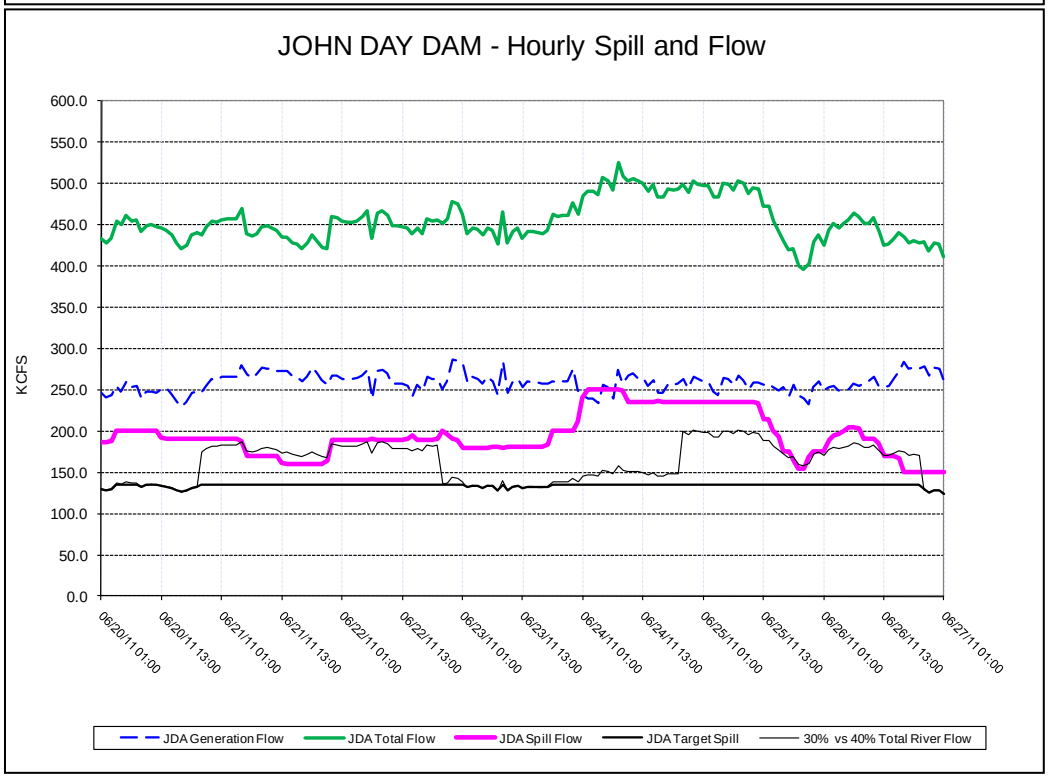

JOHN DAY DAM - Hourly Spill and Flow
KCFS
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
06/20/11 01:00
06/20/11 13:00
06/21/11 01:00
06/21/11 13:00
06/22/11 01:00
06/22/11 13:00
06/23/11 01:00
06/23/11 13:00
06/24/11 01:00
06/24/11 13:00
06/25/11 01:00
06/25/11 13:00
06/26/11 01:00
06/26/11 13:00
06/27/11 01:00
JDA Generation Flow
JDA Total Flow
JDA Spill Flow
JDA Target Spill
30% vs 40% Total River Flow

Figure 31

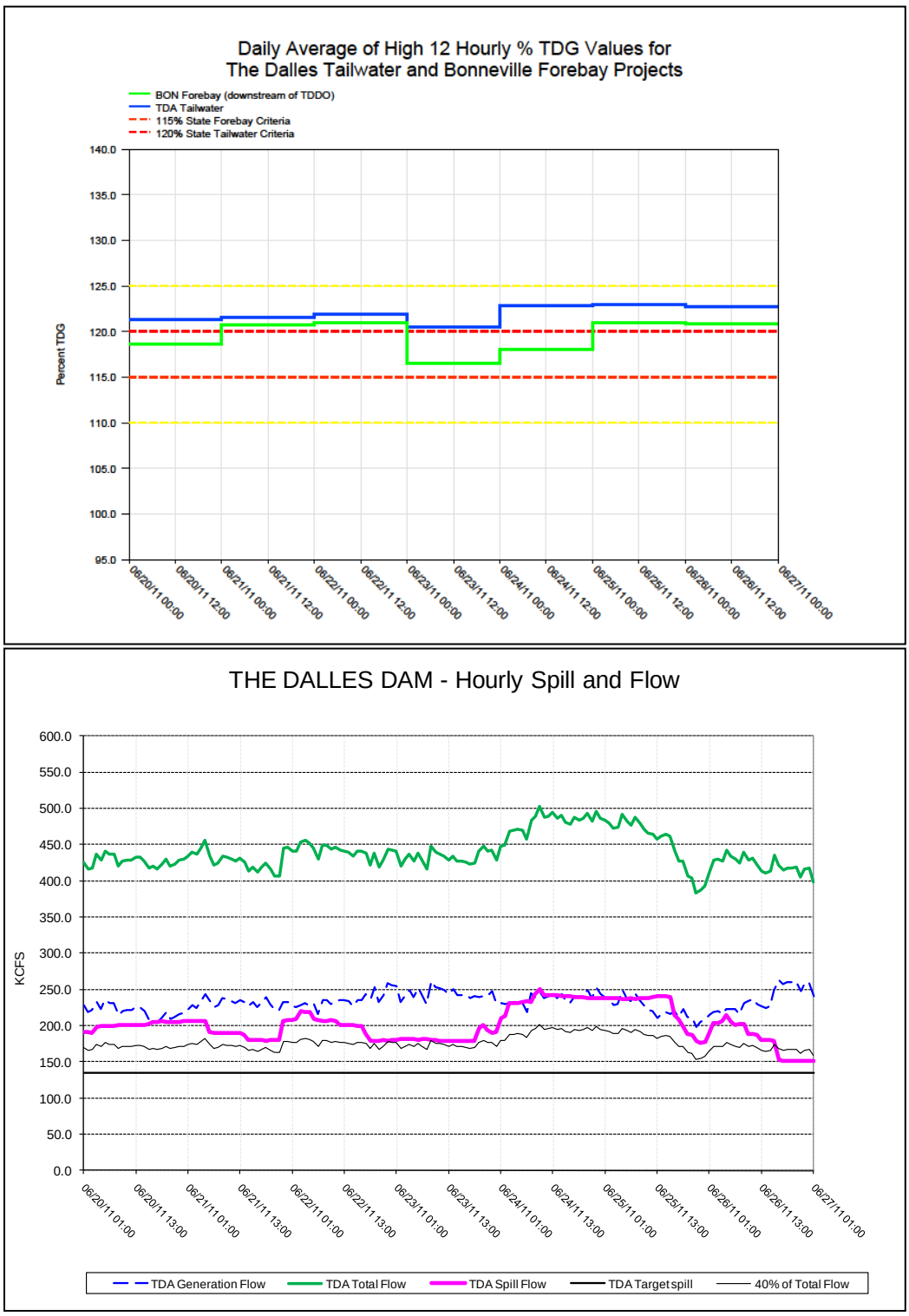
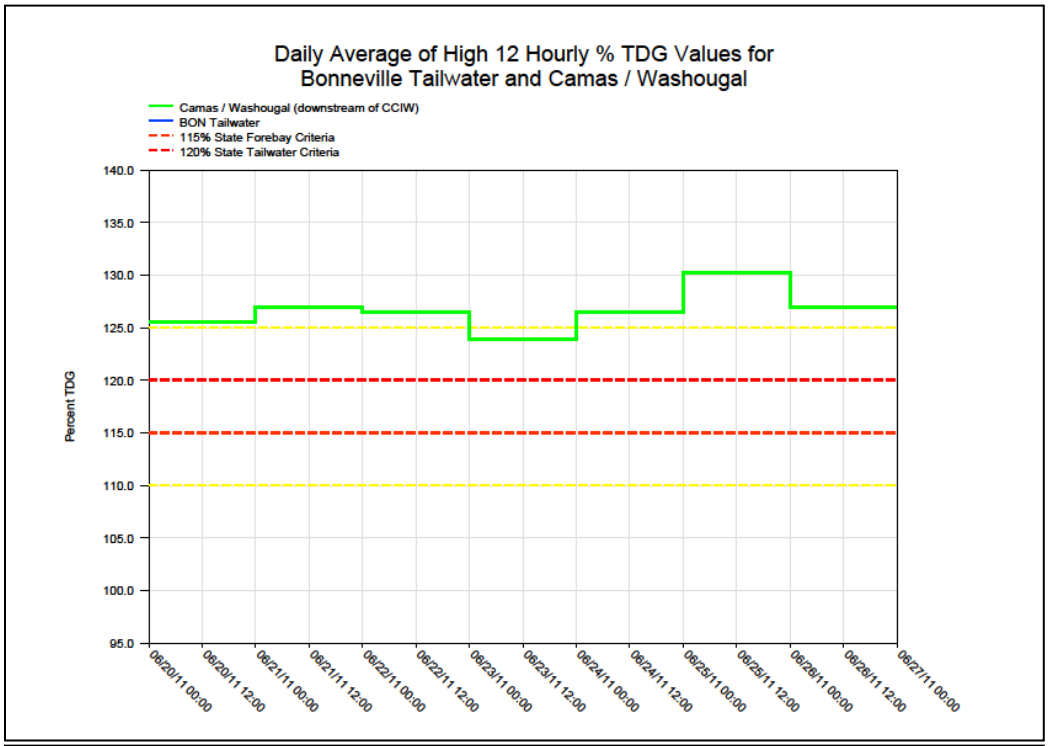

Daily Average of High 12 Hourly % TDG Values for
The Dalles Tailwater and Bonneville Forebay Projects
BON Forebay (downstream of TDDO)
TDA Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/20/11 00:00
06/20/11 12:00
06/21/11 00:00
06/21/11 12:00
06/22/11 00:00
06/22/11 12:00
06/23/11 00:00
06/23/11 12:00
06/24/11 00:00
06/24/11 12:00
06/25/11 00:00
06/25/11 12:00
06/26/11 00:00
06/26/11 12:00
06/27/11 00:00
THE DALLES DAM - Hourly Spill and Flow
KCFS
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
06/20/11 01:00
06/20/11 13:00
06/21/11 01:00
06/21/11 13:00
06/22/11 01:00
06/22/11 13:00
06/23/11 01:00
06/23/11 13:00
06/24/11 01:00
06/24/11 13:00
06/25/11 01:00
06/25/11 13:00
06/26/11 01:00
06/26/11 13:00
06/27/11 01:00
TDA Generation Flow
TDA Total Flow
TDA Spill Flow
TDA Target spill
40% of Total Flow

Figure 32


Daily Average of High 12 Hourly % TDG Values for
Bonneville Tailwater and Camas / Washougal
Camas / Washougal (downstream of CCIW)
BON Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/20/11 00:00
06/20/11 12:00
06/21/11 00:00
06/21/11 12:00
06/22/11 00:00
06/22/11 12:00
06/23/11 00:00
06/23/11 12:00
06/24/11 00:00
06/24/11 12:00
06/25/11 00:00
06/25/11 12:00
06/26/11 00:00
06/26/11 12:00
06/27/11 00:00

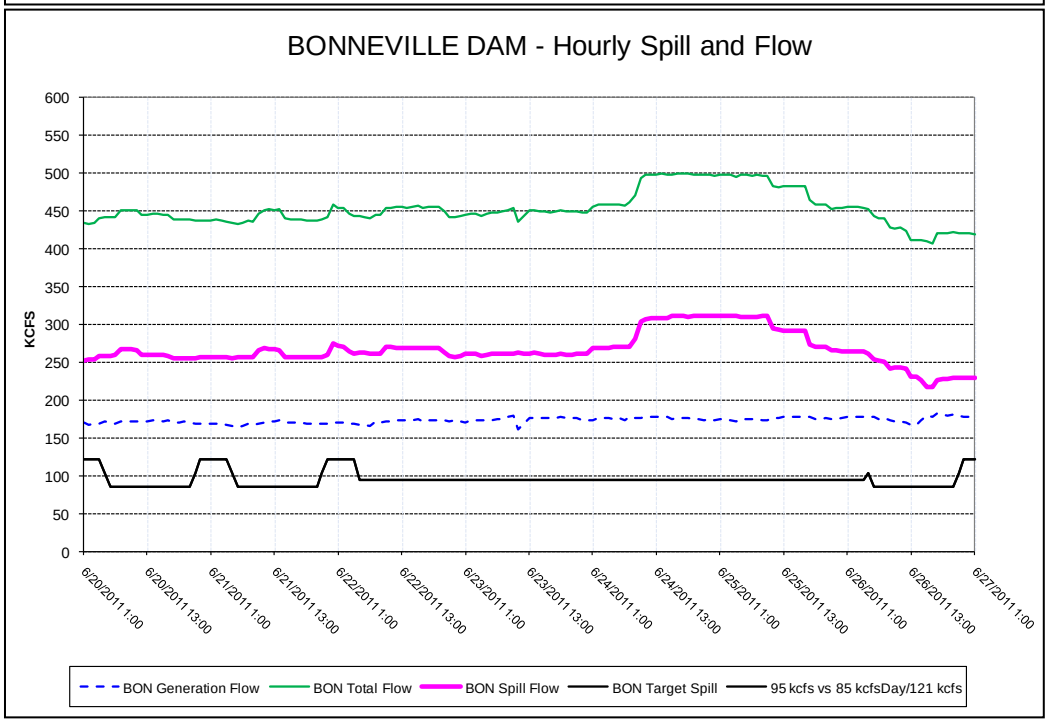

BONNEVILLE DAM - Hourly Spill and Flow
KCFS
600
550
500
450
400
350
300
250
200
150
100
50
0
6/20/2011 1:00
6/20/2011 13:00
6/21/2011 1:00
6/21/2011 13:00
6/22/2011 1:00
6/22/2011 13:00
6/23/2011 1:00
6/23/2011 13:00
6/24/2011 1:00
6/24/2011 13:00
6/25/2011 1:00
6/25/2011 13:00
6/26/2011 1:00
6/26/2011 13:00
6/27/2011 1:00
BON Generation Flow
BON Total Flow
BON Spill Flow
BON Target Spill
95 kcfs vs 85 kcfsDay/121 kcfs

Figure 33

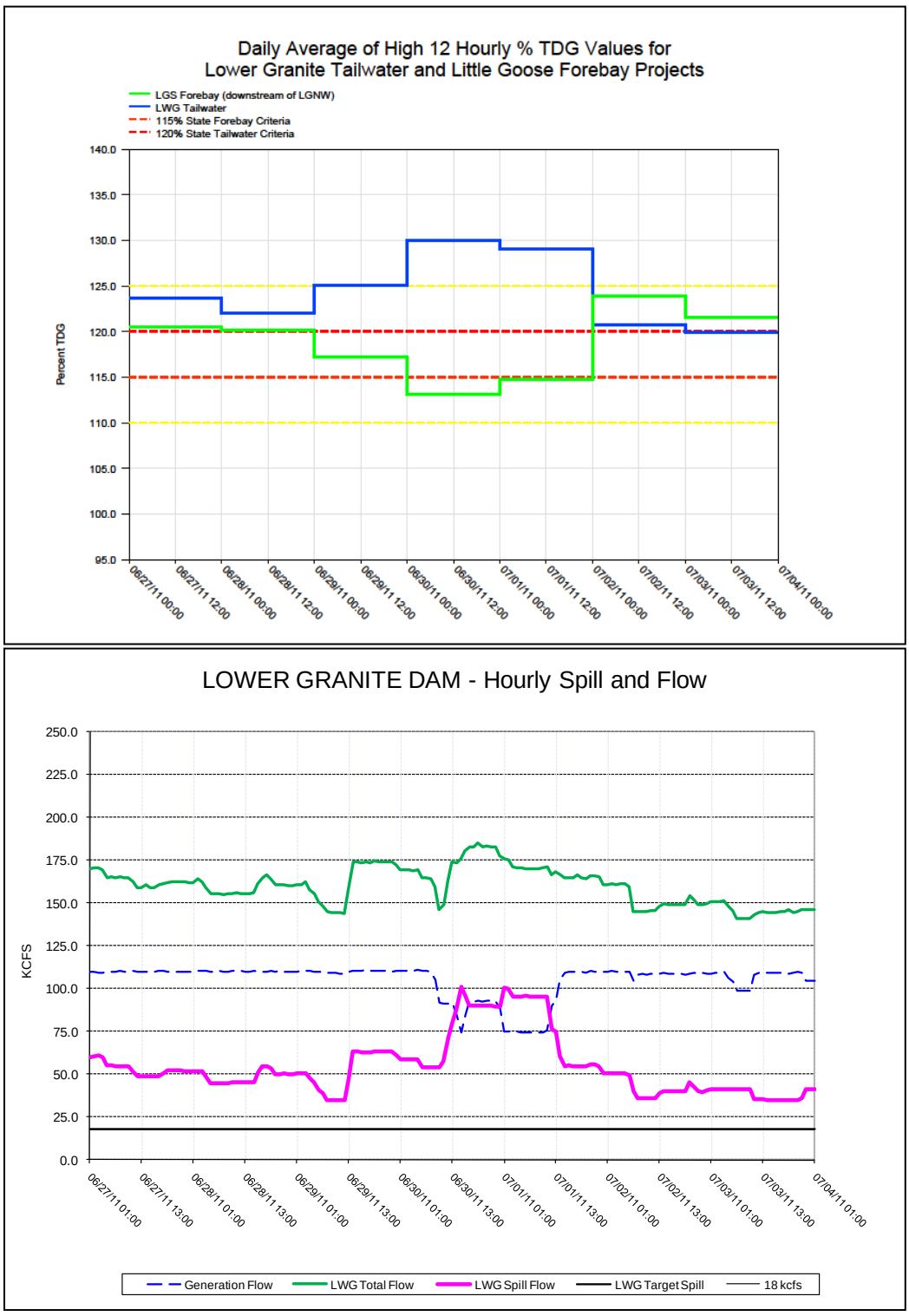
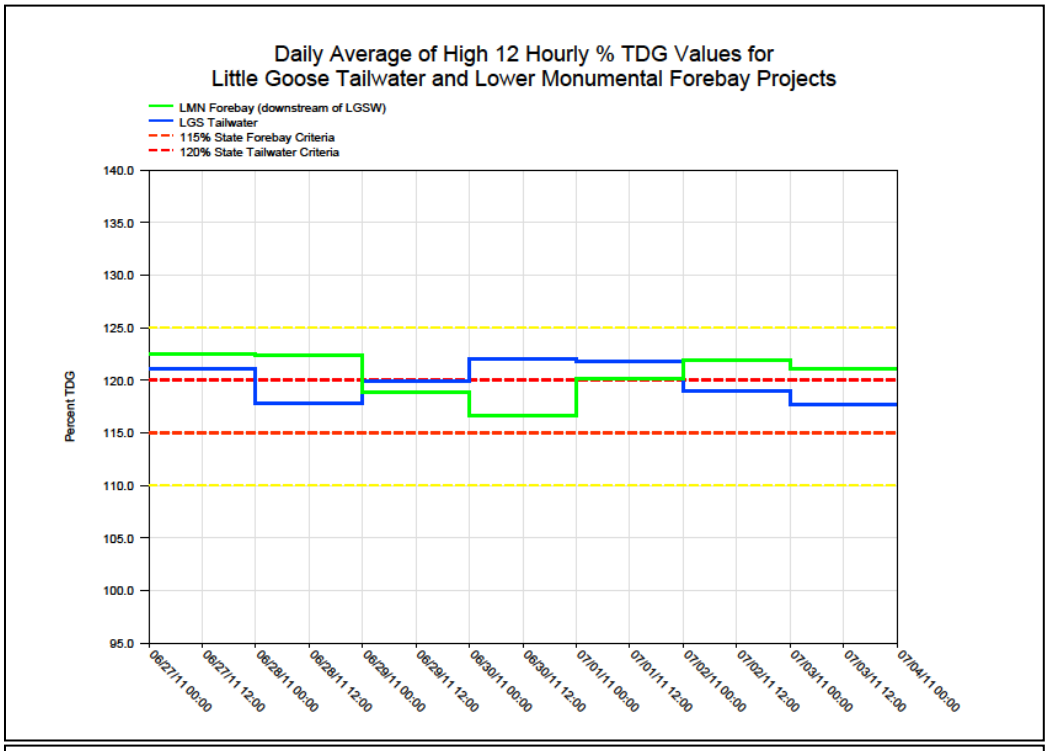

Daily Average of High 12 Hourly % TDG Values for
Lower Granite Tailwater and Little Goose Forebay Projects
LGS Forebay (downstream of LGNW)
LWG Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/27/11 00:00
06/27/11 12:00
06/28/11 00:00
06/28/11 12:00
06/29/11 00:00
06/29/11 12:00
06/30/11 00:00
06/30/11 12:00
07/01/11 00:00
07/01/11 12:00
07/02/11 00:00
07/02/11 12:00
07/03/11 00:00
07/03/11 12:00
07/04/11 00:00
LOWER GRANITE DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
06/27/11 01:00
06/27/11 13:00
06/28/11 01:00
06/28/11 13:00
06/29/11 01:00
06/29/11 13:00
06/30/11 01:00
06/30/11 13:00
07/01/11 01:00
07/01/11 13:00
07/02/11 01:00
07/02/11 13:00
07/03/11 01:00
07/03/11 13:00
07/04/11 01:00
Generation Flow
LWG Total Flow
LWG Spill Flow
LWG Target Spill
18 kcfs

Figure 34


Daily Average of High 12 Hourly % TDG Values for
Little Goose Tailwater and Lower Monumental Forebay Projects
LMN Forebay (downstream of LGSW)
LGS Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/27/11 00:00
06/27/11 12:00
06/28/11 00:00
06/28/11 12:00
06/29/11 00:00
06/29/11 12:00
06/30/11 00:00
06/30/11 12:00
07/01/11 00:00
07/01/11 12:00
07/02/11 00:00
07/02/11 12:00
07/03/11 00:00
07/03/11 12:00
07/04/11 00:00

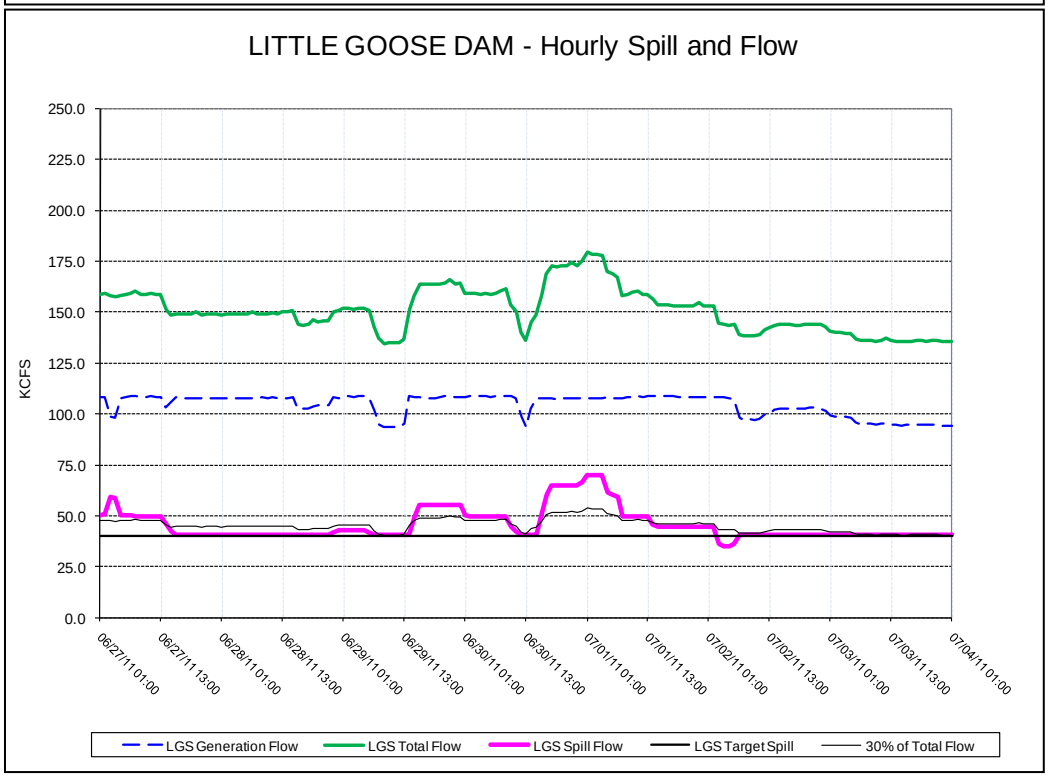

LITTLE GOOSE DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
06/27/11 01:00
06/27/11 13:00
06/28/11 01:00
06/28/11 13:00
06/29/11 01:00
06/29/11 13:00
06/30/11 01:00
06/30/11 13:00
07/01/11 01:00
07/01/11 13:00
07/02/11 01:00
07/02/11 13:00
07/03/11 01:00
07/03/11 13:00
07/04/11 01:00
LGS Generation Flow
LGS Total Flow
LGS Spill Flow
LGS Target Spill
30% of Total Flow

Figure 35

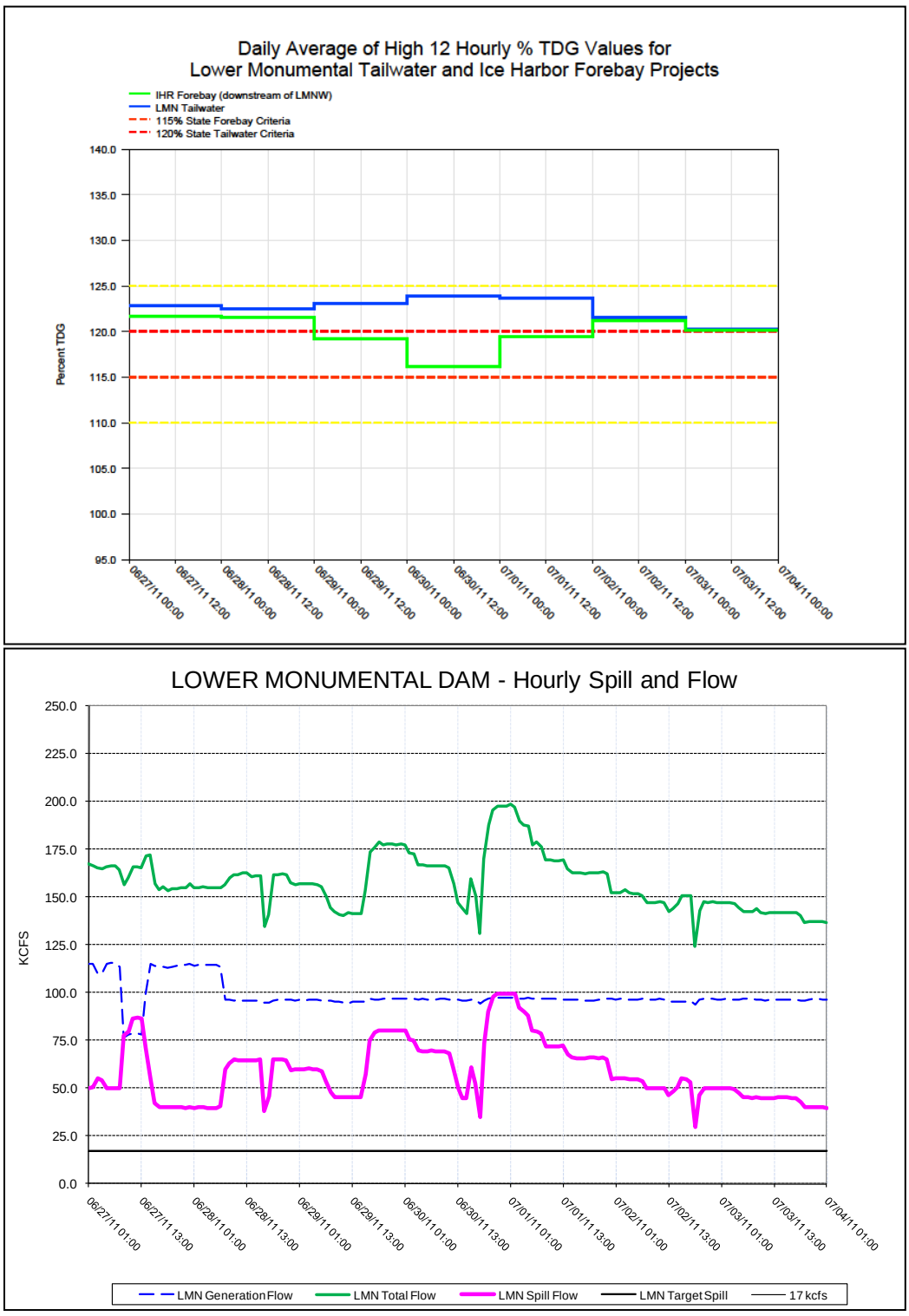
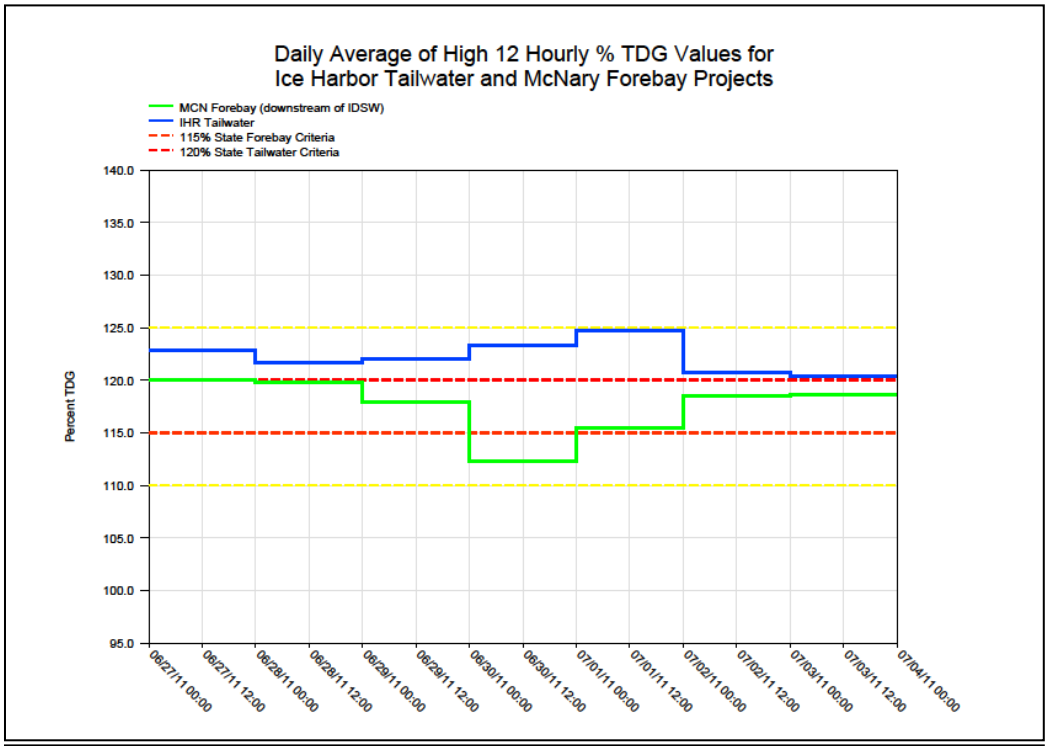

Daily Average of High 12 Hourly % TDG Values for
Lower Monumental Tailwater and Ice Harbor Forebay Projects
IHR Forebay (downstream of LMNW)
LMN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/27/11 00:00
06/27/11 12:00
06/28/11 00:00
06/28/11 12:00
06/29/11 00:00
06/29/11 12:00
06/30/11 00:00
06/30/11 12:00
07/01/11 00:00
07/01/11 12:00
07/02/11 00:00
07/02/11 12:00
07/03/11 00:00
07/03/11 12:00
07/04/11 00:00
LOWER MONUMENTAL DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
06/27/11 01:00
06/27/11 13:00
06/28/11 01:00
06/28/11 13:00
06/29/11 01:00
06/29/11 13:00
06/30/11 01:00
06/30/11 13:00
07/01/11 01:00
07/01/11 13:00
07/02/11 01:00
07/02/11 13:00
07/03/11 01:00
07/03/11 13:00
07/04/11 01:00
LMN Generation Flow
LMN Total Flow
LMN Spill Flow
LMN Target Spill
17 kcfs

Figure 36


Daily Average of High 12 Hourly % TDG Values for
Ice Harbor Tailwater and McNary Forebay Projects
MCN Forebay (downstream of IDSW)
IHR Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/27/11 00:00
06/27/11 12:00
06/28/11 00:00
06/28/11 12:00
06/29/11 00:00
06/29/11 12:00
06/30/11 00:00
06/30/11 12:00
07/01/11 00:00
07/01/11 12:00
07/02/11 00:00
07/02/11 12:00
07/03/11 00:00
07/03/11 12:00
07/04/11 00:00

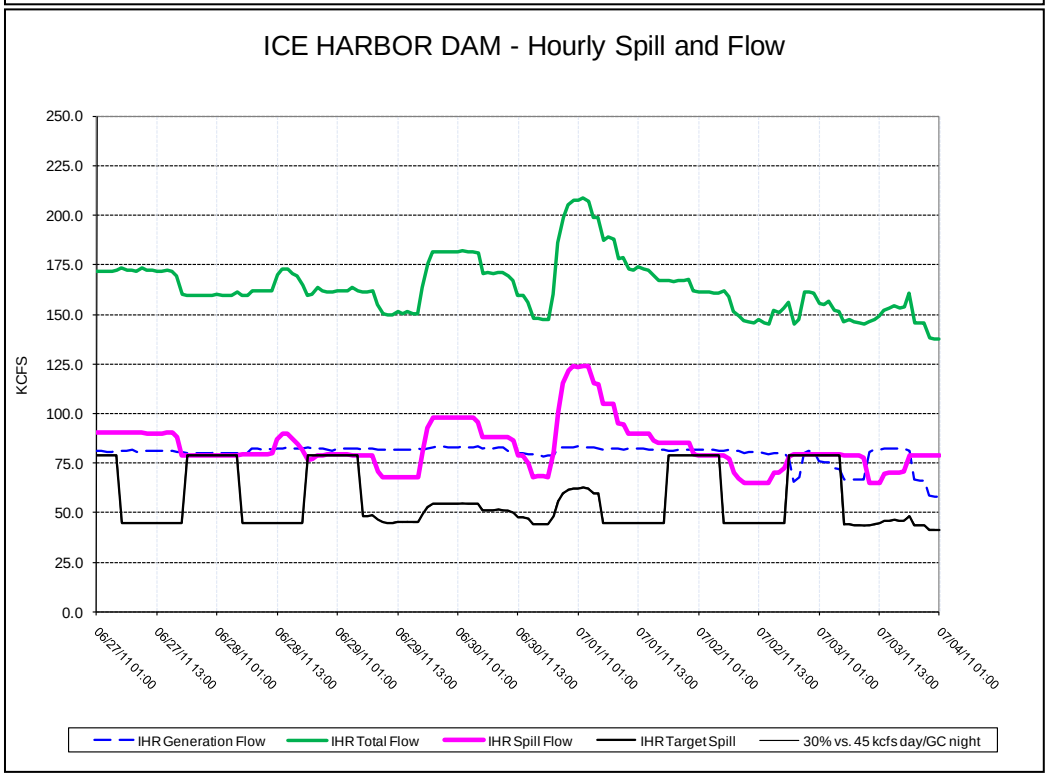
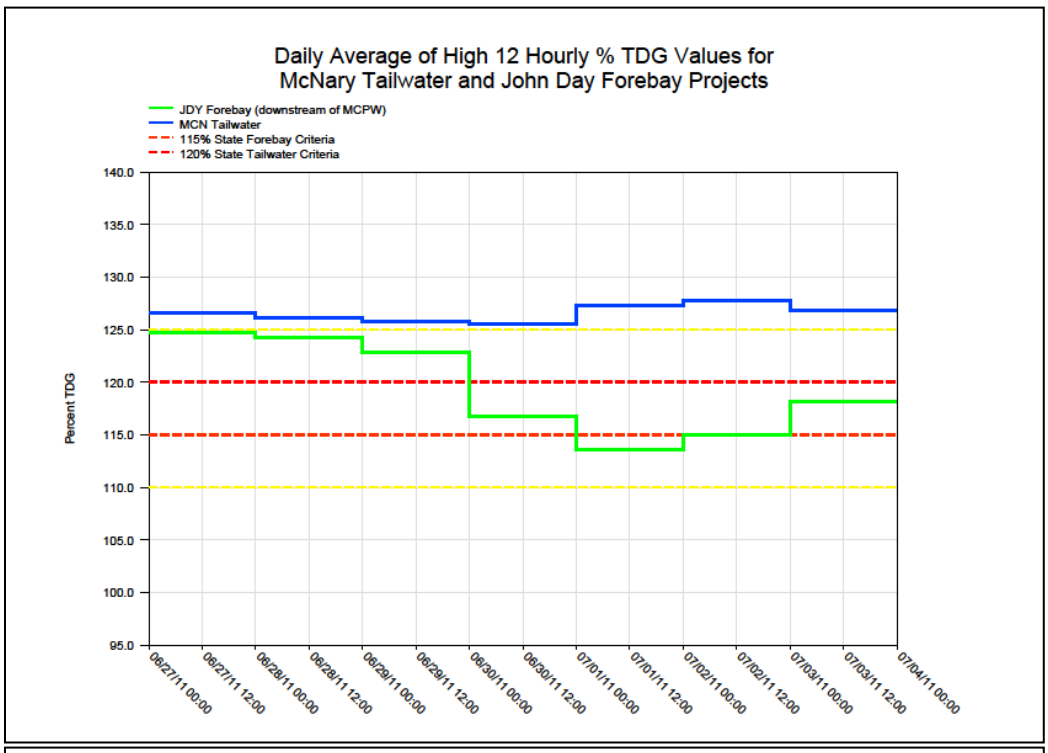

ICE HARBOR DAM - Hourly Spill and Flow
KCFS
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
06/27/11 01:00
06/27/11 13:00
06/28/11 01:00
06/28/11 13:00
06/29/11 01:00
06/29/11 13:00
06/30/11 01:00
06/30/11 13:00
07/01/11 01:00
07/01/11 13:00
07/02/11 01:00
07/02/11 13:00
07/03/11 01:00
07/03/11 13:00
07/04/11 01:00
IHR Generation Flow
IHR Total Flow
IHR Spill Flow
IHR Target Spill
30% vs. 45 kcfs day/GC night

Figure 37


Daily Average of High 12 Hourly % TDG Values for
McNary Tailwater and John Day Forebay Projects
JDY Forebay (downstream of MCPW)
MCN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/27/11 00:00
06/27/11 12:00
06/28/11 00:00
06/28/11 12:00
06/29/11 00:00
06/29/11 12:00
06/30/11 00:00
06/30/11 12:00
07/01/11 00:00
07/01/11 12:00
07/02/11 00:00
07/02/11 12:00
07/03/11 00:00
07/03/11 12:00
07/04/11 00:00

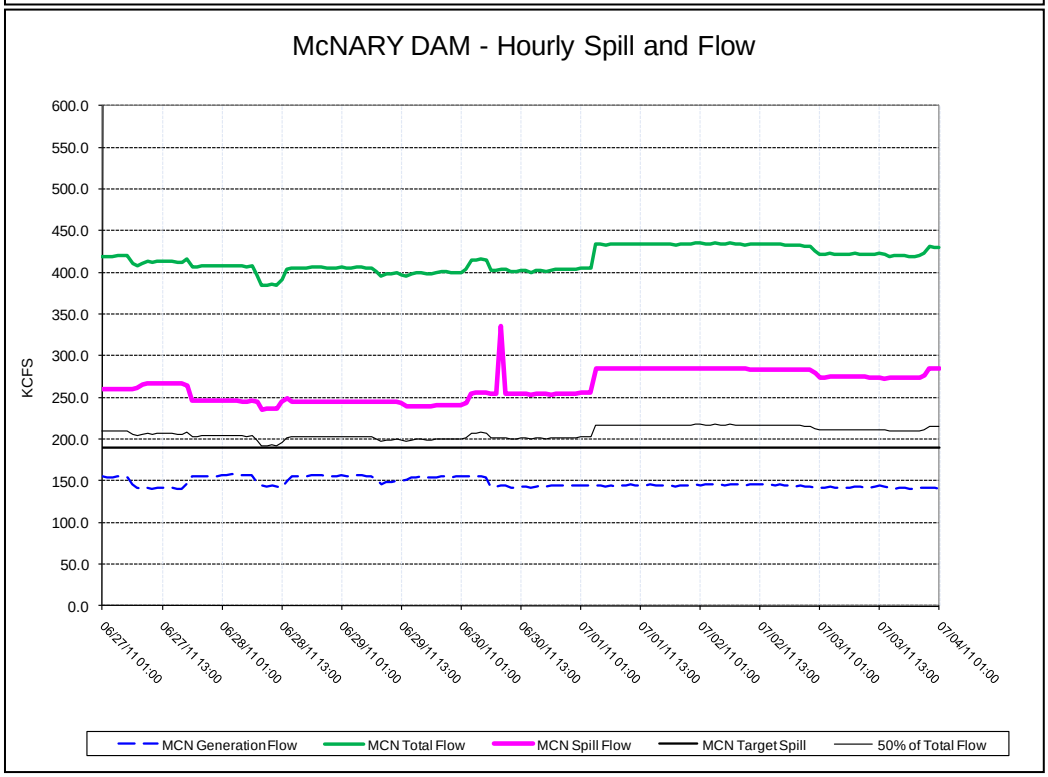
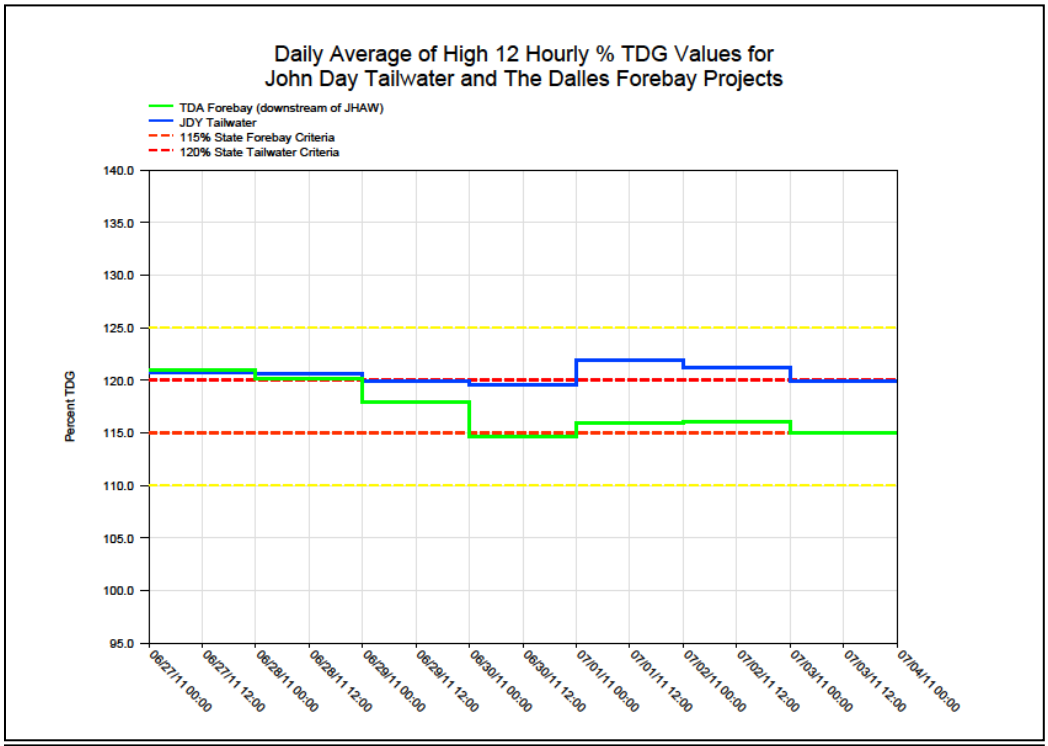

McNARY DAM - Hourly Spill and Flow
KCFS
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
06/27/11 01:00
06/27/11 13:00
06/28/11 01:00
06/28/11 13:00
06/29/11 01:00
06/29/11 13:00
06/30/11 01:00
06/30/11 13:00
07/01/11 01:00
07/01/11 13:00
07/02/11 01:00
07/02/11 13:00
07/03/11 01:00
07/03/11 13:00
07/04/11 01:00
MCN Generation Flow
MCN Total Flow
MCN Spill Flow
MCN Target Spill
50% of Total Flow

Figure 38


Daily Average of High 12 Hourly % TDG Values for
John Day Tailwater and The Dalles Forebay Projects
TDA Forebay (downstream of JHAW)
JDY Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/27/11 00:00
06/27/11 12:00
06/28/11 00:00
06/28/11 12:00
06/29/11 00:00
06/29/11 12:00
06/30/11 00:00
06/30/11 12:00
07/01/11 00:00
07/01/11 12:00
07/02/11 00:00
07/02/11 12:00
07/03/11 00:00
07/03/11 12:00
07/04/11 00:00

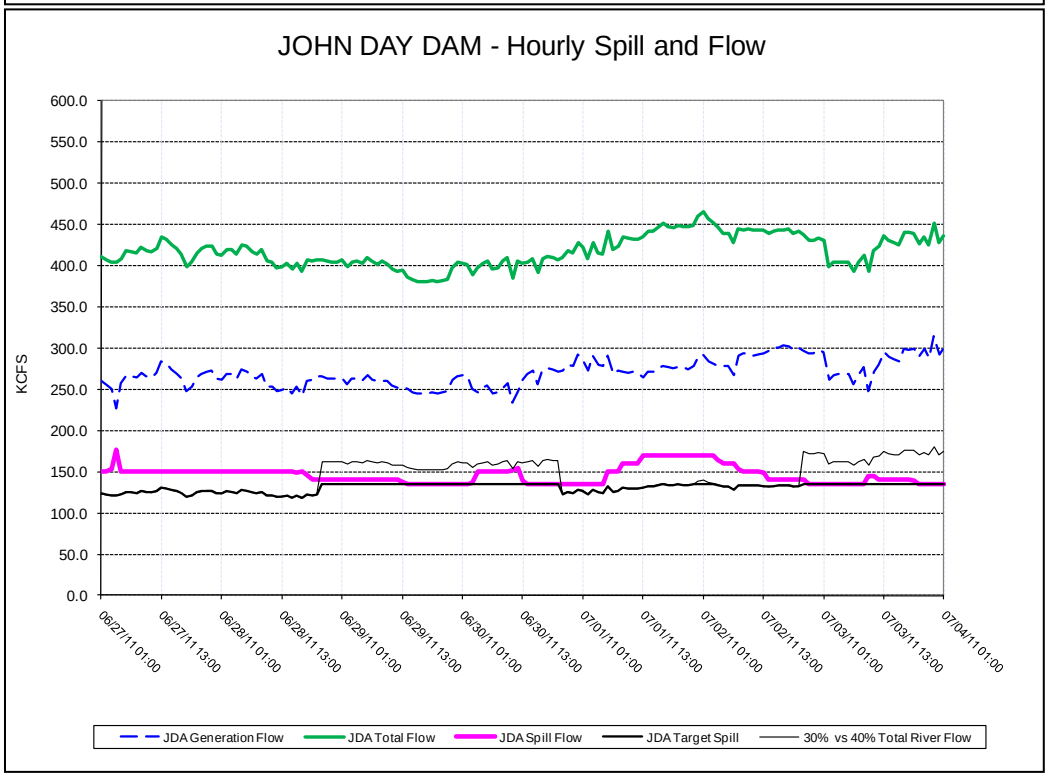
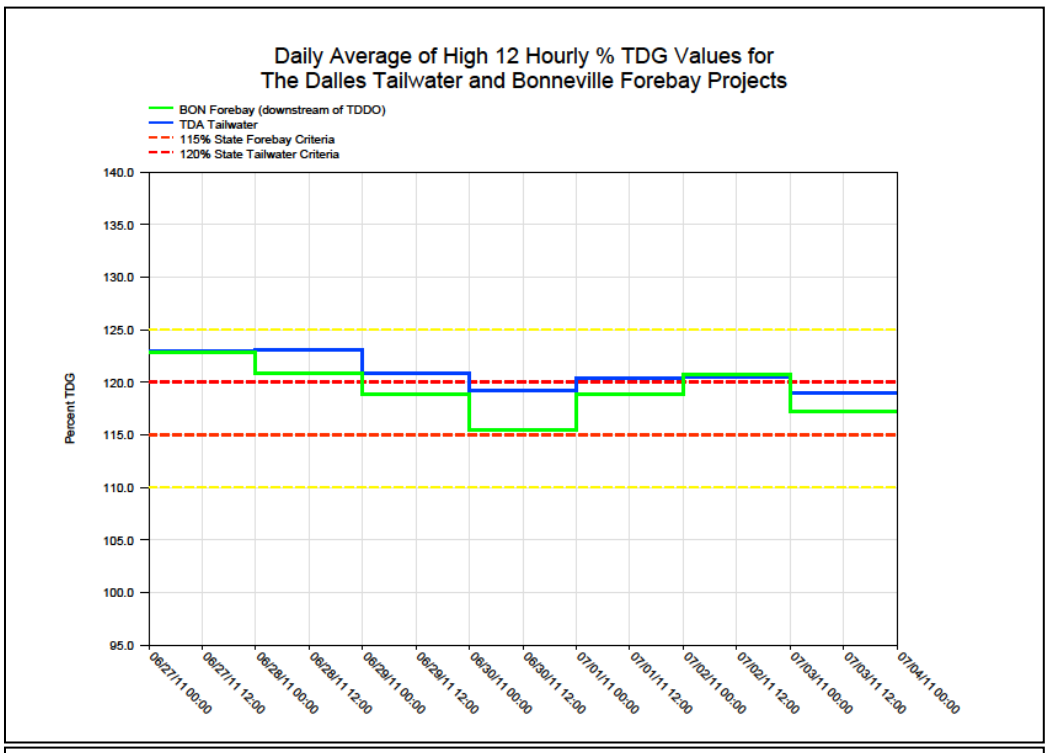

JOHN DAY DAM - Hourly Spill and Flow
KCFS
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
06/27/11 01:00
06/27/11 13:00
06/28/11 01:00
06/28/11 13:00
06/29/11 01:00
06/29/11 13:00
06/30/11 01:00
06/30/11 13:00
07/01/11 01:00
07/01/11 13:00
07/02/11 01:00
07/02/11 13:00
07/03/11 01:00
07/03/11 13:00
07/04/11 01:00
JDA Generation Flow
JDA Total Flow
JDA Spill Flow
JDA Target Spill
30% vs 40% Total River Flow

Figure 39


Daily Average of High 12 Hourly % TDG Values for
The Dalles Tailwater and Bonneville Forebay Projects
BON Forebay (downstream of TDDO)
TDA Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/27/11 00:00
06/27/11 12:00
06/28/11 00:00
06/28/11 12:00
06/29/11 00:00
06/29/11 12:00
06/30/11 00:00
06/30/11 12:00
07/01/11 00:00
07/01/11 12:00
07/02/11 00:00
07/02/11 12:00
07/03/11 00:00
07/03/11 12:00
07/04/11 00:00

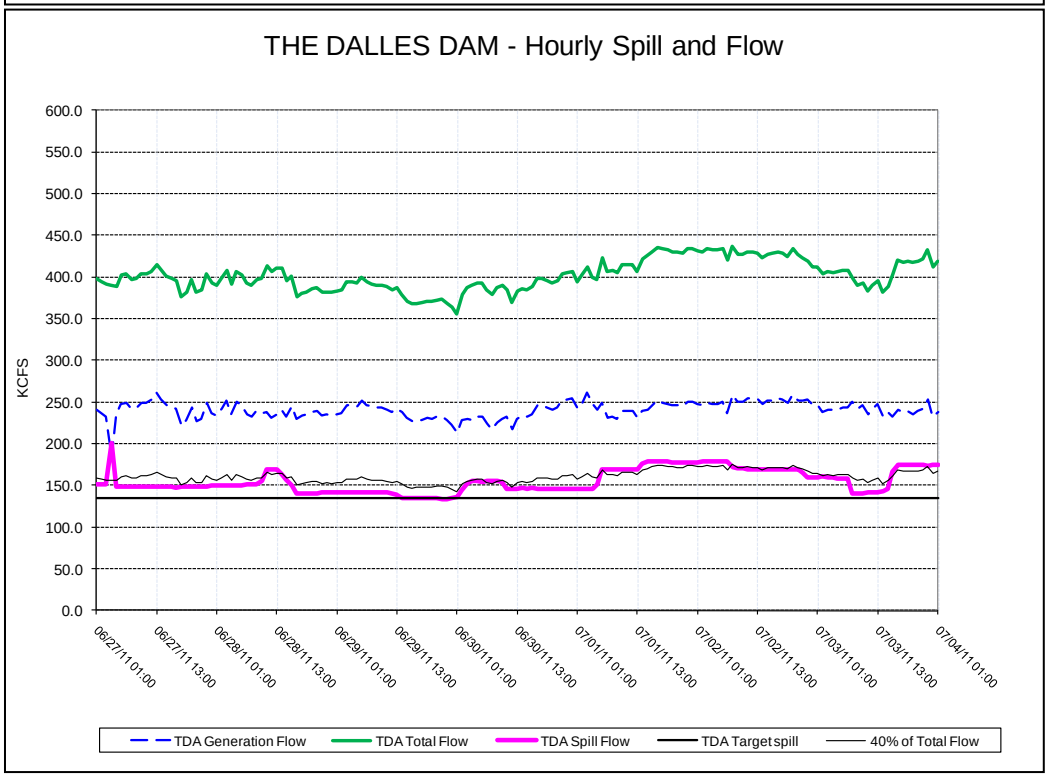
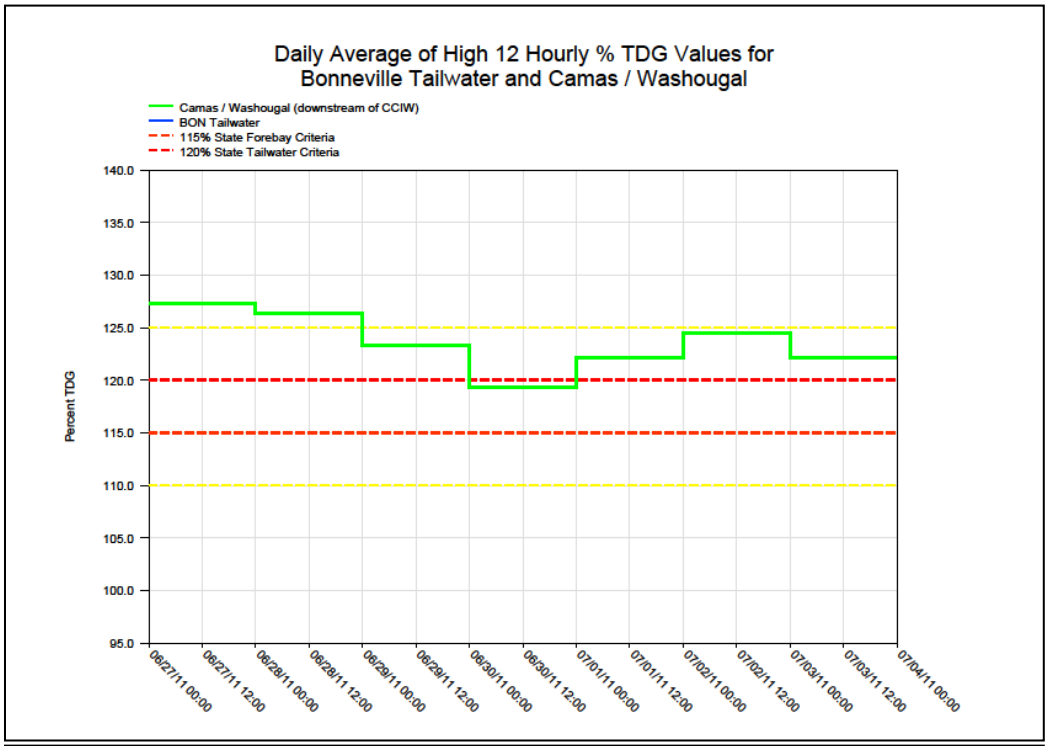

THE DALLES DAM - Hourly Spill and Flow
KCFS
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
06/27/11 01:00
06/27/11 13:00
06/28/11 01:00
06/28/11 13:00
06/29/11 01:00
06/29/11 13:00
06/30/11 01:00
06/30/11 13:00
07/01/11 01:00
07/01/11 13:00
07/02/11 01:00
07/02/11 13:00
07/03/11 01:00
07/03/11 13:00
07/04/11 01:00
TDA Generation Flow
TDA Total Flow
TDA Spill Flow
TDA Target spill
40% of Total Flow

Figure 40


Daily Average of High 12 Hourly % TDG Values for
Bonneville Tailwater and Camas / Washougal
Camas / Washougal (downstream of CCIW)
BON Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
06/27/11 00:00
06/27/11 12:00
06/28/11 00:00
06/28/11 12:00
06/29/11 00:00
06/29/11 12:00
06/30/11 00:00
06/30/11 12:00
07/01/11 00:00
07/01/11 12:00
07/02/11 00:00
07/02/11 12:00
07/03/11 00:00
07/03/11 12:00
07/04/11 00:00

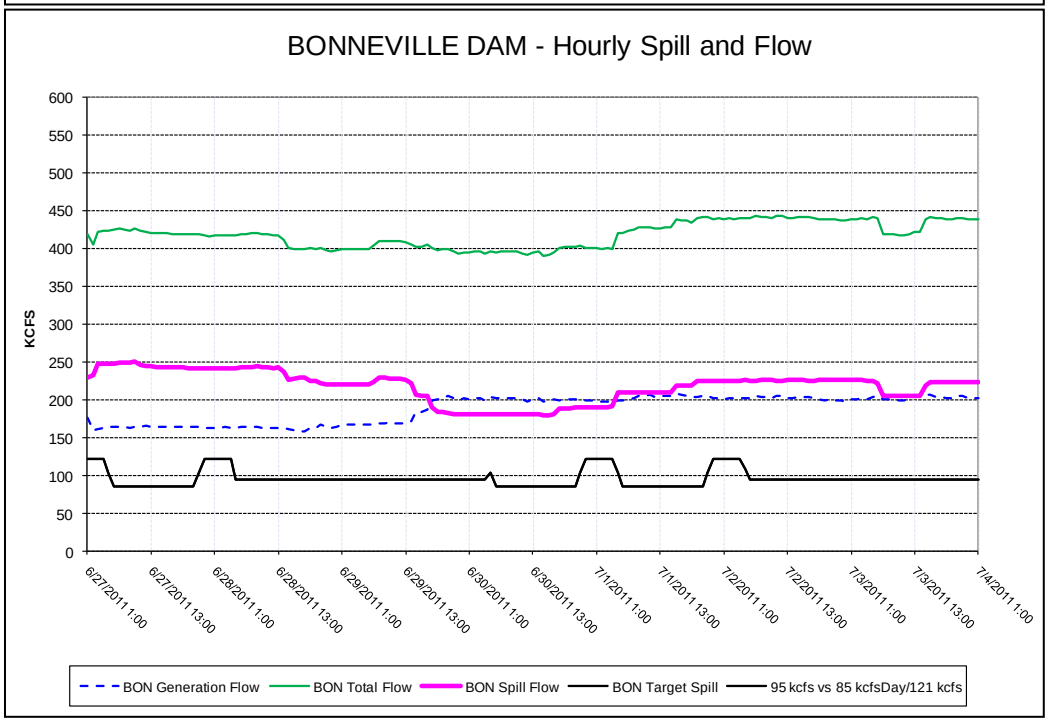

BONNEVILLE DAM - Hourly Spill and Flow
KCFS
600
550
500
450
400
350
300
250
200
150
100
50
0
6/27/2011 1:00
6/27/2011 13:00
6/28/2011 1:00
6/28/2011 13:00
6/29/2011 1:00
6/29/2011 13:00
6/30/2011 1:00
6/30/2011 13:00
7/1/2011 1:00
7/1/2011 13:00
7/2/2011 1:00
7/2/2011 13:00
7/3/2011 1:00
7/3/2011 13:00
7/4/2011 1:00
BON Generation Flow
BON Total Flow
BON Spill Flow
BON Target Spill
95 kcfs vs 85 kcfsDay/121 kcfs

Figure 41

Average Percent TDG for Highest 12-Hours: May 31 – July 3, 2011

Date	FIXED MONITORING STATIONS																
	LWG	LGNW	LGSA	LGSW	LMNA	LMNW	IHRA	IDSW	MCNA	MCPW	JDY	JHAW	TDA	TDDO	BON	CCIW	CWMW
Gas Cap %	115	120	115	120	115	120	115	120	115	120	115	120	115	120	115	120	115
5/31/2011	106.4	121.3	115.7	127.4	131	124	123.8	122.3	119.7	129.7	122.3	130.7	123.4	124.7	122.7	---	128
6/1/2011	106.6	119.3	115.2	127.1	130.9	121.2	124.4	122.5	120.6	129.4	124.2	129.4	123.1	124.7	122.1	---	127.6
6/2/2011	106.4	118.8	114.1	121.7	130.6	121	123.2	121.8	118.8	130.5	122.6	129.6	121.1	123.6	119.7	---	126.1
6/3/2011	104.5	121.5	110.6	124.3	119.6	121.8	119.2	123.7	117	131.6	118.8	129	122.3	124.5	122.3	---	126.9
6/4/2011	106.1	120.2	115	123.2	125.3	121.3	119.1	122.5	119.7	130.2	119.7	129.6	122.7	124.9	124.2	---	127.7
6/5/2011	107.3	120.5	117	123.5	124.9	120.8	121.9	121.7	121.8	130.5	125.8	129.4	124.3	125.8	124.3	---	129.3
6/6/2011	107.4	123	116.4	124.3	125.1	121.8	121.8	122.6	121.9	130.3	127.3	129.9	123.3	125.2	122.6	---	128.1
6/7/2011	106	128.3	114.3	127.4	122.6	125.6	118.8	125.6	119.4	132.2	121.7	129.2	120.4	123.3	117.5	---	125
6/8/2011	105.5	132.2	114.5	129.6	128.2	127.5	119.5	129.4	114.8	139.4	115.3	129.3	118.7	122.3	118.6	---	125.2
6/9/2011	107.2	130.4	121.2	129.1	132.4	126.7	125.6	130.6	117.6	137.4	115.5	129.8	121.1	124.2	122	---	128.3
6/10/2011	108.7	129.5	123.5	128.6	132.1	125.8	126.2	128.2	122	131.3	128.9	129.4	122.5	124.5	121.8	---	127.1
6/11/2011	109.1	126	123.3	127.4	131.1	124.4	125.5	126.5	120.3	131.4	130.7	128.8	125.6	126.3	121.6	---	127
6/12/2011	108.7	125.5	121.7	125.7	128.3	123.3	124	124.6	118.4	130.9	126.2	128.3	124.5	125.5	123	---	127.4
6/13/2011	107.7	125.8	118.9	126.3	126.7	123.1	121.7	124.7	118	130.9	121.9	127.9	122.3	124.3	122.3	---	126.4
6/14/2011	106.9	127	116.9	126.9	127.2	125	121	127.1	117.4	130.5	118.8	129.3	120.8	123.6	120.1	---	125.3
6/15/2011	108.3	127.4	117.4	127.5	128.2	125.1	121.8	127.2	116.9	130.8	116.4	131.1	120.5	123.1	119.4	---	125.4
6/16/2011	107.8	125.2	117.2	126.4	128	124	122.1	126	117.4	130.7	116.2	130.9	122	124.3	119.9	---	128.3
6/17/2011	108.2	124.1	118.2	125.3	126.9	123.4	122	124.7	118	129.8	118.6	129.4	120.7	123.7	121	---	128.9
6/18/2011	108.7	121.5	118.3	123.6	127.2	121.5	122	122.8	118.4	128.2	118.6	126.8	119	122.3	120.5	---	128.2
6/19/2011	107.4	118.3	116.6	121.1	123.5	119.9	120.4	121.2	116.2	126.4	116.9	124.6	116.6	120.8	117.6	---	124.9
6/20/2011	107.2	120.1	114.2	122.3	120.5	120.9	118.6	121.5	116.5	126.5	114.8	125	117.3	121.3	118.7	---	125.6
6/21/2011	108.1	120.9	115.4	124.9	123.2	120.7	119.1	123.1	119.2	126.3	116.5	123.4	117.9	121.6	120.8	---	127
6/22/2011	108.5	125.4	117.2	120.2	127.8	121.9	121.3	122.6	119.9	127.4	120.1	124.7	119	121.8	121	---	126.5
6/23/2011	107.6	127.5	115.8	124.2	120	123.3	121.1	123.9	118.6	127.6	118.5	124	115.7	120.5	116.5	---	123.9
6/24/2011	107.1	128.4	116.1	125	123.1	124.3	119.2	126.5	116.2	130.6	115.7	128.6	120.4	122.8	118	---	126.5
6/25/2011	108.3	126.8	119.1	123.9	124	123.4	121.5	125.5	118	128.4	114.8	127.5	120.3	123	121	---	130.2
6/26/2011	108.6	125.7	119.7	121.6	123.5	122.2	121.5	123.4	118.8	127.7	120.5	124	120.4	122.8	120.8	---	127
6/27/2011	109.5	123.6	120.5	121	122.4	122.9	121.6	122.9	120.1	126.6	124.7	120.7	120.9	122.9	122.9	---	127.3
6/28/2011	109.2	122.1	120.1	117.8	122.4	122.5	121.6	121.7	119.8	126.2	124.3	120.6	120.2	123.1	120.9	---	126.3
6/29/2011	107.8	125.1	117.2	119.9	118.9	123	119.2	122	117.9	125.8	122.8	119.9	118	120.8	118.9	---	123.3
6/30/2011	105.9	130.0	113.1	122.0	116.6	123.9	116.2	123.3	112.3	125.6	116.8	119.6	114.7	119.2	115.5	---	119.3
7/1/2011	107	129.0	114.7	121.8	120.2	123.6	119.5	124.8	115.4	127.2	113.6	121.9	115.9	120.3	118.8	---	122.1
7/2/2011	109.1	120.7	123.9	118.9	121.8	121.5	121.2	120.7	118.4	127.7	114.9	121.2	116	120.5	120.7	---	124.4
7/3/2011	108.4	119.9	121.6	117.7	121.1	120.3	120.1	120.4	118.6	126.8	118.1	119.9	115	119	117.2	---	122.1

Figure 42

Total Dissolved Gas Monitoring Stations

Code	Station Name
LWG	Lower Granite Forebay
LGNW	Lower Granite Tailwater
LGSA	Little Goose Forebay
LGSW	Little Goose Tailwater
LMNA	Lower Monumental Forebay
LMNW	Lower Monumental Tailwater
IHRA	Ice Harbor Forebay
IDSW	Ice Harbor Tailwater
MCNA	McNary Forebay
MCPW	McNary Tailwater
JDY	John Day Forebay
JHAW	John Day Tailwater
TDA	The Dalles Forebay
TDDO	The Dalles Tailwater
BON	Bonneville Forebay
CCIW	Bonneville Tailwater (Cascade Island)
CWMW	Camas / Washougal

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UNITED STATES DISTRICT COURT

DISTRICT OF OREGON

NATIONAL WILDLIFE FEDERATION, *et al.* Plaintiffs, v. NATIONAL MARINE FISHERIES SERVICE, *et al.* Defendants.	Civil No. 01-640-RE **NOTICE OF FEDERAL DEFENDANTS' FOURTH 2011 SPILL IMPLEMENTATION STATUS REPORT**

In accordance with the Court's June 14, 2011 Order concerning 2011 summer spill

operations, Federal Defendants submit their fourth 2011 spill implementation status report. *See* Exhibit 1. This status report includes, among other things: the hourly flow through the powerhouse at each dam; the hourly flow over the spillway compared to the target spill for that hour; and the resultant 12-hour average total dissolved gas ("TDG") for the tailwater at each project and for the next project's forebay downstream. The report also provides written explanations of variances that occurred during the reporting period.

