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Subject: Review - Draft Upper Basin Drought Response Operations Documents
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For Review by COB January 21, 2022: Upper Basin Drought Response Operations Plan

Pursuant to the Drought Response Operations Agreement, the Upper Division States and Reclamation have prepared the attached draft Drought Response Operations Plan (Plan). The Plan consists of a Framework document and several Attachments as described below. The Upper Division States and Reclamation are transmitting the Plan to you for your review. Please provide your comments by COB January 21, 2022.

As we have previously indicated, we will host a webinar in late January to describe the documents. There will be further opportunity for additional comments following the webinar.

Please note that the attached file contains the templates of the Plan Framework and Attachments A through E (Attachments F and G are being developed), without specific hydrologic information or operations plans. These documents will continue to evolve as more information is available and through ongoing discussions and reviews. A specific Plan for 2022 drought response operations will be prepared in the first quarter of 2022, when there is more certainty in the hydrology for the year. The specific Plan will be primarily contained in the Attachments and will be shared with you during its development.

The Upper Division States and Reclamation would be happy to schedule a meeting with you to discuss the draft Plan. Please let me know if you would like to schedule a meeting or if you have any questions.



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2022 Drought Response Operations Plan

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Note to Reader: The DROA Parties have been working to develop a Drought Response Operations Plan (Plan) to implement, if needed, as early as April of 2022. As described more fully below, this draft document identifies consistent provisions which will form the basis for the development of yearly Plans. Additionally, this draft document identifies the types of information the DROA Parties intend to include as part of any future Plans. It does not contain specific Drought Response Operations for 2022 but instead describes the process and the decision-making framework the DROA Parties intend to follow as they develop a Plan for 2022 and following years. Attachments will be the dynamic part of this work and will be completed as information becomes available.

The DROA Parties request a review of this draft document now, beginning in December of 2021, as an initial opportunity to obtain input regarding the more durable process and decision-making framework provisions. After receiving and considering input through this initial review, the DROA Parties will begin developing a Drought Response Operations Plan for implementation in 2022, if needed. No Plan can be developed until more information becomes known such as precipitation, snowpack, runoff, reservoir elevations, and other variables during the winter and spring of 2022. As the DROA Parties develop a Plan for 2022, they will engage in the consultation, coordination, and outreach described in this draft document as may be amended through this initial review process.

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1. Introduction and Background

27 A Drought Response Operations Plan (Plan) describes planning procedures and processes
28 needed to support a proposed Drought Response Operation under the Drought Response
29 Operating Agreement (DROA).¹ A Plan is divided into two general components: 1) This
30 Framework document (Framework) contains provisions the DROA Parties will use to form the
31 basis for the development of yearly Plans and will remain relatively unchanged from year to
32 year; and 2) attachments to this Framework (Attachments) identify Drought Response
33 Operations for the year's Plan and will be updated annually and modified as needed during each
34 year. This Framework and its Attachments together constitute the Plan. The DROA Parties may
35 amend Plans as necessary based upon changing conditions. Drought Response Operations
36 described in any Plan include operational adjustments, releases, and recovery within or from the
37 Colorado River Storage Project Initial Units (Lake Powell, Flaming Gorge, Aspinall and Navajo)
38 under DROA.

39 All Plans will describe annual Drought Response Operations from April of the Plan year to
40 April of the following year, unless otherwise specified.

41 This Framework is organized as follows:

- 42
- 43 ● Section 2 briefly describes the authorities that govern Drought Response
44 Operations, including the basis for any proposed Drought Response Operations to
45 reduce the magnitude and duration of a forecasted decline in Lake Powell water
46 elevations below the Target Elevation.²
- 47
- 48 ● Section 3 incorporates the summary of the information to be included in
49 Attachment A Part 1. Attachment A Part 1 describes the current and projected
50 hydrology for the applicable Plan.
- 51
- 52 ● Section 4 incorporates the summary of the information to be included in
53 Attachment A Part 2. Attachment A Part 2 describes the proposed Drought
54 Response Operations for the applicable Plan.
- 55
- 56 ● Section 5 explains how DROA's criteria and principles are applied to develop
57 Drought Response Operations.
- 58

¹ DROA is one element of the package of documents known as the 2019 Colorado River Drought Contingency Plan (DCP). The DCP agreements in both the Upper Basin and Lower Basin provide tools to address the ongoing historic drought in the Colorado River Basin. The seven Colorado River Basin States submitted the DCP agreements to Congress, resulting in the "Colorado River Drought Contingency Plan Authorization Act," 2019 DCP Act, Pub. L. No. 116-14, 133 Stat. 850 (Apr. 16, 2019) ("the 2019 DCP Act"). Consistent with the 2019 DCP Act, the DCP agreements were executed in May of 2019, and the various DCP agreement parties have been implementing the agreements in the Upper and Lower Colorado River Basins since their execution.

² If there is a conflict between the content of this Plan and the provisions of DROA, the provisions of DROA control.

- 59 ● Section 6 describes the methods that will be used to account for water released
60 and recovered pursuant to any implemented Plan.
- 61
- 62 ● Section 7 describes the consultation, coordination, and outreach that the DROA
63 Parties will conduct when developing and before finalizing a Plan.
- 64
- 65 ● Section 8 describes monitoring and the process for potential Plan amendments
66 during implementation of a Plan.
- 67

68 This Framework does not address “emergency action” under DROA. In DROA, the Department
69 of the Interior (Department) committed to conduct any emergency action, “to the greatest extent
70 practicable, with advance consultation and coordination with the Upper Division States, through
71 the [Upper Colorado River] Commission, and following consultation with the Governors’
72 Representatives of the Colorado River Basin States.”³ Any releases made under an emergency
73 action are subject to recovery pursuant to DROA. The Department “retains all applicable
74 authority to make release from [Colorado River Storage Project Act] Initial Units and perform
75 subsequent recovery of storage operations if actual hydrology or actual operating experience
76 demonstrate an imminent need to protect the Target Elevation at Lake Powell.”⁴

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78

79 **2. DROA Authorities**

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81 The operating principle of DROA is to minimize the risk of Lake Powell falling below a
82 minimum “Target Elevation,” expressly defined as a water surface elevation of 3,525 ft.⁵ The
83 Target Elevation was adopted to “minimiz[e] the risk of Lake Powell declining below minimum
84 power pool (approximately elevation 3,490 feet msl) and to assist in maintaining Upper Division
85 States’ compliance with the Colorado River Compact.”⁶ DROA further states that the Target
86 Elevation “appropriately balances the need to protect infrastructure, compact obligations, and
87 operations at Glen Canyon Dam, as storage approaches minimum power pool with the Upper
88 Division States’ rights to put Colorado River System water to beneficial use.”⁷ Section I of
89 DROA further describes the purposes of the Target Elevation.

90

91 Maintaining Lake Powell elevation above the Target Elevation helps allow the upstream
92 Initial Units (Flaming Gorge, Aspinall, and Navajo Reservoirs) to continue to serve their
93 Congressionally authorized purposes. Those purposes are articulated in the authorizing Colorado
94 River Storage Project Act of 1956 (CRSPA):

95

96 In order to initiate the comprehensive development of the water resources
97 of the Upper Colorado River Basin, for the purposes, among others, of regulating
98 the flow of the Colorado River, storing water for beneficial consumptive use,
99 making it possible for the States of the Upper Basin to utilize, consistently with

³ DROA §§ II(A)(3)(j) & II(A)(4)(e).

⁴ DROA §§ II(A)(3)(j).

⁵ DROA § II(A)(2) (defining “Target Elevation”).

⁶ DROA § II(A)(2).

⁷ DROA § II(A)(2).

100 the provisions of the Colorado River Compact, the apportionments made to and
101 among them in the Colorado River Compact and the Upper Colorado River Basin
102 Compact, respectively, providing for the reclamation of arid and semiarid land,
103 for the control of floods, and for the generation of hydroelectric power, as an
104 incident of the foregoing purposes, the Secretary of the Interior is hereby
105 authorized (1) to construct, operate, and maintain the following initial units of the
106 Colorado River storage project, consisting of dams, reservoirs, powerplants,
107 transmission facilities and appurtenant works: Curecanti, Flaming Gorge, Navajo
108 (dam and reservoir only), and Glen Canyon

109
110 The purposes first articulated in the CRSPA were reinforced by Congress' approval of
111 DROA as part of the 2019 Colorado River Drought Contingency Plan Authorization Act ("2019
112 DCP Act").⁸ DROA expressly states that its "primary goals"⁹ concern "ensur[ing]" compact
113 compliance, "while exercising their rights to develop and utilize the Upper Colorado River
114 Basin's ("Upper Basin") Colorado River System compact apportionment"¹⁰, "[m]aintain[ing] the
115 ability to generate hydropower at Glen Canyon Dam" for a variety of purposes,¹¹ and
116 "[m]inimiz[ing] adverse effects to resources and infrastructure in the Upper Basin."¹² In support
117 of these authorized purposes and primary goals, DROA authorities and considerations attempt to
118 ensure that the purposes of the authorized facilities are not negatively affected by Lake Powell
119 falling below the Target Elevation and that actions taken to implement DROA minimize negative
120 impacts to the operation of the Initial Units and those who depend on the operation of those
121 units.¹³

122 123 **3. Summary of Hydrologic Conditions and Projections**

124
125 To formulate a yearly Plan, the DROA Parties will rely on the most current and projected
126 hydrological information which will be outlined in Attachment A Part 1 and will include the
127 following:

128 129 3.1 Current and projected elevations at Lake Powell, including graphic representation 130 from the Bureau of Reclamation's (Reclamation) multi-year projections;

⁸ 2019 DCP Act, Pub. L. No. 116-14, 133 Stat. 850 (Apr. 16, 2019).

⁹ DROA § I(A).

¹⁰ DROA § I(A)(1): "Help ensure the Upper Division States will continue fulfilling their interstate water compact obligations while exercising their rights to develop and utilize the Upper Colorado River Basin's ("Upper Basin") Colorado River System compact apportionment."

¹¹ DROA § I(A)(2): "Maintain the ability to generate hydropower at Glen Canyon Dam so as to protect: a. Continued operation and maintenance of the Initial Units and participating projects authorized under the [1956 Act]; b. Continued funding and implementation of environmental and other programs that are beneficial to the Colorado River System; c. Continued electrical service to power customers, including municipalities, cooperatives, irrigation districts, federal and state agencies and Native American Tribes, and the continued functioning of the western Interconnected Bulk Electric System that extends from Mexico to Canada and from California to Kansas and Nebraska; and d. Safety contingencies for nuclear power plant facilities within the Colorado River Basin."

¹² DROA § I(A)(3): "Minimize adverse effects to resources and infrastructure in the Upper Basin."

¹³ DROA § II(A)(3)(b) (scope).

- 132 3.2 Reclamation’s most recent Colorado River Mid-term Modeling System 24-Month
133 Study (24-Month Study);
134
135 3.3 Identification of the first months when the 24-Month Study Minimum Probable
136 inflow¹⁴ and the Most Probable inflow each projected Lake Powell to be at or
137 below the Target Elevation;
138
139 3.4 Current and projected elevations and the associated volumes at each of the Initial
140 Units for the following 24 months, including any difference in volume from the
141 projected elevations and the Target Elevation at Lake Powell, according to the 24-
142 Month Study Minimum Probable inflow and Most Probable inflow;
143
144 3.5 Availability of water for Drought Response Operations at each of the Initial Units
145 and the timing of such water availability; and
146
147 3.6 Summary of previous Drought Response Operations at each upstream Initial Unit
148 (Flaming Gorge, Aspinnall, Navajo), if any. The summary will include:
149
150 3.6.1 Previous Drought Response Operation Releases
151 3.6.2 Status of Recovery from previous Drought Response Operation
152 Releases
153

154 **4. Summary of Proposed Drought Response Operations:**
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156

157 As part of yearly Plans, the DROA Parties will provide a summary of Drought Response
158 Operations in Attachment A Part 2, and that summary will include the following:
159

- 160 4.1 The 24-Month Study with projections for the Drought Response Operations
161 incorporated for the Minimum, Maximum, and Most Probable inflow traces.
162
163 4.2 A description of operational adjustments at Glen Canyon Dam, if any, which will
164 include a comparison of the operational adjustments to operations when no
165 adjustments are made. This comparison may be provided through text, tables,
166 figures, and graphs as needed.
167
168 4.3 A description of Drought Response Operations releases and recovery at affected
169 Initial Units, as applicable. This will include the amount of Drought Response
170 Operations water (rate, volume, and timing), a description of each reservoir’s
171 projected water level and surface area changes over the following 24 months.
172

¹⁴ In the 24-Month Study, the first year of the Most Probable inflow trace is based on the 50th percentile of Colorado Basin River Forecast Center forecasts and the second year is based on the 50th percentile of historical flows. To represent dry and wet future conditions, the Minimum Probable and Maximum Probable traces use the 10th and 90th forecast percentiles in the first year and the 25th and 75th percentiles of historical flows in the second year, respectively.

173 **5. Application of DROA’s Process and Principles for Drought Response Operations**
174

175 This section describes how a Plan will be developed to be consistent with the DROA
176 provisions and principles, ensuring that the Plan meets the obligations imposed by the 2019 DCP
177 Act.
178

179
180 **5.1 DROA Planning Timeline**
181

182 DROA relies on hydrologic projections and establishes a timeframe of approximately two
183 years to plan for and implement Drought Response Operations with as much advance
184 notice as possible to avoid Lake Powell declining below the Target Elevation.¹⁵ The
185 process begins when any Minimum Probable inflow trace of the 24-Month Study projects
186 Lake Powell falling to or below the Target Elevation within the upcoming 24-month
187 period of the study. This begins a process for more frequent monitoring, data collection,
188 and coordination.¹⁶
189

190 The next phase of DROA planning occurs when any Most Probable inflow trace of the
191 24-Month Study shows Lake Powell declining to or below the Target Elevation in the
192 upcoming 24-month study period.¹⁷ When this occurs, the DROA Parties begin to
193 develop a Plan pursuant to DROA¹⁸ and this Framework, and then seek approval¹⁹ and
194 implementation²⁰ of that Plan, starting as early as the April²¹ before Lake Powell is
195 projected to decline below the Target Elevation. Attachment A Section 2 describes the
196 proposed Drought Response Operations for the applicable Plan.
197

198 **5.2 Scope of Drought Response Operations at the Initial Units**
199

200 DROA calls for Drought Response Operations that fit within the flexibilities allowed by
201 existing Initial Unit operations.²² The proposed Drought Response Operations are
202 designed to work within the existing flexibilities of each of the Initial Units, which are
203 described generally for each Initial Unit in this Section 5.2 and in the applicable

¹⁵ See DROA § II(A)(4).

