FISH OPERATIONS PLAN IMPLEMENTATION REPORT

April 2025

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

Introduction

The 2025 Fish Operations Plan (2025 FOP) describes the U.S. Army Corps of Engineers' (Corps) planned operations for fish[1] passage at its four lower Snake River and four lower Columbia River dams during the 2025 surface spill operations in March through early April, spring, and summer fish migration seasons, generally April 3 through August 31, and surface spill operations September through mid-November. The 2025 FOP is consistent with spill operations for fish passage and the regional forum process for adaptive management and in-season management provisions outlined in the Record of Decision for the Columbia River System Operations Environmental Impact Statement (CRSO EIS ROD) dated September 28, 2020, CRSO Final EIS, 2020 National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS) Columbia River System (CRS) Biological Opinions (2020 CRS BiOps)[2], the Extensions of the 2008 Columbia Basin Fish Accords (Accord Extensions), the Corps' requirements under the Endangered Species Act (ESA), and the ongoing communication with the relevant wildlife agencies to ensure consistency with the Act. The 2025 FOP also incorporates operations outlined in Appendix B of the "U.S. Government Commitments in Support of the Columbia Basin Restoration Initiative" (USG Commitments). The USG Commitments were agreed to as part of the 2023 Memorandum of Understanding (*see* Section 3 of the MOU). Other project operations and water management actions not specifically addressed in this document will be consistent with other guiding operative documents, including the 2025 Water Management Plan (WMP), seasonal WMP updates, and the 2025 Fish Passage Plan (FPP).

The FOP Implementation Reports are produced to reflect implementation of the 2025 FOP for spring and summer fish passage spill. This report describes the Corps' implementation of the 2025 FOP during the month of April. Information in this report includes the following:

- total flow: the total hourly river flow rate;
- generation flow: the hourly flow through the powerhouse units;
- target spill: the spill target for that hour (Table 1);
- adjusted spill: the hourly spill level that can be achieved considering that spill may vary as a function of total river flow, forebay elevation and generator capacity, and is subject to routine

[1] ESA-listed salmon and steelhead.
[2] The Corps, in coordination with the other Action Agencies, and NMFS, employs the Regional Implementation Oversight Group (RIOG) and technical teams including the Technical Management Team (TMT) and Fish Passage Operations & Maintenance (FPOM) coordination group, to coordinate with state, tribal and other federal experts for recommendations for implementing operations consistent with the 2020 BiOps.

operational adjustments that limit the ability to spill to the target spill (see 2025 FOP, Section 4.1);
- actual spill: the hourly flow over the spillway; and,
- resultant 12-hour average TDG for the tailwater at each project.

This report also provides information on issues and unanticipated or emergency situations that arose during implementation of the 2025 FOP in April 2025.

Data Reporting

I. For each project providing fish passage operations, this report contains a graph displaying the performance of the spring fish passage spill program for the month of April, with hourly spill, target spill, adjusted spill, generation, and total flows. The monthly graphs begin on April 1 and end on April 30 and reflect the following operations for the lower Snake River and the lower Columbia River projects:

- The black line represents the average hourly total river flow through the project in thousand cubic feet per second (kcfs).
- The orange line represents the average hourly generation flow through the powerhouse each hour in kcfs.
- The thin solid blue line represents the actual average hourly spill level through the spillway in kcfs.
- The dashed blue line represents the spill cap portion of the target spill estimated to reach the gas cap or target TDG.
- The thick light blue line represents the performance standard spill level portion of the target spill, where applicable.
- The thick dark blue line represents the adjusted spill cap spill: the hourly spill cap level that can be achieved taking into consideration that spill may vary as a function of total river flow, forebay elevation, and generator capacity, and is subject to routine operational adjustments that limit the ability to spill to the target spill (2025 FOP section 4.1).

II. The average daily %TDG for the 12 highest hourly TDG measurements in a calendar day for all projects is shown in the April 2025 Average Percent TDG Values Table (Table 4). Red numbers indicate that the project exceeded the %TDG cap - i.e. 125% (tailwater) on that day.

General Implementation Remarks

For all projects that spill for fish passage, the actual spill may vary from the adjusted spill due to various conditions as described below. When actual spill varied from adjusted spill levels during periods of planned spill, the change in spill level is described below in the April 2025 Spill Variance Table (Table 2).[3] The Spill Variance Table includes average hourly data; but when spill varies from adjusted spill for a portion of an hour, it is characterized as a variance for a full hour. There are instances when the hourly adjusted 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 adjusted spill to the extent practicable. Other routine activities that changed spill levels, which were coordinated with regional partners, are identified in the monthly Pre-Coordinated Operations Table (Table 3).

"Low flow" operations at the lower Columbia and lower Snake projects are triggered when inflow is insufficient to provide both minimum generation and the target spill levels. For this report, the decrease in target spill is represented as adjusted spill. In these situations, the projects operate at minimum generation and pass the remainder of project inflow as spill and through other routes, such as fish ladders, sluiceways, and navigation locks. 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 when 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.

Actual spill levels at Corps projects may vary up to ±2 kcfs, or ±1% when targeting an hourly percent of outflow, within the hour as compared to the target spill rate, except as otherwise noted in the 2025 FOP. A number of factors influence actual spill, including hydraulic efficiency, exact spillway gate opening calibration, spillway gate hoist cable stretch due to temperature changes, and forebay elevation (e.g., a higher forebay results in a greater level of spill since more water can pass under the spill gate or over the surface spillway weir). Transition periods between gas cap spill and performance standard spill hours may result in actual hourly spill levels that are slightly higher or lower than target spill levels. Occurrences requiring an adjustment in operations and/or regional coordination are described in greater detail in the “Operational Adjustments” section below.

[3] Forced spill conditions shown in the graphs are not considered variances and are not reported in the Spill Variance Table. Forced spill conditions may result from lack of load, high river inflows that exceed available powerhouse capacity, scheduled or unscheduled turbine unit outages or transmission outages of various durations, passing debris, etc.