Respectfully submitted this 15th day of August, 2011.

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CERTIFICATE OF SERVICE

Pursuant to Local Rule Civil 100.13(c), and F.R. Civ. P. 5(d), I certify that on August 15, 2011, the foregoing will be electronically filed with the Court's electronic court filing system, which will generate automatic service upon on all Parties enrolled to receive such notice. The following will be manually served by overnight mail:

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FISH OPERATIONS PLAN IMPLEMENTATION REPORT
July 2011

Submitted by the U.S. Army Corps of Engineers
Northwestern Division
Portland, OR

Introduction:

The U.S. Army Corps of Engineers (Corps) is submitting this report in accordance with the U.S. District Court of Oregon June 14, 2011 Order adopting the 2011 Summer Fish Operations Plan (2011 Summer FOP). The 2011 Summer FOP describes the Corps' project operations for fish passage at its Federal Columbia River Power System (FCRPS) dams during the summer fish migration season, generally July through August. To the extent Corps project operations are not specified in the 2011 Summer FOP, the FCRPS operations will be consistent with the 2010 NOAA Fisheries Biological Opinion (2010 BiOp), the USFWS 2000 and 2006 BiOps, and/or other operative documents, including the 2011 Water Management Plan (WMP), WMP seasonal updates, and the 2011 Fish Passage Plan (FPP).

The Corps' July 2011 lower Snake and Columbia River project and fish passage operations are contained in this report. In particular, information in this report includes the following:

- hourly flow through the powerhouse at each dam;
- hourly flow over the spillway compared to the spill target for that hour; and,
- resultant 12-hour average percent Total Dissolved Gas (%TDG) levels in the tailrace at each project and in the subsequent downstream project's forebay and the Camas-Washougal gauge below Bonneville Dam.

This report also provides information on presented issues and unanticipated or emergency situations that arose during implementation of the 2011 Summer FOP in July.

Data Reporting:

I. For each project providing fish passage operations, this report contains two graphs per operational week[1] in July displaying the performance of the spill program as follows:

(A). Daily Average of the High 12 Hourly %TDG Values - described in the upper graph.
(B). Hourly Spill and Generation Flows - described in the lower graph.

The weekly graphs begin on July 4 and end on July 31 for the following lower Snake River and lower Columbia River projects: Lower Granite, Little Goose, Lower Monumental, Ice Harbor, McNary, John Day, The Dalles, and Bonneville.

[1] Operations are implemented from Monday through Sunday.

Each figure represents one week of operation for a project. The graphs start at 0000 hours (%TDG graphs) and 0100 hours (flow/spill graphs) on July 4 for the lower Snake River and Lower Columbia River projects.

July 4 –July 10	Figures 1 – 8
July 11 –July 17	Figures 9 – 16
July 18 –July 24	Figures 17 – 24
July 25 – July 31	Figures 25 – 32

A. Upper Graph: Shows the resultant daily average %TDG for the 12 highest hours. This is primarily a result of spill at dams. The objective is to operate each project up to the TDG limits without exceeding those limits to the extent practicable.

- The blue line represents the %TDG in the tailrace of the dam. 120% TDG is the upper operating limit.[2]
- The green line represents the %TDG in the forebay of the next dam downstream. 115% TDG is the upper operating limit.

B. Lower Graph: Shows the hourly flow and spill at the dam.

- The dotted blue line shows the flow through the powerhouse each hour, in thousand cubic feet per second (kcfs).
- The medium green line represents the average hourly total river flow through the project in kcfs.
- The heavy pink line represents the average hourly flow through the spillway in kcfs.
- The thin black line represents the hourly spill level as defined in the 2011 Summer FOP.
- The heavy black line represents the target spill. This is the hourly maximum spill level. The hourly target spill may vary as a function of total river flow, forebay elevation and generator capacity, subject to the following conditions:

    - spill percentage or discharge specified in the FOP;
    - spill caps as set daily for TDG management;
    - test spill levels for fish passage research;
    - minimum generation for power system needs;
    - minimum spill at Bonneville (50 kcfs) dam;
    - minimum spill at John Day is 25 percent of project outflow.

II. A table is included at the end of the figures that lists the average daily %TDG for the 12 highest hours for all projects. The numbers in red indicate the project exceeded the %TDG gas cap - 115 percent (forebay of the next downstream dam) or 120 percent (tailwater) for each project.

[2] On May 18 at 1400, the Bonneville tailwater TDG gauge was destroyed by high flows and debris; therefore, the blue line on Figure 24 of Exhibit 2 ends on this date. USGS is in the process of rebuilding the fixed monitoring station and currently estimates it will be operable in mid August. To set the spill caps, the Corps uses an analog to calculate the Bonneville tailwater %TDG levels using the Warrendale TDG gauge readings.

General Implementation Remarks:

For all projects that spill for fish passage, the target spill may be limited to a lesser quantity due to various conditions as described below. When spill levels briefly deviate below or above the level specified in the 2011 Summer FOP, the heavy pink line will be below or above the heavy black line in the graphs. Actual operation deviations from the target operation during voluntary spill hours are described below. The July 2011 Spill Variance Table includes average hourly data; therefore, while spill may vary from target spill for only a portion of an hour, the July 2011 Spill Variance Table characterizes the reduction as a full hour. There are instances when the hourly spill levels are not achievable due to mechanical limitations in setting spill gates to implement the regionally coordinated spill pattern. The project operator sets the spill gate stops to most closely approximate the 2011 Summer FOP level of spill while also avoiding exceeding the %TDG spill cap to the extent practicable.

"Low flow" operations at the lower Columbia and Snake projects are triggered when inflow is insufficient to provide both minimum generation and the specified spill levels. In these situations, the projects operate at minimum generation and spill the remainder of project inflow. As flows transition from higher flows to low flows, there may be situations when flows recede at a higher rate than forecasted. In addition, inflows provided by nonfederal projects upstream are variable and uncertain.

The combination of these factors may result in instances where unanticipated changes to inflow result in forebay elevations dropping to the low end of the Minimum Operating Pool (MOP). Since these projects have limited operating flexibility, maintaining minimum generation, MOP elevation, and the target spill may not be possible throughout every hour. During low flow periods at Little Goose Dam, the overall project spill percentage appears to be reduced because the calculations do not account for the volume of water released during navigational lockages; however, the actual spill volume remains constant. When these variances occur, they are recorded in the monthly Spill Variance Table for Little Goose under the variance type "Navigation."

Actual spill levels at Corps projects may range from 1 to 2 kcfs (Bonneville Dam may range from 1 to 3 kcfs) lower or higher than specified in the 2011 Summer FOP and the RCC spill priority list (defines the projects' %TDG spill caps). A number of factors influence actual spill, including hydraulic efficiency, exact gate opening calibration, spillway gate hoist cable stretch due to temperature changes, and forebay elevation (e.g., a higher forebay results in a greater volume of spill since more water can pass under the spill gate).

The 2011 Summer FOP describes project operations during "Rapid Load Changes" (p. 6). For reporting purposes, the notation "Transmission Stability" in the July 2011 Spill Variance Report Table replaces "Rapid Load Changes," and identifies instances when hourly spill levels were not met as a result of load swing hours and other related within-hour load variability issues. "Transmission Stability" occurs because projects must be available to respond to within-hour load variability to satisfy North American Electric Reliability Council (NERC) reserve requirements ("on response"). In addition to within-hour load variability, projects on response

must be responsive to within hour changes resulting from intermittent generation (such as wind generation). During periods of rapidly changing loads and intermittent generation, projects on response may have significant changes in turbine discharge within the hour while spill quantity remains the same within the hour. Under normal conditions, within-hour load changes primarily occur immediately preceding and following the peak load hours; however, within-hour changes in intermittent generation can occur at any hour of the day. Occasionally, several hours after peak load hours, the project may be decreasing total outflow and generation faster than the corresponding spill decreases causing the percent spill to be slightly higher. Due to the high variability of within-hour load, reporting actual spill percentages that vary by more than the ±1 percent requirement (or other ranges specified in the 2011 Summer FOP) may occur with greater frequency with "Transmission Stability" hours than other hours.

Occurrences requiring an adjustment in operations and/or regional coordination are described in greater detail in the "Operational Adjustments" section below.

July Operations:

The month of July was characterized by above average flows for the lower Snake and the lower Columbia Rivers caused by a combination of above normal rainfall and snow melt. The NOAA Northwest River Forecast Center's Runoff Processor indicates July 2011 runoff was above the 30 year average (1971-2000): 210 percent of average at Lower Granite Dam, and 167 percent of average at The Dalles Dam.

The high flow conditions resulted in instances of involuntary spill continuing through the month as flows exceeded powerhouse capacity or load requirements. In most involuntary spill instances, the resulting Daily Average of High 12 Hourly %TDG values exceeded the 115 percent forebay and 120 percent tailrace standards[3] as shown in the corresponding %TDG graphs for the lower Columbia and Snake River projects. In some instances of involuntary spill, the hourly %TDG values observed exceeded 125 %TDG.

During the July reporting period, planned spill operations according to the 2011 Summer FOP were as follows:

- Lower Granite Dam - The hourly target spill discharge was 18 kcfs 24-hours/day.
- Little Goose Dam - The hourly target spill discharge was 30 percent of total river discharge 24-hours/day.
- Lower Monumental Dam - The hourly target spill discharge was 17 kcfs 24-hours/day.
- Ice Harbor Dam - The hourly target spill alternated daily every two days between 45 kcfs daytime (0500-1800) and the %TDG spill cap nighttime vs. 30 percent of total river discharge 24-hours/day up to July 13, at which time the target spill was changed to 45 kcfs day/TDG spill cap night.
- McNary Dam - The hourly target spill discharge was 50 percent of total river discharge for 24-hours/day.

[3] As provided for in the 2011 Summer FOP (*see* pp. 2-3).

- John Day Dam - The hourly target spill alternated between 40 percent vs. 30 percent of total river discharge for 24-hours/day due to two-day treatment summer spill test up to July 20, at which time the target spill was changed to 30 percent of total river discharge for 24-hours/day.
- The Dalles Dam - The target spill discharge was 40 percent of total river discharge for 24-hours/day.
- Bonneville Dam - The hourly target spill discharge was alternating every two days between 95 kcfs 24-hours/day vs. 85 kcfs daytime/121 kcfs nighttime up to July 20, at which time the target spill was changed to 75 kcfs daytime/% TDG spill cap nighttime.

Operational Adjustments

1. Lower Granite Dam:

   On July 9 at 0100 hours, the Corps implemented the variable MOP operation at Lower Granite Dam pursuant to the SOR submitted by the Columbia River Towboaters Association on March 23 and modified by the Corps with TMT coordination on March 30 and April 1 (see April 2011 Fish Operations Plan Implementation Report). Beginning July 9, daily average inflow decreased below the threshold of 120 kcfs, initiating an increase of the Lower Granite Dam pool to MOP+1 (734 feet with 1-foot operating range) in order to address navigation safety concerns with lower flows. Beginning July 19, and continuing through the end of the month, inflows decreased below the threshold of 80 kcfs, initiating an increase to MOP+1.5 (734.5 feet with 1-foot operating range).

2. John Day Dam:

   On July 14, the Corps determined that the two spillway weirs (SWs) would remain in operation through the remainder of the summer spill season. The 2011 Summer FOP calls for a continuation of 2010 summer operations which ended operation of the SWs on July 21. Removing the SWs from service in July was a continuation of 2009 operations when a greater predation risk existed in the tailrace due to avian wire array limitations. Current tailrace predation risk has been greatly reduced due to the addition of a more extensive avian wire array. Based on these improvements, the Corps coordinated continued operation of the SWs to provide a safer and more efficient route of fish passage throughout the entire summer spill season with TMT on July 13 and FPOM on July 14. TMT and FPOM members either supported or did not object to the operation.

July 2011 Spill Variance Table

Project	Parameter	Date	Time[4]	Hours	Type	Reason
Little Goose	Reduced % Spill	7/20/11	1400	1	Navigation	Hourly spill decreased to 28.9% (below 30.0% ± 1% range). Reduced spill for safe passage of fish barge. 24 hr avg. spill was 29.7%.
Little Goose	Reduced % Spill	7/25/11	0900	1	Navigation	Hourly spill decreased to 28.0% (below 30.0% ± 1% range). Reduced spill for safe passage of fish barge. 24 hr avg. spill was 29.7%.
Little Goose	Reduced % Spill	7/25/11	1100	1	Navigation	Hourly spill decreased to 28.9% (below 30.0% ± 1% range). Reduced spill for safe passage of fish barge. 24 hr avg. spill was 29.7%.
Little Goose	Reduced % Spill	7/26/11	1200	1	Navigation	Hourly spill decreased to 28.3% (below 30.0% ± 1% range). Reduced spill for safe passage of fish barge. 24 hr avg. spill was 29.6%.
Little Goose	Reduced % Spill	7/26/11	1600-1700	2	Navigation	Hourly spill decreased ranging from 28.8 to 28.9% (below 30.0% ± 1% range). Reduced spill for safe passage of fish barge. 24 hr avg. spill was 29.6%.
Little Goose	Reduced % Spill	7/27/11	2000	1	Navigation	Hourly spill decreased to 28.7% (below 30.0% ± 1% range). Reduced spill for safe passage of fish barge. 24 hr avg. spill was 29.8%.
Little Goose	Reduced % Spill	7/29/11	0500-0600	2	Navigation	Hourly spill decreased ranging from 28.5 to 28.9% (below 30.0% ± 1% range). Reduced spill for safe passage of fish barge. 24 hr avg. spill was 29.7%.
Little Goose	Reduced % Spill	7/30/11	0400	1	Navigation	Hourly spill to 28.8% (below 30.0% ± 1% range). Reduced spill for safe passage of fish barge. 24 hr avg. spill was 29.8%.
Lower Monumental	Reduced Spill	7/10/11	1800-1900	2	Navigation	Hourly spill decreased to 13.8 kcfs (below 17 kcfs FOP spill). Reduced spill for safe passage of fish barge.
Lower Monumental	Reduced Spill	7/12/11	1700-1800	2	Navigation	Hourly spill decreased to 13.6 kcfs (below 17 kcfs FOP spill). Reduced spill for safe passage of fish barge.

Lower Monumental	Reduced Spill	7/14/11	1800-1900	2	Navigation	Hourly spill decreased to 13.9 kcfs (below 17 kcfs FOP spill). Reduced spill for safe passage of fish barge.
Lower Monumental	Reduced Spill	7/16/11	1700	1	Navigation	Hourly spill decreased to 13.9 kcfs (below 17 kcfs FOP spill). Reduced spill for safe passage of fish barge.
Lower Monumental	Reduced Spill	7/18/11	1800	1	Navigation	Hourly spill decreased to 15.3 kcfs (below 17 kcfs FOP spill). Reduced spill for safe passage of fish barge.
Lower Monumental	Reduced Spill	7/22/11	1700-1800	2	Navigation	Hourly spill decreased ranging from 10.3 to 14.6 kcfs (below 17 kcfs FOP spill). Reduced spill for safe passage of fish barge.
Lower Monumental	Reduced Spill	7/25/11	0700	1	Navigation	Hourly spill decreased to 15.3 kcfs (below 17 kcfs FOP spill). Reduced spill for safe passage of fish barge.
Lower Monumental	Reduced Spill	7/26/11	1600-1700	2	Navigation	Hourly spill decreased ranging from 14.7 to 15.8 kcfs (below 17 kcfs FOP spill). Reduced spill for safe passage of fish barge.
Lower Monumental	Reduced Spill	7/28/11	1700	1	Navigation	Hourly spill decreased to 12.0 kcfs (below 17 kcfs FOP spill). Reduced spill for safe passage of fish barge.
Lower Monumental	Reduced Spill	7/30/11	1600-1700	2	Navigation	Hourly spill decreased ranging from 13.1 to 14.9 kcfs (below 17 kcfs FOP spill). Reduced spill for safe passage of fish barge.
McNary	Reduced % Spill	7/21/11	0700	1	Navigation	Hourly spill decreased to 45.9% (below 50.0% ± 1% range). Reduced spill for safe passage of fish barge. Due to involuntary spill, 24 hr avg. spill was 55.0%.
McNary	Reduced % Spill	7/23/11	0700	1	Navigation	Hourly spill decreased to 41.3% (below 50.0% ± 1% range). Reduced spill for safe passage of fish barge. 24 hr avg. spill was 49.4%.

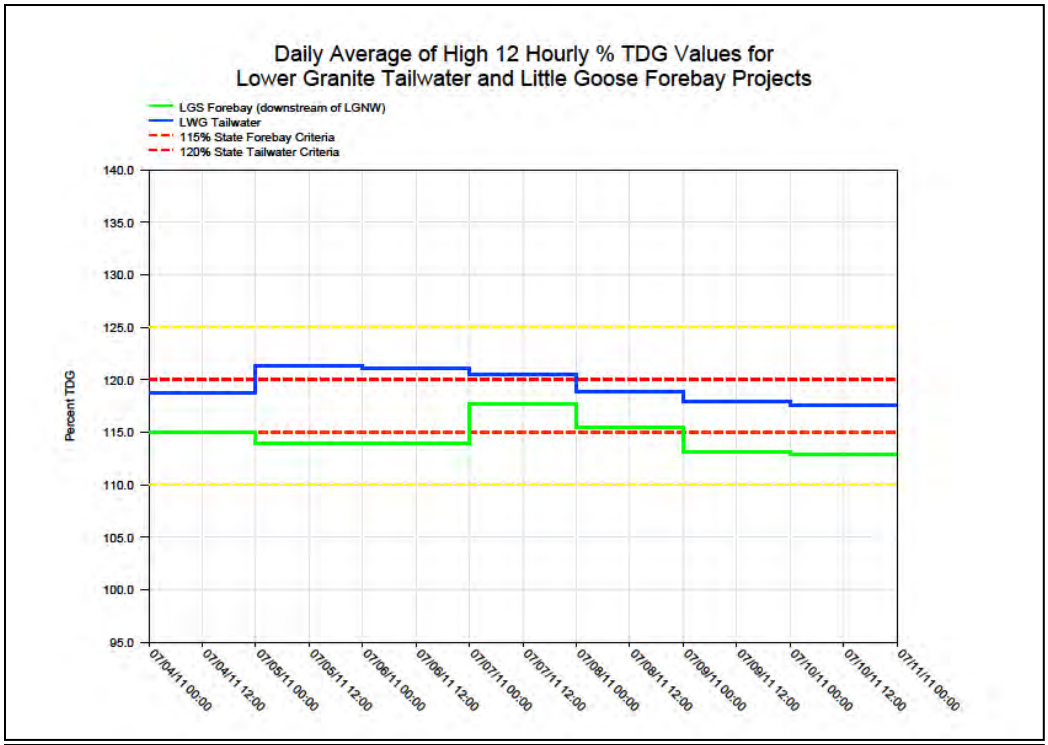
McNary	Reduced % Spill	7/23/11	1000-1100	2	Navigation	Hourly spill decreased to 45.6% (below 50.0% ± 1% range). Reduced spill for safe passage of fish barge. 24 hr avg. spill was 49.4%.
McNary	Additional % Spill	7/25/11	0700-1500	9	Maintenance	Hourly spill increased ranging from 56.0 to 58.4% (above 50.0% ± 1% range). Units were taken offline in order to perform doble testing. 24 hr avg. spill was 54.5%.
McNary	Reduced % Spill	7/25/11	1600	1	Navigation	Hourly spill decreased to 45.9% (below 50.0% ± 1% range). Reduced spill for safe passage of fish barge. 24 hr avg. spill was 54.5%.
McNary	Additional % Spill	7/25/11 - 7/26/11	1700-0300	11	Maintenance	Hourly spill increased ranging from 51.5 to 56.3% (above 50.0% ± 1% range). Units were taken offline in order to perform doble testing.
McNary	Additional % Spill	7/26/11	1100-1700	7	Maintenance	Hourly spill increased ranging from 51.5 to 53.4% (above 50.0% ± 1% range). Units were taken offline in order to perform doble testing. 24 hr avg. spill was 51.4%.
McNary	Reduced % Spill	7/27/11	0700	1	Navigation	Hourly spill decreased to 43.1% (below 50.0% ± 1% range). Reduced spill for safe passage of fish barge. 24 hr avg. spill was 50.0%.
McNary	Reduced % Spill	7/27/11	1000	1	Navigation	Hourly spill decreased to 48.1% (below 50.0% ± 1% range). Reduced spill for safe passage of fish barge. 24 hr avg. spill was 50.0%.
McNary	Reduced % Spill	7/29/11	0700	1	Navigation	Hourly spill decreased to 41.9% (below 50.0% ± 1% range). Reduced spill for safe passage of fish barge. 24 hr avg. spill was 49.6%.
McNary	Reduced % Spill	7/29/11	1100	1	Navigation	Hourly spill decreased to 45.6% (below 50.0% ± 1% range). Reduced spill for safe passage of fish barge. 24 hr avg. spill was 49.6%.
McNary	Reduced % Spill	7/31/11	0700	1	Navigation	Hourly spill decreased to 46.2% (below 50.0% ± 1% range). Reduced spill for safe passage of fish barge. 24 hr avg. spill was 49.9%.

John Day	Additional % Spill	7/18/11	2000	1	Human/Program Error	Hourly spill increased to 38.8% (above 30.0% ± 1% range). Request to change spill occurred an hour early. 24 hr avg. spill was 32.2%.
John Day	Reduced % Spill	7/18/11	2300	1	Transmission Stability	Hourly spill decreased to 38.0% (below 40.0% ± 1% range). Project on response during intermittent generation. See p. 3-4. 24 hr avg. spill was 32.2%.
John Day	Additional % Spill	7/18/11	2400	1	Transmission Stability	Hourly spill increased to 41.2% (above 40.0% ± 1% range). Project on response during intermittent generation. See p. 3-4. 24 hr avg. spill was 32.2%.
John Day	Additional % Spill	7/19/11	0100	1	Transmission Stability	Hourly spill increased to 43.5% (above 40.0% ± 1% range). Project on response during intermittent generation. See p. 3-4. 24 hr avg. spill was 40.2%.
The Dalles	Additional % Spill	7/14/11	0200-0500	4	Operational Limitation	Hourly spill increased to 43.8% (above 40.0% ± 1% range) due to project maintaining forebay elevation for tribal treaty fishing.
The Dalles	Reduced % Spill	7/18/11	1700	1	Transmission Stability	Hourly spill decreased to 37.2% (below 40.0% ± 1% range). Project on response during intermittent generation. See p. 3-4. 24 hr avg. spill was 39.4%.
The Dalles	Reduced % Spill	7/19/11	1400	1	Human/Program Error	Hourly spill decreased to 38.8% (below 40.0% ± 1% range) due to a miscalculation. 24 hr avg. spill was 40.0%.
The Dalles	Reduced % Spill	7/24/11	1600	1	Human/Program Error	Hourly spill decreased to 38.3% (below 40.0% ± 1% range). GDACS error reporting forebay elevation, data was manually corrected and GDACS was reset. Spill was reduced due to low forebay elevation. 24 hr avg. spill was 39.9%.

The Dalles	Additional % Spill	7/25/11	0300	1	Transmission Stability	Hourly spill increased to 41.4% (above 40.0% ± 1% range). Project on response during intermittent generation. See p. 3-4. 24 hr avg. spill was 39.9%.
Bonneville	Additional Spill	7/25/11 - 7/29/11	0900-2200	110	Maintenance	Hourly spill increased to 168.6 kcfs (above 75 kcfs during the day and 130 kcfs at night). Transmission line maintenance resulting in reduced generation and spill of excess flow
Bonneville	Reduced Spill	7/29/11	2300	1	Maintenance	Hourly spill decreased to 122.9 kcfs (below 130 kcfs at night). Delay in transitioning to nighttime spill due to transmission line maintenance.

Note: Data collected for reporting spill variances is reported using hourly-averaged data. Therefore, while spill may be increased or decreased for only a portion of an hour, it is represented in the Spill Variance Table as an hour.

Figure 1


Daily Average of High 12 Hourly % TDG Values for
Lower Granite Tailwater and Little Goose Forebay Projects
LGS Forebay (downstream of LGNW)
LWG Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/04/11 00:00
07/04/11 12:00
07/05/11 00:00
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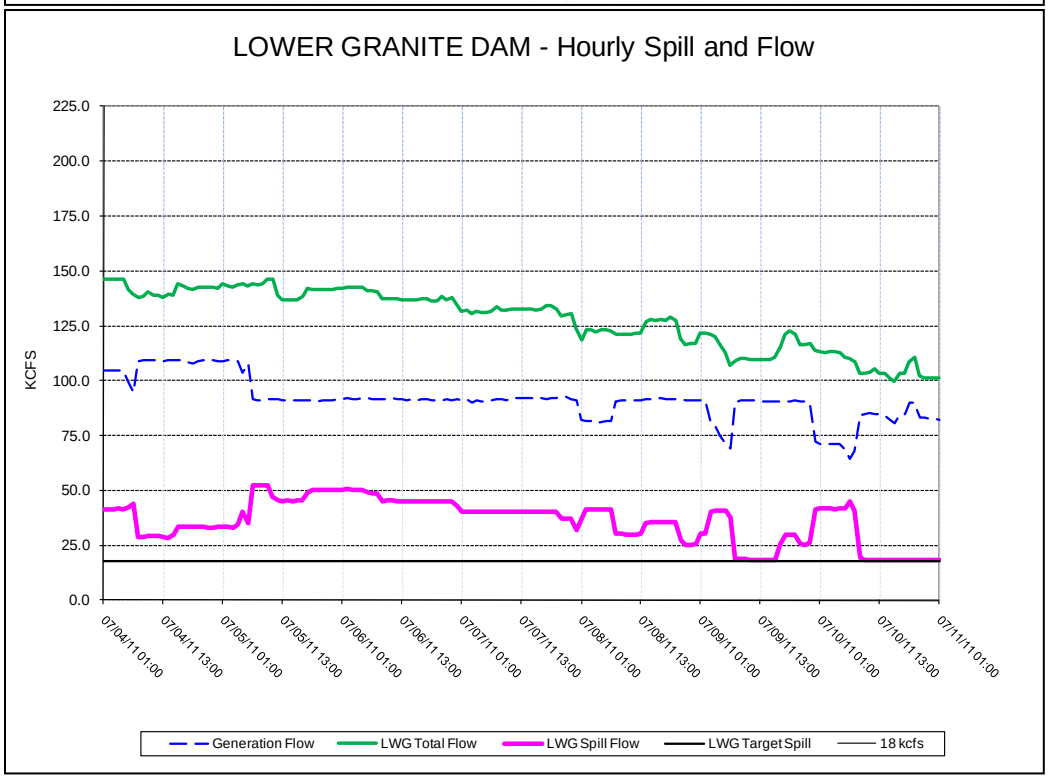
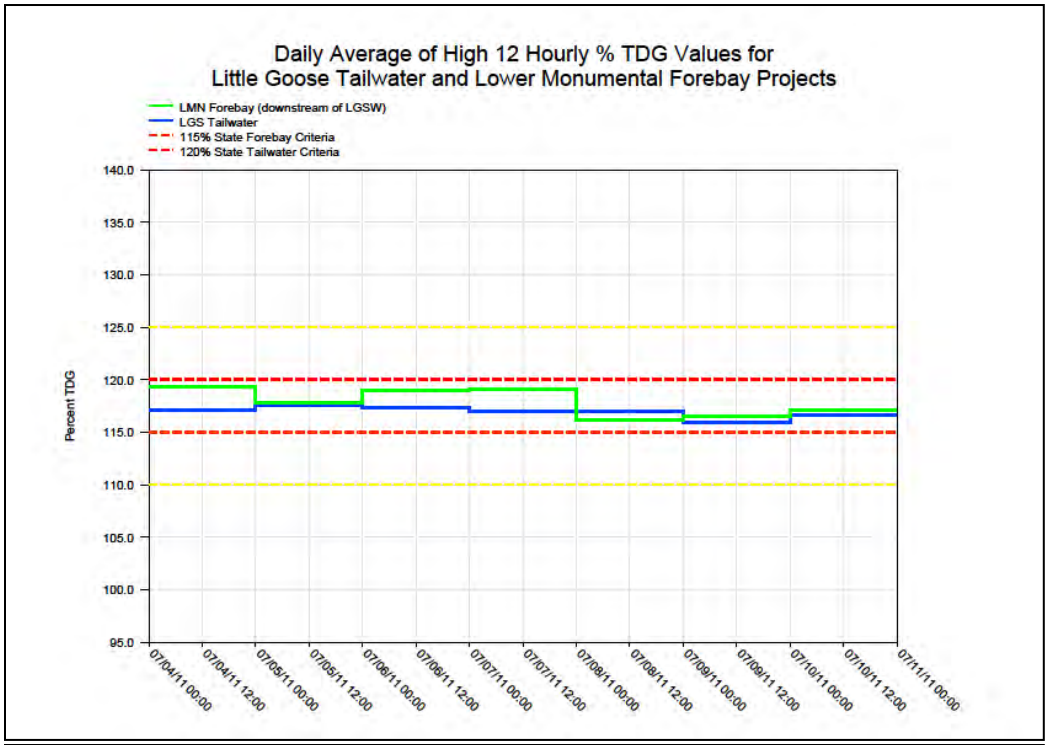

LOWER GRANITE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
07/04/11 01:00
07/04/11 13:00
07/05/11 01:00
07/05/11 13:00
07/06/11 01:00
07/06/11 13:00
07/07/11 01:00
07/07/11 13:00
07/08/11 01:00
07/08/11 13:00
07/09/11 01:00
07/09/11 13:00
07/10/11 01:00
07/10/11 13:00
07/11/11 01:00
Generation Flow
LWG Total Flow
LWG Spill Flow
LWG Target Spill
18 kcfs

Figure 2


Daily Average of High 12 Hourly % TDG Values for
Little Goose Tailwater and Lower Monumental Forebay Projects
LMN Forebay (downstream of LGSW)
LGS Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/04/11 00:00
07/04/11 12:00
07/05/11 00:00
07/05/11 12:00
07/06/11 00:00
07/06/11 12:00
07/07/11 00:00
07/07/11 12:00
07/08/11 00:00
07/08/11 12:00
07/09/11 00:00
07/09/11 12:00
07/10/11 00:00
07/10/11 12:00
07/11/11 00:00

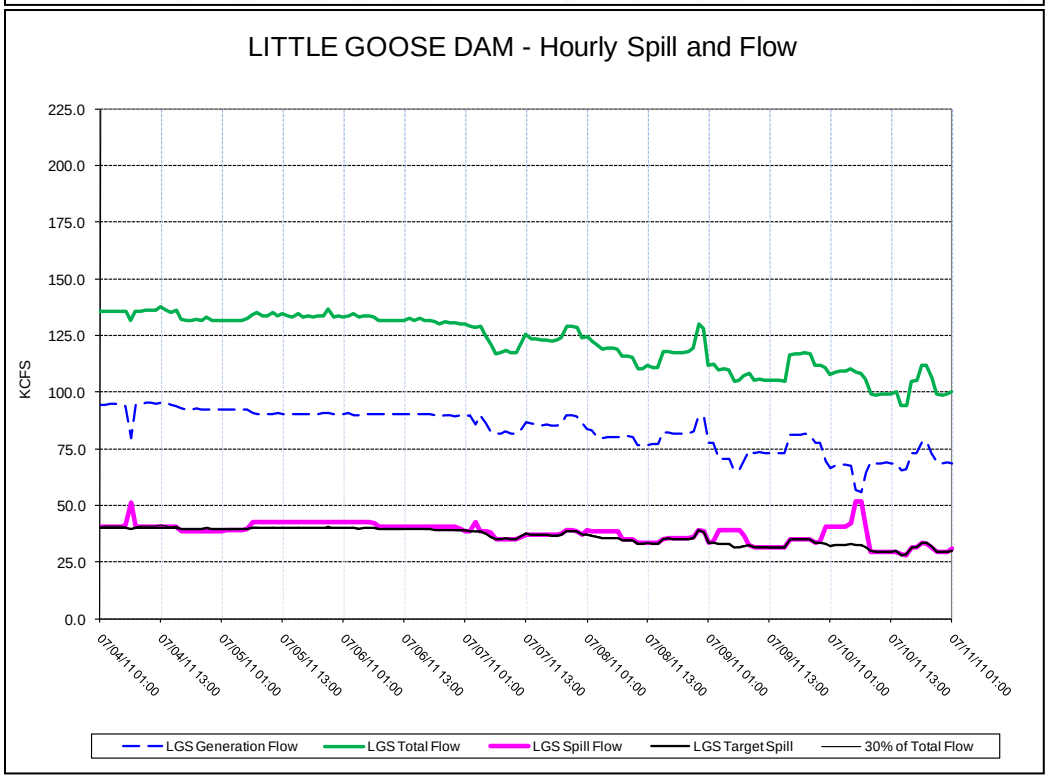
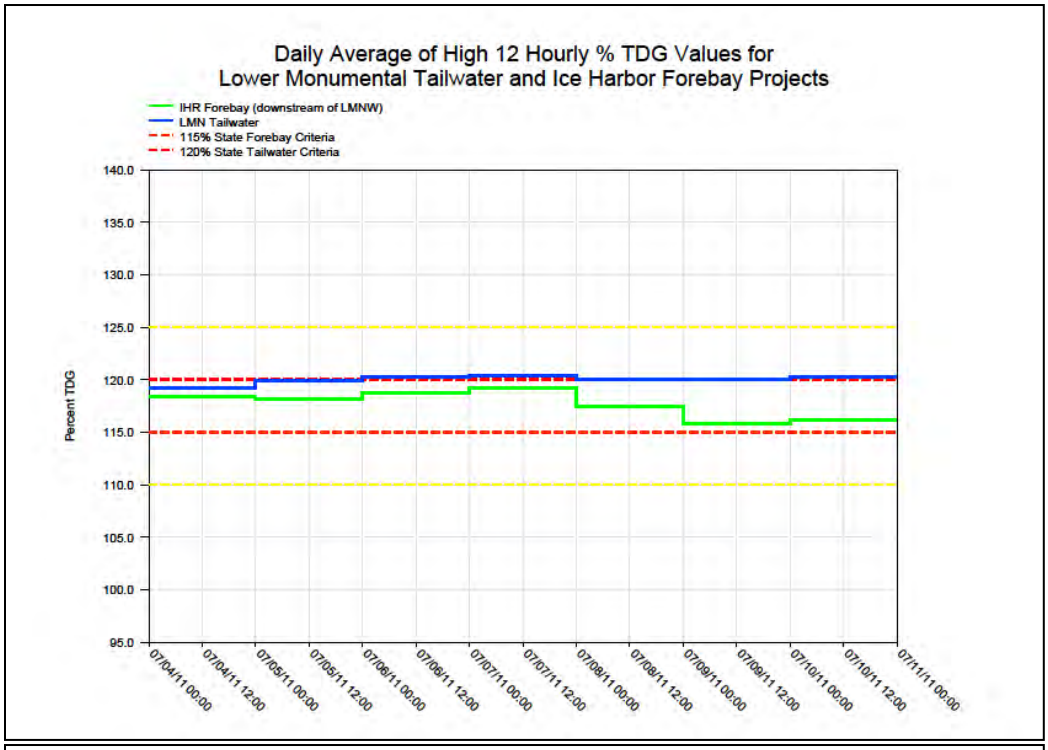

LITTLE GOOSE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
07/04/11 01:00
07/04/11 13:00
07/05/11 01:00
07/05/11 13:00
07/06/11 01:00
07/06/11 13:00
07/07/11 01:00
07/07/11 13:00
07/08/11 01:00
07/08/11 13:00
07/09/11 01:00
07/09/11 13:00
07/10/11 01:00
07/10/11 13:00
07/11/11 01:00
LGS Generation Flow
LGS Total Flow
LGS Spill Flow
LGS Target Spill
30% of Total Flow

Figure 3


Daily Average of High 12 Hourly % TDG Values for
Lower Monumental Tailwater and Ice Harbor Forebay Projects
IHR Forebay (downstream of LMNW)
LMN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/04/11 00:00
07/04/11 12:00
07/05/11 00:00
07/05/11 12:00
07/06/11 00:00
07/06/11 12:00
07/07/11 00:00
07/07/11 12:00
07/08/11 00:00
07/08/11 12:00
07/09/11 00:00
07/09/11 12:00
07/10/11 00:00
07/10/11 12:00
07/11/11 00:00

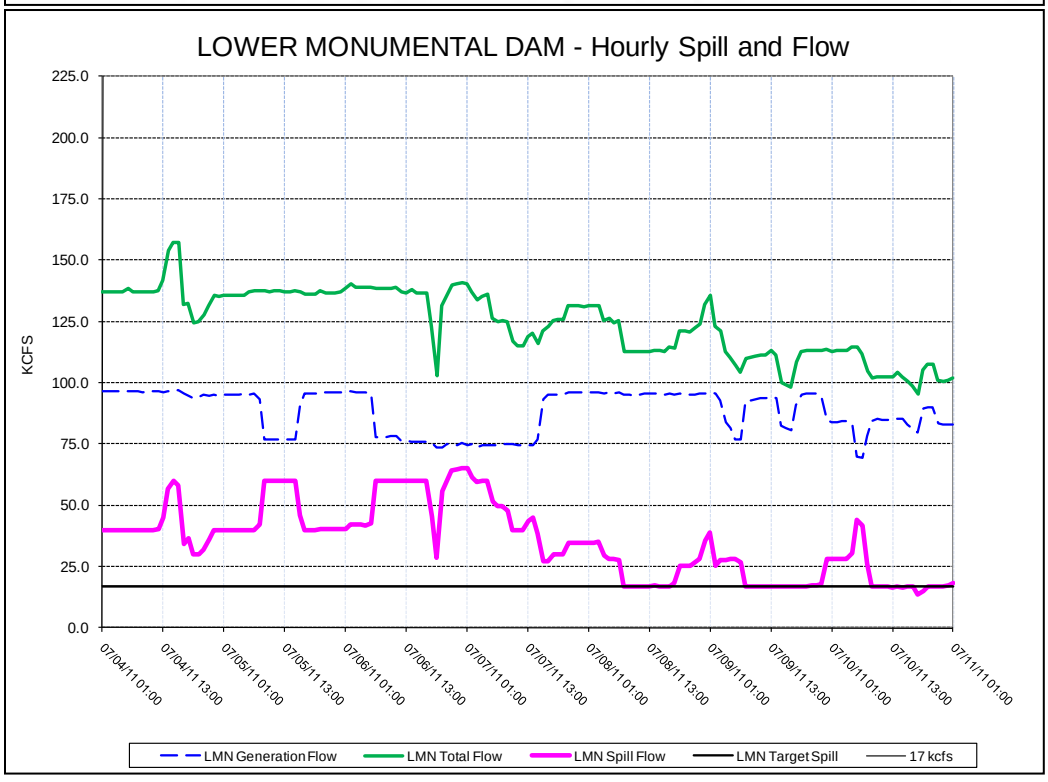
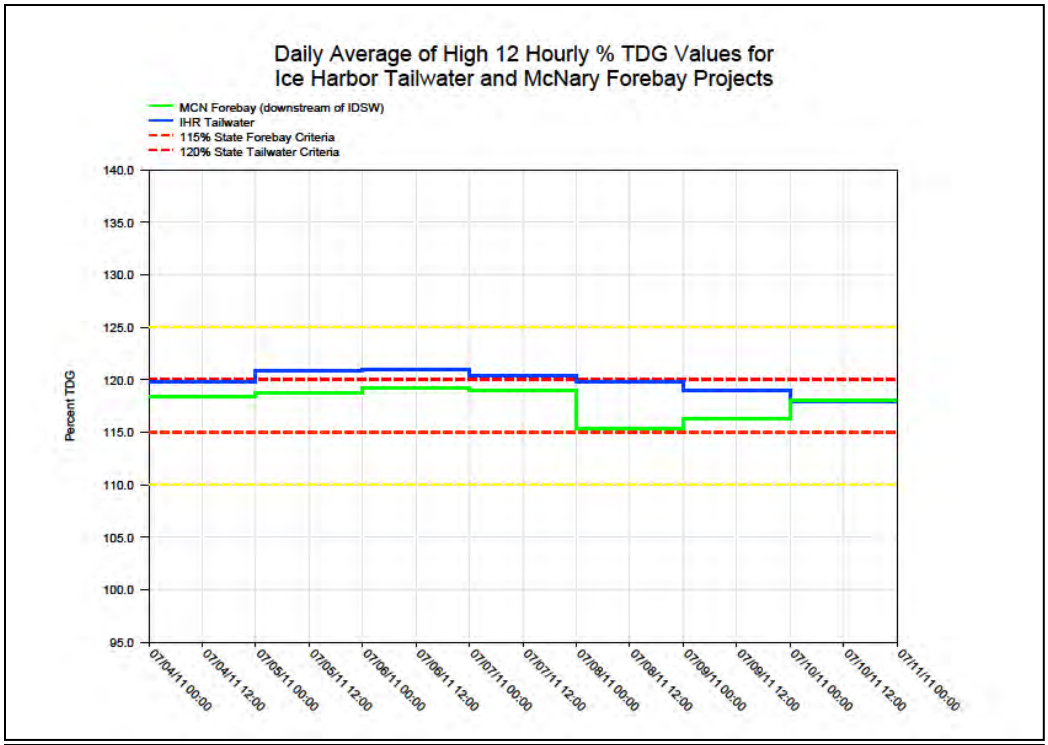

LOWER MONUMENTAL DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
07/04/11 01:00
07/04/11 13:00
07/05/11 01:00
07/05/11 13:00
07/06/11 01:00
07/06/11 13:00
07/07/11 01:00
07/07/11 13:00
07/08/11 01:00
07/08/11 13:00
07/09/11 01:00
07/09/11 13:00
07/10/11 01:00
07/10/11 13:00
07/11/11 01:00
LMN Generation Flow
LMN Total Flow
LMN Spill Flow
LMN Target Spill
17 kcfs

Figure 4


Daily Average of High 12 Hourly % TDG Values for
Ice Harbor Tailwater and McNary Forebay Projects
MCN Forebay (downstream of IDSW)
IHR Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/04/11 00:00
07/04/11 12:00
07/05/11 00:00
07/05/11 12:00
07/06/11 00:00
07/06/11 12:00
07/07/11 00:00
07/07/11 12:00
07/08/11 00:00
07/08/11 12:00
07/09/11 00:00
07/09/11 12:00
07/10/11 00:00
07/10/11 12:00
07/11/11 00:00

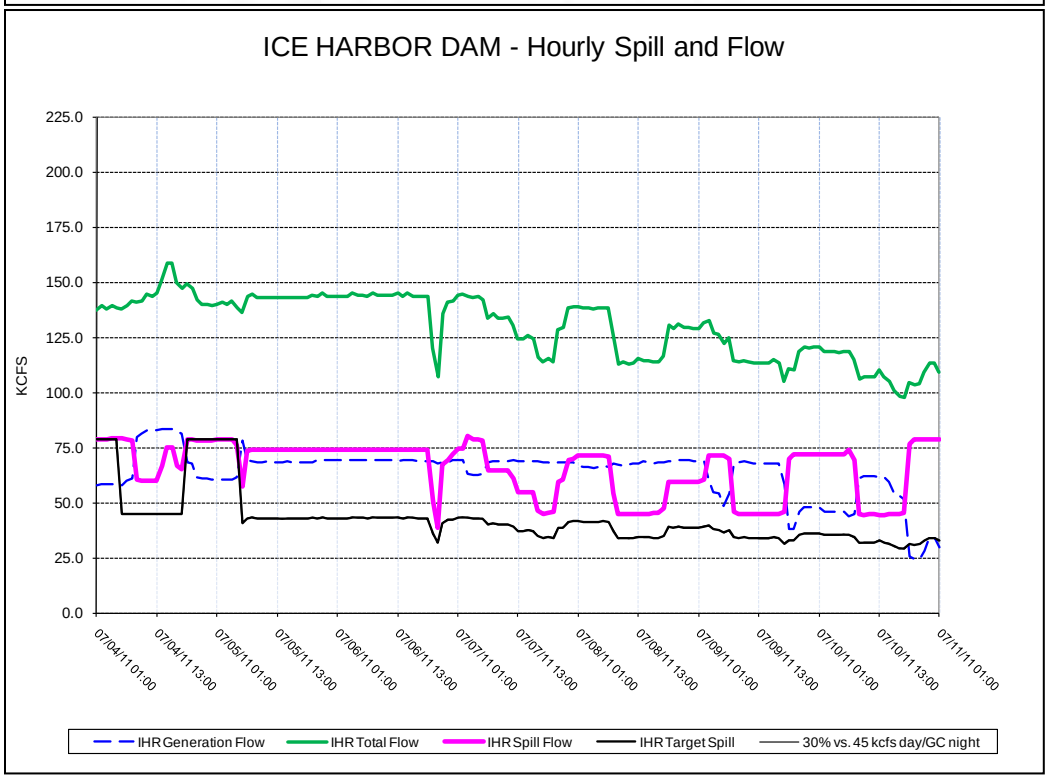

ICE HARBOR DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
07/04/11 01:00
07/04/11 13:00
07/05/11 01:00
07/05/11 13:00
07/06/11 01:00
07/06/11 13:00
07/07/11 01:00
07/07/11 13:00
07/08/11 01:00
07/08/11 13:00
07/09/11 01:00
07/09/11 13:00
07/10/11 01:00
07/10/11 13:00
07/11/11 01:00
IHR Generation Flow
IHR Total Flow
IHR Spill Flow
IHR Target Spill
30% vs. 45 kcfs day/GC night

Figure 5

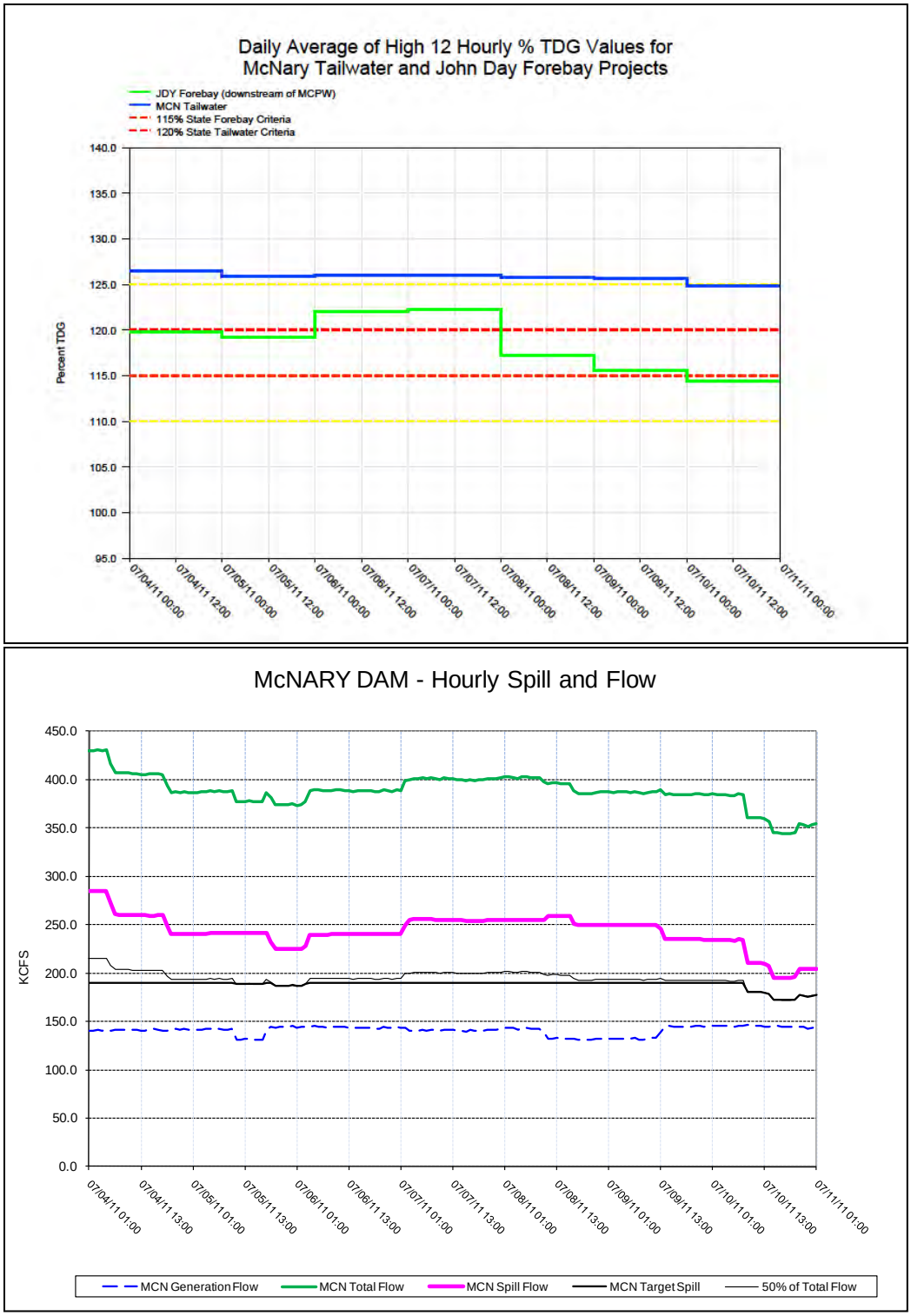
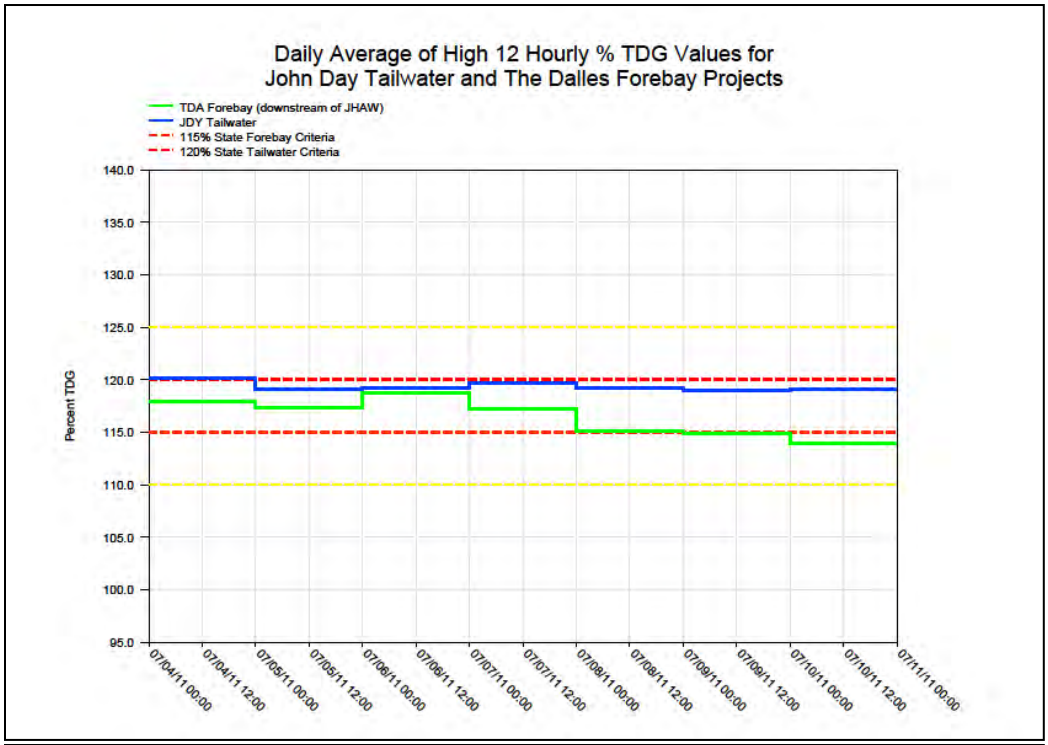

Daily Average of High 12 Hourly % TDG Values for
McNary Tailwater and John Day Forebay Projects
JDY Forebay (downstream of MCPW)
MCN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/04/11 00:00
07/04/11 12:00
07/05/11 00:00
07/05/11 12:00
07/06/11 00:00
07/06/11 12:00
07/07/11 00:00
07/07/11 12:00
07/08/11 00:00
07/08/11 12:00
07/09/11 00:00
07/09/11 12:00
07/10/11 00:00
07/10/11 12:00
07/11/11 00:00
McNARY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
07/04/11 01:00
07/04/11 13:00
07/05/11 01:00
07/05/11 13:00
07/06/11 01:00
07/06/11 13:00
07/07/11 01:00
07/07/11 13:00
07/08/11 01:00
07/08/11 13:00
07/09/11 01:00
07/09/11 13:00
07/10/11 01:00
07/10/11 13:00
07/11/11 01:00
MCN Generation Flow
MCN Total Flow
MCN Spill Flow
MCN Target Spill
50% of Total Flow

Figure 6


Daily Average of High 12 Hourly % TDG Values for
John Day Tailwater and The Dalles Forebay Projects
TDA Forebay (downstream of JHAW)
JDY Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/04/11 00:00
07/04/11 12:00
07/05/11 00:00
07/05/11 12:00
07/06/11 00:00
07/06/11 12:00
07/07/11 00:00
07/07/11 12:00
07/08/11 00:00
07/08/11 12:00
07/09/11 00:00
07/09/11 12:00
07/10/11 00:00
07/10/11 12:00
07/11/11 00:00

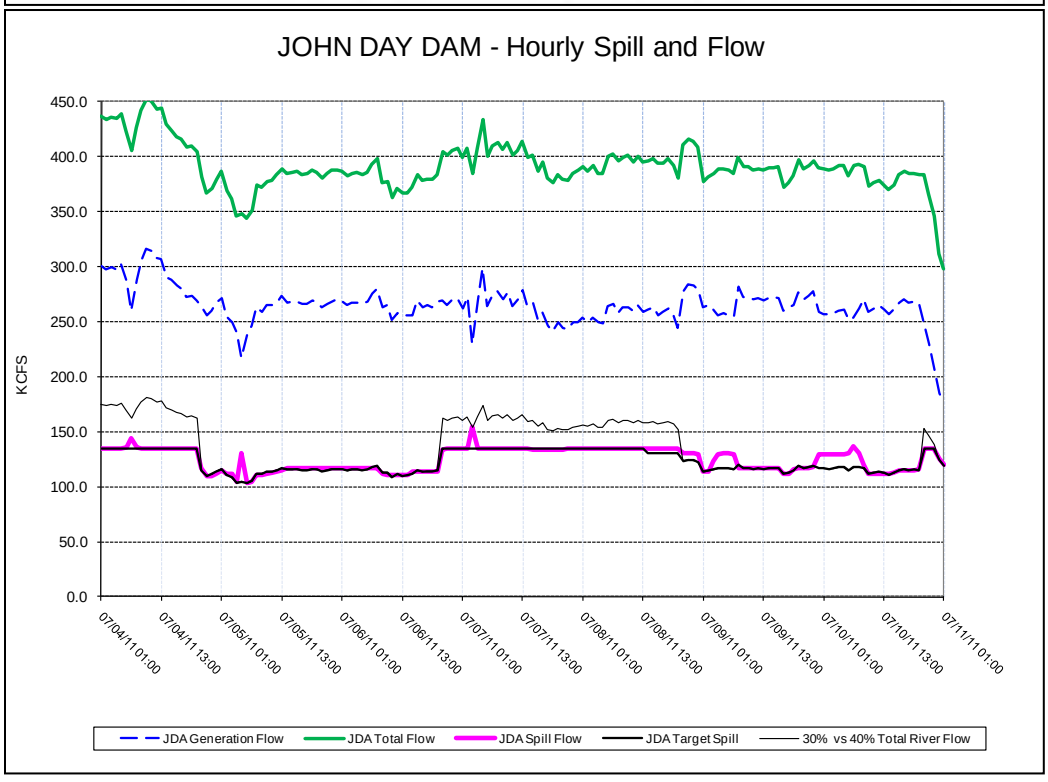
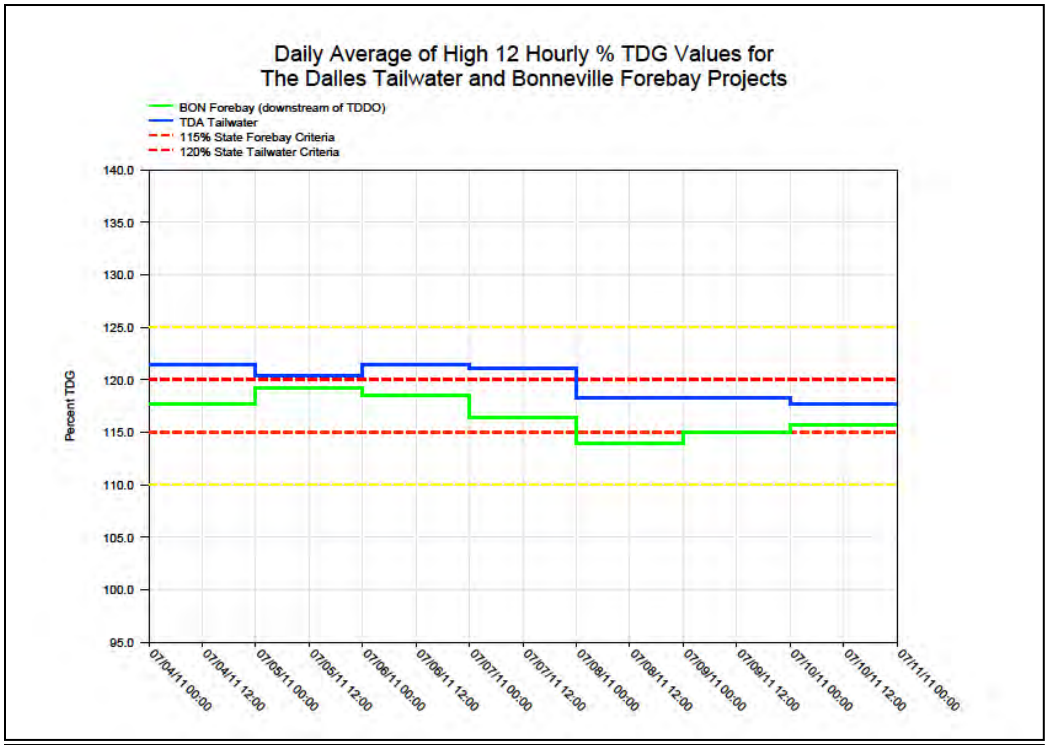

JOHN DAY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
07/04/11 01:00
07/04/11 13:00
07/05/11 01:00
07/05/11 13:00
07/06/11 01:00
07/06/11 13:00
07/07/11 01:00
07/07/11 13:00
07/08/11 01:00
07/08/11 13:00
07/09/11 01:00
07/09/11 13:00
07/10/11 01:00
07/10/11 13:00
07/11/11 01:00
JDA Generation Flow
JDA Total Flow
JDA Spill Flow
JDA Target Spill
30% vs 40% Total River Flow

Figure 7


Daily Average of High 12 Hourly % TDG Values for
The Dalles Tailwater and Bonneville Forebay Projects
BON Forebay (downstream of TDDO)
TDA Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/04/11 00:00
07/04/11 12:00
07/05/11 00:00
07/05/11 12:00
07/06/11 00:00
07/06/11 12:00
07/07/11 00:00
07/07/11 12:00
07/08/11 00:00
07/08/11 12:00
07/09/11 00:00
07/09/11 12:00
07/10/11 00:00
07/10/11 12:00
07/11/11 00:00