¹⁶ DROA § II(A)(4)(a).

¹⁷ DROA § II(A)(4)(a)(iv)(2).

¹⁸ DROA § II(A)(4)(b).

¹⁹ DROA § II(A)(4)(c).

²⁰ DROA § II(A)(4)(d).

²¹ DROA § II(A)(4)(b)(iv)(2).

²² DROA § II(A)(3)(b): “Scope of Drought Response Operations: Any drought response operation, including drought response releases and recovery of storage operations, at a CRSPA Initial Unit will be managed with the maximum flexibility practicable consistent with: the Colorado River Compact; the Upper Colorado River Basin Compact; the Colorado River Storage Project Act; the Colorado River Basin Project Act; the San Juan-Chama Project Act (P.L. 87-483); the Northwestern New Mexico Rural Water Projects Act (P.L. 111-11); the project-specific criteria for each CRSPA Initial Unit, including the relevant Records of Decision, Biological Opinions and authorized purposes for each Unit (see Section I.C.2); legal obligations, including existing and future contracts related to water and/or hydropower; states’ water right administration requirements and decrees; and all applicable rules and regulations promulgated thereunder.”

204 Attachments.

205

206

5.2.1 *General Release and Recovery Principles*

207

208 DROA requires consideration of all the Initial Units for a Drought Response Operation.²³

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210

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212

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Lake Powell operations and releases from the upstream Initial Units reservoirs are each governed by one or more Record of Decision and authorized purposes dictating constraints and flexibilities. For each Initial Unit, Reclamation’s reservoir operator determines a release rate that meets prescribed criteria within an allowable range. For Drought Response Operations, three possible types of reservoir operations are considered:

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- Operations without Drought Response – Reservoir operations absent Drought Response Operations. These operations will continue to be within each reservoir’s allowable range. The allowable range is governed by physical constraints, regulatory constraints, dam safety considerations, safe channel capacity, public safety, and applicable state and federal law, among other things.

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- Drought Release Operations – In addition to the constraints identified above, Drought Release Operations are also constrained by DROA²⁴ which dictates operations that must be completed according to authorizing legislation and agreements and will consider applicable existing and future contracts²⁵ related to water and/or hydropower, and each State’s water rights administration and decrees, among other things. Drought Release Operations will be performed within each upstream Initial Unit’s allowable range of releases, and above the Operations without Drought Response.

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- Drought Response Recovery – Recovery of releases made pursuant to a prior Plan or when an emergency action is performed by storing more water when hydrology allows and/or reducing releases when hydrology does not allow. When operational releases reach the low end of the allowable operational range and cannot be reduced further, recovery cannot occur until conditions allow. Recovery is further addressed in Section 6.

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238

As described above, it is important to emphasize that any Drought Response Operation must be consistent with any constraint on Initial Unit operations,²⁶ including the Law of the River,

²³ DROA § II(A)(3)(c): “Participation from all CRSPA Initial Units: Recognizing the shared risk of extended drought and acknowledging the Upper Division States’ continuing responsibilities to maintain compact compliance within the Upper Basin, a drought response operation contemplated by this Drought Response Operations Agreement shall ensure that ALL CRSPA Initial Units will be considered for drought response operations...”

²⁴ DROA § II(A)(3)(b).

²⁵ DROA Section II(A)(3)(b) states that “future contracts” are among the parameters considered in any Drought Response Operation. Accordingly, the DROA Parties will consider contracts that have been executed after the effective date of DROA. Any contract executed after a Drought Response Operation has begun will be addressed in an amendment to the applicable Plan, if necessary.

²⁶DROA § II(A)(3)(b).

239 Records of Decision, Biological Opinions, authorized purposes for individual Initial Units,
240 states' water right administration requirements, contracts, and any other constraints that affect
241 operation of the Initial Units. Additionally, impacts to river flows and upstream Initial Unit
242 reservoir water levels related to recreation visitation and the economic value of recreation will
243 be considered, along with potential downstream flooding risks. To determine what flexibilities
244 may be available, the DROA Parties will work with the existing entities and processes that
245 govern Initial Unit operations to develop a Plan that will both minimize the risk of Lake Powell
246 falling below the Target Elevation and maintain consistency with Initial Unit operation.
247 Depending on the Initial Unit, these entities include Federal agencies, Tribes, States,
248 contractors, water users, applicable advisory groups, non-governmental organizations, and the
249 public. Early communication with such entities will be critical and will occur as described in
250 Section 7 of this Framework. The DROA Parties will also maintain a long-term focus to ensure
251 appropriate operation of Initial Units for their authorized purposes into the future.

252 253 254 *5.2.2 Lake Powell Monthly Operational Adjustments*

255
256 Glen Canyon Dam provides 26.2 million acre-feet of water storage capacity in Lake
257 Powell. As Lake Powell fulfills its authorized purposes, its elevation fluctuates depending on the
258 amount of spring runoff from the mountains, releases required under current law, and the amount
259 of water carried over from the previous year. Each year, the lake level typically increases
260 between May and July from runoff followed by a decrease in lake level throughout the remainder
261 of the year.

262
263 DROA states that “[o]perational adjustments in monthly volumes at Glen Canyon Dam
264 will be considered first to minimize the risk of Lake Powell declining below the Target Elevation
265 consistent with the Criteria for Coordinated Long-Range Operation of Colorado River
266 Reservoirs, which is currently implemented through the 2007 Interim Guidelines.”²⁷ Monthly
267 releases from Glen Canyon Dam are determined by the 2016 Record of Decision for the Glen
268 Canyon Dam Long-Term Experimental and Management Plan (LTEMP), which addresses
269 hourly, daily, monthly, and experimental releases from Glen Canyon Dam and a variety of
270 resources below Lake Powell in accordance with the Grand Canyon Protection Act of 1992.
271 These operational parameters determine the flexibility for any Drought Response Operation.
272 The 2007 Interim Guidelines control annual release volumes, and any monthly adjustments to
273 Glen Canyon Dam releases do not alter the annual release volume requirements and cannot
274 change the annual release volumes.

275
276 LTEMP expressly provides for modifications to Glen Canyon Dam monthly releases “to
277 respond to low reservoir conditions as a result of drought in the Colorado River Basin.”²⁸

²⁷ DROA § II(A)(3)(c)(i).

²⁸ LTEMP ROD, Attachment B, § 1.2, p. B-7: “In addition, Reclamation may make modifications under circumstances that may include operations that are prudent or necessary for the safety of dams, public health and safety, other emergency situations, or other unanticipated or unforeseen activities arising from actual operating experience (including, in coordination with the Basin States, actions to respond to low reservoir conditions as a result of drought in the Colorado River Basin).”

278 LTEMP requires Reclamation to make such adjustments “in coordination with the Basin
279 States,”²⁹ through a process described in LTEMP,³⁰ including a Glen Canyon Monthly
280 Operations Call, along with updates to the Glen Canyon Dam Adaptive Management Program
281 (GCDAMP). Explanations for monthly operational adjustments may include an analysis
282 pursuant to the parameters defined under LTEMP.³¹
283

284 The DROA Parties will consider the following criteria, without limitation and subject to
285 existing law and regulation, when assessing operational adjustments at Lake Powell:
286

- 287 1. Glen Canyon Dam monthly volume calculations as projected by Reclamation prior to
288 Drought Response Operations.
- 289 2. During years when early forecasts indicate that operational adjustments at Glen Canyon
290 Dam may be needed to maintain the Target Elevation, smaller incremental monthly
291 adjustments shall be considered before the April 24-Month Study forecast in order to
292 have sufficient time to maintain the required volume needed in Lake Powell and to
293 minimize more significant impacts to monthly flow volumes later in the water year.
294
- 295 3. Any monthly release volume adjustments made under a Plan will be incorporated into
296 Glen Canyon Dam operations and offset to ensure the Dam’s required annual release
297 volume is not modified³².
298

299 Attachment B addresses Glen Canyon Dam with respect to the current Plan.
300

301 *5.2.3 Flaming Gorge* 302

303 Flaming Gorge is the largest upstream Initial Unit and is situated high in the Upper
304 Colorado River Basin across the Utah and Wyoming border. When the reservoir is full at
305 elevation 6,040 feet above mean sea level, it has a total capacity of 3,788,800 acre-feet with an
306 active capacity of 3,749,000 acre-feet and a surface area of 42,020 acres. The Flaming Gorge
307 Annual Operation Plan (FG AOP) may be amended and releases made within the flexibility of
308 the 2006 Flaming Gorge Record of Decision and within the provisions of DROA.
309

310 Flaming Gorge is operated for authorized purposes, including water storage, contract
311 releases, power production, recreation, and environmental conditions downstream of the
312 reservoir for endangered fish recovery pursuant to the 2005 Biological Opinion and 2006
313 Flaming Gorge Record of Decision. Operating criteria have been developed to produce the

²⁹ LTEMP ROD, Attachment B, § 1.2, p. B-7.

³⁰ LTEMP ROD, Attachment B, § 1.1.

³¹ LTEMP ROD, Attachment B, § 1.3 Implementation Process for Experiments Under Alternative D.

³² Under the 2007 Interim Guidelines Section XI.G.7.D. “The Secretary will base annual determinations regarding the operations of Lake Powell and Lake Mead on these Guidelines, unless extraordinary circumstances arise. Such circumstances could include operations that are prudent or necessary for safety of dams, public health and safety, other emergency situations, or other unanticipated or unforeseen activities arising from actual operating experience.”

314 necessary environmental parameters under a variety of hydrologic conditions.³³

315
316 The allowable range of Flaming Gorge operations is a function of the period of the year,
317 hydrologic conditions, and ongoing or planned studies related to adaptive management in
318 support of the endangered fish recovery program. Current operations at Flaming Gorge reflect
319 ongoing experimentation that has been coordinated by and through the Flaming Gorge Technical
320 Working Group and with the Flaming Gorge Working Group stakeholders.

321
322 *5.2.3.1. Flaming Gorge Operations*

323
324 Flaming Gorge operations are established in the spring based on forecasted runoff for the
325 next year until the following spring. The year is broken into three periods: Spring, Base
326 Flow, and Transition.

327
328 Specific operations for the Spring Period are established in the FG AOP for each given
329 year and its timing varies depending on yearly hydrology. The Base Flow Period follows
330 the Spring Period and typically constitutes flows from mid-July through the end of
331 February. The Transition Period runs from March 1st through the beginning of the Spring
332 Period or peak release. Details of potential flows during each of the periods can be found
333 in Attachment C and the FG AOP.

334
335 *5.2.3.2. Flaming Gorge Operating Range during Drought Response Operations*

336
337 The range of flows meeting required environmental conditions downstream of the dam
338 for each hydrologic condition is included in Tables in Appendix 1 to Attachment C.

339
340 Drought Response Operations must remain within the range prescribed in the tables for
341 the corresponding hydrologic conditions within the authorized flexibilities. Further,
342 pursuant to DROA Section II(A)(5), any proposed changes in release targets (release and
343 recovery flow) will be coordinated with the Flaming Gorge Working Group.

344
345 Attachment C addresses Flaming Gorge with respect to the current Plan.

346
347 *5.2.4 Aspinall*

348
349 The Wayne N. Aspinall Unit is a series of three consecutive dams and reservoirs on the
350 Gunnison River in Colorado: Blue Mesa, Morrow Point, and Crystal. Blue Mesa Reservoir is the
351 most upstream facility of the Aspinall Unit and serves as its primary storage reservoir. Blue
352 Mesa Reservoir has a total capacity of 938,469 acre-feet at elevation 7,519.4 feet above mean sea
353 level, including an active pool of 747,898 acre-feet. Key reservoir elevations are described in
354 Attachment D.

355
356 *5.2.4.1. Aspinall Current Reservoir Operations*

³³ These criteria are found in several documents, including the Environmental Impact Statement, Record of Decision, Biological Opinion, and the FG AOP, among others.

357 The Aspinall Unit (Aspinall) operates in accordance with its federally authorized
358 purposes, multiple state-decreed water rights and agreements, executed contracts and
359 pursuant to the 2012 Aspinall Record of Decision.
360 Blue Mesa storage peaks late in the spring runoff period and reservoir elevations decline
361 as releases are made to satisfy States' water rights administration and decrees, to meet
362 authorized purposes including power generation, for flood control, for downstream target
363 flows pursuant to the 2012 Aspinall Record of Decision, and to meet the December 31
364 target elevation of 7,490 feet to prevent icing issues upstream of the reservoir.
365 Downstream target flows vary by hydrologic year type and are determined by May 1
366 forecasts of April through July inflow into Blue Mesa Reservoir as detailed in
367 Attachment D.

368 *5.2.4.1.1. Contracted Water at Aspinall*

369
370 Aspinall currently has various amounts of water under contract for delivery downstream,
371 or for augmentation of depletions upstream in any given year. Current contracts are listed
372 in Attachment D. Water under contract is not available for Drought Response Operations.

373 *5.2.4.1.2. Taylor Park Exchange Agreement*

374
375 The Taylor Park Reservoir Operation and Storage Exchange Agreement (1975) allows
376 for the exchange of water stored in Taylor Park Reservoir and Blue Mesa Reservoir to
377 improve utilization and management of available water supplies under the water rights of
378 the Uncompahgre Project and Blue Mesa. The maximum amount of Taylor Park
379 Reservoir exchange water that can be stored within Blue Mesa Reservoir at any time
380 throughout the year is 106,230 acre-feet. The amount of Taylor Park Reservoir exchange
381 water stored in Blue Mesa Reservoir is for diversion by the Uncompahgre Project at the
382 Gunnison Tunnel and is determined through accounting managed by the Colorado
383 Division of Water Resources. This water is not available for release pursuant to DROA.

384 *5.2.4.1.3. Aspinall Subordination Agreement*

385
386 The Subordination Agreement, dated June 1, 2000, formalizes the commitment made by
387 the United States during the planning of the Aspinall Unit to allow subordination of
388 Aspinall Rights up to 60,000 acre-feet per year to in-basin water users so that Aspinall
389 would not interfere with future water development in the Upper Gunnison River Basin. A
390 decree entered in Case No. 03CW263 (October 10, 2006), Water Court, Water Division
391 No. 4, for a plan for augmentation permitted the subordination of Aspinall Rights to
392 augment existing and future water rights exercised for all decreed beneficial purposes
393 within the Gunnison River Basin through any decreed structure or facility upstream of the
394 Crystal Reservoir Dam. Accounting for the plan for augmentation is the responsibility of
395 the State of Colorado Division Engineer's Office, Water Division No. 4.
396

397 Attachment D addresses Aspinall with respect to the current Plan.

398

399 *5.2.5 Navajo Reservoir*

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Navajo Dam is located in San Juan County, New Mexico, and the reservoir extends upstream from New Mexico into Colorado. The reservoir has a total capacity of 1,647,940 acre-feet, including an active capacity of 1,021,910 acre-feet.³⁴ Maximum active storage is at elevation 6,085 ft above mean sea level. Minimum active storage is elevation 5,990 ft, which is the minimum operating level for the Navajo Indian Irrigation Project (NIIP) and the Navajo-Gallup Water Supply Project Cutter Lateral intake.

