

No. 137, Original

♦

In The
Supreme Court Of The United States

♦

STATE OF MONTANA,

Plaintiff,

v.

STATE OF WYOMING

and

STATE OF NORTH DAKOTA

Defendants.

♦

Before the Honorable Barton H. Thompson, Jr.
Special Master

♦

MONTANA'S POST-TRIAL BRIEF

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INTRODUCTION

Montana hereby files its Post-Trial Brief regarding the trial of the liability phase of this case, which occurred in the fall of 2013 in Billings, Montana.

Montana has proven that Wyoming violated the Compact in a number of years and has established the amount by which Wyoming violated the Compact in four years. Specifically, the evidence presented at trial shows that (1) Montana provided notice to Wyoming sufficient to meet the requirements set by the Special Master in all the years at issue; (2) Montana's Pre-Compact¹ water rights went unsatisfied in these years; and (3) Wyoming allowed its post-Compact² water rights to store and divert during times when Montana's pre-Compact rights were unsatisfied.

STATEMENT OF CLAIMS

Trial on the liability phase of this case is now complete. The objective is to determine whether Wyoming has violated the Yellowstone River Compact (the "Compact"), and if so, in what amount of water. *See* CMP No 1, § II.

The Special Master has held that, to demonstrate a Compact violation in any given year, Montana must establish the following elements: (1) insufficient water entered Montana to satisfy Montana's pre-1950 appropriative rights; and (2) Wyoming provided water to its post-1950 users when Montana's pre-1950 rights were not being satisfied. *See, e.g.*, First Interim Report of the Special Master at 29 (Feb. 10, 2010) ("FIR"); Transcript of Telephonic Status Hearing Before Special Master Barton Thompson at 25:25-26:4 (July 29, 2011) ("Hearing Transcript").

¹ "Post-Compact" and "post-1950" refer to the period after January 1, 1950

² "Pre-Compact" and "pre-1950" refer to the period before January 1, 1950.

Additionally, in ruling on Wyoming's previous summary judgment motions, the Special Master ruled that Wyoming could be held liable for a Compact violation in a given year only if it had been placed on notice that Montana's pre-Compact rights were not being satisfied. The Special Master found a triable issue with respect to such notice for the years 1981, 1987-89, 2000, 2001, 2002, 2003, 2004, and 2006. Montana was permitted at trial to present evidence regarding Wyoming's liability in those years. Pre-Trial Conf. Tr. 47:6-23 (Special Master (Oct. 15, 2013)).

As will be shown in the discussion that follows, the evidence at trial establishes that Wyoming violated the Compact in all of the years at issue. Montana has quantified the amount of Wyoming's violations in acre-feet of water for the years 2001, 2002, 2004, and 2006.

Montana's claims can be divided into two categories: (1) storage claims and (2) direct flow claims. Montana has one reservoir, the Tongue River Reservoir ("TRR" or "Reservoir"), on the mainstem just below the stateline. The Reservoir typically fills by the end of June or early July each year, and the stored water is then released over the remainder of the irrigation season as needed by contract users. Montana maintains that it is entitled under the Compact to fill the Reservoir to its full capacity of 79,071 acre-feet by the end of the fill season in late June or early July. Thus, when the Reservoir does not fill by the end of the fill season, as happened in 2001, 2002, 2004, and 2006, Montana is entitled to receive all water stored that year during the fill period under post-Compact priorities by reservoirs in Wyoming. In addition, the Compact protects Montana from further diversions of storage or direct flow water under post-Compact rights in Wyoming so long as Montana's Pre-Compact rights remain unsatisfied.

Montana has 77 Pre-Compact direct flow rights on the Tongue River. These direct flow rights have diversion rights in a total amount of over 350 cubic feet per second ("cfs"). The full

amount of each diversion right is not required in every month of the irrigation season, so the total monthly demand has been quantified by Montana's expert, Dale E. Book, P.E. That demand ranges from 195 cfs in May to 350 cfs in July. In most years, the river flows available for diversion fall off precipitously at or near the end of the fill season for the Reservoir, causing the situation on the river to shift rapidly from one where direct flows are sufficient for all users to one where flows are sufficient only for one user in Montana. At that point in the irrigation season, the direct flow demand is dominated by the demand of the T&Y Irrigation District ("T&Y"), with its 187.5 cfs right at the lower end of the Tongue River in Montana. During that period, the T&Y is typically unable to obtain enough water to satisfy its direct flow right, and therefore must rely, as must all other more junior pre-1950 irrigators, on releases of contract water from the Reservoir.

When pre-Compact water rights are going unsatisfied in Montana, no post-Compact rights in Wyoming are allowed to divert or store. It is Wyoming's responsibility under the Compact to regulate off all post-Compact storage and direct flow rights in Wyoming when the pre-Compact direct flow rights of Montana are not being satisfied. *See* FIR at 89; *Montana v. Wyoming*, 131 S. Ct. 1765, 1771 (2011).

The evidence presented at trial establishes that Wyoming violated the Compact in each of the years at issue. Montana has analyzed the available data and quantified Wyoming's violations for four of those years as follows: 1,530 acre-feet in 2001; 2,795 acre-feet in 2002; 2,166 acre-feet in 2004; and 3,232 acre-feet in 2006. These violations add up to a cumulative Compact violation in the amount of 9,723 acre-feet for those four years .

BACKGROUND

I. Procedural Background

1. Following the Court's ruling on Montana's exceptions to the First Interim Report, the Special Master authorized Wyoming to file a motion for partial summary judgment to preclude Montana from claiming damages for any years in which Montana did not notify Wyoming that its pre-1950 appropriators were not receiving adequate water.

2. Wyoming filed a motion for partial summary judgment ("Wyo. First Mot." or "First Motion") and brief in support ("Wyo. First Br.") on September 12, 2011. In its First Motion, Wyoming argued that Montana should be precluded from claiming damages for any years other than 2004 and 2006 because it did not notify Wyoming that it needed water to satisfy pre-1950 appropriators.

3. After obtaining the parties' comments on a draft opinion, the Special Master issued his Memorandum Opinion on Notice Requirements on December 20, 2011. In that opinion, the Special Master reserved final ruling on Wyoming's First Motion to allow further discovery. *Id.* at 11. Wyoming was instructed to file a renewed motion for partial summary judgment on or before June 15, 2012. *Id.* at 12; *see also* Case Management Order No. 10 ("CMO No. 10) at ¶ 10.

4. On June 15, 2012, Wyoming filed a renewed motion for partial summary judgment ("Wyo. Second Mot." or "Renewed Motion") and brief in support ("Wyo. Second Br."). Montana filed a brief in opposition to the Renewed Motion on July 14, 2012.

5. The Special Master granted partial summary judgment in favor of Wyoming, precluding Montana from claiming damages or other relief for Article V(A) violations except for the years 1987, 1988, 1989, 2000, 2001, 2002, 2003, 2004 and 2006, and directed Montana to

provide supplemental evidence for all of the remaining years apart from 2004 and 2006. Following submission of Montana's supplemental evidence, the Special Master held that for the years 1987-1989 and 2001-2003, Montana would be allowed to seek damages, that for the year 2000 it would be allowed to seek relief only for the period before the end of the irrigation season, and that for all years it would be required to prove that it acted diligently in learning of pre-1950 deficiencies and notifying Wyoming of those deficiencies.

6. Following the close of discovery, the parties submitted pre-trial filings, including additional dispositive motions and motions *in limine*. These filings included Wyoming's motion for summary judgment on all the years remaining at issue, claiming, among other things, that a 1992 agreement relating to the Northern Cheyenne Tribe Compact was dispositive of the majority of Montana's claims in the case. Montana also filed a motion for summary judgment seeking a legal ruling that the Compact leaves administration of water rights in each State to be determined under that State's law.

7. On September 16, 2013 the Special Master ruled on these dispositive motions. With respect to Wyoming's motion, the Special Master disagreed with Wyoming's interpretation of the 1992 agreement, and denied the motion except that he determined that, while Montana could present evidence of liability for years other than 2001, 2002, 2004, and 2006, evidence on the quantification of Wyoming's violations would only be allowed for those four years. With respect to Montana's motion, the Special Master held that Montana is not required to adopt any specific intrastate regulations or administration of its water rights in order to claim the protections under the Compact, so long as those regulations and administration are consistent with the doctrine of prior appropriation and that the presumption was that Montana's water administration was satisfactory under the Compact. Memorandum Opinion of the Special

Master on Montana's Motion for Summary Judgment on the Compact's Lack of Specific Intrastate Administration Requirements at 5 ("Sept. 16 Mem. Op.")

8. Trial was held from October 16 to December 4, 2013 in Billings Montana.

II. The Yellowstone River Compact

9. The Yellowstone River Compact "deals with the entitlements of the States of Montana and Wyoming to the waters of the . . . Tongue River[]." FIR at 1 (Feb. 10, 2010).

10. "Article V allocates the waters of the Yellowstone River system among the three states and is the key substantive provision of the Compact for purposes of this action." *Id.* at 10.

11. "Read together, Articles V(A) and V(B) of the Compact establish a three-level hierarchy.

(1) First, pre-1950 appropriative rights are to 'continue to be enjoyed.' Compact, Art. V(A). These pre-1950 rights receive the highest priority under the Compact.

(2) 'Of the unused and unappropriated waters of the Interstate tributaries of the Yellowstone River as of January 1, 1950,' water goes next to 'provide supplemental water supplies' for pre-1950 right holders. Compact, Art. V(B), 1st clause. These supplemental water rights, like pre-1950 rights, are to be 'enjoyed in accordance with the laws governing the acquisition and use of water under the doctrine of appropriation.' Compact, Art. V(B), 2nd clause.

(3) Finally, the 'remainder of the unused and unappropriated water is allocated to each State for storage or direct diversions for beneficial use on new lands or for other purposes' according to the percentages for each tributary. Compact, Art. V(B), 3rd clause."

Id. at 18-19.

12. "The final Compact provides block protection for all existing, pre-1950 appropriations, without attempting to quantify the amounts of those appropriations, and then,

after providing for supplemental appropriations for lands already under irrigation, apportions the amount that remains.” *Id.* at 22.

13. Article V(A), which is the primary focus of this case, “requires Wyoming to ensure on a constant basis that water uses in Wyoming from after January 1, 1950 are not depleting the waters flowing into Montana to such an extent as to interfere with pre-1950 appropriative rights in Montana.” *Id.* at 29.

14. Article V(A) specifically protects “[a]ppropriative rights to the beneficial uses of . . . water.” “Beneficial use,” in turn, is defined in Article II(H) as “that use by which the water supply of a drainage basin is depleted when usefully employed by the activities of man.” The Compact definition of “Beneficial use,” however, “does not change the scope of the pre-1950 appropriative rights that it protects in both States.” *Montana v. Wyoming*, 131 S. Ct. at 1777-79.

15. The Compact makes clear that all water users in each State are subject to the Compact rights and obligations of their State, providing that

Any individual, corporation, partnership, association, district, administrative department, bureau, political subdivision, agency, person, permittee, or appropriator authorized by or under the laws of a signatory State and all others using, claiming, or in any manner asserting any right to the use of the waters of the Yellowstone River System under the authority of said State, shall be subject to the terms of this Compact.

Compact, Art. I(B).

16. The Compact further provides that “[n]othing contained in this Compact shall be so construed or interpreted as to affect adversely any rights to the use of the waters of Yellowstone River and its tributaries owned by or for Indians, Indian tribes, and their reservations.” *Id.* at Art. VI.

17. The historical record from the negotiations of the Yellowstone River Compact indicates that Wyoming and Montana meant for pre-Compact water rights in use as of January 1, 1950, to be defined, administered, and managed by each State in accordance with that State's laws and practices. *See* Ex. M12.

18. Consistent with this historical record, the Compact states:

No sentence, phrase, or clause in this Compact or in any provision thereof, shall be construed or interpreted to divest any signatory State or any of the agencies or officers of such States of the jurisdiction of the water of each State as apportioned in this Compact.

Compact, Art. XVIII.

III. Summary of Trial Evidence

A. Notice

19. The historical record indicates that the negotiators intended to avoid interstate administration under the Compact. There is no indication in the historical record that the negotiators intended to require Montana to make an interstate priority call when its pre-Compact uses were unsatisfied. Ex. M12 at 1-2.

20. The Compact does not contain any reference to an interstate priority call. Ex. J1; *see also* Tr. 5067:21-25 (Lowry).

21. The Yellowstone River Compact Commission ("YRCC") meets on an annual basis and provides annual reports of those meetings. The YRCC annual reports are available at <http://yrcc.usgs.gov/YRCC%20-%20Commission%20Annual%20Reports.htm>, and were received in evidence as Exhibits J2 through J57 in this case. Over the years, the YRCC has adopted regulations concerning the Compact and its administration. The YRCC has never adopted regulations requiring Montana to make interstate priority calls as a condition of its right to seek relief under the Compact. Tr. 5068:1-7 (Lowry).

1. Wyoming Had Information About the Amount of Water Satisfy Necessary to Montana's Pre-Compact Water Rights

22. Wyoming has historically used Montana's lack of a centralized water rights system as an excuse for Compact non-compliance. The record shows, however, that the States have exchanged numerous documents over the years regarding water rights in both States. Tr. 5040:2-5 (Lowry). Wyoming thereby possessed ample information enabling it to ensure that water reached the stateline in sufficient quantities to satisfy Montana's pre-Compact rights.

23. The Engineering Report, which was produced as part of the Compact negotiations, contains detailed information about the water rights on the Tongue and Powder Rivers in each State. See Ex. W266.

24. In 1958 Montana provided Wyoming with water resources reports documenting water uses and irrigation practices in the nine counties within the Yellowstone River Basin affected by the Compact. Ex. M16. Mr. Moy provided those same water resources reports to Wyoming in the 1980s. The water resources reports provide detailed and accurate information concerning Montana's pre-Compact water rights. Tr. 2566:21 – 2570:9 (Moy); Tr. 4952:8 – 4953:5 (Lowry).

25. In 1966 Montana presented a report to the YRCC detailing all water right filings in Montana's four tributary basins from January 1, 1950 to October 1966. Ex. J16 at 4.

26. In 1978 Montana provided a report to Wyoming and the Compact Commissioners containing "estimates of irrigated lands, irrigation requirements, and number of reservoirs in the Montana portion of the Tongue River Basin." Ex. M260. That report contained information regarding the amount of water necessary for pre-1950 Montana irrigators at the headgate, and indicated that 19,755 acres of pre-1950 land was being irrigated in Montana and required 57,913

acre feet of water. The report also provided information on pre-1950 reservoirs and monthly streamflow data for 1971 to 1976. *Ibid.*; Ex. J28.

27. By the 1980s, and likely much earlier, Montana provided Wyoming with a copy of the 1914 Miles City Decree. Tr. 5041:-10 (Lowry); Tr. 5059:4-10 (Lowry); Ex. M243.

28. In the 1980s, as part of planning for the enlargement of the Tongue River Reservoir, Montana developed a model of the firm annual yield and available water supply for the Reservoir. That effort included an evaluation of the water supply upstream of the Reservoir as well as the water uses downstream of the Reservoir so that Montana could understand how much water it was entitled to under the Compact. Tr. 4958:3 – 4959:3 (Lowry); Tr. 4960:16-18 (Lowry). As part of that process, Montana provided detailed information about its pre-Compact water rights to Wyoming. Tr. 2566:21–2570:9 (Moy); Tr. 4952:8–4953:5 (Lowry). A representative of the Wyoming State Engineer's office participated in the technical committee that developed the model. Tr. 2569:6-14 (Moy); Tr. 2697:3-19 (Moy). In that role, the Wyoming representative evaluated Wyoming's water use, and estimated Wyoming's supplemental supplies under the Compact. Ex. M427; Tr. 4959:16 – 4960:18 (Lowry). The final model was provided to Wyoming. Tr. 4958:3 – 4959:3 (Lowry).

29. In the 1980s, Montana also requested information from Wyoming about its pre-Compact uses. Tr. 2688:5 – 2690:2 (Moy). By no later than the early 2000s, and likely before, Montana informed Wyoming that it sought the information about Wyoming's pre-Compact water use because it was concerned that Wyoming was using more than its share of the water. Tr. 2689:13 – 2690:2 (Moy).

30. Montana kept Wyoming informed about the adjudication process on the Tongue River in Montana, including the adjudication of the water rights associated with the Reservoir. Tr. 4954:24 – 4955:14 (Lowry).

31. In the early 2000s, Wyoming conducted its own detailed analysis of Compact water use in Wyoming. Part of Wyoming's analysis involved determining the amount of water that is available to Wyoming in dry, normal, and wet years. This evaluation necessarily involved considering the amount of water that Montana is entitled to under the Compact. Ex. J58 at Part II-1, III-1, III-63; Tr. 5048:3 – 5050:24 (Lowry).

32. The YRCC annual reports contain information about the Tongue River Reservoir, including information about the priority date and whether the Reservoir filled to capacity. *E.g.*, Tr. 4956:7 – 4957:10 (Lowry). Wyoming periodically monitored the gauges at the stateline and at the Tongue River Reservoir to see how much water was available to Montana. Tr. 4984:20 – 4986:2 (Lowry).

2. Wyoming's Longstanding Position on Article V(A)

33. Wyoming's longstanding position was that Wyoming had no obligation under the Compact to provide water to satisfy Montana's pre-Compact water rights. Ex. J65; Ex. J69; Ex. M183 at 2; Ex. M157; Ex. W76; Tr. 689:15-23 (Stults); Tr. 2631:12-21 (Moy) (describing "Wyoming's position from day one"); Tr. 4991:6-16 (Lowry); Tr. 4995:23 – 49096:2 (Lowry).

34. A related and equally longstanding position taken by Wyoming was that the Compact makes no provision for interstate calls. Ex. J65; Ex. J69; Tr. 2631:3-11 (Moy) (describing "what Wyoming has said all along for all those years"); Tr. 4994:8-23 (Lowry); Tr. 5025:18 – 5026 (Lowry); Tr. 5052:4-24 (Lowry). That position changed only in the course of

this litigation. Now Wyoming maintains that a call is required as a condition of Montana's enforcement of its pre-Compact water rights. Tr. 5052:4 – 5053:19 (Lowry).

35. Montana communicated to Wyoming its view that Article V(A) protected Montana's pre-Compact rights throughout the period from the 1980s through the 2000s. Tr. 2552:12 – 2553:8 (Moy). Wyoming disagreed with Montana's position and held to its established position that the Compact did not protect pre-Compact rights and did not allow for a priority call. Tr. 2553:9- 20 (Moy). Wyoming's position remained from the 1980s until this litigation. Tr. 2556:18 – 2557:4 (Moy). This was "extremely frustrating" to Montana officials who were working hard to provide water for Montana's pre-Compact uses. Tr. 2554:5-22 (Moy).

36. Wyoming's position on the related issues of Article V(A) and interstate calls was so entrenched that the Wyoming Water Commissioners did not "receive any direction from the state engineer with regard to what action to take, if any, in response to calls from the State of Montana." Tr. 2000:4-11 (LoGuidice).

37. Montana was guided by the longstanding conflict over the interpretation of the Compact in its communications with Wyoming. *E.g.*, Tr. 888:1-7 (Stults).

3. Wyoming's Rejection of Montana's Attempts to Administer Article V(A)

38. In 1952, shortly after the adoption of the Compact, the Wyoming State Engineer made the following statement about Article V: "The compact only divided the unappropriated waters, and left the division of the appropriated waters for later settlement by the Courts." Ex. M59. Wyoming maintained that view of the Compact until the Special Master issued his First Interim Report in this case. Wyoming thereby effectively foreclosed administration of Article V for the purpose of protecting pre-1950 uses in Montana. In addition, Wyoming has rebuffed all

attempts to quantify water availability for administration of Article V(A), focusing instead on post-1950 development contemplated in Article V(B).

39. In 1971, YRCC Chairman R.C. Williams urged the States to develop a model for computing water allocations and water uses in Montana and Wyoming. Mr. Williams presented a proposed model to the Commission in 1971, Ex. J21, but it was inconsistent with Wyoming's position on Article V(A), and was never adopted. *See* Ex. J22.

40. The 1971 Annual Report indicates that "[d]uring 1971, a large amount of time and effort was devoted to the exchange of views on provisions of the Compact." Ex. J21 at 3.