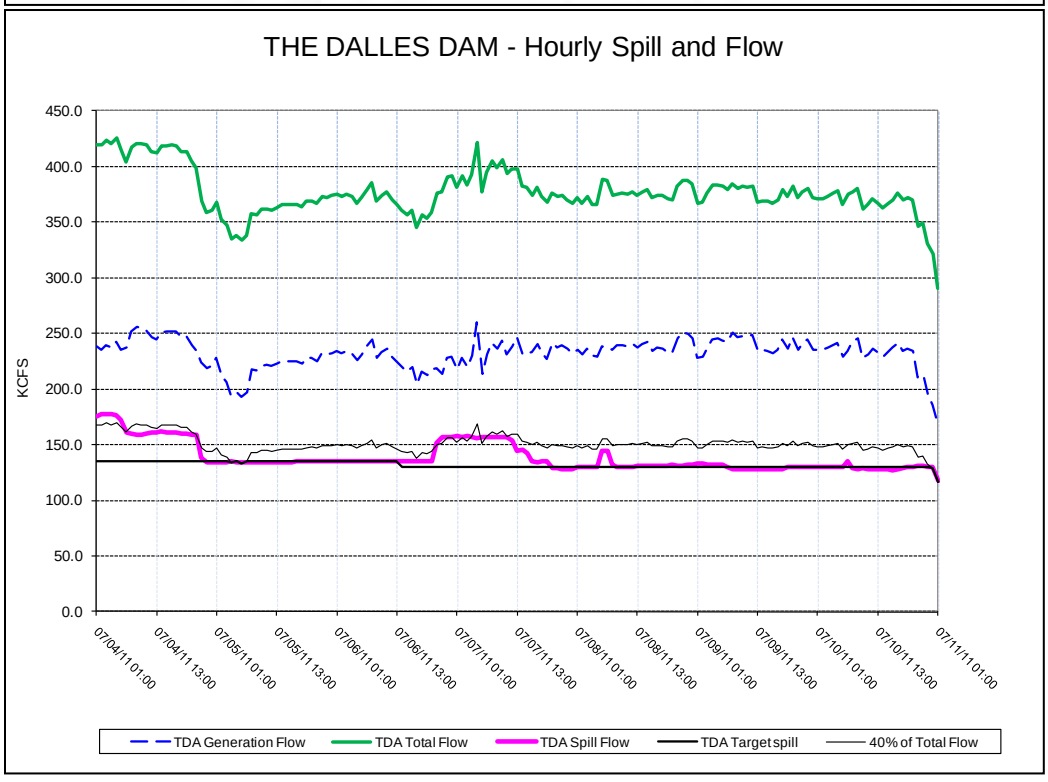
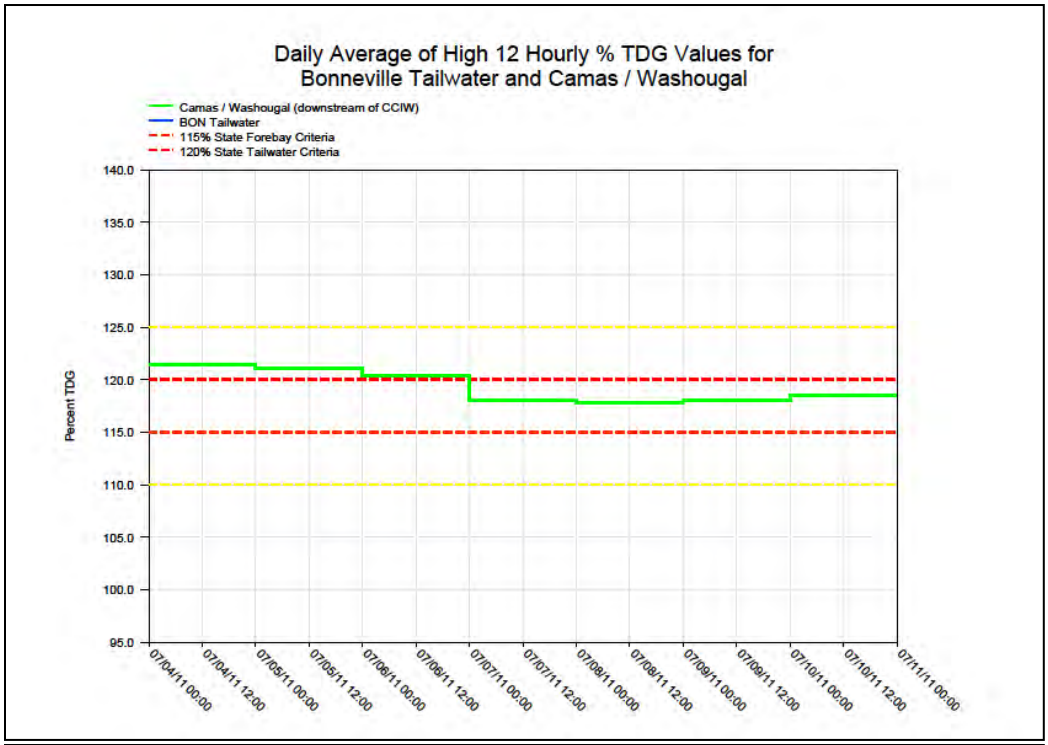

THE DALLES DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
07/04/11 01:00
07/04/11 13:00
07/05/11 01:00
07/05/11 13:00
07/06/11 01:00
07/06/11 13:00
07/07/11 01:00
07/07/11 13:00
07/08/11 01:00
07/08/11 13:00
07/09/11 01:00
07/09/11 13:00
07/10/11 01:00
07/10/11 13:00
07/11/11 01:00
TDA Generation Flow
TDA Total Flow
TDA Spill Flow
TDA Target spill
40% of Total Flow

Figure 8


Daily Average of High 12 Hourly % TDG Values for
Bonneville Tailwater and Camas / Washougal
Camas / Washougal (downstream of CCIW)
BON Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/04/11 00:00
07/04/11 12:00
07/05/11 00:00
07/05/11 12:00
07/06/11 00:00
07/06/11 12:00
07/07/11 00:00
07/07/11 12:00
07/08/11 00:00
07/08/11 12:00
07/09/11 00:00
07/09/11 12:00
07/10/11 00:00
07/10/11 12:00
07/11/11 00:00

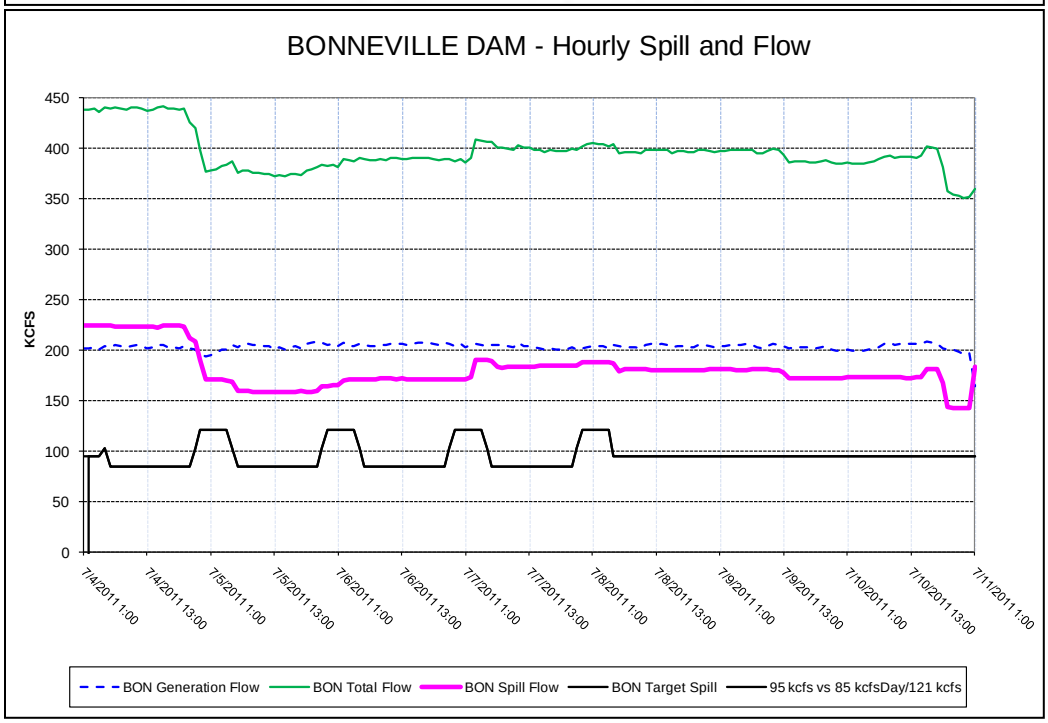

BONNEVILLE DAM - Hourly Spill and Flow
KCFS
450
400
350
300
250
200
150
100
50
0
7/4/2011 1:00
7/4/2011 13:00
7/5/2011 1:00
7/5/2011 13:00
7/6/2011 1:00
7/6/2011 13:00
7/7/2011 1:00
7/7/2011 13:00
7/8/2011 1:00
7/8/2011 13:00
7/9/2011 1:00
7/9/2011 13:00
7/10/2011 1:00
7/10/2011 13:00
7/11/2011 1:00
BON Generation Flow
BON Total Flow
BON Spill Flow
BON Target Spill
95 kcfs vs 85 kcfsDay/121 kcfs

Figure 9

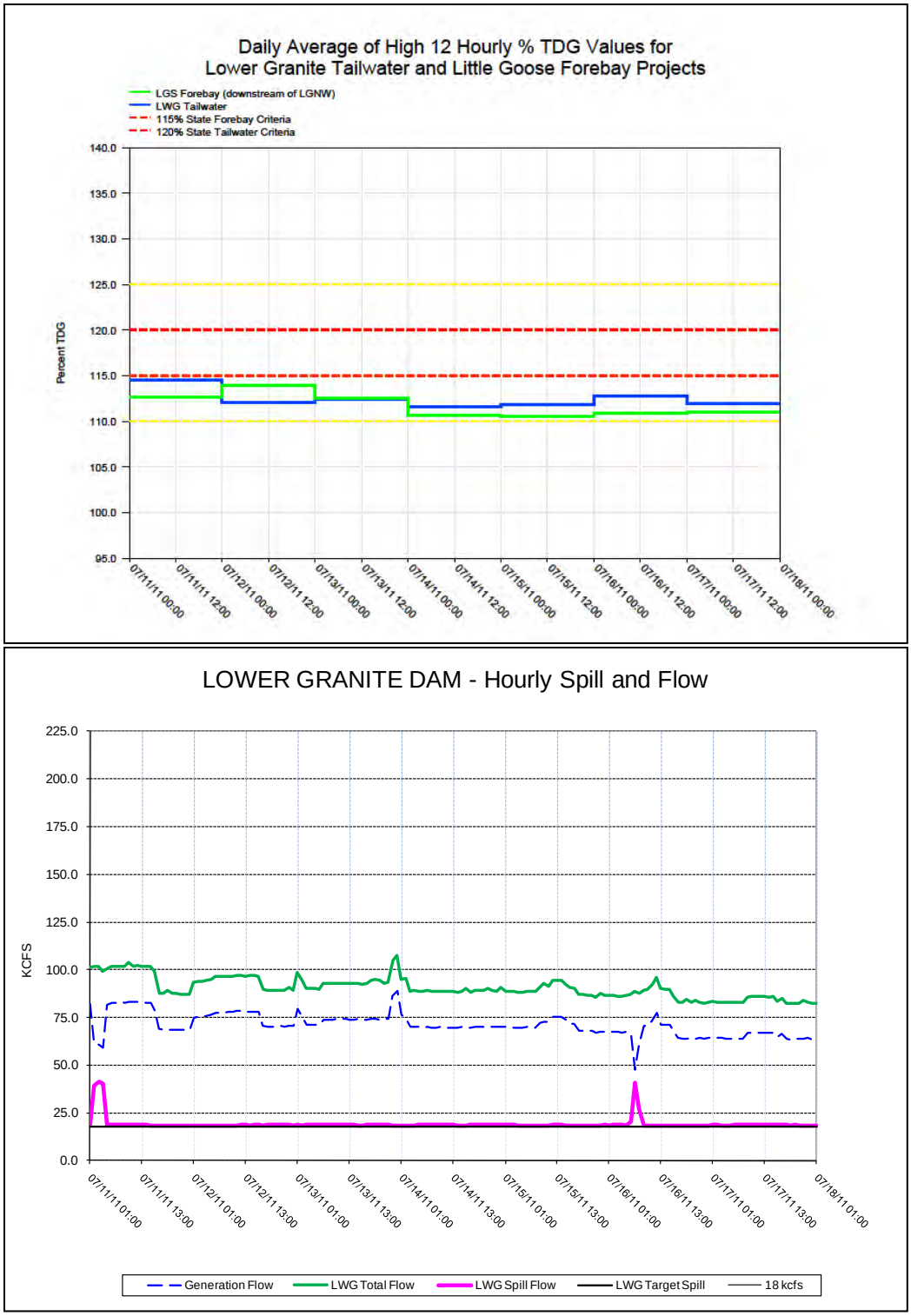
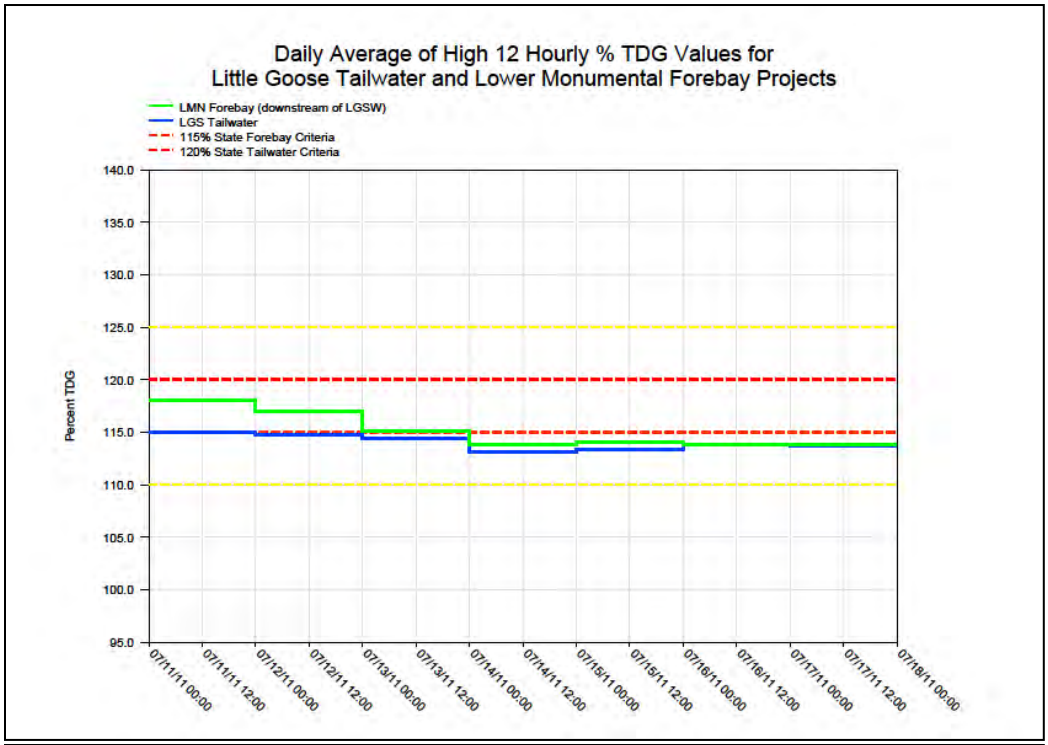

Daily Average of High 12 Hourly % TDG Values for
Lower Granite Tailwater and Little Goose Forebay Projects
LGS Forebay (downstream of LGNW)
LWG Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/11/11 00:00
07/11/11 12:00
07/12/11 00:00
07/12/11 12:00
07/13/11 00:00
07/13/11 12:00
07/14/11 00:00
07/14/11 12:00
07/15/11 00:00
07/15/11 12:00
07/16/11 00:00
07/16/11 12:00
07/17/11 00:00
07/17/11 12:00
07/18/11 00:00
LOWER GRANITE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
07/11/11 01:00
07/11/11 13:00
07/12/11 01:00
07/12/11 13:00
07/13/11 01:00
07/13/11 13:00
07/14/11 01:00
07/14/11 13:00
07/15/11 01:00
07/15/11 13:00
07/16/11 01:00
07/16/11 13:00
07/17/11 01:00
07/17/11 13:00
07/18/11 01:00
Generation Flow
LWG Total Flow
LWG Spill Flow
LWG Target Spill
18 kcfs

Figure 10


Daily Average of High 12 Hourly % TDG Values for
Little Goose Tailwater and Lower Monumental Forebay Projects
LMN Forebay (downstream of LGSW)
LGS Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/11/11 00:00
07/11/11 12:00
07/12/11 00:00
07/12/11 12:00
07/13/11 00:00
07/13/11 12:00
07/14/11 00:00
07/14/11 12:00
07/15/11 00:00
07/15/11 12:00
07/16/11 00:00
07/16/11 12:00
07/17/11 00:00
07/17/11 12:00
07/18/11 00:00

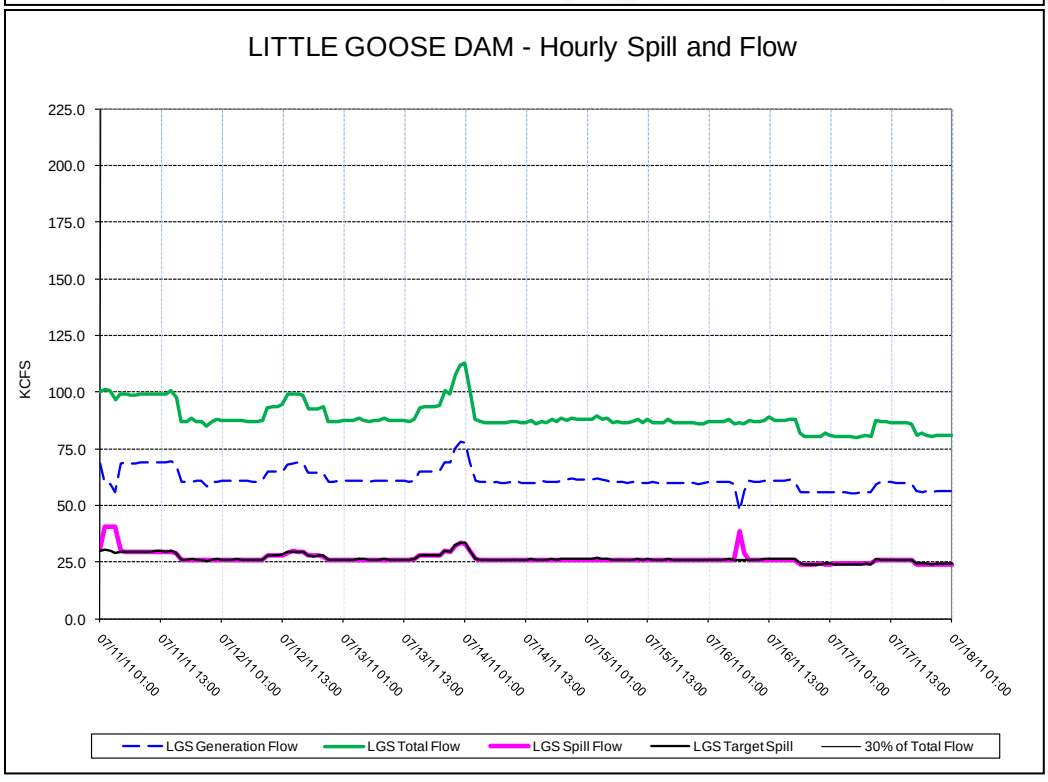
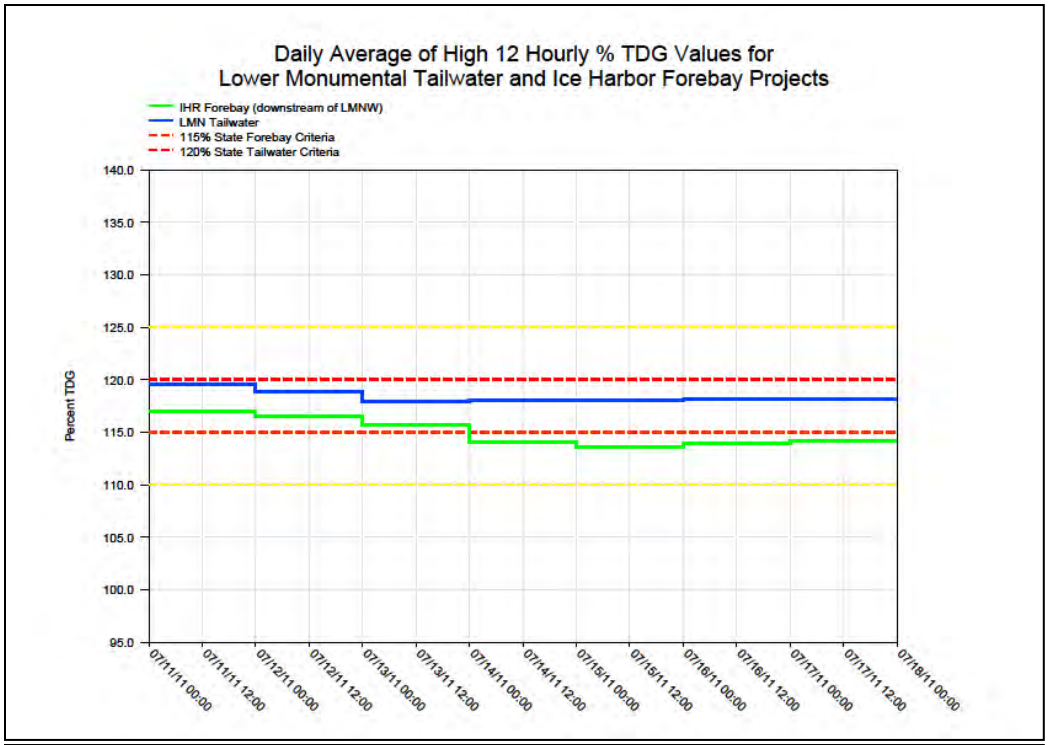

LITTLE GOOSE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
07/11/11 01:00
07/11/11 13:00
07/12/11 01:00
07/12/11 13:00
07/13/11 01:00
07/13/11 13:00
07/14/11 01:00
07/14/11 13:00
07/15/11 01:00
07/15/11 13:00
07/16/11 01:00
07/16/11 13:00
07/17/11 01:00
07/17/11 13:00
07/18/11 01:00
LGS Generation Flow
LGS Total Flow
LGS Spill Flow
LGS Target Spill
30% of Total Flow

Figure 11


Daily Average of High 12 Hourly % TDG Values for
Lower Monumental Tailwater and Ice Harbor Forebay Projects
IHR Forebay (downstream of LMNW)
LMN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/11/11 00:00
07/11/11 12:00
07/12/11 00:00
07/12/11 12:00
07/13/11 00:00
07/13/11 12:00
07/14/11 00:00
07/14/11 12:00
07/15/11 00:00
07/15/11 12:00
07/16/11 00:00
07/16/11 12:00
07/17/11 00:00
07/17/11 12:00
07/18/11 00:00

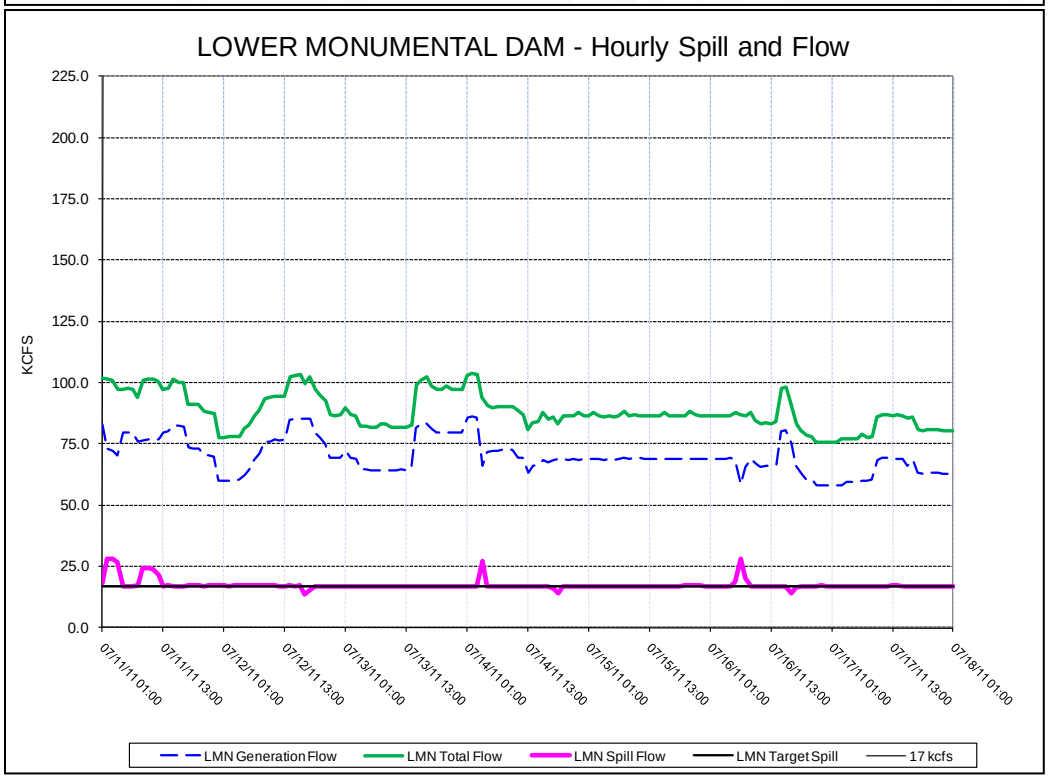
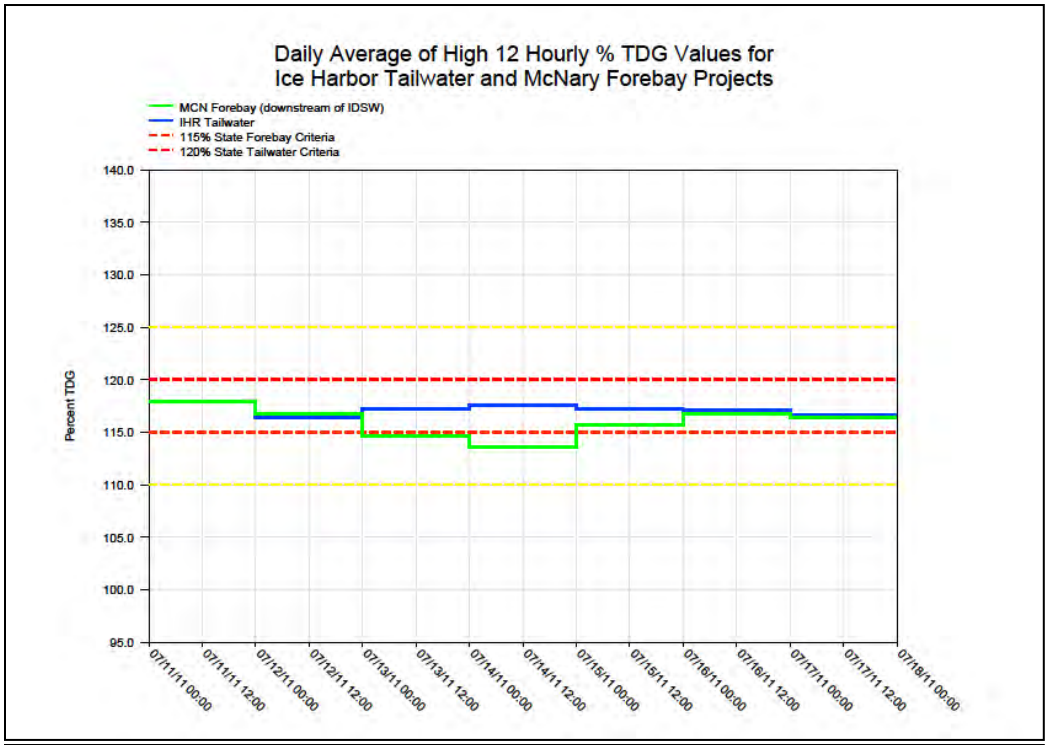

LOWER MONUMENTAL DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
07/11/11 01:00
07/11/11 13:00
07/12/11 01:00
07/12/11 13:00
07/13/11 01:00
07/13/11 13:00
07/14/11 01:00
07/14/11 13:00
07/15/11 01:00
07/15/11 13:00
07/16/11 01:00
07/16/11 13:00
07/17/11 01:00
07/17/11 13:00
07/18/11 01:00
LMN Generation Flow
LMN Total Flow
LMN Spill Flow
LMN Target Spill
17 kcfs

Figure 12


Daily Average of High 12 Hourly % TDG Values for
Ice Harbor Tailwater and McNary Forebay Projects
MCN Forebay (downstream of IDSW)
IHR Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/11/11 00:00
07/11/11 12:00
07/12/11 00:00
07/12/11 12:00
07/13/11 00:00
07/13/11 12:00
07/14/11 00:00
07/14/11 12:00
07/15/11 00:00
07/15/11 12:00
07/16/11 00:00
07/16/11 12:00
07/17/11 00:00
07/17/11 12:00
07/18/11 00:00

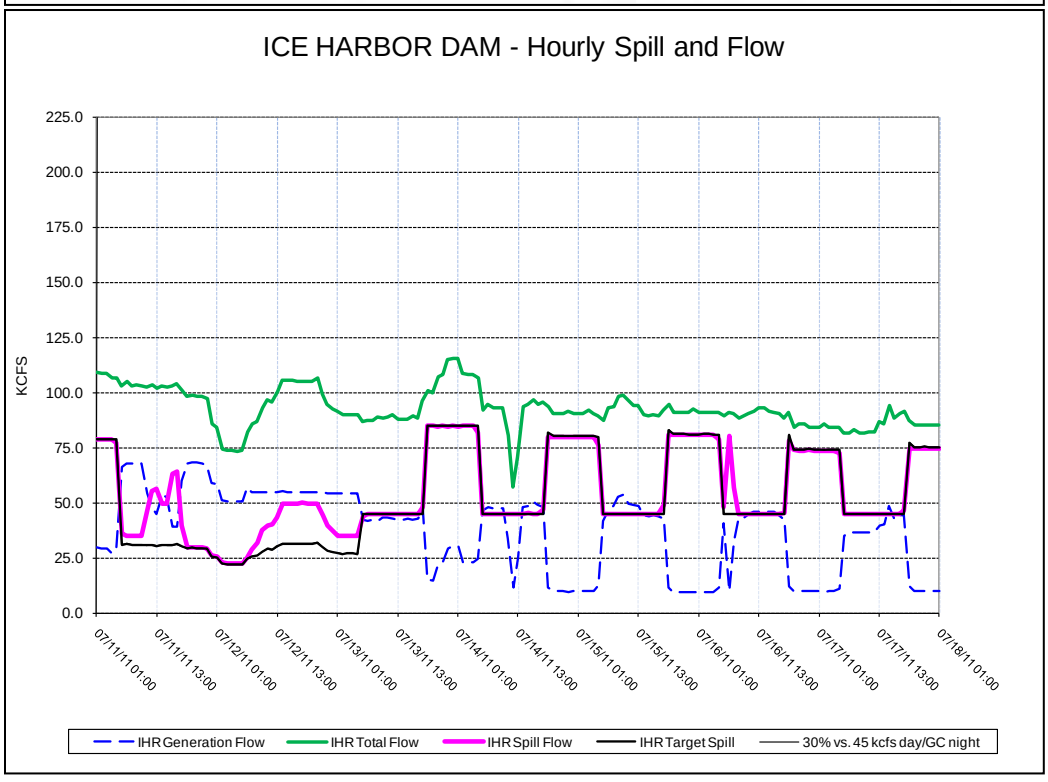
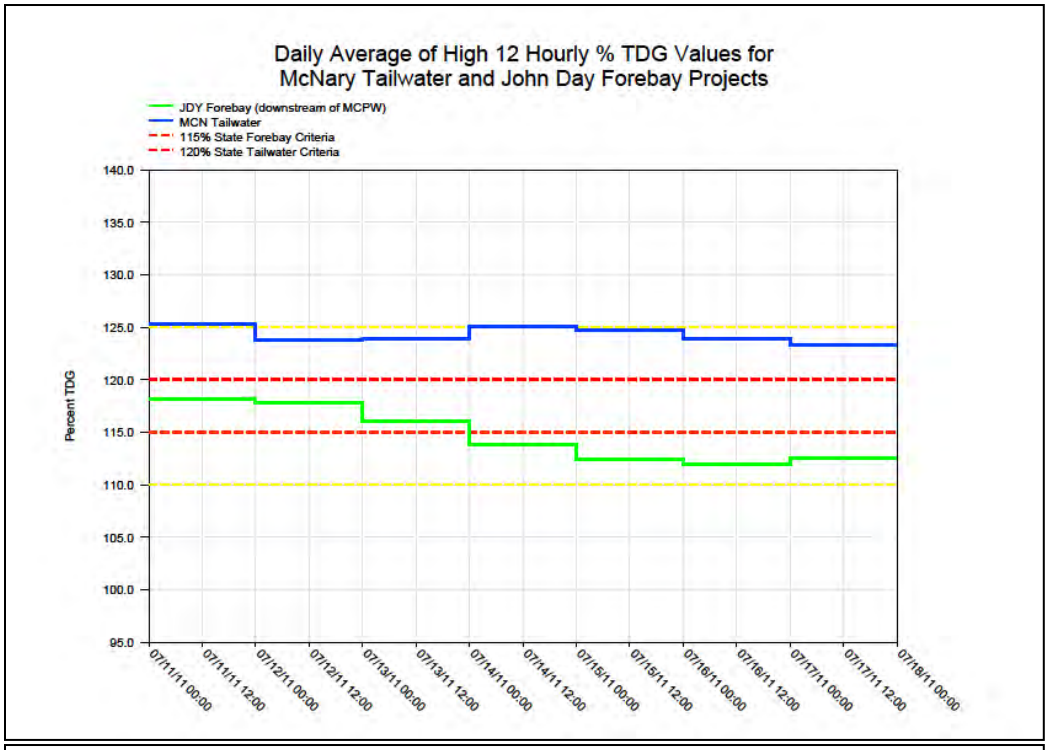

ICE HARBOR DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
07/11/11 01:00
07/11/11 13:00
07/12/11 01:00
07/12/11 13:00
07/13/11 01:00
07/13/11 13:00
07/14/11 01:00
07/14/11 13:00
07/15/11 01:00
07/15/11 13:00
07/16/11 01:00
07/16/11 13:00
07/17/11 01:00
07/17/11 13:00
07/18/11 01:00
IHR Generation Flow
IHR Total Flow
IHR Spill Flow
IHR Target Spill
30% vs. 45 kcfs day/GC night

Figure 13


Daily Average of High 12 Hourly % TDG Values for
McNary Tailwater and John Day Forebay Projects
JDY Forebay (downstream of MCPW)
MCN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/11/11 00:00
07/11/11 12:00
07/12/11 00:00
07/12/11 12:00
07/13/11 00:00
07/13/11 12:00
07/14/11 00:00
07/14/11 12:00
07/15/11 00:00
07/15/11 12:00
07/16/11 00:00
07/16/11 12:00
07/17/11 00:00
07/17/11 12:00
07/18/11 00:00

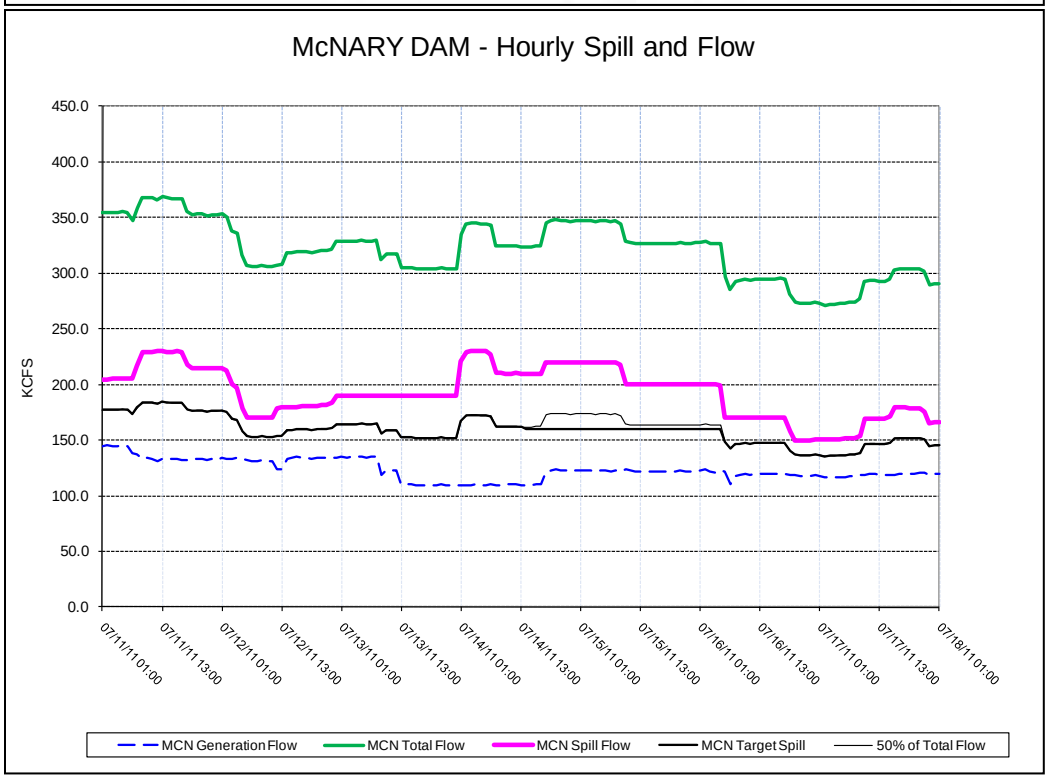
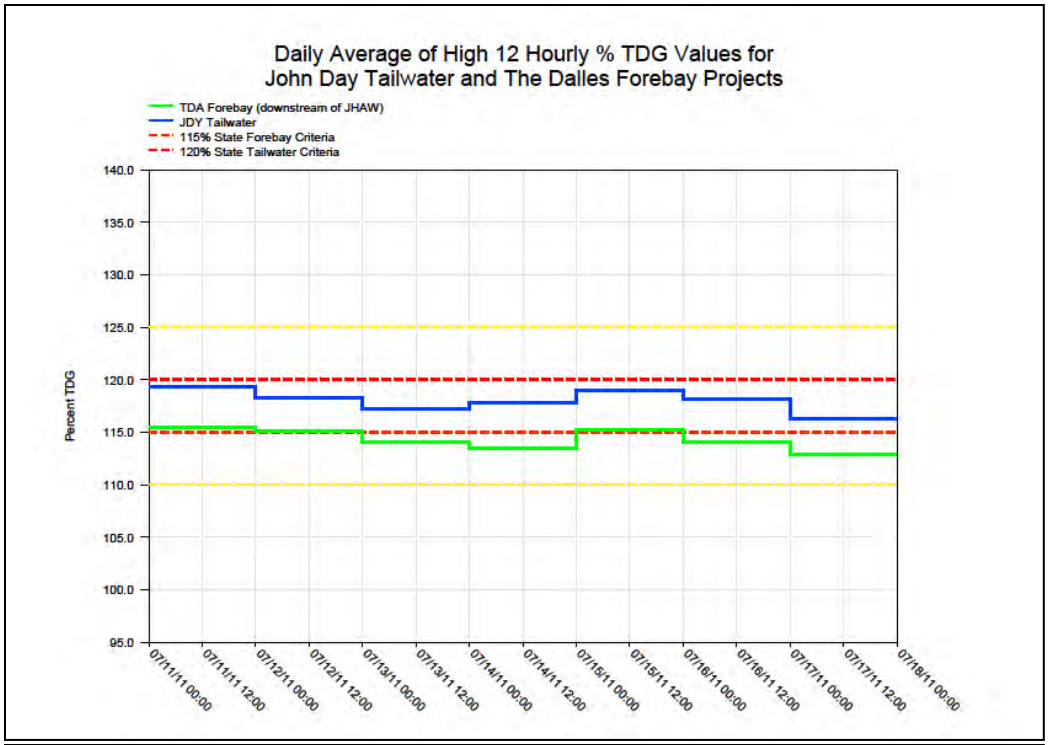

McNARY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
07/11/11 01:00
07/11/11 13:00
07/12/11 01:00
07/12/11 13:00
07/13/11 01:00
07/13/11 13:00
07/14/11 01:00
07/14/11 13:00
07/15/11 01:00
07/15/11 13:00
07/16/11 01:00
07/16/11 13:00
07/17/11 01:00
07/17/11 13:00
07/18/11 01:00
MCN Generation Flow
MCN Total Flow
MCN Spill Flow
MCN Target Spill
50% of Total Flow

Figure 14


Daily Average of High 12 Hourly % TDG Values for
John Day Tailwater and The Dalles Forebay Projects
TDA Forebay (downstream of JHAW)
JDY Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/11/11 00:00
07/11/11 12:00
07/12/11 00:00
07/12/11 12:00
07/13/11 00:00
07/13/11 12:00
07/14/11 00:00
07/14/11 12:00
07/15/11 00:00
07/15/11 12:00
07/16/11 00:00
07/16/11 12:00
07/17/11 00:00
07/17/11 12:00
07/18/11 00:00

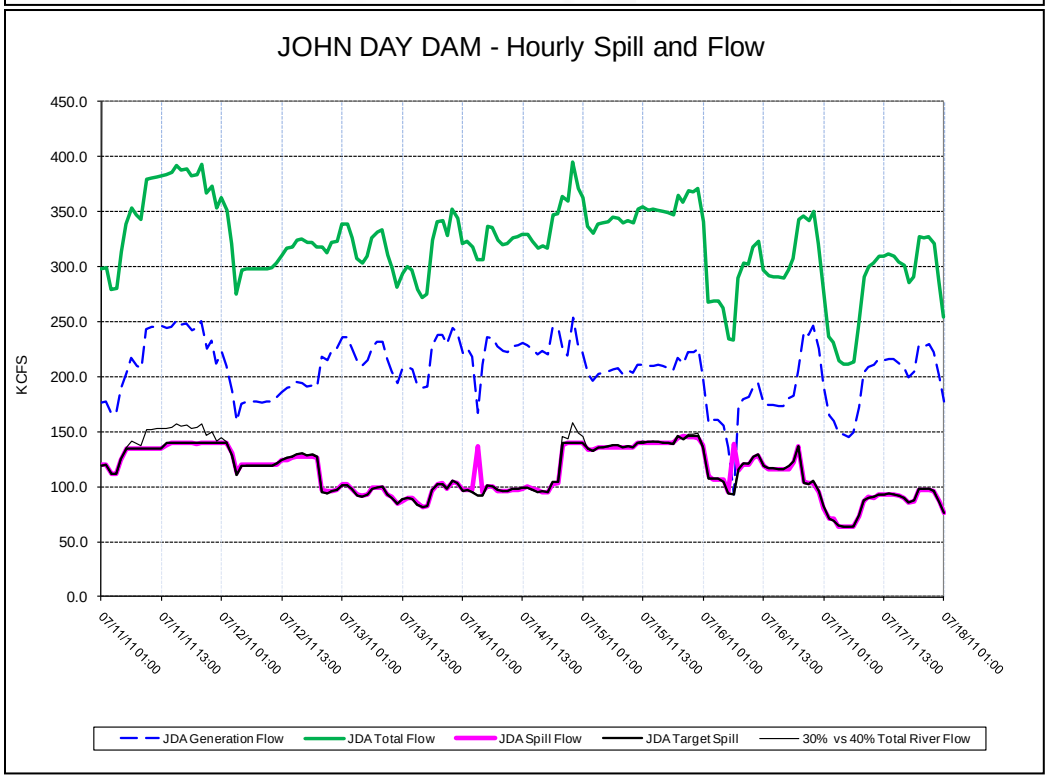
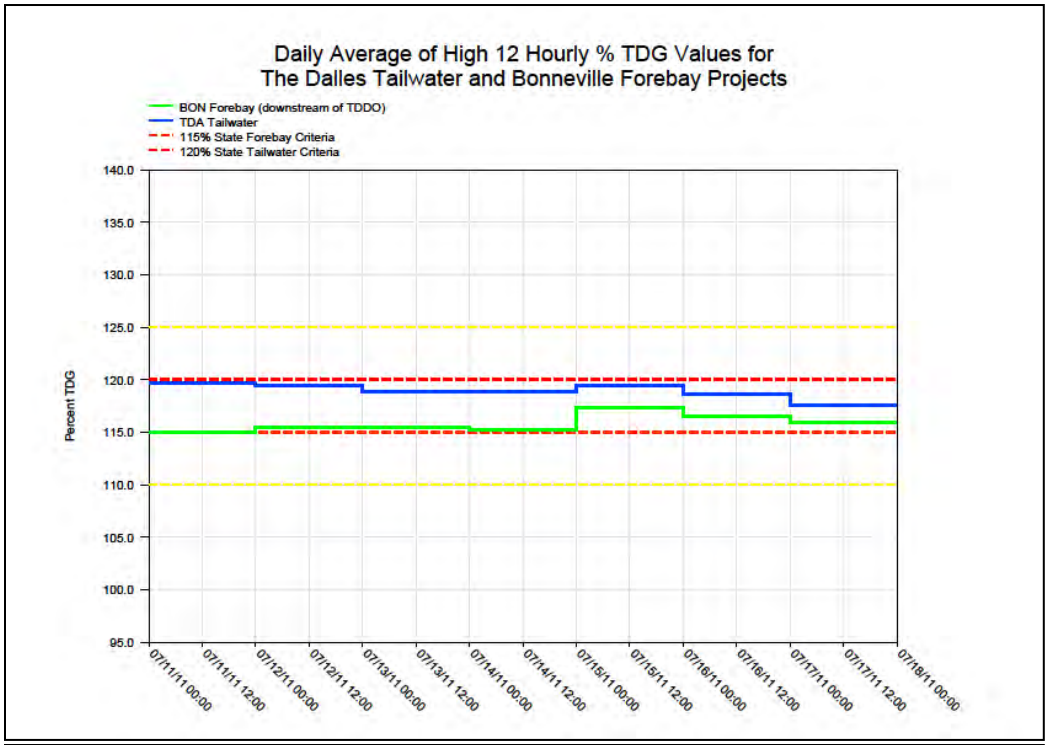

JOHN DAY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
07/11/11 01:00
07/11/11 13:00
07/12/11 01:00
07/12/11 13:00
07/13/11 01:00
07/13/11 13:00
07/14/11 01:00
07/14/11 13:00
07/15/11 01:00
07/15/11 13:00
07/16/11 01:00
07/16/11 13:00
07/17/11 01:00
07/17/11 13:00
07/18/11 01:00
JDA Generation Flow
JDA Total Flow
JDA Spill Flow
JDA Target Spill
30% vs 40% Total River Flow

Figure 15


Daily Average of High 12 Hourly % TDG Values for
The Dalles Tailwater and Bonneville Forebay Projects
BON Forebay (downstream of TDDO)
TDA Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/11/11 00:00
07/11/11 12:00
07/12/11 00:00
07/12/11 12:00
07/13/11 00:00
07/13/11 12:00
07/14/11 00:00
07/14/11 12:00
07/15/11 00:00
07/15/11 12:00
07/16/11 00:00
07/16/11 12:00
07/17/11 00:00
07/17/11 12:00
07/18/11 00:00

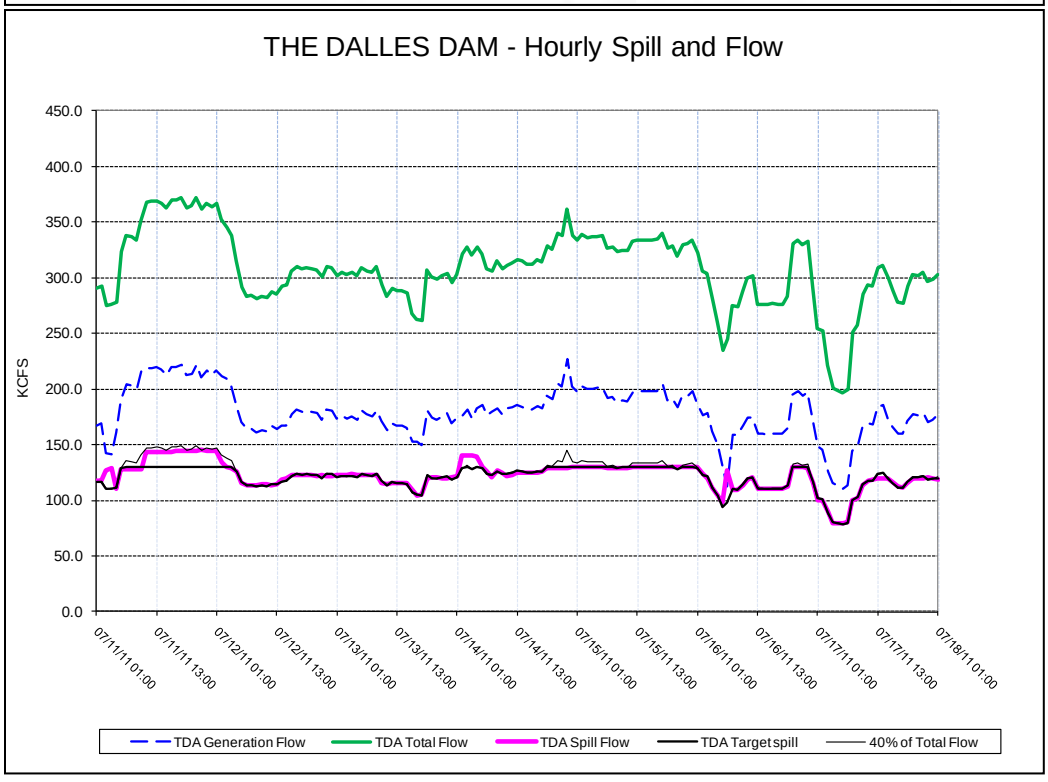
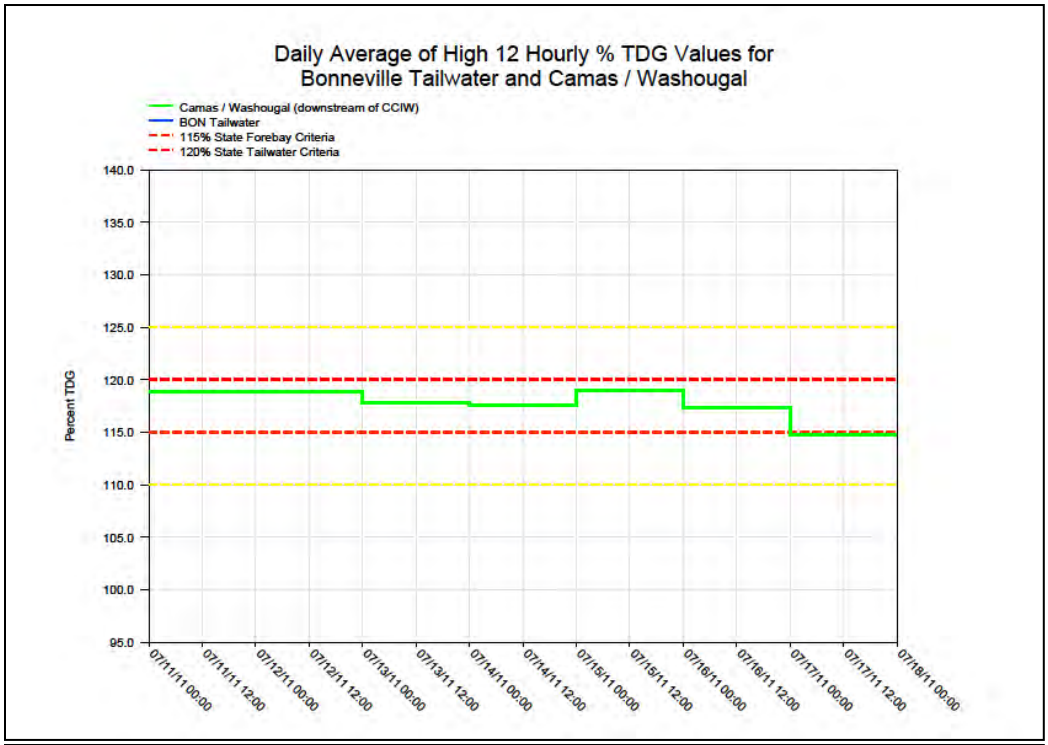

THE DALLES DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
07/11/11 01:00
07/11/11 13:00
07/12/11 01:00
07/12/11 13:00
07/13/11 01:00
07/13/11 13:00
07/14/11 01:00
07/14/11 13:00
07/15/11 01:00
07/15/11 13:00
07/16/11 01:00
07/16/11 13:00
07/17/11 01:00
07/17/11 13:00
07/18/11 01:00
TDA Generation Flow
TDA Total Flow
TDA Spill Flow
TDA Target spill
40% of Total Flow

Figure 16


Daily Average of High 12 Hourly % TDG Values for
Bonneville Tailwater and Camas / Washougal
Camas / Washougal (downstream of CCIW)
BON Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/11/11 00:00
07/11/11 12:00
07/12/11 00:00
07/12/11 12:00
07/13/11 00:00
07/13/11 12:00
07/14/11 00:00
07/14/11 12:00
07/15/11 00:00
07/15/11 12:00
07/16/11 00:00
07/16/11 12:00
07/17/11 00:00
07/17/11 12:00
07/18/11 00:00

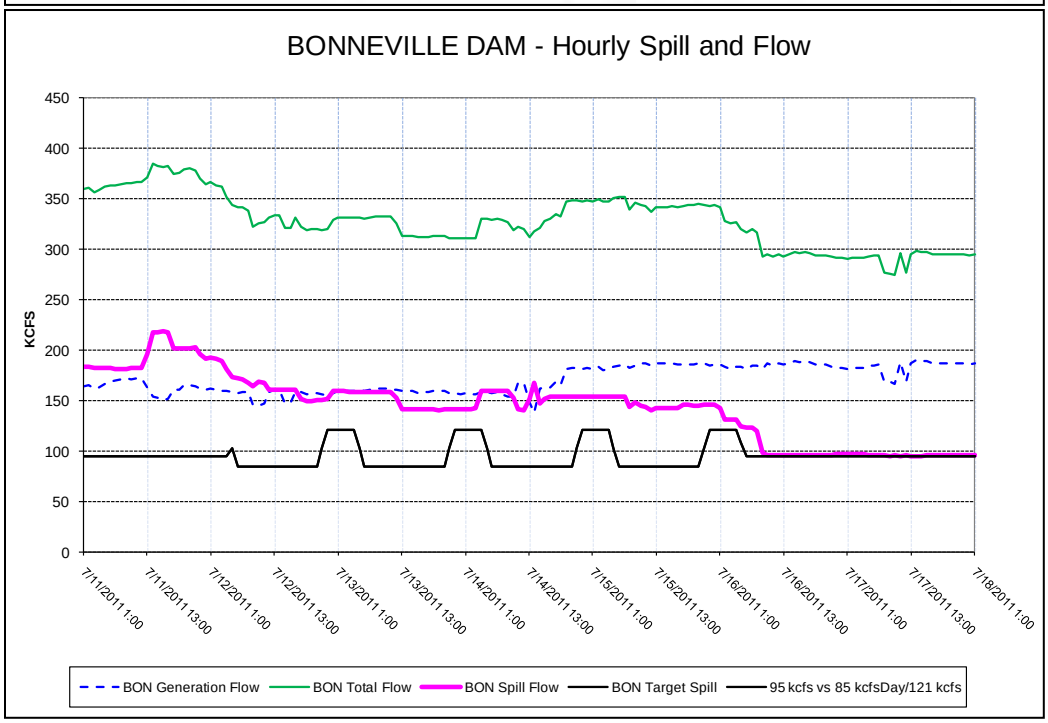

BONNEVILLE DAM - Hourly Spill and Flow
KCFS
450
400
350
300
250
200
150
100
50
0
7/11/2011 1:00
7/11/2011 13:00
7/12/2011 1:00
7/12/2011 13:00
7/13/2011 1:00
7/13/2011 13:00
7/14/2011 1:00
7/14/2011 13:00
7/15/2011 1:00
7/15/2011 13:00
7/16/2011 1:00
7/16/2011 13:00
7/17/2011 1:00
7/17/2011 13:00
7/18/2011 1:00
BON Generation Flow
BON Total Flow
BON Spill Flow
BON Target Spill
95 kcfs vs 85 kcfsDay/121 kcfs

Figure 17

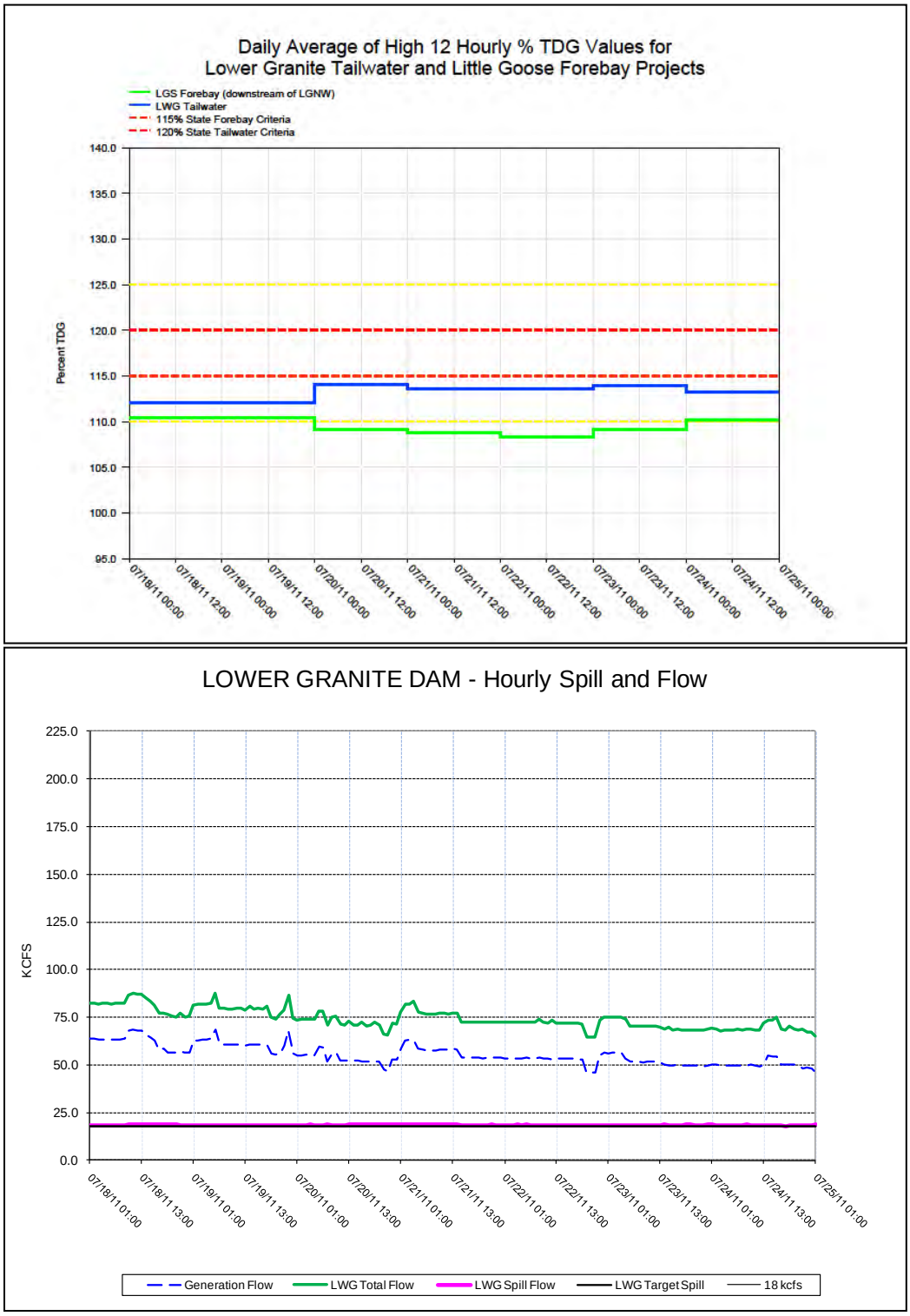

Daily Average of High 12 Hourly % TDG Values for
Lower Granite Tailwater and Little Goose Forebay Projects
LGS Forebay (downstream of LGNW)
LWG Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/18/11 00:00
07/18/11 12:00
07/19/11 00:00
07/19/11 12:00
07/20/11 00:00
07/20/11 12:00
07/21/11 00:00
07/21/11 12:00
07/22/11 00:00
07/22/11 12:00
07/23/11 00:00
07/23/11 12:00
07/24/11 00:00
07/24/11 12:00
07/25/11 00:00
LOWER GRANITE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
07/18/11 01:00
07/18/11 13:00
07/19/11 01:00
07/19/11 13:00
07/20/11 01:00
07/20/11 13:00
07/21/11 01:00
07/21/11 13:00
07/22/11 01:00
07/22/11 13:00
07/23/11 01:00
07/23/11 13:00
07/24/11 01:00
07/24/11 13:00
07/25/11 01:00
Generation Flow
LWG Total Flow
LWG Spill Flow
LWG Target Spill
18 kcfs

Figure 18

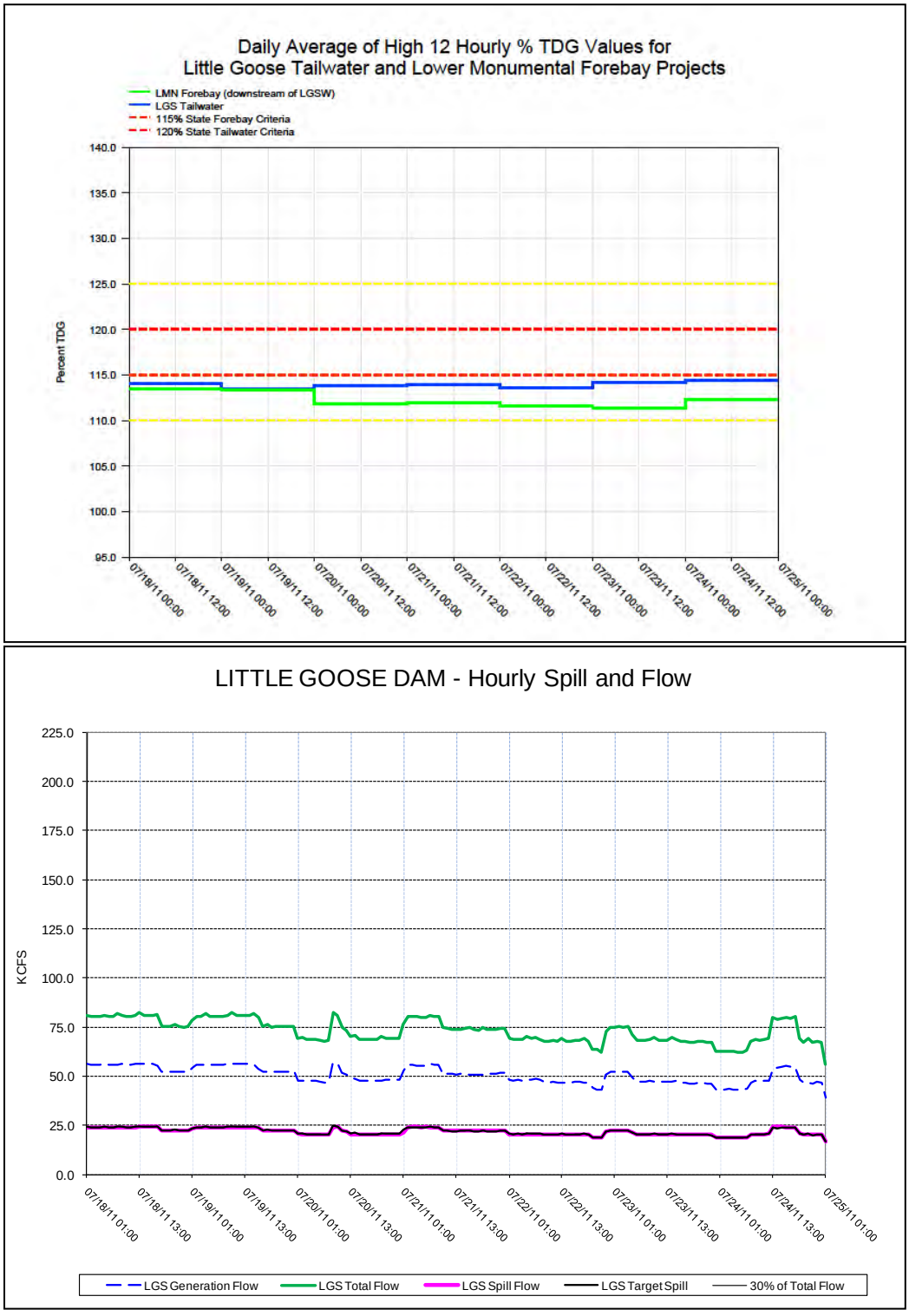

Daily Average of High 12 Hourly % TDG Values for
Little Goose Tailwater and Lower Monumental Forebay Projects
LMN Forebay (downstream of LGSW)
LGS Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/18/11 00:00
07/18/11 12:00
07/19/11 00:00
07/19/11 12:00
07/20/11 00:00
07/20/11 12:00
07/21/11 00:00
07/21/11 12:00
07/22/11 00:00
07/22/11 12:00
07/23/11 00:00
07/23/11 12:00
07/24/11 00:00
07/24/11 12:00
07/25/11 00:00
LITTLE GOOSE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
07/18/11 01:00
07/18/11 13:00
07/19/11 01:00
07/19/11 13:00
07/20/11 01:00
07/20/11 13:00
07/21/11 01:00
07/21/11 13:00
07/22/11 01:00
07/22/11 13:00
07/23/11 01:00
07/23/11 13:00
07/24/11 01:00
07/24/11 13:00
07/25/11 01:00
LGS Generation Flow
LGS Total Flow
LGS Spill Flow
LGS Target Spill
30% of Total Flow