5.2.5.1. Current Navajo Reservoir Operations

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5.2.5.1.1. Contracted Water at Navajo Reservoir

Navajo Reservoir contracted water volumes are described below. These volumes represent the full allocation of water contracts and may differ from actual annual use.

- i. Williams Gas Processing (expires 3/31/28): 50 af/yr.
- ii. Navajo Nation Settlement Contract (no expiration): 508,000 af/yr for NIIP, which includes 22,650 af/yr of diversion (20,780 af/yr of depletion) for the Navajo-Gallup Water Supply Project.
- iii. Jicarilla Apache Nation Settlement Contract (no expiration): not to exceed 33,500 af/yr diversion (25,500 af/yr of depletion) for use in New Mexico from the Navajo Reservoir Supply.

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428

Shortages to contracts at Navajo Reservoir will be handled according to the provisions of Public Law No. 87-483,³⁵ as amended by Public Law No. 111-11.³⁶ In the case of severe drought with anticipated shortages to the Navajo Reservoir water users, the Navajo Reservoir Operations ROD allows for consideration of a temporary revision to spring peak release criteria or lowering of baseflow targets in the critical habitat reach.

5.2.5.1.2. Navajo Reservoir Requirements related to Endangered Species

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Navajo Reservoir is operated consistent with the Navajo Reservoir Operations Biological Opinion issued for the Animas-La Plata Project and the flow recommendations of the San Juan River Recovery Implementation Program (SJRIP). Those require operating the reservoir to mimic the natural hydrograph of the river and to maintain certain flow targets. Further detail is provided in Attachment E.

5.2.5.1.3. Other Reclamation Operations at Navajo Reservoir

436

Reclamation makes other releases for the purposes of channel maintenance, downstream

³⁴ Reclamation Technical Report, ENV-2021-002, Navajo Reservoir 2019 Sedimentation Survey

³⁵ <https://www.govinfo.gov/content/pkg/STATUTE-76/pdf/STATUTE-76-Pg96.pdf>

³⁶ <https://www.congress.gov/111/plaws/publ11/PLAW-111publ11.pdf>

437 channel work, requests from downstream coal power plants, requests from other
438 agencies, or other activities as needed. Modifying such operations could be used for
439 DROA recovery, so long as such actions do not interfere with Navajo Reservoir’s
440 authorized purposes. Water available for Drought Response Operations may include
441 Spring Peak Releases and Excess Water as those terms are defined in Attachment E.
442

443 Attachment E addresses Navajo Reservoir with respect to the current Plan.
444

445 5.3 Effectiveness 446

447 DROA requires consideration of whether a proposed release will be effective in
448 maintaining the Target Elevation. This includes the option to proceed with releases that
449 may not completely protect the Target Elevation and the option not to recommend a release
450 that is not sufficiently protective of the Target Elevation.³⁷
451

452 DROA relies on available storage in all four Initial Units to reduce the risk of Lake
453 Powell dropping below the Target Elevation. If dry conditions persist or worsen, available
454 storage volumes for potential adjustments or releases may be insufficient to protect the
455 Target Elevation at Lake Powell. As such, Drought Response Operations may be ineffective
456 and therefore futile.
457

458 The effectiveness of a Plan is difficult to predict prior to knowing actual hydrologic
459 conditions. The forecasts on which modeling projections rely can be highly variable and
460 may not reflect future hydrologic conditions. For illustration, projections in 2021 predict
461 Lake Powell will contain anywhere between 4.8 and 13.3 million acre-feet for the upcoming
462 12-month period. Likewise, 24-Month Study projections have predicted volumes ranging
463 from 4.5 and 17.3 million acre-feet in a subsequent 2-year period. Moreover, those
464 projections only represent the most likely 80% of the modeled possibilities; they do not
465 reflect the wettest or driest possible projections.
466

467 In certain years, releases from the upstream Initial Units may be insufficient to reduce the
468 risk of Lake Powell falling below the Target Elevation. For example, the driest projection in
469 the October 2021 24-Month Study shows Lake Powell approximately 2.8 million acre-feet
470 below the volume associated with the Target Elevation by August of 2022. In comparison,
471 volumes of storage available in the CRSP Initial Units for potential adjustments or releases
472 in any single year may be less than one million acre-feet depending on the year’s resource
473 conditions.
474

475 Before the DROA Parties can assess the effectiveness or futility of any Drought
476 Response Operation, the Plan must first meet the requirements established in the “Scope of

³⁷ DROA § II(A)(3)(d): “Effectiveness: The Parties agree that a drought response release from a CRSPA Initial Unit may be recommended even if it is determined that such release would not, by itself, fully achieve the intent or goals of this Drought Response Operations Agreement. Such releases, however, may not be recommended if they are ultimately determined to be futile to achieve the goals or intent of this Drought Response Operations Agreement.”

477 Drought Response Operations”³⁸ provision, including, among other things, the following:
478

- 479 a. applicable laws and regulations;
480 b. intrastate water rights administration requirements and decrees; and
481 c. ability to meet contractual obligations related to any upstream Initial
482 Unit.

483 If a proposed Plan meets DROA requirements, the DROA Parties will assess the
484 effectiveness or futility of a Drought Response Operation based on whether, and to what
485 extent, the Drought Response Operation will reduce the risk of Lake Powell falling below
486 the Target Elevation during the next 12-month period, as projected by the most recent 24-
487 Month Study. In making such an assessment, the DROA Parties may rely on current or
488 projected operations at Lake Powell, and other information that any DROA Party deems
489 relevant. The DROA Parties will specifically consider the following criteria, without
490 limitation:

- 491
- 492 1. The likelihood that the Drought Response Operation will increase the risk of a net
493 decrease in the elevation at Lake Powell over any consecutive 12-month period based
494 on the most recent 24-Month Study;
 - 495
 - 496 2. The extent to which conducting a Drought Response Operation for certain durations
497 and at certain times during the water year might affect the ability of the released water
498 to reach Lake Powell;
 - 499
 - 500 3. The extent to which a Drought Response Operation changes the risk of Reclamation
501 being unable to meet obligations related to an upstream Initial Unit in future years at
502 times after the 12-month period when a Drought Response Operation would occur;³⁹
503
 - 504 4. The degree to which a Drought Response Operation minimizes, to the extent
505 practicable, impacts of the Drought Response Operation to natural resource
506 conditions;⁴⁰
507
 - 508 5. The degree to which a Drought Response Operation minimizes, to the extent
509 practicable, impacts to the Upper Colorado River Basin Fund and impacts to the
510 reliability of the Western Interconnected Bulk Electrical System;⁴¹
511
 - 512 6. The extent to which a Drought Response Operation minimizes adverse effects to
513 resources and infrastructure in the Upper Basin⁴² and provides additional certainty on

³⁸DROA § II(A)(3)(b)

³⁹DROA § II(A)(3)(b).

⁴⁰ DROA § II(A)(3)(f).

⁴¹ DROA § II(A)(3)(g).

⁴² DROA § I(A)(3).

514 Colorado River water management,⁴³ including but not limited to associated economic
515 implications; and

516
517 7. The extent to which a Drought Response Operation recovery at a particular Initial Unit
518 will occur or has occurred by October 1, 2026.⁴⁴

519
520 Attachment A contains an overview of effectiveness and an explanation of how a
521 determination was made.

522
523 5.4 Natural Resources Considerations

524
525 Subject to specific feedback for each Initial Unit that might be affected by Drought
526 Response Operations, general natural resource considerations include the following:

527
528 To the extent practicable, Drought Response Operations should be made to mimic the
529 natural timing of streamflow. Most Initial Unit operations, for example, contain an option for
530 releasing additional water at times that coincide with natural high flows in the spring. Releasing
531 water during these windows will generally align with existing operations, provide ecological
532 benefits, and may support operational flexibilities related to retaining water in storage until more
533 information about runoff is known in the spring.

534
535 In addition to other limitations described herein, specific considerations for each Initial
536 Unit were provided by the relevant natural resource agencies and include the following:

537
538 Lake Powell:

- 539 ● minimizing spring reservoir elevation drop and corresponding risk of
- 540 non-native fish pass-through by reducing releases from January-April;
- 541 ● transferring most of the withheld winter volume as a spring peak flow
- 542 in May or June; and
- 543 ● balancing sediment erosion and summer peak hydropower production.

544
545 Flaming Gorge:

- 546 ● releasing most of the Drought Response Operation volume during a
- 547 naturally timed spring peak;
- 548 ● following, among other things, experimental recommendations of the
- 549 Upper Colorado River Endangered Fishes Recovery Program for
- 550 biologically-triggered peak flow timing to support larval razorback
- 551 sucker, flows to limit smallmouth bass reproduction and summer base
- 552 flows supportive of young-of-year Colorado pikeminnow; and
- 553 ● not exceeding recommended baseflows between December and March.

554

⁴³ DROA § I(B)(3).

⁴⁴ DROA § II(A)(6). “Operations to recover storage after a drought response operation has been implemented will continue as long as necessary to recover from any drought response operations taken before October 1, 2026.”

555 Aspinall:
556 ● limiting the overall volumes used from Blue Mesa; and
557 ● releasing most of the Drought Response Operation volume during a
558 naturally timed spring peak, with the next preference for releases in
559 fall and least preferred released Jan-April.

560 Navajo:
561 ● consistency with the hydrograph recommended by the SJRIP;
562 ● meeting recommended high spring flows when available; and
563 ● ensuring the ability to meet future releases recommended by the
564 SJRIP.
565

566 Attachment F contains an overview of the consideration of natural resource conditions
567 and an explanation of how a determination was made for each specific Plan.
568

569 5.5 Impacts to the Basin Fund and Bulk Electrical System 570

571 DROA requires consideration of drought response operations that “help minimize, to the
572 extent practicable, impacts to the Upper Colorado River Basin Fund and impacts to the reliability
573 of the Western Interconnected Bulk Electrical System.”⁴⁵ Maintaining the ability to generate
574 hydropower at Glen Canyon Dam helps maintain water facility operations and maintenance,
575 environmental and other programs, electrical service to power customers, and functioning of the
576 Western Interconnected Bulk Electric System.⁴⁶
577

578 Concerns about the Basin Fund's solvency and the viability of hydropower have grown as
579 the current drought has persisted. The Western Area Power Administration (WAPA) is the
580 agency responsible for marketing the power produced from the Initial Units, of which
581 approximately 75% is produced at Glen Canyon.
582

583 WAPA supports Drought Response Operations when they are necessary to protect the
584 Target Elevation at Lake Powell. In general, when Drought Response Operations are necessary,
585 WAPA has proposed specific considerations for mitigation to hydropower generation, when
586 practicable, as follows:
587

588 a. Operations at Glen Canyon Dam: 589

- 590 ● Planning for monthly volume releases should consider maximizing
591 hydropower production during winter and summer peak electrical demand.
592 For fall operations, October through November, releases from Glen
593 Canyon Dam should be reduced. Reduced releases in December and
594 January should be avoided. For spring operations, monthly release
595 volumes should be modified to retain water in storage until after spring

⁴⁵ DROA § II(A)(3)(g): “Impacts to Basin Fund and Bulk Electric System: Drought response operations at CRSPA Initial Units will consider the timing, duration, and magnitude of water releases to help minimize, to the extent practicable, impacts to the Upper Colorado River Basin Fund and impacts to the reliability of the western Interconnected Bulk Electrical System, within the scope identified in Section II.A.3.b.”

⁴⁶ DROA § I(A)(2).

596 runoff thereby allowing larger release volumes in July through September
597 to maximize the value of hydropower and reduce days spent below the
598 Target Elevation.

- 599
- 600 ● Specific considerations for projected Lake Powell elevation of 3,490,
601 which is considered minimum power pool.
- 602
- 603 b. Operations at Flaming Gorge: Drought Response Operations from Flaming Gorge
604 should primarily be scheduled during the summer months, June through September.
605 Bypasses should be avoided whenever possible unless essential to avoid Lake Powell
606 dropping below the minimum power pool elevation.
 - 607
 - 608 c. Operations at the Aspinall Unit: Drought Response Operations from the Aspinall Unit
609 should primarily be scheduled during the summer months, June through September,
610 and secondarily from the winter months, December through February. Bypasses
611 should be avoided whenever possible unless essential to avoid Lake Powell dropping
612 below the minimum power pool elevation.
 - 613
 - 614 d. There is no CRSP power generation at Navajo Dam and therefore WAPA provided
615 no recommendations.
 - 616

617 The general proposals described here will be considered, in addition to other DROA
618 considerations, in Attachment G, which will contain an overview of impacts to the Basin Fund
619 and Bulk Electrical System and an explanation of how a determination was made for each
620 specific Plan.

621

622 5.6 Released Water Distribution and Transit Loss

623

624 *5.6.1. Released Water Distribution*

625

626 Drought Response Operations releases from the upstream Initial Units need to
627 occur for the duration and at times of year identified by the Upper Division State(s) to
628 optimize the amount of released water that reaches Lake Powell. Optimization includes,
629 but is not limited to, consideration of intervening uses. Notice to the downstream Upper
630 Division State(s) will be provided prior to the initiation of such releases. Each Upper
631 Division State, through the exclusive authority vested in each for the administration and
632 distribution of its waters, will ensure that released water is directed to each state line or to
633 Lake Powell pursuant to state law, as applicable.