41. "Again during 1972, a large amount of time and effort was devoted to the exchange of views on provisions of the Compact." Ex. J22 at 3. "Because it is absolutely necessary that all parties have the same interpretation of Compact terms, the Commission has also focused attention on the ambiguity of some parts of the Compact." *Id.* at 4. The States did not agree on the interpretation of the Compact or a method for administration.

42. In 1974, Montana's Commissioner Orrin Ferris suggested that the YRCC adopt procedures for calculating allocation of water under the Compact. A special meeting of the YRCC was called in 1975 "to initiate discussions of water-right procedures in Montana and Wyoming and definition of terms in the Compact. This was considered a first step toward the development of a model of the Yellowstone River." Ex. J25 at 2. No agreement on Compact terms was ever reached.

43. In 1977 a special Compact administration subcommittee was formed to discuss differences in the interpretation of the Compact. Ex. J27.

44. In 1978 the YRCC continued to focus on procedures for implementing and enforcing the Compact. Ex. J28.

45. In 1980 the YRCC indicated that there was a need to administer the Compact, but the YRCC was not in a position to do so. A proposal for a grant to assist with administration of the Compact was discussed. Ex. J29.

46. In 1981 Wyoming rejected Montana's request to regulate Wyoming water rights for the benefit of the Tongue River Reservoir and other post-Compact rights. Ex. M136. Mr. Moy thereafter prepared a memo for Gary Fritz, the YRCC Commissioner appointed after Orrin Ferris retired. *See* Ex. M76. In that memo, Mr. Moy recounted the history of the Compact and its key provisions, and articulated an understanding of Article V that is consistent with the position adopted by the Special Master and the Court. Mr. Moy concluded that "post-1950 rights in Wyoming could be shut down to satisfy pre-1950 rights in Montana. But junior pre-1950 rights in Wyoming could not be or it would be very difficult to shut them off to protect senior pre-1950 rights in Montana." *Id.* at 3. Wyoming did not agree with that position.

47. In 1982, at Montana's request, the YRCC formed a technical committee to determine and agree on storable inflows for the Tongue River Reservoir. Montana proposed studies of the Tongue River in the hope of providing information to assist in the development of an administrative procedure for administering Article V. Montana also developed the Tongue River Model, which was discussed by the YRCC. Ex. J32.

48. In 1983, hydrologist Dan Ashenberg of the Montana Department of Natural Resources and Conservation ("DNRC") prepared a draft report entitled "A Cooperative Plan to Administer the Yellowstone River Compact." Ex. M88. The Montana methodology was first presented to the YRCC in April 1984. Ex. J34; *see also* Ex. J38 at IV; Ex. J39 at IV; Ex. M82; Ex. M90; Ex. M97. Montana's methodology would have protected its pre-Compact water rights before allowing for division of the water according to the percentage allocations of Article V(B).

Ex. M82; Ex. M88 at 11; Ex. 97 at 81; Tr. 2557:16 – 2559:6 (Moy); Tr. 2584:21-23 (Moy); Tr. 2585:18-21 (Moy); Tr. 4262:4-10 (Fassett); Tr. 4263:19-24 (Fassett).

49. Montana informed Wyoming that one of the reasons that it was interested in developing a methodology was to ensure that it protected Montana's pre-Compact water rights. Tr. 2564:14 – 6 (Moy); Tr. 2565:18 – 2566:6 (Moy). Wyoming recognized that this was Montana's purpose. Tr. 1798:11-17 (Whitaker); Tr. 5057:19 – 5058:1 (Lowry).

50. Montana's efforts to develop a methodology reached an impasse. Tr. 4258:12-21 (Fassett). The States were unable to agree to a methodology because Wyoming was not interested in developing any administrative procedure and maintained its position that Article V(A) did not obligate Wyoming to curtail post-Compact use. Ex. M69; Ex. W76; Tr. 1069:19 – 1070:7 (Fritz); Tr. 2561:11 – 2562:18 (Moy); Tr. 2564:11-13 (Moy); Tr. 2603:9-13 (Moy); Tr. 2707:15 – 2708:10 (Moy) (“[I]t was like pulling teeth to get Wyoming to look at anything”). Instead, the only Compact protection that Wyoming recognized was for the percentage allocations. Tr. 2599:13-2600:4 (Moy). According to Mr. Moy, the only witness who had been personally involved in the process, the States could not agree on a methodology because Wyoming “had no desire to protect Montana's pre-50 rights.” Tr. 2599:23 – 2600:4 (Moy); *see also* Tr. 665:4-7 (Stults); Tr. 666:23 – 667:3 (Stults); Tr. 2600:3-4 (Moy); Tr. 2682:13 – 2684:19 (Moy); Tr. 2686:18-22 (Moy). Montana officials “pushed it as long and as hard as we could push it. But sometimes you can't push water uphill and we finally just gave up.” Tr. 2588:6-17 (Moy).

51. In 1984, the governors of Montana and Wyoming exchanged letters regarding proposals for new storage in Wyoming. Montana's Governor was concerned that the proposed development would adversely affect water resources in Montana based on Montana's

interpretation of Article V: "All pre-1950 rights and their supplemental supplies must be satisfied before streamflow is available for allocation on a percentage basis between the states." Ex. M70. He urged: "I would recommend that Montana and Wyoming work together to develop a water management plan that provides water for future uses, while at the same time protects existing water rights that are protected by the Yellowstone River Compact." *Ibid.* In response, Wyoming's Governor wrote: "In general the position I have taken in the past and will continue to take is that the State of Wyoming is entitled to develop its water in all of the tributaries of the Yellowstone River, provided its compact allocations are not exceeded." Ex. M64. Wyoming's Governor thereby reiterated its position that there was no protection for pre-Compact water rights. Tr. 2595:2 – 2598:1 (Moy).

52. By 1985, the YRCC's meeting minutes began reflecting Montana's frustration with Wyoming's lack of cooperation. Ex. J35.

53. In a memo to Mr. Fritz in advance of the 1986 commission meeting, Mr. Moy stated: "Montana continually takes the initiative to work out our differences with Wyoming but it appears to us that Wyoming will always attempt to stifle the process[.]" Ex. M69. Mr. Moy also wrote: "Montana feels that we may have been harmed by the lack of an administrative process to apportion the flows of the interstate tributaries during low flow years." *Id.* He continued:

The perception in Montana is that Wyoming does not want to work with us. And I believe the facts support this statement. No progress has been made to date on finalizing an administrative process to apportion the waters of the Yellowstone tributaries. Wyoming water development activities proceed merrily along without communication or coordination with Montana officials.

Id.

54. The 1988 YRCC report reflects that the States were still in disagreement about how to administer Article V: "Wyoming has developed an application method and Montana developed an administrative model for the administration of water rights under Article V." Ex.

J38 at 4. Despite previous efforts, the federal chairman suggested that another “management committee” and “technical committee” be established to develop “an acceptable approach.” Mr. Fritz emphasized that a “sincere effort” must be made to develop an acceptable procedure, although he questioned whether administrative models would be of any value in extremely dry years. *Id.* Nonetheless, Montana offered to prepare a statement on the scope of work for the technical committee, including a framework for administration of water rights. *Id.* at 5.

55. At the 1992 YRCC meeting, Mr. Fritz expressed his frustration with “the absence of a methodology to administer the Compact.” Ex. J42 at 6. Mr. Fritz reported that his staff had compiled information on pre- and post-1950 water uses in Wyoming. Based on that information, Mr. Fritz concluded that “pre-1950 use impacts Montana and evidence suggests that post-1950 use also affects Montana’s utilization of water in the basin.” Mr. Fritz noted that the impacts “do not occur every year but they do occur.” *Id.* Mr. Fritz was “skeptical” that the Commission “would proactively establish an administrative method and process, and after years of attempting to have such a system adopted by the Commission, would no longer pursue such an action.” *Id.* When the federal chairman asked Mr. Fritz if he would like the Commission to consider the issue of quantification, Mr. Fritz responded that “a proactive approach to resolving long-standing Compact issues seems prudent but the Commission has historically been unwilling to address issues other than in a crisis mode.” *Id.* at 7.

56. Although the Compact contains no express provision requiring it to do so, Montana sent Wyoming a letter on May 18, 2004, calling for water to satisfy its pre-1950 allocation. Ex. J64. Wyoming responded on May 24, 2004, that it would not honor Montana’s request for water. Ex. J65. Wyoming stated that “the Compact makes no provision for any state

to make a call on a river.” *Ibid.* Wyoming continued that, in its view, Article V(A) “simply expresses that the status quo of January 1, 1950 within each state is preserved.” *Ibid.*

57. Although the Compact contains no express provision requiring it to do so, Montana sent Wyoming a letter on July 28, 2006, calling for water to satisfy its pre-1950 allocation. Ex. J68. Montana stated that in its view the letter was “not required by the Compact.” *Id.* at 2. On August 9, 2006, Wyoming responded that it would not honor Montana’s request for water. Ex. J69. According to Wyoming, “the only water being apportioned [by the Compact] was the post-1950 ‘unused and unappropriated waters of the interstate tributaries’” *Id.* at 1. Wyoming declared its intent to adhere to its “long held position” that “[a]n interstate delivery schedule for pre-1950 rights is not now, and never was, a provision of this Compact.” *Id.* at 2. Thus, Wyoming again stated its position that “the Compact makes no provision for the ‘call’ your letter suggests.” *Ibid.* Montana replied on October 3, 2006, that “the States have been at loggerheads for years over Wyoming’s assertion that it has no obligation to provide water to Montana to satisfy pre-1950 water rights,” but that “Montana understands the Compact to provide the general principles from which delivery obligations can be determined. In fact, the delivery obligation is simple: whenever there are unsatisfied pre-1950 rights in Montana, there is no water available in Wyoming for post 1950 uses.” Ex. J70.

58. The disagreement over Wyoming’s Article V(A) obligations arose again at the December 6, 2006 meeting of the YRCC. Montana proposed a resolution that “Article V.A of the Compact requires Wyoming to curtail consumption of the water of the Yellowstone River System in excess of Wyoming’s pre-January 1, 1950 consumption of such water whenever the amount of water necessary to satisfy Montana’s pre-January 1, 1950 uses of such water is not passing the stateline .” Ex. J56 at Attachment E, ¶ 3. The resolution was not adopted because

Wyoming refused to consider it. *Id.* at xii (“Wyoming’s point of view is that the proposed resolution is not an instrument of discussion. The resolution is a commitment to positions that we have disagreed upon relatively strenuously”).

59. In sum, Montana and Wyoming had a longstanding disagreement, dating back to the 1980s or earlier, over Wyoming’s obligations under Article V(A). Wyoming rejected any obligation under the Compact to provide water pursuant to Article V(A). Because the Wyoming representatives continually refused to recognize any Compact obligation to protect Montana’s pre-1950 uses, Montana considered interstate priority calls to be futile.

4. Montana’s Notice to Wyoming of Shortages

a. Nature of the Notice Requirement

60. There is no provision in the Compact explicitly requiring a call or notification from Montana to Wyoming when Montana is not receiving sufficient water to satisfy its pre-Compact rights. Memorandum Opinion of the Special Master on Wyoming’s Renewed Motion for Partial Summary Judgment (Notice Requirement for Damages) at 8, 13 (Sept. 28, 2012).

61. Nonetheless, the Special Master has found in this case that “Montana was generally under an obligation . . . to let Wyoming know that insufficient water was reaching it to satisfy pre-1950 appropriations in Montana.” Memorandum Opinion of the Special Master on Wyoming’s Motion for Partial Summary Judgment (Notice Requirements for Damages) at 11 (Dec. 20, 2011). “[T]he notice need not have contained any specific information other than that Montana did not believe that it was receiving sufficient water under the Compact. . . . The key requirement is simply that Montana have placed Wyoming on adequate notice that Montana was not receiving sufficient water to meet the requirements of Article V(A) of the Compact.” *Id.* at 7-8. “To do this, Montana did not need to determine the reason for the water insufficiency.

Instead, once notice was provided, the burden would have been on Wyoming to determine whether the insufficiency was the result of post-January 1, 1950 uses in Wyoming in violation of Article V of the Compact.” *Id.* at 11.

62. Although the States never developed rules governing notice to be provided by Montana, Tr. 5068:1-7 (Lowry), the States did discuss the issue at the YRCC. In 1982, Montana voiced its concern that “during low-flow years Wyoming needs to regulate its post-1950 water rights more carefully so that Montana can use its pre-1950 water.” Ex. J32 at IV. The States agreed that “Montana, in turn, must notify Wyoming when it is not able to obtain its pre-1950 water.” *Id.* The States confirmed this approach in 1983. Ex. J33 at IV. Wyoming did not suggest that any further communication would be required. Tr. 2681:15 – 2682:5 (Moy).

63. This approach is consistent with the nature of a call under the doctrine of appropriation. For example, the Wyoming Water Commissioners testified that a call is defined as a communication from a downstream senior water user that he or she is not receiving sufficient water to satisfy his or her water right. Tr. 1967:19 – 1968:3 (LoGuidice) (describing a call as a water user’s notification “that they need some water in their ditch, that they feel they are senior to somebody upstream of them”); Tr. 2232:12 – 2233:4 (Boyd); Tr. 2067:8-22 (Knapp). “It might be as simple as the senior right calling and saying, hey, I’m short of water.” Tr. 2232:19-22 (Boyd).

64. A call in Wyoming need not be in writing, Tr. 1705:2-21 (Whitaker); Tr. 2232:12-18 (Boyd); Tr. 2074:20-24 (Knapp); Tr. 2007:17-23 (LoGuidice), and need not take any particular form, Tr. 2232:23 – 2233:4 (Boyd) (“Q. And it’s not necessary for a water user to use any specific words, correct, when he’s telling you he’s short of water? A. No”).

65. Likewise, in Montana, the doctrine of appropriation does not require a written call, and a call need not be from any particular person or take any particular form. Tr. 461:14-25 (Davis). Indeed, the Wyoming Water Commissioners will often place a river under regulation based on stream flows without a formal call. Ex. W2 at 13.

b. Montana Provided Notice to Wyoming

66. Beginning no later than 1981, Montana experienced shortages of its pre-1950 allocation that Montana believed were caused by Wyoming's overuse of its Compact allocation. During these years, Montana complained to Wyoming about Wyoming's overuse, but Wyoming was unresponsive.

67. During the periods 1987-1989, and 2000-2006, water supply and availability was a constant concern to Montana. Tr. 664:14-23 (Stults); Tr. 668:5-14 (Stults).

68. Montana diligently monitored the water supply conditions that developed throughout the season. Tr. 950:8-15 (Kerbel). Montana monitored the snow pack, the gauge at the state line, the gauge at the Tongue River Reservoir, water levels in the Tongue River Reservoir, and drought indices in an effort to understand when the Tongue River was short of water in Montana. Ex. W139; Tr. 667:6 – 668:4 (Stults); 765:16-20 (Stults); Tr. 827:22 – 828:7 (Stults); Tr. 2543:17 – 2544:24 (Moy); Tr. 2571:11-22 (Moy); Tr. 2575:20 – 2576:3 (Moy). Montana also established a Drought Advisory Committee to assist in preparing for water shortages. Tr. 766:7 – 768:8 (Stults).

69. During the years 2000, 2001, 2002, 2004 and 2006, water commissioners tracked water use in Montana. Ex. M378A; Ex. M380A; Ex. M385; Ex. M394; Tr. 669:16-20 (Stults).

70. Montana officials communicated on a regular basis with the water users on the Tongue River in Montana. Tr. 2542:24 – 2543:20 (Moy). Through this communication, the

Montana officials understood when there were shortages in 1987, 1988, 1989, 2000, 2001, 2002, 2003, 2004, and 2006. Ex. M133; Ex. M142; Tr. 667:6 – 668:4 (Stults); Tr. 2542:24 – 2543:20 (Moy); Tr. 2544:25 – 2545:22 (Moy); Tr. 2571:23-25 (Moy); Tr. 2611:15 – 2612:8 (Moy); 2679:15-18 (Moy); Tr. 2705:21 – 2706:24 (Moy).

71. During the years 1981, 1987, 1988, 1989, 2000, 2001, 2002, 2003, 2004, and 2006, Montana's pre-Compact rights were not satisfied. Tr. 668:11-14 (Stults); Tr. 690:14-20 (Stults). Montana suspected that Wyoming was using more than its share of water in the early 2000s. Ex. W139; Tr. 683:14 – 684:13 (Stults); Tr. 748:19 – 749:2 (Stults). Montana officials reported or observed that at times when Montana's rights were not satisfied, Wyoming was diverting water for post-Compact uses. Tr. 668:11 – 669:12 (Stults); Tr. 690:21 – 691:1 (Stults); Tr. 842:14-19 (Stults); Tr. 865:9-21 (Stults) (explaining the reports in 2000 through 2006 that "it was green in Wyoming and brown in Montana"); Tr. 870:5-18 (Stults); Tr. 871:15-22 (Stults). Montana notified Wyoming that it believed Wyoming was using more than its share of water. Tr. 869:21 – 870:10 (Stults).

72. In 2001 Montana "recommended that discussions and close communications among technical people be maintained to deal with water availability during 2002, particularly in the Tongue River basin." Ex. J51 at IV.

73. Several Montana water users including Mr. Hayes, Mr. Hirsch, and Mr. Muggli attended the 2001 YRCC meeting. Wyoming understood that the Montana water users were concerned about water for their water rights, including the T&Y and the Tongue River Reservoir. Ex. J51 at IV; Tr. 4971:3-24 (Lowry); Tr. 4973:6-10 (Lowry).

74. In the early 2000s Montana inquired about expanded irrigation and water use in Wyoming. Ex. J51 at IV; Tr. 4972:7-24 (Lowry). For example, Mr. Kerbel investigated

Wyoming post-Compact water use. He inquired about Wyoming water use and specific Wyoming water rights. Tr. 4208:19-20 (Fassett); Tr. 4976:5-24 (Lowry). Similarly, Mr. Moy inquired of Ms. Lowry and Mr. Whitaker about increased irrigation and storage facilities in Wyoming. Ex. W65; Tr. 4978:17 – 4980:4 (Lowry); Tr. 4982:13-18 (Lowry).

75. Over the years Montana repeatedly inquired about the regulation of Wyoming water rights. Ex. M205 at 4918; Tr. 1796:10 – 1797:16 (Whitaker); Tr. 4181:17-21 (Fassett); Tr. 4196:9-24 (Fassett). The reason for these inquiries was to determine whether Wyoming was complying with Article V(A) of the Compact. Tr. 2564:14-2565:6 (Moy).

76. The discussion about increased water use in Wyoming continued into early 2002, when Montana initiated a meeting between the States to discuss water use in Wyoming. Ex. M133. This was part of an ongoing effort to “get a handle on water usage in Wyoming.” Tr. 2612:20 – 2613:5 (Moy).

77. In 2000, 2001, and 2002 Montana received inquiries from water users about whether Montana was receiving its share of water under the Compact. Montana informed Wyoming of these inquiries and alerted Wyoming that Montana was not getting its share of water under the Compact. Ex. M65 at MT 12930; Ex. M137; Ex. M343; Tr. 1456:13 – 1457:8 (Hayes); Tr. 1489:6 -1490:14 (Hayes); Tr. 4975:17-4976:17 (Lowry). Montana also expressed concern to Wyoming about expanded use of water in Wyoming. Tr. 2614:9 – 2615:1 (Moy).

78. Wyoming resisted the suggestion that it was allowing diversions that were not authorized by the Compact. To persuade Wyoming and to confirm its observations, Montana hired HKM Engineering in 2001 or early 2002 to conduct an independent study of Wyoming water use. Ex. M434; Tr. 880:20 – 881:8 (Stults); Tr. 2615:7-15 (Moy); Tr. 2616:11-15 (Moy). The objective of the study was “to determine if there [had] been significant changes in the extent

of irrigation from the time the Yellowstone River Compact was signed in 1950 to present.” Ex. M434 at 1.