Figure 19

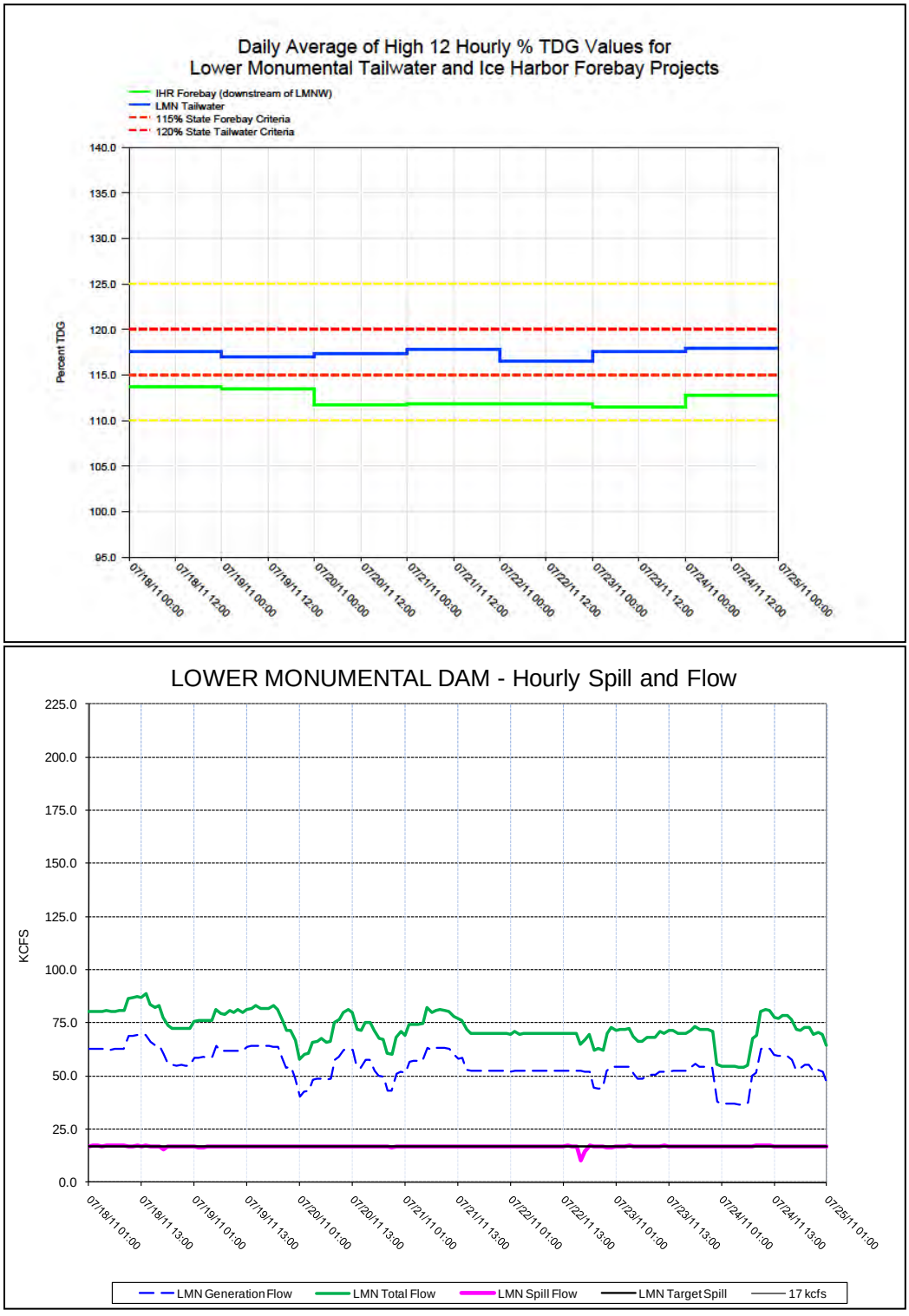

Daily Average of High 12 Hourly % TDG Values for
Lower Monumental Tailwater and Ice Harbor Forebay Projects
IHR Forebay (downstream of LMNW)
LMN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/18/11 00:00
07/18/11 12:00
07/19/11 00:00
07/19/11 12:00
07/20/11 00:00
07/20/11 12:00
07/21/11 00:00
07/21/11 12:00
07/22/11 00:00
07/22/11 12:00
07/23/11 00:00
07/23/11 12:00
07/24/11 00:00
07/24/11 12:00
07/25/11 00:00
LOWER MONUMENTAL DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
07/18/11 01:00
07/18/11 13:00
07/19/11 01:00
07/19/11 13:00
07/20/11 01:00
07/20/11 13:00
07/21/11 01:00
07/21/11 13:00
07/22/11 01:00
07/22/11 13:00
07/23/11 01:00
07/23/11 13:00
07/24/11 01:00
07/24/11 13:00
07/25/11 01:00
LMN Generation Flow
LMN Total Flow
LMN Spill Flow
LMN Target Spill
17 kcfs

Figure 20

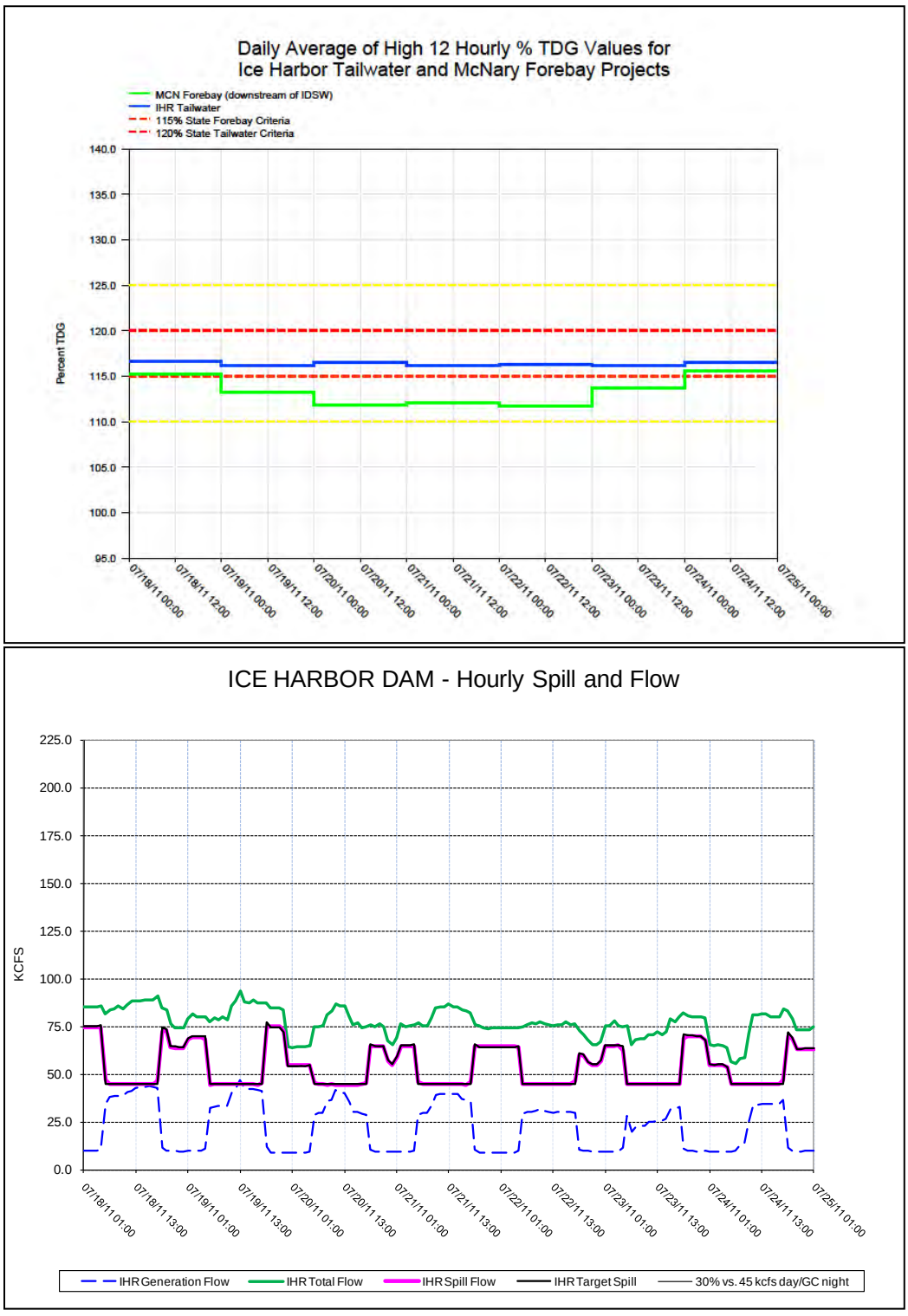

Daily Average of High 12 Hourly % TDG Values for
Ice Harbor Tailwater and McNary Forebay Projects
MCN Forebay (downstream of IDSW)
IHR Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/18/11 00:00
07/18/11 12:00
07/19/11 00:00
07/19/11 12:00
07/20/11 00:00
07/20/11 12:00
07/21/11 00:00
07/21/11 12:00
07/22/11 00:00
07/22/11 12:00
07/23/11 00:00
07/23/11 12:00
07/24/11 00:00
07/24/11 12:00
07/25/11 00:00
ICE HARBOR DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
07/18/11 01:00
07/18/11 13:00
07/19/11 01:00
07/19/11 13:00
07/20/11 01:00
07/20/11 13:00
07/21/11 01:00
07/21/11 13:00
07/22/11 01:00
07/22/11 13:00
07/23/11 01:00
07/23/11 13:00
07/24/11 01:00
07/24/11 13:00
07/25/11 01:00
IHR Generation Flow
IHR Total Flow
IHR Spill Flow
IHR Target Spill
30% vs. 45 kcfs day/GC night

Figure 21

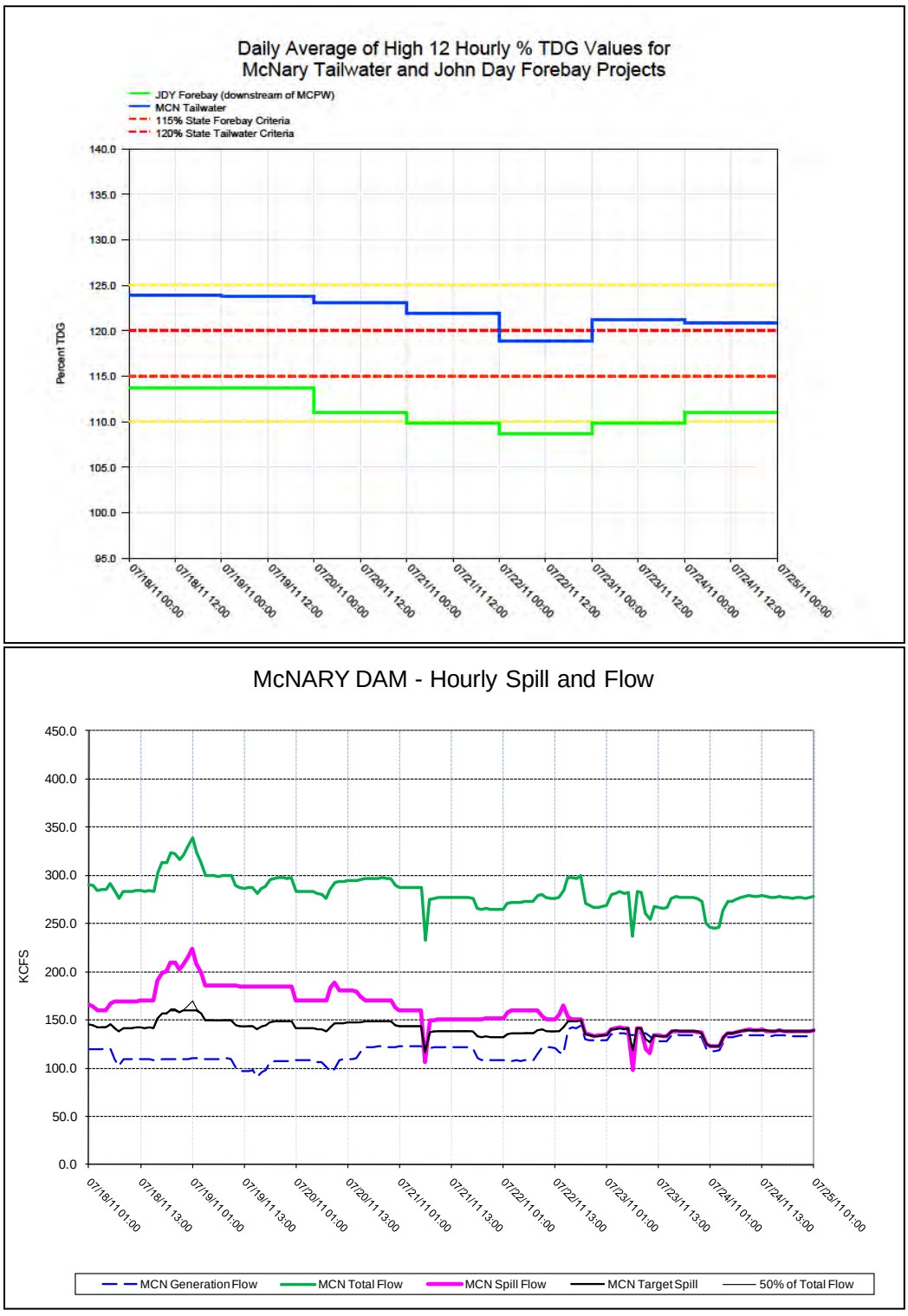

Daily Average of High 12 Hourly % TDG Values for
McNary Tailwater and John Day Forebay Projects
JDY Forebay (downstream of MCPW)
MCN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/18/11 00:00
07/18/11 12:00
07/19/11 00:00
07/19/11 12:00
07/20/11 00:00
07/20/11 12:00
07/21/11 00:00
07/21/11 12:00
07/22/11 00:00
07/22/11 12:00
07/23/11 00:00
07/23/11 12:00
07/24/11 00:00
07/24/11 12:00
07/25/11 00:00
McNARY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
07/18/11 01:00
07/18/11 13:00
07/19/11 01:00
07/19/11 13:00
07/20/11 01:00
07/20/11 13:00
07/21/11 01:00
07/21/11 13:00
07/22/11 01:00
07/22/11 13:00
07/23/11 01:00
07/23/11 13:00
07/24/11 01:00
07/24/11 13:00
07/25/11 01:00
MCN Generation Flow
MCN Total Flow
MCN Spill Flow
MCN Target Spill
50% of Total Flow

Figure 22

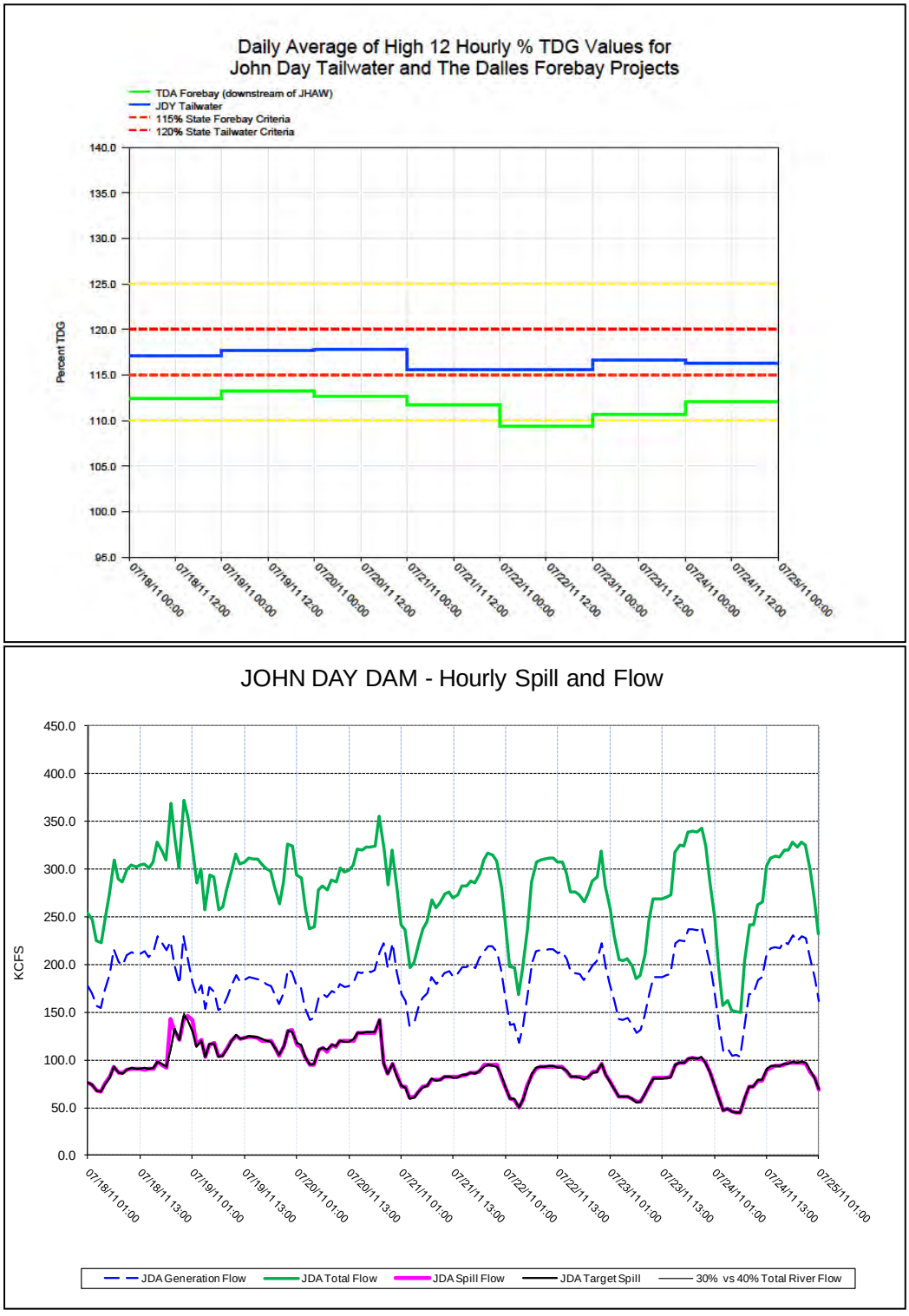

Daily Average of High 12 Hourly % TDG Values for
John Day Tailwater and The Dalles Forebay Projects
TDA Forebay (downstream of JHAW)
JDY Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/18/11 00:00
07/18/11 12:00
07/19/11 00:00
07/19/11 12:00
07/20/11 00:00
07/20/11 12:00
07/21/11 00:00
07/21/11 12:00
07/22/11 00:00
07/22/11 12:00
07/23/11 00:00
07/23/11 12:00
07/24/11 00:00
07/24/11 12:00
07/25/11 00:00
JOHN DAY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
07/18/11 01:00
07/18/11 13:00
07/19/11 01:00
07/19/11 13:00
07/20/11 01:00
07/20/11 13:00
07/21/11 01:00
07/21/11 13:00
07/22/11 01:00
07/22/11 13:00
07/23/11 01:00
07/23/11 13:00
07/24/11 01:00
07/24/11 13:00
07/25/11 01:00
JDA Generation Flow
JDA Total Flow
JDA Spill Flow
JDA Target Spill
30% vs 40% Total River Flow

Figure 23

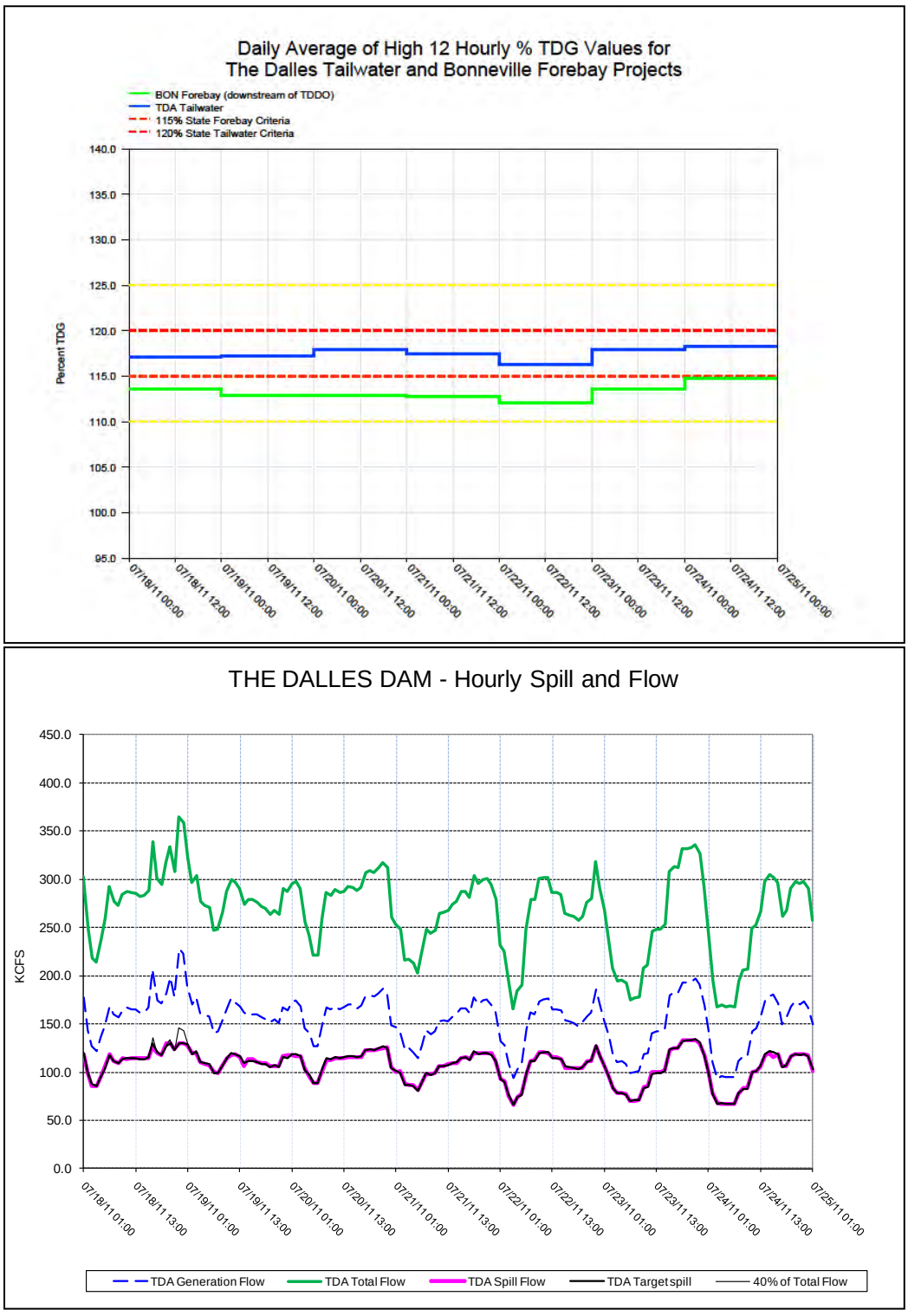

Daily Average of High 12 Hourly % TDG Values for
The Dalles Tailwater and Bonneville Forebay Projects
BON Forebay (downstream of TDDO)
TDA Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/18/11 00:00
07/18/11 12:00
07/19/11 00:00
07/19/11 12:00
07/20/11 00:00
07/20/11 12:00
07/21/11 00:00
07/21/11 12:00
07/22/11 00:00
07/22/11 12:00
07/23/11 00:00
07/23/11 12:00
07/24/11 00:00
07/24/11 12:00
07/25/11 00:00
THE DALLES DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
07/18/11 01:00
07/18/11 13:00
07/19/11 01:00
07/19/11 13:00
07/20/11 01:00
07/20/11 13:00
07/21/11 01:00
07/21/11 13:00
07/22/11 01:00
07/22/11 13:00
07/23/11 01:00
07/23/11 13:00
07/24/11 01:00
07/24/11 13:00
07/25/11 01:00
TDA Generation Flow
TDA Total Flow
TDA Spill Flow
TDA Target spill
40% of Total Flow

Figure 24

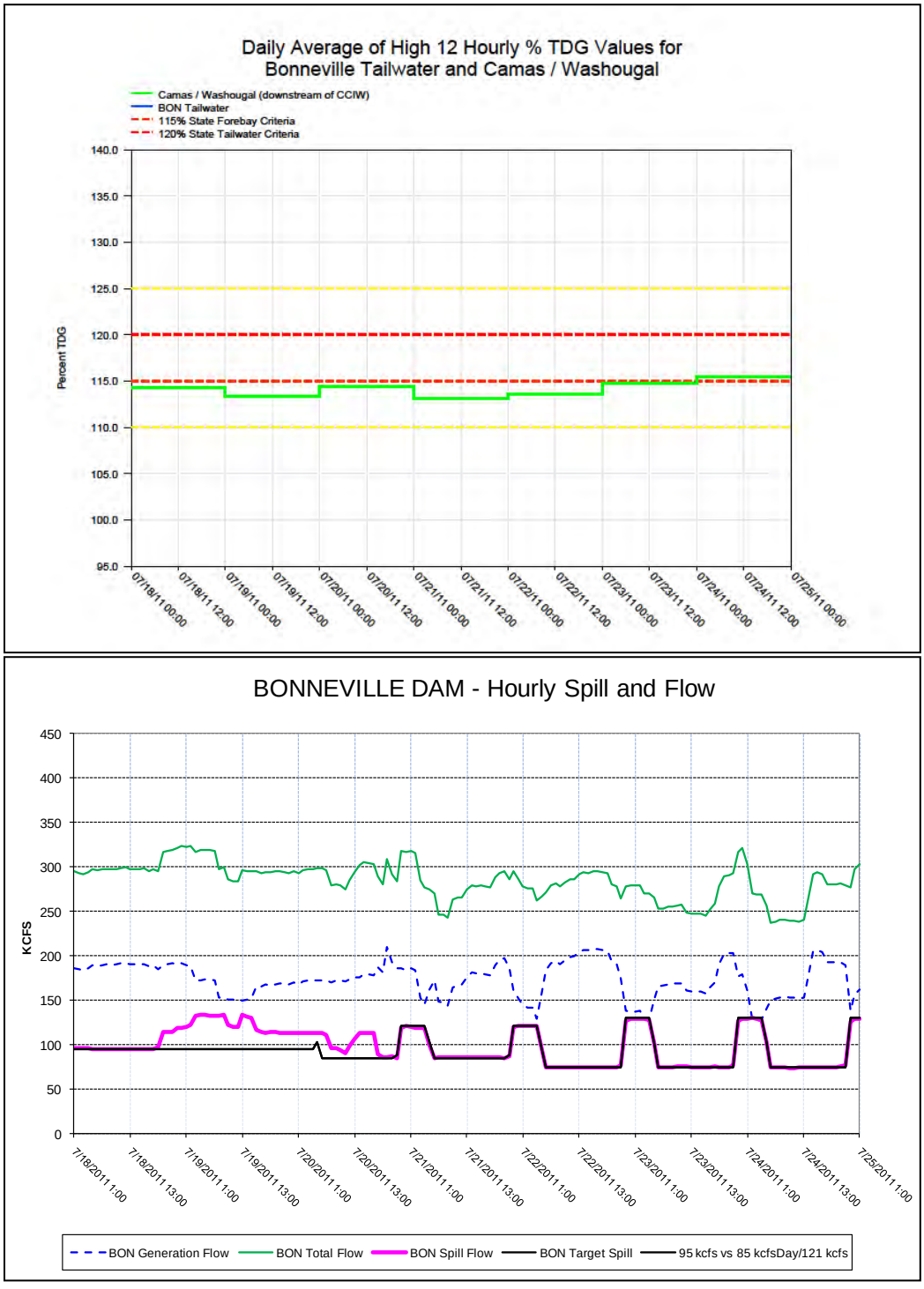
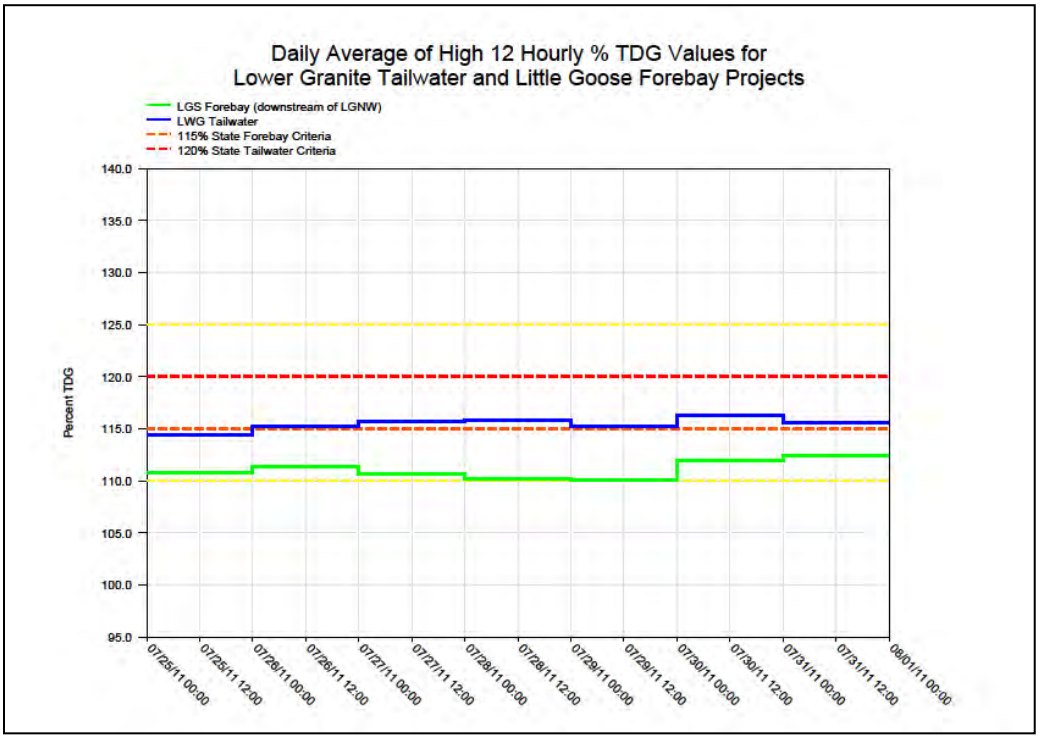

Daily Average of High 12 Hourly % TDG Values for
Bonneville Tailwater and Camas / Washougal
Camas / Washougal (downstream of CCIW)
BON Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/18/11 00:00
07/18/11 12:00
07/19/11 00:00
07/19/11 12:00
07/20/11 00:00
07/20/11 12:00
07/21/11 00:00
07/21/11 12:00
07/22/11 00:00
07/22/11 12:00
07/23/11 00:00
07/23/11 12:00
07/24/11 00:00
07/24/11 12:00
07/25/11 00:00
BONNEVILLE DAM - Hourly Spill and Flow
KCFS
450
400
350
300
250
200
150
100
50
0
7/18/2011 1:00
7/18/2011 13:00
7/19/2011 1:00
7/19/2011 13:00
7/20/2011 1:00
7/20/2011 13:00
7/21/2011 1:00
7/21/2011 13:00
7/22/2011 1:00
7/22/2011 13:00
7/23/2011 1:00
7/23/2011 13:00
7/24/2011 1:00
7/24/2011 13:00
7/25/2011 1:00
BON Generation Flow
BON Total Flow
BON Spill Flow
BON Target Spill
95 kcfs vs 85 kcfsDay/121 kcfs

Figure 25


Daily Average of High 12 Hourly % TDG Values for
Lower Granite Tailwater and Little Goose Forebay Projects
LGS Forebay (downstream of LGNW)
LWG Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/25/11 00:00
07/25/11 12:00
07/26/11 00:00
07/26/11 12:00
07/27/11 00:00
07/27/11 12:00
07/28/11 00:00
07/28/11 12:00
07/29/11 00:00
07/29/11 12:00
07/30/11 00:00
07/30/11 12:00
07/31/11 00:00
07/31/11 12:00
08/01/11 00:00

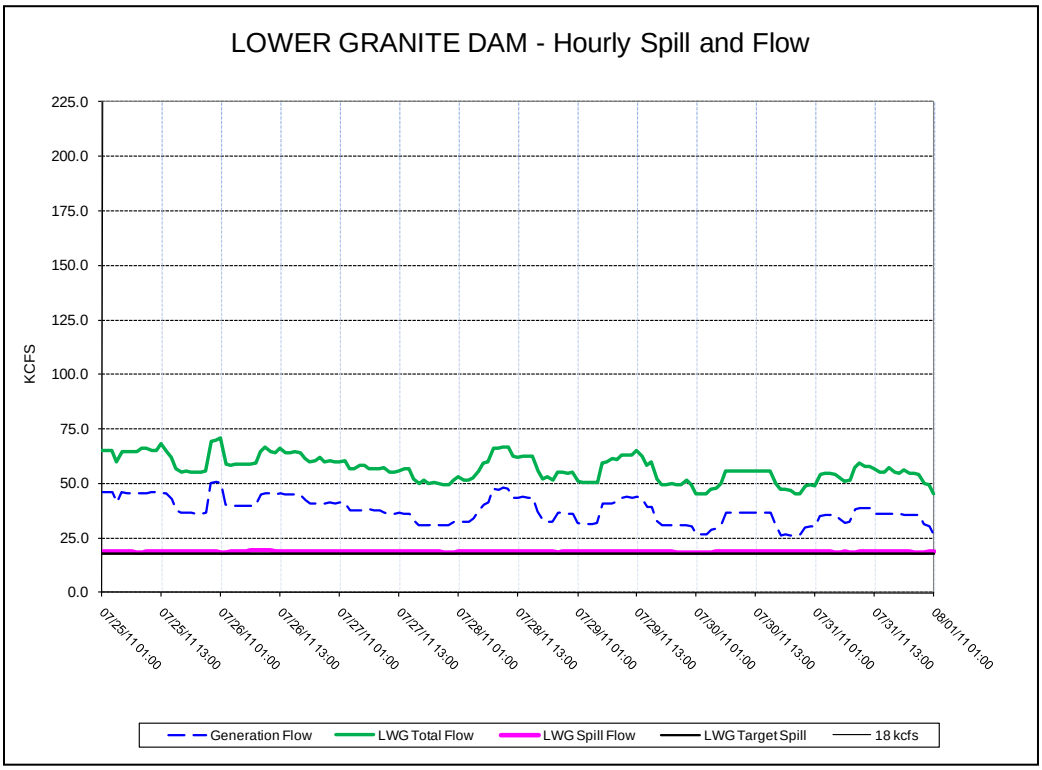
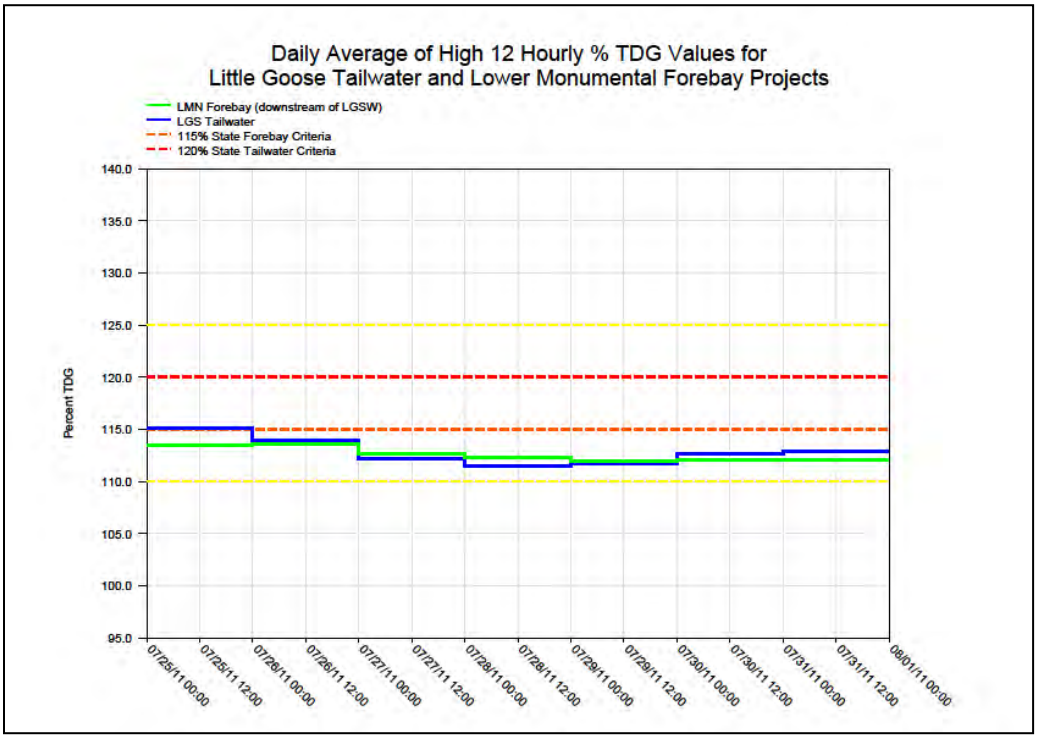

LOWER GRANITE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
07/25/11 01:00
07/25/11 13:00
07/26/11 01:00
07/26/11 13:00
07/27/11 01:00
07/27/11 13:00
07/28/11 01:00
07/28/11 13:00
07/29/11 01:00
07/29/11 13:00
07/30/11 01:00
07/30/11 13:00
07/31/11 01:00
07/31/11 13:00
08/01/11 01:00
Generation Flow
LWG Total Flow
LWG Spill Flow
LWG Target Spill
18 kcfs

Figure 26


Daily Average of High 12 Hourly % TDG Values for
Little Goose Tailwater and Lower Monumental Forebay Projects
LMN Forebay (downstream of LGSW)
LGS Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/25/11 00:00
07/25/11 12:00
07/26/11 00:00
07/26/11 12:00
07/27/11 00:00
07/27/11 12:00
07/28/11 00:00
07/28/11 12:00
07/29/11 00:00
07/29/11 12:00
07/30/11 00:00
07/30/11 12:00
07/31/11 00:00
07/31/11 12:00
08/01/11 00:00

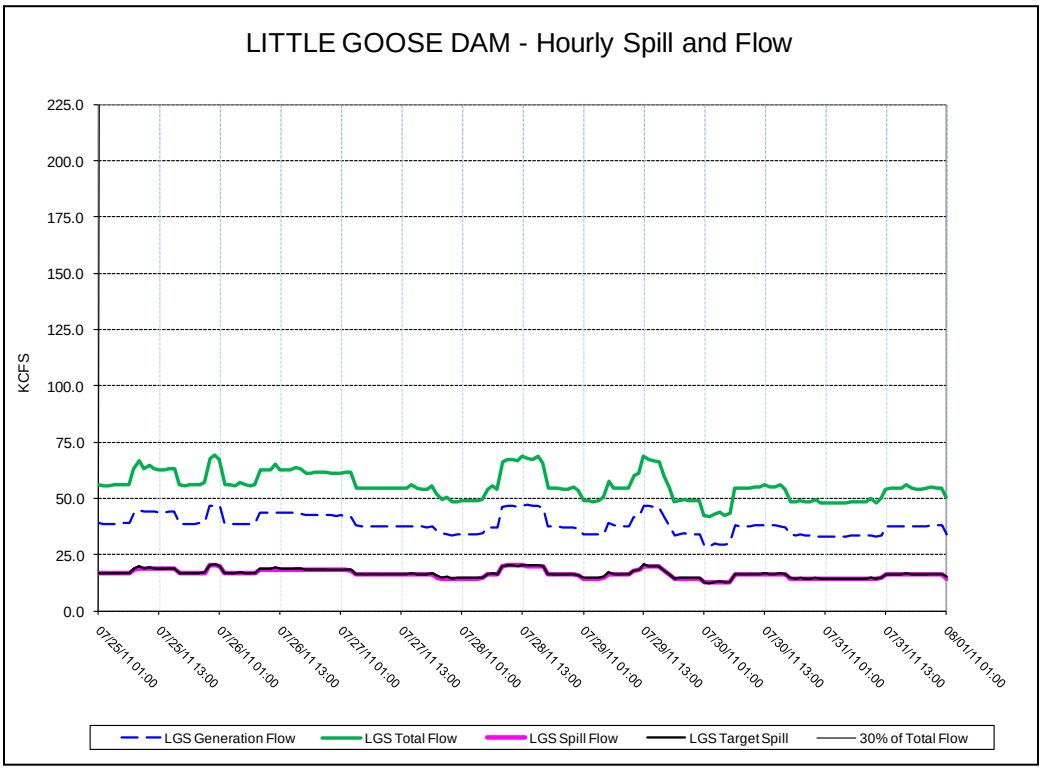
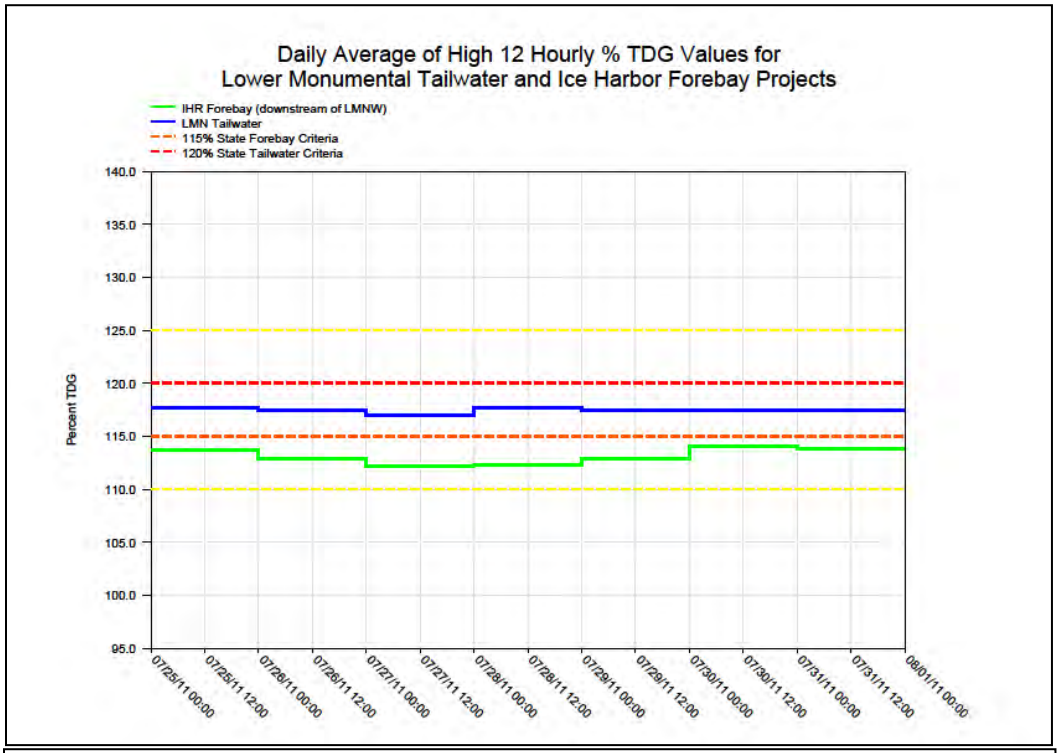

LITTLE GOOSE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
07/25/11 01:00
07/25/11 13:00
07/26/11 01:00
07/26/11 13:00
07/27/11 01:00
07/27/11 13:00
07/28/11 01:00
07/28/11 13:00
07/29/11 01:00
07/29/11 13:00
07/30/11 01:00
07/30/11 13:00
07/31/11 01:00
07/31/11 13:00
08/01/11 01:00
LGS Generation Flow
LGS Total Flow
LGS Spill Flow
LGS Target Spill
30% of Total Flow

Figure 27


Daily Average of High 12 Hourly % TDG Values for
Lower Monumental Tailwater and Ice Harbor Forebay Projects
IHR Forebay (downstream of LMNW)
LMN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/25/11 00:00
07/25/11 12:00
07/26/11 00:00
07/26/11 12:00
07/27/11 00:00
07/27/11 12:00
07/28/11 00:00
07/28/11 12:00
07/29/11 00:00
07/29/11 12:00
07/30/11 00:00
07/30/11 12:00
07/31/11 00:00
07/31/11 12:00
08/01/11 00:00

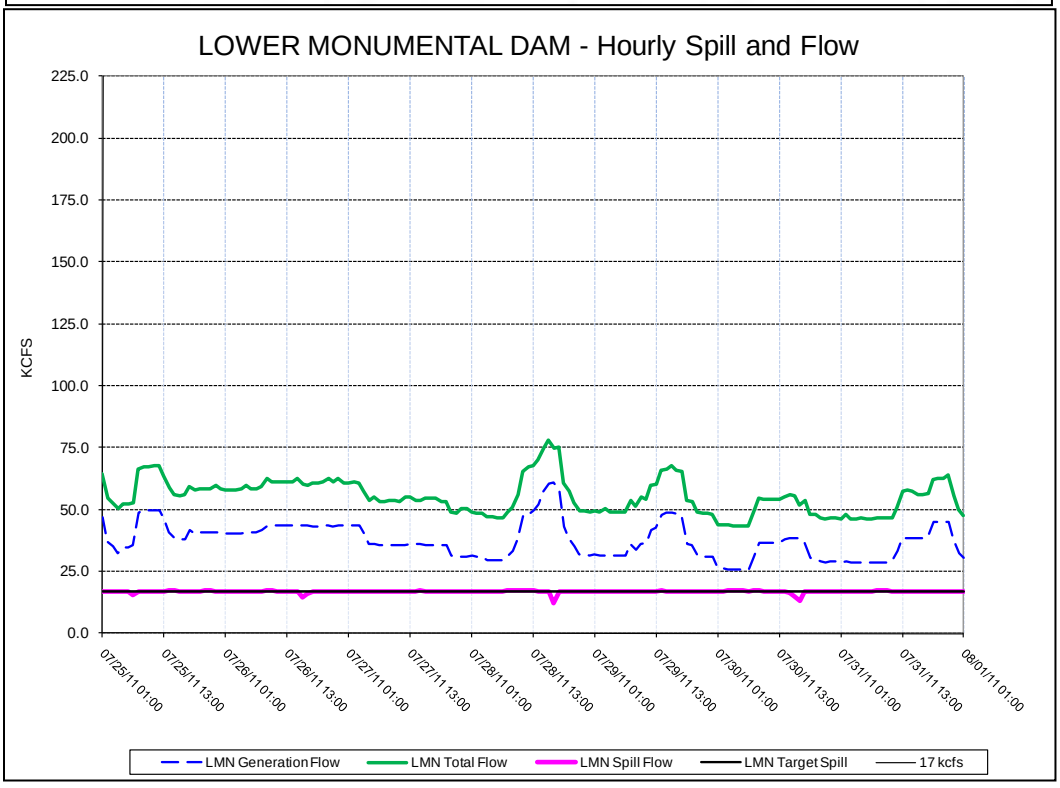
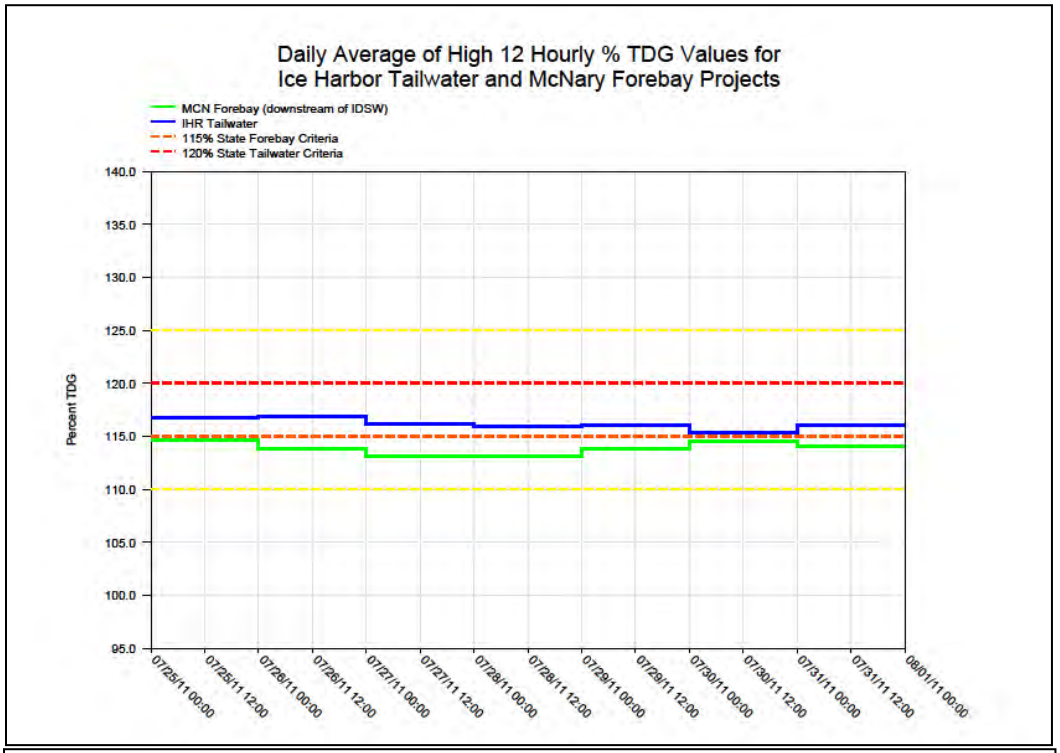

LOWER MONUMENTAL DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
07/25/11 01:00
07/25/11 13:00
07/26/11 01:00
07/26/11 13:00
07/27/11 01:00
07/27/11 13:00
07/28/11 01:00
07/28/11 13:00
07/29/11 01:00
07/29/11 13:00
07/30/11 01:00
07/30/11 13:00
07/31/11 01:00
07/31/11 13:00
08/01/11 01:00
LMN Generation Flow
LMN Total Flow
LMN Spill Flow
LMN Target Spill
17 kcfs

Figure 28


Daily Average of High 12 Hourly % TDG Values for
Ice Harbor Tailwater and McNary Forebay Projects
MCN Forebay (downstream of IDSW)
IHR Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/25/11 00:00
07/25/11 12:00
07/26/11 00:00
07/26/11 12:00
07/27/11 00:00
07/27/11 12:00
07/28/11 00:00
07/28/11 12:00
07/29/11 00:00
07/29/11 12:00
07/30/11 00:00
07/30/11 12:00
07/31/11 00:00
07/31/11 12:00
08/01/11 00:00

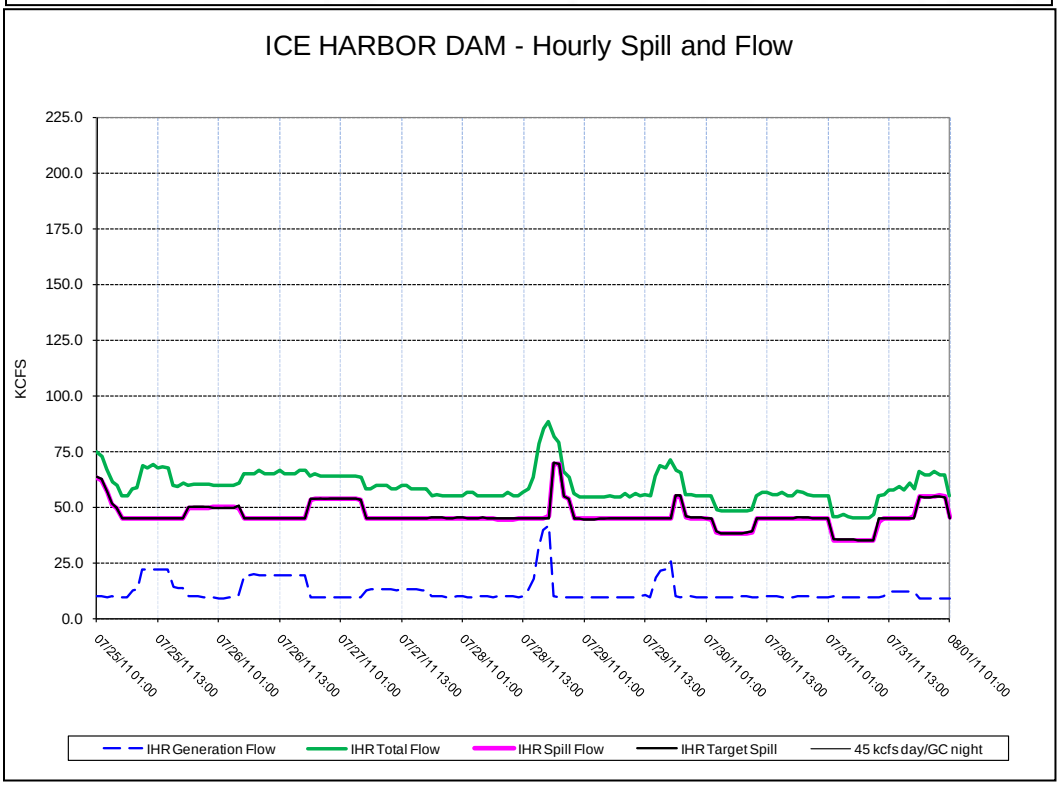
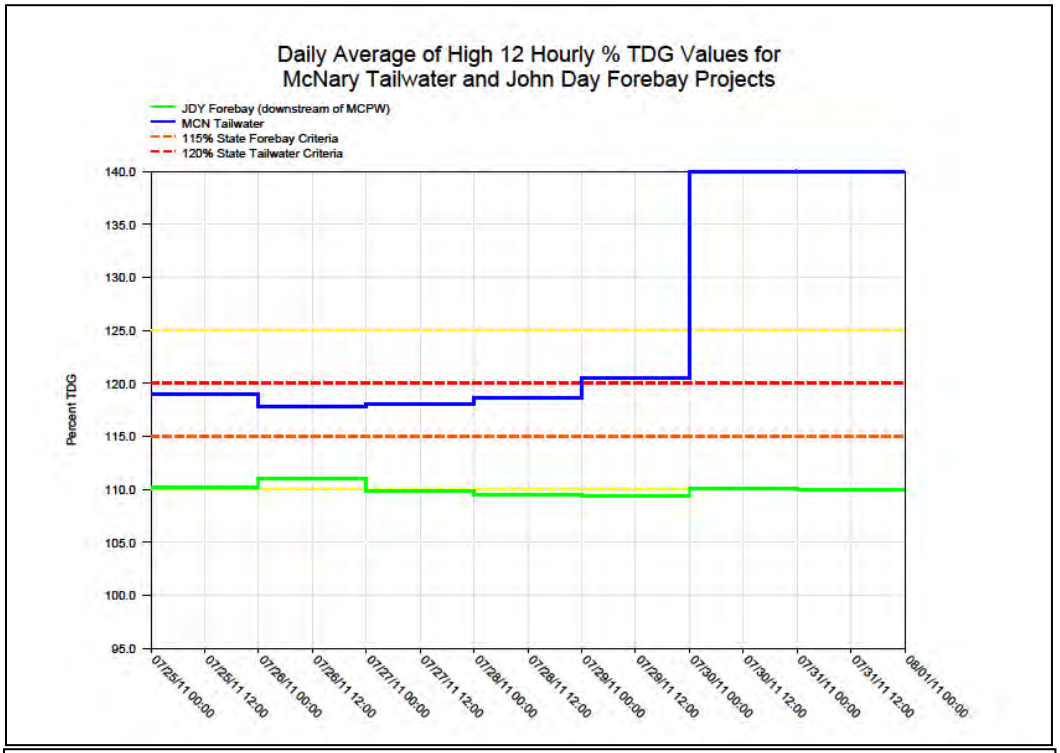

ICE HARBOR DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
07/25/11 01:00
07/25/11 13:00
07/26/11 01:00
07/26/11 13:00
07/27/11 01:00
07/27/11 13:00
07/28/11 01:00
07/28/11 13:00
07/29/11 01:00
07/29/11 13:00
07/30/11 01:00
07/30/11 13:00
07/31/11 01:00
07/31/11 13:00
08/01/11 01:00
IHR Generation Flow
IHR Total Flow
IHR Spill Flow
IHR Target Spill
45 kcfs day/GC night

Figure 29


Daily Average of High 12 Hourly % TDG Values for
McNary Tailwater and John Day Forebay Projects
JDY Forebay (downstream of MCPW)
MCN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/25/11 00:00
07/25/11 12:00
07/26/11 00:00
07/26/11 12:00
07/27/11 00:00
07/27/11 12:00
07/28/11 00:00
07/28/11 12:00
07/29/11 00:00
07/29/11 12:00
07/30/11 00:00
07/30/11 12:00
07/31/11 00:00
07/31/11 12:00
08/01/11 00:00

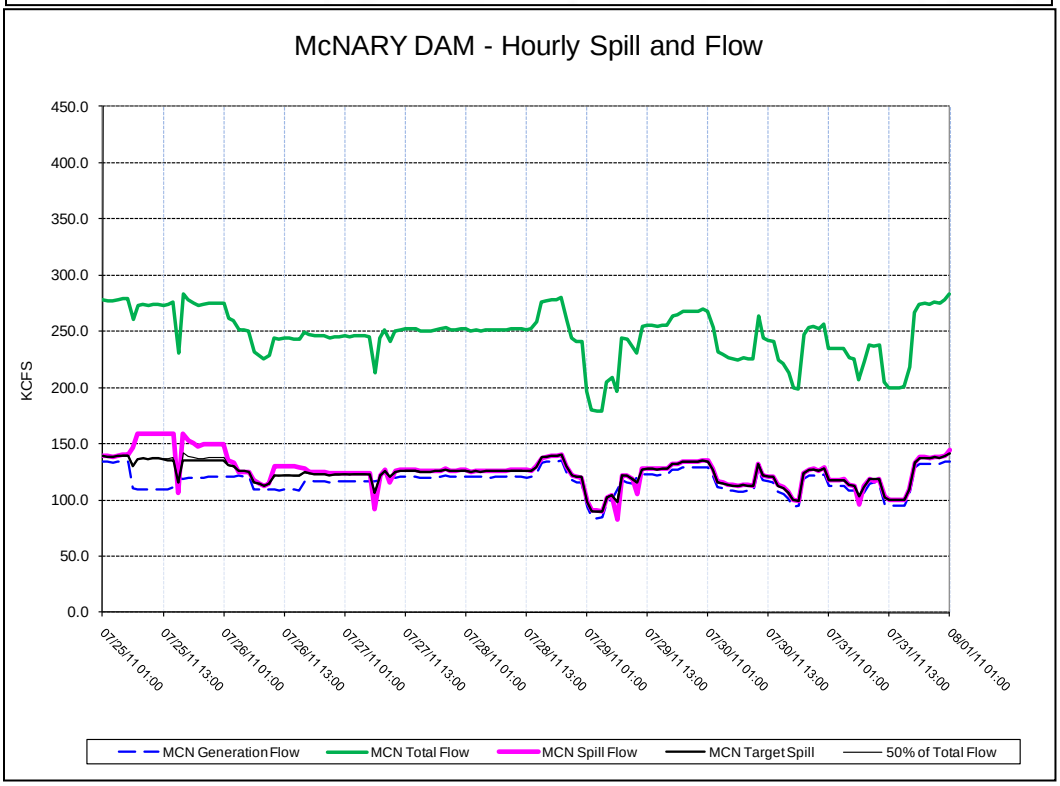
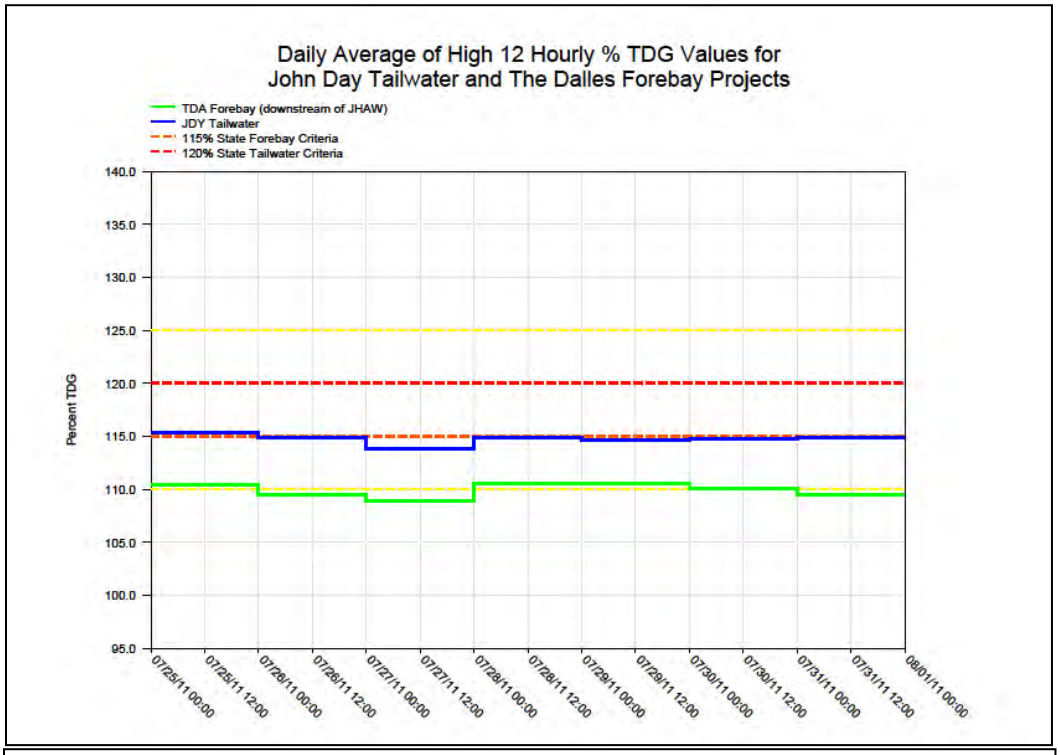

McNARY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
07/25/11 01:00
07/25/11 13:00
07/26/11 01:00
07/26/11 13:00
07/27/11 01:00
07/27/11 13:00
07/28/11 01:00
07/28/11 13:00
07/29/11 01:00
07/29/11 13:00
07/30/11 01:00
07/30/11 13:00
07/31/11 01:00
07/31/11 13:00
08/01/11 01:00
MCN Generation Flow
MCN Total Flow
MCN Spill Flow
MCN Target Spill
50% of Total Flow

Figure 30


Daily Average of High 12 Hourly % TDG Values for
John Day Tailwater and The Dalles Forebay Projects
TDA Forebay (downstream of JHAW)
JDY Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/25/11 00:00
07/25/11 12:00
07/26/11 00:00
07/26/11 12:00
07/27/11 00:00
07/27/11 12:00
07/28/11 00:00
07/28/11 12:00
07/29/11 00:00
07/29/11 12:00
07/30/11 00:00
07/30/11 12:00
07/31/11 00:00
07/31/11 12:00
08/01/11 00:00