April Operations

The April 2025 observed precipitation was well below normal with 46% of average precipitation observed at the Snake River above Ice Harbor and 49% of average precipitation observed at the Columbia River above The Dalles.[4] The NOAA Northwest River Forecast Center runoff summary for April indicated that the adjusted runoff for the Snake River at Lower Granite was 96% of the 30-year average (1991-2020) with a volume of 4.6 MAF (Million acre-feet). The April 2025 adjusted runoff for the Columbia River at The Dalles was 90% of the 30-year average (1991-2020) with a volume of 13.1 MAF.[5]

Spring spill operations occur April 3–June 20 at the four lower Snake River projects, and April 10–June 15 at the four lower Columbia River projects. The Corps initiates spill at 0001 hours, or shortly after midnight, at each of the projects on the start date. Target spill levels for spring 2025 at each project are defined in Table 1 (Table 4 in the 2025 FOP). If deleterious impacts of the proposed spill operations are observed in-season, existing adaptive management processes may be employed to address the cause of the impacts. Spill may be temporarily reduced at any project to ensure navigation safety or transmission reliability, or in the event of adult salmonid migration delay (see 2025 FOP section 7.1). In order to operate consistently with state water quality standards, spill may also be reduced if observed gas bubble trauma (GBT) levels exceed those identified in state water quality standards (*See* WASH. ADMIN. CODE § 173-201A-200(l)(f)(ii)(B)(III) and *Order Approving a Modification to the Oregon's Water Quality Standard for Total Dissolved Gas in the Columbia River Mainstem*, page 5).

Spill up to the 125% Gas Cap is spill to the maximum level that meets, but does not exceed, the TDG criteria allowed under state laws. This includes a criterion for not exceeding 126% TDG for the average of the two greatest hourly values within a day.

[4] Retrieved May 1, 2025: https://www.nwrfc.noaa.gov/water_supply/wy_summary/wy_summary.php?tab=5
[5] Retrieved May 1, 2025: https://www.nwrfc.noaa.gov/runoff/runoff_summary.php

Table 1: Summary of 2025 spring target spill levels at lower Snake River (April 3 – June 20) and lower Columbia River (April 10 – June 15) projects (Table 4 in the 2025 FOP).

PROJECT	SPRING SPILL DATES	SPRING SPILL OPERATION
Lower Granite [A, C]	April 3 - June 20	24 hours/day: 125% Gas Cap
Little Goose [B, C]	April 3 – June 20	125% Gas Cap 24 hours/day (until adult criteria met) *then* 16 hours/day: 125% Gas Cap; 8 hours/day: 30% of outflow (Performance Standard)
Lower Monumental [A]	April 3 - June 20	24 hours/day: 125% Gas Cap
Ice Harbor	April 3 – June 20	24 hours/day: 125% Gas Cap
McNary	April 10 – June 15	24 hours/day: 125% Gas Cap
John Day [D]	April 10 – June 15	Daytime hours: 40% of outflow; Nighttime hours: 125% Gas Cap
The Dalles [E]	April 10 – June 15	24 hours/day: 40% of outflow (Performance Standard)
Bonneville [F]	April 10 – June 15	24 hours/day: 125% Gas Cap

A. Lower Granite and Lower Monumental Adult Delay Criteria – See Section 7.1.
B. Little Goose Adult Criteria –Within 1 business day of when the earliest of the following conditions occurs: (1) a cumulative total of 25 adult spring Chinook salmon (not including jacks) pass Lower Monumental Dam; or (2) a cumulative total of 50 adult spring Chinook salmon (not including jacks) pass Ice Harbor Dam; or (3) April 24, 2025, the Corps will implement performance standard spill at Little Goose Dam for 8 consecutive AM hours (April 3–15 starting at 0500 hours; April 16–June 20 starting at 0400 hours) to target hours of peak adult passage. If lack of load conditions preclude the implementation of performance standard spill during the targeted periods, performance standard spill will begin as soon as practicable during AM hours and continue for up to 8 consecutive hours. If a second block is needed, it will start as soon as load conditions allow, continue for at least two consecutive hours, and conclude no later than 2000.
C. During periods of high river flow that exceeds powerhouse hydraulic capacity, implementing 8 consecutive hours of spill as described in Footnotes A and B may result in storing additional inflow in the forebay above MOP. If it is necessary to pond water to achieve the 8-hour block of spill during high inflow, water stored above MOP should be drafted out over the remaining hours by increasing spill to pass inflow from 1200-1600 hours, then increasing spill as necessary from 1600-0400 to draft the pool back to MOP. If it is forecasted that the drafting spill will result in exceeding 130% TDG in the tailrace, all 16 hours will be used to return the pool to MOP. In lack of load conditions performance standard spill blocks will be prioritized at Little Goose, Lower Monumental, and Lower Granite dams, in that order.
D. John Day Dam – Daytime hours are defined in FPP Chapter 4, Table JDA-5. Daytime hourly spill target of 40% river flows with ±5% flexibility in river flow for balancing reserves, consistent with current target spill level calculations.
E. The Dalles Dam –TDG in The Dalles tailrace may fluctuate up to 125% prior to reducing spill at upstream projects or reducing spill at The Dalles below 40%. Maintain 40% spill for 24 hours at The Dalles and reduce John Day spill below the 125% TDG spill cap as needed for TDG management. Spill above 40%, up to 125% TDG, may occur for TDG management or for carrying reserves.
F. Bonneville Dam – Spill for fish passage should not exceed 150 kcfs due to erosion concerns.

In its implementation of the 2025 FOP in April, the Corps evaluated conditions every day to establish spill caps at a level that was estimated to meet, but not exceed, the gas cap or target TDG in the tailrace (see Table 4).[6] This evaluation considered environmental conditions (e.g., river flow, wind, water temperature, barometric pressure, incoming TDG from upstream, and

[6] See 2025 FOP, Section 2.2

water travel time) and project operations (e.g., spill level, spill pattern, tailwater elevation, proportion of flow through the turbines, and project configuration).

Operational Adjustments

1. Little Goose

Total adult spring Chinook counts at Lower Monumental exceeded the minimum criterion of 25 fish on April 16, initiating the transition at Little Goose to an 8-hour block of performance standard spill (30% of outflow) every morning starting April 17 for the remainder of spring spill, pursuant to the 2025 FOP, Table 4, footnote B.

2. Lower Monumental

On April 24, the juvenile fish transport program began at Lower Monumental as specified in the 2025 FOP section 5. Directions were given to the project and BPA to maintain MOP during spill reductions required for the daily fish barge transit and loading in the Lower Monumental tailrace by increasing generation outflow. Following a consensus request from salmon managers at the April 30 TMT meeting, and to better align with expectations outlined in the RIOG decision distributed on April 22[7], directions were clarified to BPA and the project to make best efforts to minimize reductions in total outflow by increasing generation during barge transit and loading. Instances when spill was reduced below target spill and generation increased above minimum generation levels are documented in Table 3. This change in operational guidance was communicated to TMT in an email on May 1.