634

635 *5.6.2. Transit Loss*

636

637 Transit losses are generally factored in as part of Reclamation's existing models,
638 which estimate loss and gain volumes related to water conveyance from the Upper Basin
639 to Lake Powell. Using those existing models, Reclamation can estimate the adjustments
640 to Lake Powell elevation levels based on any Drought Response Operations from the
641 upstream Initial Units. Therefore, the DROA Parties will not separately estimate transit

642 losses above and beyond the relationships that are captured in the existing models. The
643 Upper Division States will not be bound to relationships assumed in Reclamation's
644 models for other operational activities.
645

646 **6. Accounting and Recovery**

647
648 DROA requires monitoring of Drought Response Operations, including releases from or
649 recovery at the upstream Initial Units.⁴⁷ One purpose of monitoring is to determine when to
650 conclude Drought Response Operations, including monitoring the recovery of released water.
651

652 *6.1. Accounting*

653
654 Monitoring will be achieved through the development, implementation, and maintenance of a
655 water accounting system that exhibits the functional requirements and salient characteristics
656 described hereafter:
657

658 1) Definitions:

- 659 a. Account: A ledger of credit and debit entries kept individually for each upstream
660 Initial Unit to record the release or recovery of Drought Response Operation
661 water. The DROA Parties will establish Accounts beginning with the initial
662 adjustment of releases from each upstream Initial Unit.
663
- 664 b. Account Balance: The status of releases or recovery of Drought Response
665 Operation water in each upstream Initial Unit reservoir portrayed in each
666 Account. This is calculated as the sum of all Drought Response Operation
667 released volumes minus the sum of all Drought Response Operation recovered
668 volumes to date.
669
- 670 c. Credit and Debit: For accounting purposes, the terms Credit and Debit are used to
671 reflect released (Credit) and recovered (Debit) volumes of water, respectively,
672 from each Initial Unit.
673
- 674 d. Actual Condition: This reflects the condition of each upstream Initial Unit under
675 Drought Response Operations and is the observed reservoir elevation, storage,
676 and discharge from each Unit.
677
- 678 e. Regular Operating Target Elevation: Established elevations for each Initial Unit
679 that indicates full recovery when met as described in Attachment C through E.
680
- 681 f. Operations Without Drought Response Operations: Facility operations had the
682 Storage Condition Without Drought Response been the Actual Condition.
683 Operations Without Drought Response require operational judgement and will be
684 consistent with historical operations and current operational policy at each
685 upstream Initial Unit reservoir.
686

⁴⁷ DROA § II(A)(3)(h).

- 687 g. Storage Condition Without Drought Response: This is the storage condition of
688 each upstream Initial Unit had Drought Response Operations not been
689 implemented. The Storage Condition Without Drought Response for each
690 upstream Initial Unit is its observed storage plus its current Drought Response
691 Operation Account Balance.
692
- 693 2) The accounting platform will be integrated into Reclamation’s monthly operations
694 modeling.
695
- 696 3) Monthly accounting will include forward-looking projections and backward-looking
697 calculations:
698
- 699 a. Forward-looking projection: Through modeling, a projection for each Account
700 Balance will be determined for planning purposes only. An upstream Initial Unit’s
701 actual Account Balance can only be updated in the backward-looking mode
702 (below). Forward-looking projections will not prevent facility operators from
703 making necessary operational adjustments in response to emerging information.
704
- 705 b. Backward-looking calculation: This calculates each month’s Credit or Debit to
706 each Account Balance by subtracting the release volume that would have
707 occurred without Drought Response Operations from the actual volume released
708 (with Drought Response Operations). Each month’s Credit or Debit is added to
709 the prior Account Balance to calculate the current month’s Account Balance.
710
- 711 4) Monthly Reporting:
712
- 713 a. Monthly reports will be made available for each upstream Initial Unit Account
714 and will contain the following:
715 i. Drought Response Operation Credits;
716 ii. Drought Response Operation Debits; and
717 iii. End of month Account Balance.
718
- 719 b. Monthly reporting will continue for each upstream Initial Unit until recovery is
720 completed, and will resume each time an Account Balance accrues.
721
- 722 Accounting for release and recovery volumes will be based on releases measured
723 according to the established method at each upstream Initial Unit. Entries in the appropriate
724 Account for each upstream Initial Unit will be fully documented and supportable. Ledger values
725 (Credits and Debits) will be traceable to their origination, including as available; meter readings
726 through powerplants and bypasses, modeling rulesets, annual operation plans including EISs,
727 RODs, and approved experimental releases and/or documentation of decision-making related to
728 the Condition Without Drought Response Operations.
729
730
731

732 The monthly operations model and the accounting results will be made available to the
733 public on Reclamation’s website [insert link]. Reclamation will consider timely feedback from
734 the public on accounting results.

735
736 *6.2. Recovery*

737 An essential element of any Drought Response Operation is recovering any water
738 released as part of a Plan.⁴⁸ Full recovery occurs when the Initial Unit has either
739 “recovered the cumulative volume of water that was released” from a Drought Response
740 Operation⁴⁹ or when the Initial Unit “has reached the regular operating target elevation”⁵⁰
741 based on hydrologic conditions and actual operating experience at each Initial Unit at the
742 time of recovery. Each proposed Plan needs a description of how recovery will be
743 achieved under the current or any future Plan, taking into consideration the status of
744 recovery of each Initial Unit from previous Drought Response Operation releases.

745
746 To minimize the risk of Lake Powell falling below the Target Elevation, recovery
747 of Drought Response Operations at the upstream Initial Units should occur after water
748 storage conditions at Lake Powell have improved.⁵¹ However, this will not preclude the
749 potential for Dual Operations, in accordance with DROA⁵².

750
751 DROA specifies that operations to recover storage after a Drought Response
752 Operation has been implemented will continue as long as necessary to recover from any
753 Drought Response Operations conducted before October 1, 2026.⁵³

754 Specifics regarding recovery for each upstream Initial Unit are in Attachments C through E.

755
756 **7. Consultation, Coordination, & Outreach**

⁴⁸ DROA § II(A)(3)(e): “Recovery of Storage at CRSPA Initial Units: Recovery of storage at the CRSPA Initial Units is essential to any drought response operation. Consistent with Section II.A.3.b-c, the drought response operations process will be completed only after each CRSPA Initial Unit has recovered the storage as defined below.”

⁴⁹ DROA § II(A)(3)(e)(i)(1): “The CRSPA Initial Unit, operating consistent with Section II.A.3.b, has recovered the cumulative volume of water that was released for implementation of drought response operations to minimize the risk of Lake Powell declining below the Target Elevation.”

⁵⁰ DROA § II(A)(3)(e)(i)(2): “The water elevation at the CRSPA Initial Unit has reached the regular operating target elevation for that facility, for example, deicing target elevation at the Aspinall Unit, the current end-of- water-year storage target at Navajo Reservoir, or the May 1 Upper Level Drawdown Elevation target at Flaming Gorge Reservoir.”

⁵¹ DROA § II(A)(3)(e)(i): “Storage at a CRSPA Initial Unit is recovered when the first of either of the following occurs: (1) The CRSPA Unit...has recovered the cumulative volume of water that was released for implementation of drought response operations...; or (2) the water elevation at the CRSPA Initial Unit has reached the regular operating target elevation for that facility...”

⁵² DROA § II(A)(3)(e)(ii): “Hydrologic variability within the Upper Basin may render releases from a CRSPA Initial Unit ineffective in achieving the intent and goal of this Drought Response Operations Agreement...Moreover, drought response releases from any CRSPA Initial Unit do not preclude recovery of storage actions at another Unit simultaneously.”

⁵³ DROA § II(A)(6): “...Operations to recover storage after a drought response operation has been implemented will continue as long as necessary to recover from any drought response operations taken before October 1, 2026.”

759
760 DROA contains various provisions for consultation, coordination, and outreach from the
761 DROA Parties to non-DROA entities during the development and implementation of Plans.⁵⁴ In
762 years when they are needed, the DROA Parties anticipate developing draft Plans during the late
763 winter and early spring (February to April) of each year as more reliable hydrologic information
764 becomes available. The DROA Parties anticipate the finalization of yearly plans in April of each
765 year, with implementation occurring throughout the year until April of the following year. As
766 such, the consultation, coordination, and outreach described in this section will need to occur
767 during the February to April time period each year. The DROA Parties intend to provide draft
768 Drought Response Operations concepts and Plans as they become available,⁵⁵ usually during this
769 February to April time period each year.

770
771 Consistent with the DROA provisions, the DROA Parties will conduct consultation,
772 coordination, and outreach as follows:

773
774 *7.1. Consultation with the Lower Division States*

775
776 DROA requires consultation with the Lower Division States several times. First, prior to
777 finalizing a Plan, DROA requires providing the terms of a draft Plan to the Governors’
778 Representatives of the Lower Division States.⁵⁶ DROA then requires the DROA Parties to
779 consider and address, as appropriate, any questions or concerns regarding the terms of the draft
780 Plan.⁵⁷

781
782 Second, when implementing a Plan, the DROA Parties will “[b]e available to respond to
783 the Lower Division States’ questions or concerns, should they arise, regarding ongoing
784 implementation of Drought Response Operations.”⁵⁸

785
786 Third, the DROA Parties will consult with the Lower Division States when “the Parties
787 agree that the finalized Drought Response Operations Plan needs to be modified, amended, or
788 supplemented for the purpose of more specifically clarifying the scope and detail of recovery of
789 storage.”⁵⁹

790
791 *7.2. Outreach to and consultation with Native American Tribes*

792
793 DROA requires outreach and notification to Native American Tribes “relevant to the
794 respective CRSPA Initial Units of plans and concepts for drought response operations as they

⁵⁴ During “Emergency Action,” as defined in DROA, DROA §§ II(A)(3)(j) & II(A)(4)(e). The Department committed to conduct any Emergency Action, “to the greatest extent practicable, with advance consultation and coordination with the Upper Division States, through the Commission, and following consultation with the Governors’ Representatives of the Colorado River Basin States consistent with the Agreement Concerning Colorado River Drought Contingency Management and Operations (“Companion Agreement”).”

⁵⁵ DROA § II(A)(5).

⁵⁶ DROA § II(A)(4)(b)(iii).

⁵⁷ DROA § II(A)(4)(b)(iii).

⁵⁸ DROA § II(A)(4)(d)(ii).

⁵⁹ DROA § II(A)(4)(d)(iv).

795 become available.”⁶⁰ The DROA Parties will provide regular updates on the status of Drought
796 Response Operations planning for Native American Tribes as information becomes available.
797

798 The DROA Parties will specifically involve Upper Basin Tribes. The DROA Parties will
799 also offer opportunities for all Colorado River Basin Native American Tribes to participate.
800 Participation may include providing written input on the development of a Plan, exchanging
801 background documents and data, and meeting for individual informal discussions. Additionally,
802 the Department will offer informal and formal Government-to-Government consultations with
803 Tribes. Discussions between the Tribes and the Department do not preclude other DROA Parties
804 from discussing potential Plans with Tribes as appropriate.
805

806 Any DROA discussions with Native American Tribes are in addition to and do not
807 replace opportunities that Tribes may have for input and consultation regarding operations of
808 Initial Units or other authorities that govern the Tribal-federal government relationships.
809

810 DROA requires that water rights and other interests of Tribal Nations, often
811 memorialized in settlements and contracts, be considered as part of Initial Unit Operations that
812 cannot change as part of Drought Response Operations.⁶¹ As part of development of this
813 Framework, several Tribal Nations commented on the need to protect their water rights and other
814 aspects of Initial Unit operations as part of any Plan. Tribal involvement in the development of
815 Drought Response Operations will ensure that Tribal rights remain protected and that Drought
816 Response Operations consider the preferences of individual Tribes within the flexibilities
817 available for a particular Drought Response Operation.
818

819 *7.3. Coordination within the Department of the Interior*

820

821 Reclamation will arrange for discussions and coordination among agencies within the
822 Department regarding Drought Response Operations, as appropriate. Such discussions and
823 coordination are in addition to and do not replace coordination with Departmental agencies that
824 occur as part of the Initial Units’ operations.
825

826 *7.4. Coordination with WAPA*

827

828 Reclamation has an agreement to consult with WAPA⁶² regarding Drought Response
829 Operations and will coordinate with WAPA pursuant to that agreement. Such coordination is in
830 addition to and does not replace discussions with WAPA that occur as part of the Initial Units’
831 operations.
832

833 *7.5. Coordination with Initial Unit Workgroups*

⁶⁰ DROA § II(A)(5) “public outreach regarding drought response operations will include, but may not be limited to, notifying Native American Tribes, local governments, interested stakeholders, and operational and technical workgroups relevant to the respective CRSPA Initial Units of plans and concepts for drought response operations as they become available.”

⁶¹ DROA § II(A)(3)(b).

⁶² Contract No. 19-WC-40-746, dated June 7, 2019 between Bureau of Reclamation and Western Area Power Administration.

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The DROA Parties will coordinate with the appropriate workgroups involved with Initial Unit operations including, but not limited to the Glen Canyon Dam Adaptive Management Work Group, Flaming Gorge Technical Work Group, Flaming Gorge Work Group, San Juan River Basin Recovery Implementation Program, and Upper Colorado River Endangered Fish Recovery Program.

7.6. Outreach to other stakeholders and interested entities

The DROA Parties will provide regular updates on the status of Drought Response Operations planning for water users, NGOs, other stakeholders, and interested entities. The DROA Parties will also offer opportunities for such entities and stakeholders to provide written comments on any draft Plan. The Upper Division States have the primary responsibility to conduct outreach to water users within their respective state, while the Federal government retains responsibility to conduct outreach concerning Federal contracts.

7.7. Coordination among the DROA Parties

DROA requires that the DROA Parties “will coordinate on any public outreach for drought response operations at the CRSPA Initial Units” and that “[s]uch coordination will begin prior to outreach activities with the goal of streamlining discussions and avoiding or resolving differences.”⁶³ A DROA Party conducting public outreach activity will notify the other DROA Parties in advance of such outreach and, if applicable, be prepared to describe the anticipated scope of such outreach. Public outreach under this provision does not include internal communications within an individual DROA Party’s organization necessary for that DROA Party’s internal consideration of a proposed Plan.

Pursuant to DROA, the Upper Division State Commissioners and the Upper Colorado River Commission (UCRC) will review and consider a final Plan after consultation with the Governors’ Representatives of the Lower Division States. Upon approval of the final Plan by both the Upper Division State Commissioners and the UCRC, the UCRC will forward the final Plan to the Secretary for consideration and approval.⁶⁴

Attachment H describes consultation, coordination, and outreach that was conducted. It may not be possible for all concerns raised during Outreach to be mitigated.

8. Monitoring and Potential Amendments During Plan Implementation

DROA requires monitoring activities as appropriate as part of any Plan.⁶⁵ Modeling projections relied upon for a Plan cannot predict precise conditions at a given time in the Upper

⁶³ DROA § II(A)(5).

⁶⁴ DROA § II(A)(4)(c).

⁶⁵ DROA § II(A)(3)(h): “Monitoring: The Parties agree to include monitoring activities as appropriate as part of any drought response operations (release or recovery of storage). The Parties will incorporate the results of such monitoring into consideration of whether to begin, end, or modify drought response operations.”

875 Basin. Accordingly, the DROA Parties intend for any Plan to provide sufficient flexibility to
876 begin, end, or adjust Drought Response Operations as needed based on actual hydrologic
877 conditions.