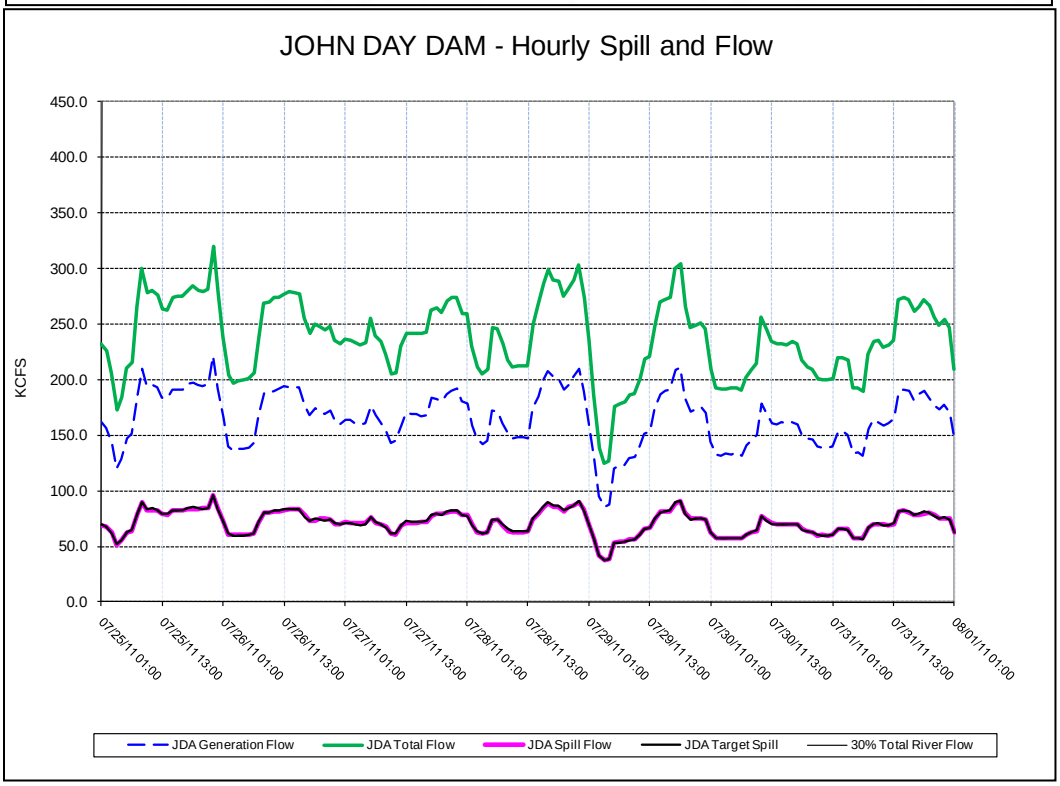
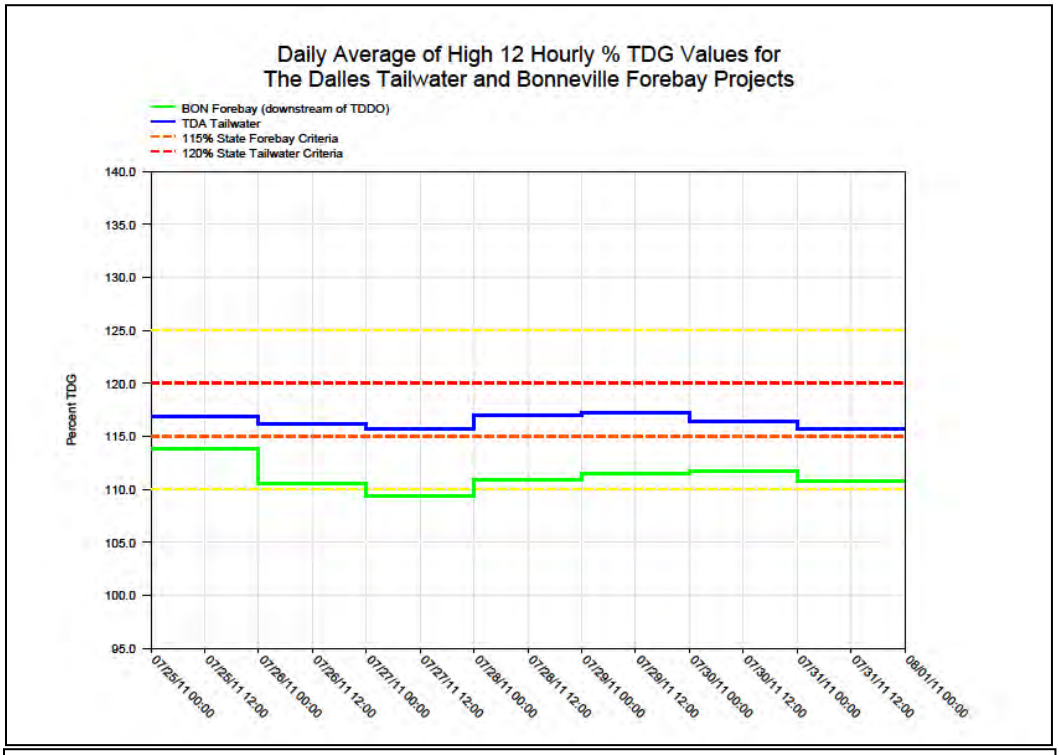

JOHN DAY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
07/25/11 01:00
07/25/11 13:00
07/26/11 01:00
07/26/11 13:00
07/27/11 01:00
07/27/11 13:00
07/28/11 01:00
07/28/11 13:00
07/29/11 01:00
07/29/11 13:00
07/30/11 01:00
07/30/11 13:00
07/31/11 01:00
07/31/11 13:00
08/01/11 01:00
JDA Generation Flow
JDA Total Flow
JDA Spill Flow
JDA Target Spill
30% Total River Flow

Figure 31


Daily Average of High 12 Hourly % TDG Values for
The Dalles Tailwater and Bonneville Forebay Projects
BON Forebay (downstream of TDDO)
TDA Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/25/11 00:00
07/25/11 12:00
07/26/11 00:00
07/26/11 12:00
07/27/11 00:00
07/27/11 12:00
07/28/11 00:00
07/28/11 12:00
07/29/11 00:00
07/29/11 12:00
07/30/11 00:00
07/30/11 12:00
07/31/11 00:00
07/31/11 12:00
08/01/11 00:00

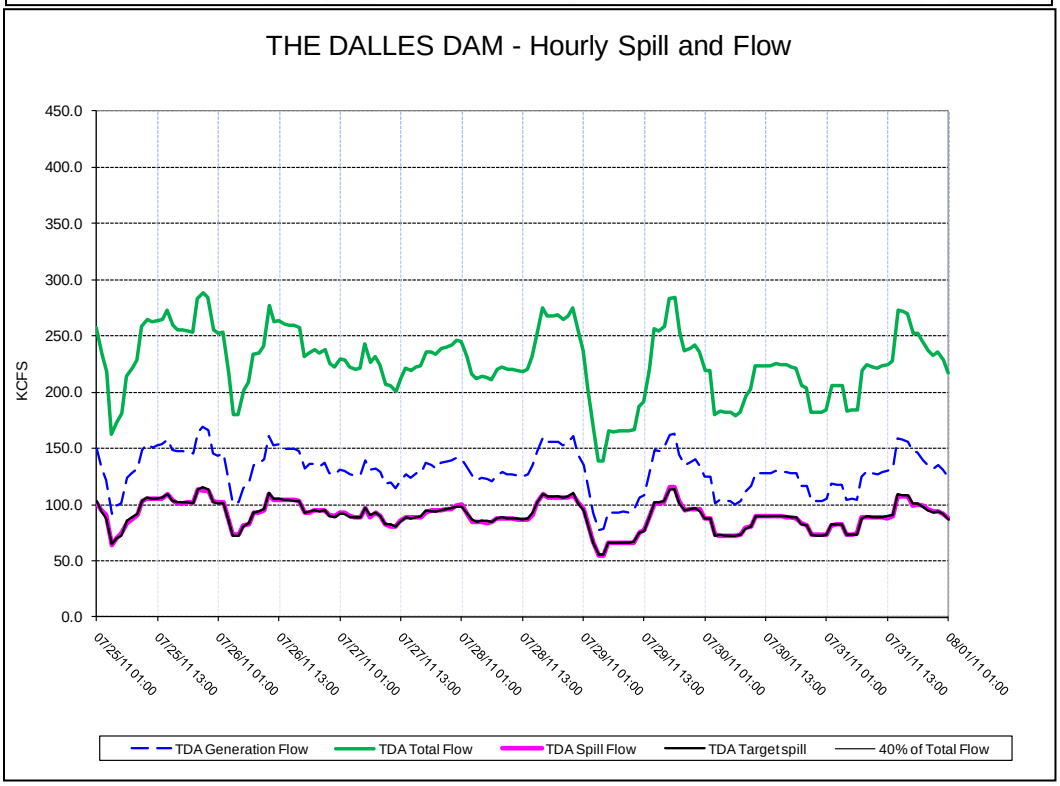

THE DALLES DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
07/25/11 01:00
07/25/11 13:00
07/26/11 01:00
07/26/11 13:00
07/27/11 01:00
07/27/11 13:00
07/28/11 01:00
07/28/11 13:00
07/29/11 01:00
07/29/11 13:00
07/30/11 01:00
07/30/11 13:00
07/31/11 01:00
07/31/11 13:00
08/01/11 01:00
TDA Generation Flow
TDA Total Flow
TDA Spill Flow
TDA Target spill
40% of Total Flow

Figure 32

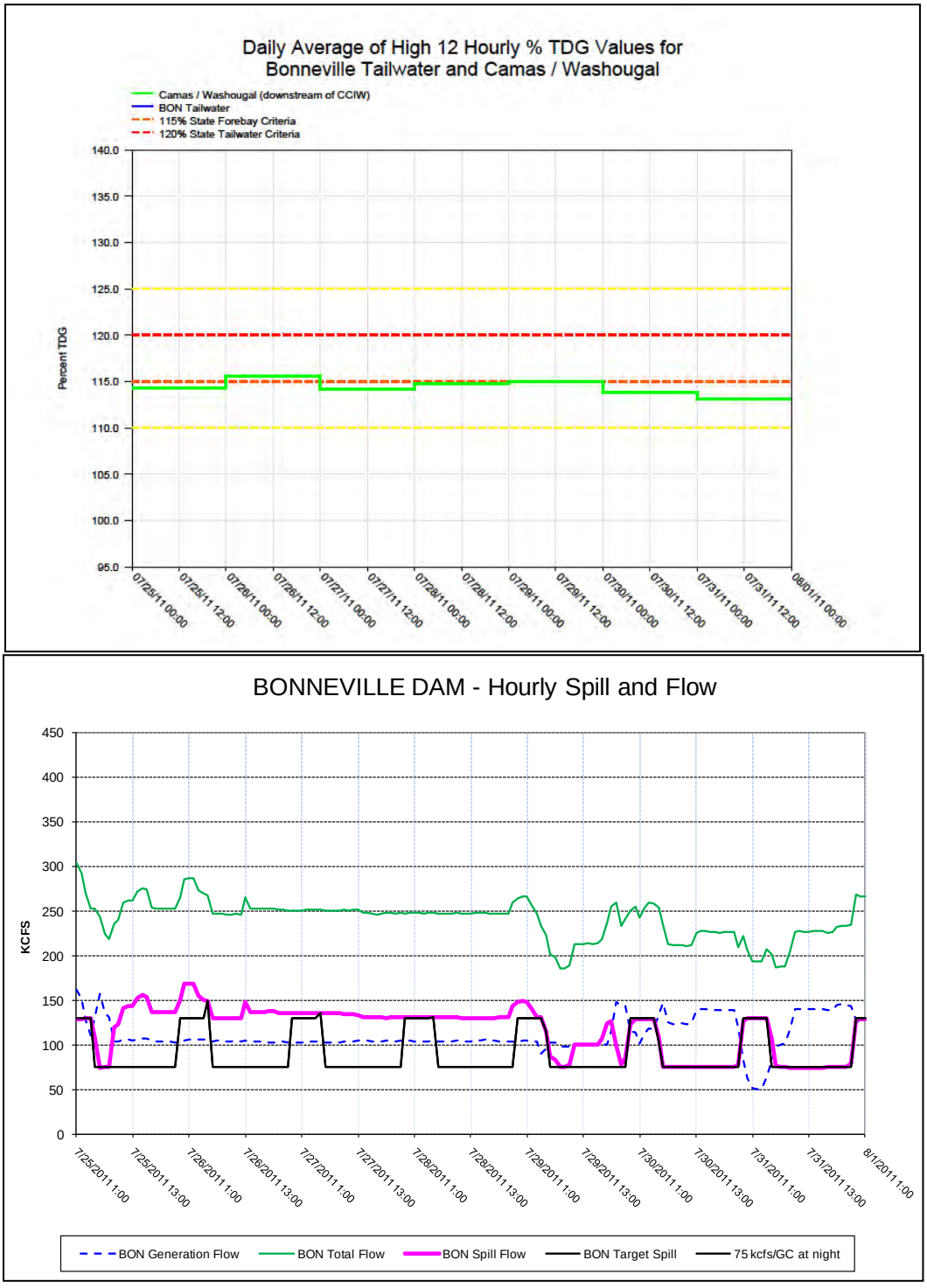

Daily Average of High 12 Hourly % TDG Values for
Bonneville Tailwater and Camas / Washougal
Camas / Washougal (downstream of CCIW)
BON Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
07/25/11 00:00
07/25/11 12:00
07/26/11 00:00
07/26/11 12:00
07/27/11 00:00
07/27/11 12:00
07/28/11 00:00
07/28/11 12:00
07/29/11 00:00
07/29/11 12:00
07/30/11 00:00
07/30/11 12:00
07/31/11 00:00
07/31/11 12:00
08/01/11 00:00
BONNEVILLE DAM - Hourly Spill and Flow
KCFS
450
400
350
300
250
200
150
100
50
0
7/25/2011 1:00
7/25/2011 13:00
7/26/2011 1:00
7/26/2011 13:00
7/27/2011 1:00
7/27/2011 13:00
7/28/2011 1:00
7/28/2011 13:00
7/29/2011 1:00
7/29/2011 13:00
7/30/2011 1:00
7/30/2011 13:00
7/31/2011 1:00
7/31/2011 13:00
8/1/2011 1:00
BON Generation Flow
BON Total Flow
BON Spill Flow
BON Target Spill
75 kcfs/GC at night

Figure 33

Average Percent TDG for Highest 12-Hours: July 4 – July 31, 2011

Date	FIXED MONITORING STATIONS																
	LWG	LGNW	LGSA	LGSW	LMNA	LMNW	IHRA	IDSW	MCNA	MCPW	JDY	JHAW	TDA	TDDO	BON	CCIW	CWMW
Gas Cap %	115	120	115	120	115	120	115	120	115	120	115	120	115	120	115	120	115
7/4/2011	106.8	118.7	115.0	117.1	119.3	119.2	118.3	119.8	118.4	**126.5**	119.8	**120.2**	117.9	**121.4**	117.6	---	**121.4**
7/5/2011	106.5	**121.3**	113.9	117.6	117.8	119.8	118.1	**120.8**	118.7	**125.9**	119.2	119.1	117.4	**120.4**	119.2	---	**121.0**
7/6/2011	107.1	**121.1**	113.9	117.3	118.9	**120.3**	118.7	**120.9**	119.2	**126.0**	122.1	119.2	118.8	**121.4**	118.4	---	**120.3**
7/7/2011	107.3	**120.5**	117.7	117.0	119.1	**120.3**	119.2	**120.3**	118.9	**126.0**	122.2	119.7	117.3	**121.1**	116.4	---	**118.0**
7/8/2011	106.0	118.8	115.4	117.0	116.2	**120.1**	117.4	119.8	115.3	**125.8**	117.3	119.2	115.1	118.2	113.9	---	**117.8**
7/9/2011	105.1	117.9	113.1	115.9	116.5	**120.1**	115.9	118.9	116.3	**125.6**	115.5	119.0	114.9	118.3	115.0	---	**118.0**
7/10/2011	105.4	117.5	112.9	116.6	117.1	**120.2**	116.2	117.9	118.0	**124.8**	114.4	119.0	113.9	117.7	115.7	---	**118.5**
7/11/2011	105.8	114.5	112.6	115.0	118.0	119.5	116.9	117.9	117.9	**125.2**	118.2	119.3	115.4	119.7	114.9	---	**118.8**
7/12/2011	105.2	112.1	114.0	114.7	116.9	118.8	116.5	116.4	116.8	**123.8**	117.8	118.3	115.1	119.4	115.4	---	**118.9**
7/13/2011	104.6	112.4	112.5	114.3	115.1	117.9	115.6	117.2	114.6	**123.9**	116.1	117.2	114.1	118.8	115.5	---	**117.8**
7/14/2011	103.8	111.5	110.6	113.2	113.9	118.1	114.0	117.5	113.6	**125.1**	113.8	117.8	113.5	118.9	115.3	---	**117.6**
7/15/2011	103.2	111.8	110.5	113.4	114.0	118.0	113.6	117.2	115.6	**124.7**	112.5	119.0	115.2	119.4	117.4	---	**118.9**
7/16/2011	103.6	112.7	110.9	113.8	113.8	118.1	114.0	117.1	116.7	**123.9**	111.9	118.1	114.1	118.6	116.5	---	**117.3**
7/17/2011	104.0	111.9	111.0	113.7	113.8	118.2	114.1	116.6	116.4	**123.3**	112.5	116.3	112.9	117.6	115.9	---	114.7
7/18/2011	103.2	112.1	110.4	114.0	113.4	117.6	113.7	116.7	115.2	**123.9**	113.7	117.1	112.4	117.1	113.6	---	114.3
7/19/2011	103.3	112.1	110.4	113.5	113.4	117.0	113.4	116.1	113.2	**123.8**	113.7	117.7	113.2	117.2	112.9	---	113.4
7/20/2011	103.2	114.1	109.1	113.8	111.8	117.3	111.7	116.5	111.8	**123.1**	111.0	117.8	112.6	117.9	112.9	---	114.4
7/21/2011	103.2	113.6	108.7	114.0	111.9	117.7	111.9	116.2	112.0	**121.9**	109.8	115.5	111.7	117.4	112.7	---	113.2
7/22/2011	102.9	113.5	108.3	113.6	111.6	116.5	111.8	116.2	111.7	118.9	108.7	115.6	109.4	116.3	112.1	---	113.6
7/23/2011	103.4	113.9	109.2	114.1	111.4	117.6	111.5	116.1	113.7	**121.2**	109.8	116.6	110.7	117.9	113.5	---	114.8
7/24/2011	103.2	113.3	110.2	114.3	112.3	117.9	112.7	116.5	115.6	**120.9**	111.0	116.2	112.0	118.3	114.8	---	**115.5**
7/25/2011	103.4	114.4	110.8	115.1	113.5	117.7	113.7	116.7	114.6	119.0	110.2	115.3	110.4	116.9	113.8	---	114.3
7/26/2011	103.1	115.2	111.3	113.9	113.6	117.4	112.9	116.8	113.8	117.8	110.9	114.8	109.5	116.1	110.5	---	**115.6**
7/27/2011	103.3	115.7	110.6	112.2	112.7	117.0	112.2	116.1	113.1	118.0	109.8	113.8	108.9	115.6	109.4	---	114.1
7/28/2011	103.0	115.8	110.2	111.5	112.2	117.7	112.2	116.0	113.0	118.7	109.5	114.9	110.5	116.9	110.9	---	114.8
7/29/2011	102.7	115.2	110.1	111.7	111.9	117.4	112.8	116.0	113.9	**120.5**	109.4	114.6	110.5	117.3	111.4	---	115.0
7/30/2011	102.9	116.3	111.9	112.6	112.1	117.4	114.0	115.4	114.5	**151.6**	110.0	114.8	110.1	116.4	111.7	---	113.8
7/31/2011	102.9	115.6	112.4	112.8	112.0	117.4	113.8	116.1	114.0	**152.2**	110.0	114.8	109.5	115.7	110.8	---	113.1

Figure 34

Total Dissolved Gas Monitoring Stations

Code	Station Name
LWG	Lower Granite Forebay
LGNW	Lower Granite Tailwater
LGSA	Little Goose Forebay
LGSW	Little Goose Tailwater
LMNA	Lower Monumental Forebay
LMNW	Lower Monumental Tailwater
IHRA	Ice Harbor Forebay
IDSW	Ice Harbor Tailwater
MCNA	McNary Forebay
MCPW	McNary Tailwater
JDY	John Day Forebay
JHAW	John Day Tailwater
TDA	The Dalles Forebay
TDDO	The Dalles Tailwater
BON	Bonneville Forebay
CCIW	Bonneville Tailwater (Cascade Island)
CWMW	Camas / Washougal

Notices

3:01-cv-00640-RE National Wildlife Federation et al v. National Marine Fisheries Service et al
PROTECTIVE ORD

U.S. District Court

District of Oregon

Notice of Electronic Filing

The following transaction was entered by Eitel, Michael on 8/15/2011 at 3:10 PM PDT and filed on 8/15/2011

Case Name:	National Wildlife Federation et al v. National Marine Fisheries Service et al
Case Number:	3:01-cv-00640-RE
Filer:	National Marine Fisheries Service U.S. Army Corps Of Engineers U.S. Bureau of Reclamation
Document Number:	1856

Docket Text:
Notice *of Filing Fourth Spill Implementation Report* Filed by National Marine Fisheries Service, U.S. Army Corps Of Engineers, U.S. Bureau of Reclamation (Attachments: # (1) Exhibit 1)Associated Cases: 3:01-cv-00640-RE, 3:05-cv-00023-RE (Eitel, Michael)

Case Name:	Columbia Snake River Irrigators Association et al v. Evans et al
Case Number:	3:05-cv-00023-RE
Filer:	
WARNING: CASE CLOSED on 06/30/2005	
Document Number:	924

Docket Text:
Notice *of Filing Fourth Spill Implementation Report* Filed by National Marine Fisheries Service, U.S. Army Corps Of Engineers, U.S. Bureau of Reclamation (Attachments: # (1) Exhibit 1)Associated Cases: 3:01-cv-00640-RE, 3:05-cv-00023-RE (Eitel, Michael)

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Document description: Main Document
Original filename: Not Available
Electronic document Stamp:
[STAMP ordStamp_ID=875559790 [Date=8/15/2011] [FileNumber=3708117-0] [
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e34d46c816cbbf8c8d927307b82381d72c25049379831b5ecfb58d0a46]]
Document description: Exhibit 1
Original filename: Not Available
Electronic document Stamp:
[STAMP ordStamp_ID=875559790 [Date=8/15/2011] [FileNumber=3708117-1] [
7f194afa1d42cb1c3209e23f1f2687f22fadf0561586c16f38fa174ba74db916a5a0ae
c80d4b19a1c90b27c58f2f7ad3354403134451f4896068ac7685444170]]

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UNITED STATES DISTRICT COURT

DISTRICT OF OREGON

NATIONAL WILDLIFE FEDERATION, *et al.*	Civil No. 01-640-RE
Plaintiffs,	**NOTICE OF FEDERAL DEFENDANTS' FIFTH 2011 SPILL IMPLEMENTATION STATUS REPORT**
v.	
NATIONAL MARINE FISHERIES SERVICE, *et al.*	
Defendants.	

In accordance with the Court's June 14, 2011 Order concerning 2011 summer spill

operations (Doc. 1852), Federal Defendants submit their fifth 2011 spill implementation status report. *See* Exhibit 1. This status report includes, among other things: the hourly flow through the powerhouse at each dam; the hourly flow over the spillway compared to the target spill for that hour; and the resultant 12-hour average total dissolved gas ("TDG") for the tailwater at each project and for the next project's forebay downstream. The report also provides written explanations of variances that occurred during the reporting period.

Respectfully submitted this 14th day of September, 2011.

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CERTIFICATE OF SERVICE

Pursuant to Local Rule Civil 100.13(c), and F.R. Civ. P. 5(d), I certify that on September 14, 2011, the foregoing will be electronically filed with the Court's electronic court filing system, which will generate automatic service upon on all Parties enrolled to receive such notice. The following will be manually served by overnight mail:

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FISH OPERATIONS PLAN IMPLEMENTATION REPORT
August 2011

Submitted by the U.S. Army Corps of Engineers
Northwestern Division
Portland, OR

Introduction:

The U.S. Army Corps of Engineers (Corps) is submitting this report in accordance with the U.S. District Court of Oregon June 14, 2011 Order adopting the 2011 Summer Fish Operations Plan (2011 Summer FOP). The 2011 Summer FOP describes the Corps' project operations for fish passage at its Federal Columbia River Power System (FCRPS) dams during the summer fish migration season, generally July through August. To the extent Corps project operations are not specified in the 2011 Summer FOP, the FCRPS operations will be consistent with the 2010 NOAA Fisheries Biological Opinion (2010 BiOp), the USFWS 2000 and 2006 BiOps, and/or other operative documents, including the 2011 Water Management Plan (WMP), WMP seasonal updates, and the 2011 Fish Passage Plan (FPP).

The Corps' August 2011 lower Snake and Columbia River project and fish passage operations are contained in this report. In particular, information in this report includes the following:

- hourly flow through the powerhouse at each dam;
- hourly flow over the spillway compared to the spill target for that hour; and,
- resultant 12-hour average percent Total Dissolved Gas (%TDG) levels in the tailrace at each project and in the subsequent downstream project's forebay and the Camas-Washougal gauge below Bonneville Dam.

This report also provides information on presented issues and unanticipated or emergency situations that arose during implementation of the 2011 Summer FOP in August.

Data Reporting:

I. For each project providing fish passage operations, this report contains two graphs per operational week[1] in August displaying the performance of the spill program as follows:

(A). Daily Average of the High 12 Hourly %TDG Values - described in the upper graph.
(B). Hourly Spill and Generation Flows - described in the lower graph.

The weekly graphs begin on August 1 and end on September 4 for the following lower Snake River and lower Columbia River projects: Lower Granite, Little Goose, Lower Monumental, Ice Harbor, McNary, John Day, The Dalles, and Bonneville.

[1] Operations are implemented from Monday through Sunday.

Each figure represents one week of a project's operation. The graphs start on August 1 at 0000 hours (%TDG graphs) and 0100 hours (flow/spill graphs).

August 1 – August 7	Figures 1 – 8
August 8 – August 14	Figures 9 – 16
August 15 – August 21	Figures 17 – 24
August 22 – August 28	Figures 25 – 32
August 29 – September 4	Figures 33 - 40

A. Upper Graph: Shows the resultant daily average %TDG for the 12 highest hours. This is primarily a result of spill at dams. The objective is to operate each project up to the TDG limits without exceeding those limits to the extent practicable.

- The blue line represents the %TDG in the tailrace of the dam. 120% TDG is the upper operating limit.[2]
- The green line represents the %TDG in the forebay of the next dam downstream. 115% TDG is the upper operating limit.

B. Lower Graph: Shows the hourly flow and spill at the dam.

- The dotted blue line shows the flow through the powerhouse each hour, in thousand cubic feet per second (kcfs).
- The medium green line represents the average hourly total river flow through the project in kcfs.
- The heavy pink line represents the average hourly flow through the spillway in kcfs.
- The thin black line represents the hourly spill level as defined in the 2011 Summer FOP.
- The heavy black line represents the target spill. This is the hourly maximum spill level. The hourly target spill may vary as a function of total river flow, forebay elevation and generator capacity, subject to the following conditions:

    - spill percentage or discharge specified in the FOP;
    - spill caps as set daily for TDG management;
    - test spill levels for fish passage research;
    - minimum generation for power system needs;
    - minimum spill at Bonneville (50 kcfs) dam;
    - minimum spill at John Day is 25 percent of project outflow.

II. A table is included at the end of the figures that lists the average daily %TDG for the 12 highest hours for all projects. The numbers in red indicate the project exceeded the %TDG gas cap - 115 percent (forebay of the next downstream dam) or 120 percent (tailwater) for each project.

[2] In May 2011, the Bonneville tailwater TDG gauge (CCIW) was destroyed by high flows and debris. USGS is in the process of rebuilding this monitoring station and expects it to be operable this fall. On August 17 a temporary logger that collects water quality data was installed. The information from the logger is down-loaded on a weekly basis and is presented, on Figures 24, 32 and 40 of Exhibit A.

General Implementation Remarks:

For all projects that spill for fish passage, the target spill may be reduced due to various conditions as described below. When spill levels briefly deviate below or above the level specified in the 2011 Summer FOP, the heavy pink line will be below or above the heavy black line in the graphs. Actual operation deviations from the target operation during voluntary spill hours are described below. The August 2011 Spill Variance Table includes average hourly data; therefore, while spill may vary from target spill for only a portion of an hour, the August 2011 Spill Variance Table characterizes the reduction as a full hour. There are instances when the hourly spill levels are not achievable due to mechanical limitations in setting spill gates to implement the regionally coordinated spill pattern. The project operator sets the spill gate stops to most closely approximate the 2011 Summer FOP level of spill while also avoiding exceeding the %TDG spill cap to the extent practicable.

"Low flow" operations at the lower Columbia and Snake projects are triggered when inflow is insufficient to provide both minimum generation and the specified spill levels. In these situations, the projects operate at minimum generation and spill the remainder of project inflow. As flows transition from higher flows to low flows, there may be situations when flows recede at a higher rate than forecasted. In addition, inflows provided by nonfederal projects upstream are variable and uncertain.

The combination of these factors may result in instances where unanticipated changes to inflow result in forebay elevations dropping to the low end of the Minimum Operating Pool (MOP). Since these projects have limited operating flexibility, maintaining minimum generation, MOP elevation, and the target spill may not be possible throughout every hour. During low flow periods at Little Goose Dam, the overall project spill percentage appears to be reduced because the calculations do not account for the volume of water released during navigational lockages; however, the actual spill volume remains constant. When these variances occur, they are recorded in the monthly Spill Variance Table for Little Goose under the variance type "Navigation."

Actual spill levels at Corps projects may range from 1 to 2 kcfs (Bonneville Dam may range from 1 to 3 kcfs) lower or higher than specified in the 2011 Summer FOP and the RCC spill priority list (defines the projects' %TDG spill caps). A number of factors influence actual spill, including hydraulic efficiency, exact gate opening calibration, spillway gate hoist cable stretch due to temperature changes, and forebay elevation (e.g., a higher forebay results in a greater volume of spill since more water can pass under the spill gate).

The 2011 Summer FOP describes project operations during "Rapid Load Changes" (p. 6). For reporting purposes, the notation "Transmission Stability" in the August 2011 Spill Variance Report Table replaces "Rapid Load Changes," and identifies instances when hourly spill levels were not met as a result of load swing hours and other related within-hour load variability issues. "Transmission Stability" occurs because projects must be available to respond to within-hour load variability to satisfy North American Electric Reliability Council (NERC) reserve requirements ("on response"). In addition to within-hour load variability, projects on response

must be responsive to within hour changes resulting from intermittent generation (such as wind generation). During periods of rapidly changing loads and intermittent generation, projects on response may have significant changes in turbine discharge within the hour while spill quantity remains the same within the hour. Under normal conditions, within-hour load changes primarily occur immediately preceding and following the peak load hours; however, within-hour changes in intermittent generation can occur at any hour of the day. Occasionally, several hours after peak load hours, the project may be decreasing total outflow and generation faster than the corresponding spill decreases causing the percent spill to be slightly higher. Due to the high variability of within-hour load, reporting actual spill percentages that vary by more than the ±1 percent requirement (or other ranges specified in the 2011 Summer FOP) may occur with greater frequency with "Transmission Stability" hours than other hours.

Occurrences requiring an adjustment in operations and/or regional coordination are described in greater detail in the "Operational Adjustments" section below.

August Operations:

The month of August was characterized by above average flows for the lower Snake and the lower Columbia Rivers. The NOAA Northwest River Forecast Center's Runoff Processor indicates final runoff volume, as measured at The Dalles, for April – August is 127.4 MAF or 137 percent of average. The Runoff Processor also indicates August 2011 runoff was above the 30 year average (1971-2000): 126 percent of average at Lower Granite Dam, and 119 percent of average at The Dalles Dam. August precipitation was noticeably low, less than 50 percent of average at most Columbia Basin locations in the U.S.

A combination of coordinated powerhouse outages and higher than normal flows at Lower Granite, Little Goose and McNary projects resulted in instances of involuntary spill during the month as flows exceeded the reduced available powerhouse capacity. In some involuntary spill instances for Lower Granite, the resulting Daily Average of High 12 Hourly %TDG values exceeded the 115 percent forebay (Little Goose) and 120 percent tailrace state standards[3] as shown in the corresponding %TDG graphs and table (Figure 41) for the lower Columbia and Snake River projects.

During the August reporting period, planned spill operations according to the 2011 Summer FOP were as follows:

- Lower Granite Dam - The hourly target spill discharge was 18 kcfs 24-hours/day.
- Little Goose Dam - The hourly target spill discharge was 30 percent of total river discharge 24-hours/day.
- Lower Monumental Dam - The hourly target spill discharge was 17 kcfs 24-hours/day.
- Ice Harbor Dam - The hourly target spill discharge was 45 kcfs daytime (0500-1800) and the % TDG spill cap nighttime.
- McNary Dam - The hourly target spill discharge was 50 percent of total river discharge for 24-hours/day.

[33] As provided for in the 2011 Summer FOP (see p. 2-3).

- John Day Dam - The hourly target spill discharge was 30 percent of total river discharge for 24-hours/day.
- The Dalles Dam - The hourly target spill discharge was 40 percent of total river discharge for 24-hours/day.
- Bonneville Dam - The hourly target spill discharge was 75 kcfs daytime and the % TDG spill cap nighttime.

Operational Adjustments

1. Lower Granite Dam:

   From August 1 at 0700 hours to August 9 at 1200 hours, a scheduled powerhouse outage occurred at Lower Granite Dam resulting in spilling all inflow except approximately 5 kcfs to maintain station service generation. This outage was included in the 2011 FPP. During this outage, the Corps discovered an oil leak at transformer T1-B. To make necessary repairs, there were a number of occasions when there was limited generation resulting in additional spill. The additional outages were coordinated with FPOM via email on August 8 and 12 and during the August 11 FPOM meeting. FPOM members either supported or did not object to the operation. Please refer to the August Spill Variance Table for details.

2. Little Goose Dam:

   From August 1 at 0700 hours through August 9 at 0900 hours, scheduled powerhouse outages occurred in order to facilitate repairs of the T-1 transformer. The first two days of repair and inspection (August 1-2) required a full powerhouse outage during the day resulting in spilling all inflow except approximately 5 kcfs to maintain station service generation. During the outages, hourly spill exceeded 30 percent of total river discharge specified in the 2011 Summer FOP. Turbine units 1 through 4 were returned to service each evening at 1800 hours through 0630 hours the following morning. Upon completion of the inspections on August 4, the project returned turbine units 5 and 6 to service. On August 9 at 0900, all units were back in service. These outages were coordinated with FPOM via email on March 16 and during the FPOM meetings on April 14 and July 14. FPOM members either supported or did not object to the operation.

3. Ice Harbor Dam:

   For navigation safety purposes, as identified in the 2011 Summer FOP, the Ice Harbor pool elevation was increased by 0.5 feet. The Corps operated at the adjusted pool elevation range through the remainder of August. This operation did not impact spill levels and was coordinated with TMT via email on August 23, and during the TMT meeting on August 31. TMT members either supported or did not object to this operation.

4. Bonneville Dam:

   On August 10 at 1400 hours, the project temporarily changed powerhouse (PH) priority to PH1 and expanded the 1% operating range of PH1 turbine units in order to decrease attraction flow to make repairs to the Washington Shore (WS) fish ladder. On August 11 at

1430 hours, operations to accommodate the repairs, the project maintained spill consistent with the 2011 Summer FOP. The operations were coordinated with FPOM via conference call on August 10 and email on August 15. FPOM members either supported or did not object to the operations.

August 2011 Spill Variance Table

Project	Parameter	Date	Time[4]	Hours	Type	Reason
Lower Granite	Additional Spill	8/1/11 - 8/11/11	0700 - 0700	241	Maintenance	Hourly spill increased to 50.3 kcfs (above 18 kcfs FOP spill). Spill of excess outflow to take the line out of service.
Lower Granite	Additional Spill	8/12/11	0700 - 2200	16	Maintenance	Hourly spill increased to 25.9 kcfs (above 18 kcfs FOP spill). Spill of excess outflow to take transformer bank out of service and perform repairs.
Lower Granite	Additional Spill	8/13/11 - 8/14/11	1000 - 0100	16	Maintenance	Hourly spill increased to 26.2 kcfs (above 18 kcfs FOP spill). Spill of excess outflow to take transformer bank out of service and perform repairs.
Lower Granite	Additional Spill	8/15/11 - 8/17/11	0700 - 1800	60	Maintenance	Hourly spill increased to 35.2 kcfs (above 18 kcfs FOP spill). Spill of excess outflow to take transformer bank out of service and perform repairs.
Lower Granite	Additional Spill	8/19/11	1300 - 2000	8	Maintenance	Hourly spill increased to 31.1 kcfs (above 18 kcfs FOP spill) due to testing after transformer maintenance.
Little Goose	Reduced % Spill	8/1/11	0100	1	Navigation	Hourly spill decreased to 28.9% (below 30.0% ±1% range) due to water volume needed to empty the navigation lock. See p. 3. 24 hr avg. spill was 58.6%.
Little Goose	Additional % Spill	8/1/11	0600 - 1900	14	Maintenance	Hourly spill increased to 92.5% (above 30.0% ±1% range). Spill of excess outflow to take line out of service. 24 hr avg. spill was 58.6%.

[4] Note: Data collected for reporting spill variances is reported using hourly-averaged data. Therefore, while spill may be increased or decreased for only a portion of an hour, it is represented in the Spill Variance Table as an hour.

Little Goose	Additional % Spill	8/2/11	0600 - 1800	13	Maintenance	Hourly spill increased to 90.8% (above 30.0% ±1% range). Spill of excess outflow to take line out of service). 24 hr avg. spill was 60.9%.
Little Goose	Reduced % Spill	8/4/11	0900	1	Navigation	Hourly spill decreased to 28.5% (below 30.0% ±1% range). Reduced spill for safe passage of fish barge. 24 hr avg. spill was 29.8%.
Little Goose	Reduced % Spill	8/4/11	2000; 2200	2	Navigation	Hourly spill decreased to 28.9% (below 30.0% ±1% range). Reduced spill for safe passage of fish barge. 24 hr avg. spill was 29.8%.
Little Goose	Reduced % Spill	8/5/11	1300	1	Navigation	Hourly spill decreased to 28.9% (below 30.0% ±1% range). Reduced spill for safe passage of fish barge. 24 hr avg. spill was 29.9%.
Little Goose	Reduced % Spill	8/6/11	0700; 1000	2	Navigation	Hourly spill decreased to 28.8 and 28.7% (below 30.0% ±1% range). Reduced spill for safe passage of fish barge. 24 hr avg. spill was 30.0%.
Little Goose	Reduced % Spill	8/8/11	0800	1	Navigation	Hourly spill decreased to 28.8 (below 30.0% ±1% range) due to water volume needed to empty the navigation lock. See p. 3. 24 hr avg. spill was 30.0%.
Little Goose	Additional % Spill	8/9/11	0900	1	Maintenance	Hourly spill increased to 75.7 % (above 30.0% ±1% range). Spill of excess outflow to bring a line back into service. 24 hr avg. spill was 31.7%.
Little Goose	Reduced % Spill	8/10/11	1000	1	Navigation	Hourly spill decreased to 28.9% (below 30.0% ±1% range) due to water volume needed to empty the navigation lock. See p. 3. 24 hr avg. spill was 30.0%.
Little Goose	Reduced % Spill	8/11/11	0100; 0400	2	Navigation	Hourly spill decreased ranging from 28.7 to 28.8% (below 30.0% ±1% range) due to water volume needed to empty the navigation lock. See p. 3. 24 hr avg. spill was 29.8%.

Little Goose	Reduced % Spill	8/12/11	1000; 1900	2	Navigation	Hourly spill decreased to 28.8% (below 30.0% ±1% range) due to water volume needed to empty the navigation lock. See p. 3. 24 hr avg. spill was 29.6%.
Little Goose	Reduced % Spill	8/13/11	1300; 2400	2	Navigation	Hourly spill decreased ranging from 28.9 to 28.7% (below 30.0% ±1% range) due to water volume needed to empty the navigation lock. See p. 3. 24 hr avg. spill was 29.9%.
Little Goose	Reduced % Spill	8/16/11	0300; 2100	2	Navigation	Hourly spill decreased to 28.9% (below 30.0% ±1% range) due to water volume needed to empty the navigation lock. See p. 3. 24 hr avg. spill was 29.9%.
Little Goose	Reduced % Spill	8/17/11	1600; 1800; 2400	3	Navigation	Hourly spill decreased ranging from28.8 to 28.9% (below 30.0% ±1% range) due to water volume needed to empty the navigation lock. See p. 3. 24 hr avg. spill was 29.8%.
Little Goose	Reduced % Spill	8/22/11	0800; 2100	2	Navigation	Hourly spill decreased ranging from 28.7 to 28.8% (below 30.0% ±1% range) due to water volume needed to empty the navigation lock. See p. 3. 24 hr avg. spill was 29.8%.
Little Goose	Reduced % Spill	8/23/11	0200	1	Navigation	Hourly spill decreased 28.9% (below 30.0% ±1% range) due to water volume needed to empty the navigation lock. See p. 3. 24 hr avg. spill was 29.9%.
Little Goose	Reduced % Spill	8/24/11	0300; 1300; 1900; 2000	4	Navigation	Hourly spill decreased ranging from28.8 to 28.9% (below 30.0% ±1% range) due to water volume needed to empty the navigation lock. See p. 3. 24 hr avg. spill was 29.7%.

Little Goose	Reduced % Spill	8/25/11	1300	1	Navigation	Hourly spill decreased to 28.9% (below 30.0% ±1% range) due to water volume needed to empty the navigation lock. See p. 3. 24 hr avg. spill was 29.9%.
Little Goose	Reduced % Spill	8/26/11	0300; 0700; 1500	3	Navigation	Hourly spill decreased ranging from 28.6% and 28.9% (below 30.0% ±1% range) due to water volume needed to empty the navigation lock. See p. 3. 24 hr avg. spill was 29.8%.
Little Goose	Reduced % Spill	8/27/11	0800	1	Navigation	Hourly spill decreased to 28.8% (below 30.0% ±1% range) due to water volume needed to empty the navigation lock. See p. 3. 24 hr avg. spill was 29.9%.
Little Goose	Reduced % Spill	8/28/11	1000; 1800	2	Navigation	Hourly spill decreased to 28.8% and 28.9% (below 30.0% ±1% range) due to water volume needed to empty the navigation lock. See p. 3. 24 hr avg. spill was 30.0%.
Little Goose	Reduced % Spill	8/30/11	2400	1	Navigation	Hourly spill decreased to 28.8% (below 30.0% ±1% range) due to water volume needed to empty the navigation lock. See p. 3. 24 hr avg. spill was 29.9%.
Lower Monumental	Reduced Spill	8/1/11	1800 - 1900	2	Navigation	Hourly spill decreased ranging from 12.4 to 15.2 kcfs (below 17 kcfs FOP spill). Reduced spill for safe passage of fish barge.
Lower Monumental	Reduced Spill	8/3/11	1600 - 1700	2	Navigation	Hourly spill decreased ranging from 8.9 to 14.0 kcfs (below 17 kcfs FOP spill). Reduced spill for safe passage of fish barge.
Lower Monumental	Reduced Spill	8/5/11	1700	1	Navigation	Hourly spill decreased to 10.8 kcfs (below 17 kcfs FOP spill). Reduced spill for safe passage of fish barge.

Lower Monumental	Reduced Spill	8/7/11	1600 - 1700	2	Navigation	Hourly spill decreased ranging from 12.5 to 14.4 kcfs (below 17 kcfs FOP spill). Reduced spill for safe passage of fish barge.
Lower Monumental	Reduced Spill	8/9/11	1700	1	Navigation	Hourly spill decreased to 12.3 kcfs (below 17 kcfs FOP spill). Reduced spill for safe passage of fish barge.
Lower Monumental	Reduced Spill	8/11/11	1700 - 1800	2	Navigation	Hourly spill decreased to 13.2 kcfs (below 17 kcfs FOP spill). Reduced spill for safe passage of fish barge.
Lower Monumental	Reduced Spill	8/13/11	1700 - 1800	2	Navigation	Hourly spill decreased to 5.8 kcfs (below 17 kcfs FOP spill). Reduced spill for safe passage of fish barge.
Lower Monumental	Reduced Spill	8/15/11	1700 - 1800	2	Navigation	Hourly spill decreased to 7.3 kcfs (below 17 kcfs FOP spill). Reduced spill for safe passage of fish barge.
Ice Harbor	Reduced Spill	8/25/111	1100; 1200	2	Maintenance	Hourly spill remained at 34.9 kcfs while generation increased above minimum range (8.5-10.3 kcfs for unit 1 & 3) to 11.3 and 13.9 kcfs, for testing after annual maintenance.
McNary	Additional % Spill	8/1/11	1000 - 2100	12	Maintenance	Hourly spill increased to 62.4% (above 50.0% ±1% range). Spill of excess outflow to take the line out of service. Planned outage in 2011 WMP. 24 hr avg. spill was 55.3%.
McNary	Additional % Spill	8/2/11 - 8/5/11	0700 - 2000	86	Maintenance	Hourly spill increased to 70.7% (above 50.0% ±1% range). Spill of excess outflow to take line out of service. Planned outage in 2011 WMP. 24 hr avg. spill was 60.5%; 62.8%; 60.4%; 57.9%.
McNary	Additional % Spill	8/6/11	0600 - 2000	15	Maintenance	Hourly spill increased to 65.3% (above 50.0% ±1% range). Spill of excess outflow to take the line out of service. Planned outage in 2011 WMP. 24 hr avg. spill was 56.9%.

McNary	Additional % Spill	8/8/11	0700 - 2100	15	Maintenance	Hourly spill increased to 62.2% (above 50.0% ±1% range). Spill of excess outflow to take line out of service. Planned outage in 2011 WMP. 24 hr avg. spill was 56.2%.
McNary	Additional % Spill	8/9/11	0700	1	Maintenance	Hourly spill increased to 53.1% (above 50.0% ±1% range). Spill of excess outflow to take line out of service. Planned outage in 2011 WMP. 24 hr avg. spill was 50.1%.
McNary	Reduced % Spill	8/12/11	0700 - 0800	2	Navigation	Hourly spill decreased ranging from 43.9 to 46% (below 50.0% ±1% range) Reduced spill for safe passage of fish barge. 24 hr avg. spill was 49.6%.
McNary	Reduced % Spill	8/12/11	1000	1	Navigation	Hourly spill decreased to 44.1% (below 50.0% ±1% range) Reduced spill for safe passage of fish barge. 24 hr avg. spill was 49.6%.
McNary	Reduced % Spill	8/14/11	0700 - 0800	2	Navigation	Hourly spill decreased ranging from 46.3 to 47.5% (below 50.0% ±1% range) Reduced spill for safe passage of fish barge. 24 hr avg. spill was 49.6%.
McNary	Reduced % Spill	8/14/11	1000	1	Navigation	Hourly spill decreased to 45.8% (below 50.0% ±1% range) Reduced spill for safe passage of fish barge. 24 hr avg. spill was 49.6%.
McNary	Reduced % Spill	8/16/11	0700; 1000	2	Navigation	Hourly spill decreased to 35.8 and 44.8% (below 50.0% ±1% range) Reduced spill for safe passage of fish barge. 24 hr avg. spill was 49.4%.
McNary	Reduced % Spill	8/24/11	0300	1	Human/Program Error	Hourly spill decreased to 47.9% (below 50.0% ±1% range). Delay in changing to requested 100 kcfs. 24 hr avg. spill was 50.1%.
McNary	Additional % Spill	8/31/11	1600	1	Transmission Stability	Hourly spill increased to 51.1% (above 50.0% ±1% range). Project on response during rapidly changing loads or changes in intermittent generation. See p. 3-4. 24 hr avg. spill was 50.3%.

John Day	Additional % Spill	8/11/11	0500	1	Human/Program Error	Hourly spill increased to 31.2% (above 30.0% ±1% range). Request to change to 47 kcfs at 0500 hr. occurred in the previous hour. 24 hr avg. spill was 30.0%.
John Day	Reduced % Spill	8/21/11	1200	1	Human/Program Error	Hourly spill decreased to 28.8% (below 30.0% ±1% range) due to electronic control system tripping. Once operator noticed he reset electronic control system. 24 hr avg. spill was 29.9%.
The Dalles	Additional % Spill	8/2/11	0200	1	Transmission Stability	Hourly spill increased to 41.2% (above 40.0% ±1% range). Project on response during rapidly changing loads or changes in intermittent generation. See p. 3-4. 24 hr avg. spill was 40.0%.
The Dalles	Reduced % Spill	8/26/11	0800	1	Transmission Stability	Hourly spill decreased to 38.5% (below 40.0% ±1% range). Project on response during rapidly changing loads or changes in intermittent generation. See p. 3-4. 24 hr avg. spill was 40.0%.

Figure 1

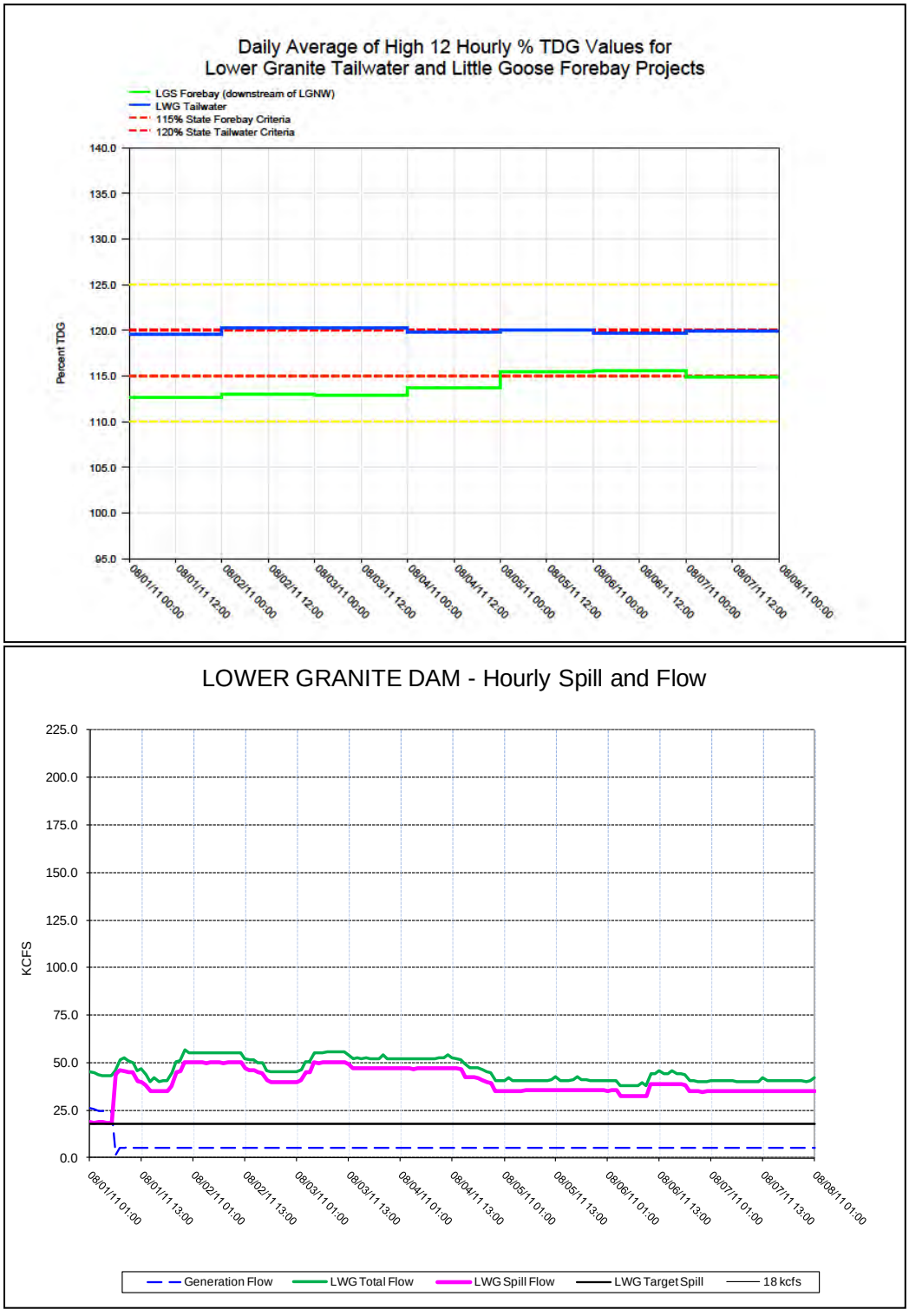

Daily Average of High 12 Hourly % TDG Values for
Lower Granite Tailwater and Little Goose Forebay Projects
LGS Forebay (downstream of LGNW)
LWG Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/01/11 00:00
08/01/11 12:00
08/02/11 00:00
08/02/11 12:00
08/03/11 00:00
08/03/11 12:00
08/04/11 00:00
08/04/11 12:00
08/05/11 00:00
08/05/11 12:00
08/06/11 00:00
08/06/11 12:00
08/07/11 00:00
08/07/11 12:00
08/08/11 00:00
LOWER GRANITE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
08/01/11 01:00
08/01/11 13:00
08/02/11 01:00
08/02/11 13:00
08/03/11 01:00
08/03/11 13:00
08/04/11 01:00
08/04/11 13:00
08/05/11 01:00
08/05/11 13:00
08/06/11 01:00
08/06/11 13:00
08/07/11 01:00
08/07/11 13:00
08/08/11 01:00
Generation Flow
LWG Total Flow
LWG Spill Flow
LWG Target Spill
18 kcfs

Figure 2

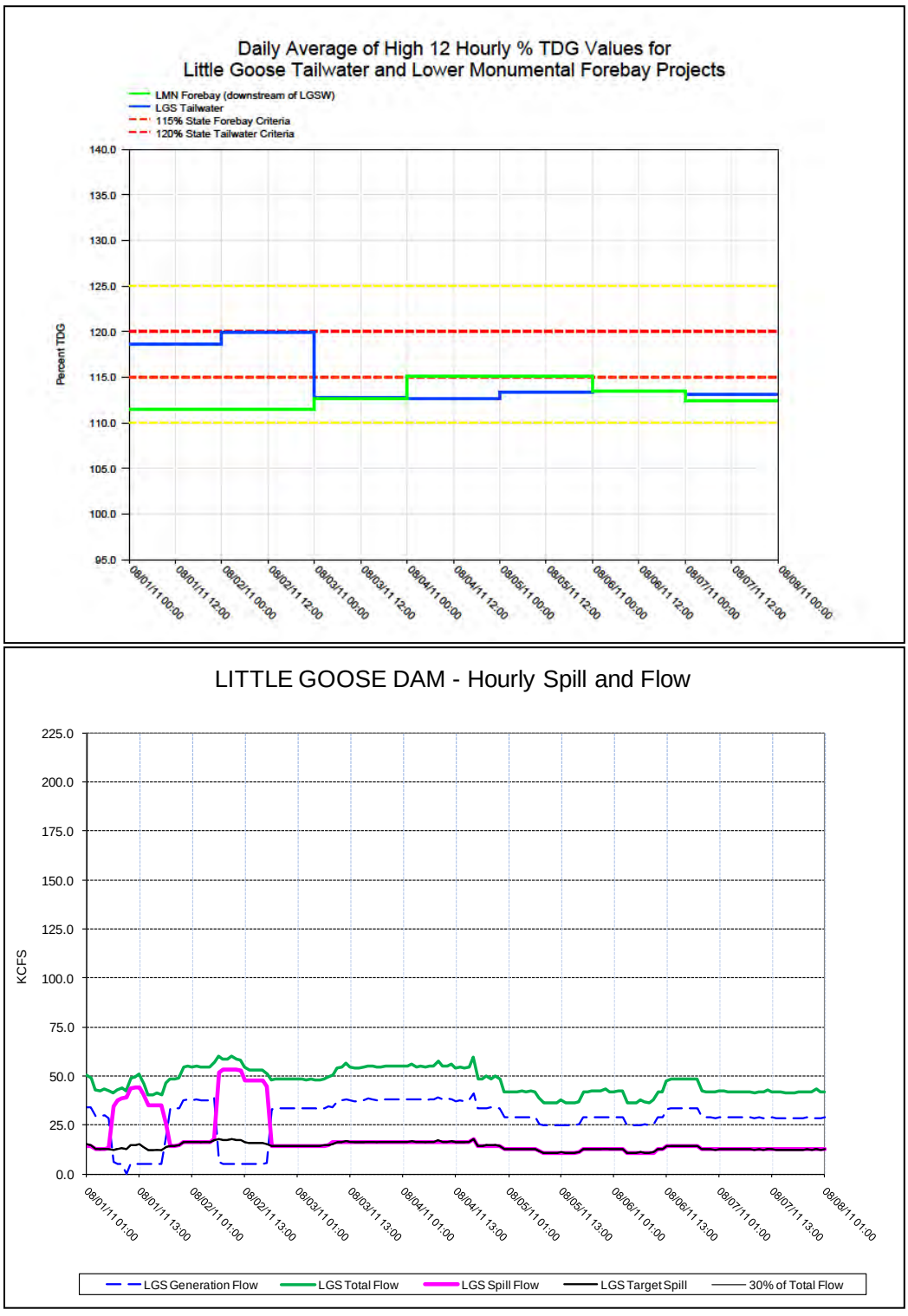

Daily Average of High 12 Hourly % TDG Values for
Little Goose Tailwater and Lower Monumental Forebay Projects
LMN Forebay (downstream of LGSW)
LGS Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/01/11 00:00
08/01/11 12:00
08/02/11 00:00
08/02/11 12:00
08/03/11 00:00
08/03/11 12:00
08/04/11 00:00
08/04/11 12:00
08/05/11 00:00
08/05/11 12:00
08/06/11 00:00
08/06/11 12:00
08/07/11 00:00
08/07/11 12:00
08/08/11 00:00
LITTLE GOOSE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
08/01/11 01:00
08/01/11 13:00
08/02/11 01:00
08/02/11 13:00
08/03/11 01:00
08/03/11 13:00
08/04/11 01:00
08/04/11 13:00
08/05/11 01:00
08/05/11 13:00
08/06/11 01:00
08/06/11 13:00
08/07/11 01:00
08/07/11 13:00
08/08/11 01:00
LGS Generation Flow
LGS Total Flow
LGS Spill Flow
LGS Target Spill
30% of Total Flow

Figure 3

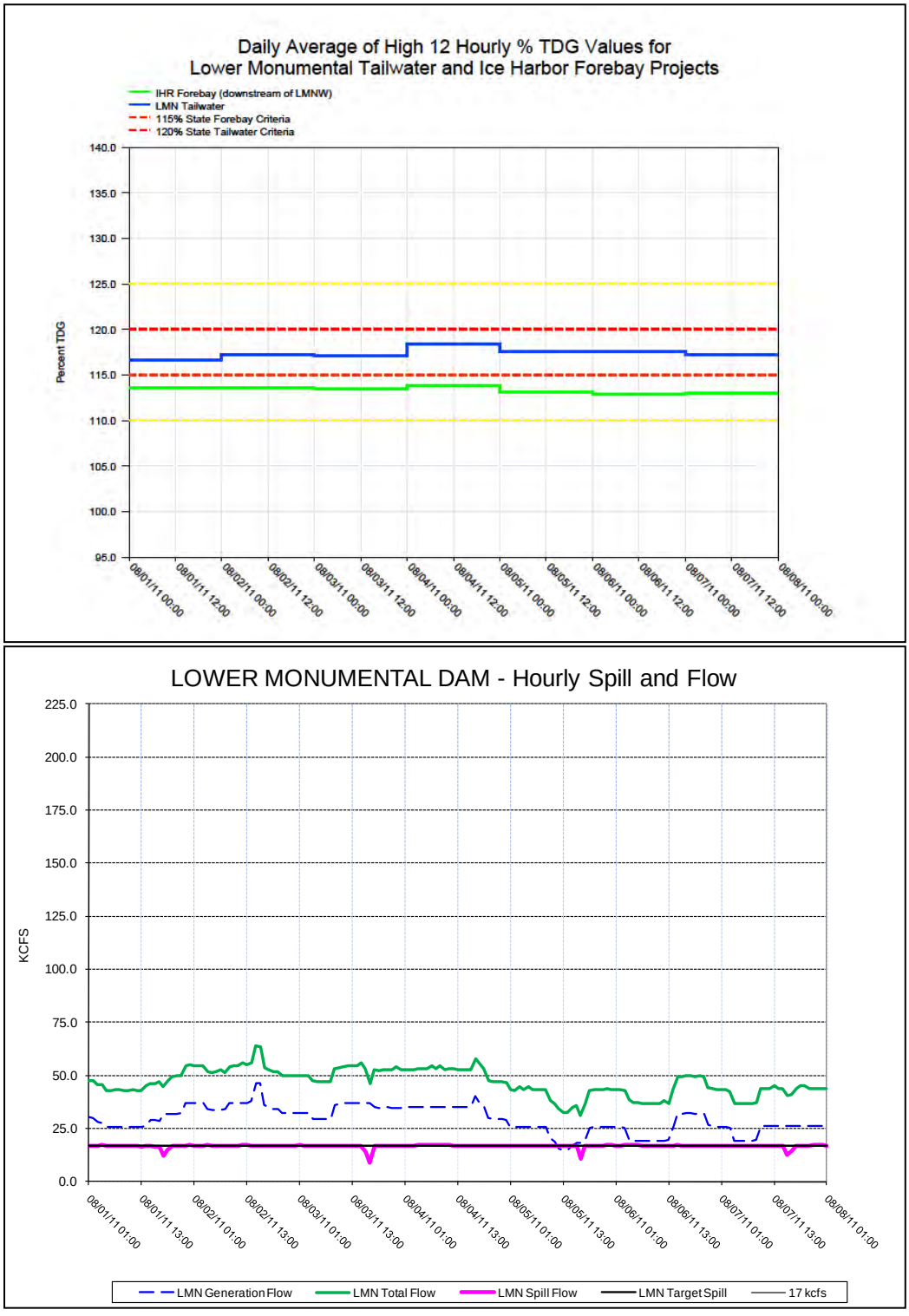

Daily Average of High 12 Hourly % TDG Values for
Lower Monumental Tailwater and Ice Harbor Forebay Projects
IHR Forebay (downstream of LMNW)
LMN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/01/11 00:00
08/01/11 12:00
08/02/11 00:00
08/02/11 12:00
08/03/11 00:00
08/03/11 12:00
08/04/11 00:00
08/04/11 12:00
08/05/11 00:00
08/05/11 12:00
08/06/11 00:00
08/06/11 12:00
08/07/11 00:00
08/07/11 12:00
08/08/11 00:00
LOWER MONUMENTAL DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
08/01/11 01:00
08/01/11 13:00
08/02/11 01:00
08/02/11 13:00
08/03/11 01:00
08/03/11 13:00
08/04/11 01:00
08/04/11 13:00
08/05/11 01:00
08/05/11 13:00
08/06/11 01:00
08/06/11 13:00
08/07/11 01:00
08/07/11 13:00
08/08/11 01:00
LMN Generation Flow
LMN Total Flow
LMN Spill Flow
LMN Target Spill
17 kcfs