79. On May 3, 2002, Mr. Hayes wrote to Mr. Stults to express concern that “Wyoming is expanding its irrigation on Tongue River yearly.” Ex. M142. Representative Bixby sent a similar letter to. Ex. M144. Mr. Stults responded that “[p]ost-1950 development in Wyoming is an important issue.” Ex. W67; *see also* Ex. M141. This exchange of letters prompted Mr. Stults to communicate to Wyoming that action was required to satisfy Montana’s pre-Compact water rights. Ex. M141; Tr. 880:1-881:4 (Stults).

80. Due to Wyoming’s unwillingness to work with Montana, in 2001 or 2002 Montana officials began considering a request to the Montana Legislature for funding for anticipated litigation. Ex. M189; Tr. 2618:2-5 (Moy); Tr. 2619:7-9 (Moy). In 2003, Mr. Moy testified before the Montana Legislature that “Wyoming has continued to develop more storage and new water uses and to convert existing flood irrigation to sprinkler irrigation that depletes more water from these interstate rivers. These uses have decreased flows crossing the border to the detriment of Montana irrigators and instream uses.” Ex. M189 at 2. Mr. Moy’s testimony was the culmination of “[m]any years of frustration” in which “nothing changed.” Tr. 2619:10-15 (Moy). The Montana Legislature unanimously approved the proposed joint resolution. Tr. 2617:18-2618:15 (Moy); Tr. 2620:16-19 (Moy).

81. Throughout the 1980s and early 2000s, there were numerous Commission meetings and technical committee meetings between the States. These meetings often occurred in the spring and summertime. Tr. 2657:2-20 (Moy).

82. In addition to official Compact meetings, there were numerous meetings and opportunities in the early 2000s for Montana and Wyoming officials to discuss water conditions

in the Tongue River Basin throughout the year. Ex. W61; Tr. 670:4 – 671:25 (Stults); 678:15-20 (Stults); Tr. 682:19 – 683:7 (Stults); Tr. 921:16 – 922 (Kerbel); Tr. 689:24 – 690:2 (Stults); Tr. 932:11-16 (Kerbel); Tr. 4172:10 – 4174:9 (Fassett); Tr. 4198:16-18 (Fassett); Tr. 4198:24 – 4199:1 (Fassett); Tr. 4200:16 (Fassett) (acknowledging spring meetings); Tr. 4201:13-15 (Fassett); Tr. 4322:3-14 (Fassett); Tr. 4968:19-21 (Lowry); Tr. 5054:2 – 5055:16 (Lowry) (“Q. And there were indications that you had to communicate with Mr. Moy and Mr. Stults throughout the year in the early 2000s, right? A. Probably more with Mr. Stults, but, yes.”). Communications between Montana and Wyoming took place in person, as well as by email and phone. Tr. 952:25 – 953:5 (Kerbel); Tr. 2701:7-10 (Moy); Tr. 2706:25 – 2707:14 (Moy). In addition, in the early 2000s Montana and Wyoming officials took tours in the irrigation season during which they discussed water supply conditions. Tr. 672:1-15 (Stults).

83. Wyoming was aware that Montana had pre-Compact direct flow rights on the Tongue River, Tr. 1794:13-19 (Whitaker), and had information about specific Montana pre-Compact rights such as the Nance and T&Y water rights, including the fact that the T&Y water right was the second oldest right in Montana, and was located at the bottom of the system. Ms. Lowry, the Interstate Streams Commissioner, has acknowledged that in 2000, 2001 and 2002, Montana informed Wyoming that the T&Y was not getting enough water to satisfy its pre-Compact water right. Tr. 4973:22 – 4974:7 (Lowry); Tr. 5061:5-20 (Lowry).

84. Wyoming officials were aware that the Tongue River Reservoir was important for irrigation in Montana. Tr. 4980:17-19 (Lowry). Wyoming officials were also aware that the Tongue River Reservoir was a pre-Compact right. Tr. 1794:20 – 1795:1 (Whitaker); Tr. 5059:19-21 (Lowry). Wyoming considered the pre-Compact capacity to be “[t]he reservoir that was there prior to the enlargement.” Tr. 4957:3-11 (Lowry). Wyoming understood that

Montana's goal has been to fill the Tongue River Reservoir in the spring, Tr. 4971:14-24 (Lowry) Tr. 5013:23 – 5014:2 (Lowry), and Wyoming had available the information needed to determine whether the Tongue River Reservoir had filled. Tr. 5066:20-22 (Lowry). Indeed, Wyoming monitored the Tongue River Reservoir and was aware of when it filled in the years at issue. *E.g.*, Ex. W37 at WY032854; Tr. 2157:19 – 2158:21 (Knapp) (indicating that he monitored the DNRC Tongue River Reservoir website to determine whether and when the Reservoir filled).

85. In addition, Wyoming recognized that when releases occurred from the Tongue River Reservoir, Montana direct flow rights did not receive sufficient water. Tr. 1795:2-5 (Whitaker). It was common knowledge when the Tongue River Reservoir released water, and Wyoming had the ability to verify water releases by monitoring data at the Tongue River Reservoir gauge.

86. In the years 1987, 1988, 1989, 2000, 2001, 2002, and 2003, Montana informed Wyoming whenever it had the opportunity that Montana was not receiving sufficient water to satisfy its pre-Compact rights, Tr. 1086:12-16 (Fritz); Tr. 1088:5-13 (Fritz); Tr. 2546:18-24 (Moy), Tr. 2548:11-16 (Moy); Tr. 2546:25 – 2547:9 (Moy), Tr. 2548:17 – 2549:8 (Moy); Tr. 2554:17 – 2555:9 (Moy); Tr. 2664:8-13 (Moy); Tr. 2666:13-20 (Moy); Tr. 2700:22 – 2701:10 (Moy).

87. During the irrigation seasons of 1981, 1987, 1988, 1989, 2000, 2001, 2002, and 2003, when Wyoming was in a position to take action to provide Montana with water, Montana repeatedly informed Wyoming that it was not receiving sufficient water to satisfy its water rights. Ex. M136; Tr. 950:16 – 951:14 (Kerbel); Tr. 2548:22 – 2549:8 (Moy); Tr. 2700:16 – 2701:3 (Moy); Tr. 2708:11 – 2710:10 (Moy) (“Q. Mr. Moy, sitting here today, do you believe

that you made calls to Wyoming during the irrigation season? A. Yes.”); Tr. 4197:3-9 (Fassett); Tr. 4207:4-7 (Fassett); Tr. 4208:1-3 (Fassett); Tr. 4259:14-18 (Fassett); Tr. 4264:12-14 (Fassett); Tr. 4322:24-25 (Fassett); Tr. 4323:19-21 (Fassett) (“Q. So there are a lot of communications during the irrigation season, would you agree with that? A. Sure.”).

88. Wyoming’s response to Montana’s communications indicate that the communications occurred during the irrigation season. Wyoming responded that conditions were dry in Wyoming too and that it was regulating down to senior rights. Tr. 1796:10-15 (Whitaker); Tr. 2629:21 – 2630:3 (Moy); Tr. 4264:19 – 4265:22 (Fassett); Tr. 4270:14 – 4271:2 (Fassett); Tr. 4294:13-24 (Fassett); Tr. 4326:12-16 (Fassett). This was also Wyoming’s response to Montana’s letter of May 18, 2004. Ex. J65 at 1.

89. Another indication that Montana informed Wyoming during the irrigation season that it was not receiving sufficient water to satisfy its pre-Compact water rights is that Montana was motivated by communications with its water users that they were not receiving enough water. Ex. M137; Ex. M343; Tr. 952:9-953:5 (Kerbel); Tr. 1456:13 – 1457:8 (Hayes); Tr. 1489:6 -1490:14 (Hayes); Tr. 2544:25 – 2545:22 (Moy); Tr. 2554:17-22 (Moy); Tr. 2571:23-25 (Moy); Tr. 2575:13-19 (Moy); Tr. 2656:16-22 (Moy); Tr. 2666:13-20 (Moy); Tr. 2699:12-17 (Moy); Tr. 2700:22 – 2701:10 (Moy); Tr. 2705:21 – 5706:24 (Moy).

90. For example, in 2001, Mr. Hayes went to Mr. Moy’s office to ask for help during a time when “there was hardly any water going across the border.” This prompted Mr. Moy to inform Wyoming that Montana was not receiving sufficient water to satisfy its pre-Compact rights. Tr. 2547:22 – 2548:1 (Moy). Similarly, at the May 15, 2002 TRWUA meeting, the water users discussed their concern that Wyoming was using more than its share of Compact water.

The water users followed up with Mr. Stults, causing him to discuss the issue with Wyoming. Ex. M137; Ex. M343; Tr. 1489:6 -1490:14 (Hayes).

91. Montana informed Wyoming that it was not receiving sufficient water to satisfy its pre-Compact rights each year after the Tongue River Reservoir did not fill. Tr. 693:3 – 694:4 (Stults); Tr. 2544:22-24 (Moy)

92. In late April and early May of 1981, Montana informed Wyoming that it was not receiving sufficient water to satisfy its pre-Compact rights. Ex. M136; Tr. 1070:19 – 1079:7 (Fritz). Although the notes from the telephone conversations focused on the Tongue River Reservoir, Montana alerted Wyoming that it was not receiving sufficient water for both its direct flow and reservoir rights. Ex. M76; Tr. 2578:22 – 2579:19 (Moy). Wyoming refused to regulate any water rights for the benefit of Montana's pre-Compact rights. Ex. M136 at WY048191.

93. In 1987, 1988, and 1989, Montana informed Wyoming that it was not receiving sufficient water to satisfy its pre-Compact direct flow and storage rights. Tr. 937:2-8 (Kerbel); Tr. 938:2-6 (Kerbel); Tr. 950:16 – 951:14 (Kerbel) ("I would ask Mike, is there any opportunity to kick more water down to Montana?"); Tr. 952:2 - 953:5 (Kerbel) ("Q. So you typically made that call, especially in dry years? A. Yeah, I tried to. I felt it was our responsibility"); Tr. 971:24 – 972:24 (Kerbel); Tr. 1796:3-6 (Whitaker); Tr. 2570:25 – 2574:23 (Moy); Tr. 2664:8-13 (Moy); Tr. 2666:13-20 (Moy); Tr. 2667:3-9 (Moy); Tr. 2698:5 – 5699:17 (Moy); Tr. 4264:19-23 (Fassett) (describing as "routine" communications where Montana was indicating that "we're not getting all of our pre-1950 water rights"); Tr. 4329:3-7 (Fassett).

94. In 2000, 2001, 2002, and 2003 Montana informed Wyoming that it was not receiving sufficient water to satisfy its pre-Compact direct flow and storage rights. Ex. W310 at 2; Tr. 684:5 – 685:9 (Stults); Tr. 688:14 – 689:3 (Stults); Tr. 691:2 – 692:24 (Stults); Tr. 960:2-

17; Tr. 713:3-12 (Stults); Tr. 878:21 – 879:25 (Stults); (Kerbel); Tr. 1796:3-6 (Whitaker); Tr. 2574:24 – 2577:1 (Moy); Tr. 2617:2-15 (Moy); Tr. 4264:19-23 (Moy); Tr. 2621:5-14 (Moy); Tr. 2664:8-13 (Moy); Tr. 2666:13-20 (Moy); (Fassett); Tr. 4329:3-7 (Fassett); Tr. 4965:9-22 (Lowry); Tr. 4973:22 – 4974:7 (Lowry); Tr. 4989:8-11 (Lowry); Tr. 5064:22 – 5065:8 (Lowry).

95. The verbal notifications in 1981, 1987, 1988, 1989, 2000, 2001, 2002, and 2003 were substantively the same as the letters sent in 2004 and 2006. Tr. 2627:19 – 2628:20 (Moy). In each of those years, Montana requested that Wyoming take action to ensure that Montana receive additional water. Tr. 684:5-20 (Stults) (“I felt we were entitled to more water. And I made it – I believe honestly that I made it clear to my counterparts in Wyoming”); Tr. 687:17-24 (Stults); Tr. 904:14-19 (Stults); Tr. 952:2 - 953:5 (Kerbel); Tr. 960:2-17 (Kerbel); Tr. 2698:5 – 5670:10 (Moy); Tr. 2704:15 (Moy).

96. Wyoming understood that Montana’s communications regarding shortages were requests for Wyoming to take action to get additional water to Montana. Tr. 778:23 – 779:5 (Stults); Tr. 909:10-19 (Stults); Tr. 2574:21-23 (Moy); Tr. 2576:24 – 2577:1 (Moy); Tr. 4330:2-8 (Fassett) (“Q. And did you believe in any of the times when Montana gave you this information that one of the purposes was to see whether or not anything could be done in Wyoming to help? A. Oh, I think to some extent, that’s correct.”).

97. Wyoming’s repeated refusals to provide water to Montana in response to Montana’s requests led Montana to begin to prepare for litigation as early as 2000 or 2001. Tr. 2548:2-6 (Moy).

98. Mr. Stults communicated to Wyoming in April 2004 that Montana believed that it was not receiving sufficient water to satisfy its pre-Compact rights, and that Montana would be sending a follow-up letter. Ex. J64 at 1; Tr. 716:2-13 (Stults); Tr. 717:1 – 718:5 (Stults).

99. In early May 2004, Montana communicated with water users and staff members to confirm water supply conditions. Ex. M186; Tr. 2633:5-17 (Moy).

100. On May 12, 2004, the States attended a YRCC technical team meeting. At that meeting, Montana stated that the Tongue River Reservoir was not yet full and that Montana was not receiving sufficient water to satisfy its pre-Compact rights. Ex. W71. After the meeting, the Montana team developed an action plan to continue to investigate the water use in the Tongue River Basin. *Id.*

101. Montana realized that the efforts to work with Wyoming were not producing results. Montana made the decision to send a call letter in 2004 and 2006 because it recognized that litigation was likely the only way to receive its share of water from Wyoming. Tr. 2627:19-25 (Moy).

102. On May 18, 2004, Montana informed Wyoming in writing that it was not receiving sufficient water to satisfy its pre-Compact rights. Ex. J64.

103. In 2004 Montana explained to Wyoming that it would be helpful if Montana could fill the Tongue River Reservoir. Ex. W319 at WY0187561; Tr. 5004:16 – 5005:8 (Lowry). Despite this information, Wyoming took no action to provide water to Montana. *Id.*

104. In 2006 Montana was monitoring water conditions in the Tongue River Basin. In June, 2006 appeared to be a wet year with mean stateline flows at 324 cfs, which is sufficient to satisfy Montana's pre-Compact rights. Ex. M5 at 35. On July 7, 2006, conditions continued to look favorable, and Montana predicted that the Tongue River Reservoir would fill. Ex. M193 at MT01425. Conditions changed quickly, however, and by later in July the mean stateline flows had dropped to 41 cfs. At the end of July it was apparent that the Reservoir would not fill. *Id.* at 1; Ex. M5 at 35.

105. On July 28, 2006, Montana informed Wyoming in writing that it was not receiving sufficient water to satisfy its pre-Compact rights. Ex. J68.

106. Wyoming has never regulated any Wyoming water rights for the benefit of Montana, and has never released water from post-Compact storage for Montana. Tr. 712:1-17 (Stults); Tr. 760:21 – 761:3 (Stults); Tr. 778:17-22 (Stults); Tr. 955:18-21 (Kerbel); Tr. 5026:14:21 (Lowry).

B. Pre-1950 Water Rights and Water Supply in Montana

1. The Tongue River Reservoir

a. History

107. The Montana State Water Conservation Board initiated the storage right in Tongue River Reservoir in April 1937. The maximum volume on the original volume was tied to the probable maximum flood, and the State filed for all unappropriated waters in the basin. Ex. M558A; Ex. 558B; Ex. 558C; Tr. 1021:19 – 1022:13 (Smith).

108. The construction of the dam and reservoir was completed in 1939. Tr. 1022:1-3 (Smith); Tr. 1055:16-17 (Smith). Over the years, occasional documents have referred to the capacity of the Tongue River Reservoir as 69,400 acre-feet, but that was the capacity in 1948 after many years of sedimentation. Tr. 1034:17 – 1035:7 (Smith). The original capacity of the Tongue River Reservoir before sedimentation was approximately 72,500 acre-feet at the spillway crest. Ex. M5 at 29; Ex. M280 at 14 (identifying the storage capacity as 73,950 acre-feet); Ex. M309-A at MT-03296-97; Ex. M557-A; Ex. M557-B; Ex. M557-C; Ex. M557-D; Ex. M557-E; Tr. 1808:1-9 (Aycock); Tr. 1809:7-18 (Aycock); Tr. 1810:8-16 (Aycock); Tr. 1812:11 – 1816:23 (Aycock).

109. The Tongue River Reservoir filled by 1942. Tr. 1055:18 – 1056:12 (Smith). Records show end-of-month contents of 65,500 acre-feet in 1942 and 75,760 acre-feet in 1944. During the period before the Compact was entered in 1950, the Reservoir filled and released in excess of 50,000 acre-feet at least three times. Ex. M5 at 29.

110. The purpose of the Tongue River Reservoir was to market water to agricultural users downstream. Tr. 1022:23-25 (Smith). The water was marketed in 1937 with a marketing contract with the TRWUA. Ex. M529-A; Tr. 1056:14-15 (Smith). The entire firm annual yield of the Tongue River Reservoir was committed in 1937. Ex. M529-A; Tr. 1057:2 – 1058:8 (Smith).

111. The dam, reservoir, and control works are located on the Tongue River in the State of Montana near Decker, Montana. Ex. M3 at 4-6.

112. The protection of pre-Compact rights was the subject of considerable discussion among the States and the United States before the Compact was entered. *See generally* Ex. M12. Montana made it clear that “Montana is interested in preserving as far as possible vested and present uses, and obviously any compact which might seriously interfere with such uses would be difficult of ratification.” *Id.* at 17; Tr. 2409:4-17 (Littlefield). This interest was particularly strong for the Tongue River Reservoir, which all of the States understood was an essential facility for Montana irrigation. Tr. 2441:2-18 (Littlefield).

113. The States were aware of the Tongue River Reservoir when negotiating the Compact. For example, the Federal Power Commission in its Preliminary Report on Yellowstone River Basin: Compilation of Factual Data for Use of Yellowstone River Compact Commission included multiple references to the Tongue River Reservoir. Ex. J72; Tr. 2412:13 – 2413:3 (Littlefield). The Montana County Water Resources Surveys, which were considered

valuable “in negotiating the Yellowstone River Compact,” Tr. 2427:17-23 (Littlefield) (quoting Ex. M16 at 3), identified the Tongue River Reservoir as “the main feature on the Tongue River.” Ex. M16 at 30.

114. The Compact Engineering Committee identified the protected capacity of the Tongue River Reservoir as 69,440 acre feet. Tr. 2433:5 – 2435:17 (Littlefield); *see also* Ex. W266. In Dr. Littlefield’s uncontested expert opinion, the negotiators understood that the Tongue River Reservoir had established a water right for all the unappropriated waters of the Tongue River. Tr. 2430:4 – 2431:16 (Littlefield).

115. According to Dr. Littlefield, the negotiators agreed to retain the laws of each State in defining the water rights protected by the Compact, including the laws defining reservoir water rights. Ex M12 at 1-5; Tr. 2441:2-18 (Littlefield). Thus, the Montana rules for the definition of the water right and the operation of the Reservoir apply. *Id.*

116. In May of 1978, a flood caused damage to the Reservoir and to the communities downstream of the Reservoir. Tr. 1093:18 – 1094:24 (Smith); Tr. 1133:12 – 1132:7 (Smith). “The long-term effect of that flood pointed out the serious deficiencies in the capacity and capabilities of that project to handle what should have been a run-of-the-mill flood event in that basin.” Tr. 1132:2 – 1133:20 (Smith).

117. Rehabilitation of the Tongue River Reservoir was considered in connection with the negotiation of the settlement of the existing Northern Cheyenne Tribe (“NCT” or “Tribe”) reserved water rights. Tr. 1599:25-1600:8 (Tweeten)

118. The NCT, the State of Montana, and the United States negotiated and agreed on a compact to quantify the Tribe’s water rights in 1991, after many years of negotiations. The

Northern Cheyenne Tribe Compact ("NCT Compact") settles and quantifies the Tribe's senior reserved water rights in the Tongue River and Rosebud Creek basins. Ex. M527.