3. John Day

During the first several days of spring spill at John Day during nighttime hours at gas cap spill (Table 1), navigators reported multiple instances when barges separated from tows due to hydraulic conditions in the tailrace during high spill. Based on the spill level during those instances, direction was given to BPA and the project that navigators could request a reduction in spill up to 100 kcfs if they believed that river conditions inhibited safe navigation to or from the lock. A notice to navigators containing this information was distributed on April 18. Subsequent to the notice to navigators, there was an increase in requests for the maximum spill reduction, occasionally during periods of relatively low spill. On April 22, in response to requests for spill reductions during periods of low spill, the Corps further refined directions to the project and BPA that total spill should not be reduced below 150 kcfs for the purpose of safe navigation, as that spill level was generally understood to provide safe navigation conditions. Instances when spill was reduced and generation increased above minimum generation levels are documented in Table 3. Information regarding John Day spill reductions for navigation was reported at the April 23 TMT meeting.

[7] https://public.crohms.org/tmt/sor/2024/SOR_2024-1_Disposition_Corps-Summary-of-Decision-2025-LMN-spring-transport.pdf

Table 2: Spill Variance Table – April 2025 (4/1 to 4/30)

Project	Parameter	Date	Time[8]	# of Hours	Type	Reason
Little Goose	Reduced Spill	4/3	0100-0400	4	Human Error	Hourly spill was between 58 and 70 kcfs (less than adjusted spill target of between 62 and 74 ±2 kcfs) when generation remained above the minimum generation range for Unit 1 specified in 2025 FOP Table 1 due to a misinterpretation of FPP LGS Section 4.2.2.2.
John Day	Additional Spill	4/21	1800	1	Program Error	Hourly spill increased to 43% (greater than adjusted spill target of 40% ±1%) due to a GDACs programming error.
The Dalles	Reduced Spill	4/30	1900	1	Human Error	Hourly spill decreased to 37% (less than adjusted spill target of 40% ±1%) due to miscommunication of spill operations.

Table 3: Pre-Coordinated Operations – April 2025 (4/1 to 4/30)

Project	Parameter	Date	Time	# of Hours	Type	Reason
Lower Monumental	Reduced Spill	4/24 4/25 4/26 4/28 4/29 4/30	2300 1900 1900-2100 2100-2200 1700-1900 1900-2100	1 1 3 2 3 3	Navigation	Hourly spill decreased to between 18 and 69 kcfs (less than adjusted spill target of between 32 and 73 kcfs) for navigation safety. Regionally coordinated via 2025 FOP, Sections 4.1 and 4.6.
John Day	Reduced Spill	4/15 4/16 4/17 4/18 4/19	2300-2400 0100, 1500 0600 2300 0200	2 2 1 1 1	Navigation	Hourly spill decreased to between 85 and 225 kcfs (less than adjusted spill target of between 93 and 230 kcfs) for navigation safety. Regionally coordinated via 2025 FOP, Sections 4.1 and 4.6.

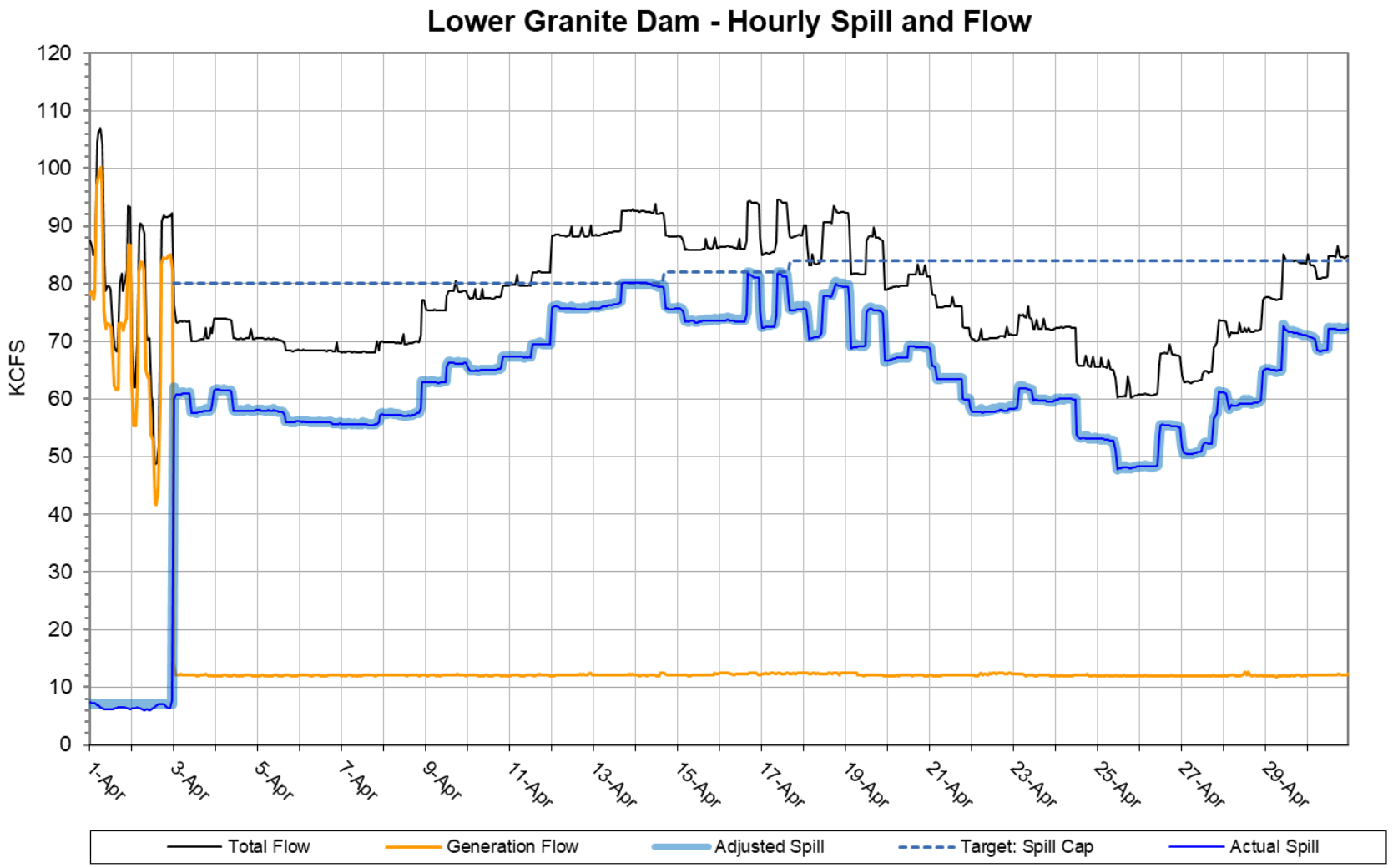
[8] Note: Data collected for reporting spill variances is reported using hourly-averaged data. Therefore, while spill may be increased or decreased for only a portion of an hour, it is represented in the table as an hour.