Figure 4

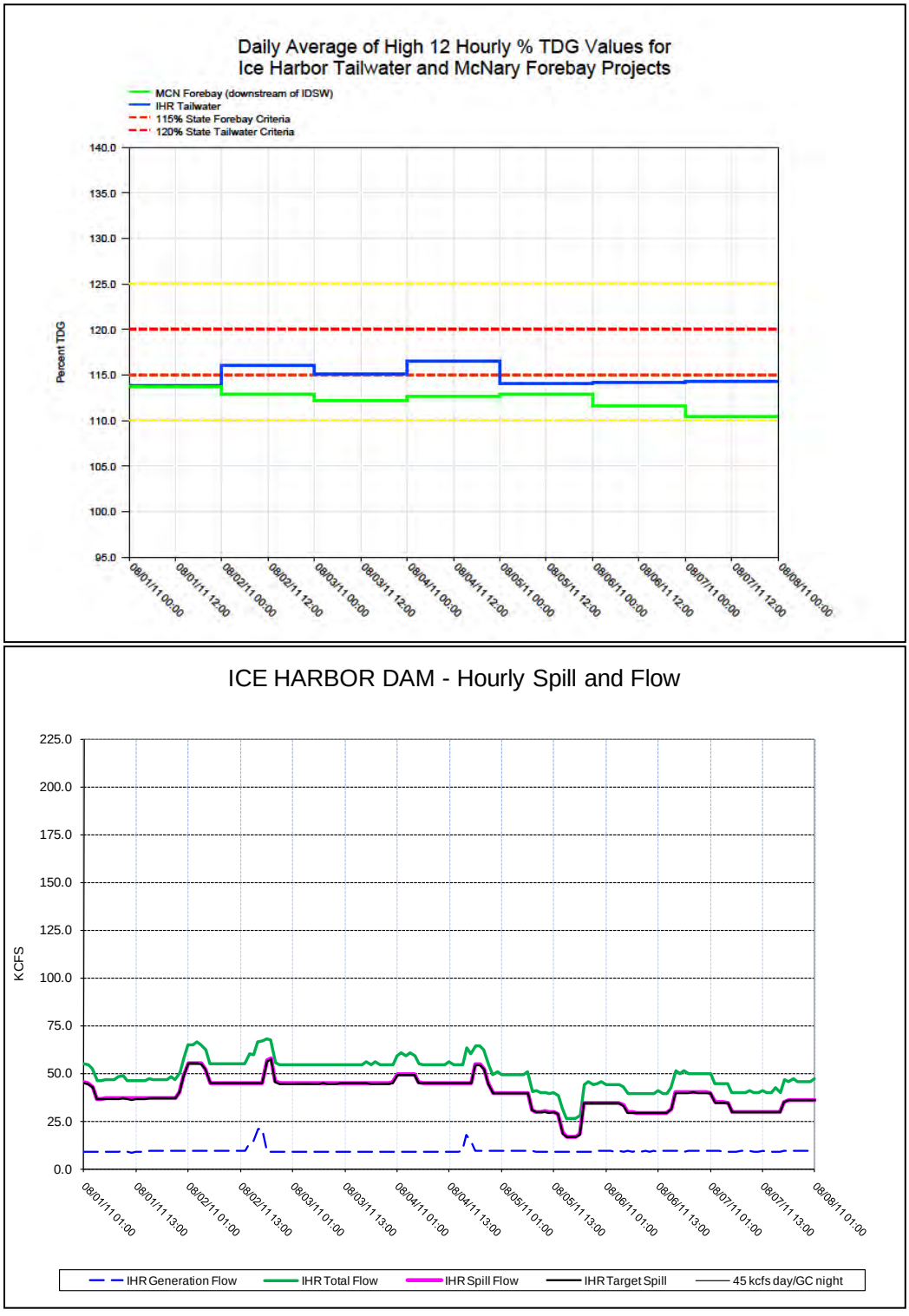

Daily Average of High 12 Hourly % TDG Values for
Ice Harbor Tailwater and McNary Forebay Projects
MCN Forebay (downstream of IDSW)
IHR Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/01/11 00:00
08/01/11 12:00
08/02/11 00:00
08/02/11 12:00
08/03/11 00:00
08/03/11 12:00
08/04/11 00:00
08/04/11 12:00
08/05/11 00:00
08/05/11 12:00
08/06/11 00:00
08/06/11 12:00
08/07/11 00:00
08/07/11 12:00
08/08/11 00:00
ICE HARBOR DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
08/01/11 01:00
08/01/11 13:00
08/02/11 01:00
08/02/11 13:00
08/03/11 01:00
08/03/11 13:00
08/04/11 01:00
08/04/11 13:00
08/05/11 01:00
08/05/11 13:00
08/06/11 01:00
08/06/11 13:00
08/07/11 01:00
08/07/11 13:00
08/08/11 01:00
IHR Generation Flow
IHR Total Flow
IHR Spill Flow
IHR Target Spill
45 kcfs day/GC night

Figure 5

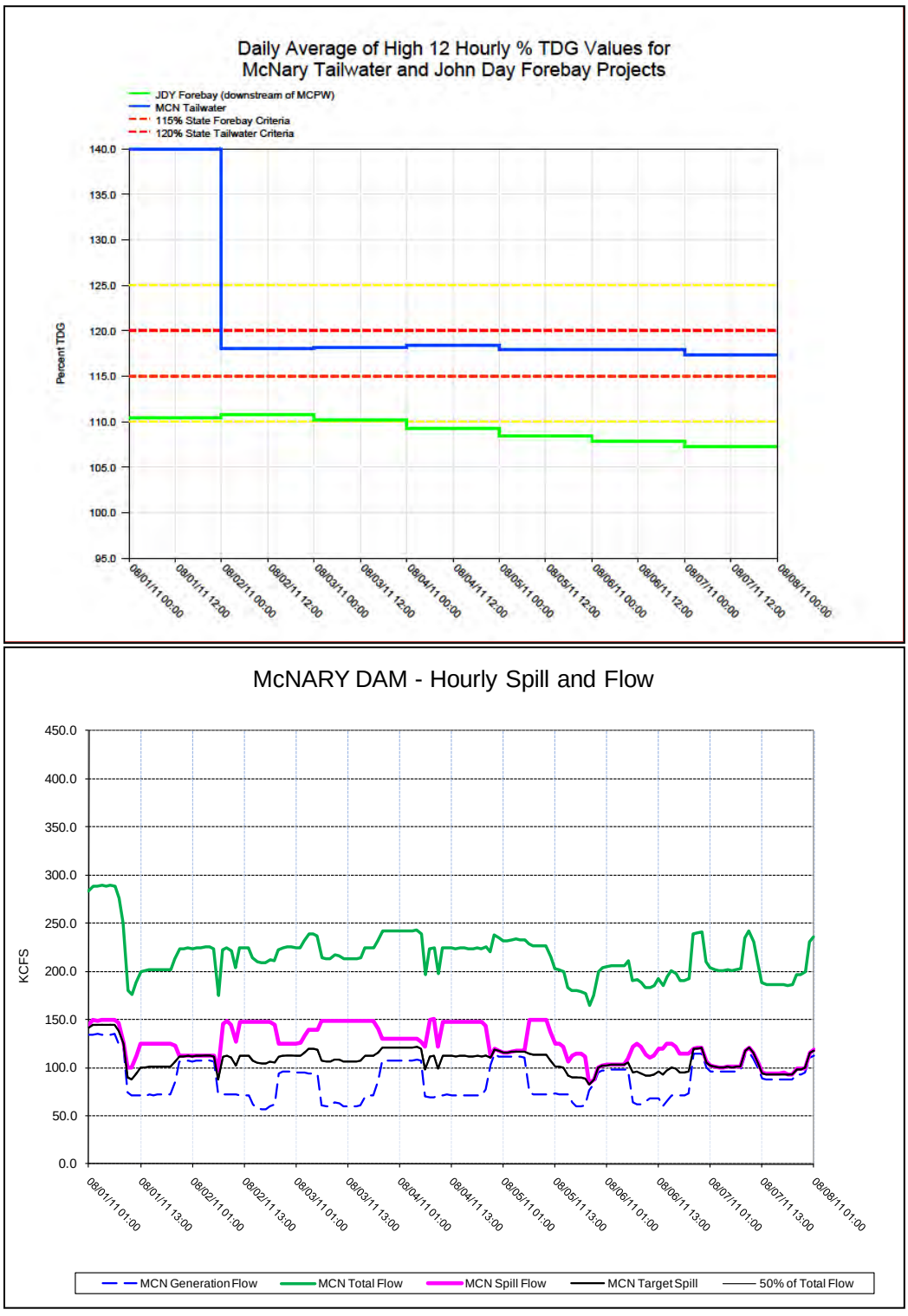

Daily Average of High 12 Hourly % TDG Values for
McNary Tailwater and John Day Forebay Projects
JDY Forebay (downstream of MCPW)
MCN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/01/11 00:00
08/01/11 12:00
08/02/11 00:00
08/02/11 12:00
08/03/11 00:00
08/03/11 12:00
08/04/11 00:00
08/04/11 12:00
08/05/11 00:00
08/05/11 12:00
08/06/11 00:00
08/06/11 12:00
08/07/11 00:00
08/07/11 12:00
08/08/11 00:00
McNARY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
08/01/11 01:00
08/01/11 13:00
08/02/11 01:00
08/02/11 13:00
08/03/11 01:00
08/03/11 13:00
08/04/11 01:00
08/04/11 13:00
08/05/11 01:00
08/05/11 13:00
08/06/11 01:00
08/06/11 13:00
08/07/11 01:00
08/07/11 13:00
08/08/11 01:00
MCN Generation Flow
MCN Total Flow
MCN Spill Flow
MCN Target Spill
50% of Total Flow

Figure 6

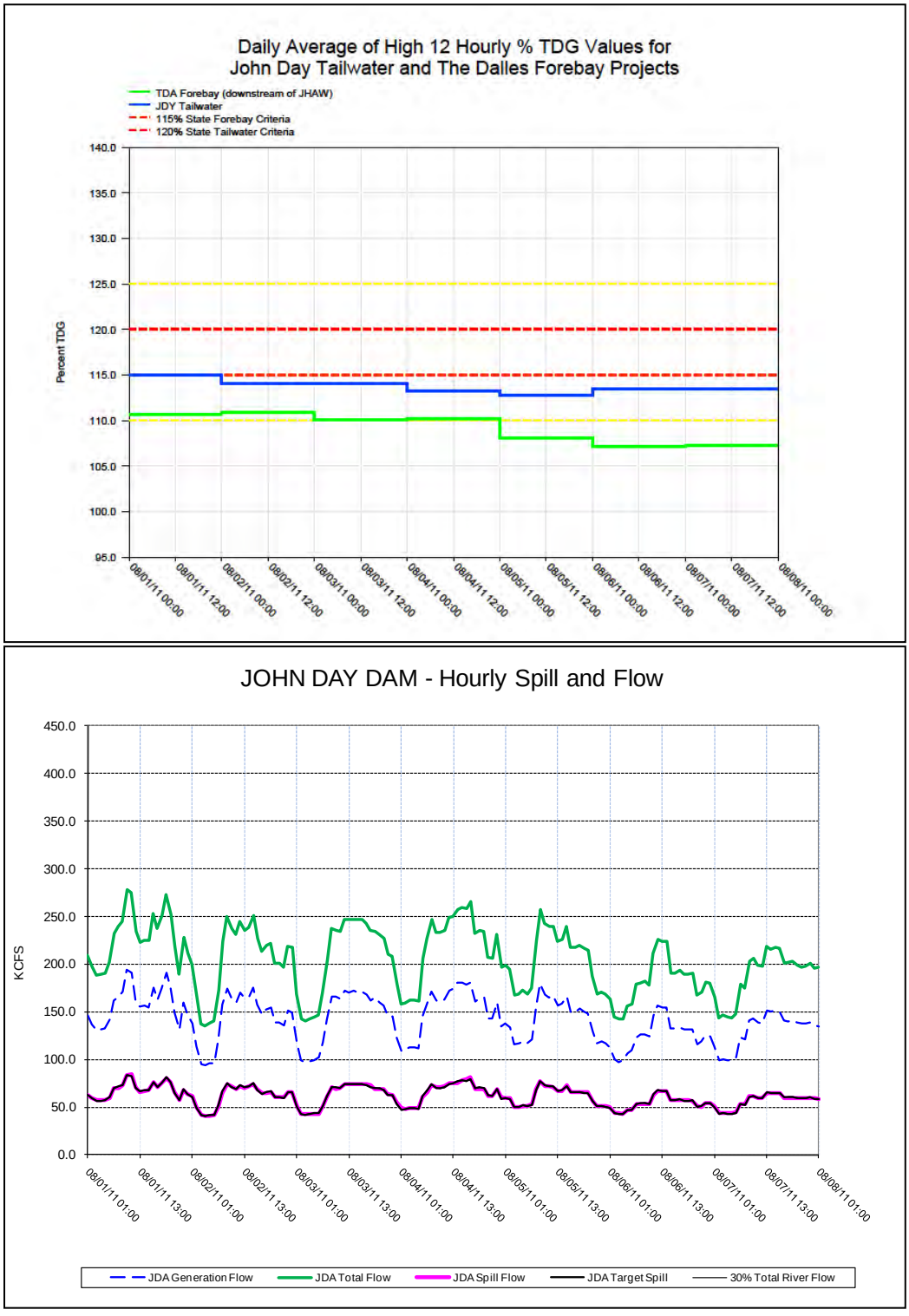

Daily Average of High 12 Hourly % TDG Values for
John Day Tailwater and The Dalles Forebay Projects
TDA Forebay (downstream of JHAW)
JDY Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/01/11 00:00
08/01/11 12:00
08/02/11 00:00
08/02/11 12:00
08/03/11 00:00
08/03/11 12:00
08/04/11 00:00
08/04/11 12:00
08/05/11 00:00
08/05/11 12:00
08/06/11 00:00
08/06/11 12:00
08/07/11 00:00
08/07/11 12:00
08/08/11 00:00
JOHN DAY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
08/01/11 01:00
08/01/11 13:00
08/02/11 01:00
08/02/11 13:00
08/03/11 01:00
08/03/11 13:00
08/04/11 01:00
08/04/11 13:00
08/05/11 01:00
08/05/11 13:00
08/06/11 01:00
08/06/11 13:00
08/07/11 01:00
08/07/11 13:00
08/08/11 01:00
JDA Generation Flow
JDA Total Flow
JDA Spill Flow
JDA Target Spill
30% Total River Flow

Figure 7

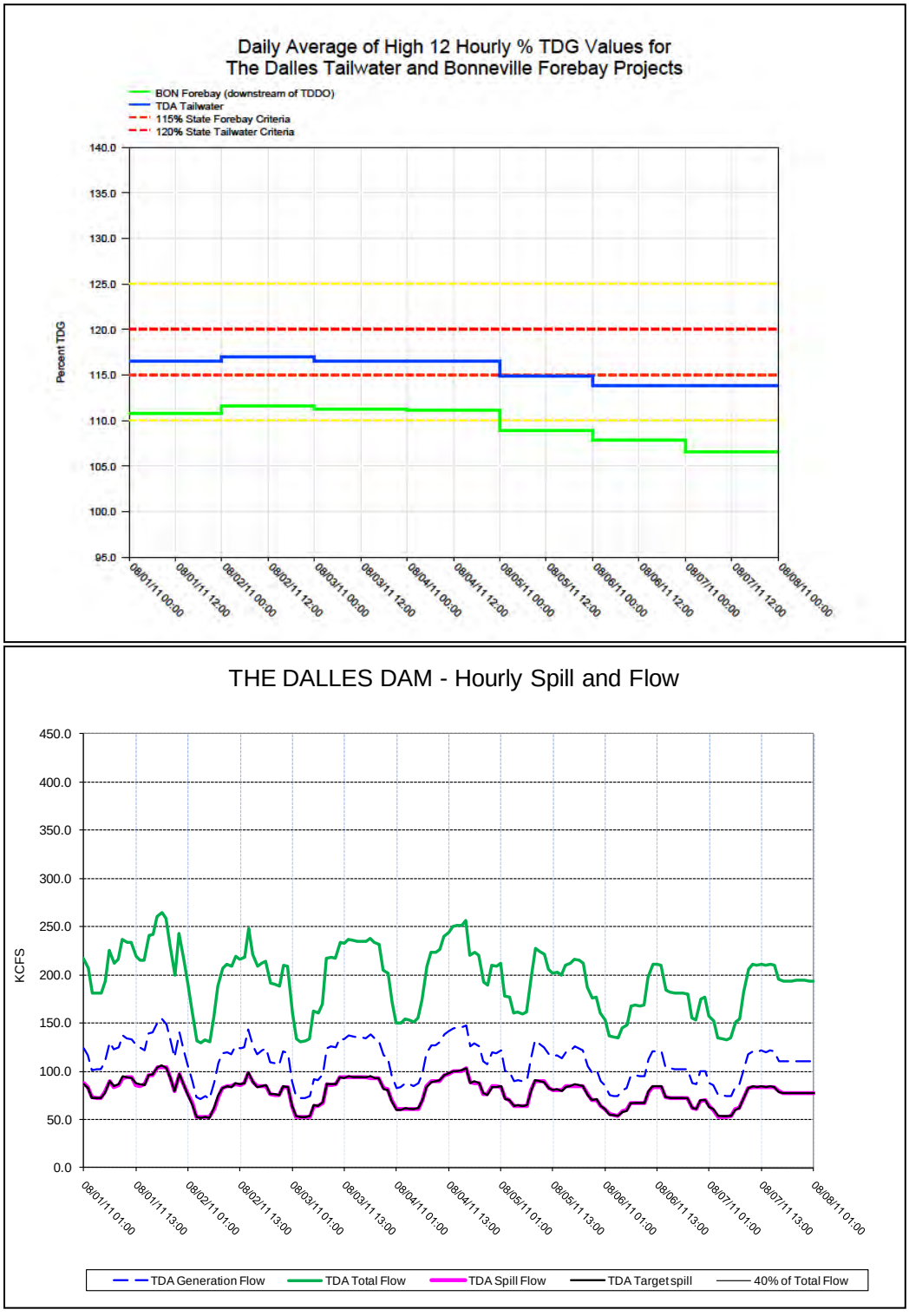

Daily Average of High 12 Hourly % TDG Values for
The Dalles Tailwater and Bonneville Forebay Projects
BON Forebay (downstream of TDDO)
TDA Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/01/11 00:00
08/01/11 12:00
08/02/11 00:00
08/02/11 12:00
08/03/11 00:00
08/03/11 12:00
08/04/11 00:00
08/04/11 12:00
08/05/11 00:00
08/05/11 12:00
08/06/11 00:00
08/06/11 12:00
08/07/11 00:00
08/07/11 12:00
08/08/11 00:00
THE DALLES DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
08/01/11 01:00
08/01/11 13:00
08/02/11 01:00
08/02/11 13:00
08/03/11 01:00
08/03/11 13:00
08/04/11 01:00
08/04/11 13:00
08/05/11 01:00
08/05/11 13:00
08/06/11 01:00
08/06/11 13:00
08/07/11 01:00
08/07/11 13:00
08/08/11 01:00
TDA Generation Flow
TDA Total Flow
TDA Spill Flow
TDA Target spill
40% of Total Flow

Figure 8

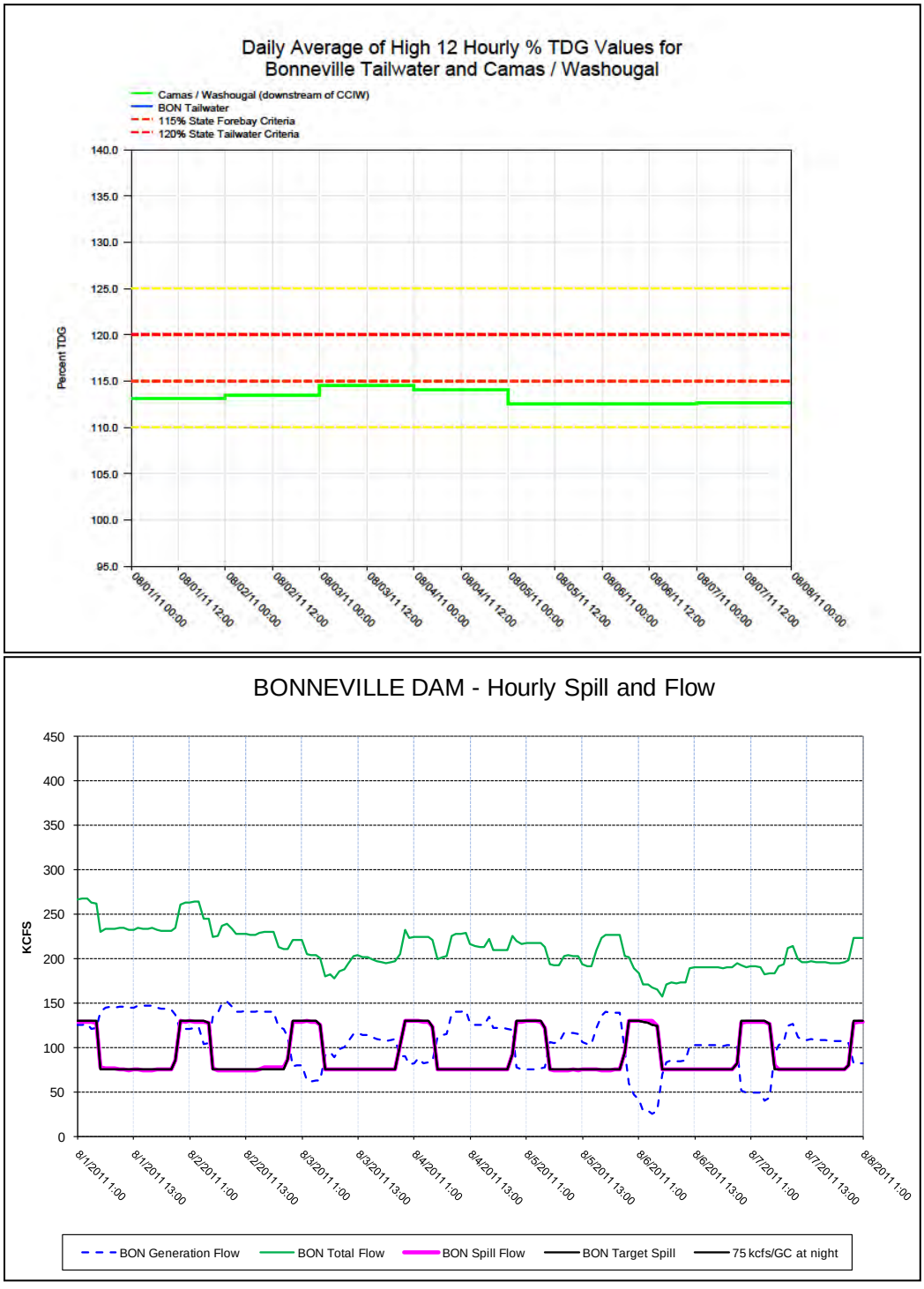

Daily Average of High 12 Hourly % TDG Values for
Bonneville Tailwater and Camas / Washougal
Camas / Washougal (downstream of CCIW)
BON Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/01/11 00:00
08/01/11 12:00
08/02/11 00:00
08/02/11 12:00
08/03/11 00:00
08/03/11 12:00
08/04/11 00:00
08/04/11 12:00
08/05/11 00:00
08/05/11 12:00
08/06/11 00:00
08/06/11 12:00
08/07/11 00:00
08/07/11 12:00
08/08/11 00:00
BONNEVILLE DAM - Hourly Spill and Flow
KCFS
450
400
350
300
250
200
150
100
50
0
8/1/2011 1:00
8/1/2011 13:00
8/2/2011 1:00
8/2/2011 13:00
8/3/2011 1:00
8/3/2011 13:00
8/4/2011 1:00
8/4/2011 13:00
8/5/2011 1:00
8/5/2011 13:00
8/6/2011 1:00
8/6/2011 13:00
8/7/2011 1:00
8/7/2011 13:00
8/8/2011 1:00
BON Generation Flow
BON Total Flow
BON Spill Flow
BON Target Spill
75 kcfs/GC at night

Figure 9

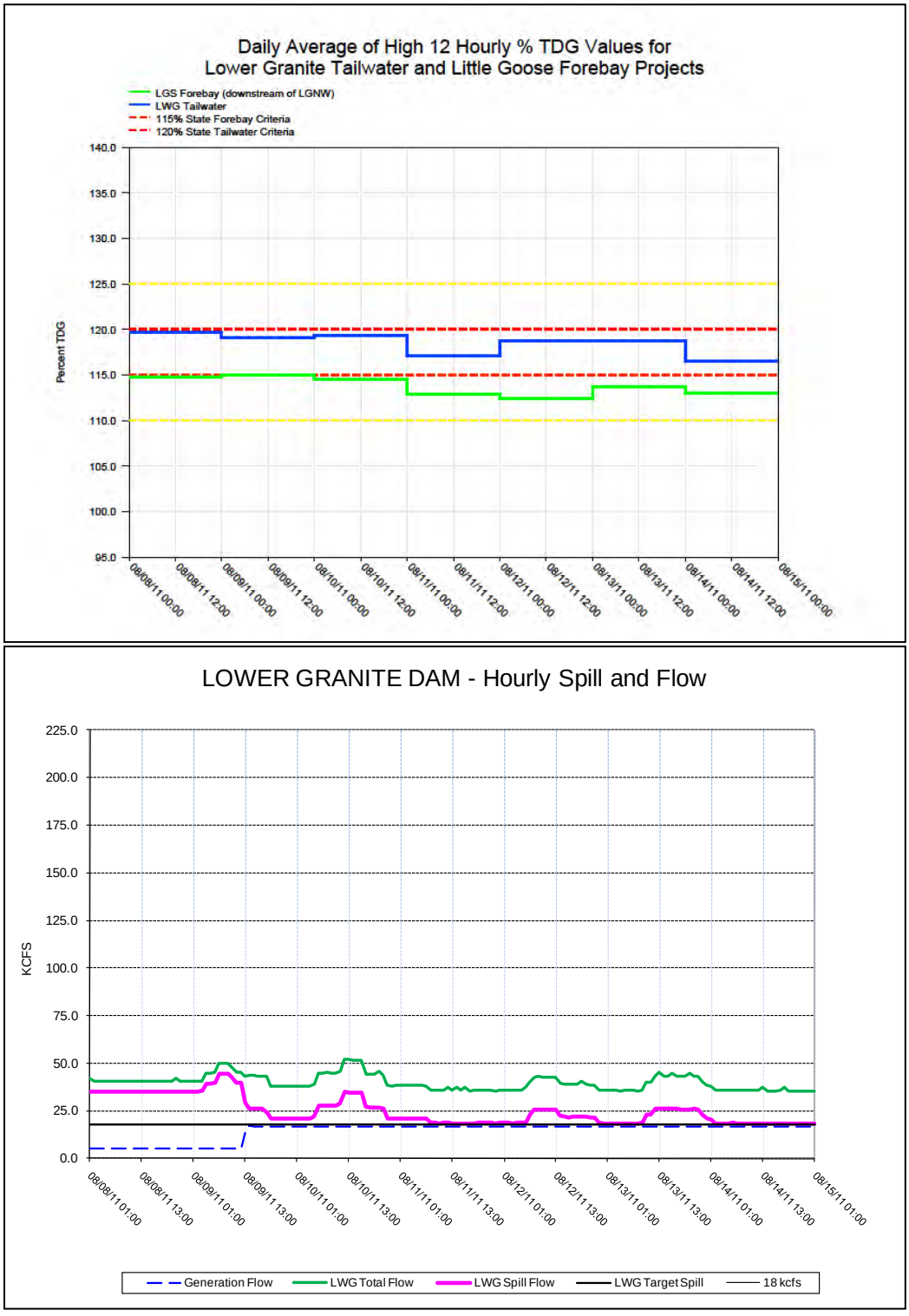

Daily Average of High 12 Hourly % TDG Values for
Lower Granite Tailwater and Little Goose Forebay Projects
LGS Forebay (downstream of LGNW)
LWG Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/08/11 00:00
08/09/11 12:00
08/09/11 00:00
08/09/11 12:00
08/10/11 00:00
08/10/11 12:00
08/11/11 00:00
08/11/11 12:00
08/12/11 00:00
08/12/11 12:00
08/13/11 00:00
08/13/11 12:00
08/14/11 00:00
08/14/11 12:00
08/15/11 00:00
LOWER GRANITE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
08/08/11 01:00
08/08/11 13:00
08/09/11 01:00
08/09/11 13:00
08/10/11 01:00
08/10/11 13:00
08/11/11 01:00
08/11/11 13:00
08/12/11 01:00
08/12/11 13:00
08/13/11 01:00
08/13/11 13:00
08/14/11 01:00
08/14/11 13:00
08/15/11 01:00
Generation Flow
LWG Total Flow
LWG Spill Flow
LWG Target Spill
18 kcfs

Figure 10

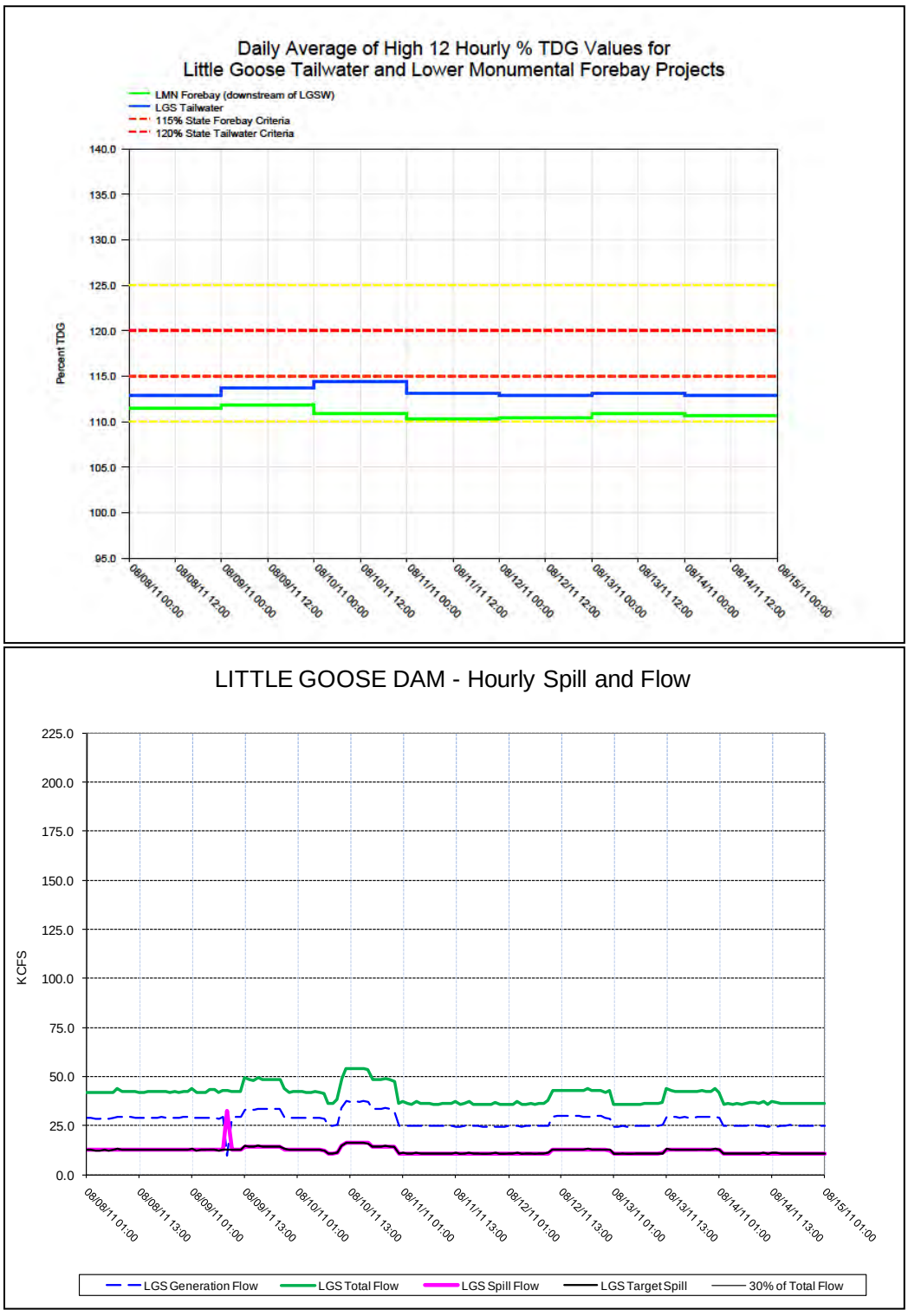

Daily Average of High 12 Hourly % TDG Values for
Little Goose Tailwater and Lower Monumental Forebay Projects
LMN Forebay (downstream of LGSW)
LGS Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/08/11 00:00
08/08/11 12:00
08/09/11 00:00
08/09/11 12:00
08/10/11 00:00
08/10/11 12:00
08/11/11 00:00
08/11/11 12:00
08/12/11 00:00
08/12/11 12:00
08/13/11 00:00
08/13/11 12:00
08/14/11 00:00
08/14/11 12:00
08/15/11 00:00
LITTLE GOOSE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
08/08/11 01:00
08/08/11 13:00
08/09/11 01:00
08/09/11 13:00
08/10/11 01:00
08/10/11 13:00
08/11/11 01:00
08/11/11 13:00
08/12/11 01:00
08/12/11 13:00
08/13/11 01:00
08/13/11 13:00
08/14/11 01:00
08/14/11 13:00
08/15/11 01:00
LGS Generation Flow
LGS Total Flow
LGS Spill Flow
LGS Target Spill
30% of Total Flow

Figure 11

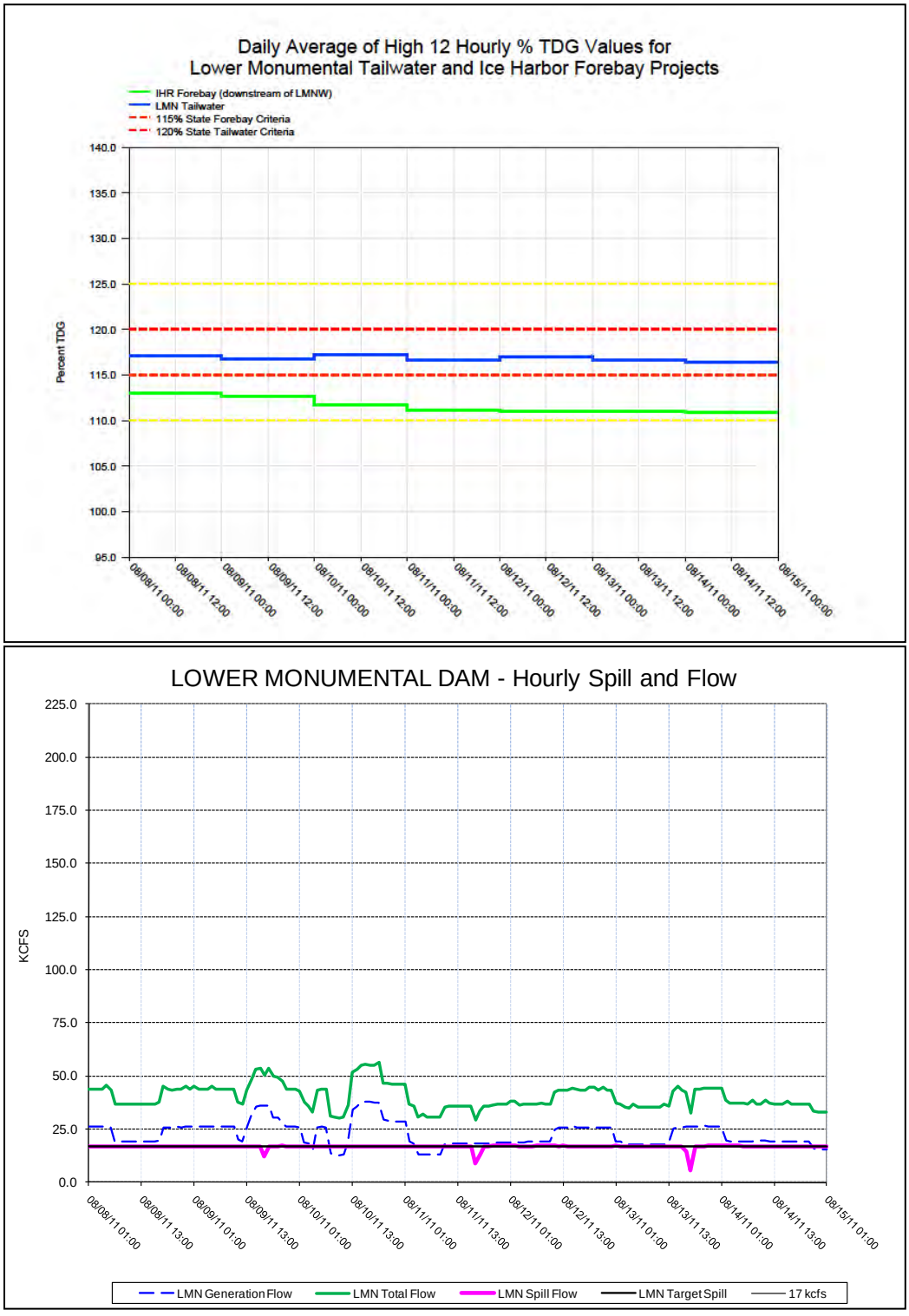

Daily Average of High 12 Hourly % TDG Values for
Lower Monumental Tailwater and Ice Harbor Forebay Projects
IHR Forebay (downstream of LMNW)
LMN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/08/11 00:00
08/09/11 12:00
08/09/11 00:00
08/09/11 12:00
08/10/11 00:00
08/10/11 12:00
08/11/11 00:00
08/11/11 12:00
08/12/11 00:00
08/12/11 12:00
08/13/11 00:00
08/13/11 12:00
08/14/11 00:00
08/14/11 12:00
08/15/11 00:00
LOWER MONUMENTAL DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
08/09/11 01:00
08/09/11 13:00
08/09/11 01:00
08/09/11 13:00
08/10/11 01:00
08/10/11 13:00
08/11/11 01:00
08/11/11 13:00
08/12/11 01:00
08/12/11 13:00
08/13/11 01:00
08/13/11 13:00
08/14/11 01:00
08/14/11 13:00
08/15/11 01:00
LMN Generation Flow
LMN Total Flow
LMN Spill Flow
LMN Target Spill
17 kcfs

Figure 12

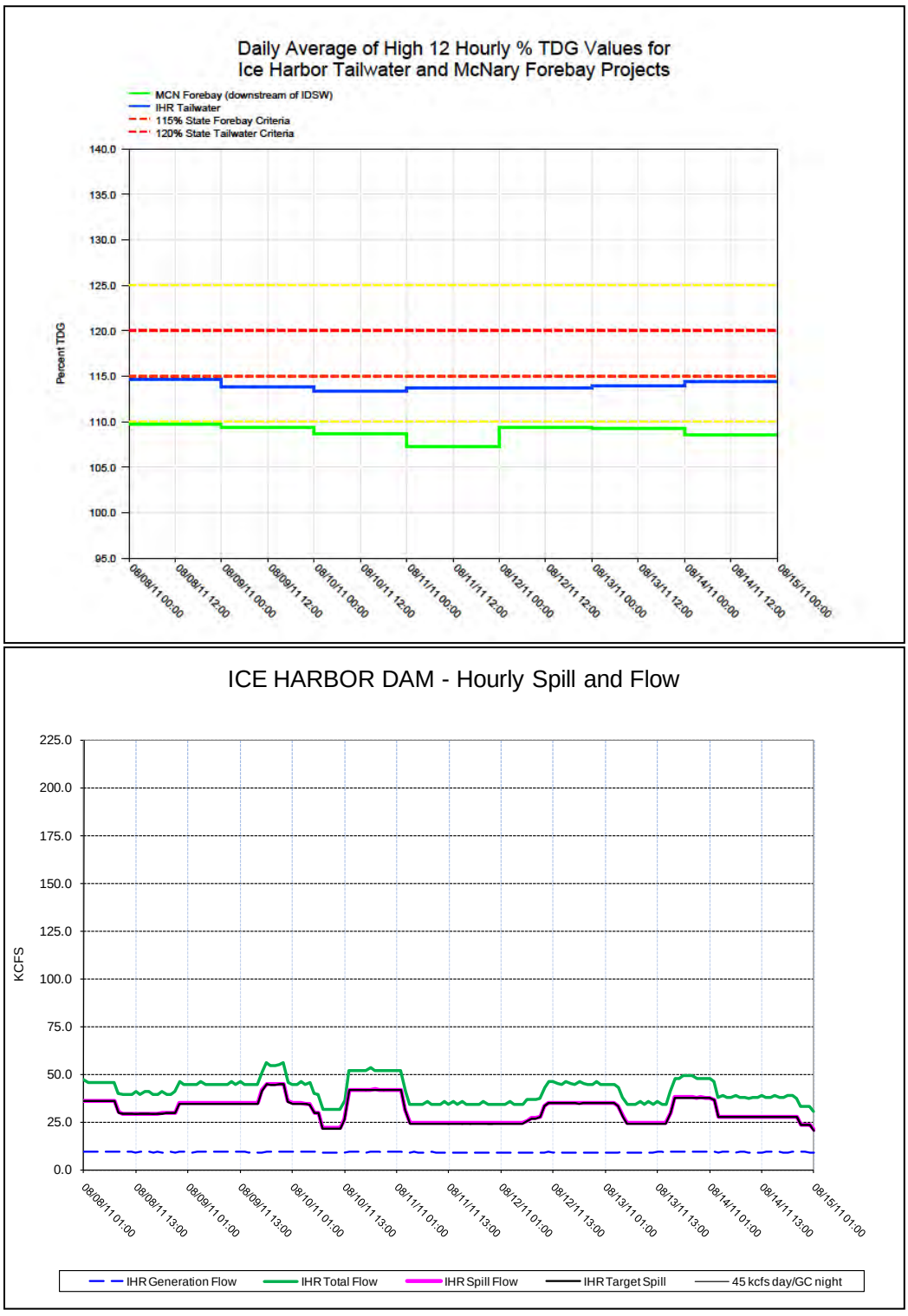

Daily Average of High 12 Hourly % TDG Values for
Ice Harbor Tailwater and McNary Forebay Projects
MCN Forebay (downstream of IDSW)
IHR Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/08/11 00:00
08/08/11 12:00
08/09/11 00:00
08/09/11 12:00
08/10/11 00:00
08/10/11 12:00
08/11/11 00:00
08/11/11 12:00
08/12/11 00:00
08/12/11 12:00
08/13/11 00:00
08/13/11 12:00
08/14/11 00:00
08/14/11 12:00
08/15/11 00:00
ICE HARBOR DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
08/08/11 01:00
08/08/11 13:00
08/09/11 01:00
08/09/11 13:00
08/10/11 01:00
08/10/11 13:00
08/11/11 01:00
08/11/11 13:00
08/12/11 01:00
08/12/11 13:00
08/13/11 01:00
08/13/11 13:00
08/14/11 01:00
08/14/11 13:00
08/15/11 01:00
IHR Generation Flow
IHR Total Flow
IHR Spill Flow
IHR Target Spill
45 kcfs day/GC night

Figure 13

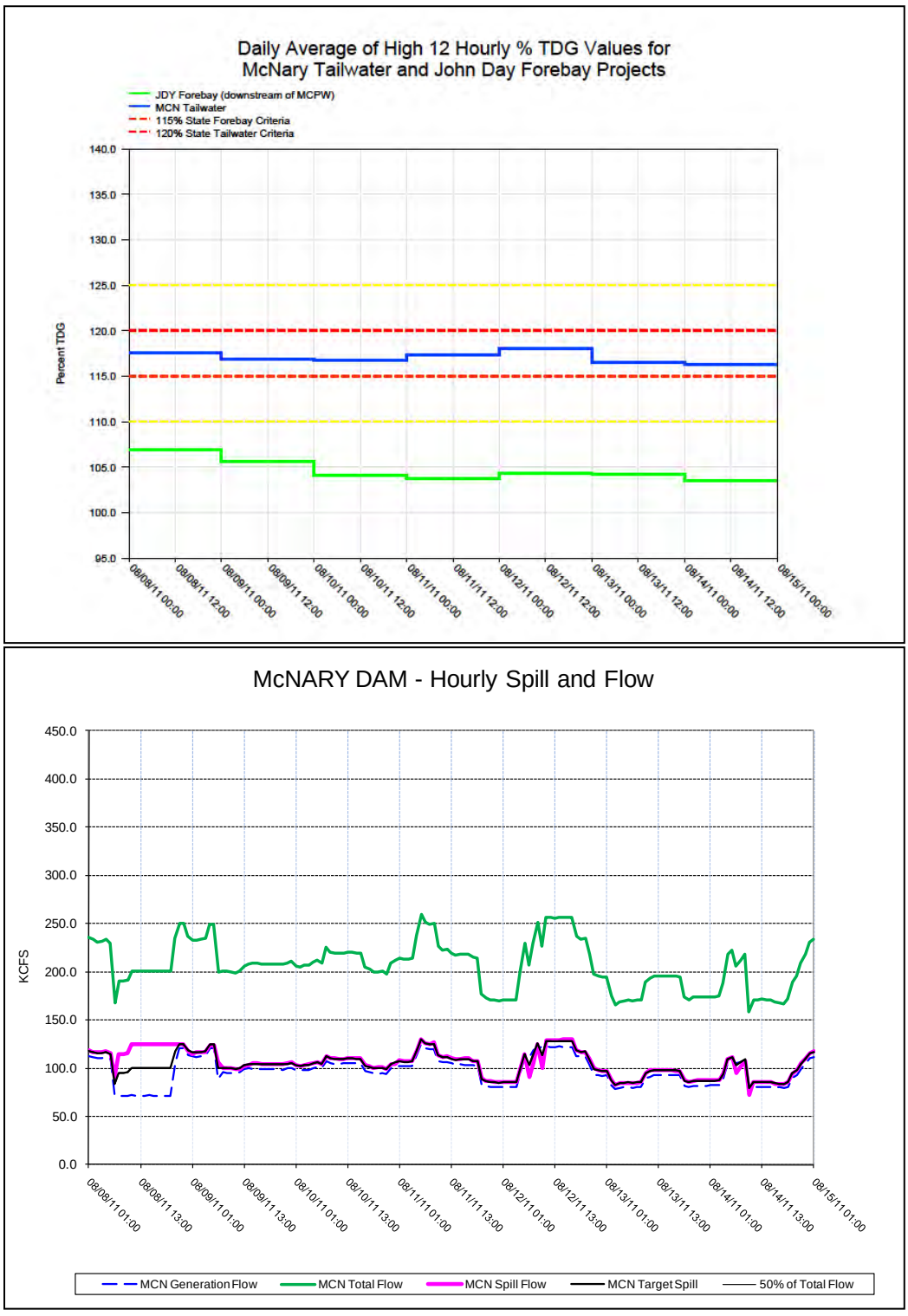

Daily Average of High 12 Hourly % TDG Values for
McNary Tailwater and John Day Forebay Projects
JDY Forebay (downstream of MCPW)
MCN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/09/11 00:00
08/09/11 12:00
08/09/11 00:00
08/09/11 12:00
08/10/11 00:00
08/10/11 12:00
08/11/11 00:00
08/11/11 12:00
08/12/11 00:00
08/12/11 12:00
08/13/11 00:00
08/13/11 12:00
08/14/11 00:00
08/14/11 12:00
08/15/11 00:00
McNARY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
08/08/11 01:00
08/08/11 13:00
08/09/11 01:00
08/09/11 13:00
08/10/11 01:00
08/10/11 13:00
08/11/11 01:00
08/11/11 13:00
08/12/11 01:00
08/12/11 13:00
08/13/11 01:00
08/13/11 13:00
08/14/11 01:00
08/14/11 13:00
08/15/11 01:00
MCN Generation Flow
MCN Total Flow
MCN Spill Flow
MCN Target Spill
50% of Total Flow

Figure 14

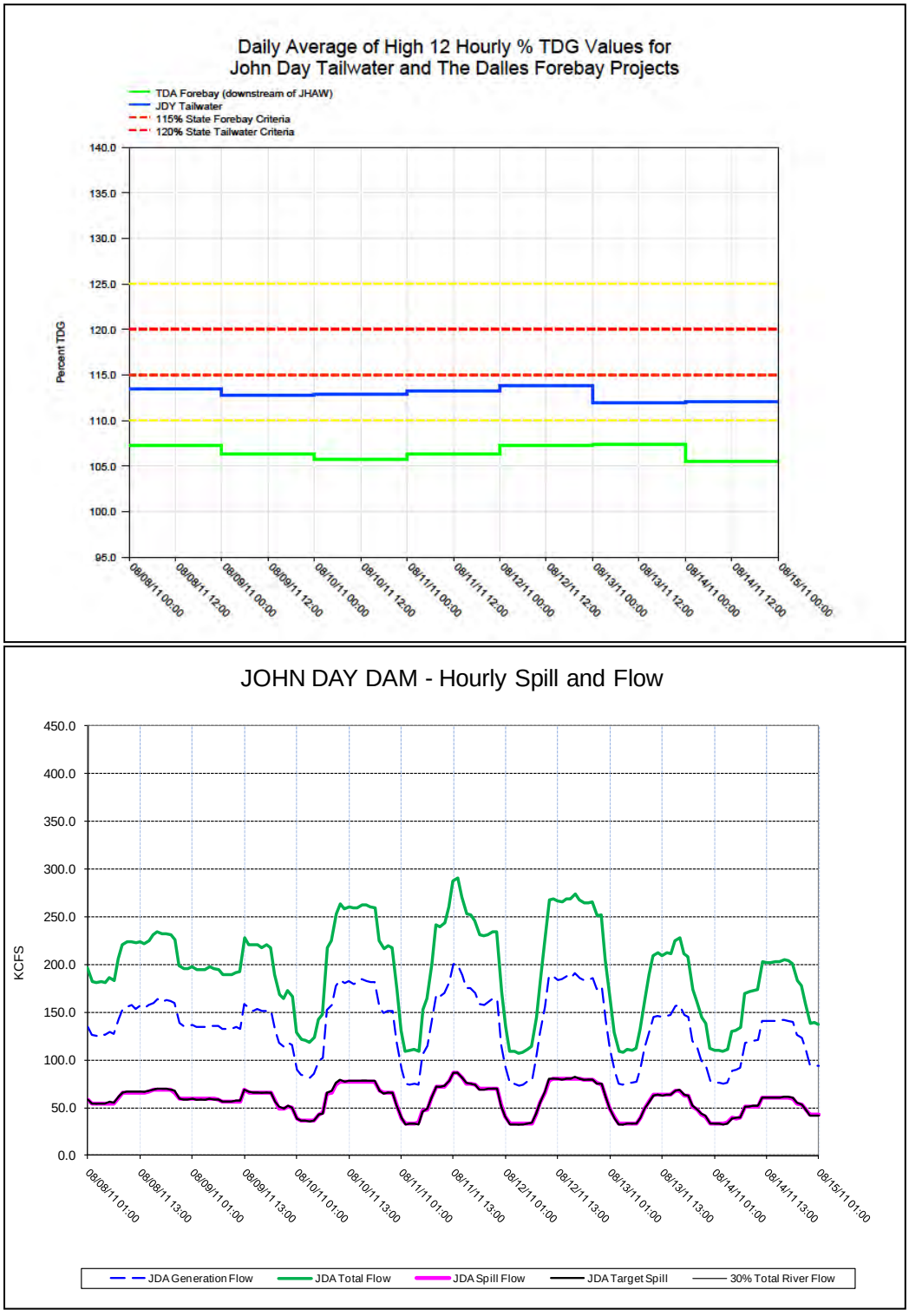

Daily Average of High 12 Hourly % TDG Values for
John Day Tailwater and The Dalles Forebay Projects
TDA Forebay (downstream of JHAW)
JDY Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/08/11 00:00
08/09/11 12:00
08/09/11 00:00
08/09/11 12:00
08/10/11 00:00
08/10/11 12:00
08/11/11 00:00
08/11/11 12:00
08/12/11 00:00
08/12/11 12:00
08/13/11 00:00
08/13/11 12:00
08/14/11 00:00
08/14/11 12:00
08/15/11 00:00
JOHN DAY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
08/08/11 01:00
08/08/11 13:00
08/09/11 01:00
08/09/11 13:00
08/10/11 01:00
08/10/11 13:00
08/11/11 01:00
08/11/11 13:00
08/12/11 01:00
08/12/11 13:00
08/13/11 01:00
08/13/11 13:00
08/14/11 01:00
08/14/11 13:00
08/15/11 01:00
JDA Generation Flow
JDA Total Flow
JDA Spill Flow
JDA Target Spill
30% Total River Flow

Figure 15

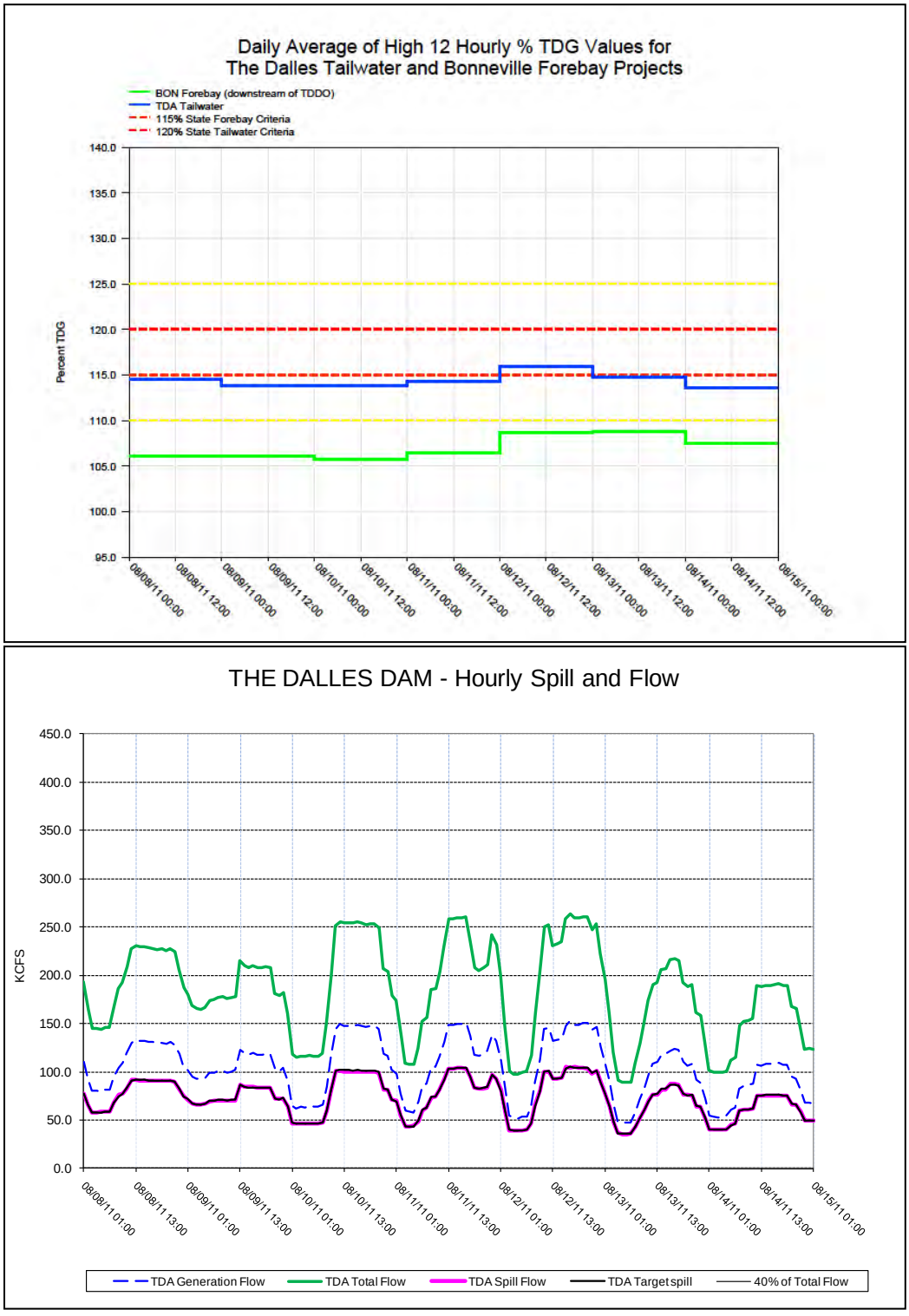

Daily Average of High 12 Hourly % TDG Values for
The Dalles Tailwater and Bonneville Forebay Projects
BON Forebay (downstream of TDDO)
TDA Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/08/11 00:00
08/08/11 12:00
08/09/11 00:00
08/09/11 12:00
08/10/11 00:00
08/10/11 12:00
08/11/11 00:00
08/11/11 12:00
08/12/11 00:00
08/12/11 12:00
08/13/11 00:00
08/13/11 12:00
08/14/11 00:00
08/14/11 12:00
08/15/11 00:00
THE DALLES DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
08/08/11 01:00
08/08/11 13:00
08/09/11 01:00
08/09/11 13:00
08/10/11 01:00
08/10/11 13:00
08/11/11 01:00
08/11/11 13:00
08/12/11 01:00
08/12/11 13:00
08/13/11 01:00
08/13/11 13:00
08/14/11 01:00
08/14/11 13:00
08/15/11 01:00
TDA Generation Flow
TDA Total Flow
TDA Spill Flow
TDA Target spill
40% of Total Flow

Figure 16

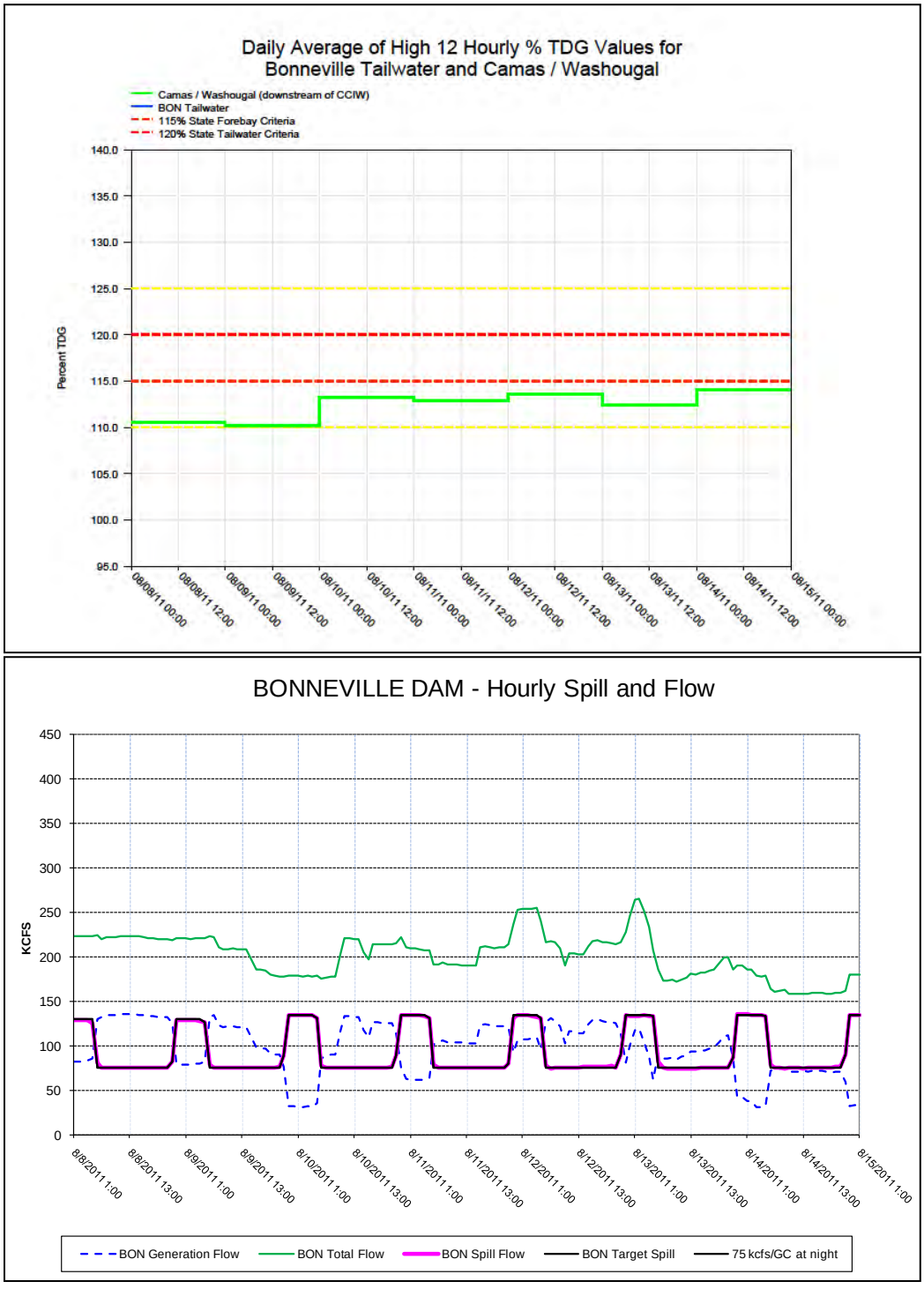

Daily Average of High 12 Hourly % TDG Values for
Bonneville Tailwater and Camas / Washougal
Camas / Washougal (downstream of CCIW)
BON Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/08/11 00:00
08/08/11 12:00
08/09/11 00:00
08/09/11 12:00
08/10/11 00:00
08/10/11 12:00
08/11/11 00:00
08/11/11 12:00
08/12/11 00:00
08/12/11 12:00
08/13/11 00:00
08/13/11 12:00
08/14/11 00:00
08/14/11 12:00
08/15/11 00:00
BONNEVILLE DAM - Hourly Spill and Flow
KCFS
450
400
350
300
250
200
150
100
50
0
8/8/2011 1:00
8/8/2011 13:00
8/9/2011 1:00
8/9/2011 13:00
8/10/2011 1:00
8/10/2011 13:00
8/11/2011 1:00
8/11/2011 13:00
8/12/2011 1:00
8/12/2011 13:00
8/13/2011 1:00
8/13/2011 13:00
8/14/2011 1:00
8/14/2011 13:00
8/15/2011 1:00
BON Generation Flow
BON Total Flow
BON Spill Flow
BON Target Spill
75 kcfs/GC at night

Figure 17

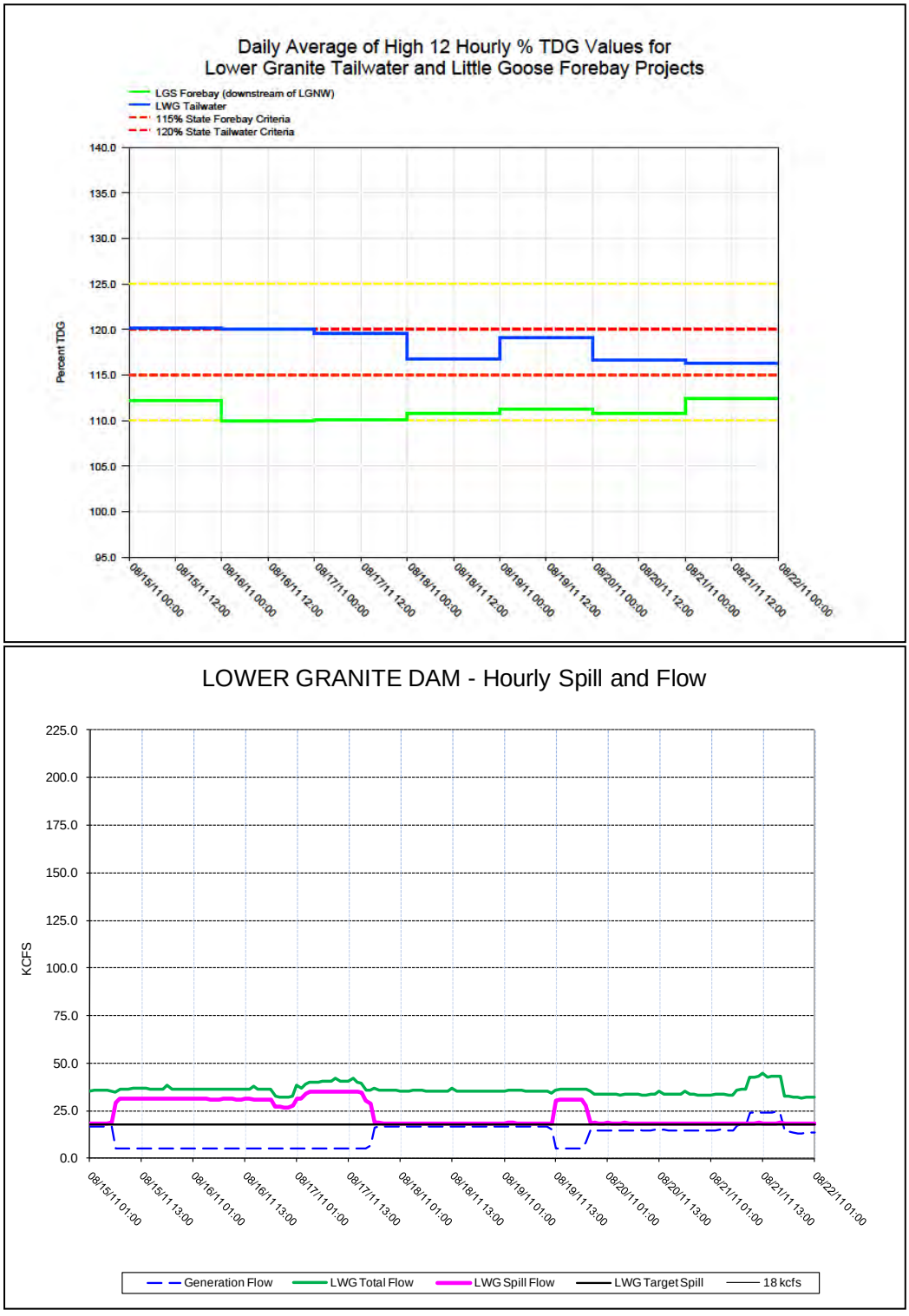

Daily Average of High 12 Hourly % TDG Values for
Lower Granite Tailwater and Little Goose Forebay Projects
LGS Forebay (downstream of LGNW)
LWG Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/15/11 00:00
08/15/11 12:00
08/16/11 00:00
08/16/11 12:00
08/17/11 00:00
08/17/11 12:00
08/18/11 00:00
08/18/11 12:00
08/19/11 00:00
08/19/11 12:00
08/20/11 00:00
08/20/11 12:00
08/21/11 00:00
08/21/11 12:00
08/22/11 00:00
LOWER GRANITE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
08/15/11 01:00
08/15/11 13:00
08/16/11 01:00
08/16/11 13:00
08/17/11 01:00
08/17/11 13:00
08/18/11 01:00
08/18/11 13:00
08/19/11 01:00
08/19/11 13:00
08/20/11 01:00
08/20/11 13:00
08/21/11 01:00
08/21/11 13:00
08/22/11 01:00
Generation Flow
LWG Total Flow
LWG Spill Flow
LWG Target Spill
18 kcfs