878
879 During the implementation of a Plan, the DROA Parties will coordinate weekly, or at
880 such intervals as otherwise agreed to, to conduct monitoring activities related to the Drought
881 Response Operations. Monitoring activities will include consideration of the most current
882 hydrologic conditions and projections as described in Section 3 herein, as well as application of
883 the principles described in Section 5 herein. The DROA Parties may amend Plans as necessary
884 based upon changing conditions.

885
886 Based upon monitoring activities, and only upon mutual agreement of the DROA
887 Parties,⁶⁶ any Plan may be modified, adjusted, or ended through the adoption of an amendment
888 to the applicable Attachment(s). Amendments to Attachments will include all of the types of
889 information included in the original Attachment(s) and will incorporate a description of
890 monitoring activities and monitoring activity results. Amendments to Attachments will fully
891 describe the reasons for the amendment(s) and will supersede the original Attachment(s) or any
892 preceding amendments.

893
894 Any Plan amendments may need to be implemented quickly due to changing hydrology
895 to achieve the purpose and intent of a Plan.⁶⁷ Except when an imminent need does not permit
896 sufficient time, the DROA Parties will use their best efforts to satisfy the consultation,
897 coordination, and outreach provisions as described in Section 7 of this Framework.

898
899 In addition to the monitoring activities described in this Section, any DROA Party may
900 request a meeting with other DROA Parties to consider any Plan amendments.

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⁶⁶ The Secretary retains all applicable authority as described in DROA § II(A)(4)(e).

⁶⁷ DROA § II(A)(4)(b)(ii): Plans will “Provide for timely adjustments in drought response operations based upon actual monthly hydrology to achieve the purpose and intent of this Drought Response Operations Agreement.”

Attachment A

Summary of 2022 Drought Response Operations Plan - Template

1. Current and Projected Hydrological Information:

1.1 Insert current and projected elevations at Lake Powell, including graphic representation from the Bureau of Reclamation's (Reclamation) multi-year projections;

1.2 Insert Reclamation's most recent Colorado River Mid-term Modeling System 24-Month Study (24-Month Study);

1.3 Insert identification of months when the 24-Month Study Minimum Probable inflow and the Most Probable inflow each projected Lake Powell to be at an elevation below the Target Elevation;

1.4 Insert current and projected elevations at each of the Initial Units for the following 24 months;

1.5 Insert availability of water for Drought Response Operations at each of the Initial Units and the timing of such water availability; and

1.6 Insert summary of previous Drought Response Operations at each upstream Initial Unit (Flaming Gorge, Aspinall, Navajo), if any. The summary will include:

1.6.1 Previous Drought Response Operation Releases

1.6.2 Status of Recovery from previous Drought Response Operation Releases

2. Insert summary of 2022 Drought Response Operations. This summary will include the following:

2.1 The 24-Month Study with projections for the Drought Response Operations incorporated for the Minimum, Maximum, and Most Probable inflow traces.

2.2 A description of operational adjustments at Glen Canyon Dam, if any, which will include a comparison of the operational adjustments to no operational adjustments. This comparison may be provided through text, tables, figures, and graphs as needed.

2.3 A description of Drought Response Operations releases and recovery at affected Initial Units, as applicable. This will include the amount of Drought Response Operations water involved (rate, volume, and timing), a description of each reservoir's water level and surface area changes over the following 24 months.

3. *Insert summary describing application of the effectiveness criteria described at Section 5.3. These criteria include, without limitation:*

3.1 *The likelihood that the Drought Response Operation will increase the risk of a net decrease in the elevation at Lake Powell over any consecutive 12-month period based on the most recent 24-Month Study;*

3.2 *The extent to which conducting a Drought Response Operation for certain durations and at certain times during the water year might affect the ability of the released water to reach Lake Powell;*

3.3 *The extent to which a Drought Response Operation changes the risk of Reclamation being unable to meet obligations related to an upstream Initial Unit in future years at times after the 12-month period when a Drought Response Operation would occur;*

3.4 *The degree to which a Drought Response Operation minimizes, to the extent practicable, impacts of the Drought Response Operation to natural resource conditions;*

3.5 *The degree to which a Drought Response Operation minimizes, to the extent practicable, impacts to the Upper Colorado River Basin Fund and impacts to the reliability of the Western Interconnected Bulk Electrical System;*

3.6 *The extent to which a Drought Response Operation minimizes adverse effects to resources and infrastructure in the Upper Basin and provides additional certainty on Colorado River water management, including but not limited to associated economic implications; and*

3.7 *The extent to which a Drought Response Operation recovery at a particular Initial Unit will occur or has occurred by October 1, 2026.*

Attachment B

2022 Drought Response Operations Plan

Operational Adjustments at Glen Canyon Dam

1. Glen Canyon Dam Operations Without Drought Response

The 2007 Interim Guidelines control annual release volumes, and any monthly adjustments to Glen Canyon Dam releases cannot and do not change annual release volumes. Monthly releases from Glen Canyon Dam are determined by the 2016 Record of Decision for the Glen Canyon Dam Long-Term Experimental and Management Plan (LTEMP), which addresses hourly, daily, monthly, and experimental releases from Glen Canyon Dam and a variety of resources below Lake Powell in accordance with the Grand Canyon Protection Act of 1992. These operational parameters determine the flexibility for any Drought Response Operation. Monthly release volume adjustments cannot alter the annual release volume requirements.

2. Current Hydrology

Insert hydrological information specific to Glen Canyon Dam used to inform the determination of Drought Response Operations at Glen Canyon Dam, including elevation projections relative to the Target Elevation.

3. Glen Canyon Dam without Drought Response during Plan year

Insert description of Glen Canyon Dam Operations without Drought Response Operations: including the annual release volume and the corresponding table of LTEMP monthly volumes and a reference to the basis for potential adjustments to monthly releases for experimental or other specified purposes.

4. Glen Canyon Dam Drought Response Operations

If there are no Drought Response Operations at Glen Canyon Dam, describe why.

Insert description of Drought Response Operations at Glen Canyon Dam, if any. Include description of: (a) timing and duration when Lake Powell is projected to be below the Target Elevation; (b) the volume of water associated with the projected time below the Target Elevation; (c) how adjusting monthly release volumes could minimize the risk of falling below the Target Elevation; and (d) an estimate of the timeframe when monthly releases would be adjusted to maintain the annual release volume.

Modifications to Monthly Releases.

Modification to monthly release patterns will not affect annual releases at Glen Canyon Dam.

Insert description of the process followed in accordance with LTEMP ROD, Attachment B, § 1.1. and the analysis performed pursuant to the parameters defined under LTEMP ROD, Attachment B, § 1.3 Implementation Process for Experiments Under Alternative D.

5. Contracts

Contracts for water from Lake Powell are not affected by monthly release volumes.

6. Coordination regarding Glen Canyon operations

Insert description of coordination with the Glen Canyon Dam Adaptive Management Workgroup and evaluation of any experiments as triggered under the LTEMP ROD.

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Attachment C

2022 Drought Response Operations Plan

Operations at Flaming Gorge

1. Flaming Gorge Operations Without Drought Response

Operations without Drought Response at Flaming Gorge are generally balanced between the needs of power production and environmental conditions downstream of the reservoir for endangered fish recovery programs and other purposes. Drought Response Operations is an additional consideration that must be balanced when conditions require.

Operating criteria at Flaming Gorge has been developed to produce the necessary environmental parameters under a variety of hydrologic conditions. These criteria are found in several documents, including the Flaming Gorge Environmental Impact Statement, Record of Decision, Biological Decision, and the Annual Operating Plan, among others. The annual operating plan establishes Flaming Gorge releases according to hydrologic conditions that are influenced by the Upper Green and the Yampa Rivers. Further, the year is broken into three periods which are the Spring, Base Flow and Transition. The allowable range of flow is a function of the period, hydrologic conditions, and ongoing, or planned studies related to adaptive management in support of the endangered fish recovery program.

The Spring Period marks the beginning of the Annual Operation Plan for Flaming Gorge. It is characterized by the timing of the Spring Runoff and typically includes the months of April – July. The timing of the spring runoff period varies depending on yearly hydrology of the basin and is established in the Annual Operation Plan. The Base Flow period follows the Spring period and typically constitutes flows from mid-July through the end of February. The Base Flow period is further categorized by the Summer, Autumn, and Winter Base Flows which vary according to downstream targets (Muth et al, 2000) established in approved study plans and are dependent on Yampa River flows, and Flaming Gorge reservoir surface elevation. The Transition Period comprises releases from March 1st through mid-May.

Paragraph II of the February 2006 Record of Decision for Operations of Flaming Gorge Dam Final Environmental Impact Statement indicates Reclamation’s “decision includes the potential for refinement of the flow and temperature recommendations if relevant new information gained through adaptive management supports that possibility.” Current operations at Flaming Gorge reflect ongoing experimentation that has been coordinated with the Flaming Gorge Working Group stakeholders and vary from the flow recommendations included in the Final EIS (Table 2.1, Recommended Magnitudes and

Duration of Maximum Spring Peak and Summer-to-Winter Base Flows and Temperatures for Endangered Fishes in the Green River Downstream from Flaming Gorge Dam as identified in the 2000 Flow and Temperature Recommendations).

2. Current Hydrology

Insert hydrological information specific to Flaming Gorge used to inform the determination of Drought Response Operations at Flaming Gorge.

3. Flaming Gorge Operations without Drought Response during Plan year

Insert description of Flaming Gorge operations without Drought Response Operations as developed for the Flaming Gorge Annual Operating Plan during the process generally described in this Section. This description will include a summary of planned reservoir releases during the Spring, Base Flow, and Transition periods in both flow rate and volumetric amounts.

4. Flaming Gorge Drought Response Operations

The acceptable range of flows meeting required environmental conditions downstream of the dam for each hydrologic condition are included in Tables in Appendix 1 to this Attachment.

Drought Response Operations will be performed within the operating range for the year's hydrologic condition classification. Monthly operations during Spring releases may be modified by changing the hydrologic classification up two levels, or down one level. During base flow operations, the hydrologic classification may be changed up one level, or down one level. Drought Response Operations must remain within the range prescribed in the tables for the corresponding hydrologic conditions within the authorized flexibilities. Further, changes in release targets (for Drought Response Operations) will be coordinated with the Flaming Gorge Working group.

Insert description of Flaming Gorge Operations with Drought Response Operations as generally described in this Section. This description will include a summary of planned reservoir releases under Drought Response Operations during the Spring, Base Flow, and Transition periods in both flow rate and volumetric amounts.

Insert a description of the difference between Flaming Gorge Operations without Drought Response Operations and Flaming Gorge Operations with Drought Response Operations. This description will include the difference between the two operations during the Spring, Base Flow, and Transition periods in both flow rate and volumetric amounts.

5. Upper Limit Drawdown Level

In addition to the operating ranges identified in the tables in Appendix 1 to this Attachment, Flaming Gorge has a range of operating elevations that correspond to hydrologic conditions. The upper limit drawdown level is defined in the 2005 EIS, Table 2-3, provided here in Table 1, and was established to provide safe operations of the reservoir. Generally, to provide adequate flood storage space, Flaming Gorge must be drawn down to at least the elevations in Table 1 by May 1 of each year.

Table 1 –Upper Limit Drawdown Levels
 for Flaming Gorge Reservoir (2005 EIS
 Table 2.3)

Unregulated Inflow Forecast Percentage Exceedance Range	May 1 Upper Limit Drawdown Elevation Level
1 to 10	6023
10.1 to 30	6024
30.1 to 40	6025
40.1 to 59.9	6027

6. Lower Drought Response Operations Limit

The lower Drought Response Operations limit is a function of hydrologic conditions and storage water demands necessary on May 1st. At Flaming Gorge, these demands are primarily releases made for Endangered Fish Recovery programs, but also include certain associated water rights. The lower Drought Response Operations limit is an elevation of 5,911.5 feet, below which Drought Response Releases are not available.

7. Drought Response Recovery at Flaming Gorge

Recovery of the total Drought Response Operations volume can occur in one operation, or over several operations with partial recovery. All recovery scenarios are dependent upon hydrological conditions. Recovery would not occur under any of the described scenarios if below-average hydrology persists in future years. Any reduction in Operations without Drought Response may count towards recovery. It should be noted that some of these scenarios for recovery may have an impact on the volume, frequency and duration of releases.

Drought Response Recovery at Flaming Gorge will be complete when the first of either of the following occurs:

- a. The Flaming Gorge Account Balance as defined in Section 6 of the Framework has no balance; or

- b. Flaming Gorge elevation reaches the May 1 Upper Limit Drawdown Level. However, this Upper Limit Drawdown Level represents the maximum allowable elevation for dam safety purposes and operators have typically held a buffer from the maximum elevation as a prudent reservoir management measure. An evaluation of operations from 2006 to 2021 demonstrates the regular operating threshold is typically one-half foot below the May 1 Upper Limit Drawdown Level as shown in Table 2. When the targets in Table 2 are achieved, recovery will be complete.

Table 2 – Regular Operation Target Elevation (2005 EIS Table 2.3)

Unregulated Inflow Forecast Percentage Exceedance Range	Recovery May 1 Elevation Level
1 to 10	6023 (+/-0.5)
10.1 to 30	6024 (+/-0.5)
30.1 to 40	6025 (+/-0.5)
40.1 to 59.9	6027 (+/-0.5)
60.0 to 70	6027 (+/-0.5)
70.1 to 90	6026.75 (+/-0.75)
90.1 to 100	6026.5 (+/-1.0)

8. Contracts

Existing water supply contracts and agreements at Flaming Gorge are described below. Any future contracts which become executed will be described here. Water supply contracts and agreements are not impaired by any Drought Response Operations because the water under contract is considered unavailable under DROA.

9. Coordination

Insert description of coordination with the Flaming Gorge Technical Work Group and the Flaming Gorge Working Group regarding Drought Response Operations.

10. Accounting

Insert a full accounting of any past Drought Release Operations from Flaming Gorge and a full accounting of any Drought Response Recovery at Flaming Gorge.

Attachment D

2022 Drought Response Operations Plan

Operations at the Aspinall Unit (Aspinall)

1. Aspinall Operations Without Drought Response

Aspinall operates in accordance with multiple state-decreed water rights and agreements and pursuant to the 2012 Aspinall Record of Decision.