Table 4: April 2025 Average Percent TDG Values Table (4/1 to 4/30)

Station:	LWG	LGNW	LGSA	LGSW	LMNA	LMNW	IHRA	IDSW	MCNA	MCPW	JDY	JHAW	TDA	TDDO	BON	CCIW
Gas Cap %:		**125**		**125**		**125**		**125**		**125**		**125**		**125**		**125**
1-Apr	102	106	104	107	108	113	109	114	107	115	106	113	106	106	106	113
2-Apr	102	105	103	107	106	111	109	112	108	113	106	112	106	106	105	109
3-Apr	100	120	103	122	104	120	108	116	106	110	106	111	105	105	104	110
4-Apr	100	120	102	121	103	117	107	116	106	110	106	111	106	106	104	110
5-Apr	100	120	103	121	119	117	115	116	108	111	107	111	107	107	105	109
6-Apr	102	120	108	121	123	118	117	117	109	112	108	111	107	108	107	110
7-Apr	103	120	117	121	124	118	117	117	110	112	108	111	108	107	108	110
8-Apr	103	120	119	121	122	118	115	116	110	112	107	111	107	107	107	110
9-Apr	102	122	118	122	119	118	114	116	109	112	107	111	107	106	106	110
10-Apr	101	122	118	122	121	119	115	117	110	122	108	117	111	115	107	122
11-Apr	102	122	119	123	123	118	116	117	111	122	107	118	115	119	111	122
12-Apr	102	123	119	123	123	122	117	116	111	122	107	120	114	118	112	122
13-Apr	101	123	117	123	120	121	115	117	110	123	107	120	119	120	113	122
14-Apr	102	124	118	124	124	121	117	117	112	123	109	121	121	123	116	122
15-Apr	104	124	120	124	127	122	121	117	113	123	113	121	122	122	120	122
16-Apr	104	124	123	124	127	122	122	117	115	123	116	122	121	122	119	122
17-Apr	103	124	122	124	124	121	119	118	113	122	120	121	123	123	117	122
18-Apr	102	124	121	124	124	122	119	117	113	121	122	119	121	123	119	122
19-Apr	102	123	121	124	124	122	120	118	113	120	123	119	119	121	119	122
20-Apr	103	122	120	122	123	119	119	117	112	122	119	120	115	118	113	122
21-Apr	103	121	119	122	121	118	118	117	111	120	116	119	117	119	112	122
22-Apr	102	120	118	120	120	117	117	117	111	120	115	120	118	119	114	122
23-Apr	102	121	118	122	121	118	118	116	112	121	115	117	120	121	118	122
24-Apr	103	121	120	121	121	118	118	116	114	120	116	118	•[9]	120	118	122
25-Apr	104	119	122	120	122	118	119	117	114	120	117	118	•	121	120	122
26-Apr	104	120	122	120	123	118	120	117	115	119	118	119	116	120	116	122
27-Apr	104	119	121	120	121	117	119	117	114	119	116	117	112	117	110	121
28-Apr	102	121	118	122	117	118	115	116	110	118	114	117	110	115	108	121
29-Apr	102	122	116	123	116	121	114	117	110	119	112	117	113	117	109	121
30-Apr	102	123	115	123	119	121	116	117	110	121	111	117	115	118	111	121
Exceedances:		**0**		**0**		**0**		**0**		**0**		**0**		**0**		**0**

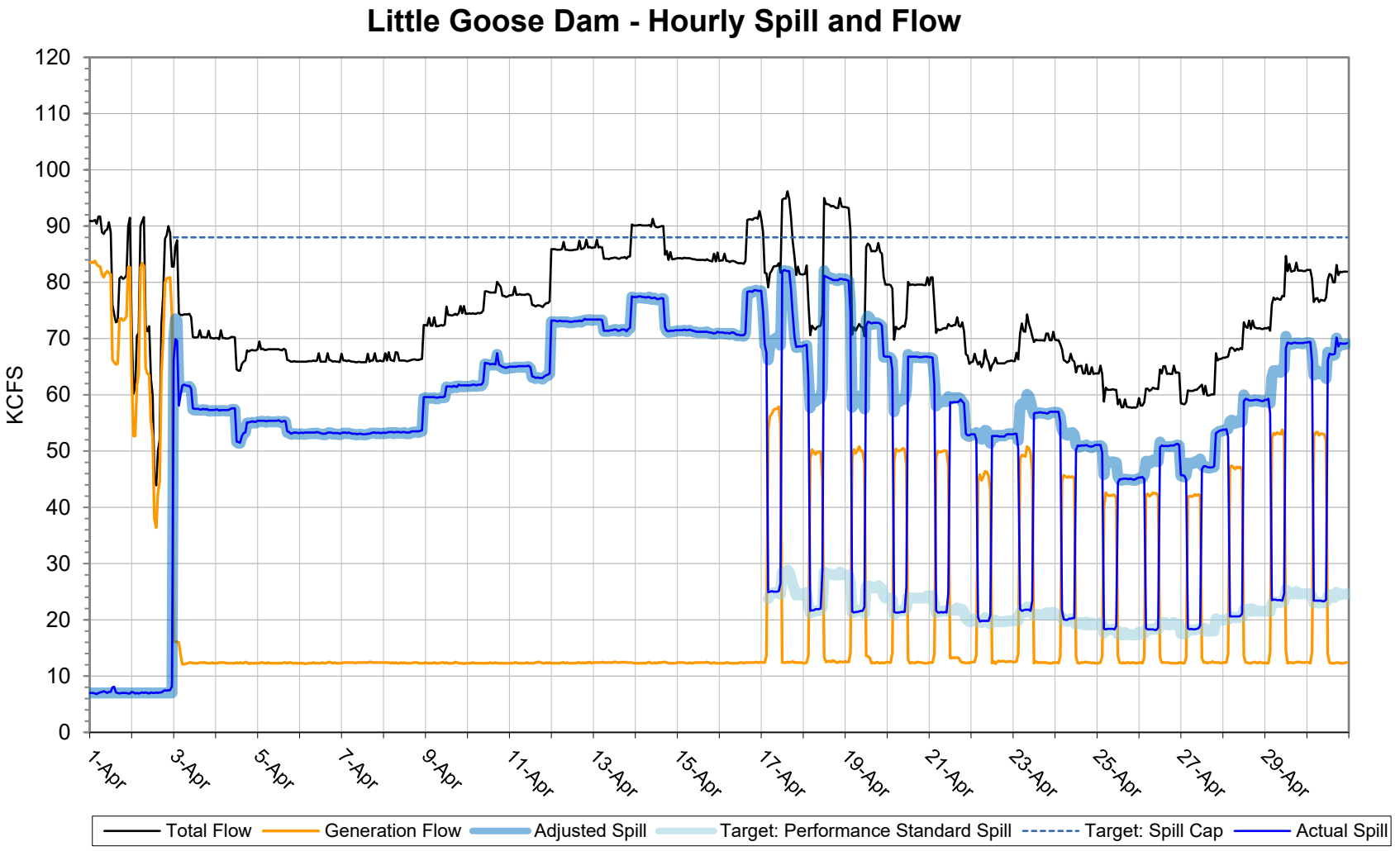
[9] Missing data at TDA due to failed sensor.