119. Under the Compact and Decree, the Tribe's water right in the Tongue River has two components. The first is a direct flow right in the amount of 12,500 acre-feet with a priority date of October 1, 1881. MCA §85-20-301 (Art. II.A.2.a) (entered into evidence as Ex. M527). The second is a storage right in the Tongue River Reservoir in the amount of 20,000 acre-feet, *id.*, Art. II.A.2.b, with a priority date "equal to the senior-most right for stored water in the Tongue River Reservoir[.]" *Id.* at III.2.c. The senior-most right for water stored in the Tongue River Reservoir is the right belonging to the Montana DNRC denominated as Water Right Claim No. 42B 119280-00, which has a priority date of April 21, 1937. The Tribe also has a separate contract right for 7,500 acre-feet of Tongue River Reservoir water.

120. As part of the NCT Compact, the United States and the State of Montana funded the rehabilitation and enlargement of Tongue River Reservoir in order to secure the Tribe's storage right under the NCT Compact. *See id.*, Art. IX.A.

121. As a result of the rehabilitation and enlargement of the Reservoir, the normal operating pool now has a capacity of 79,071 acre-feet. *See* Ex. M3 at 2, ¶ 4. The additional storage was for the NCT Compact, and was associated with the 20,000 storage right that Congress recognized for the Tribe.

b. The Tongue River Reservoir Water Right

122. Both the 1889 and subsequent 1972 Montana Constitutions recognize "sale" as a beneficial use of water. Mont. Const. art. IX, § 3. In Montana, a State Project water right is perfected after the reservoir is built, the water offered for sale, and the reservoir is filled. Tr. 1057:2 – 1058:8 (Smith); Tr. 1131:10-21 (Smith).

123. The purpose of the Tongue River Reservoir was “sale” - to market water to agricultural users downstream. Ex. M526; Tr. 1022:23-25 (Smith). By marketing the water and entering into a contract, the State of Montana ensured that there was a funding source for the project. Tr. 1043:4-14 (Smith).

124. In 1937, the State of Montana and the TRWUA entered into a marketing contract. Ex. M529-A; Ex. M529-B. At that time the Tongue River Reservoir was “estimated” to have a “live capacity of *at least* 32,000 acre feet of water annually.” Ex. M529-A at MT-15157 (emphasis added); *see also id.* at MT-15158 (“*It is estimated* that 32,000 acre feet of water will be available annually to be furnished to the Association”). Based on that understanding, the State agreed to “furnish to the Association *the total available yield of storage water* from the project.” *Id.* at MT-15158, Section 1 (emphasis added). Thus, as of 1937, the State of Montana was obligated to provide “the total available yield” of the Tongue River Reservoir to the TRWUA.

125. The water right for the Tongue River Reservoir was fully perfected for the firm annual yield no later than 1944 when the Reservoir filled. Ex. M319 at 3; Ex. M529A (intent was “[t]o obtain sufficient waters so that the project may be operated at its full capacity”); Ex. M539 at 5; Tr. 1058:6-8 (Smith); Tr. 1215:21 – 1216:7 (Smith); Tr. 1385:19 – 1386:12 (Smith).

126. After the Tongue River Reservoir was operated for a number of years, it was determined that that 40,000, not 32,000, was the “approximate firm yield of the Project.” Ex. M529-C at MT-15172. An Amendatory Marketing Contract was entered in 1969.

127. Consistent with other projects in other basins in Montana, no new water right or appropriation was necessary to accommodate the new contracts. This was so because the Tongue River Reservoir already had a water right entitling it to store, market and deliver the entire firm annual yield of the reservoir. Ex. M529A at 3, Section 4 (contemplating that

additional contracts between the TRWUA and end-users would be sold if the firm annual yield was greater than anticipated); Tr. 1337:5-25 (Smith).

128. The perfection of the Reservoir right at the time it was filled is also consistent with the practice in other states. Mr. Aycock testified that based on his expert experience working on projects throughout the west for the Bureau of Reclamation, a reservoir right is fully protected once it fills to capacity. Tr. 1816:23 (Aycock).

129. A condition of the full ratification and implementation (state and federal) of the NCT Compact was the adoption of a decree in the Montana Water Court. Tr. 1147:18-20 (Smith); Mont. 85-20-301, Art V, 106 STAT. 1186, Sec. 4. Since the rehabilitation, two water rights are associated with the water stored in the Tongue River Reservoir. These rights are held by the DNRC and the Tribe. The DNRC water right is identified in Montana's general water rights adjudication as Water Right Claim No. 42B 119280-00. *See* Ex. M526.

130. Montana DNRC's water right for the Tongue River Reservoir is currently being adjudicated in Montana's state-wide adjudication in the Montana Water Court. A Stipulation, as amended, among Montana, the Tribe, and objector and appearing parties, regarding the State of Montana's storage right in Tongue River Reservoir was filed with the Water Court of Montana on August 10, 2012. Ex. M526.

131. The Stipulation settled all objections, including the objections of the United States, on the Tongue River Reservoir. Tr. 506:4 – 507:11 (Davis). The deadline for filing comments or objections has passed, and Wyoming did not participate.

132. Under the Amended Stipulation for Cause 42B-62, the water right is commingled and administered in conjunction with water stored in Tongue River Reservoir that has been reserved for the Northern Cheyenne Tribe pursuant to the NCT Compact. Ex. M526 at ¶ 6, pg.

3. Both storage rights are dependent on the State of Montana's ability to fill the reservoir, subject to physical and legal water availability and capacity in the reservoir. Tr. 508:7-12 (Davis). If the Reservoir does not fill the shortages are shared by the State and the NCT as set forth in NCT Compact. Tr. 1211:16-17 (Smith).

133. Under the Amended Stipulation, the Tongue River Reservoir is authorized to provide up to 40,000 acre feet of stored water per year to the TRWUA, and 20,000 acre feet of stored water per year to the Tribe. Ex. M526. The priority date of both the DNRC right and the Tribe right is April 21, 1937. *Id.*

134. Montana has no one-fill rule. *E.g.*, Tr. 1214:16 – 1215:4 (Smith); Tr. 1856:1-12 (Aycock). For instance, the Montana Supreme Court Claims Examination Rules contain no prohibition on multiple fills of a reservoir right. Instead, a claims examiner is instructed that an issue remark is only placed on a reservoir right if the claimed volume exceeds the capacity by more than two times the volume of the reservoir. Tr. 490:23 – 492:11 (Davis). None of the State Water Projects, including the Tongue River Reservoir are limited to one-fill. Tr. 1215:3-4 (Smith).

135. The Amended Stipulation recognizes that water is diverted and released pursuant to the Operating Plan developed by the Advisory Committee. Ex. M526 at ¶ 12.

c. Operations of the Tongue River Reservoir

136. General considerations in the operation of a reservoir include the purpose of the reservoir, safety considerations, physical (including hydrological) characteristics of the basin, physical limitations of the facility, and upstream and downstream water rights (both junior and senior). Tr. 1015:10 - 1018:19 (Smith). Given this complex set of considerations, it is necessary to have flexibility in operating a reservoir. Ex. M7 at 9-10; Tr. 1019:11 – 1021:11

(Smith); Tr. 1093:18 – 1095:5 (Smith); Tr. 1205:13 – 1206:12 (Smith); Tr. 1308:10-12 (Smith); Tr. 1832:5 – 1834:6 (Aycock).

137. The Reservoir is owned and managed by the DNRC, Montana State Water Projects Bureau (“SWPB”). The TRWUA operates and maintains the dam. Ex. M524 at 19.

138. The NCT Compact, as ratified by the United States and Montana, provides for the creation of a five-member advisory committee comprised of representatives of the State of Montana, the Tongue River Water Users Association, the NCT, the United States, and a fifth member to be elected by the other four (“Advisory Committee”). The Advisory Committee was given the responsibility of creating an operating plan for the Tongue River Reservoir. *See* Ex. M527, art. III.D; Tr. 1144:16 – 1145:20 (Smith); Tr. 1197:4-17 (Smith).

139. The Advisory Committee did adopt an Operating Plan for the Tongue River Reservoir, Ex. M316 (“Operating Plan”), as well as a Manual for Operation and Maintenance, Ex. M524 (“Reservoir Manual”). The Reservoir Manual was originally adopted in June of 1995. *See* Ex. M527, art. III.D. The most recent revision for the Tongue River Dam Manual for Operation and Maintenance was adopted in January of 2004. Ex. M524.

140. If the Tongue River Reservoir does not fill, every storage right is cut back by a proportionate amount. Ex. M343; Ex. M500; Ex. M527 at art. II.A.2.c.ii; Tr. 3338:18-23 (Kepper).

141. Each fall through the spring, the DNRC and TRWUA continually evaluate snowpack and weather forecasts to plan the operations for the upcoming season. M316 at A5; Tr. 1206:16 – 1207:15 (Smith); Tr. 1313:4-5 (Smith); Tr. 1481:9 – 1482:22 (Hayes). Conditions are dynamic. If a shortage is predicted, the Advisory Committee develops “a storage plan to minimize the impact of such a shortage.” Ex. M316 at A5; Tr. 1350:8 – 1352:3 (Smith).

142. Two experts testified about the operations of the Tongue River Reservoir. Tr. 1008:10-18 (Smith); Tr. 1549:22 – 1550:3 (Aycok). In addition, Mr. Hayes testified as the operator of the Reservoir and President of the TRWUA. Wyoming did not offer a single witness on the issue of the operations of the Tongue River Reservoir. Tr. 5713;17-5714:10 (Hinckley).

i. Historic Operations

143. A reservoir water right in Montana is defined by “that amount of water by pattern and operation that a water right holder has put to use.” Ex. M4 at 3. In other words, a reservoir water right in Montana is limited and defined by the historic pattern of use. Tr. 1018:8-19 (Smith); Tr. 1095:18 – 1096:3 (Smith). Therefore, in the uncontested expert opinion of Mr. Smith, “the water right for the Tongue River Reservoir is tied to its pattern of use.” Ex. M4 at 21; *see also* Tr. 1096:7-18 (Smith).

144. The historic pattern of use prior to the Compact for the Tongue River Reservoir includes a spring fill period, Ex. M4 at 21, a maximum storage of 38,000, Ex. M5 at 29, winter bypass flows of no less than 173 cfs, Ex. M3 at 14, Attachment 8; Ex. M300, and the operation of the Reservoir to prevent flooding. *See generally* Tr. 1104:11 – 1106:1 (Smith); Tr. 1097:3 – 1098:10 (Smith).

145. The current operations of the Tongue River Reservoir are consistent with the historic operations. *Compare* Tr. 1096:24 – 1098:25 (Smith), *with* Tr. 1107:14 – 1108:7 (Smith), *with* Tr. 1218:2-20 (Smith); *see also* Ex. M4 at 11-13, 22-24; Ex. M309-A at 2; Ex. 309-B at MT-03300. Junior and senior water users are relying on the historic operations, and the historic pattern of use cannot be changed if other users, who have a right to the stream conditions when they came on the source, will be impacted. Tr. 615:15 – 617:15 (Hefner); 1103:17 – 1103:9 (Smith).

146. When the rehabilitation project was evaluated, the United States, the NCT, and the State of Montana intended to operate the Reservoir in a way that is consistent with historic operations. Ex. M335 at 4-20, E11; Tr. 1157:12 – 1159:18 (Smith). The Environmental Impact Statement produced by the United States, the NCT, and the State of Montana contemplated winter bypass flows of 150 cfs. Ex. M335; Tr. 1341:12-15 (Smith).

147. In his expert opinion, Mr. Aycock found “that the Reservoir had been managed in a very practical, reasonable manner.” Tr. 1848:6 – 16 (Aycock). According to Mr. Aycock, operating the Reservoir to maximize storage by changing winter bypass flows would represent a “radical change” in the historic operations. Tr. 1846:6 – 1847:2 (Aycock).

148. Even after the rehabilitation, the amount of water stored in any given year is the same as it was before the Compact. Tr. 1218:21 – 1219:8 (Smith).

ii. Winter Operations

149. The Reservoir Manual imposes a maintenance and safety restriction on winter storage for the Tongue River Reservoir. It provides as follows:

Maximum Winter Storage: The maximum reservoir elevation for winter storage is 3,417.5 feet with 45,000 acre-feet of storage. This maximum helps prevent damage to the riprap and embankment from wind-driven waves and ice.

Ex. M524 at 21. The maximum winter storage is set at approximately 45,000 acre-feet to prevent damage to the spillway and prolong the life of the structure. Tr. 1186:17 – 1187:15 (Smith).

150. Similarly, the Operating Plan states:

The Advisory Committee recommends that the maximum preferred carry-over be 45,000 AF (elevation 3417.5) in order to minimize freeze-thaw damage to the dam by allowing water to remain at the bottom of the concrete walls.

Ex. M316 at A6.

151. The Operating Plan was developed by the Advisory Committee pursuant to the NCT Compact. The Operating Plan underwent a rigorous review; many parties, including the Bureau of Reclamation, provided input into the final Operating Plan. Ex. M340; Tr. 1197:13 – 1204:2 (Smith). In the expert opinion of both Mr. Smith and Mr. Aycock, the Reservoir Manual and Operating Plan are consistent with industry standards and reasonable. Ex. M7 at 3, ¶ 1 (“I have reviewed the Operating Manual and the Operating Plan for the Reservoir and [they are] reasonable.”); Tr. 1211:14-22 (Smith); Tr. 1869:14-24 (Aycock) (describing the 45,000 winter storage maximum as “a reasonable restriction based on experience with reclamation reservoirs”).

152. The experience of the TRWUA has also confirmed that a maximum winter storage of 45,000 to 50,000 is necessary to prevent ice damage to the Reservoir spillway and other facilities. Tr. 1474:11-23 (Hayes); Tr. 3646:15 – 3647:2 (Hamilton); Tr. 3709:22 – 3710:13 (Hirsch).

153. The pre-1950 operating records for the Tongue River Reservoir show that the reservoir was consistently operated below a storage level of 38,000 acre-feet during the October through March season. Ex. M5 at 29.

154. In response to the severe drought of the 2000s, the DNRC and TRWUA have experimented with evaluating the performance of the new materials and raising the maximum storage to approximately 52,000 acre-feet. If the structure is able to safely operate at this level, the Operating Plan and Reservoir Manual will be changed. Tr. 1191:22 – 1193:18 (Smith). The TRWUA will bear the financial burden of any damage to the Reservoir. Tr. 1193:19 – 1194:8 (Smith).

155. Winter bypass flows are necessary from Tongue River Reservoir for operational, safety, and water rights purposes. Ex. M3 at 14-15; Ex. M4 at 14-17; Ex. M7 at 3, 11-16. The

Tongue River Reservoir is an on-channel reservoir. Winter bypass flows are normal flows of the river that are allowed to pass unimpeded through the on-stream Reservoir. Tr. 1102:2-16 (Smith). There are multiple reasons that winter bypass flows are necessary:

a. Provide Stock Water:

i. Stock water rights for stock drinking directly from the source were exempted from the claim filing process in the Montana adjudication process, meaning water users did not need to file claims for their stock water rights for stock drinking from the Tongue River. 85-2-222. As a result, there are a number of pre-Compact stock water rights that were not listed in the Tongue River Reservoir. The water users with stock water rights are the individuals with the best information about the stock water rights on the Tongue River in Montana. Tr. 483:7 – 484:5 (Davis).

ii. Other water users elected to file their stock water claims as part of the adjudication. There are 48 pre-Compact stock water rights listed in the Tongue River Adjudication, including several stock water rights that are senior to the Tongue River Reservoir. Tr. 497:4-8 (Davis); Tr. 501:11 – 502:16 (Davis).

iii. Cows and calves need to be able to water from the Tongue River in Montana in the winter. A number of water users testified that they water stock in the Tongue River in Montana pursuant to a pre-Compact water right. Tr. 1423:17-23 (Hayes); Tr. 3687:18-22 (Hirsch); Tr. 3752:9-22 (Hirsch); Tr. 3804:16 – 3805:20 (Nance). It is necessary to allow a minimum flow to satisfy these pre-Compact stock water rights for conveyance, so that water is not iced over and therefore inaccessible to the cattle, and for consumption. In 1967, the

DNRC estimated that the minimum flow necessary to satisfy the stock water rights was 167 cfs. Ex. M284; Ex. M309-A; Tr. 1112:24 – 1116:10 (Smith) (expressing the expert opinion that 167 cfs is an appropriate level of winter flows to satisfy the senior stock rights on the Tongue River in Montana); Tr. 1252:2-12 (Smith); Tr. 1467:9 – 1468:22 (Hayes).

b. Prevent Icing:

i. Minimum bypass flows are necessary to prevent icing on the Tongue River in Montana. Ex. M19 at 4; Ex. M335 at 4-19; Ex. M360; Ex. M361; Ex. M515; Tr. 1154:7 – 1157:5 (Smith); Tr. 1849:23 – 1850:11 (Aycock).

ii. Every one of the Montana water users testified to the significant issues caused by winter ice jams. Tr. 1469:9 – 1470:10 (Hayes); 1472:10 – 1473:13 (Hayes); Tr. 3643:18 – 3646:14 (Hamilton); Tr. 3719:16-24 (Hirsch); Tr. 3802:15 – 3804:15 (Nance); Tr. 3879:26 – 3880:5 (Muggli). According to Mr. Hamilton winter ice “is a very serious problem in the management of the river, not only for the economic value to agriculture but for safety.” Tr. 3645:19-21 (Hamilton). Based on the experience of the water users, a minimum flow of 175 cfs is necessary to protect against damage caused by ice jams. Tr. 3646:8-14 (Hamilton).

c. Flood Control:

i. Flood control was one of the original purposes of the Tongue River Reservoir. Tr. 1366:3-18 (Smith). Due to the potential for loss of life downstream if it were to fail, the Reservoir is considered a high-hazard dam. Ex. M335 at 2-3; Tr. 1134:8 – 1136:7 (Smith). It is necessary to operate the reservoir

in a way that does not directly lead to a flood and resultant damage downstream. This requires leaving some capacity in the Tongue River Reservoir to capture high volume spring runoff flows. Ex. M316 at A5; Tr. 1094:8 – 1095:5 (Smith); Tr. 1136:8 – 1137:7 (Smith); Tr. 1207:24 – 1208:8 (Smith); Tr. 1349:16-25 (Smith); Tr. 1366:3-22 (Smith); Tr. 1367:22 – 1368:7 (Smith).

d. Historic Winter Bypass Flows:

i. As discussed above, the historic pattern of winter bypass flows for the Tongue River Reservoir helps define the water right. Junior rights downstream, including the in-stream flow right of the Montana Department of Fish and Wildlife and Parks, have a reasonable expectation that the Reservoir will continue to be operated in a manner that is consistent with its historic use. Tr. 1102:24 – 1103:9 (Smith); Tr. 1301:7-16 (Smith); Tr. 1391:5-24 (Smith).

ii. Prior to 1950, there were minimum winter bypass flows similar to the 175 cfs requirement established by the Advisory Committee. Ex. M3 at 14; Ex. M7 at 12-13 and Figures 1-3, 15-16; Ex. 309-B at MT-03300. Long-term average monthly outflows during the non-irrigation season range from 168 cfs to 350 cfs over the period of 1939 through 2012. Ex. M3 at 14. The historic, pre-Compact, bypass flows were as follows:

	Oct.	Nov.	Dec.	Jan.	Feb.	March	April
Mean Monthly Discharge (CFS)	408	428	218	173	174	237	412

Ex. M300.

iii. Pre-Compact winter bypass flows were a minimum of 173 cfs, and the winter bypass flows during the years 2001, 2002, 2004, and 2006 were similar or more conservative than pre-Compact operations. Ex. M4 at 22-24, Figures 1-3; Ex. M327; Ex. M328; Ex. M329; Ex. M330.

e. Maximum Winter Storage:

i. As described above, winter bypass flows are necessary so that storage does not get significantly above the maximum level and damage the Reservoir. Ex. M524 at 21; Tr. 1186:17 – 1187:15 (Smith).

f. Prevent Damage to the Tunnels:

i. Winter bypass flows are necessary to prevent ice damage to the outlets. Ex. M524 at 21; Tr. 1189:21 – 1191:15 (Smith).

See Ex. M7 at 11-16; Tr. 1238:3 – 1244:7 (Smith) (summarizing the reasons for winter bypass flows).