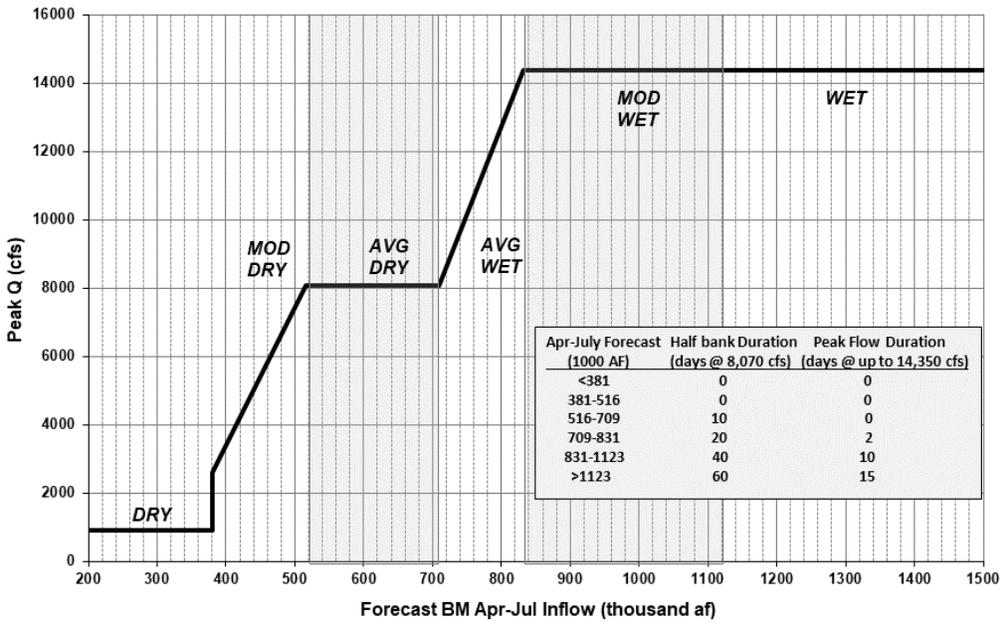
At all times, Aspinall must meet Colorado water administration requirements as determined by the Division 4 Engineer, including bypassing the amount of inflow necessary for downstream water rights senior to Aspinall. Releases above the aforementioned bypass requirements may be made for various purposes according to the water right decrees for the Aspinall Unit reservoirs and their power plants and/or in the minimum amount necessary to meet target flows specified in the 2012 Aspinall Record of Decision as measured by the average daily flow at the Gunnison River near Grand Junction gage.

As the primary storage facility for the Aspinall Unit, Blue Mesa Reservoir is operated to store water during the spring runoff period. Reservoir elevations typically peak late in the spring runoff and then decline as releases are made to satisfy water administration requirements, to meet authorized purposes including power generation, for flood control, for downstream target flows pursuant to the 2012 Aspinall ROD and to meet the December 31 target elevation of 7,490 feet.

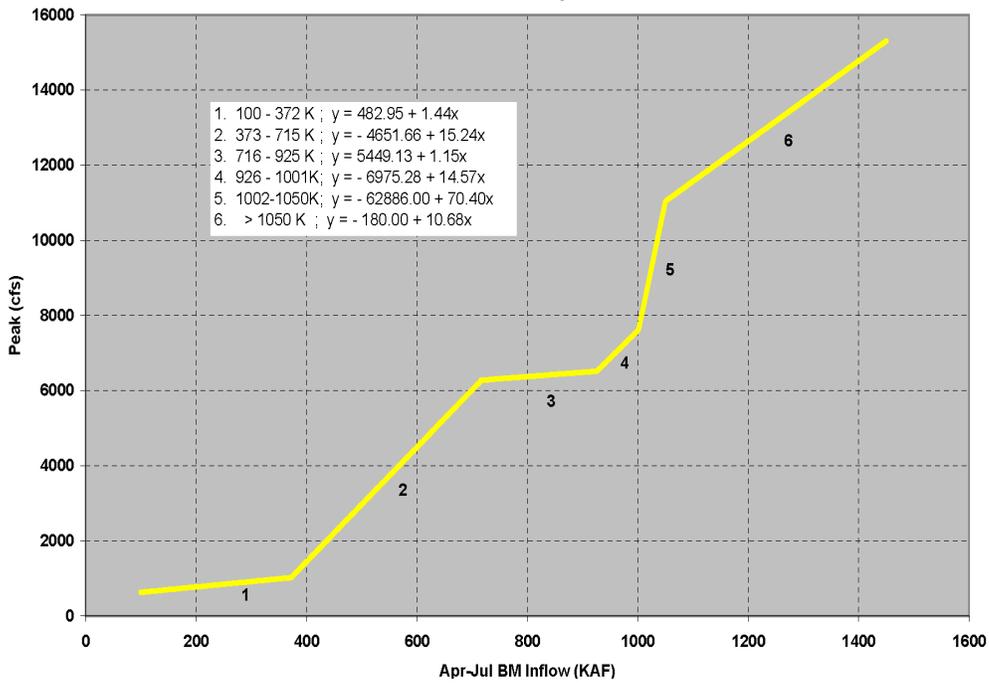
Downstream target flows pursuant to the ROD are divided into spring peak and baseflow periods. These targets vary by hydrologic year type and are determined by May 1 forecasts of April through July inflow into Blue Mesa Reservoir as detailed in Figures 1 and 2 and Table 4.

Operations for spring peak flows are typically timed to match the spring peak from the North Fork of the Gunnison River. Releases during the baseflow period meet multiple purposes including power generation and baseflow targets and to draw the reservoir down to 7,490 feet by December 31 to prevent icing issues upstream of the reservoir. Flexibility exists during the baseflow period to increase releases pursuant to DROA.

Peak Flow and Duration Day Targets at Whitewater



Black Canyon Peak Flow Determination based on Blue Mesa May 1 forecast



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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wet	1050	1050	1050	1050	1050	1500	1500	1500	1050	1050	1050	1050
Mod Wet	1050	1050	1050	1050	1050	1500	1500	1500	1050	1050	1050	1050
Avg Wet	1050	1050	1050	1050	1050	1500	1500	1050	1050	1050	1050	1050
Avg Dry	1050	1050	1050	1050	1050	1500	1500	1050	1050	1050	1050	1050
Mod Dry*	750	750	750/790	750/890	750/890	1050	1050	1050	750/890	750/790	750/790	750
Dry*	750	750	750/790	750/890	750/890	1050	1050	750/890	750/890	750/790	750/790	750

*During March through November in Moderately Dry and Dry type years, additional releases will be made as necessary to provide flows above the 750 cfs anticipated to be diverted by the Redlands Water and Power Company, for the fish ladder and fish screen as shown.

During DROA operations releases above bypasses necessary to meet downstream senior water rights may be made for other decreed purposes such as power generation at the Aspinall Unit reservoirs. Releases above that required for the aforementioned decreed purposes will not be considered as made pursuant to "Operations without Drought Response" as defined in 5.2.1, but would be calculated as "Drought Release Operations".

Current Hydrology

Insert hydrological information specific to Aspinall used to inform the determination of Drought Response Operations at Aspinall.

2. Aspinall Operations without Drought Response during Plan year
3. Aspinall Drought Response Operations

If there are no Drought Response Operations at Aspinall, describe why.

a. Releases

Insert description of Aspinall releases under Drought Response Operations, if any. This will include a description of the amount of water involved (rate, volume, and timing). This will also include a graphic to illustrate the change in water level elevation at Blue Mesa Reservoir, and how that change will change the reservoir's surface area over a specific time period.

b. Recovery

Recovery options are hydrology/year type dependent. For years with longer duration targets (such as moderately wet), there may be opportunities to reduce durations to recover water. This would require consultation with and concurrence from the Upper Colorado River Endangered Fish Recovery Program. Recovery of

the total Drought Response Operations volume can occur in one operation, or over several operations with partial recovery. All recovery scenarios are dependent upon hydrological conditions. Recovery would not occur under any of the described scenarios if below-average hydrology persists in future years. Any reduction in Operations without Drought Response may count towards recovery. It should be noted that some of these scenarios for recovery may have an impact on the volume, frequency and duration of releases.

If Drought Response releases result in Blue Mesa elevation being below the spillway when it otherwise would have been on the spillway, the reductions in spring releases based upon elevation limitations can be accounted as recovered water.

When operations without Drought Response would cause releases to drop Blue Mesa elevation to the Dec 31 icing target, accounting would include that volumetric difference as recovered.

There are two elevation targets, which, if reached, will “recover” all prior Drought Response Operation releases:

- 7517.4 - 7519.4 feet (full reservoir)
- Dec. 31: 7490.0 feet (icing target)

Insert description of Aspinall recovery under Drought Response Operations, if any. This will include a description of the amount of water involved (rate, volume, and timing). This will also include a graphic to illustrate the change in water level elevation at Blue Mesa Reservoir, and how that change will change the reservoir’s surface area over a specific time period.

5. Contracts

Existing water supply contracts and agreements at Aspinall are described below. Any future contracts which become executed will be described here. Water supply contracts and agreements are not impaired by any Drought Response Operations because the water under contract is considered unavailable under DROA.

a. Contract Deliveries

Aspinall currently has various amounts of water under contract for delivery downstream, or for augmentation of depletions upstream in any given year. Current contracts are listed below. Water under contract is not available for Drought Response Operations pursuant to DROA.

b. Taylor Park Exchange Agreement

The Taylor Park Reservoir Operation and Storage Exchange Agreement (1975) allows for the exchange of water stored in Taylor Park Reservoir and Aspinall (Blue Mesa Reservoir) to improve utilization and management of available water supplies under the water rights of the Uncompahgre Project and Blue Mesa Reservoir. The maximum amount of Taylor Park Reservoir exchange water that can be stored within Blue Mesa Reservoir at any time throughout the year is 106,230 acre-feet. The amount of Taylor Park Reservoir exchange water stored in Blue Mesa Reservoir is for diversion by the Uncompahgre Project at the Gunnison Tunnel and is determined through accounting managed by the Colorado Division of Water Resources. This water is not available for release pursuant to DROA.

c. Subordination Agreement

The Subordination Agreement, dated June 1, 2000, formalizes the commitment made by the United States during the planning of the Aspinall Unit to allow subordination of Aspinall Rights up to 60,000 acre-feet per year to in-basin water users so that Aspinall would not interfere with future water development in the Upper Gunnison River Basin. A decree entered in Case No. 03CW263 (October 10, 2006), Water Court, Water Division No. 4, for a plan for augmentation permitted the subordination of Aspinall Rights to augment existing and future water rights exercised for all decreed beneficial purposes within the Gunnison River Basin through any decreed structure or facility upstream of the Crystal Reservoir Dam. Accounting for the plan for augmentation is the responsibility of the State of Colorado Division Engineer's Office, Water Division No. 4.

6. Coordination

Insert description of coordination with Aspinall Operations Meeting, Division 4 Engineer, Upper Colorado River Endangered Fish Recovery Program regarding DROA Releases or recovery.

7. Accounting

Insert a full accounting of any past Drought Response releases from Aspinall and a full accounting of any Drought Response recovery at Aspinall.

Attachment E

2022 Drought Response Operations Plan

Operations at Navajo Reservoir

1. Navajo Reservoir Operations Without Drought Response

Navajo Reservoir Operations are guided by the requirements related to the Navajo Reservoir Operations Biological Opinion (Operations BO) and the San Juan River Recovery Implementation Program (SJRIP) Flow Recommendations.

Navajo Reservoir is operated consistent with the Operations BO issued for the Animas-La Plata Project and the flow recommendations of the SJRIP. Those require operating the reservoir to mimic the natural hydrograph of the river and to maintain certain flow targets.

Reclamation completed an EIS and ROD¹ covering the flow recommendations implementation in 2006. The ROD provides for potential refinement of the flow recommendations based on relevant new information that may be gained over time through an adaptive management process. The range of downstream releases specified in the Navajo Reservoir Operations ROD ranges from 250 to 5,000 cfs.

The Navajo Dam Operating Procedures for implementing the Flow Recommendations are evaluated and revised as needed. The most recent operating procedures for the flow recommendations² were adopted by the SJRIP and Reclamation in 2018. The Flow Recommendations document and the Revised Operating Procedures document prescribe a year-round target baseflow in the San Juan of 500 to 1000 cfs in the critical habitat reach (from Farmington, NM to Lake Powell).

The flow recommendations recommend mimicry of a natural hydrograph in terms of flow magnitude, duration, and frequency during the spring runoff period. Duration and frequency minimums are specified in the Flow Recommendations document and are based on modeling of hydrology from 1928 to 1993. A spring peak release is considered every year to meet recommended flow targets in the critical habitat reach, based on water availability forecasts, projected contract water use, and releases to meet the target baseflow. A spring peak release calls for 5,000 cfs of water to be released continuously, over a period varying from 21 to 60 days.

The End of Water Year Storage Target (EWYST) is one of two target reservoir elevations on September 30th of each year. The lower EWYST, 6,050 ft, is used for the calculation

¹ Record of Decision for the Navajo Reservoir Operations, Navajo Unit – San Juan River New Mexico, Colorado, Utah Final Environmental Impact Statement July 2006.

² Revised Navajo Dam operating procedures for the 1999 San Juan River Flow Recommendations Draft May 2018 (Revised Operating Procedures document).

of forecast available water for a spring peak release to benefit endangered fish and critical habitat. If there is not enough available water for a spring peak release or after the spring peak release occurs, then the EWYST changes to 6,063 ft for the calculation of Excess Water (Excess Water). If there is water in the reservoir above 6,063 ft, that water is considered Excess Water. If Excess Water is available in a given year, it could be released based on a request from the SJRIP to meet a variety of goals of the SJRIP.

Spring Peak Releases and Excess Water are both examples of water which release is timed to benefit the goals of the SJRIP.

In case of severe drought with anticipated shortages to the Navajo Reservoir water users, the Navajo Reservoir Operations ROD allows for consideration of a temporary revision to the spring peak release criteria or lowering of baseflow targets in the critical habitat reach.

2. Current Hydrology

Insert hydrological information specific to Navajo Reservoir used to inform the determination of Drought Response Operations at Navajo Reservoir.

3. Navajo Reservoir Operations without Drought Response during Plan year

4. Navajo Reservoir Drought Response Operations

If there are no releases or recovery for Navajo Reservoir, describe why.

a. Releases

Insert description of Navajo Reservoir releases under Drought Response Operations, if any. This will include a description of the amount of water involved (rate, volume, and timing). This will also include information regarding the change in water level elevation at Navajo Reservoir, and how that change will change the reservoir's surface area over a specific time period.

b. Recovery

Operational Flexibilities for Drought Response Recovery

- a. Recovery Tools Under the Navajo Reservoir Operations:
 - i. Recovery of the Cumulative Volume of the Drought Response Operation Release

Recovery of the total Drought Response Operations volume can occur in one operation, or over several operations with partial recovery. The following are examples of potential operations that result in recovery. All recovery scenarios are dependent upon hydrological conditions. Recovery would not occur under any of the

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described scenarios if below-average hydrology persists in future years. Any reduction in Operations without Drought Response may count towards recovery. It should be noted that some of these scenarios for recovery may have an impact on the volume, frequency and duration of releases as specified in the Revised Operating Procedures document.