Figure 1[10]



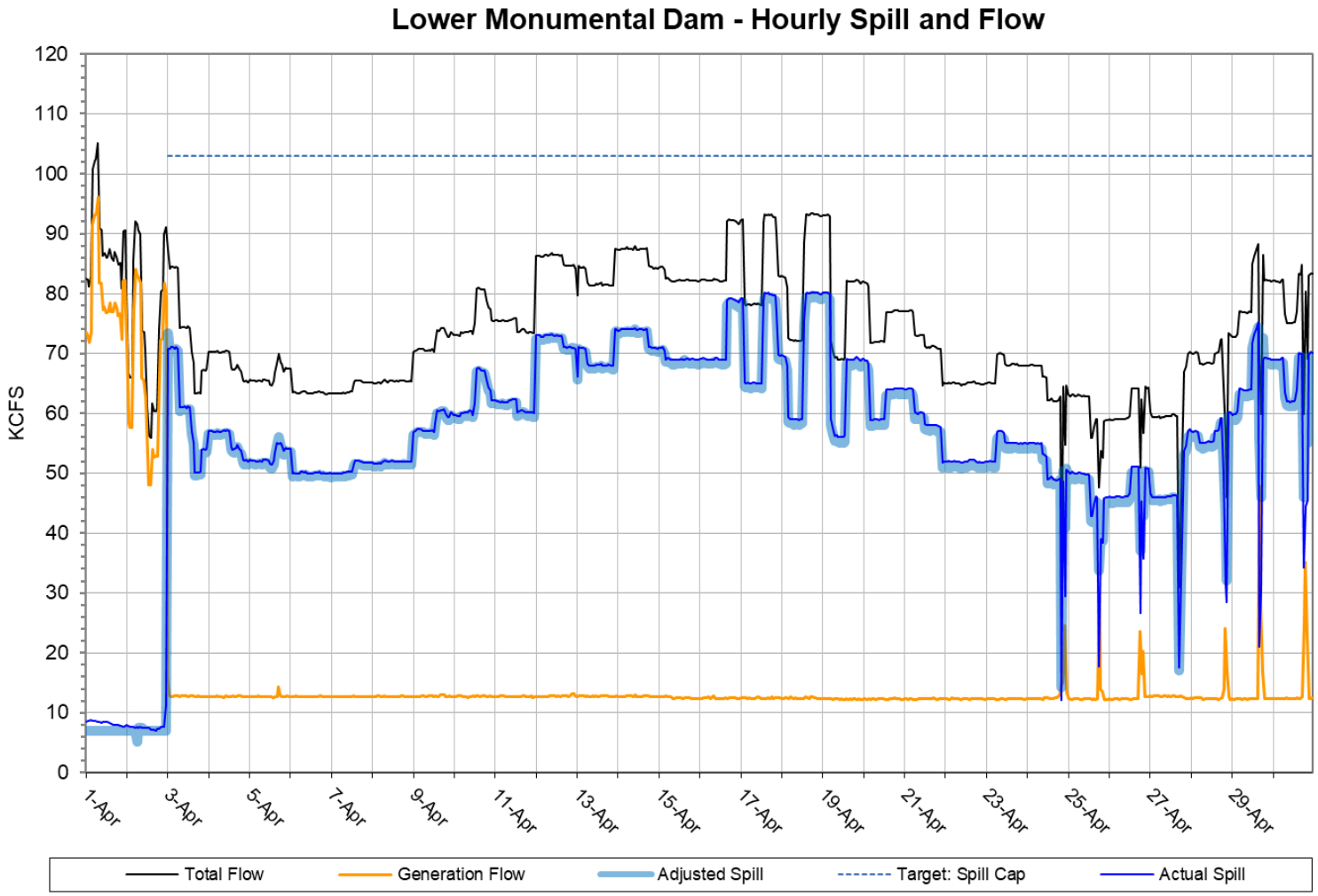
[10] The adjusted spill line is a simplified representation due to limitations of representing a range of minimum generation values. See Tables 2 and 3 for spill variances and pre-coordinated operations.

Figure 2[11]