156. In the uncontested expert opinion of Mr. Smith, it would be “reckless and irresponsible” to set the winter bypass flows as either 50 cfs or 75 cfs. Tr. 1254:21 – 1257:6 (Smith). Similarly, Mr. Aycock opined that it would be “very risky” and irresponsible to operate the Reservoir as suggested by Wyoming. Tr. 1844:9 – 1845:11 (Aycock); Tr. 1846:6 – 1847:2 (Aycock).

157. The Reservoir also has a minimum winter storage level of 10,800 acre-feet. Ex. M524 at 21. Since the rehabilitation, the minimum winter storage has not dropped below this level. Tr. 1188:12-17 (Smith).

158. DNRC has operating plans similar in format to the Tongue River Reservoir Operating Plan for all of its Water Projects. Of the 21 State Water Projects, all of them have

maximum winter storage levels; of the 17 on-channel projects, 16 have requirements for winter bypass flows. Ex. M320; Ex. M321; Ex. M322; Ex.. M323; Ex. M324; Tr. 1262:6 – 1263:9 (Smith).

iii. Fill Period

159. The Tongue River Reservoir relies primarily on spring runoff from April to July to fill to or near its normal full capacity. Tr. 1036:22 – 1037:14 (Smith).

160. The Advisory Committee determined that the Tongue River Reservoir should be operated to fill the Reservoir during the spring runoff. Ex. M316 at A4

161. As described above, the historic operations define the water right, and the fill of the Reservoir is during the spring runoff period. Ex. M335 at 3-5; Tr. 1152:7 – 1153:3 (Smith); Tr. 1185:6-10 (Smith).

d. Operations in 2001, 2002, 2004 and 2006

162. The Tongue River Reservoir did not fill in 2001, 2002, 2004, and 2006. Ex. M5 at 11, Tables 4-A through E, Table 12.

163. When timing of storage is considered, the Tongue River Reservoir would not have filled to either the original or the rehabilitated capacity in 2001, 2002, 2004, and 2006, even if the winter bypass flow had been set at 75 cfs for the entire winter. Ex. M6 at 20, Figure 9-A, Figure 9-B; Ex. M7 at 17-21, Table 3.

164. The winter bypass flows in 2001, 2002, 2004 and 2006 were lower than the historic pre-Compact flows. *Compare* Ex. M11 at 10, *with* Ex. M300.

165. In 2001, 2002, 2004 and 2006, Montana stored less water than it did prior to the Compact. Tr. 1390:21-25 (Smith).

166. Mr. Aycock reviewed the operations of the Reservoir in 2001, 2002, 2004 and 2006 and found those operations to be reasonable. Ex. M7 at 3, 9-10.

2. Montana Direct Flow Rights

167. The irrigators in Montana each have unique irrigation practices. Tr. 3325:24 – 3327:5 (Kepper). Despite this variation, it can generally be said that the irrigation season on the Tongue River in Montana starts in April or May. Tr. 3325:17-21 (Kepper). It lasts until approximately September. Tr. 3326:10-12 (Kepper); Tr. 3783:18-21 (Nance).

168. The runoff period can vary greatly, and can be as short as a couple of days. Tr. 3329:15-19 (Kepper). Conditions are unpredictable, making it difficult to plan. Tr. 3860:4-25 (Muggli).

169. The area irrigated by diversions from the mainstem of the Tongue River in Montana at the time of the Compact was documented in Water Resource Surveys completed in the Montana State Engineer's Office in 1947-1949. The irrigated area above the T&Y Irrigation District at the time of the Compact was 9,908 acres. Ex. M5 at 8; Ex. M6 at 14-16.

170. There are 77 pre-Compact water rights in the Tongue River Basin in Montana. Ex. M6 at App. D, pgs. 120 – 821. Each of these 77 pre-Compact water rights has been verified through the Tongue River Adjudication in Montana. Although the adjudication is not final, all of the pre-1950 claims have undergone a rigorous examination process. *See id.*; Ex. M230 at 4-14; Tr. 488:6 – 492:11 (Davis). The current preliminary decree defines the existing pre-Compact rights until the final decree is issued. Tr. 485:23 – 486 (Davis) (citing MCA § 85-2-221).

171. The two most senior water rights on the Tongue River in Montana are the Nance right and the water right for the T&Y Irrigation District ("T&Y"). The Nance right is a 10.3 cfs right. It is the most senior right on the Tongue River in Montana. Ex. M6 at 125 – 138.

172. The T&Y is located near the confluence with the Yellowstone River at the bottom of the Tongue River in Montana. The T&Y, which is the second most senior water right on the Tongue River, is entitled to divert 187.5 cubic feet per second ("cfs"). Ex. M6 at 139-143; *see also* 1914 Miles City Decree, Ex. M243. Irrigated acreage for the T&Y water right in the Montana adjudication is 9,589 acres. Ex. M6 at 15.

173. When all of the 77 pre-Compact water rights are totaled, they are entitled to deliver 350 cfs. Ex. M6 at App. D, pgs. 120 – 821.

174. Dale E. Book, P.E. tabulated the pre-1950 water right claims on the mainstem of the Tongue River from documents available as part of the ongoing Tongue River adjudication. Based on this examination, the acreage associated with pre-1950 water rights totals 11,600 acres between the stateline and the T&Y canal. The irrigation status of these rights for 2005, 2009, and 2001 was analyzed based on aerial photography. Ex. M6 at 14-15, Table 4-A and 4-B; Ex. M5 at 8, Table 2. Based on this analysis, it was concluded that the pre-1950 acreage is being irrigated. *Id.* at 16, Table 4-A and 4-B; Ex. M5 at Table 12, App. A.

175. Mr. Book then used this information concerning pre-1950 irrigated acreage to determine the amount of water that is necessary in Montana to satisfy all of Montana's pre-1950 rights. He determined that 195 cfs is necessary in May, 325 cfs in June, 350 cfs in July, 335 cfs in August, and 280 cfs in September. Ex. M5 at 9-11; Ex. M6 at 16-19.

176. Mr. Book's stateline flow model was conservative because he assumed that 1 cfs is capable of irrigating up to 40 acres of land. However, in Montana, the normal duty of water in the adjudication is 17 gpm per acre or approximately 1 cfs to 26 acres of land. Tr. 486:15 – 487:20 (Davis).

177. By July in most years, the flow in the river will not support the full direct flow demands in Montana. *Id.*; *see also* Ex. M5 at 35 (Table 5).

178. When the flow entering Montana drops below the levels shown on Table 5 of Mr. Book's Expert Report, Ex. M5 at 35, Montana irrigators must resort to reservoir storage to supplement river flow. *Id.* at 11. The water users in Montana rely on both direct flow rights and water from the reservoir. Shortages to either of those sources of water adversely affect the Montana water users. Tr. 2679:5-14 (Moy).

179. In times of water shortage, Montana has a number of options for water users to ensure that the senior rights receive their share of water first. Ex. M552; Tr. 510:8 – 519:13 (Davis). One of the options is to appoint a Water Commissioner to administer and regulate the water rights of a river or stream. Ex. M552 at ¶¶ 2, 4; MCA § 85-5-101.

180. The duties and responsibilities of the Water Commissioners include administering and distributing the water of a river based on the priority system. They do that by measuring water use, checking diversions, delivering stored water and working with water users. Tr. 3227:11 – 3228:6 (Roberts). Water Commissioners in Montana are supervised by the Montana District Court, Tr. 3228:10-15 (Roberts), and they are authorized to adjust and control headgates, place locks on headgates, and in extreme situations, make arrests. Tr. 3231:4 – 3232:21 (Roberts); Mont. Title 85, Chapter 5, Part 1. The Water Commissioners take an oath to faithfully perform their duties, and there is a procedure in place for water users to complain about the actions of a Water Commissioner to the District Court. MCA §§ 85-5-103, 109; MCA § 85-4-301.

181. The Montana DNRC provides a three-day training for Water Commissioners at least once a year. Ex. M229-A; W285; Mont. Dem. Ex. 1. The objective of the DNRC training

is to prepare the Water Commissioners to perform their duties. Tr. 3241: - 3242:1 (Roberts). At the end of the training, the Water Commissioners are provided with resources including a Water Commissioner Training Manual, a measurement guide entitled "Wyoming Guide for Water Measurement," and the "Bureau of Reclamation Water Measurement Manual." Tr. 3243:12-25 (Roberts). After the trainings, the DNRC is available throughout the year to answer questions and provide guidance. Tr. 3271:20 – 3272:13 (Roberts).

182. There were Water Commissioners appointed on the Tongue River in 2000, 2001, 2002, 2004, and 2006. Tr. 3307:18-19 (Kepper).

183. Each of the orders appointing the Water Commissioners required them to administer direct flow rights and the storage water. Ex. M378A; Ex. M380A; Ex. M385; Ex. 394. For example, the first order appointing Mr. Kepper provided that "No water user may use any water flowing in the Tongue River except as distributed by the water commissioners." Ex. 378A. Each of the subsequent orders contained similar language. Ex. M380A; Ex. M385; Ex. 394.

184. In order to prepare for their responsibilities as Water Commissioners, Mr. Kepper, Mr. Gephart, and Mr. Fjell all attended the training offered by the Montana DNRC. Tr. 3240:25 – 3241:6 (Roberts).

185. At the beginning of each year, the Montana Water Commissioners would visit every point of diversion on the Tongue River with the individual water users. Tr. 3321:14-24 (Kepper); Tr. 3578:13-20 (Fjell). The Water Commissioners showed the water users the Miles City decree from the District Court, and informed them that they would be administering all of the direct flow and storage water. Tr. 3332:4-19 (Kepper); Tr. 3711:3-22 (Hirsch). Even the first right on the river was measured at the beginning of the year. Tr. 3788:2 -3789:6 (Nance)

186. The main type of diversion on the Tongue River in Montana is the electric pump. There were also a few diesel pumps and approximately five ditches. Tr. 3322:15-23 (Kepper); Tr. 3324:11-25 (Kepper). As part of the initial visit to the points of diversion, the Water Commissioners used an ultrasonic pipe flow meter to take a baseline by measuring the capacity of the electric and diesel pumps. Tr. 3351:3-20 (Kepper). Ultrasonic pipe flow meters are highly accurate. Tr. 3268:1 – 3270:4 (Roberts).

187. For the five ditch diversions in Montana, Water Commissioners used a meter called a Marsh-McBirney meter to measure the diversions. The Marsh-McBirney meters are also accurate. Tr. 3268:1 – 3270:4 (Roberts); Tr. 3352:16-25 (Kepper).

188. Once the capacity of the diversions had been measured, the Water Commissioners were able to use the time that the diversion is used to determine how much water was diverted. The electric pumps have a gauge that measures the time; the five diesel pumps and five ditches were on the honor system. Tr. 3353:1 – 3355:21 (Kepper).

189. Mr. Kepper, the senior Water Commissioner was instructed to administer the direct flow rights by the District Court Judge. The Montana Water Commissioners utilized the 1914 Miles City Decree to administer all of the direct flow rights of the Tongue River in Montana in priority. Tr. 3315:11 – 3316:14 (Kepper); Tr. 3327:12-22 (Kepper).

190. The Water Commissioners monitored every point of diversion on the Tongue River during the years at issue. Tr. 3344:14-17 (Kepper); Tr. 3347:1 – 3348:2 (Kepper); Tr. 3405:5-12 (Kepper). They “[knew] exactly who [was] irrigating and who [was] not.” Tr. 3347:11-21 (Kepper).

191. If a senior water right was not taking direct flow water on any given day, the Water Commissioners would allow the next right in priority to take available water. Tr. 3335:24

– 3337:6 (Kepper); Tr. 3587:3-24 (Fjell); Tr. 3615:10 – 3616:10 (Fjell). When necessary, the Water Commissioners would inform junior water users that they could not divert direct flow water because it needed to go to a senior user. Tr. 3343:18 – 3344:4 (Kepper); Tr. 3655:4-17 (Hamilton). At times, the Water Commissioners physically shut down or lock headgates. Tr. 3317:1-5 (Kepper); Tr. 3337:16 – 3338:14 (Kepper); Tr. 3341:14 – 3342:16 (Kepper).

192. Physically controlling the pumps or headgates was rarely necessary, however, because the Montana water users were generally informed and cooperative. Tr. 3343:4-13 (Kepper); Tr. 3711:9-16 (Hirsch).

193. In the years at issue, after the spring runoff the only two water rights that received any direct flow water were the Nance right, and the T&Y. Tr. 3597:2-8 (Fjell). At that point, the other water users on the Tongue River in Montana are relying on stored water. Tr. 3637:3-8 (Hamilton).

194. In addition to administering the direct flow rights in priority, the Montana Water Commissioners were also responsible for ensuring that storage water from the Tongue River Reservoir was delivered to the appropriate user. Mr. Hayes provided information and input to the Water Commissioners, but ultimately the Water Commissioners were responsible for the operations of the Tongue River Reservoir. Tr. 3356:17 – 3358:17 (Kepper).

195. The Water Commissioners had a list of the water users who owned shares in the reservoir. To get stored water, a water user placed an order with a Water Commissioner. The Water Commissioner would place the order, and then make sure that the storage water was delivered to the appropriate headgate. Ex. M388; Ex. M397; Tr. 3317:19 – 3318:1 (Kepper); Tr. 3348:18-25 (Kepper); Tr. 3356:17 – 3358:17 (Kepper); Tr. 3586:8-14 (Fjell); Tr. 3713:3-11 (Hirsch).

196. In order to accomplish this task, the Water Commissioners would adjust for transit loss and the travel time. Tr. 3360:16 – 3363:14 (Kepper); Tr. 3434:3-19 (Kepper).

197. The Montana Water Commissioners measured the amount of direct flow and storage water used by each water user at the pump or headgate. Tr. 3789:3-6 (Nance) (Water Commissioners measured the first right on the river). Although the Water Commissioners kept daily records of these measurements and of their activities, these daily records were not saved. Ex. M395; Ex. M381; Ex. M390; Ex. M400; Tr. 3334:4 – 3335:4 (Kepper); Tr. 3373:10 – 3374:4 (Kepper); Tr. 3382:9-25 (Kepper); Tr. 3536:12 - 3538:12 (Gephart); Tr. 3589:20 – 3589:3 (Fjell); Tr. 3597:9-12 (Fjell).

198. Rather than daily records, the District Court instructed the Montana Water Commissioners to file bi-monthly reports listing the amount of stored water used by each water user. Ex. M382; Ex. M383; Ex. M386; Ex. M399; Tr. 3374:5-12 (Kepper); Tr. 3387:6-20 (Kepper).

199. The Water Commissioners were on the river every day. Tr. 3331:8-24 (Kepper). Each day, the Water Commissioners would check the flow at the stateline gauge, the gauge at the Tongue River Reservoir, and the gauges at other points on the river. Ex. M395; Tr. 3317:8-14 (Kepper); Tr. 3332:20-25 (Kepper). This would allow them to determine how much direct flow and storage water could be delivered. Tr. 3359:1-11 (Kepper); Tr. 3536:12 - 3538:12 (Gephart); Tr. 3567:3-22 (Gephart); Tr. 3598:7-17 (Fjell).

200. In addition to the Water Commissioners, the water users themselves would monitor the flows every day during the irrigation season. Tr. 3641:9-18 (Hamilton); Tr. 3795:21 – 3796:8 (Nance).

201. The Montana water users were careful with their use of storage water. If possible they would manage their stored water so that it could last throughout the irrigation season. Tr. 3340:1-12 (Kepper); Tr. 3428:10-20 (Kepper).

202. There is irrigation on the Tongue River in Montana every single day during the irrigation season. Tr. 3327:2-5 (Kepper).

203. Many Montana irrigators rotate their fields so that there is continuous irrigation occurring around the clock. Tr. 3713:20 – 3714:10 (Hirsch); Tr. 3732:13 – 3734:10 (Hirsch); Tr. 3784:21 – 3785:20 (Nance); Tr. 3850:17 – 3852:15 (Muggli); Tr. 1416:21-24 (Hayes); Tr. 1417:25 – 1419:7 (Hayes).

204. Almost every year the large majority of the lands irrigated by the T&Y canal are irrigated. If there was sufficient water available every year, all of these lands would be irrigated every year. Tr. 3891:16 – 3892:19 (Muggli).

205. There are approximately 400 water users on the T&Y. Tr. 3888:2-4 (Muggli). Each water user has different irrigation practices. In general, approximately 75% of the acreage is in alfalfa and 25% in corn and small grains. Tr. 3891:13-15 (Muggli). Mr. Muggli is working on the T&Y every day during the irrigation season. Tr. 3900:4-8 (Muggli). Each water user is responsible for operating his or her own headgate, but Mr. Muggli periodically tags or locks headgates if a user is not using water efficiently or taking more than their share. Tr. 3930:12 – 3932:8 (Muggli) Mr. Muggli also works to resolve disputes. Tr. 3900:15 – 3901:22 (Muggli).

206. There is an electronic measuring device located at the inlet of the T&Y. Water in the T&Y can also be measured by a series of flumes at different locations in the T&Y. Mr. Muggli uses these measuring devices to determine how much water is needed in the T&Y. Ex. M377; Tr. 3888:22 – 3891:3 (Muggli).

207. The T&Y uses water efficiently. In fact, it is assigned less water per acre than is typically assigned in the Montana adjudication. Tr. 3893:17 – 3894:19 (Muggli).

208. At times during every irrigation season, the T&Y is diverting the maximum amount of its water right. Ex. M377; Ex. W3 at 15, Table 1; Tr. 3367:17-24 (Kepper); Tr. 3543:2-6 (Gephart); Tr. 3909:7-23 (Muggli); Tr. 3932:9-21 (Muggli). For most of the irrigation season during the years at issue, the T&Y was diverting the entire amount of water in the Tongue River in Montana. Tr. 3595:12-21 (Fjell) (“I never saw water go over it”).

209. Even during the times when the T&Y is diverting all of the water in the Tongue River, there is water in the river at the Miles City Gauge. Tr. 3367:25 – 3368:14 (Kepper). Some of this water comes from perennial tributaries that enter the Tongue River below the T&Y. Tr. 3368:9-14 (Kepper). Over the years Mr. Muggli has observed between 18 and 20 cfs below the T&Y at times when the T&Y is diverting all of the water from the Tongue River. Tr. 3932:22 – 3933:25 (Muggli).

210. There are four or five water users below the T&Y. Tr. 1428:16-22 (Hayes). The Water Commissioners were responsible for shepherding storage water to those water users, which meant that it had to be allowed to pass the T&Y. Tr. 3367:2-16 (Kepper).

211. Although there are likely return flows from the water rights and reservoir water in Montana, uncontested expert testimony in this case suggests that the Tongue River is a slightly losing stream during dry years. Tr. 398:1-14 (Dalby). Over the years, the Montana water users have determined that if there is less than 200 cfs reaching the stateline, the T&Y Irrigation District’s direct flow right is not being fully satisfied, and all other users on the river, except for Jay Nance, are using stored water. Tr. 1092:20 – 1093:16 (Smith); Tr. 1438:17-24 (Hayes); Tr. 3330:14-18 (Kepper).

212. As the second, and largest direct flow right, the T&Y is typically the calling right on the Tongue River in Montana. Tr. 3330:19-25 (Kepper). In each of the years at issue there has been a time during the irrigation season when there was insufficient water reaching the canal to fully satisfy the T&Y's direct flow right. Tr. 3329:20 – 3330:13 (Kepper); Tr. 3409:1-16 (Kepper); Tr. 3587:3-24 (Fjell); Tr. 3895:3-11 (Muggli). When this condition exists, the T&Y is forced to switch to using stored water from the Tongue River Reservoir in order to obtain a full supply. Depending on various conditions, this can occur anytime between late May and August. The only time the T&Y switches to stored water is when there is insufficient water reaching the canal to satisfy T&Y's direct flow right. Tr. 3910:17 – 3911:8 (Muggli); Tr. 3920:15 -3921:3 (Muggli).

213. When there is insufficient water reaching the T&Y canal to satisfy its direct flow right, other users on the Tongue River are informed that there is no longer water available for direct flow rights, and users junior to the T&Y must use stored water to continuing irrigating. This includes all of the irrigators on the Tongue River below the Reservoir, except for Jay Nance, who is the only water user with a right senior to the T&Y. Tr. 3341:8 – 3342:16 (Kepper).