The variables used in the equations for these scenarios are as follows:

D_{tot} = Total Drought Response Operations volume released in prior release(s)

D_o = Drought Response Operations volume recovered under any of these recovery scenarios. If D_o is less than or equal to zero, no Drought Response Operations volume is recovered.

D_{rem} = Remaining Drought Response Operations Volume to be Recovered = $D_{tot} - \sum D_{oi}$ ($i=1..n$, representing total number of events that have resulted in the recovery of Drought Response Operations releases). Once D_{rem} is reduced to zero, full recovery has occurred.

S_{6063} = Storage volume at 6063 ft

S_{6085} = Storage volume at 6085 ft (maximum active storage)

S_{fcm} = Maximum flood control storage as defined by the USACE water control manual, based on forecast inflows and date.

S = Observed storage

AW = Available Water = Projected available water volume for a spring peak release

SPR = minimum volume required to make a spring peak release

SPRING OPERATIONS: A spring peak release (Spring Peak) from Navajo Reservoir, as recommended and described by the SJRIP, will occur when, after accounting for forecast inflows, regular releases and contract uses, and evaporation, it is projected that there will be enough Available Water over the lower EWYST of 6050 ft to make a spring peak release for the recommended duration. There is opportunity for partial or full Drought Response Operations recovery under this scenario. The equation below illustrates how such recovery would be calculated.

$$D_o = AW + D_{rem} - SPR$$

FALL OPERATIONS: If the Excess Water is available, withholding some, or all of that Excess Water could result in partial or full Drought Response Operations

recovery. If Excess Water is not available, there could still be a potential for partial recovery depending on the storage in the reservoir. The equation below illustrates how such recovery would be calculated.

$$Do = S + Drem - S6063$$

FLOOD CONTROL OPERATIONS: The US Army Corps of Engineers (USACE) defines variable flood control space to allow for forecast inflows without spilling during runoff season. This flood control space is based on the inflow forecast and day of the year. Partial or full Drought Response Operations recovery could occur if the difference between the maximum flood control storage volume and the actual storage is less than or equal to Drem. The equation below illustrates how such recovery would be calculated.

$$Do = S + Drem - Sfc$$

Similarly, partial or full Drought Response Operations recovery could occur if the difference between the top of active storage and the actual storage is less than or equal to Drem.

$$Do = S + Drem - S6085$$

There are four elevation targets, which, if reached, will “recover” all prior Drought Response Operation releases. These elevation targets are also used in the previous section for incremental recovery by tracking volumes.

- September 30th: 6063 ft or higher
- September 30th: 6050 ft or higher – Recovery complete (only if a spring peak release was made that calendar year).
- January 1st – July 15th: If the reservoir elevation intersects the maximum flood control elevation allowed by the U.S. Army Corps of Engineers at any point in this timeframe.
- Jan 1st – Dec 31st: 6085 ft

4. Contracts

Existing water supply contracts and agreements at Navajo Reservoir are described below. Any future contracts which become executed will be described here. Water supply contracts and agreements are not impaired by any Drought Response Operations because the water under contract is considered unavailable under DROA.

Navajo Reservoir contracted water volumes listed below represent the full allocation of water contract:

i. Williams Gas Processing (expires 3/31/28): 50 af/yr.

ii. Navajo Nation Settlement Contract (no expiration): 508,000 af/yr for NIIP which includes 22,650 af/yr of diversion (20,780 af/yr of depletion) for the Navajo-Gallup Water Supply Project.

iii. Jicarilla Apache Nation Settlement Contract (no expiration): not to exceed 33,500 af/yr diversion (25,500 af/yr of depletion) for use in New Mexico from the Navajo Reservoir Supply.

Shortages to contracts at Navajo Reservoir will be handled according to the provisions of Public Law No. 87-483, as amended by Public Law No. 111-11.

5. Coordination

Insert description of coordination with the San Juan River Recovery Implementation Program regarding Drought Response Operations.

6. Accounting

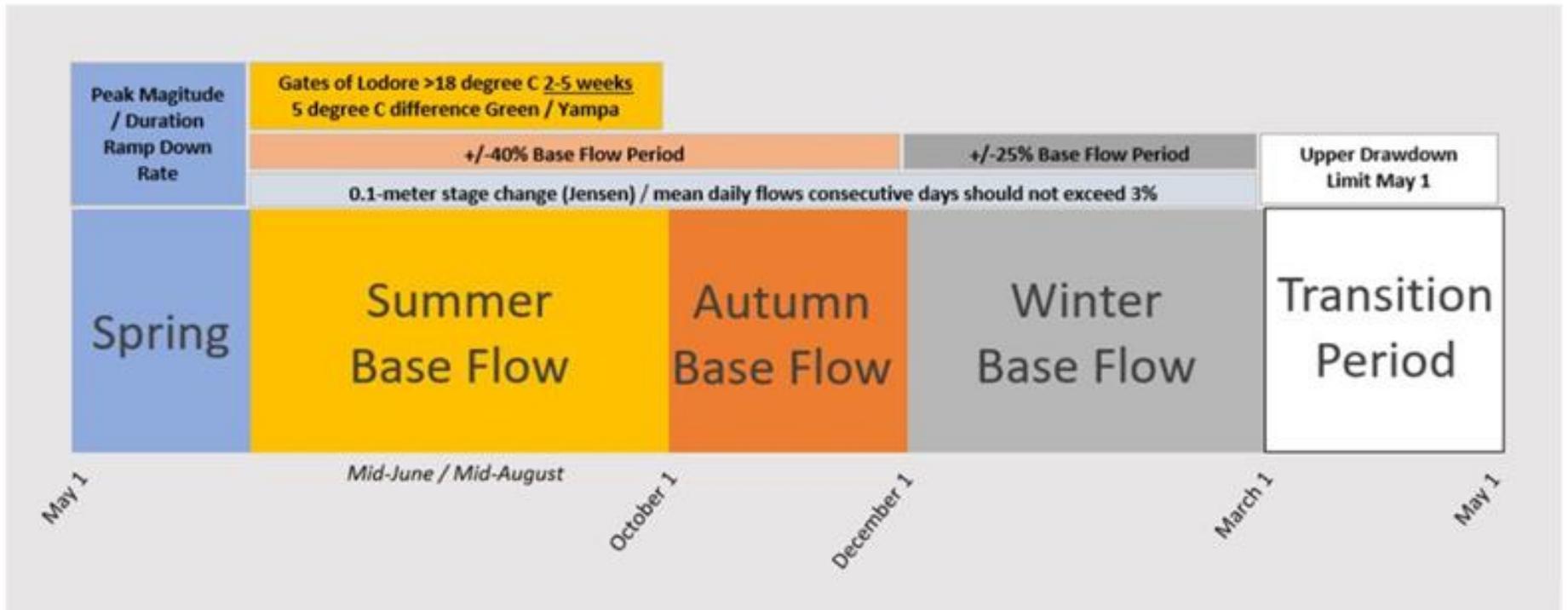
Insert a full accounting of any past Drought Response releases from Navajo Reservoir and a full accounting of any Drought Response recovery at Navajo Reservoir.

Attachment C – Appendix 1

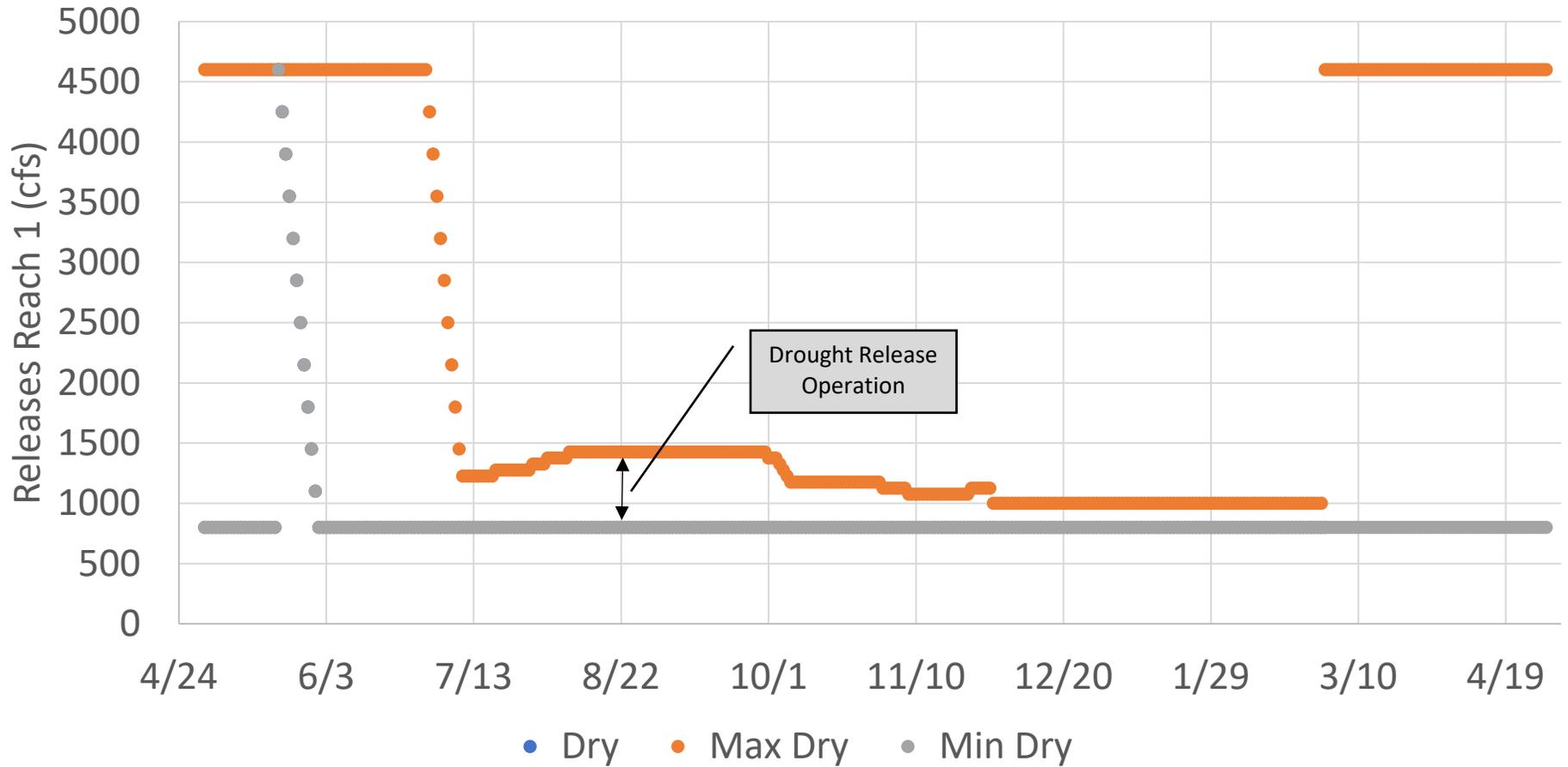
Flow and Temperature Characteristics	Summer (July-September)	Autumn (October – November)	Winter (December – February)	Transition Period (March -April)	May - April Volume)
Wet (0–10% Exceedance)	Reach 1 Normal 1990 cfs (1620-2330 cfs) Max 3550 cfs (3170-3740 cfs) Min 1600 cfs (1220-1790 cfs) Reach 2 2560 cfs (2170 – ≤ 4200 cfs)	Reach 1 Normal 3090 cfs (2330-3460 cfs) Max 3300 cfs (2530-3670 cfs) Min 2130 cfs (1360-2500 cfs) Reach 2 3950 cfs (2990 - ≤ 4200 cfs)	Reach 1 Normal 3200 cfs (2580-3470 cfs) Max 3200 cfs (2580-3470 cfs) Min 2650 cfs (2030-2920 cfs) Reach 2 3740 cfs (3190 - ≤ 3750 cfs)	Reach 1 Normal 1650 cfs Min 800 cfs Max 4600 cfs	Reach 1 Normal 2390 KAF (1900 - 2970 KAF) Max 2630 KAF (2030 - 3211 KAF) Min 2290 KAF (1730 - 2870 KAF)
Moderately Wet (10–30% Exceedance)	Reach 1 Normal 2030 cfs (1140-3340 cfs) Max 3700 cfs (2810-5010 cfs) Min 1700 cfs (940-3010 cfs) Reach 2 2200 cfs (1930 – ≤ 3920 cfs)	Reach 1 Normal 2670 cfs (2040-3900 cfs) Max 3340 cfs (2710-4570 cfs) Min 1630 cfs (1000-2860 cfs) Reach 2 3230 cfs (2190 - ≤ 3920 cfs)	Reach 1 Normal 3000 cfs (2530-3660 cfs) Max 3050 cfs (2580-3710 cfs) Min 2150 cfs (1680-2810 cfs) Reach 2 3430 cfs (2580 - ≤ 3500 cfs)	Reach 1 Normal 1650 cfs Min 800 cfs Max 4600 cfs	Reach 1 Normal 2090 KAF (1640 - 3000 KAF) Max 2600 KAF (2000 - 3504 KAF) Min 1730 KAF (1320 - 2640 KAF)
Average (30-70% Exceedance)	Reach 1 Normal 1680 cfs (1000-1860 cfs) Max 3000 cfs (2310-3180 cfs) Min 1680 cfs (1000-1860 cfs) Reach 2 2030 cfs (2030 – ≤ 3360 cfs)	Reach 1 Normal 1280 cfs (800-1670 cfs) Max 2780 cfs (2060-3170 cfs) Min 1170 cfs (800-1560 cfs) Reach 2 1830 cfs (1720 - ≤ 3360 cfs)	Reach 1 Normal 2150 cfs (1570-2500 cfs) Max 2550 cfs (1970-2900 cfs) Min 1800 cfs (1220-2150 cfs) Reach 2 2600 cfs (2250 - ≤ 3000 cfs)	Reach 1 Normal 1650 cfs Min 800 cfs Max 4600 cfs	Reach 1 Normal 1470 KAF (1090 - 2010 KAF) Max 2130 KAF (1660 - 2675 KAF) Min 1390 KAF (1030 - 1930 KAF)
Average (50–70% Exceedance)	Reach 1 Normal 1840 cfs (1520-1950 cfs) Max 3160 cfs (2850-3270 cfs) Min 1840 cfs (1520-1950 cfs) Reach 2 2030 cfs (2030 - ≤ 3360 cfs)	Reach 1 Normal 1520 cfs (1020-1750 cfs) Max 2890 cfs (2130-3120 cfs) Min 1350 cfs (840-1580 cfs) Reach 2 1940 cfs (1760 - ≤ 3360 cfs)	Reach 1 Normal 2650 cfs (2240-2950 cfs) Max 2650 cfs (2240-2950 cfs) Min 2250 cfs (1840-2550 cfs) Reach 2 3000 cfs (2600 - ≤ 3000 cfs)	Reach 1 Normal 1650 cfs Min 800 cfs Max 4600 cfs	Reach 1 Normal 1470 KAF (1160 - 1930 KAF) Max 2190 KAF (1820 - 2657 KAF) Min 1370 KAF (1070 - 1840 KAF)
Moderately Dry (70–90% Exceedance)	Reach 1 Normal 1620 cfs (1270-1710 cfs) Max 1870 cfs (1520-1960 cfs) Min 1370 cfs (1020-1460 cfs) Reach 2 1820 cfs (1570 - ≤ 2100 cfs)	Reach 1 Normal 910 cfs (800-1150 cfs) Max 1640 cfs (970-1870 cfs) Min 870 cfs (800-1110 cfs) Reach 2 1320 cfs (1280 - ≤ 2100 cfs)	Reach 1 Normal 850 cfs (800-1130 cfs) Max 1480 cfs (840-1740 cfs) Min 850 cfs (800-1130 cfs) Reach 2 1220 cfs (1220-≤ 1875 cfs)	Reach 1 Normal 1650 cfs Min 800 cfs Max 4600 cfs	Reach 1 Normal 870 KAF (680 - 1320 KAF) Max 1560 KAF (1180 - 2003 KAF) Min 830 KAF (650 - 1270 KAF)
Dry (90–100% Exceedance)	Reach 1 Normal 800 cfs (800-830 cfs) Max 1420 cfs (800-1450 cfs) Min 800 cfs (800-890 cfs) Reach 2 930 cfs (930 - ≤ 1540 cfs)	Reach 1 Normal 800 cfs (800-1040 cfs) Max 1150 cfs (800-1390 cfs) Min 800 cfs (800-1040 cfs) Reach 2 1190 cfs (1190 - ≤ 1540 cfs)	Reach 1 Normal 800 cfs (800-1060 cfs) Max 1000 cfs (800-1260 cfs) Min 800 cfs (800-1080 cfs) Reach 2 1180 cfs (1180-≤ 1375 cfs)	Reach 1 Normal 1650 cfs Min 800 cfs Max 4600 cfs	Reach 1 Normal 720 KAF (620 - 1150 KAF) Max 1340 KAF (1040 - 1770 KAF) Min 720 KAF (620 - 1160 KAF)