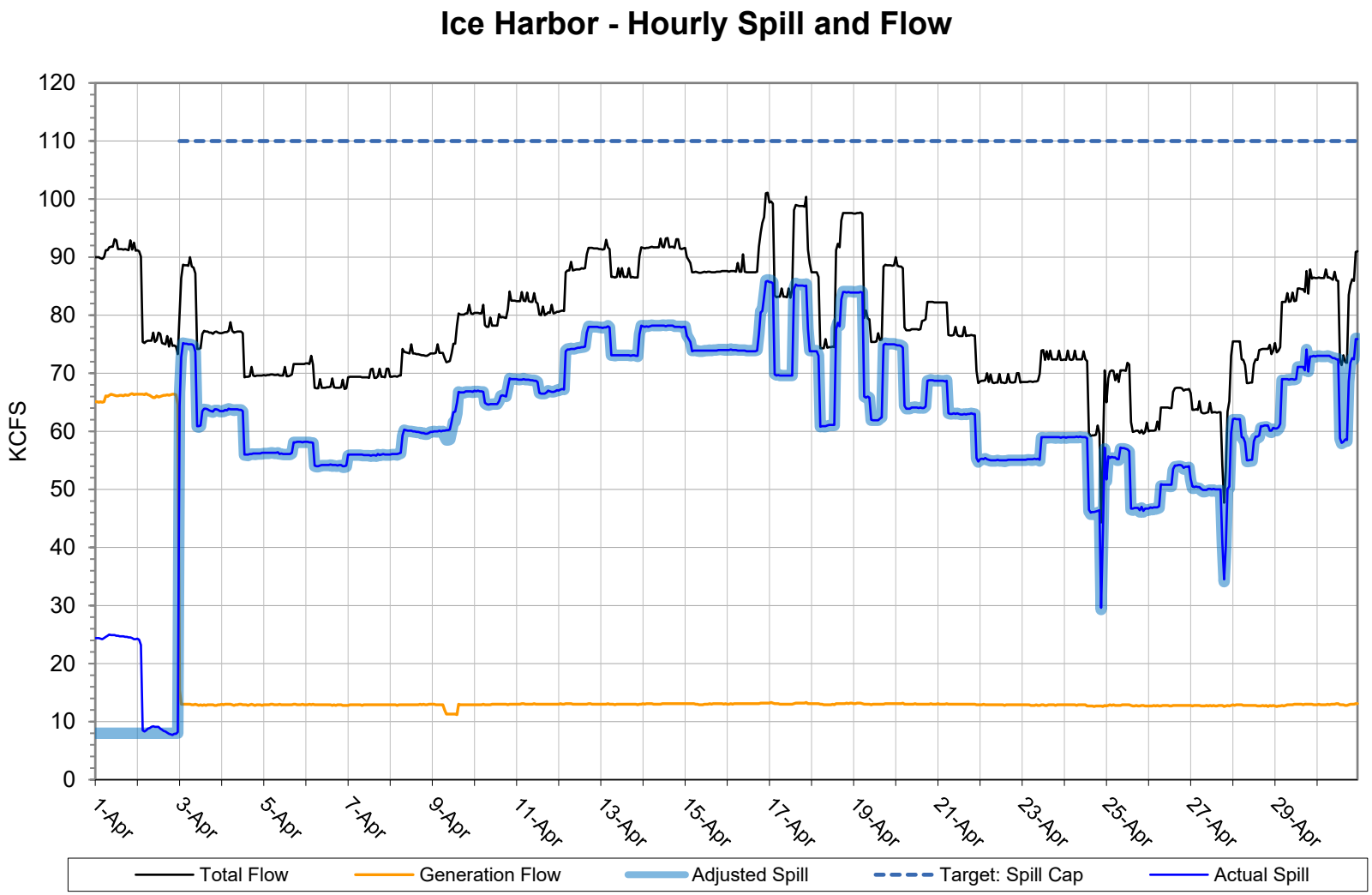
[11] The adjusted spill line is a simplified representation due to limitations of representing a range of minimum generation values. See Tables 2 and 3 for spill variances and pre-coordinated operations.

Figure 3[12]



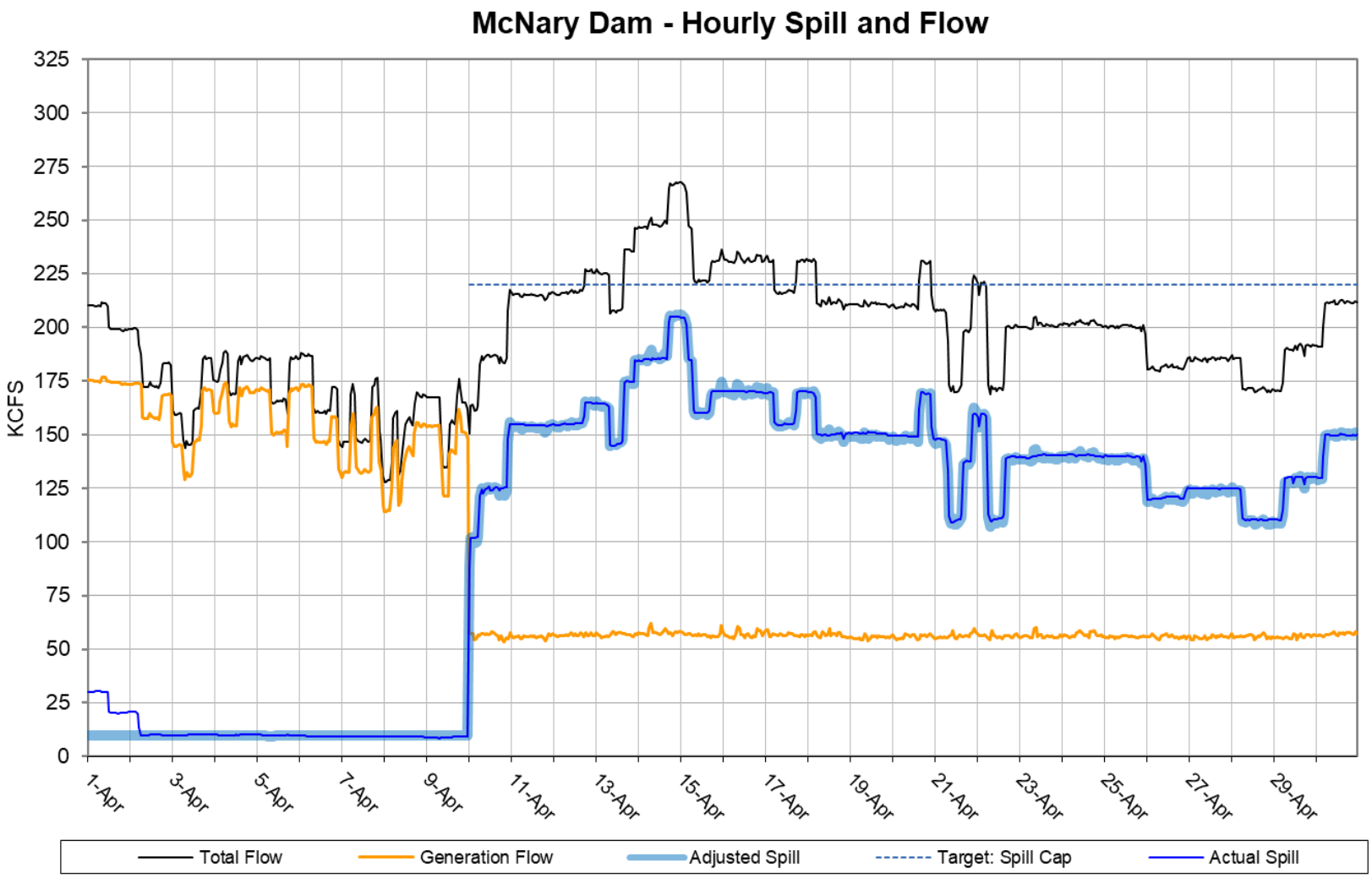
[12] The adjusted spill line is a simplified representation due to limitations of representing a range of minimum generation values. See Tables 2 and 3 for spill variances and pre-coordinated operations.