214. If there is insufficient water reaching the T&Y to satisfy its direct flow right, the T&Y will supplement the remainder of its diversion with storage water. In the years at issue, the T&Y managed its storage water to make it last as long as possible. At times, this meant that the T&Y would not take 187.5 cfs even though that water could have been used Tr. 1437:15-17 (Hayes); Tr. 3436:3-17 (Kepper); Tr. 3905:7 – 3906:6 (Muggli); Tr. 3920:15 -3921:3 (Muggli).

215. The Water Commissioners accounted for the amount of direct flow and storage water that the T&Y was taking. TR. 3339:8-17 (Kepper). Mr. Muggli would adjust the T&Y

inlet structure regularly to take the amount of water to which the T&Y was entitled and needed. Tr. 3881:2-17 (Muggli); Tr. 3903:6-9 (Muggli). He is in regular communication with the water users on the T&Y, and he bases adjustments to the inlet on those needs. Tr. 3904:7-23 (Muggli).

216. The T&Y ran out of stored water in 2001, 2002, 2004 and 2006. Tr. 3921:6-10 (Muggli). In some of those years, the T&Y had to resort to purchasing water from the NCT. Tr. 3924:16 – 3926:2 (Muggli); Tr. 3928:10-21 (Muggli).

217. There is a fish bypass louver on the T&Y inlet structure. When the T&Y needs water, this louver is shut down. Mr. Muggli will periodically open the louver to allow the fish to exit. Tr. 3884:9 – 3885:21 (Muggli).

218. During the years at issue, there was no water flowing from the T&Y into the Yellowstone River at the end of the ditch. All of the water was used in the T&Y. In at least one of the years, Mr. Muggli actually found weeds growing in the ditch. Tr. 3908:15 – 3909:6 (Muggli).

219. The T&Y addressed shortages in the years at issue by rationing the available water. Under this plan, the users would alternate such that the upper users could irrigate for 48 hours while the lower users were idle. Then they would switch. Tr. 3929:2 – 3930:11 (Muggli).

220. Montana water users used water efficiently in all of the years at issue. There was no evidence of waste. Tr. 3372:14 – 3373:9 (Kepper) (“So I didn’t observe anybody wasting water, never.”); Tr. 3540:2-15 (Gephart); Tr. 3599:15 – 3600:4 (Fjell) (“I never saw a drop of waste”); Tr. 3647:3-6 (Hamilton); Tr. 3717:2-17 (Hirsch) (“unequivocally no” waste).

221. Both Mr. Book and Mr. Aycock agreed with the Water Commissioners and water users that there was no waste. For example, based on his years of experience working with the various river systems on behalf of the Bureau of Reclamation, it was Mr. Aycock’s expert

opinion that there was very little waste and the Tongue River in Montana had been run efficiently. Ex. M7 at 38-29 (App. C, pg. 38-39); Tr. 1836:20 – 1842:24 (Aycock).

222. Insufficient water was reaching Montana at some point during the irrigation season to satisfy Montana's active pre-1950 water rights in all but three years since 1961. Ex. M5 at 11, Table 5; Ex. M6 at 17-19, Tables 5-A & B, Tables 6A, B, & C.

223. In 2001 the mean flows entering Montana were below 200 cfs in June, July, August and September; in 2002 the mean flows entering Montana were below 200 cfs in July, August and September; in 2004 the mean flows entering Montana were below 200 cfs in May, June, July, August and September; and in 2006 the mean flows entering Montana were below 200 cfs in August and September. Ex. M5 at Table 5. During these times, the T&Y was not receiving sufficient water to satisfy its direct flow right. *E.g.*, Ex. J64.

224. Insufficient water was reaching Montana to satisfy its pre-1950 water rights in Montana in every day of July, August, and September in 2001, 2002, 2004, and 2006. Ex. M6 at Table 6-B; insufficient water was reaching Montana to satisfy its pre-1950 water rights in Montana in June on 30 days in 2001, 17 days in 2002, 30 days in 2004, and 14 days in 2006. *Id.*

225. Water shortages in Montana caused serious hardship for the water users in Montana. Tr. 3369:6 – 3371:10 (Kepper). In each year, a free river status of unlimited diversions existed in Wyoming until regulation.

226. Had Wyoming taken some action to allow more water to pass into Montana, some of it would have been received by the pre-Compact water users. Tr. 3427:19 – 3428:6 (Kepper). In Montana, "Every little bit helps." *Id.*; see also Tr. 1490:15-23 (Hayes) ("A small amount of water can go on a long ways in the Tongue River Basin"); Tr. 3443:25 – 3444:2 (Kepper) ("even

small amounts count in Montana”; Tr. 3653:1-3 (Hamilton) (“I guess every drop of water is valuable”).

227. Montana water users made sacrifices to deal with the shortages such as irrigating less acreage, changing their crops, purchasing storage water from other users of the NCT, selling cattle, and purchasing feed or feed products from other sources. Ex. M389; Tr. 1445:8-20 (Hayes); Tr. 1483:11 – 1484:16 (Hayes); Tr. 3369:6 – 3371:10 (Kepper); Tr. 3394:22-25 (Kepper); Tr. 3641:19 – 3643:17 (Hamilton); Tr. 3662:3 – 3669:22 (Hamilton); Tr. 3675:19 – 3676:23 (Hamilton); Tr. 3689:24 – 3690:4 (Hirsch); Tr. 3691:7 – 3695:10 (Hirsch); Tr. 3720:7 – 3721:2 (Hirsch); Tr. 3859:2 3860:2 (Muggli). Each of these choices caused damages to the State of Montana and its water users.

228. For example, Mr. Muggli discussed the adjustments at his family farm during the years at issue. In a normal year, Mr. Muggli’s operation produces approximately 5,000 tons of alfalfa, 30,000 bushels of corn, and 20,000 bushels of small grain which is used primarily in his feed operation. Tr. 3852:16 – 3853:14 (Muggli). But in the dry years at issue, some of Mr. Muggli’s fields were idle. Even those that were being irrigated had less water and were therefore less productive. On average, Mr. Muggli produced approximately 40% of a normal year. To address this lack of production, Mr. Muggli had to purchase products from other irrigators at a cost of over \$250,000 per year. Tr. 3861:5 – 3866:17 (Muggli).

C. Post-Compact Water Rights and Water Use in Wyoming

1. Post-Compact Direct Flow Rights

229. Water is extremely important to irrigators in both Montana and Wyoming because they rely on it for their livelihood. Tr. 2231:2-10 (Boyd).

230. In Wyoming, a water right can be lost for non-use. This provides an incentive for water users to use their water every year. Tr. 1697:10 – 1698:23 (Whitaker). There are

approximately 4,320 acres in Wyoming that are irrigated with post-1950 rights. Ex. M5 at 17-19, Table 10, Figure 3. A list of post-1950 rights in Wyoming is provided in Appendix G-2 of the Book Report.

231. Unless regulated, all active water users in the Tongue River Basin in Wyoming are permitted to take the full amount of their water right. In the dry years at issue, when the Wyoming water users had access to water, those users diverted water. Tr. 1699:3-12 (Whitaker); Tr. 1782:21-25 (Whitaker); Tr. 4269:10-13 (Fassett); Tr. 4271:3-8 (Fassett). Most of the post-Compact water rights in Wyoming were used every year. Tr. 2231:11-19 (Boyd). Some irrigators in Wyoming irrigate 24 hours per day. Tr. 3458:7-18 (Benzel). Ex. M5 at 323-25

232. Wyoming water users begin irrigating in April or May when water becomes available. During the spring runoff, before regulation begins, Wyoming water users are allowed to take as much water as they can. The only limitation is the size of their ditch or diversion. Tr. 1699:3-15 (Whitaker); Tr. 1703:16 – 1704:3 (Whitaker); *see also* Ex. M481 at 8 (describing Wyoming provisions for surplus and excess water). During the years at issue, to the extent water was available, Wyoming water users diverted as much as their diversions would allow before regulation began. Tr. 1721:19 – 1722:14 (Whitaker); Tr. 2231:11 – 2232:5 (Boyd). The spring runoff period is also the primary fill period for the Tongue River Reservoir.

233. Wyoming water commissioners are instructed that “it is the duty of the Commissioner to regulate all upstream appropriations to the extent necessary to supply the requesting appropriation its full entitlement if available.” Ex. M481 at 6. Thus, regulation only occurs if and when there is junior water use. Tr. 1783:1-12 (Whitaker); Tr. 2232:6-8 (Boyd).

234. Regulation in the Tongue River Basin in Wyoming typically begins in mid-July. Tr. 1704:4-21 (Whitaker).

235. As described above, a call in Wyoming need not be in writing and need not take any particular form. Rather, it is a communication from a senior user that he or she is short of water. *Id.*

236. Although they are required to do so by statute, Wyoming Water Commissioners rarely place a tag on a diversion that is under regulation. Ex. M481 at 7; Ex. M499; Tr. 1711:7 – 1712:21 (Whitaker); Tr. 1969:7-24 (LoGuidice); Tr. 2074:20 – 2075:3 (Knapp).

237. Water users in Wyoming, like those in Montana, typically voluntarily comply with the instructions of the Wyoming Water Commissioners. For that reason, it is often unnecessary for the Water Commissioners to place a tag or lock on a diversion. Tr. 1711:7 – 1712:21 (Whitaker); Tr. 1783:13 – 1784:2 (Whitaker).

238. After regulation has begun, Wyoming water users, like those in Montana, will often still control their diversion works. Tr. 1971:1 – 1972:10 (LoGuidice).

239. As in Montana, the Wyoming Water Commissioners do not measure return flows. Tr. 1976:12-16 (LoGuidice); Tr. 2089:7-15 (Knapp).

240. Once a ditch or diversion in Wyoming is placed into regulation, it stays in regulation for the remainder of the season. Tr. 1714:1-21 (Whitaker). Likewise, once a ditch in Wyoming is placed into regulation, regulation is not lifted based on the irrigation practices of individual users, such as when those users are cutting hay. Tr. 2238:2 – 2239:5 (Boyd) (“Q. You don’t pull your tag for when the irrigators are haying, correct? A. No, not normally.”); Tr. 2344:8 – 2345:3 (Schroeder).

241. Water users typically call for water to be released from a reservoir when there is insufficient direct flow. For that reason, calls for releases of reservoir water are a good indicator

of when water was short and regulation occurred in Wyoming. Tr. 1686:15-21 (Whitaker); Tr. 1743:8-17 (Whitaker).

242. The Wyoming Hydrographer Reports indicate the following dates for releases of water from reservoirs with post-Compact storage in the Tongue River Basin in Wyoming:

- a. 2001
 - i. Big Horn July 2, 2001 (Ex. J59 at 98)
 - ii. Cross Creek July 2, 2001 (Ex. J59 at 97)
 - iii. Dome Lake July 7, 2001 (Ex. J59 at 106)
 - iv. Park June 22, 2001 (Ex. J59 at 101)
 - v. Sawmill August 2, 2001 (Ex. J59 at 107)
 - vi. Twin Lakes June 22, 2001 (Ex. J59 at 93)
- b. 2002
 - i. Big Horn July 3, 2002 (Ex. J60 at 101)
 - ii. Cross Creek July 18, 2002 (Ex. J60 at 100)
 - iii. Dome Lake July 8, 2002 (Ex. J60 at 109)
 - iv. Park July 1, 2002 (Ex. J60 at 104)
 - v. Sawmill July 26, 2002 (Ex. J60 at 112)
 - vi. Twin Lakes July 8, 2002 (Ex. J60 at 97)
- c. 2004
 - i. Big Horn June 21, 2004 (Ex. J61 at 107)
 - ii. Cross Creek August 2, 2004 (Ex. J61 at 104)
 - iii. Dome Lake July 20, 2004 (Ex. J61 at 116)
 - iv. Park July 16, 2004 (Ex. J61 at 110)
 - v. Sawmill August 9, 2004 (Ex. J61 at 118)
 - vi. Twin Lakes June 21, 2004 (Ex. J61 at 97)
- d. 2006
 - i. Big Horn June 21, 2006 (Ex. J62 at 110)
 - ii. Cross Creek July 12, 2006 (Ex. J62 at 107)
 - iii. Dome Lake June 28, 2006 (Ex. J62 at 119)
 - iv. Park June 16, 2006 (Ex. J62 at 113)
 - v. Sawmill June 28, 2006 (Ex. J62 at 122)
 - vi. Twin Lakes July 12, 2006 (Ex. J62 at 100)

243. Based on this information and Table 5 of the Book Expert Report, mean stateline flows can be deduced in the following amounts and at the following times:

Year	Dates When Regulation Likely Occurred in Wyoming	Mean Stateline Flows
2001	July 2, 2001	55 cfs
	July 2, 2001	55 cfs
	July 7, 2001	55 cfs
	June 22, 2001	176 cfs
	August 2, 2001	13 cfs
	June 22, 2001	55 cfs
2002	July 3, 2002	83 cfs
	July 18, 2002	83 cfs
	July 8, 2002	83 cfs
	July 1, 2002	83 cfs
	July 26, 2002	83 cfs
	July 8, 2002	83 cfs
2004	June 21, 2004	181 cfs
	August 2, 2004	64 cfs
	July 20, 2004	150 cfs
	July 16, 2004	150 cfs
	August 9, 2004	64 cfs
	June 21, 2004	181 cfs
2006	June 21, 2006	324 cfs
	July 12, 2006	41 cfs
	June 28, 2006	324 cfs
	June 16, 2006	324 cfs
	June 28, 2006	324 cfs
	July 12, 2006	41 cfs

Ex. J59, Ex. J60; Ex J61; Ex. J62; Ex. M5 at 35.; M6 at 111, 112, 114, 116 (listing stateline flows for each day in 2001, 2002, 2004, and 2006). In 2001, post-Compact water users throughout the entire Tongue River Basin in Wyoming were unregulated for one to two months at a time when the T&Y, the second most senior right on the river, was not receiving sufficient water. See Ex. M 6 at 111. In 2002, this was true for about half a month. See *id.* at 112. In

2004, this was true for three to eight weeks. *See id.* at 114. Streamflows were essentially sufficient in June 2006, which explains why Montana did not make a call for water until July of that year. *See* Ex. M5 at 35 (Table 5); Ex. J68. In 2006, only the post-Compact rights in the unregulated parts of the Tongue River Basin in Wyoming were violating the Compact. This information is consistent with Mr. Book's opinion in his Rebuttal Report that "[i]n several years [regulation in Wyoming] did not occur until mid-June on Little Goose Creek and in July on Big Goose Creek." Ex. M6 at 11-12. Mr. Book's analysis is therefore conservative in that it did not quantify the depletions that occurred from post-Compact use in Wyoming in these Tongue River tributaries.

244. For example, in 2004 there was no regulation on Big Goose Creek until June 27, 2004. Tr. 2149:15-22 (Knapp). But as explained in Montana's May 18, 2004 letter, Montana had not received sufficient water to satisfy its pre-Compact rights since May. Ex. J64 at 1. In fact, as can be seen from Table 5 in the Book Expert Report, there was less than 200 cfs entering Montana in both May and June 2004, meaning that there was not enough water entering Montana to satisfy the T&Y, let alone the 75 other pre-Compact water rights in Montana. Ex. M5 at 35; *see also* Tr. 1438:17-24 (Hayes) (200 cfs is required at the stateline to ensure that the Nance and T&Y pre-Compact rights are satisfied); Tr. 3330:14-18 (Kepper) (same).

245. Wyoming Water Commissioners try to be proactive in their regulation. They use streamflow levels (sometimes referred to as "trigger-flows") to determine or anticipate when junior rights should be regulated. Tr. 1963:23 – 1964:25 (LoGuidice); Tr. 2008:14-24 (LoGuidice); Tr. 2009:15-20 (LoGuidice); Tr. 2153:2-25 (Knapp). For example, Mr. Fritz explained the regulation on Piney Creek as follows:

Many years of regulation have shown that about 22 cfs must be flowing past the Kearney gage in order to satisfy approximately 32 cfs of senior (i.e.

senior to the water rights in the Prairie Dog and Mead-Coffeen ditches) downstream rights before any water can be exported out of the Piney Creek drainage above this gage. When the flow drops below 22 cfs at this gage, these two ditches typically go into regulation.

Ex. W2 at 56; Tr. 2323:1 – 2324:11 (Schroeder); Tr. 2328:23 – 2333:12 (Schroeder).

246. A Water Commissioner in Wyoming will regulate in the amount of a calling right. The calling right is not always the most junior right on the stream. All rights junior to the calling right are not regulated, and are free to divert available water. Tr. 1705:22 – 1706:14 (Whitaker); 1715:7 – 1716:17 (Whitaker). Examples of calling rights in the Tongue River in Wyoming tend are:

e. Little Goose Creek: Burn Cleuch Ditch

f. Big Goose Creek: Alliance Ditch

Tr. 1717:16 – 1718:6 (Whitaker).

247. The Alliance Ditch is located near the mountain at the top of Big Goose Creek. The water rights below the Alliance Ditch are not typically regulated, and they were not regulated during the years at issue. Instead, the water rights below the Alliance Ditch on Big Goose Creek rely on return flows and other sources. Tr. 1718:7 – 1720:21 (Whitaker). There are post-Compact water rights located below the Alliance Ditch that were not regulated during the years at issue. Ex. M5 at 326 (App. G-3); Tr. 2101:20 – 2102:10 (Knapp); Tr. 2256:2 – 2257:11 (Boyd).

248. Wyoming had no measuring devices on the mainstem of the Tongue River until 2006 or 2007. Tr. 955:14-17 (Kerbel). In fact, it was not until after the commencement of this litigation in 2007 that water users on the mainstem of the Tongue River were required to have a measuring device. Ex. M493; Tr. 1730:8 – 1731:5 (Whitaker).

249. No measurements were recorded for the Interstate Ditch during the years for which damages were quantified. Ex. J59; Ex. J60 Ex. J61; Ex. J62; Tr. 1693:5 – 1694:23 (Whitaker).

250. Without regulation in the lower reaches of Tongue River, water is diverted as available and needed, without being curtailed by priority date. There are post-1950 water rights in this reach that have used water and have not been regulated. Ex. M5 at 5.

251. During the years at issue, there was no regulation of the mainstem of the Tongue River. Ex. M205; Tr. 1721:9 – 1722:15 (Whitaker); Tr. 2630:15 – 2631:2 (Moy); Tr. 4271:9 – 4272:1 (Fassett); Tr. 4325:21-24 (Fassett).

252. There are post-Compact diversions on the mainstem of the Tongue River. Ex. J54 at viii; Ex. M5 at 322-23 (App. G-1, G-2); Tr. 1722:16 – 1726:6 (Whitaker); Tr. 2240:20-22 (Boyd).

253. The Interstate Ditch is one of the post-Compact rights located on the northern end of the mainstem of the Tongue River in Wyoming. The Interstate Ditch is one of the last diversions in Wyoming. Ex. J58 at Technical Memorandum for Task 2A, page 82 (Powder/Tongue River Basin Irrigation Diversion Operation and Description Memo); Tr. 2243:15-25 (Boyd).

254. The Interstate Ditch has never been in regulation. *Ibid.* Instead, the Ditch “take[s] whatever [it] can get and as much as [it] can get.” Ex. J58 at Technical Memorandum for Task 2A, page 81 (Powder/Tongue River Basin Irrigation Diversion Operation and Description Memo); *see also* Tr. 2244:1-19 (Boyd) (“So long as the water is available, they’re taking it”).

255. On June 17, 2004, Mr. Boyd estimated that the Interstate Ditch was diverting 30-50 cfs. Ex. W35 at June 17th; Tr. 2248:14 – 2249:12 (Boyd). The year 2007, after this litigation was initiated, was the first year in which there was a functional measuring device on the Interstate Ditch. Tr. 2246:21 – 2247:18 (Boyd). Mr. Boyd observed active irrigation every time that he visited the Interstate Ditch. Tr. 2249:20-23 (Boyd).

256. Wyoming does not regulate water rights “down the ditch.” In other words, Water Commissioners regulate water at the headgate of a ditch or diversion, but play no role in regulating the water rights within the ditch. This is true even on ditches such as the Interstate Ditch that have multiple water rights with multiple priorities. Tr. 1736:16 – 1737:1 (Whitaker); Tr. 2238:21 – 2239:5 (Boyd).