Figure 18

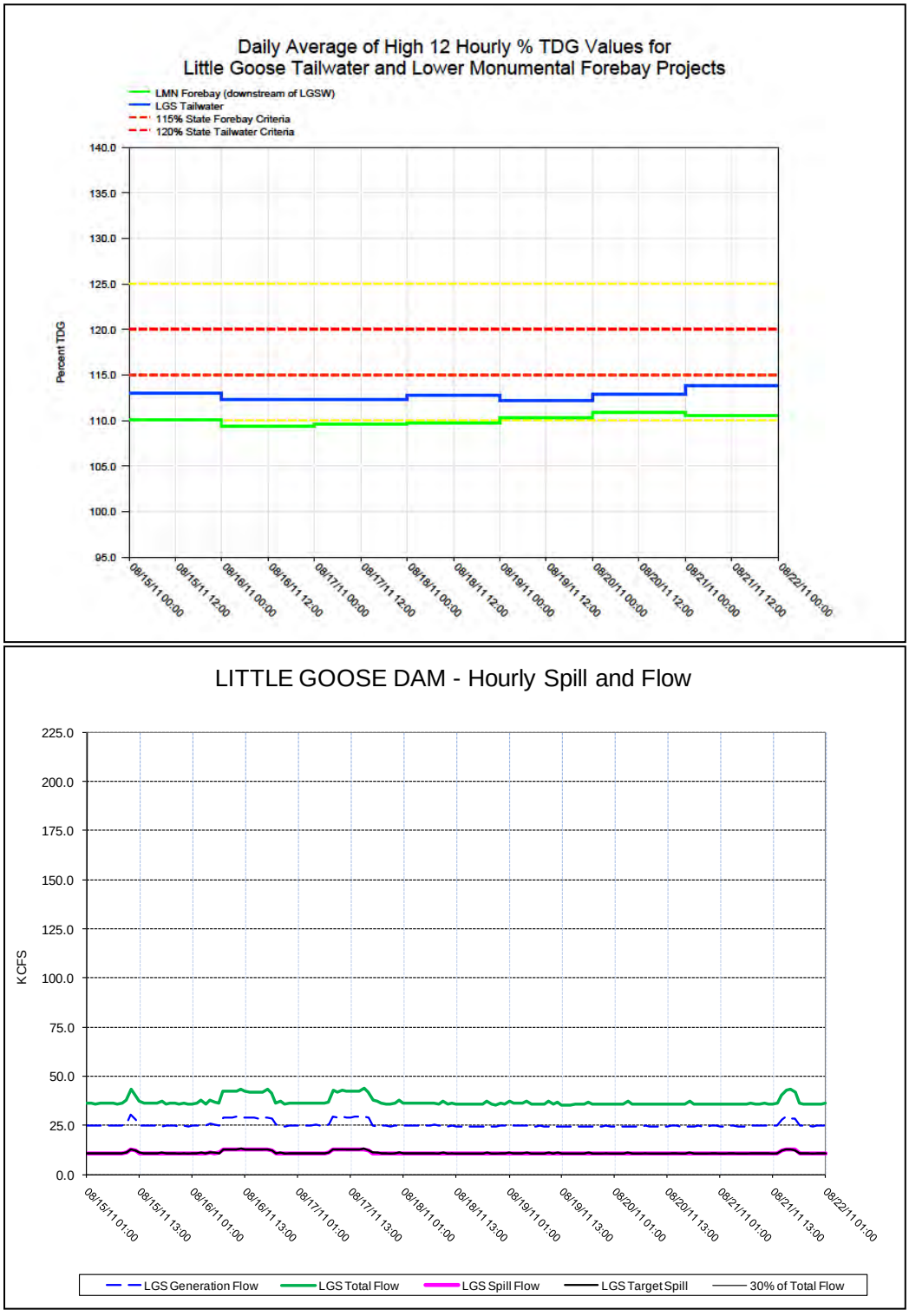

Daily Average of High 12 Hourly % TDG Values for
Little Goose Tailwater and Lower Monumental Forebay Projects
LMN Forebay (downstream of LGSW)
LGS Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/15/11 00:00
08/15/11 12:00
08/16/11 00:00
08/16/11 12:00
08/17/11 00:00
08/17/11 12:00
08/18/11 00:00
08/18/11 12:00
08/19/11 00:00
08/19/11 12:00
08/20/11 00:00
08/20/11 12:00
08/21/11 00:00
08/21/11 12:00
08/22/11 00:00
LITTLE GOOSE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
08/15/11 01:00
08/15/11 13:00
08/16/11 01:00
08/16/11 13:00
08/17/11 01:00
08/17/11 13:00
08/18/11 01:00
08/18/11 13:00
08/19/11 01:00
08/19/11 13:00
08/20/11 01:00
08/20/11 13:00
08/21/11 01:00
08/21/11 13:00
08/22/11 01:00
LGS Generation Flow
LGS Total Flow
LGS Spill Flow
LGS Target Spill
30% of Total Flow

Figure 19

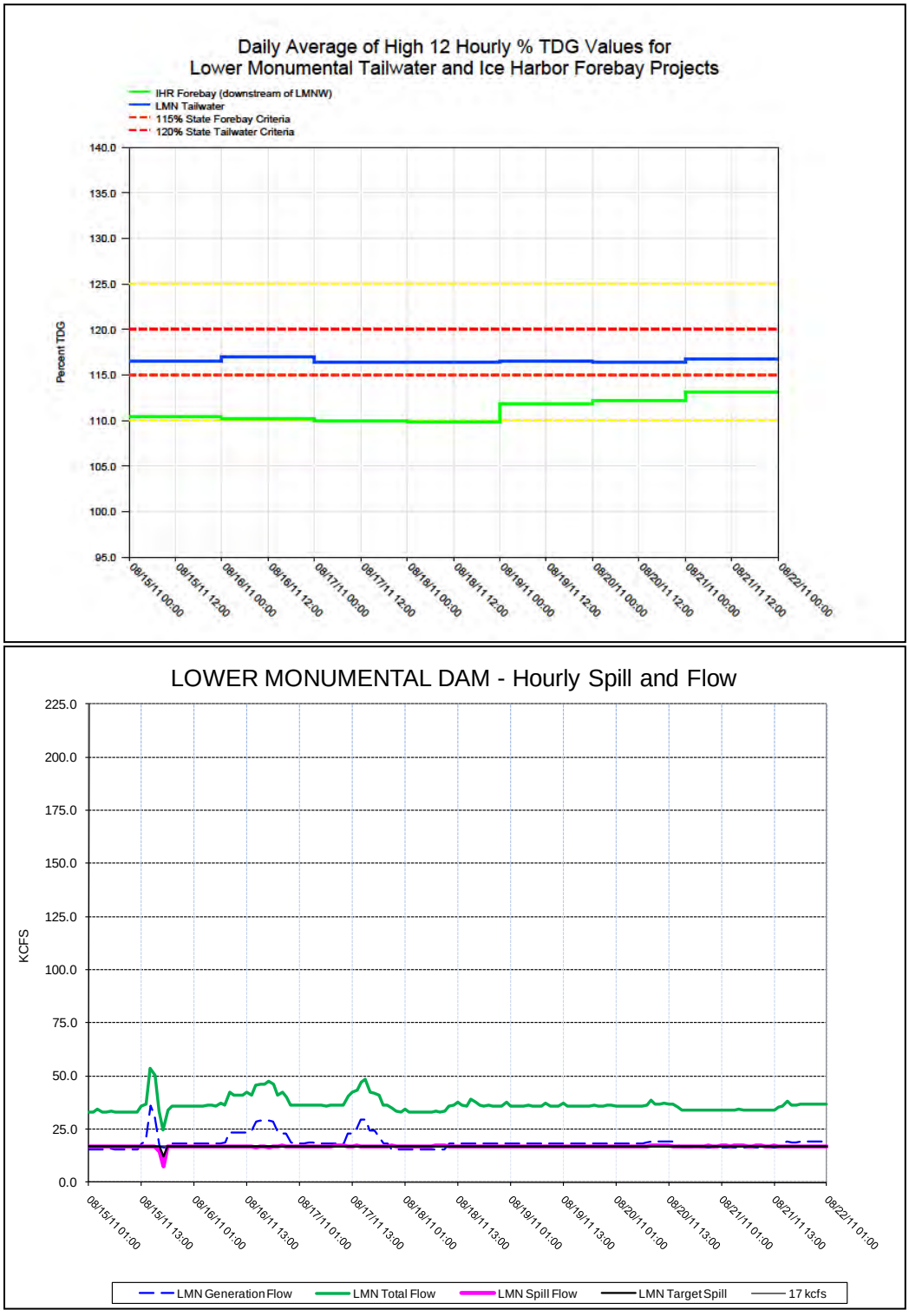

Daily Average of High 12 Hourly % TDG Values for
Lower Monumental Tailwater and Ice Harbor Forebay Projects
IHR Forebay (downstream of LMNW)
LMN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/15/11 00:00
08/15/11 12:00
08/16/11 00:00
08/16/11 12:00
08/17/11 00:00
08/17/11 12:00
08/18/11 00:00
08/18/11 12:00
08/19/11 00:00
08/19/11 12:00
08/20/11 00:00
08/20/11 12:00
08/21/11 00:00
08/21/11 12:00
08/22/11 00:00
LOWER MONUMENTAL DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
08/15/11 01:00
08/15/11 13:00
08/16/11 01:00
08/16/11 13:00
08/17/11 01:00
08/17/11 13:00
08/18/11 01:00
08/18/11 13:00
08/19/11 01:00
08/19/11 13:00
08/20/11 01:00
08/20/11 13:00
08/21/11 01:00
08/21/11 13:00
08/22/11 01:00
LMN Generation Flow
LMN Total Flow
LMN Spill Flow
LMN Target Spill
17 kcfs

Figure 20

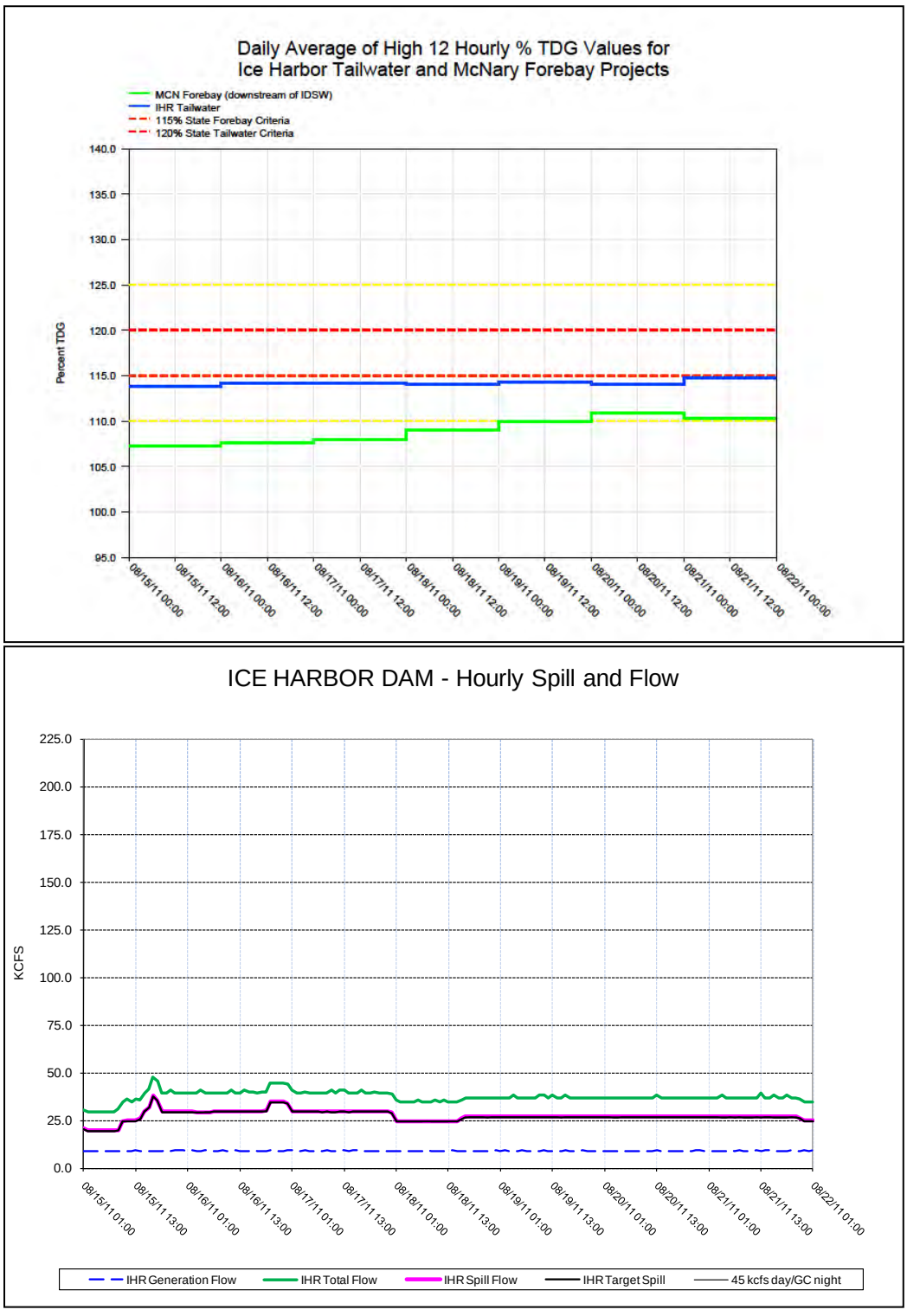

Daily Average of High 12 Hourly % TDG Values for
Ice Harbor Tailwater and McNary Forebay Projects
MCN Forebay (downstream of IDSW)
IHR Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/15/11 00:00
08/15/11 12:00
08/16/11 00:00
08/16/11 12:00
08/17/11 00:00
08/17/11 12:00
08/18/11 00:00
08/18/11 12:00
08/19/11 00:00
08/19/11 12:00
08/20/11 00:00
08/20/11 12:00
08/21/11 00:00
08/21/11 12:00
08/22/11 00:00
ICE HARBOR DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
08/15/11 01:00
08/15/11 13:00
08/16/11 01:00
08/16/11 13:00
08/17/11 01:00
08/17/11 13:00
08/18/11 01:00
08/18/11 13:00
08/19/11 01:00
08/19/11 13:00
08/20/11 01:00
08/20/11 13:00
08/21/11 01:00
08/21/11 13:00
08/22/11 01:00
IHR Generation Flow
IHR Total Flow
IHR Spill Flow
IHR Target Spill
45 kcfs day/GC night

Figure 21

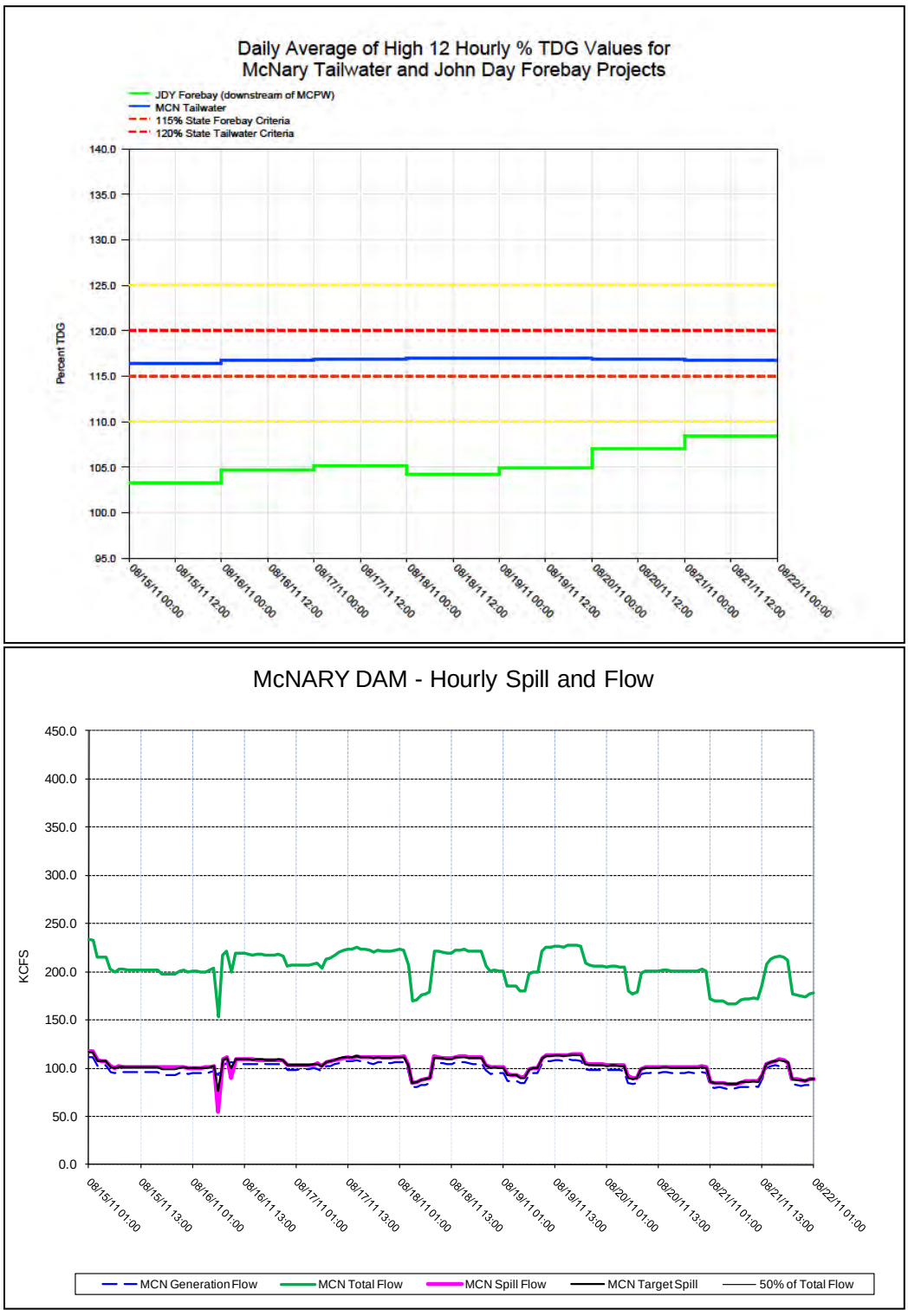

Daily Average of High 12 Hourly % TDG Values for
McNary Tailwater and John Day Forebay Projects
JDY Forebay (downstream of MCPW)
MCN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/15/11 00:00
08/15/11 12:00
08/16/11 00:00
08/16/11 12:00
08/17/11 00:00
08/17/11 12:00
08/18/11 00:00
08/18/11 12:00
08/19/11 00:00
08/19/11 12:00
08/20/11 00:00
08/20/11 12:00
08/21/11 00:00
08/21/11 12:00
08/22/11 00:00
McNARY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
08/15/11 01:00
08/15/11 13:00
08/16/11 01:00
08/16/11 13:00
08/17/11 01:00
08/17/11 13:00
08/18/11 01:00
08/18/11 13:00
08/19/11 01:00
08/19/11 13:00
08/20/11 01:00
08/20/11 13:00
08/21/11 01:00
08/21/11 13:00
08/22/11 01:00
MCN Generation Flow
MCN Total Flow
MCN Spill Flow
MCN Target Spill
50% of Total Flow

Figure 22

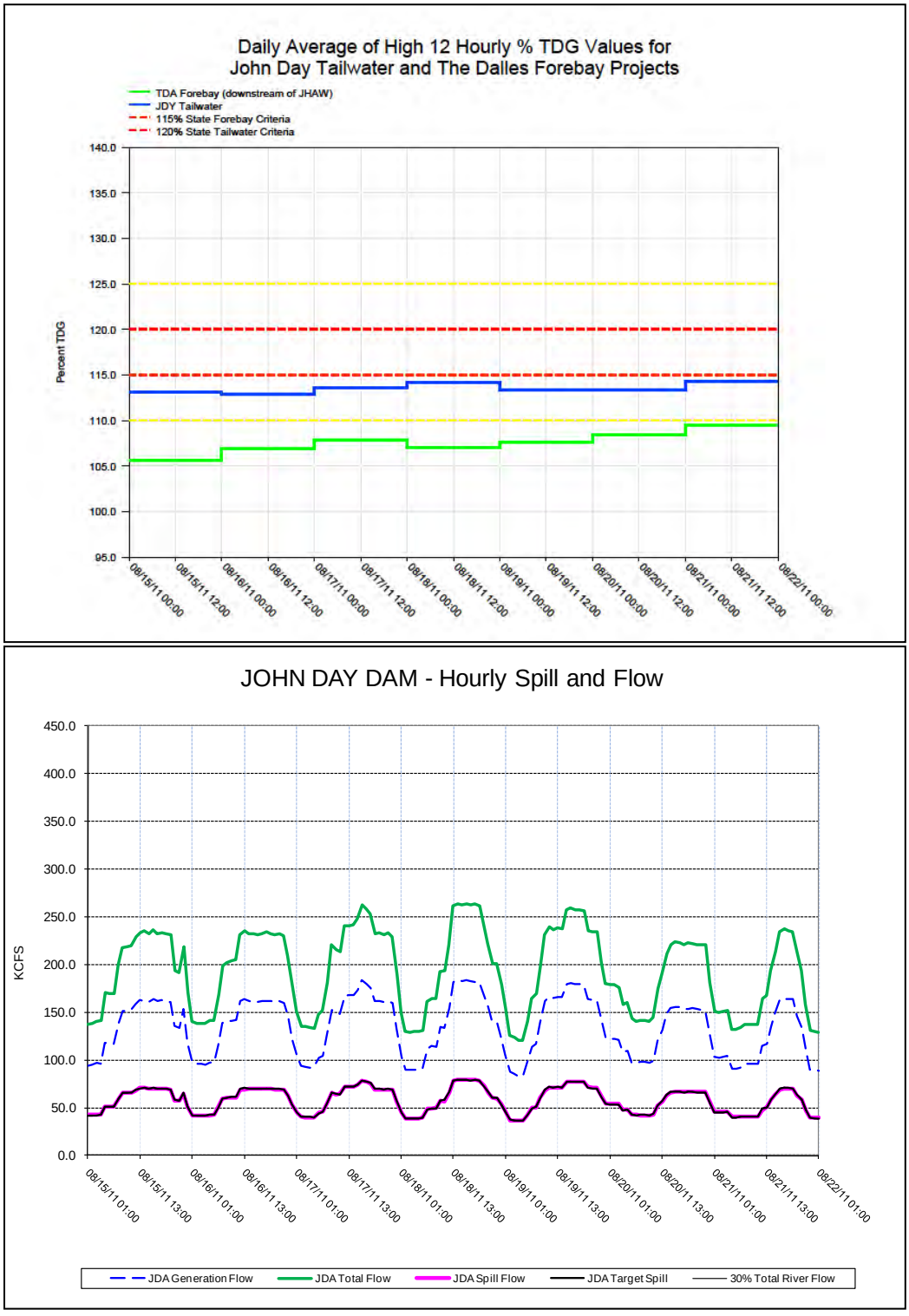

Daily Average of High 12 Hourly % TDG Values for
John Day Tailwater and The Dalles Forebay Projects
TDA Forebay (downstream of JHAW)
JDY Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/15/11 00:00
08/15/11 12:00
08/16/11 00:00
08/16/11 12:00
08/17/11 00:00
08/17/11 12:00
08/18/11 00:00
08/18/11 12:00
08/19/11 00:00
08/19/11 12:00
08/20/11 00:00
08/20/11 12:00
08/21/11 00:00
08/21/11 12:00
08/22/11 00:00
JOHN DAY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
08/15/11 01:00
08/15/11 13:00
08/16/11 01:00
08/16/11 13:00
08/17/11 01:00
08/17/11 13:00
08/18/11 01:00
08/18/11 13:00
08/19/11 01:00
08/19/11 13:00
08/20/11 01:00
08/20/11 13:00
08/21/11 01:00
08/21/11 13:00
08/22/11 01:00
JDA Generation Flow
JDA Total Flow
JDA Spill Flow
JDA Target Spill
30% Total River Flow

Figure 23

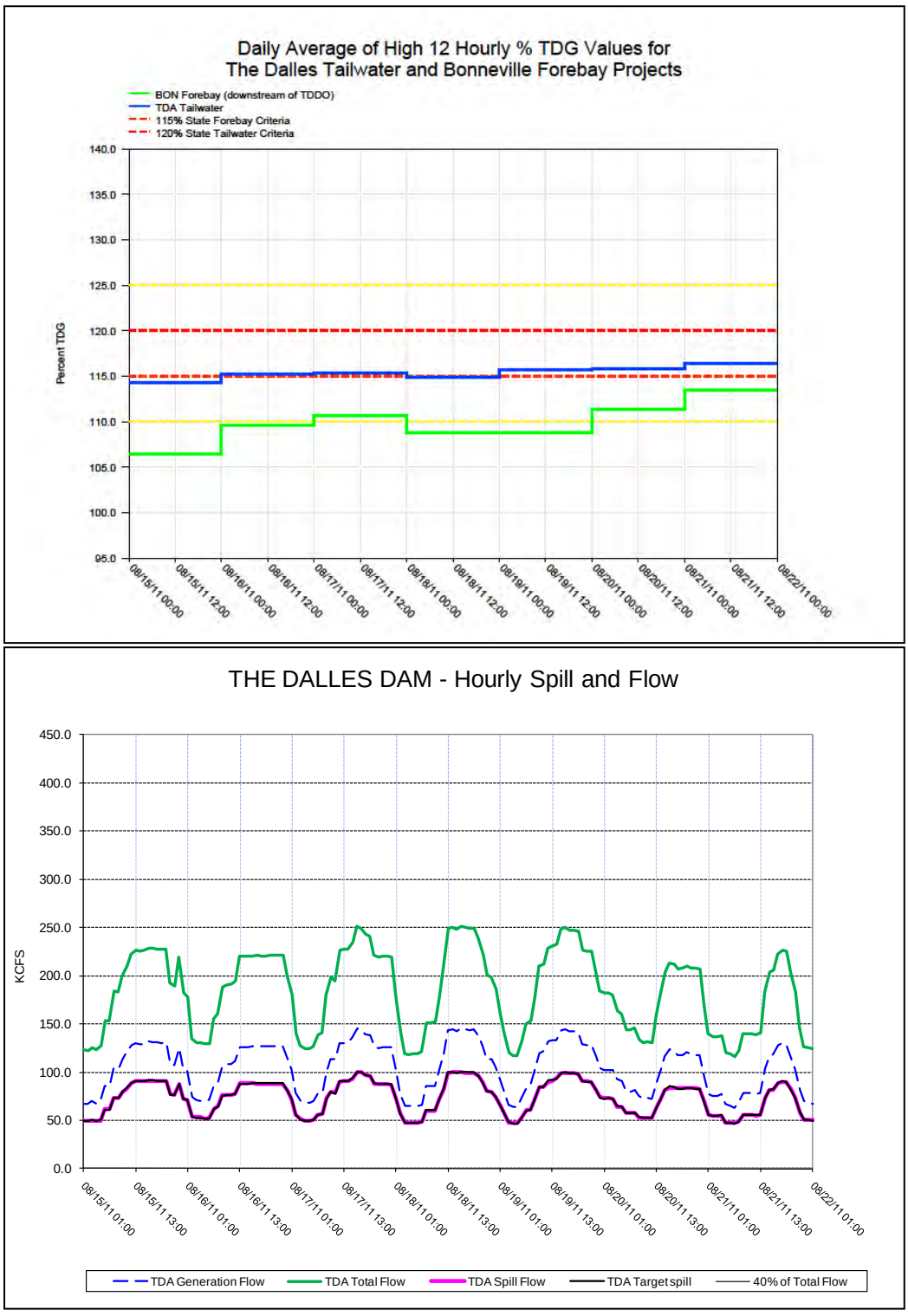

Daily Average of High 12 Hourly % TDG Values for
The Dalles Tailwater and Bonneville Forebay Projects
BON Forebay (downstream of TDDO)
TDA Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/15/11 00:00
08/15/11 12:00
08/16/11 00:00
08/16/11 12:00
08/17/11 00:00
08/17/11 12:00
08/18/11 00:00
08/18/11 12:00
08/19/11 00:00
08/19/11 12:00
08/20/11 00:00
08/20/11 12:00
08/21/11 00:00
08/21/11 12:00
08/22/11 00:00
THE DALLES DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
08/15/11 01:00
08/15/11 13:00
08/16/11 01:00
08/16/11 13:00
08/17/11 01:00
08/17/11 13:00
08/18/11 01:00
08/18/11 13:00
08/19/11 01:00
08/19/11 13:00
08/20/11 01:00
08/20/11 13:00
08/21/11 01:00
08/21/11 13:00
08/22/11 01:00
TDA Generation Flow
TDA Total Flow
TDA Spill Flow
TDA Target spill
40% of Total Flow

Figure 24

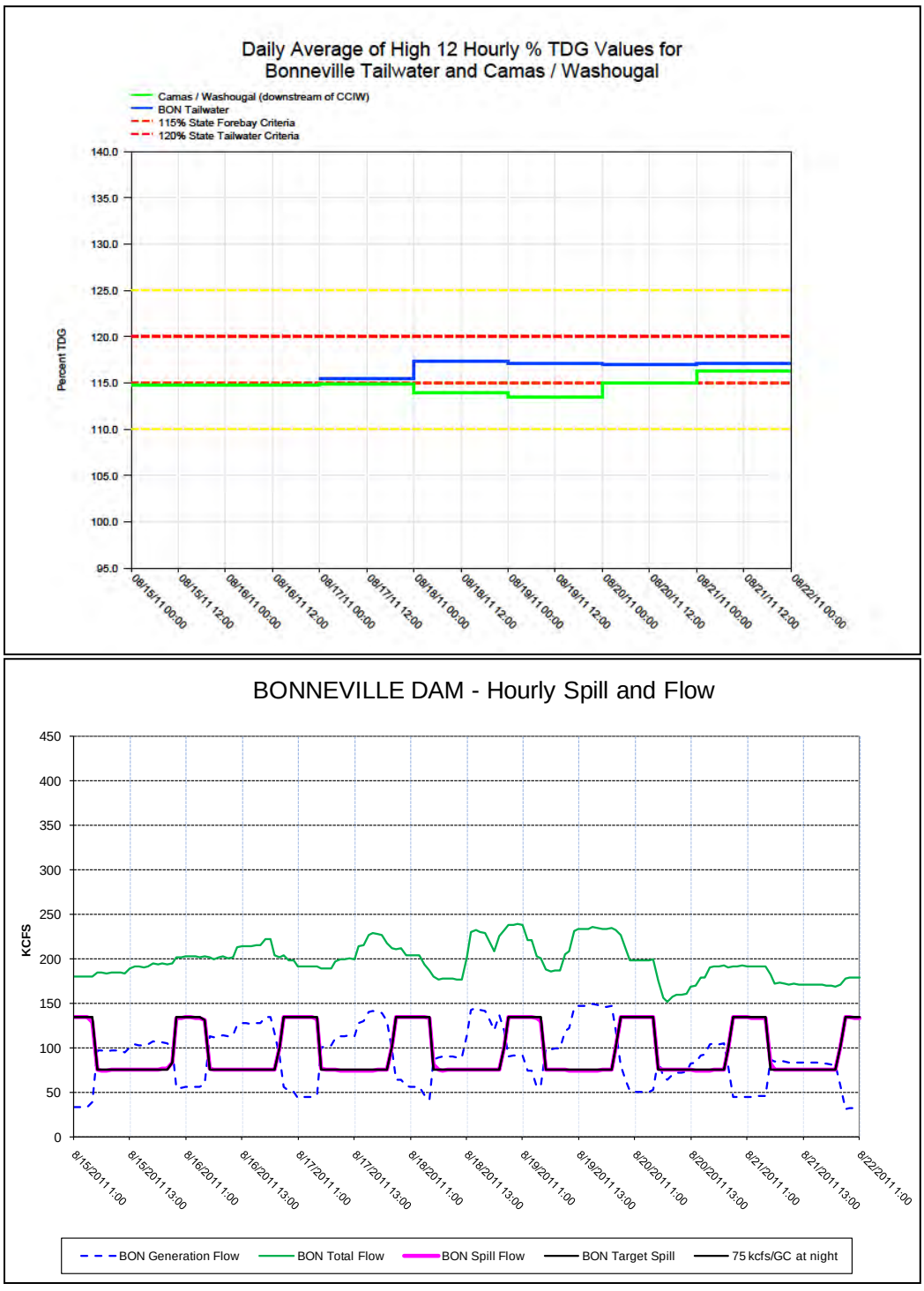

Daily Average of High 12 Hourly % TDG Values for
Bonneville Tailwater and Camas / Washougal
Camas / Washougal (downstream of CCIW)
BON Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/15/11 00:00
08/15/11 12:00
08/16/11 00:00
08/16/11 12:00
08/17/11 00:00
08/17/11 12:00
08/18/11 00:00
08/18/11 12:00
08/19/11 00:00
08/19/11 12:00
08/20/11 00:00
08/20/11 12:00
08/21/11 00:00
08/21/11 12:00
08/22/11 00:00
BONNEVILLE DAM - Hourly Spill and Flow
KCFS
450
400
350
300
250
200
150
100
50
0
8/15/2011 1:00
8/15/2011 13:00
8/16/2011 1:00
8/16/2011 13:00
8/17/2011 1:00
8/17/2011 13:00
8/18/2011 1:00
8/18/2011 13:00
8/19/2011 1:00
8/19/2011 13:00
8/20/2011 1:00
8/20/2011 13:00
8/21/2011 1:00
8/21/2011 13:00
8/22/2011 1:00
BON Generation Flow
BON Total Flow
BON Spill Flow
BON Target Spill
75 kcfs/GC at night

Figure 25

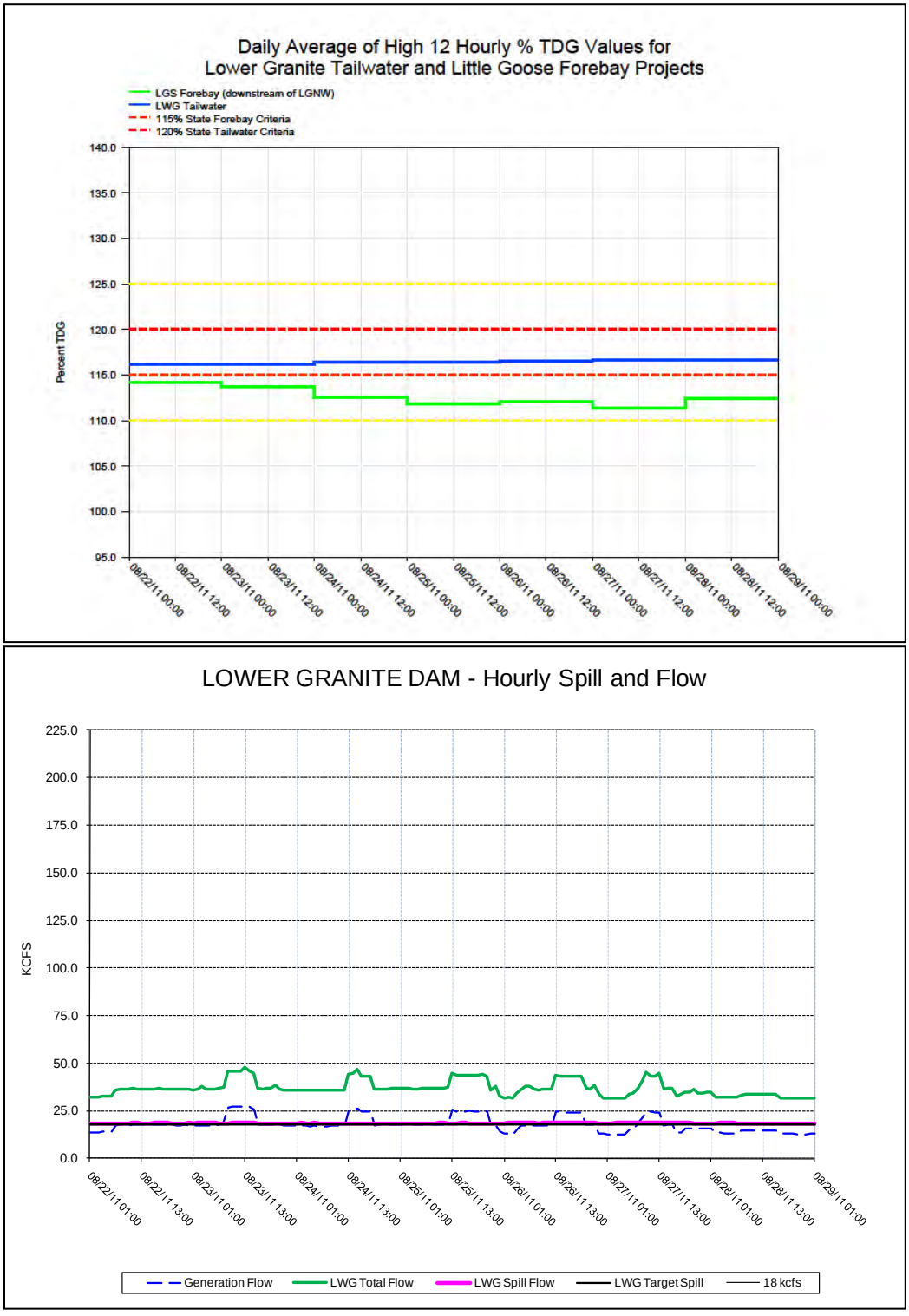

Daily Average of High 12 Hourly % TDG Values for
Lower Granite Tailwater and Little Goose Forebay Projects
LGS Forebay (downstream of LGNW)
LWG Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/22/11 00:00
08/22/11 12:00
08/23/11 00:00
08/23/11 12:00
08/24/11 00:00
08/24/11 12:00
08/25/11 00:00
08/25/11 12:00
08/26/11 00:00
08/26/11 12:00
08/27/11 00:00
08/27/11 12:00
08/28/11 00:00
08/28/11 12:00
08/29/11 00:00
LOWER GRANITE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
08/22/11 01:00
08/22/11 13:00
08/23/11 01:00
08/23/11 13:00
08/24/11 01:00
08/24/11 13:00
08/25/11 01:00
08/25/11 13:00
08/26/11 01:00
08/26/11 13:00
08/27/11 01:00
08/27/11 13:00
08/28/11 01:00
08/28/11 13:00
08/29/11 01:00
Generation Flow
LWG Total Flow
LWG Spill Flow
LWG Target Spill
18 kcfs

Figure 26

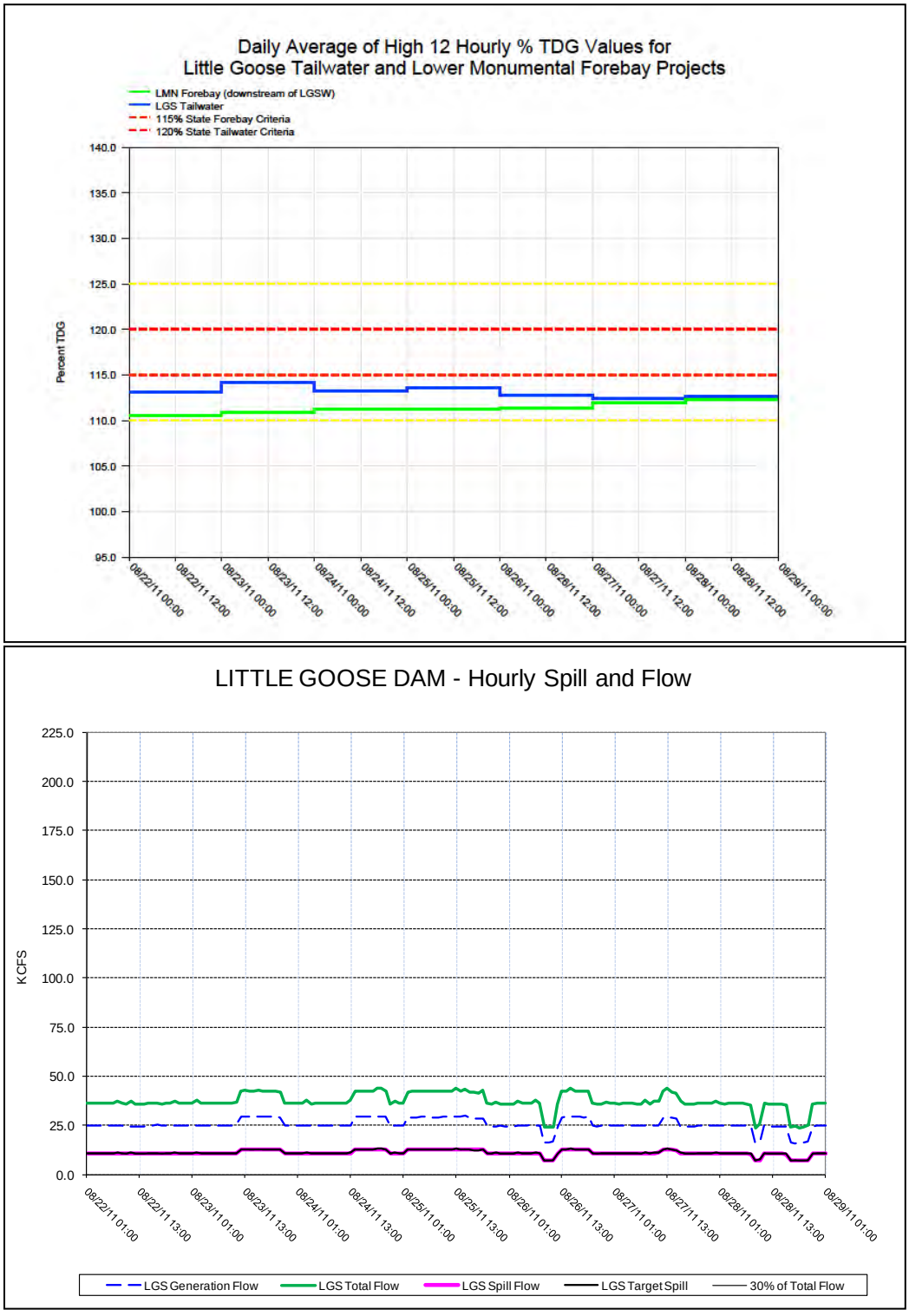

Daily Average of High 12 Hourly % TDG Values for
Little Goose Tailwater and Lower Monumental Forebay Projects
LMN Forebay (downstream of LGSW)
LGS Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/22/11 00:00
08/22/11 12:00
08/23/11 00:00
08/23/11 12:00
08/24/11 00:00
08/24/11 12:00
08/25/11 00:00
08/25/11 12:00
08/26/11 00:00
08/26/11 12:00
08/27/11 00:00
08/27/11 12:00
08/28/11 00:00
08/28/11 12:00
08/29/11 00:00
LITTLE GOOSE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
08/22/11 01:00
08/22/11 13:00
08/23/11 01:00
08/23/11 13:00
08/24/11 01:00
08/24/11 13:00
08/25/11 01:00
08/25/11 13:00
08/26/11 01:00
08/26/11 13:00
08/27/11 01:00
08/27/11 13:00
08/28/11 01:00
08/28/11 13:00
08/29/11 01:00
LGS Generation Flow
LGS Total Flow
LGS Spill Flow
LGS Target Spill
30% of Total Flow

Figure 27

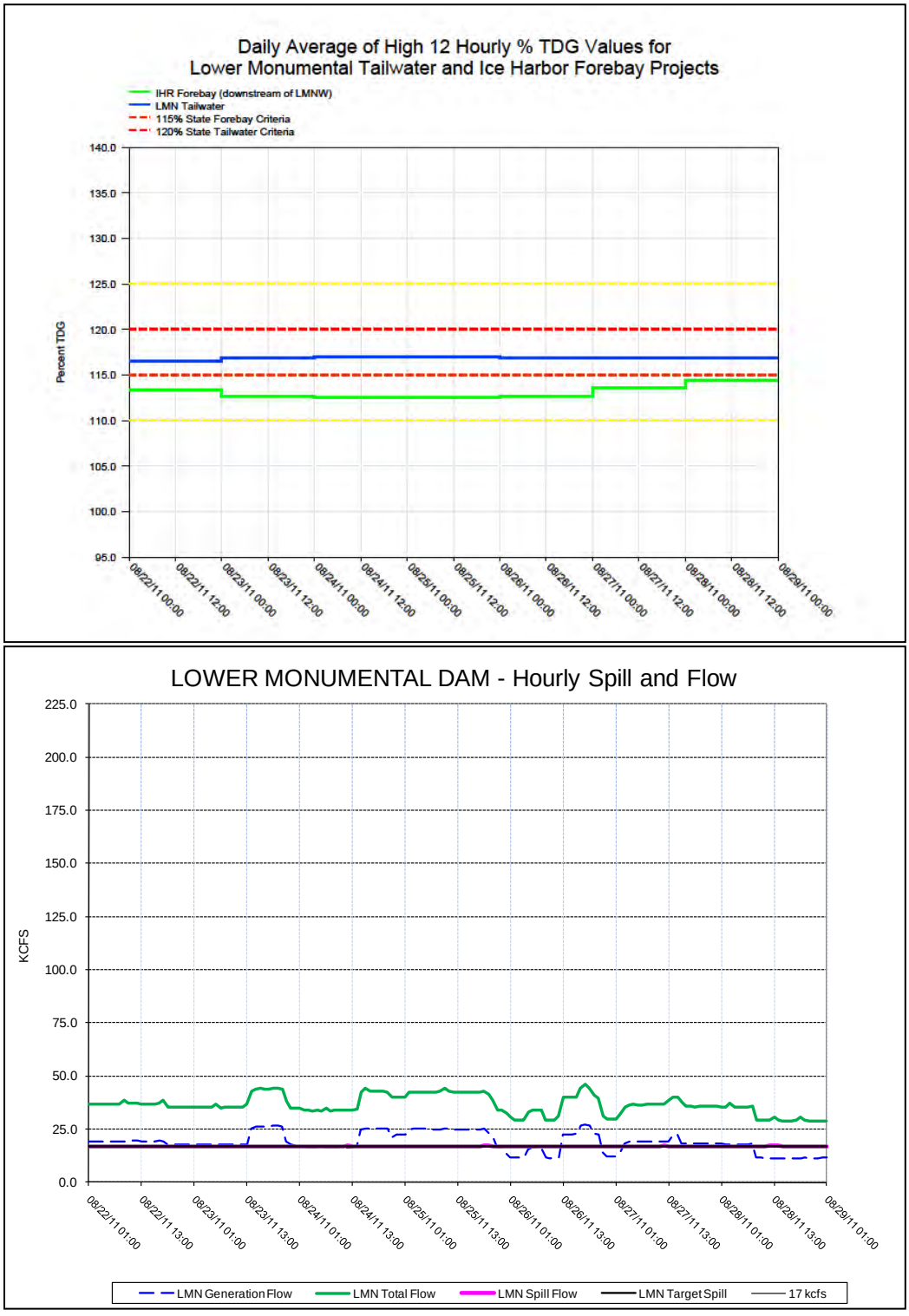

Daily Average of High 12 Hourly % TDG Values for
Lower Monumental Tailwater and Ice Harbor Forebay Projects
IHR Forebay (downstream of LMNW)
LMN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/22/11 00:00
08/22/11 12:00
08/23/11 00:00
08/23/11 12:00
08/24/11 00:00
08/24/11 12:00
08/25/11 00:00
08/25/11 12:00
08/26/11 00:00
08/26/11 12:00
08/27/11 00:00
08/27/11 12:00
08/28/11 00:00
08/28/11 12:00
08/29/11 00:00
LOWER MONUMENTAL DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
08/22/11 01:00
08/22/11 13:00
08/23/11 01:00
08/23/11 13:00
08/24/11 01:00
08/24/11 13:00
08/25/11 01:00
08/25/11 13:00
08/26/11 01:00
08/26/11 13:00
08/27/11 01:00
08/27/11 13:00
08/28/11 01:00
08/28/11 13:00
08/29/11 01:00
LMN Generation Flow
LMN Total Flow
LMN Spill Flow
LMN Target Spill
17 kcfs

Figure 28

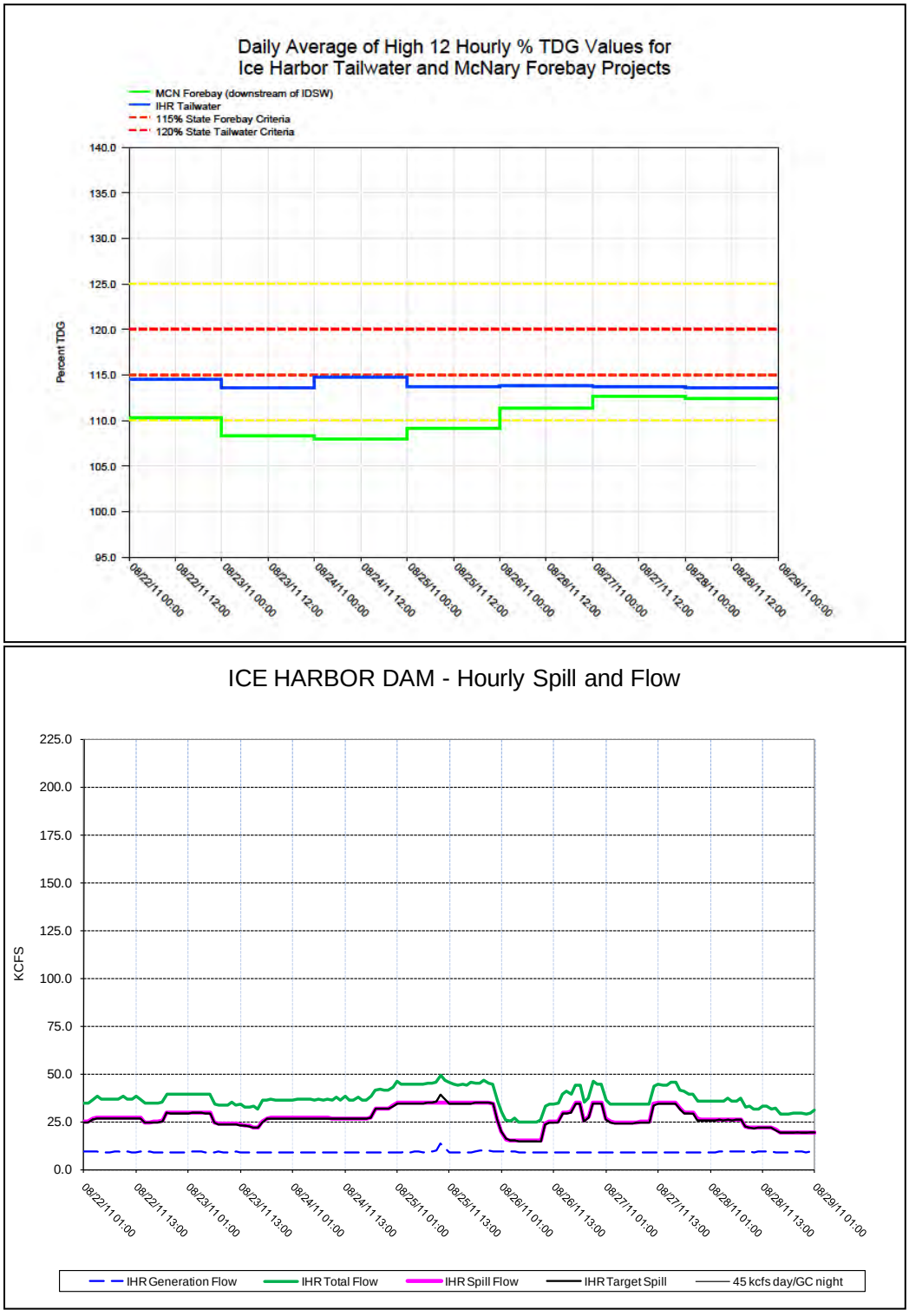

Daily Average of High 12 Hourly % TDG Values for
Ice Harbor Tailwater and McNary Forebay Projects
MCN Forebay (downstream of IDSW)
IHR Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/22/11 00:00
08/22/11 12:00
08/23/11 00:00
08/23/11 12:00
08/24/11 00:00
08/24/11 12:00
08/25/11 00:00
08/25/11 12:00
08/26/11 00:00
08/26/11 12:00
08/27/11 00:00
08/27/11 12:00
08/28/11 00:00
08/28/11 12:00
08/29/11 00:00
ICE HARBOR DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
08/22/11 01:00
08/22/11 13:00
08/23/11 01:00
08/23/11 13:00
08/24/11 01:00
08/24/11 13:00
08/25/11 01:00
08/25/11 13:00
08/26/11 01:00
08/26/11 13:00
08/27/11 01:00
08/27/11 13:00
08/28/11 01:00
08/28/11 13:00
08/29/11 01:00
IHR Generation Flow
IHR Total Flow
IHR Spill Flow
IHR Target Spill
45 kcfs day/GC night

Figure 29

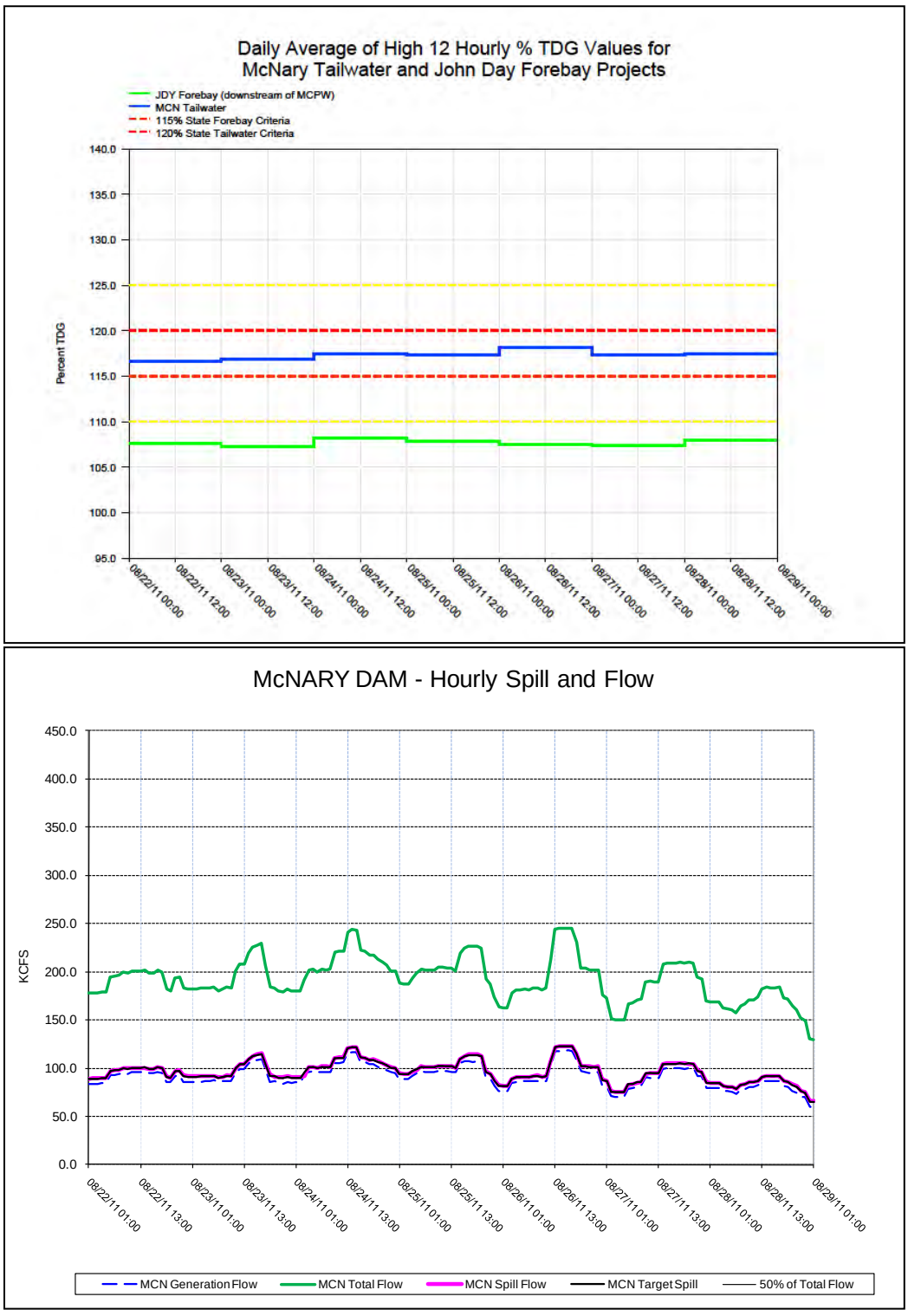

Daily Average of High 12 Hourly % TDG Values for
McNary Tailwater and John Day Forebay Projects
JDY Forebay (downstream of MCPW)
MCN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/22/11 00:00
08/22/11 12:00
08/23/11 00:00
08/23/11 12:00
08/24/11 00:00
08/24/11 12:00
08/25/11 00:00
08/25/11 12:00
08/26/11 00:00
08/26/11 12:00
08/27/11 00:00
08/27/11 12:00
08/28/11 00:00
08/28/11 12:00
08/29/11 00:00
McNARY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
08/22/11 01:00
08/22/11 13:00
08/23/11 01:00
08/23/11 13:00
08/24/11 01:00
08/24/11 13:00
08/25/11 01:00
08/25/11 13:00
08/26/11 01:00
08/26/11 13:00
08/27/11 01:00
08/27/11 13:00
08/28/11 01:00
08/28/11 13:00
08/29/11 01:00
MCN Generation Flow
MCN Total Flow
MCN Spill Flow
MCN Target Spill
50% of Total Flow

Figure 30

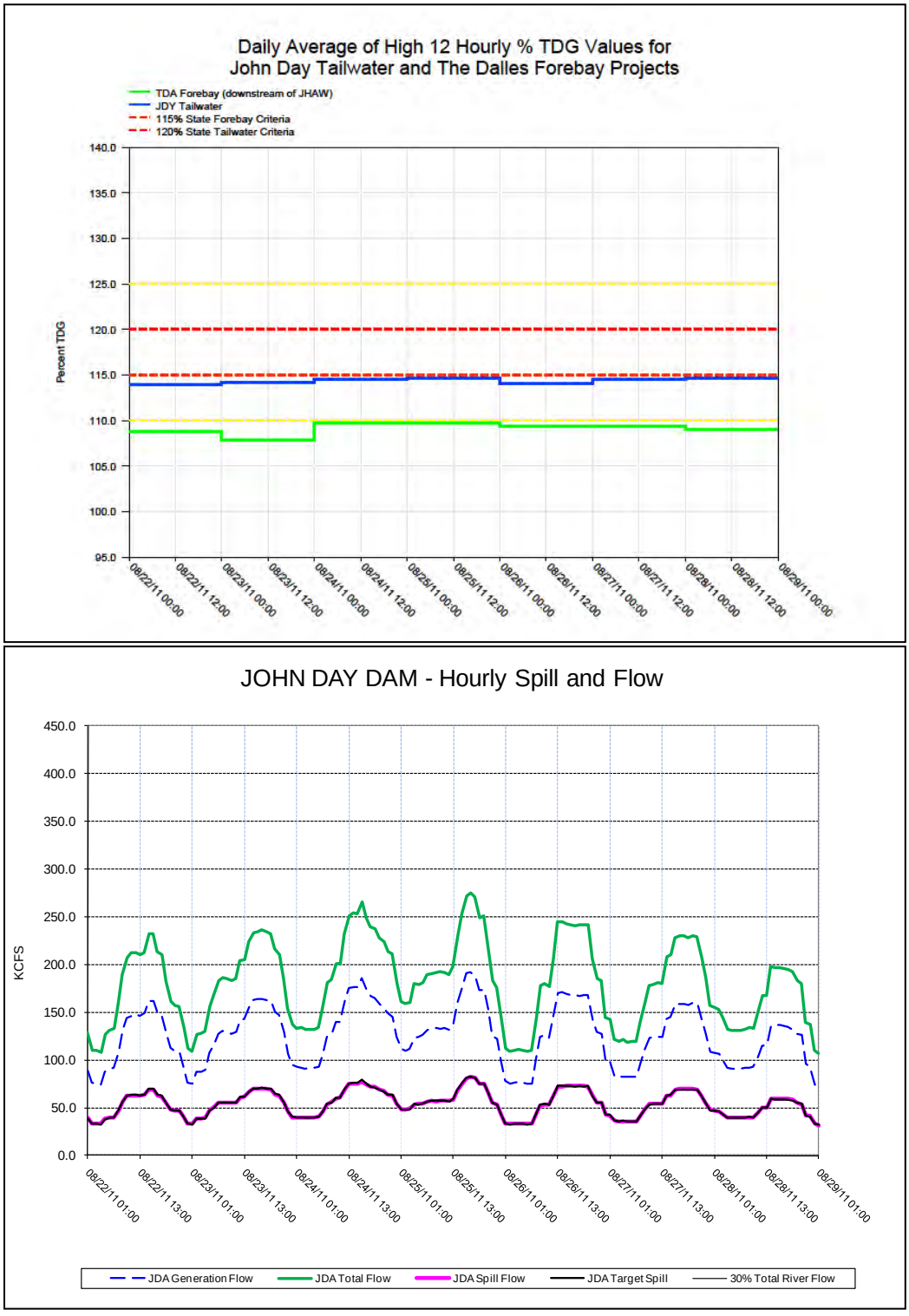

Daily Average of High 12 Hourly % TDG Values for
John Day Tailwater and The Dalles Forebay Projects
TDA Forebay (downstream of JHAW)
JDY Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/22/11 00:00
08/22/11 12:00
08/23/11 00:00
08/23/11 12:00
08/24/11 00:00
08/24/11 12:00
08/25/11 00:00
08/25/11 12:00
08/26/11 00:00
08/26/11 12:00
08/27/11 00:00
08/27/11 12:00
08/28/11 00:00
08/28/11 12:00
08/29/11 00:00
JOHN DAY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
08/22/11 01:00
08/22/11 13:00
08/23/11 01:00
08/23/11 13:00
08/24/11 01:00
08/24/11 13:00
08/25/11 01:00
08/25/11 13:00
08/26/11 01:00
08/26/11 13:00
08/27/11 01:00
08/27/11 13:00
08/28/11 01:00
08/28/11 13:00
08/29/11 01:00
JDA Generation Flow
JDA Total Flow
JDA Spill Flow
JDA Target Spill
30% Total River Flow