Figure 4[13]



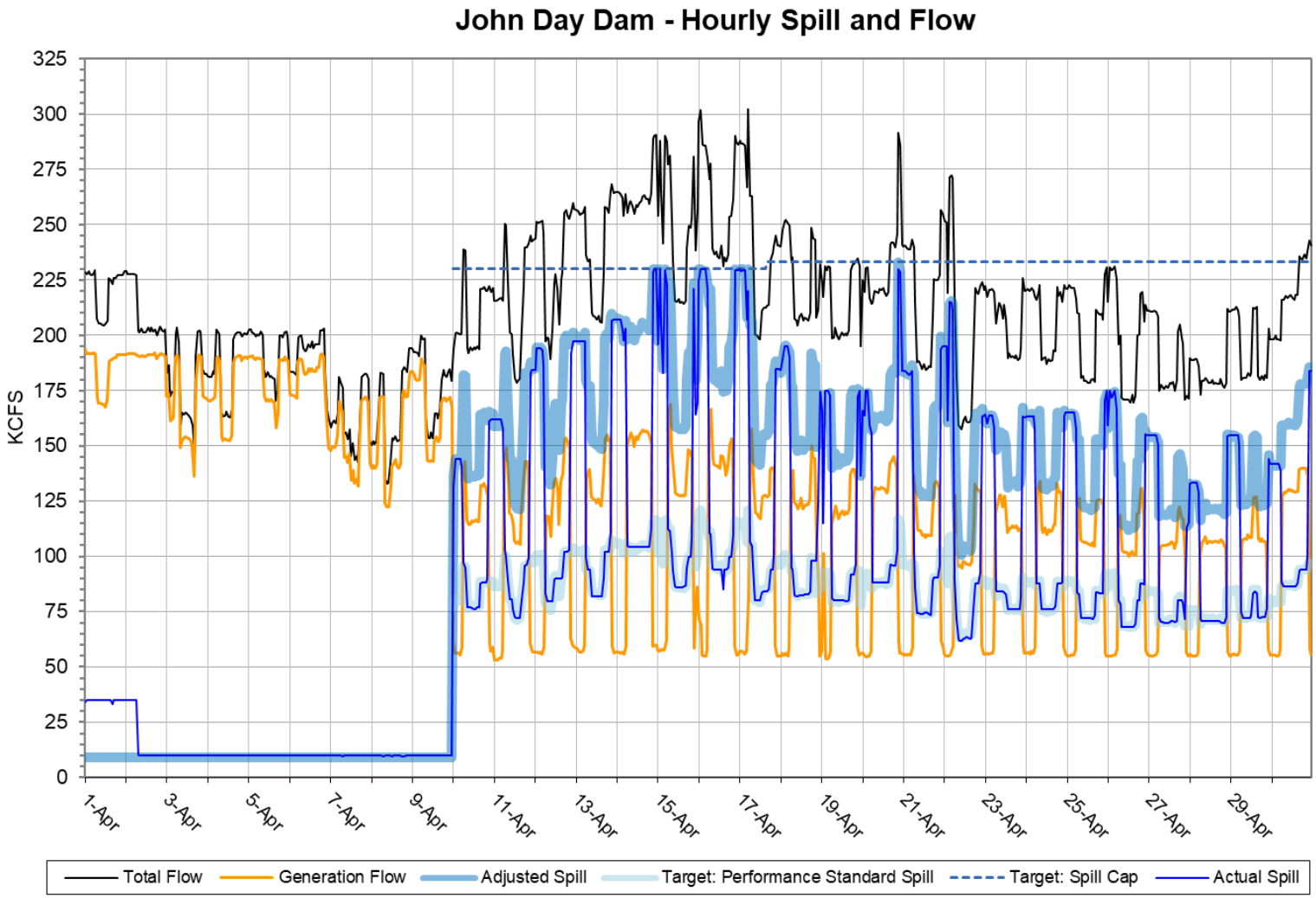
[13] The adjusted spill line is a simplified representation due to limitations of representing a range of minimum generation values. See Tables 2 and 3 for spill variances and pre-coordinated operations.

Figure 5[14]