Reclamation retains the authority to modify this table as needed and may change due to hydrologic conditions.

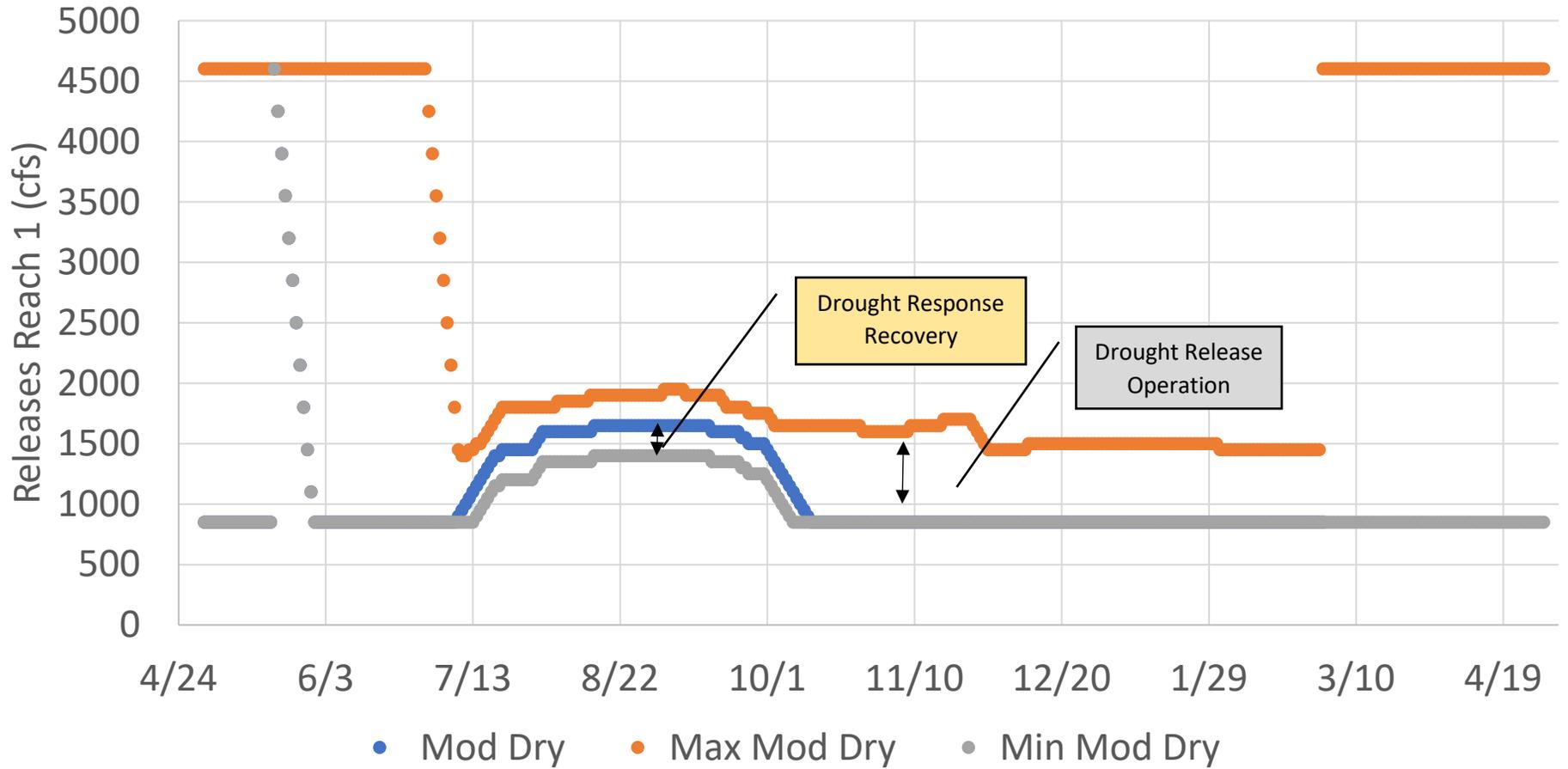
2000 Flow and Temperature Recommendations – ROD Periods



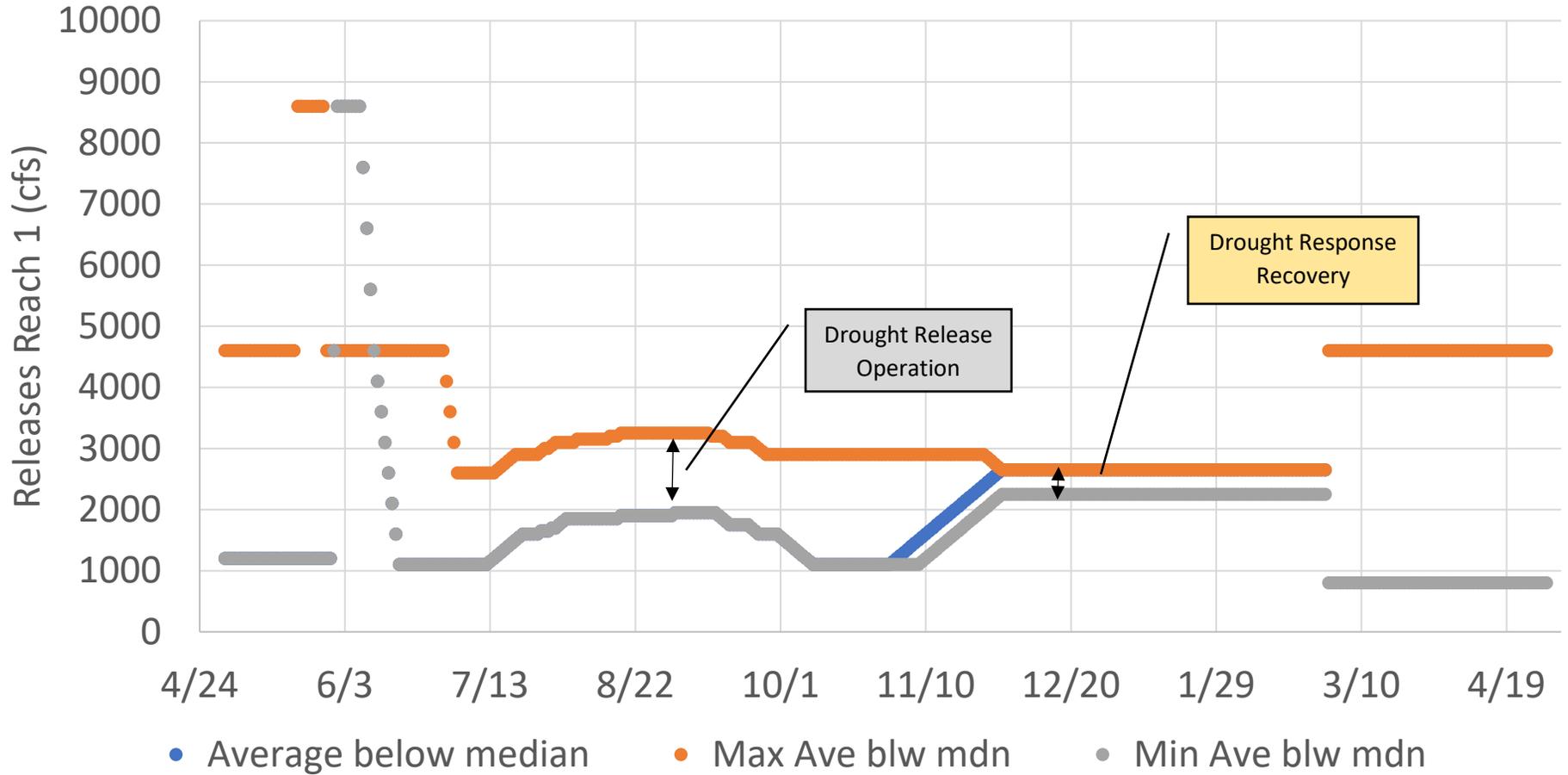
Dry, Minimum, and Maximum Releases



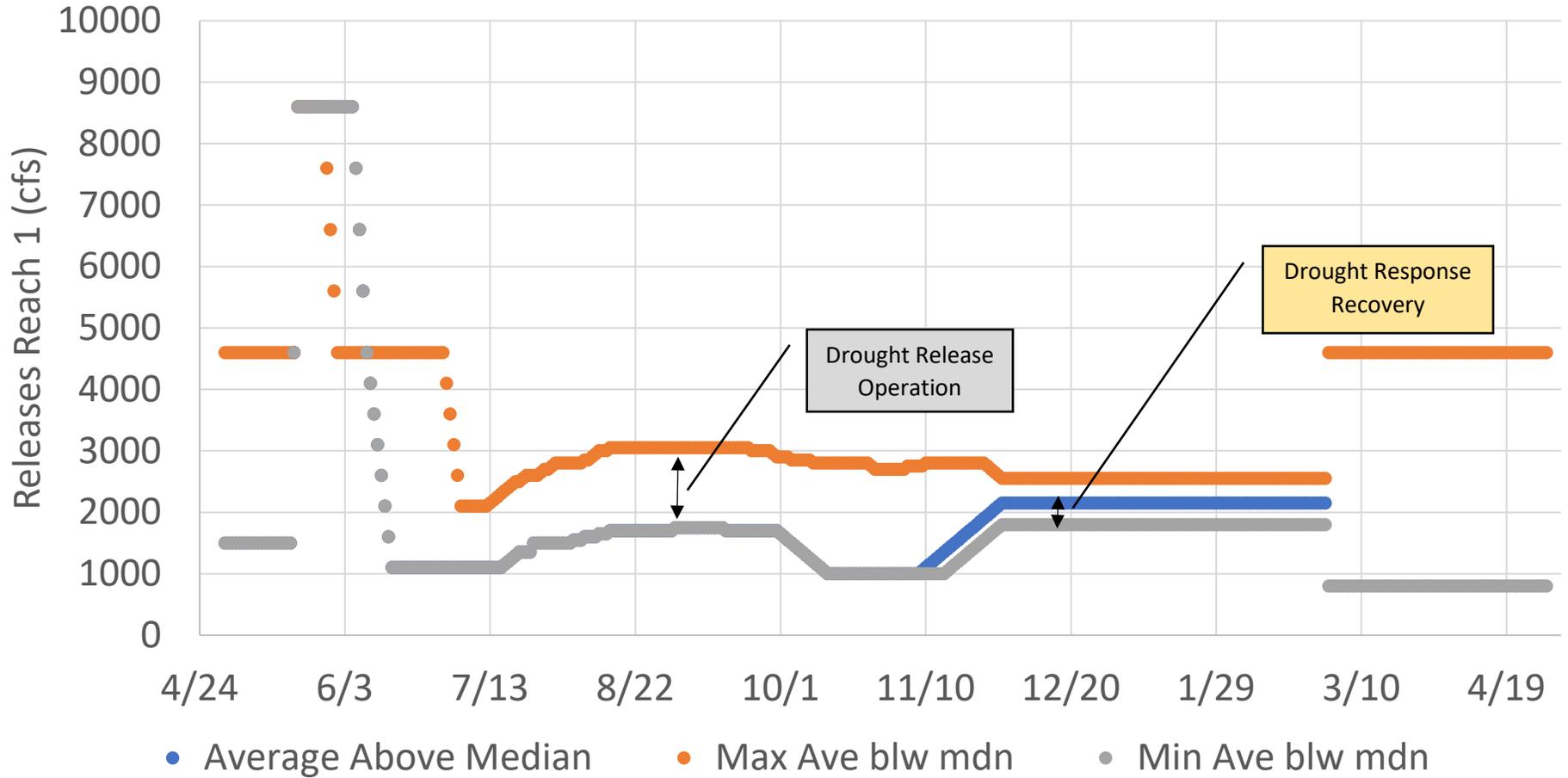
Moderately Dry, Minimum, and Maximum Releases



Average Below Median, Minimum, and Maximum Releases



Normal, Minimum, and Maximum Releases Average Median



Normal, Minimum, and Maximum Releases Moderately Wet