Figure 31

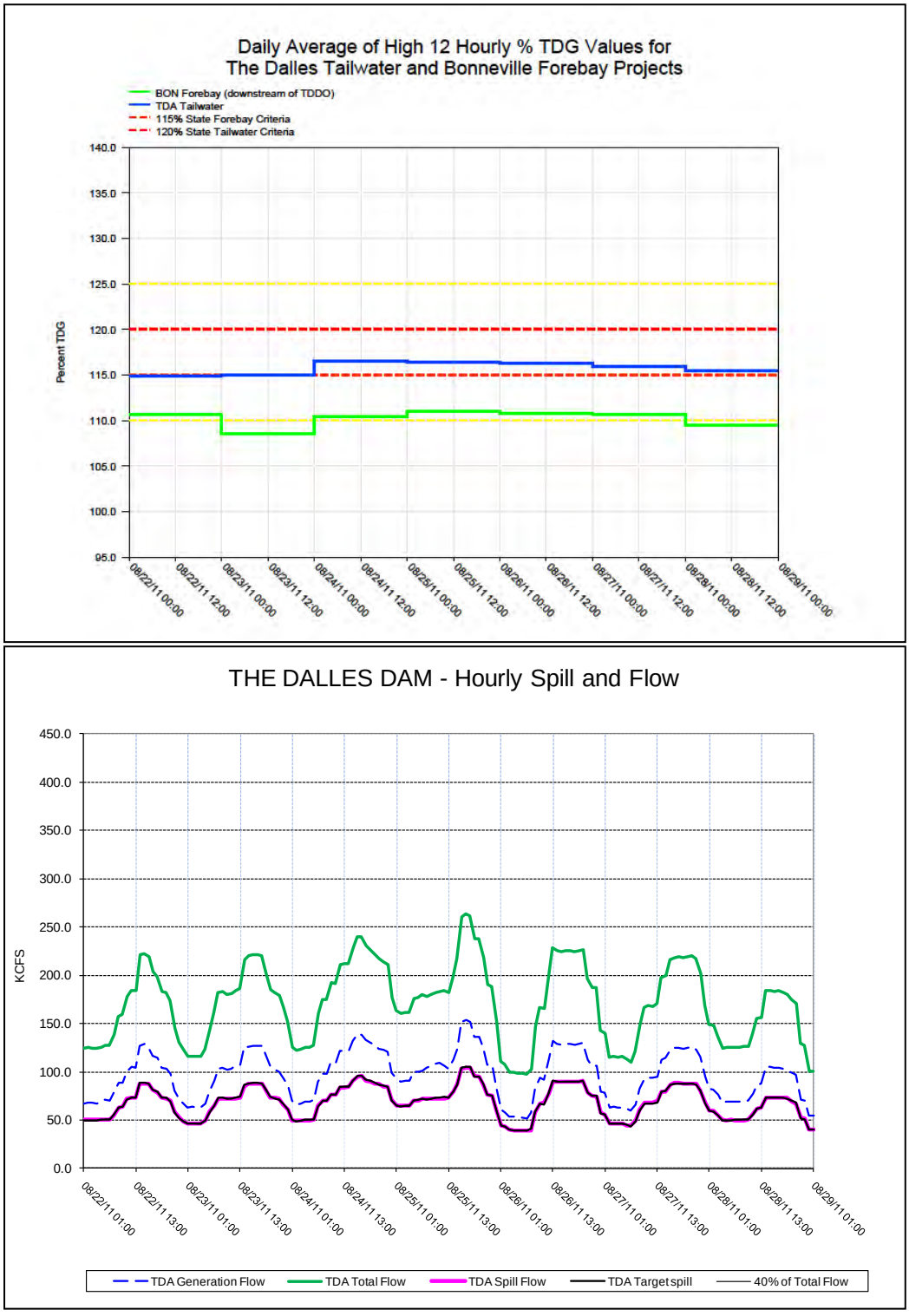

Daily Average of High 12 Hourly % TDG Values for
The Dalles Tailwater and Bonneville Forebay Projects
BON Forebay (downstream of TDDO)
TDA Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/22/11 00:00
08/22/11 12:00
08/23/11 00:00
08/23/11 12:00
08/24/11 00:00
08/24/11 12:00
08/25/11 00:00
08/25/11 12:00
08/26/11 00:00
08/26/11 12:00
08/27/11 00:00
08/27/11 12:00
08/28/11 00:00
08/28/11 12:00
08/29/11 00:00
THE DALLES DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
08/22/11 01:00
08/22/11 13:00
08/23/11 01:00
08/23/11 13:00
08/24/11 01:00
08/24/11 13:00
08/25/11 01:00
08/25/11 13:00
08/26/11 01:00
08/26/11 13:00
08/27/11 01:00
08/27/11 13:00
08/28/11 01:00
08/28/11 13:00
08/29/11 01:00
TDA Generation Flow
TDA Total Flow
TDA Spill Flow
TDA Target spill
40% of Total Flow

Figure 32

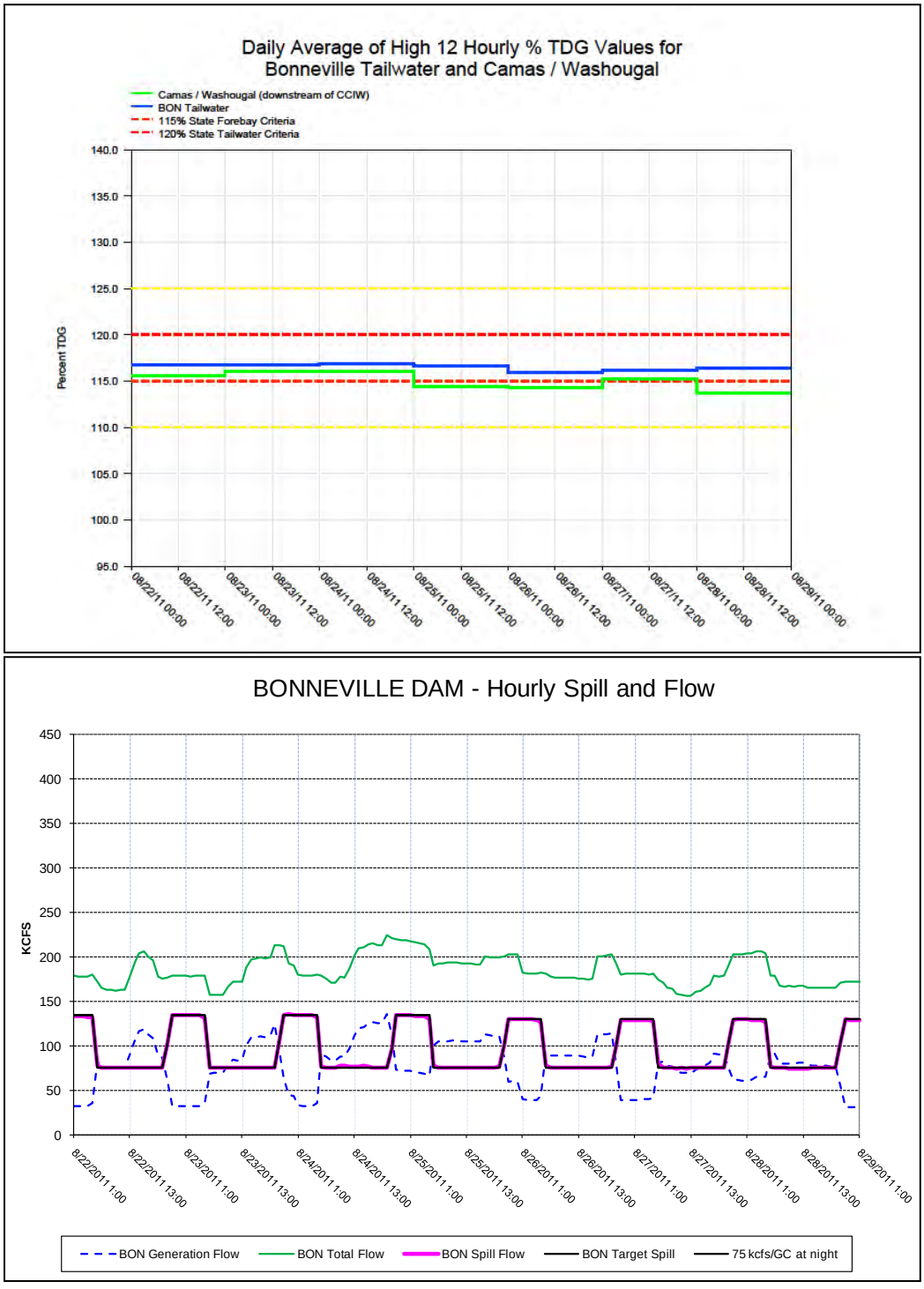
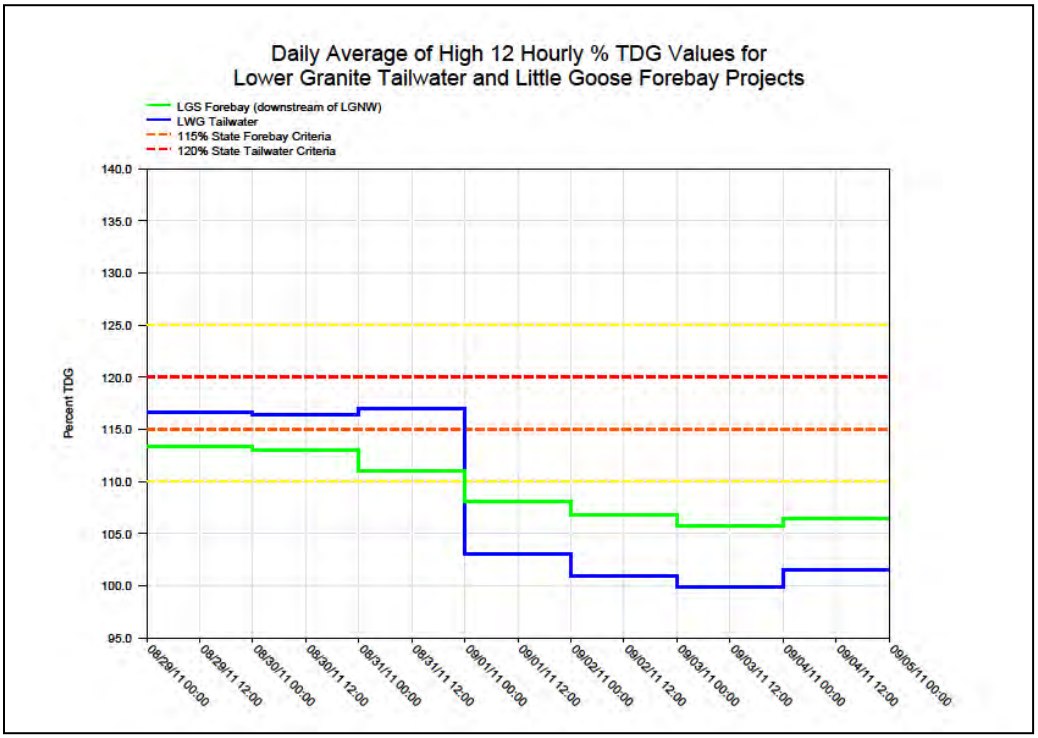

Daily Average of High 12 Hourly % TDG Values for
Bonneville Tailwater and Camas / Washougal
Camas / Washougal (downstream of CCIW)
BON Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/22/11 00:00
08/22/11 12:00
08/23/11 00:00
08/23/11 12:00
08/24/11 00:00
08/24/11 12:00
08/25/11 00:00
08/25/11 12:00
08/26/11 00:00
08/26/11 12:00
08/27/11 00:00
08/27/11 12:00
08/28/11 00:00
08/28/11 12:00
08/29/11 00:00
BONNEVILLE DAM - Hourly Spill and Flow
KCFS
450
400
350
300
250
200
150
100
50
0
8/22/2011 1:00
8/22/2011 13:00
8/23/2011 1:00
8/23/2011 13:00
8/24/2011 1:00
8/24/2011 13:00
8/25/2011 1:00
8/25/2011 13:00
8/26/2011 1:00
8/26/2011 13:00
8/27/2011 1:00
8/27/2011 13:00
8/28/2011 1:00
8/28/2011 13:00
8/29/2011 1:00
BON Generation Flow
BON Total Flow
BON Spill Flow
BON Target Spill
75 kcfs/GC at night

Figure 33


Daily Average of High 12 Hourly % TDG Values for
Lower Granite Tailwater and Little Goose Forebay Projects
LGS Forebay (downstream of LGNW)
LWG Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/29/11 00:00
08/29/11 12:00
08/30/11 00:00
08/30/11 12:00
08/31/11 00:00
08/31/11 12:00
09/01/11 00:00
09/01/11 12:00
09/02/11 00:00
09/02/11 12:00
09/03/11 00:00
09/03/11 12:00
09/04/11 00:00
09/04/11 12:00
09/05/11 00:00

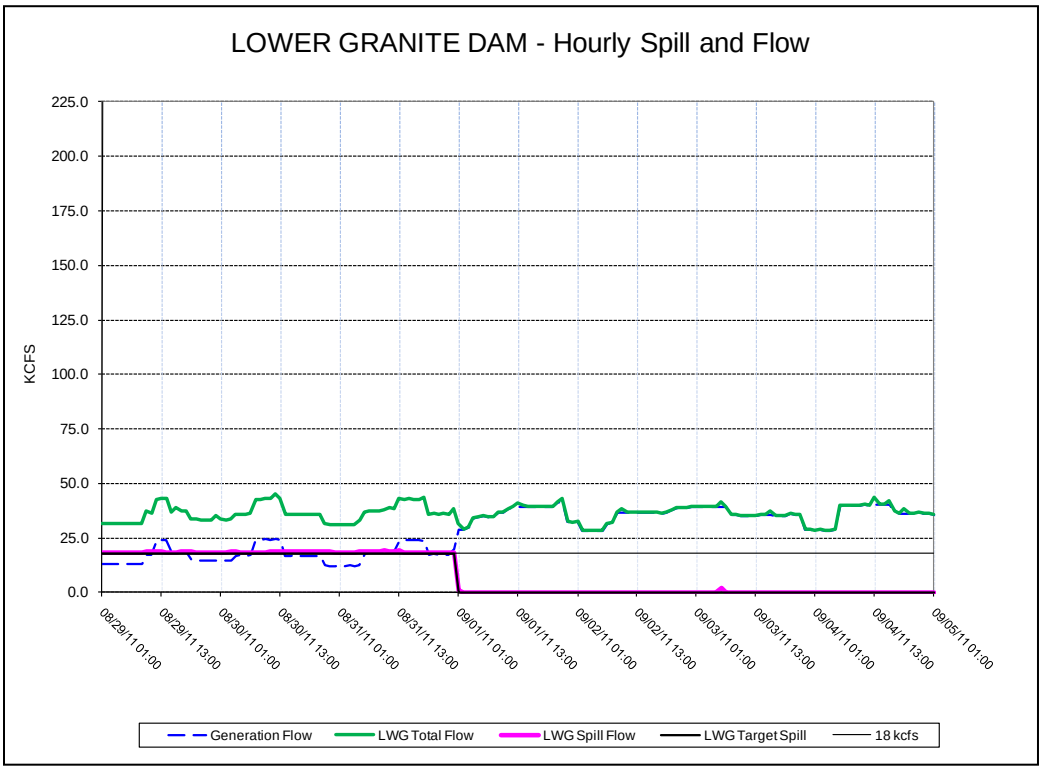
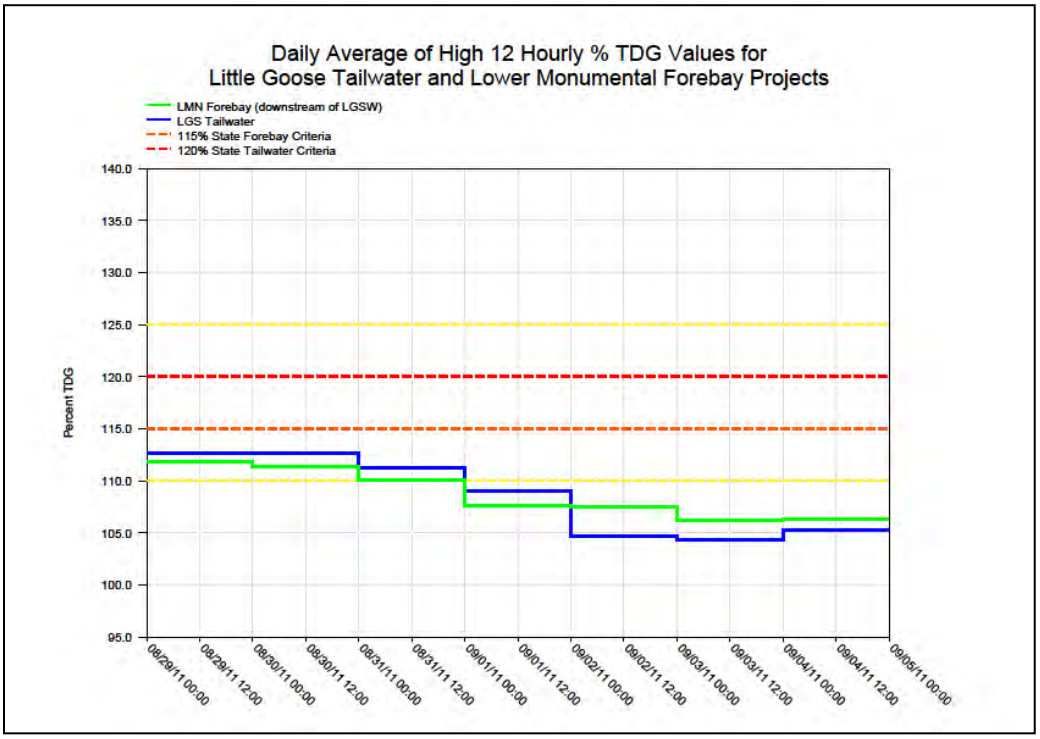

LOWER GRANITE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
08/29/11 01:00
08/29/11 13:00
08/30/11 01:00
08/30/11 13:00
08/31/11 01:00
08/31/11 13:00
09/01/11 01:00
09/01/11 13:00
09/02/11 01:00
09/02/11 13:00
09/03/11 01:00
09/03/11 13:00
09/04/11 01:00
09/04/11 13:00
09/05/11 01:00
Generation Flow
LWG Total Flow
LWG Spill Flow
LWG Target Spill
18 kcfs

Figure 34


Daily Average of High 12 Hourly % TDG Values for
Little Goose Tailwater and Lower Monumental Forebay Projects
LMN Forebay (downstream of LGSW)
LGS Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/29/11 00:00
08/29/11 12:00
08/30/11 00:00
08/30/11 12:00
08/31/11 00:00
08/31/11 12:00
09/01/11 00:00
09/01/11 12:00
09/02/11 00:00
09/02/11 12:00
09/03/11 00:00
09/03/11 12:00
09/04/11 00:00
09/04/11 12:00
09/05/11 00:00

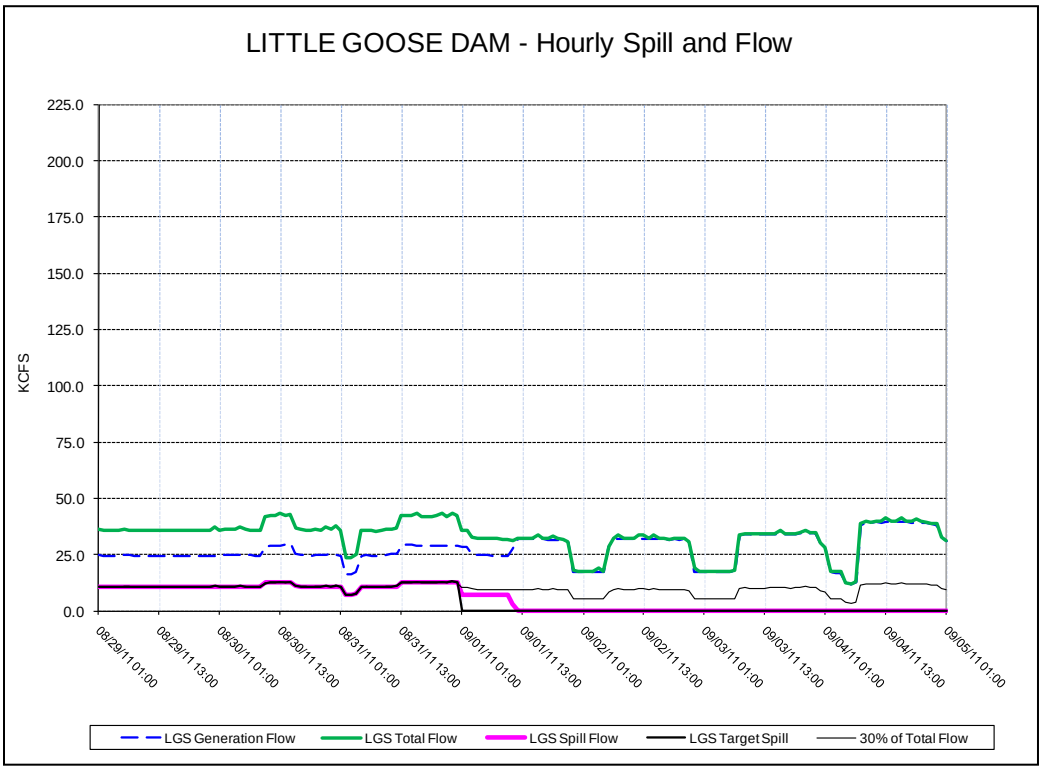
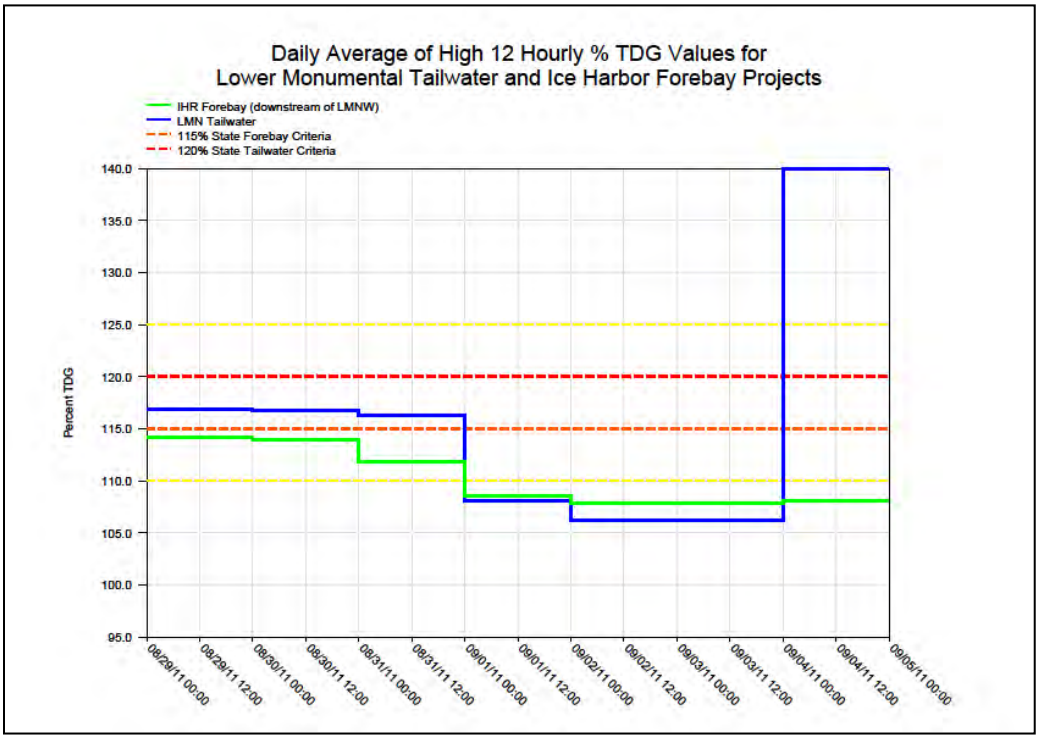

LITTLE GOOSE DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
08/29/11 01:00
08/29/11 13:00
08/30/11 01:00
08/30/11 13:00
08/31/11 01:00
08/31/11 13:00
09/01/11 01:00
09/01/11 13:00
09/02/11 01:00
09/02/11 13:00
09/03/11 01:00
09/03/11 13:00
09/04/11 01:00
09/04/11 13:00
09/05/11 01:00
LGS Generation Flow
LGS Total Flow
LGS Spill Flow
LGS Target Spill
30% of Total Flow

Figure 35


Daily Average of High 12 Hourly % TDG Values for
Lower Monumental Tailwater and Ice Harbor Forebay Projects
IHR Forebay (downstream of LMNW)
LMN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/29/11 00:00
08/29/11 12:00
08/30/11 00:00
08/30/11 12:00
08/31/11 00:00
08/31/11 12:00
09/01/11 00:00
09/01/11 12:00
09/02/11 00:00
09/02/11 12:00
09/03/11 00:00
09/03/11 12:00
09/04/11 00:00
09/04/11 12:00
09/05/11 00:00

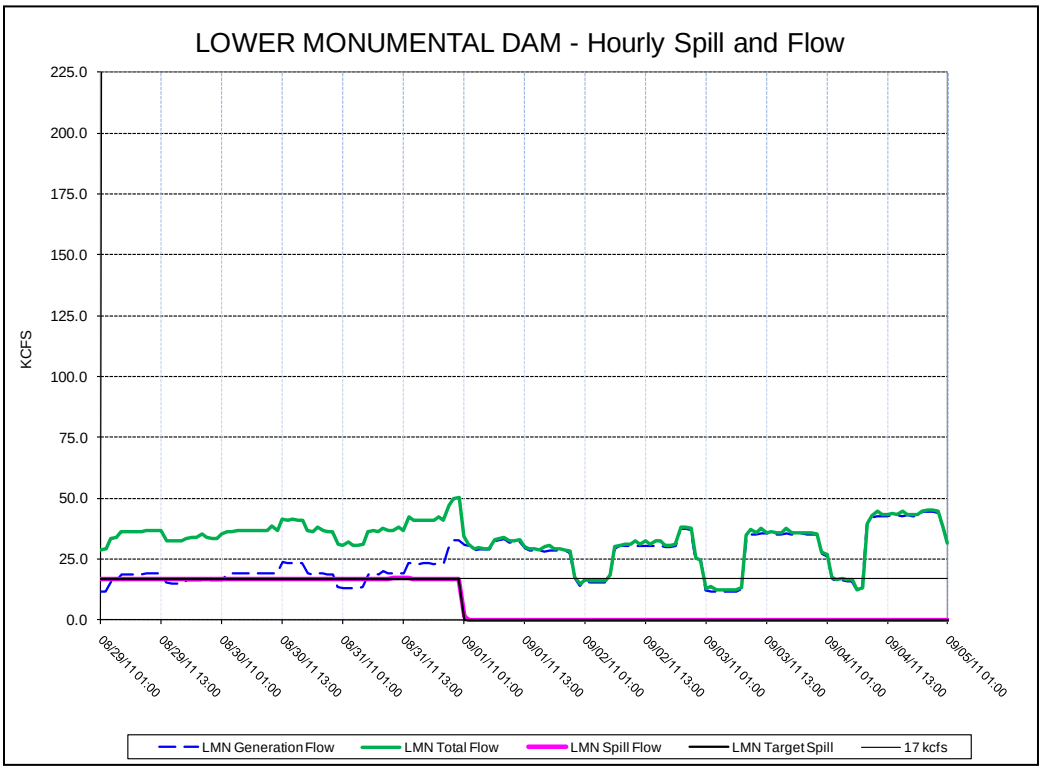
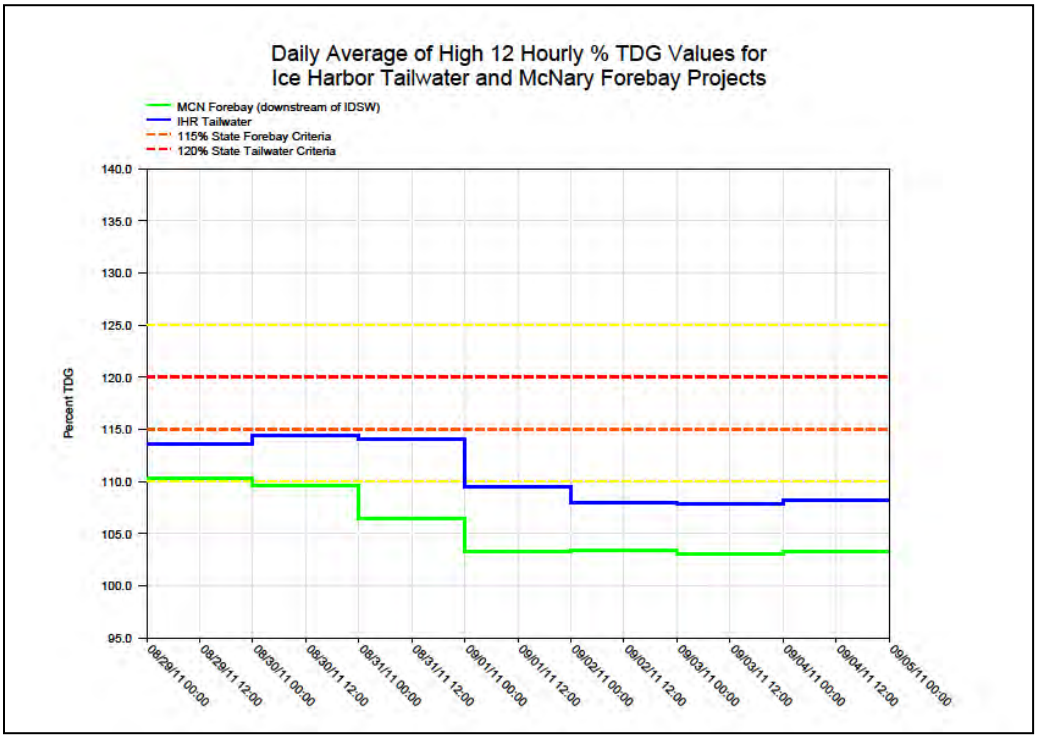

LOWER MONUMENTAL DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
08/29/11 01:00
08/29/11 13:00
08/30/11 01:00
08/30/11 13:00
08/31/11 01:00
08/31/11 13:00
09/01/11 01:00
09/01/11 13:00
09/02/11 01:00
09/02/11 13:00
09/03/11 01:00
09/03/11 13:00
09/04/11 01:00
09/04/11 13:00
09/05/11 01:00
LMN Generation Flow
LMN Total Flow
LMN Spill Flow
LMN Target Spill
17 kcfs

Figure 36


Daily Average of High 12 Hourly % TDG Values for
Ice Harbor Tailwater and McNary Forebay Projects
MCN Forebay (downstream of IDSW)
IHR Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/29/11 00:00
08/29/11 12:00
08/30/11 00:00
08/30/11 12:00
08/31/11 00:00
08/31/11 12:00
09/01/11 00:00
09/01/11 12:00
09/02/11 00:00
09/02/11 12:00
09/03/11 00:00
09/03/11 12:00
09/04/11 00:00
09/04/11 12:00
09/05/11 00:00

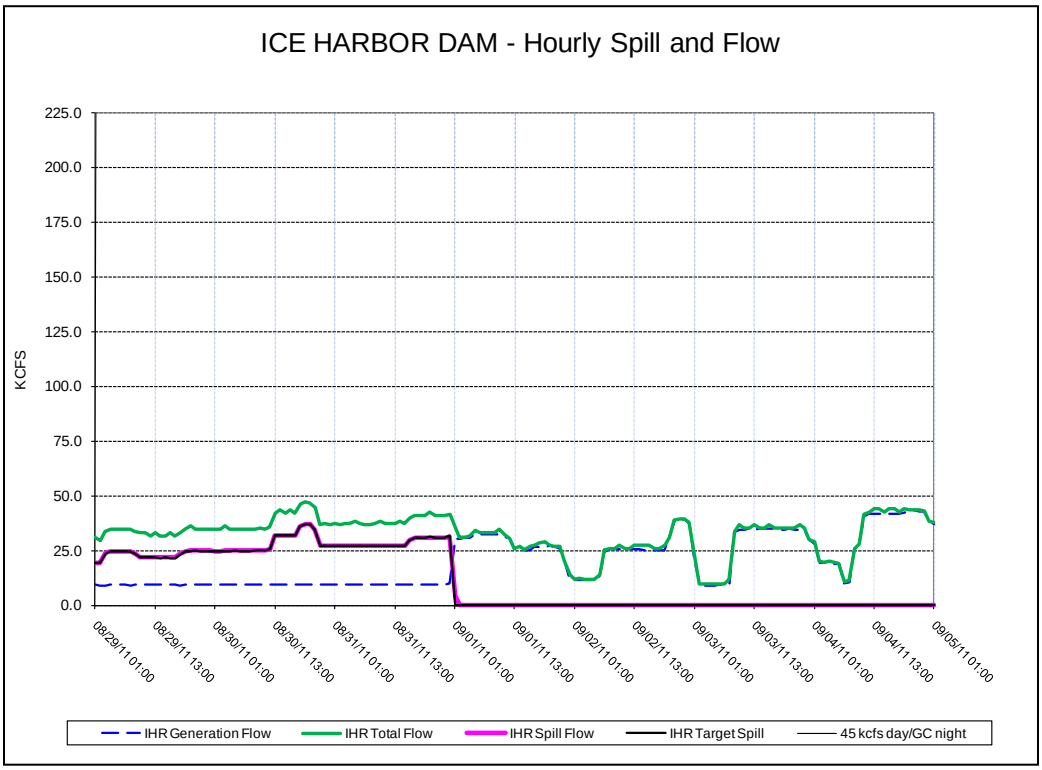
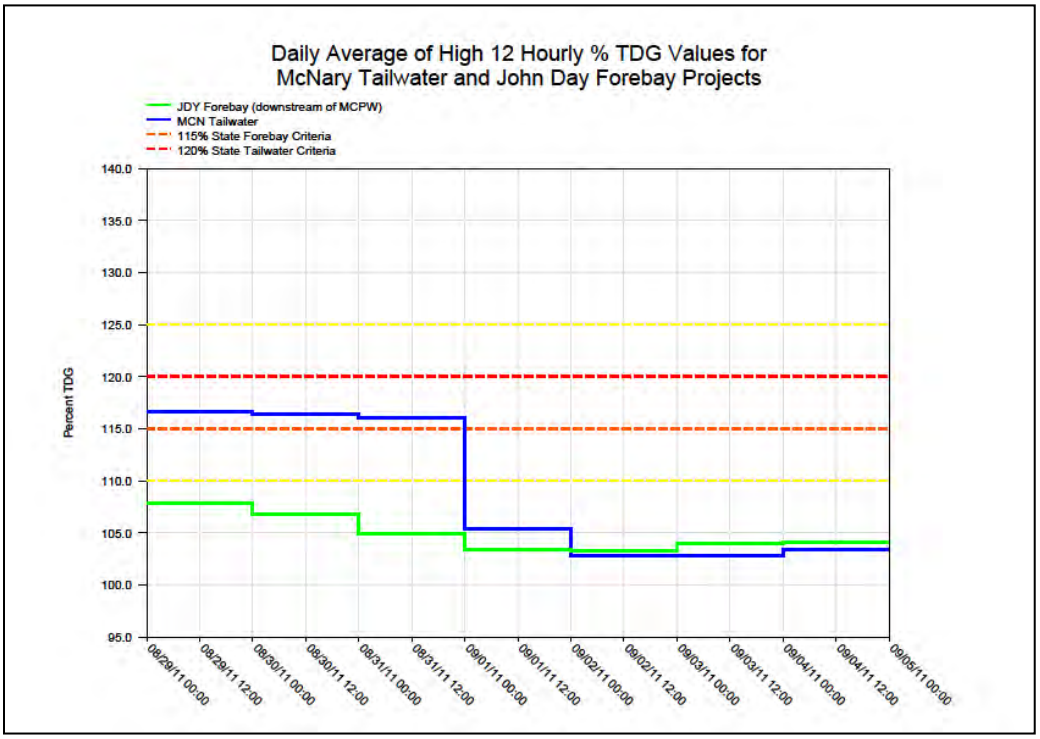

ICE HARBOR DAM - Hourly Spill and Flow
KCFS
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
08/29/11 01:00
08/29/11 13:00
08/30/11 01:00
08/30/11 13:00
08/31/11 01:00
08/31/11 13:00
09/01/11 01:00
09/01/11 13:00
09/02/11 01:00
09/02/11 13:00
09/03/11 01:00
09/03/11 13:00
09/04/11 01:00
09/04/11 13:00
09/05/11 01:00
IHR Generation Flow
IHR Total Flow
IHR Spill Flow
IHR Target Spill
45 kcfs day/GC night

Figure 37


Daily Average of High 12 Hourly % TDG Values for
McNary Tailwater and John Day Forebay Projects
JDY Forebay (downstream of MCPW)
MCN Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/29/11 00:00
08/29/11 12:00
08/30/11 00:00
08/30/11 12:00
08/31/11 00:00
08/31/11 12:00
09/01/11 00:00
09/01/11 12:00
09/02/11 00:00
09/02/11 12:00
09/03/11 00:00
09/03/11 12:00
09/04/11 00:00
09/04/11 12:00
09/05/11 00:00

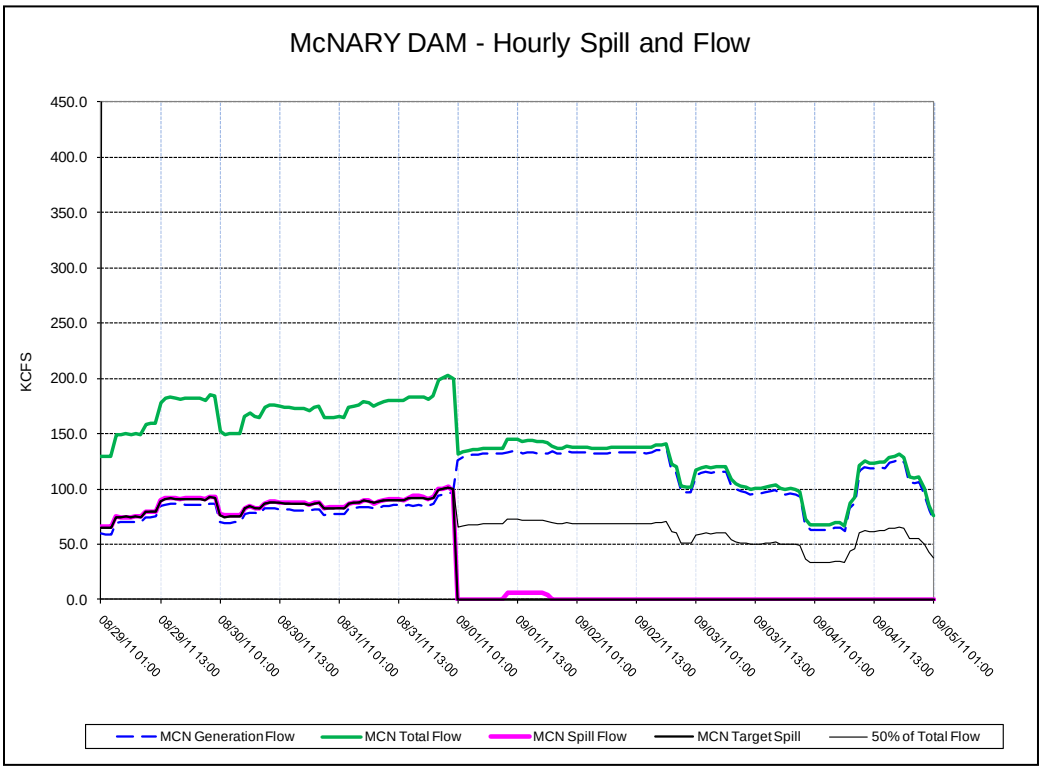
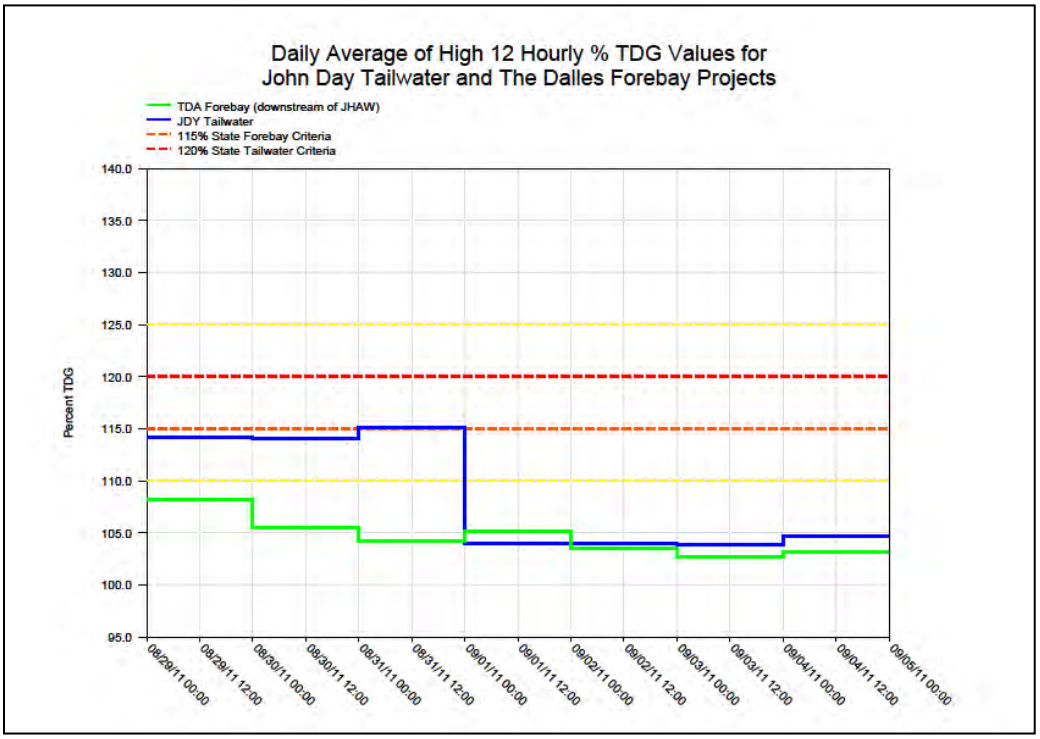

McNARY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
08/29/11 01:00
08/29/11 13:00
08/30/11 01:00
08/30/11 13:00
08/31/11 01:00
08/31/11 13:00
09/01/11 01:00
09/01/11 13:00
09/02/11 01:00
09/02/11 13:00
09/03/11 01:00
09/03/11 13:00
09/04/11 01:00
09/04/11 13:00
09/05/11 01:00
MCN Generation Flow
MCN Total Flow
MCN Spill Flow
MCN Target Spill
50% of Total Flow

Figure 38


Daily Average of High 12 Hourly % TDG Values for
John Day Tailwater and The Dalles Forebay Projects
TDA Forebay (downstream of JHAW)
JDY Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/29/11 00:00
08/29/11 12:00
08/30/11 00:00
08/30/11 12:00
08/31/11 00:00
08/31/11 12:00
09/01/11 00:00
09/01/11 12:00
09/02/11 00:00
09/02/11 12:00
09/03/11 00:00
09/03/11 12:00
09/04/11 00:00
09/04/11 12:00
09/05/11 00:00

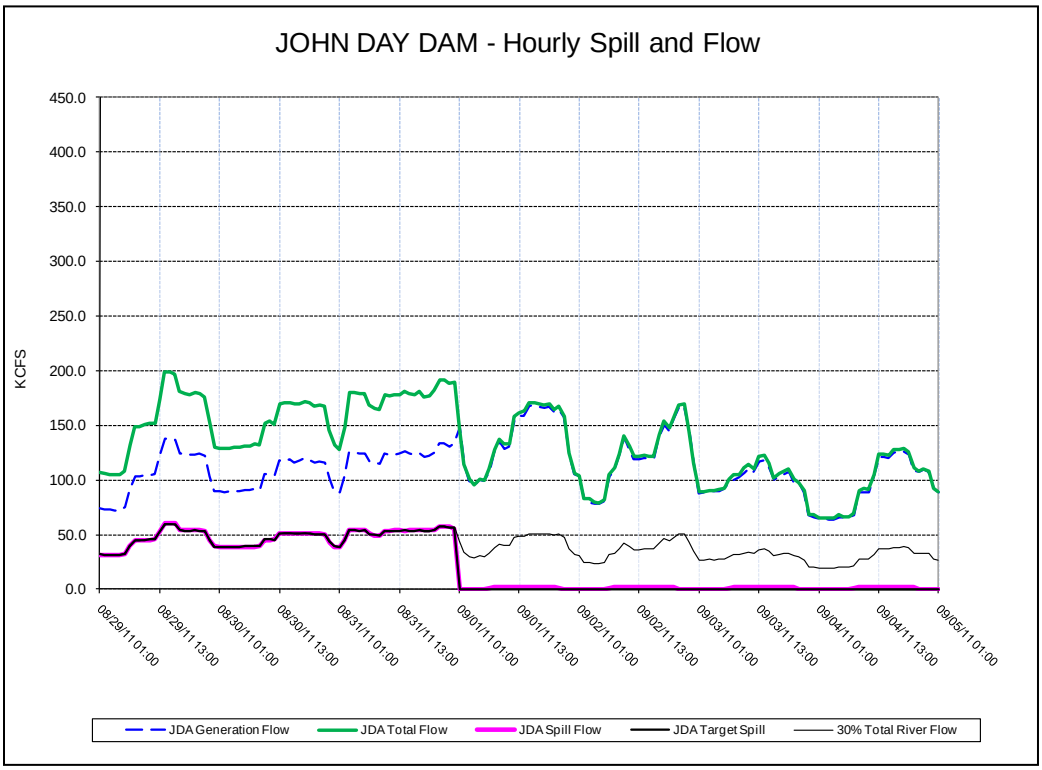
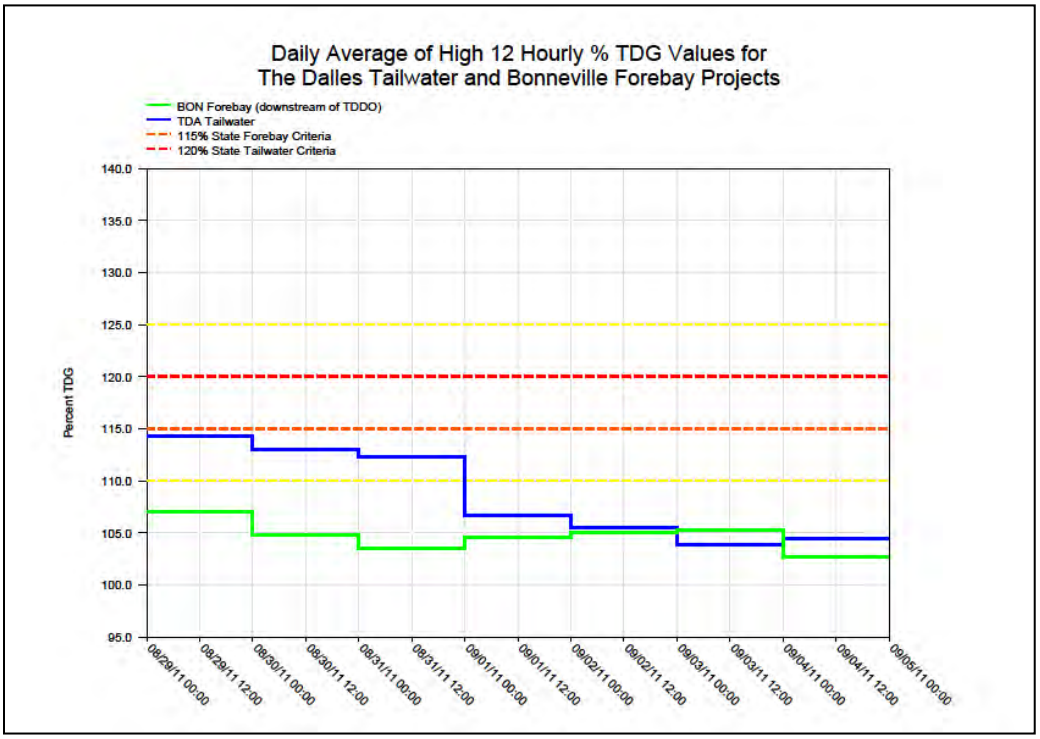

JOHN DAY DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
08/29/11 01:00
08/29/11 13:00
08/30/11 01:00
08/30/11 13:00
08/31/11 01:00
08/31/11 13:00
09/01/11 01:00
09/01/11 13:00
09/02/11 01:00
09/02/11 13:00
09/03/11 01:00
09/03/11 13:00
09/04/11 01:00
09/04/11 13:00
09/05/11 01:00
JDA Generation Flow
JDA Total Flow
JDA Spill Flow
JDA Target Spill
30% Total River Flow

Figure 39


Daily Average of High 12 Hourly % TDG Values for
The Dalles Tailwater and Bonneville Forebay Projects
BON Forebay (downstream of TDDO)
TDA Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/29/11 00:00
08/29/11 12:00
08/30/11 00:00
08/30/11 12:00
08/31/11 00:00
08/31/11 12:00
09/01/11 00:00
09/01/11 12:00
09/02/11 00:00
09/02/11 12:00
09/03/11 00:00
09/03/11 12:00
09/04/11 00:00
09/04/11 12:00
09/05/11 00:00

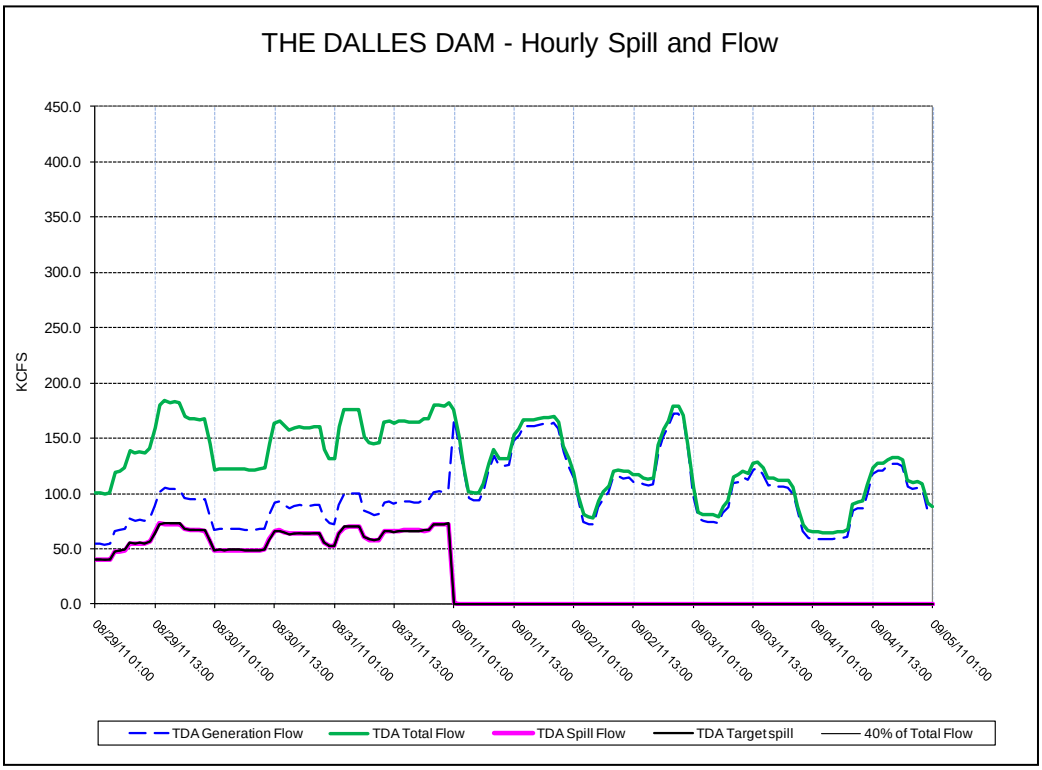
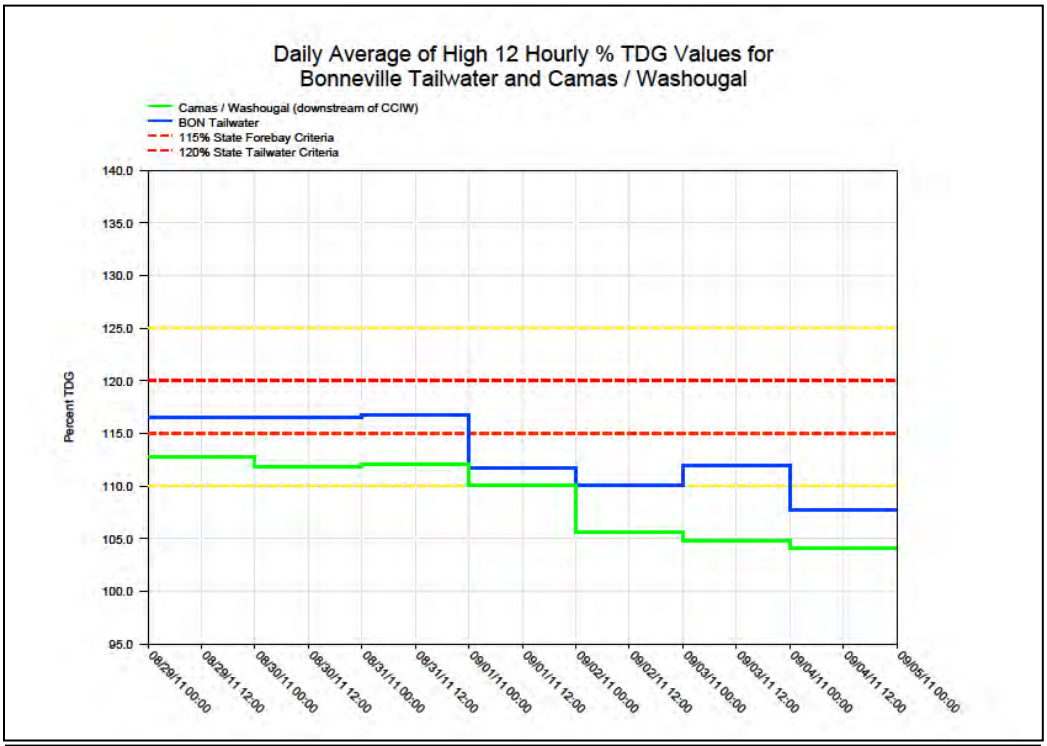

THE DALLES DAM - Hourly Spill and Flow
KCFS
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
08/29/11 01:00
08/29/11 13:00
08/30/11 01:00
08/30/11 13:00
08/31/11 01:00
08/31/11 13:00
09/01/11 01:00
09/01/11 13:00
09/02/11 01:00
09/02/11 13:00
09/03/11 01:00
09/03/11 13:00
09/04/11 01:00
09/04/11 13:00
09/05/11 01:00
TDA Generation Flow
TDA Total Flow
TDA Spill Flow
TDA Target spill
40% of Total Flow

Figure 40


Daily Average of High 12 Hourly % TDG Values for
Bonneville Tailwater and Camas / Washougal
Camas / Washougal (downstream of CCIW)
BON Tailwater
115% State Forebay Criteria
120% State Tailwater Criteria
Percent TDG
140.0
135.0
130.0
125.0
120.0
115.0
110.0
105.0
100.0
95.0
08/29/11 00:00
08/29/11 12:00
08/30/11 00:00
08/30/11 12:00
08/31/11 00:00
08/31/11 12:00
09/01/11 00:00
09/01/11 12:00
09/02/11 00:00
09/02/11 12:00
09/03/11 00:00
09/03/11 12:00
09/04/11 00:00
09/04/11 12:00
09/05/11 00:00

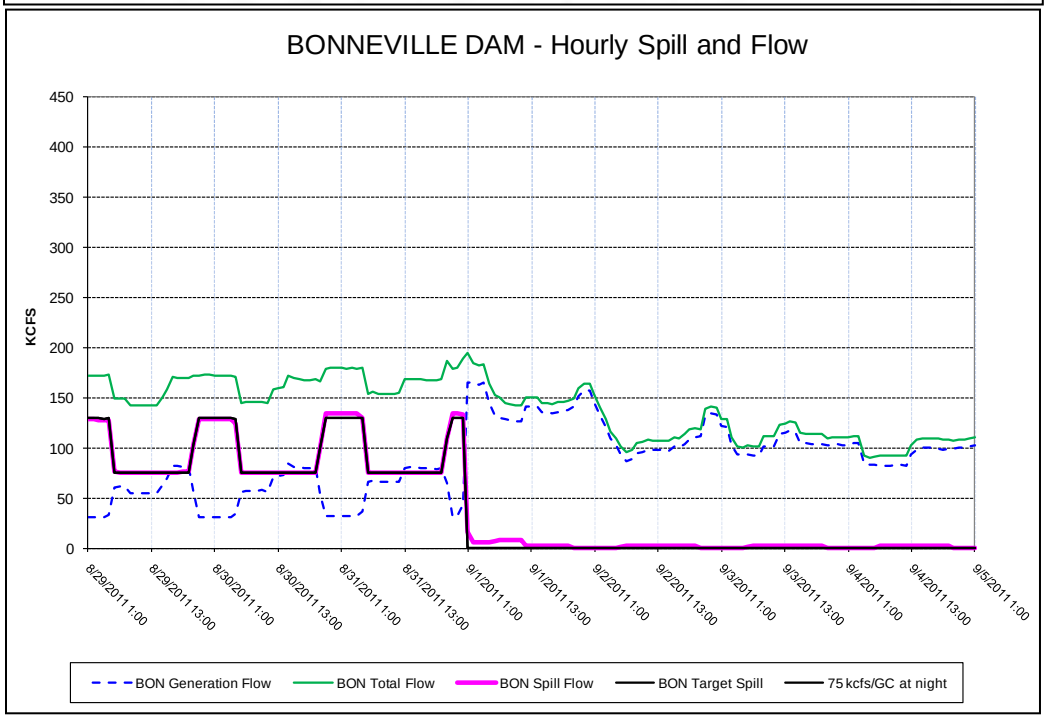

BONNEVILLE DAM - Hourly Spill and Flow
KCFS
450
400
350
300
250
200
150
100
50
0
8/29/2011 1:00
8/29/2011 13:00
8/30/2011 1:00
8/30/2011 13:00
8/31/2011 1:00
8/31/2011 13:00
9/1/2011 1:00
9/1/2011 13:00
9/2/2011 1:00
9/2/2011 13:00
9/3/2011 1:00
9/3/2011 13:00
9/4/2011 1:00
9/4/2011 13:00
9/5/2011 1:00
BON Generation Flow
BON Total Flow
BON Spill Flow
BON Target Spill
75 kcfs/GC at night

Figure 41

Average Percent TDG for Highest 12-Hours: August 1 – August 31, 2011

Date	FIXED MONITORING STATIONS																
	LWG	LGNW	LGSA	LGSW	LMNA	LMNW	IHRA	IDSW	MCNA	MCPW	JDY	JHAW	TDA	TDDO	BON	CCIW	CWMW
Gas Cap %	115	120	115	120	115	120	115	120	115	120	115	120	115	120	115	120	115
8/1/2011	103.0	119.5	112.7	118.6	111.5	116.7	113.5	113.8	113.7	147.3	110.4	115.0	110.6	116.5	110.8	---	113.1
8/2/2011	103.5	120.3	112.9	119.9	111.5	117.2	113.6	116.0	112.9	118.1	110.7	114.1	110.8	117	111.6	---	113.5
8/3/2011	103.4	120.3	112.9	112.7	112.6	117.1	113.4	115.1	112.1	118.2	110.2	114.0	110	116.5	111.2	---	114.5
8/4/2011	103.7	119.7	113.7	112.6	115.1	118.3	113.8	116.5	112.6	118.4	109.3	113.2	110.1	116.5	111.2	---	114.1
8/5/2011	103.1	120.0	115.5	113.4	115.1	117.5	113.2	114.1	112.9	117.9	108.4	112.8	108.1	114.9	108.9	---	112.5
8/6/2011	102.5	119.6	115.6	113.5	113.4	117.5	112.8	114.2	111.5	117.9	107.8	113.5	107.1	113.8	107.8	---	112.5
8/7/2011	101.7	119.9	114.9	113.1	112.4	117.2	113.0	114.3	110.4	117.4	107.3	113.5	107.3	113.9	106.5	---	112.6
8/8/2011	101.7	119.6	114.7	112.9	111.5	117.1	112.9	114.6	109.7	117.6	106.9	113.5	107.3	114.5	106	---	110.6
8/9/2011	102.9	119.1	114.9	113.6	111.9	116.8	112.7	113.8	109.4	116.9	105.6	112.7	106.4	113.8	106.1	---	110.2
8/10/2011	103.1	119.3	114.5	114.4	110.9	117.2	111.7	113.3	108.6	116.8	104.1	112.9	105.7	113.9	105.8	---	113.2
8/11/2011	102.7	117.1	112.9	113.1	110.3	116.7	111.1	113.7	107.3	117.3	103.7	113.3	106.3	114.3	106.5	---	112.9
8/12/2011	102.6	118.8	112.4	112.8	110.4	117.0	111.0	113.7	109.4	118.0	104.4	113.8	107.3	115.9	108.6	---	113.5
8/13/2011	102.8	118.7	113.7	113.1	110.8	116.6	111.0	114.0	109.3	116.5	104.1	111.9	107.4	114.8	108.8	---	112.5
8/14/2011	102.6	116.5	113.0	112.8	110.6	116.3	110.9	114.5	108.5	116.3	103.5	112.1	105.5	113.6	107.5	---	114
8/15/2011	102.3	120.1	112.2	113.0	110.1	116.5	110.4	113.8	107.2	116.4	103.3	113.1	105.5	114.3	106.5	---	114.8
8/16/2011	102.7	120.0	110.0	112.3	109.4	117.0	110.2	114.2	107.6	116.7	104.7	112.8	106.9	115.2	109.6	---	114.7
8/17/2011	102.8	119.6	110.0	112.2	109.6	116.4	110.0	114.2	107.9	116.9	105.2	113.6	107.8	115.4	110.6	115.5	114.8
8/18/2011	102.2	116.8	110.8	112.7	109.7	116.4	109.8	114.0	109.0	116.9	104.2	114.2	107	114.9	108.8	117.4	113.9
8/19/2011	102.7	119.1	111.2	112.2	110.2	116.5	111.9	114.3	109.9	117.0	104.9	113.4	107.6	115.7	108.8	117.2	113.4
8/20/2011	103.0	116.7	110.8	112.9	110.9	116.4	112.2	114.1	110.8	116.9	107.0	113.3	108.4	115.9	111.4	117.0	115
8/21/2011	102.9	116.3	112.4	113.8	110.6	116.7	113.1	114.8	110.3	116.8	108.5	114.2	109.5	116.4	113.5	117.1	116.3
8/22/2011	102.7	116.2	114.2	113.1	110.5	116.5	113.3	114.5	110.3	116.7	107.6	114.0	108.8	114.9	110.6	116.7	115.6
8/23/2011	102.2	116.1	113.7	114.1	110.9	116.8	112.7	113.5	108.3	116.9	107.2	114.1	107.9	115	108.5	116.8	116
8/24/2011	103.0	116.4	112.5	113.2	111.2	116.9	112.6	114.8	108.0	117.4	108.2	114.5	109.7	116.5	110.4	116.9	116
8/25/2011	103.4	116.4	111.8	113.6	111.2	117.0	112.5	113.7	109.2	117.3	107.8	114.6	109.7	116.4	111	116.6	114.4
8/26/2011	102.3	116.6	112.0	112.7	111.3	116.8	112.6	113.8	111.3	118.2	107.5	114.1	109.3	116.2	110.7	115.9	114.3
8/27/2011	102.1	116.6	111.4	112.4	112.0	116.9	113.6	113.7	112.6	117.3	107.3	114.5	109.3	115.9	110.6	116.2	115.3
8/28/2011	102.6	116.6	112.4	112.7	112.3	116.9	114.4	113.6	112.4	117.4	108.0	114.6	109	115.4	109.4	116.4	113.7
8/29/2011	102.8	116.6	113.3	112.6	111.8	116.8	114.1	113.6	110.3	116.6	107.8	114.2	108.2	114.3	107	116.5	112.7
8/30/2011	102.9	116.4	113	112.6	111.4	116.8	114	114.4	109.6	116.4	106.8	114.1	105.4	113	104.8	116.5	111.8
8/31/2011	103.1	117	110.9	111.3	110	116.3	111.8	114.1	106.4	116	104.9	115.1	104.2	112.3	103.5	116.8	112

Figure 42

Total Dissolved Gas Monitoring Stations

Code	Station Name
LWG	Lower Granite Forebay
LGNW	Lower Granite Tailwater
LGSA	Little Goose Forebay
LGSW	Little Goose Tailwater
LMNA	Lower Monumental Forebay
LMNW	Lower Monumental Tailwater
IHRA	Ice Harbor Forebay
IDSW	Ice Harbor Tailwater
MCNA	McNary Forebay
MCPW	McNary Tailwater
JDY	John Day Forebay
JHAW	John Day Tailwater
TDA	The Dalles Forebay
TDDO	The Dalles Tailwater
BON	Bonneville Forebay
CCIW	Bonneville Tailwater (Cascade Island)
CWMW	Camas / Washougal