257. Prairie Dog Creek, a Tongue River tributary in Wyoming, has water in it year round. During the spring runoff, there are high levels of water. Later in the summer, streamflows reduce to 1-3 cfs. Tr. 1998:4-15 (LoGuidice).

258. Prairie Dog Creek has tributaries of its own, including Wildcat Creek and Dutch Creek, which flow during the early part of the irrigation season. Tr. 2339:1-15 (Schroeder); Tr. 2476:20 – 2477:22 (Koltiska).

259. There are approximately 15 diversion ditches that divert water from Prairie Dog Creek in Wyoming. Tr. 2456:5-17 (Koltiska). There are post-Compact water rights located on Prairie Dog Creek. Ex. M5 at 337 (App. G).

260. Notwithstanding the post-Compact water rights, Wyoming has never regulated any water rights on Prairie Dog Creek, which it treats as ditch or diversion. Tr. 2257:12-14 (Boyd); Tr. 2457:25 – 2459:14 (Koltiska).

261. Many but not all Prairie Dog Creek water users also have access to reservoir water from Kearney Reservoir. Tr. 2456:18-23 (Koltiska). Prairie Dog Creek water users rely on direct flow until approximately mid-July before switching to storage water. Tr. 2451:20-23 (Koltiska). Approximately 90% of the releases from Kearney Reservoir flow into Prairie Dog Creek. The remainder flows into the Powder River Basin. Tr. 1999:6-14 (LoGuidice). Use of the Kearney Reservoir water in the Prairie Dog Creek drainage is on an "honor system." Tr. 2463:23 – 2464:2 (Koltiska).

262. Approximately 4,320 acres in Wyoming are irrigated with post-1950 rights. Ex. M5 at 17-19, Table 10, Figure 3. A list of post-1950 rights in Wyoming is provided in Appendix G-2 of the Book Report. Ex. M5 at 323-25.

263. At times when Montana irrigators use stored water, there is insufficient water to satisfy Montana pre-1950 water rights. "During such times, post-1950 use in Wyoming reduces the river supply available and results in increased demand of storage beyond what it would have been without the post-1950 depletions. It is necessary for the protection of the direct flow water rights in Montana to prevent post-1950 uses in Wyoming at such times." Ex. M5 at 11.

264. If Wyoming post-1950 diversions did not occur, approximately 90% of the water would arrive in Montana. *See, e.g., Id.* at 14.

265. Mr. Book identified post-1950 lands that were irrigated in Wyoming in 2004 and 2006. Ex. M5 at 17-21, Figure 3; Ex. M6 at 4-12, Tables 2-A & 2-B, Figures 1-7.

266. Doyl Fritz provided an expert report on behalf of Wyoming. Mr. Fritz criticized Mr. Book's evaluation of post-1950 irrigation in Wyoming. *See* Expert Report of Doyl M. Fritz, P.E., Ex. W2 at 46. Through his analysis, however, Mr. Fritz acknowledged that post-1950

water rights were used in 2004 and 2006 on many of the lands identified by Mr. Book. *See Id.* at Attachment 7 (showing post-1950 rights that were irrigated in Wyoming on July 22, 2006).

267. In his report, Mr. Fritz provided information concerning the timing of regulation and water use, including post-1950 water use in Wyoming. *Id.* at 14-61. This information shows that Wyoming was allowing its water users to divert water at a time when Montana pre-1950 users were not receiving a sufficient supply. Ex. M6 at 11-12.

268. Dr. Richard Allen prepared mapping of evapotranspiration ("ET") of post-1950 acreage in Wyoming for the years 2004 and 2006. The results are based on samplings of field-averaged ET on a monthly basis for April through October in 2004 and 2006. *See* Ex. M8. The METRIC mapping is displayed in Mr. Book's analysis at Figures 4A - 4D. Ex. M5 at 49-52.

269. Wyoming has never regulated any Wyoming water rights for the benefit of Montana or pursuant to the Yellowstone River Compact. Tr. 1726:16-19 (Whitaker).

2. Wyoming Post-Compact Reservoir Storage

270. Wyoming has six large reservoirs in the Tongue River Basin which have post-1950 storage capacity. The total post-1950 capacity for those six reservoirs is 9,386 acre-feet. Ex. M5 at 12-13, Table 6.

271. The Wyoming reservoirs are located high in the mountains and are inaccessible due to snowpack until May or June. Tr. 1740:5-8 (Whitaker); Tr. 1766:21 - 1767:1 (Whitaker); Tr. 2013:15 - 2014:3 (LoGuidice). The fill period for the Wyoming reservoirs, like that of the Tongue River Reservoir, is during the spring runoff. Tr. 1749:14-17 (Whitaker).

272. Several of the Wyoming reservoirs are hydrologically connected. For example, Cross Creek Reservoir drains into Big Horn Reservoir, which in turn drains into Park Reservoir.

All three of those reservoirs have post-Compact storage rights. Ex. M5 at 36. Park Reservoir is the largest, and it also has the greatest amount of pre-Compact storage. *Id.*

273. Wyoming manages its reservoirs according to the principle of “highority.” Under that principle, since the reservoirs are not accessible, they fill throughout the winter and spring runoff period. Once the reservoirs are accessible, the amount of storage in each is determined. If necessary, water is then physically released down to the appropriate reservoir based on the priority of the storage right. At other times the water is kept in the upstream reservoir, but is accounted for as part of the senior, downstream storage. Tr. 1739:3 – 1740:4 (Whitaker); Tr. 1741:17 – 1742:4 (Whitaker); Tr. 1776:7 – 1778:5 (Whitaker); Tr. 2014:8-20 (LoGuidice)

274. Despite the senior nature of the Tongue River Reservoir water rights and Montana’s repeated requests for storage water, see, e.g., Ex. J64; Ex. J68, Wyoming never followed the “highority” principle to release storage water to Montana. See, e.g., Ex. J65; Ex. J69.

275. In at least one of the years between 2001 and 2006, Wyoming physically sent water from Cross Creek or Big Horn to Park Reservoir, or accounted for that water as part of Park’s storage. Tr. 1739:18-23 (Whitaker); Tr. 2014:8 -20 (LoGuidice);

276. Kearney Reservoir is located in the Powder River Basin. Some but not all of the water stored in Kearney Reservoir is used in the Prairie Dog Creek area. Approximately 90% of the water from Kearney Reservoir flows into Prairie Dog Creek, and the remainder is used in the Powder River Basin. Tr. 1999:6-14 (LoGuidice). Kearney Reservoir has both A shares, associated with the pre-Compact storage in Kearney Reservoir, and B shares, associated with post-Compact storage. Tr. 2451:1 – 2452:16 (Koltiska). In his analysis of the return flows

associated with the post-Compact Kearney Reservoir storage, Mr. Fritz did not consider these shares. Ex. W2.

277. Wyoming Water Commissioners have discretion to determine when a reservoir owner must begin to fill. Ex. M519 at 5; Ex. W290. The Water Commissioners must “interpret each situation as they exist” in making that determination. Tr. 2018:9 – 2019:24 (LoGuidice).

278. Based on applicable regulations, Ex. M519, the Water Commissioners issue a “Notice to Appropriator to Begin Reservoir Storage,” which informs the reservoir owner when the reservoir must begin to fill. “All water allowed to flow past the reservoir after receipt of [a] notice [is] chargeable to the storage in said reservoir for [a] season.” Ex. W290. “The purpose of this provision of law is for the protection of junior direct flow rights against depletion of the water supply of the stream by reservoir storage during the irrigation season.” *Ibid.* This provision protects downstream junior users in Wyoming, Tr. 1791:21 – 1792:8 (Whitaker), and puts reservoir owners on notice that any bypassed flows “[m]ay be counted against you.” Tr. 2020:12-23 (LoGuidice).

279. The reason that a reservoir did not store all available flows is a relevant consideration in deciding when the reservoir should begin to fill and whether a reservoir that has allowed bypass flows should be permitted to fill. Tr. 2018:9 – 2019:24 (LoGuidice).

280. It is “standard practice” to issue a notice to begin reservoir storage for every reservoir. Tr. 2031:15-16 (LoGuidice). The Wyoming Water Commissioners issued notices to Kearney Reservoir during the years at issue. There is no evidence, however, that a notice was ever issued for any of the reservoirs located in the Tongue River Basin in Wyoming in any of the years at issue. Tr. 2032:16-23 (Kaste); Tr. 2091:7-10 (Knapp).

281. Wyoming does not require the owners or operators of Wyoming reservoirs to operate a reservoir in a way that would damage the facilities. Tr. 1793:18-22 (Whitaker). Wyoming reservoirs, like the Tongue River Reservoir, are operated to prevent damage caused by icing. Tr. 5009-15 (Lowry). There are winter bypass flows from three reservoirs that are associated with the Tongue River Basin:

- a. Park Reservoir: There have been winter bypass flows through Park Reservoir in all of the years at issue. These flows are set in the fall, and are permitted in order to allow winter flows for fish and wildlife and to prevent damage caused by ice in the winter. The winter bypass flows through Park Reservoir are not charged against its total water right, and Park Reservoir is allowed to fill each year. Tr. 2014:14 – 2015:15 (LoGuidice); Tr. 2062:14-16 (Knapp); 2164:11 – 2168:4 (Knapp).
- b. Cross Creek Reservoir: There have been winter bypass flows through Cross Creek Reservoir in all of the years at issue. The winter bypass flows through Cross Creek Reservoir are not charged against its total water right, and Cross Creek Reservoir is allowed to fill each year. Tr. 2063:11-18 (Knapp).
- c. Kearney Reservoir: There have been winter bypass flows through Kearney Reservoir in all of the years at issue. These flows are set in the fall and are permitted in order to allow winter flows for stock, fish, and wildlife, to prevent damage caused by ice in the winter, and to prevent potential downstream damage to the town of Story. The winter bypass flows through Kearney Reservoir are not charged against its total water right and Kearney Reservoir is allowed to fill each year. Ex. W63; Tr. 1747:12 – 1749:17 (Whitaker); Tr. 1769:24 – 1770:1

(Whitaker); Tr. 1775:3-19 (Whitaker); Tr. 2347:5 – 2348:1 (Schroeder); Tr. 2466:3 – 2467:1 (Koltiska).

282. Because the reservoirs are not accessible during the winter, it is not possible for Wyoming to adjust the winter bypass flows until late in the spring. The winter bypass flows are not considered to be releases; rather, they are natural flows passing through an on-channel reservoir. Tr. 2471:4-10 (Koltiska).

283. Separate from the winter bypass flows, Park Reservoir allows releases each winter to flush the creek below the Reservoir. These flushing flows are approximately 90 cfs for three days. Tr. 2064:3-12 (Knapp). In total, the flushing flows release approximately 535.41 acre-feet of stored water. To offset these flushing flows, the Wyoming Game and Fish Department has a water right in Park Reservoir of 500 acre-feet. *Id.*

284. In addition, the Wyoming Game and Fish Department has a 90 acre-foot post-Compact storage right to offset the winter bypass releases from Park Reservoir. Tr. 2064:3-8 (Knapp); Tr. 2167:15-19 (Knapp). The winter bypass flows through Park Reservoir are set at approximately 4.5 cfs throughout the winter – approximately 180 days. The total amount of water that passes through Park Reservoir in the winter is therefore approximately 1620 acre-feet. Thus, 1530 acre-feet of the winter bypass flows is not offset. Tr. 2166:18 – 2168:4 (Knapp).

285. The Wyoming reservoirs, including Park Reservoir, Cross Creek Reservoir, and Kearney Reservoir, are allowed to fill every year in the spring even though they have allowed winter bypass flows. Tr. 2014:14 – 2015:15 (LoGuidice). Park Reservoir is noteworthy because in 2001 and 2004 the Wyoming reservoirs were not able to fill. Ex. J61 at 92; Ex. M485; Tr. 2168:19 – 2171:1 (Knapp). Consistent with Wyoming's "highority" administration, water was either released to Park Reservoir or accounted for as part of its senior right. In other words, after

the Wyoming reservoirs were accessible, Park Reservoir called and received water to satisfy its senior storage right. Even though Park Reservoir made this call, it was not charged with the winter bypass flows. *Id.*

286. By law, Wyoming allows one-and-a-half fills to its reservoirs when water is available. Tr. 1794:1-7 (Whitaker).

287. In 2004, the first release of water from the Wyoming reservoirs was not until June 16, 2004, almost a month after Montana's call letter was sent. Ex. J61 at 95.

288. As in Montana, once water is released from reservoirs, the Water Commissioners are responsible for ensuring that it gets to the appropriate diversion. Tr. 1743:18 – 1744:7 (Whitaker). As in Montana, the Wyoming Water Commissioners utilize stream gauges to evaluate how much direct flow and reservoir water is in the river at a given time. Tr. 1975:1 - 1976:9 (LoGuidice); Tr. 2089:7-15 (Knapp).

289. Wyoming does not regulate water use on Five Mile Creek or Columbus Creek. Tr. 2250:20 – 2251:5 (Boyd).

290. Part of the Padlock Ranch is located in the Five Mile Creek area. The Padlock Ranch irrigates 15 pivots covering approximately 2000 acres in the Five Mile Creek area. Tr. 3461:12-14; Tr. 3465:15-17 (Benzel). The Sheeley Ranch is another ranch in the Five Mile Creek area. The Sheeley Ranch irrigates over 1,000 acres. Tr. 3462:10-16 (Benzel). Both the Padlock Ranch and the Sheeley Ranch use water from Columbus Creek that is diverted into Five Mile Ditch. Tr. 3462:17-19 (Benzel). The Five Mile Ditch diverts all of the available water from Columbus Creek. Tr. 3462:23 – 3463:1 (Benzel).

291. During the irrigation season there is not enough direct flow to satisfy both the Sheeley Ranch and the Padlock Ranch. Ex. M449 at MT24146; Tr. 3463:21-24 (Benzel). There

is only enough direct flow water in the area to irrigate approximately 1400 acres. Ex. M449 at MT24146; Tr. 3464:1 – 3465:14 (Benzel). Many years ago, the Sheeley Ranch and the Padlock Ranch entered into an agreement by which the Sheeley Ranch is entitled to take all of the direct flow water in Columbus Creek and Padlock Ranch uses all of the storage water for its irrigation. Tr. 3464:1 – 3468:3 (Benzel).

292. As part of the agreement, Padlock Ranch built new storage. There is currently approximately 1300 acre-feet of post-Compact storage in the Wagner and Five Mile Reservoirs in the Five Mile Creek area. Ex. M451 at 19-20; Tr. 3474:21 – 3478:16 (Benzel); Tr. 3480:13 – 3481:8 (Benzel). Wyoming does not regulate Five Mile, Wagner and Padlock Recovery Reservoirs. Ex. M5 at 14-15; Tr. 3471:11 - 3472:11 (Benzel).

293. Padlock Ranch relies exclusively on that post-Compact storage for its irrigation. Tr. 2253:11-14 (Boyd). Whereas without the new storage the area could only support irrigation for 1400 acres, there are now over 3,000 irrigated acres in the Five Mile Creek area. Ex. M449 at MT24146; Tr. 3464:1 – 3468:3 (Benzel).

294. The Five Mile, Wagner and Padlock Recovery Reservoirs are filled almost every year beginning in October with water diverted through the Five Mile Ditch. The Wagner and Five Mile Reservoirs have filled in all but three years. Two of the years that those reservoirs did not fill were 2004 and 2006. Ex. M448; Tr. 3469:8 – 3470:10 (Benzel). Five Mile Reservoir is filled first until March, and then water is stored in Wagner Reservoir until the irrigation season begins. The reservoirs are normally emptied every year. Ex. M5 at 15; Tr. 2255:12-16 (Boyd); Tr. 3469:8 – 3470:10 (Benzel). The Padlock Recovery Reservoir fills at least twice every year. Ex. M451 at 10; Tr. 3479:13 – 3480:12 (Benzel).

295. Mr. Book analyzed the impacts in Montana of the post-1950 storage in these three post-1950 reservoirs in Wyoming. Ex. M5 at 15, Table 12; Ex. M6 at Table 3.

296. The Windy Draw Reservoir (also known as the Rice Reservoir) has a capacity of 533 acre-feet of storage associated with a post-Compact water right. Ex. M5 at 39. The water from the Windy Draw Reservoir is used every year for irrigation of 275 acres in Wyoming. Tr. 1745:15-20 (Whitaker); Tr. 3493:10 – 3494:19 (Benzel). Because he had no specific records, Mr. Book had no specific records of the depletions associated with the use of the Windy Draw water, however, and therefore did not include these depletions.

297. The Wyoming post-Compact reservoirs store water that would otherwise be available for storage in the Tongue River Reservoir. Table 7 of the Book Report summarizes the post-1950 storage accrued in each of these large reservoirs for the years 1981 to 2008. Ex. M5 at 37.

298. Detailed calculations of the post-1950 storage in Wyoming in 2001, 2002, 2004, and 2006 are set forth in Appendix F of the Book Expert Report. Ex. M5. Mr. Aycock evaluated the timing of post-1950 storage in Wyoming on a month-by-month basis for each of those same years. Ex. M7 at 17-22, Appendix A.

3. Wyoming Post-Compact CBM Pumping

299. CBM development has also resulted in a large amount of groundwater pumping in the basin. The process of extracting CBM entails pumping of groundwater to reduce the fluid pressure in the zones that contain methane. Ex. M43; Tr. 2760:3-19 (Larson).

300. CBM production in Wyoming began in the late 1990s and peaked in approximately 2008 or 2009. Ex. M9 at Tables 1 & 2; Tr. 2762: 9-22 (Larson). At its peak in 2008, approximately 90,000 acre-feet of water was produced from CBM wells in Wyoming. Tr.

2763:8 – 2764:10 (Larson). The total production of water from CBM wells in the Powder River Basin in Wyoming over the period of 1999 to 2012 was 860,000 acre-feet (Larson).

301. The general effect of CBM pumping has been to remove groundwater from storage and lower groundwater levels. Tr. 2765:19-25 (Larson).

302. The impacts of CBM pumping on the Tongue River will continue for “a very, very long time” after the water production has stopped. Tr. 2766:1 – 2767:19 (Larson).

303. Mr. Larson used a groundwater model developed by the Bureau of Land Management (“BLM Model”) to estimate the depletive effects of CBM water production on the Tongue River. Ex. M9 at 4. The development of the BLM Model included “very detailed evaluations of the groundwater environment, detailed mapping of the different geologic units and hydrogeologic units, [and] detailed evaluation of available information on the hydrologic properties of the materials were compiled.” Tr. 2769:15-25 (Larson); *see also* M38. In addition, the BLM Model was not developed for the purposes of litigation. *Ibid.*

304. The BLM Model contains the structural features and conditions that are important for Mr. Larson’s analysis of impacts on storage depletion and groundwater discharge to streams. Ex. M38; Tr. 2769:7-23 (Larson).

305. The BLM Model utilizes the MODFLOW groundwater model program, which Mr. Larson helped to develop while working for the United States Geological Survey. Tr. 2772:10-15 (Larson).

306. Based on his expertise and experience, Mr. Larson considered the BLM Model to be a reasonable representation of the Powder River Basin including the Tongue River Basin. Tr. 2774:11-20 (Larson). He concluded that the BLM Model was appropriate for the purposes for which it was used in this case. Tr. 2776:10 – 2777:2 (Larson).

307. Mr. Larson used current information on CBM production to update the BLM Model and to make appropriate adjustments. Ex. M9 at 7-8; Tr. 2777:3 – 2778:4 (Larson). After these adjustments, the BLM Model conformed substantially to reported water levels. Tr. 2778:13-22 (Larson).

308. One factor that had to be considered was the level of infiltration of CBM-produced water into the regional groundwater system. To evaluate the level of infiltration, Mr. Larson contacted the Wyoming Department of Environmental Quality (“WDEQ”) regarding methods for disposal of CBM water in the Powder River Basin in Wyoming. Mr. Larson was informed that approximately 75-80% of the CBM impoundments in the Powder River Basin in Wyoming were full containment impoundments that would have limited infiltration. Tr. 2781:22 – 2782:9 (Larson).