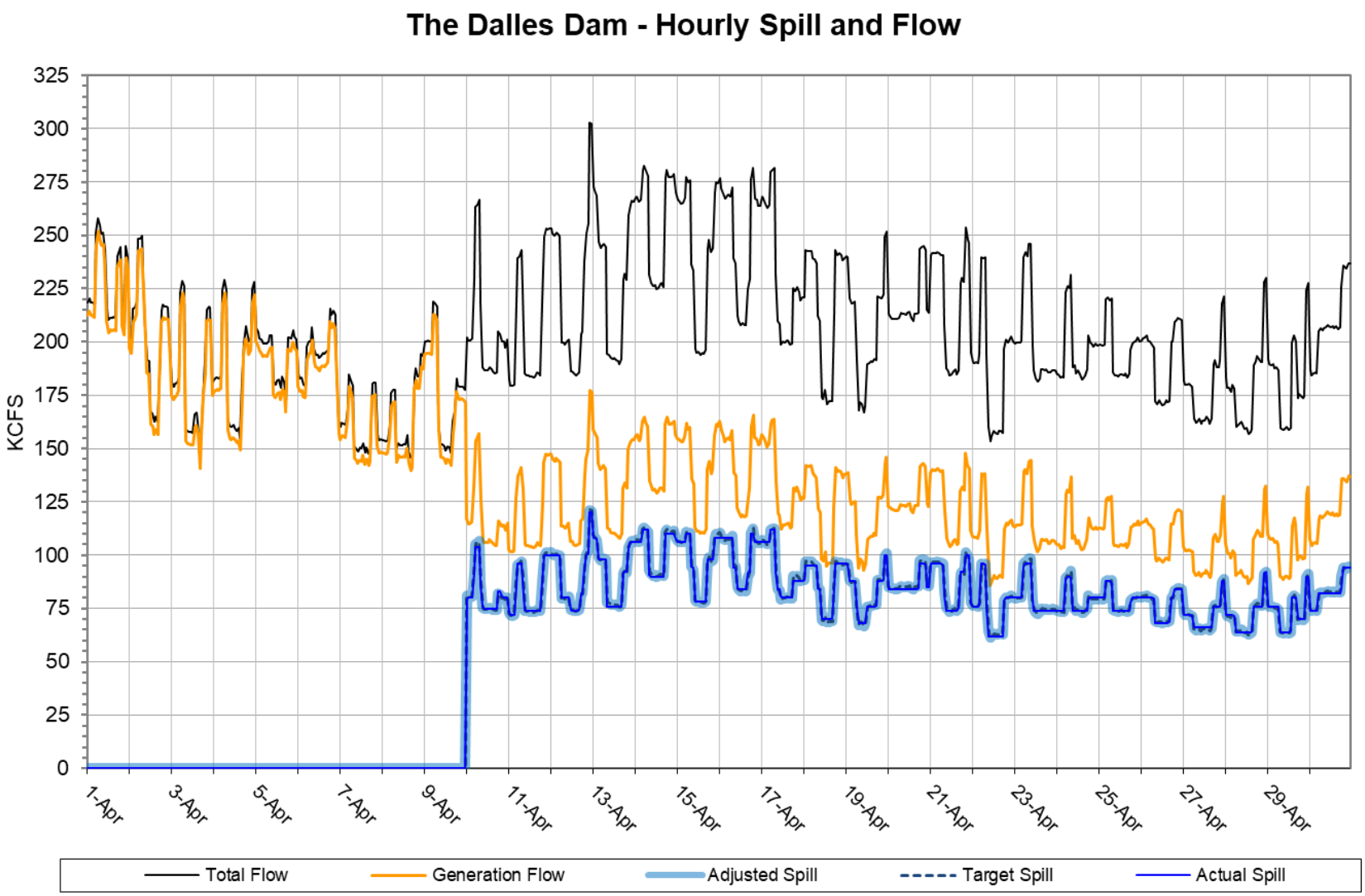
[14] The adjusted spill line is a simplified representation due to limitations of representing a range of minimum generation values. See Tables 2 and 3 for spill variances and pre-coordinated operations.

Figure 6[15]



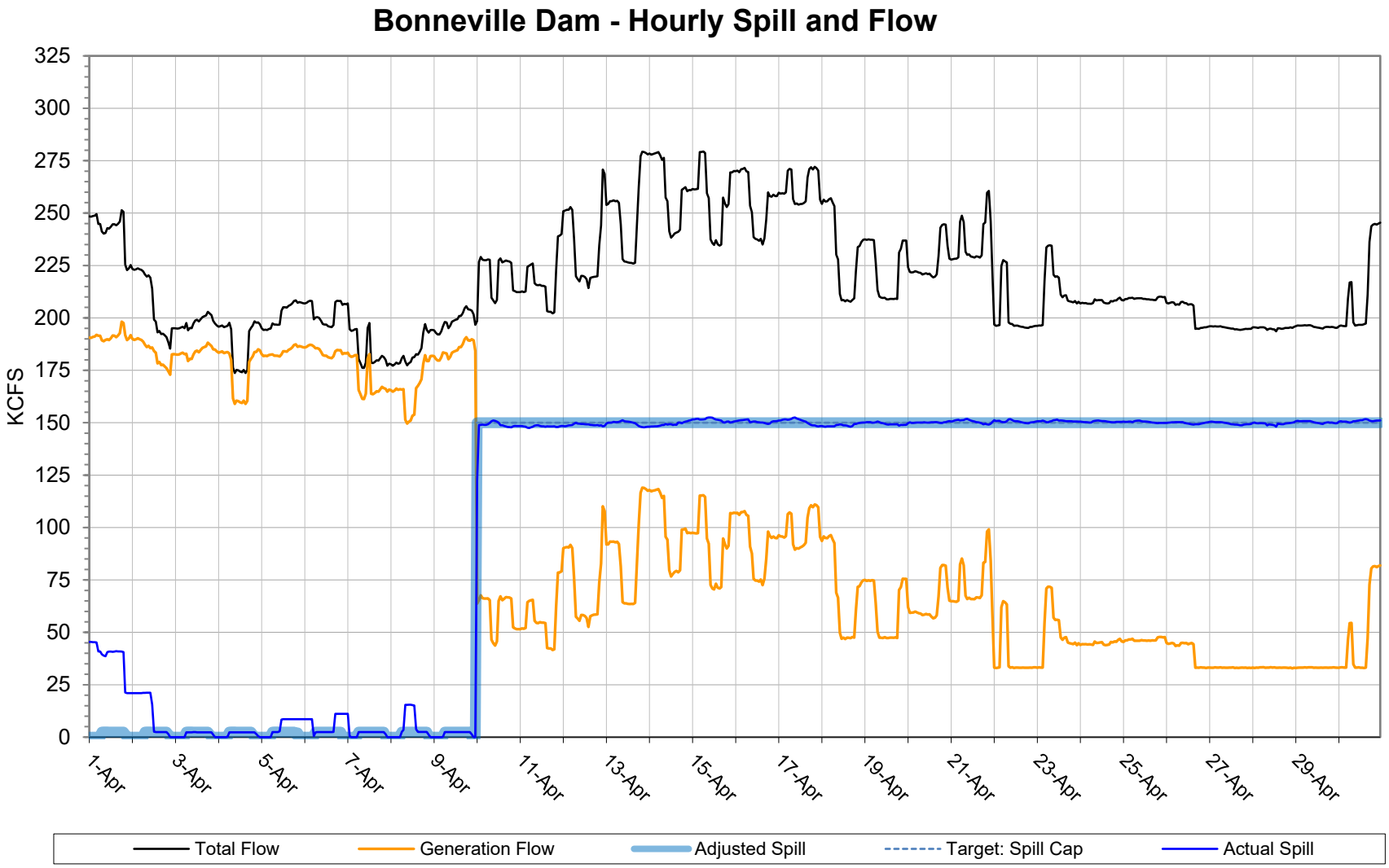
[15] The adjusted spill line is a simplified representation due to limitations of representing a range of minimum generation values. See Tables 2 and 3 for spill variances and pre-coordinated operations.

Figure 7[16]



[16] The adjusted spill line is a simplified representation due to limitations of representing a range of minimum generation values. See Tables 2 and 3 for spill variances and pre-coordinated operations.

Figure 8[17]



[17] The adjusted spill line is a simplified representation due to limitations of representing a range of minimum generation values. See Tables 2 and 3 for spill variances and pre-coordinated operations.