309. This information is consistent with information that Wyoming gave to Art Compton as an official at the Montana Department of Environmental Quality. In discussing CBM impoundments over the years, Wyoming represented to Mr. Compton that the CBM-produced water would not impact surface flows or groundwater. Tr. 3190:14 – 3191:18 (Compton).

310. Based on the information provided by the WDEQ, Mr. Larson concluded that the infiltration rate in Wyoming of CBM-produced water would be less than 33%. He considered scenarios ranging from 0 % to 25% infiltration. The numbers that he provided to Mr. Book were conservative because they were based on the 25% infiltration rate. Tr. 2781:22 – 2782:9 (Larson).

311. The only witness in this proceeding who had independently evaluated the infiltration rate of CBM-produced water was Wyoming witness John Wheaton. Mr. Wheaton

performed several studies of infiltration rates in the Powder River Basin in both Montana and Wyoming. Ex. W236; Ex. W237; Tr. 4117:9-11 (Wheaton).

312. A certain percentage of CBM impoundments are lined and do not allow any infiltration of CBM produced water. Ex. W236 at 13; Tr. 4147:3-13 (Wheaton).

313. For unlined impoundments, Mr. Wheaton explained that sodium in the CBM-produced water causes the floor to seal, which greatly restricts infiltration. Tr. 4128:7 – 4130:13 (Wheaton). Sealing caused by sodium was widespread in the Tongue River area. Tr. 4130:14-17 (Wheaton).

314. Mr. Wheaton's studies show that after a brief period of infiltration in unlined impoundments, sealing occurs and prevents infiltration. Ex. W237; Tr. 4131:23 – 4133:25 (Wheaton). After sealing occurs, there is "very little infiltration" no matter how long an impoundment is used. Tr. 4133:14-19 (Wheaton).

315. In sum, Mr. Wheaton saw no indication of infiltration of CBM-produced water into the regional aquifer system. For that reason, he considered the 25% infiltration assumption used by Mr. Larson to be high. Tr. 4154:10-23 (Wheaton).

316. Mr. Larson concluded that "water production associated with CBM development has reduced and will continue to reduce groundwater levels and thus deplete groundwater storage." He further concluded that "the depletive effects on stream flow of water production associated with CBM development will continue for many decades after CBM water production has ceased." Ex. M9 at 4.

317. Wyoming does not contest that this pumping affects the streamflow of the Tongue River in Montana.

D. Quantification of Compact Violations

318. After making appropriate adjustments based on the analysis of the Wyoming experts, Mr. Book calculated the post-1950 impacts to Montana in 2001, 2002, 2004 and 2006. In those four years, Mr. Book calculated that the impacts in those four years totaled 8,120 acre feet. Ex. M6 at 27, Table 3.

319. Mr. Aycock considered the timing of the impacts. Taking into account the timing of the impacts, he quantified Wyoming's Compact violations as follows: 1,530 acre-feet in 2001, 2,795 acre-feet in 2002, 2,166 acre-feet in 2004 and 3,232 acre-feet in 2006. Ex. M7, at 20-22. Cumulatively, Wyoming's violations of the Compact total 9,723 acre-feet.

DISCUSSION

I. Standard of Proof

The Court has stated that in original actions seeking to enforce an equitable apportionment decree, the standard of proof for showing a violation of the decree is a preponderance of the evidence. *See Nebraska v. Wyoming*, 507 U.S. 584, 592 (1993) (finding "merit in Wyoming's contention that, to the extent Nebraska seeks modification of the decree rather than enforcement, a higher standard of proof applies"). This standard of proof stands in contrast to suits seeking to modify a decree, which the Court has held entail the higher standard of clear and convincing evidence. *Id.* Similarly, a special master has determined that in a suit to enforce an interstate compact, proof of a violation is subject to the preponderance-of-the-evidence standard. *See Kansas v. Colorado*, 514 U.S. 673, 693-94 (1995) (observing that special master "concluded that an action seeking to enforce an interstate compact stood on the same

footing as an action enforcing a judicial decree,” but finding it unnecessary to decide applicable standard of proof because Kansas’ evidence satisfied both preponderance and clear-and-convincing standards). Accordingly, in the instant case, where Montana seeks to enforce the Yellowstone River Compact, a preponderance of the evidence is the proper standard of proof of Wyoming’s violation of the Compact.

II. The State of Montana has Provided Adequate Notice to the State of Wyoming

A. Applicable Legal Standard

The Special Master has ruled that Montana may recover damages only for years in which it provided notice to Wyoming that Montana was not receiving sufficient water to satisfy its pre-1950 appropriative rights.³ Memorandum Opinion on Notice Requirements, at 7 (Dec. 20, 2011) (“Dec. 20 Mem. Op.”); Memorandum Opinion on Wyoming’s Renewed Motion for Partial Summary Judgment (Notice Requirement for Damages), at 12-13 (Sept. 28, 2012) (“Sept. 28 Mem. Op.”). However, such notice “did not have to take any particular shape or form”, “meet any formal specifications”, be in writing, or be delivered by any particular person, so long as the person providing the notice had proper authority. Sept. 28 Mem. Op. at 12-14. Further, Montana’s notice need not have been instantaneous for Montana to seek damages for the entire year, so long as Montana proceeded with diligence in determining that its pre-Compact rights were not being satisfied and notifying Wyoming of those deficiencies. *Id.* at 16.

Thus, the notice envisioned by the Special Master is based on concepts of equity, and the determination of whether there was effective notice in a particular year focuses on whether the notice would have served the core function of a call, which the Master described as “*placing an*

³ Montana reserves the right to take an exception challenging the Special Master’s rulings requiring notice as a condition of Montana’s right to seek relief for Wyoming’s violations of the Compact.

upstream holder of water rights on notice that a downstream senior is not receiving adequate water under its right and that the upstream user must therefore reduce its diversions in order to allow additional water to flow downstream for the senior's use." *Id.* at 13 (emphasis in original). Once Montana carries its burden of showing it provided such notice in a given year, the burden shifts to Wyoming to show affirmatively that its post-1950 uses were not the cause of shortfalls to Montana's pre-1950 rights in that year. *See, e.g., Irion v. Hyde*, 105 P.2d 666, 673 (Mont. 1940) ("It is well settled that a subsequent appropriator attempting to justify his diversion has the burden of proving that it does not injure the prior appropriators.").

The Special Master further recognized three exceptions to the notice requirement, finding that Montana did not have an obligation to provide notice in any year in which: (1) Wyoming had made it clear that it would not alter its water use in response to Montana's concerns (the "futility exception"), Sept. 28 Mem. Op. at 35; (2) Wyoming had other sufficient reason to believe or know that insufficient water was reaching Montana to satisfy Montana's pre-1950 rights (the "other sufficient reason exception"), *id.* at 39; or (3) Wyoming prevented the adoption of a rule or process for administering the Compact without the need for a call (the "preventing compact administration exception"), *id.* at 41. The evidence presented at trial, as set forth below, supports application of all three exceptions in the years at issue.

Moreover, regardless of the applicability of the above exceptions, Montana's evidence at trial establishes that it diligently gave Wyoming sufficient notice in 1981, 1987-1989, 2000-2004, and 2006, and, that Wyoming therefore is liable for Compact violations in those years.

B. The Evidence Supports Findings of Exceptions to the Notice Requirement in All of the Years at Issue

1. The Futility Exception

The evidence overwhelmingly demonstrates that, given Wyoming's interpretation of the Compact up until the Court's ruling on the First Interim Report, any notice provided by Montana in the years at issue would have been futile. From the outset, Wyoming insisted that the Compact does not afford protection for pre-1950 rights in Montana, a position that was advantageous to Wyoming as the upstream state in control of the resource. As early as 1952, a mere two years after the adoption of the Compact and despite the Compact's stated intent to "remove all causes of present and future controversy" between the States "with respect to the Waters of the Yellowstone River and its tributaries," YRC Preamble, the Wyoming State Engineer made the following statement regarding Article V: "The compact only divided the unappropriated waters, and left the division of the appropriated waters for later settlement by the Courts." Ex. M59. Wyoming maintained this position for decades, until the Special Master and the Court ruled in this litigation that Wyoming's long-standing interpretation of the Compact was wrong. *See* Ex. J65; Ex. J69; Ex. M183 at 2; Ex. M157; Ex. W76; 5310:6-5311:3 (Tyrrell); Tr. 689:15-23, 728:2-10 (Stults); Tr. 2631:12-21, 2552:24-2555:17, 2556:18-2557:4 (Moy); Tr. 4991:6-16, 4995:23-4996:2 (Lowry). As described in III.A.3, paragraphs 38-59 above, based on this interpretation of the Compact, Wyoming systematically, and over a period of decades, ignored Montana's complaints that its pre-compact rights were not being satisfied, resisted Montana's efforts to come up with a methodology for administering the Compact, and rebuffed all attempts by Montana to quantify water availability for administration of Article V(A).

Related to Wyoming's long-standing position that the Compact did not protect pre-1950 rights in Montana was Wyoming's parallel long-standing position that the Compact makes no

provision for an interstate call. *See* Ex. J65; Ex. J69; Tr. 2631:3-11 (Moy); Tr. 4994:8-23, 5025:18-5026:21, 5052:4-24 (Lowry). Only after the Court rejected Wyoming's claims that Montana's pre-1950 rights are not protected under the Compact did Wyoming reverse course, arguing that it could be liable for past Compact violations in years where Montana made a call. *See* Tr. 5052:4-5053:19 (Lowry). During those years, of course, Wyoming steadfastly maintained that the Compact did not allow for a call and imposed no obligation on Wyoming to protect Montana's pre-1950 rights. Wyoming's long-standing positions regarding the Compact, which it communicated to Montana, understandably influenced the extent, content, and timing of Montana's communications with Wyoming regarding shortages to Montana's post-1950 rights in the years at issue. *See, e.g.*, Tr. 888:1-7 (Stults). Given these facts, it would not be equitable to permit Wyoming to shield itself from liability for its Compact violations in those years by claiming that Montana was required to make a call. Such a call would have been futile.

That futility is perfectly illustrated by Wyoming's responses to Montana's formal call letters in 2004 and 2006 – years in which it is undisputed that Montana gave sufficient notice. Ex. J64 (stating that “the Compact makes no provision for any state to make a call on a river”); Ex. J65 (stating that “the Compact makes no provision for the ‘call’ [Montana’s] letter suggests”). These responses make clear that, even if confronted with a formal written request by Montana, Wyoming would not have recognized that request as a “call” and alter its water use accordingly. Nor is such a response to Montana's complaints of shortages to its pre-1950 rights unique to the more recent years. *See* Tr. 2631:3-11 (Moy); Tr. 4994:8-23, 5025:18-5026:3, 5052:4-24 (Lowry). Wyoming cannot credibly claim that it would have responded any differently to a similar call in earlier years. Thus, any call in the years prior to the Court's ruling in this litigation would have been futile, and Montana should not be required to demonstrate that

it made a call on Wyoming in order for Wyoming to be held liable for Compact violations in any of the years at issue.

2. The “Other Sufficient Reason” Exception

The evidence at trial further showed that Wyoming knew, independent of any communications from Montana, that there were insufficient supplies of water to meet the needs of pre-1950 rights in either Wyoming or Montana. That knowledge was based on both (1) a historic understanding that the Compact was entered into because the ordinary condition of the river would require storage to be built for the purpose of supplying water to pre-Compact rights, and (2) the physical location of Wyoming’s water users between the source of the water (the Bighorn Mountains) and the Montana users downstream.

The framers of the Compact were aware that the ordinary condition of the river was insufficient to meet the needs of water rights then in place.. That is why Article V included a specific provision for supplemental rights. Following Article V(A)’s protection of pre-Compact rights, Article V(B) provides for “supplemental water supplies for the rights described in Paragraph A of this Article V.” The Special Master and the Court recognized this category of water rights as one of the three tiers of priority under the Compact. *See* FIR at 10-11; *Montana v. Wyoming*, 131 S.Ct. at 1770 (2011) (“The Yellowstone River Compact divides water into three tiers of priority . . . Second, Article V(B) allocates to each State the ‘quantity of that water as shall be necessary to provide supplemental water supply’ for the pre-1950 uses protected by Article V(A).”). Thus, the fabric of the plain language of Article V shows that there was never any doubt that additional sources of water, such as storage, were necessary to meet demand, not only in dry years, but as a regular matter. Otherwise, the framers of the Compact would not have carved out a special tier of supplemental rights.

In the years at issue, the ordinary condition of the river, which on average was already stressed, was exacerbated by drought. Wyoming reacted in those years by regulating its pre-1950 rights. Tr. 1796:10-15 (Whitaker). It is axiomatic that if Wyoming users were not receiving their full supply of pre-1950 rights such that regulation of diversions was required on Tongue River tributaries, pre-1950 rights downstream in Montana were also not receiving sufficient supplies of water. Given the geographic relationship between the two States with respect to the river, there is no way that Montana could have been receiving adequate supplies of water from the same source of supply (the winter snowpack runoff from the Bighorn Mountains) that did not meet the demands of Wyoming's senior users. Wyoming officials did not need any report or other input from Montana to reach this conclusion: it was self-evident. In any year that Wyoming's pre-1950 rights on either the mainstem or the tributaries of the Tongue River were being regulated (which is all of the years at issue here, *id.*), Wyoming had reason to know that insufficient water was reaching Montana to satisfy Montana's pre-1950 appropriative rights.

3. The "Preventing Compact Administration" Exception

Wyoming's attitude toward Compact administration can best be described as an intent to avoid any meaningful engagement. As described in III.A.3, paragraphs 38-59 above, the evidence at trial illustrates a long history of attempts by Montana to create a joint compact administration model, and resistance by Wyoming to such an idea. For example, Mr. Moy and his staff created a methodology for administering Article V of the Compact in 1983. Ex. M97. This methodology incorporated a mechanism that would have insured that all pre-1950 rights in Montana would be satisfied before any of Wyoming's post-1950 rights could be put to use. Wyoming never accepted the protocol at that time or thereafter. Mr. Moy testified that he and his staff "pushed as long and as hard as we could push it. But sometimes you can't push water

uphill, and then we finally just gave up.” Tr. 2588:11-13. Mr. Tyrrell responded to this testimony, indicating that he was aware of Montana’s efforts but, despite several meetings on the subject, “it didn’t really result in anything.” Tr. 5169:19-25, 5187:25-5188:20 (Tyrrell).

Wyoming’s position is probably best revealed in Mr. Tyrrell’s response to the 2004 “call” letter, Ex. J64, in which Montana sought administration of Pre-Compact rights. Tr. 5182:13-5184. (“the Compact makes no provision for a state to make a call on the river” quoting Ex. J65). The response of Ms. Lowry, also epitomizing Wyoming’s decades-long position, was “I think we had a basic threshold question there of where is that in the compact?” Tr. 5193:19-21 (Lowry); *see also* Tr. 5056-58 (Lowry) (noting what she characterizes as the ineffectiveness of Montana’s proposed methodology for administering rights under the Compact, and describing the talks around such administration as “unfruitful”).

It is clear from the testimony as a whole that while Montana made diligent efforts to move forward with Compact administration, Wyoming was stalling such progress in any way it could while remaining involved in the discussion just enough to ward off an appearance of bad faith. These tactics were effective in preventing administration of the Compact in all of the years at issue, and Montana therefore should be excused from providing notice in those years.

C. Montana Provided Notice to Wyoming In All The Years At Issue

As stated above, pursuant to the Special Master’s earlier rulings, in order for Montana’s notice to Wyoming to be considered valid for purposes of establishing Wyoming’s liability under the Compact in a given year, it did not need to take any particular shape or form or meet any formal specifications, be in writing, or be delivered by any particular person. *See* Sept. 28 Mem. Op. at 12-14. The evidence shows that Montana provided sufficient notice in all the years at

issue, as to both form and timing. While the circumstances differ from year to year, the information provided was always clearly stated and presented in a timely manner.

The Special Master has already held that the May 18, 2004 letter (Ex. J64) provided notice at least from that date in May until the end of 2004, and that the July 28, 2006 letter (Ex. J68) provided notice at least from that date in July until the end of 2006. Dec. 20 Mem. Op. at 11. The evidence presented at trial further shows that in each of the other years at issue, Montana provided Wyoming with timely notice. As described above at III.A.4.b, paragraphs 66-106, Montana acted diligently in determining that its pre-1950 rights were not being satisfied in each of the years at issue – years during which water availability and supply were a constant and serious concern to Montana. Accordingly, Montana has met the notice requirements specified in the Special Master's earlier rulings, and is entitled to claim damages and other relief for the entire year in all of the years at issue.

1. Montana Provided Notice In 1981

During the pretrial hearing, the Special Master ruled that Montana should be allowed to present evidence at trial regarding Wyoming's liability for a Compact violation in 1981. Tr. 47:6-48:4. The evidence at trial shows unequivocally that in April of 1981, Gary Fritz, then administrator for the Montana Water Resources Division of the DNRC and Commissioner to the YRCC, Tr. 1063:5-7; 1064:15-19 (D. Fritz), made a phone call to George Christopulos, the Wyoming State Engineer at the time, Ex. J31 at II, seeking Wyoming's cooperation in regulating the Tongue River for the benefit of Montana's pre-1950 rights. Notes identified as Exhibit M136 memorialize a series of telephone calls between Mr. Fritz and Mr. Christopulos. These notes describe what was effectively a call by Montana for water under the Compact. For instance, one set of notes memorializing a phone call from a Montana official states:

Called regarding the management of the Tongue River under the Yellowstone Compact. The Tongue River Reservoir with priority of 1939 is low in storage, 20,000 acre-feet, due to a safety problem. Montana is wondering if the junior to 1950 rights in Wyoming can be regulated to provide water to supply Tongue River Reservoir. He would like you to call him at your earliest convenience.

Ex. M136; Tr. 1072:2-9. Mr. Fritz further testified that the 1982 Report of the YRCC notes that "Montana voiced its concern that during low-flow years Wyoming needs to regulate its post-1950 water rights more carefully so that Montana can use its pre-'50 water." Tr. 1080:11-14 (D. Fritz). He went on to testify that this is "more or less" what he did in 1981. Tr. 1080:23-25 (D. Fritz).

Mr. Fritz' testimony regarding this note, and others like it included within Ex. M136, along with the YRCC report, are evidence of notice to Wyoming that Montana needed it to release water to Montana. These notes also show that Montana had been diligent in discovering the water shortage that was limiting supply to pre-1950 rights. Tr. 1078:6-1081:12 (D. Fritz). The notes are dated April and May of 1981, early in the irrigation season. By that time, Montana had reviewed the situation, identified the problem, and notified proper authorities in Wyoming. Thus, notice was diligently given and Montana should not be precluded from claiming damages for 1981.

2. Notice was Timely and Diligently Given for the Entire Year in 1987-89 and 2001-03

In ruling on Wyoming's motion for partial summary judgment, the Special Master determined that Montana should be allowed to claim damages or other relief from 1987 through 1989 and from 2001 through 2003, provided that Montana can prove that it acted diligently in learning of pre-1950 deficiencies and notifying Wyoming of the deficiencies. Dec. 22, 2012 Mem. Op. at 18-19. The evidence shows that in each of these years, pre-1950 rights in Montana

went unsatisfied, Montana notified Wyoming of the shortage, and that the notice was diligently given.

In 1987 through 1989 and 2001 through 2003, as in the other years, Montana was diligent in tracking water supply conditions as they developed throughout the season, monitoring snow pack, the gauge at the state line, the gauge at Tongue River Reservoir, water levels at the Reservoir, and drought indices. The evidence shows that Montana water users informed DNRC officials that they were not receiving sufficient water to satisfy their pre-1950 water rights. *See* Tr. 661:7-23, 663:2-10 (Stults); Tr. 954:13-24 (Kerbel); Tr. 2539:11-2540:7, 2542:3-13, 2546:2-7 (Moy); Tr. 669:25-671:25 (Stults). Montana officials were in regular contact with Montana irrigators regarding water conditions on the Tongue River. Tr. 667:6-668:4 (Stults); Tr. 1456-57 (Hayes). As discussed in III.4.b paragraphs 66-106, these communications and investigations were in direct response to drought conditions.

Further, as explained in III.4.b paragraphs 66-106 above, DNRC staff communicated frequently with Wyoming officials during this time, including Sue Lowry, Mike Whitaker, and Patrick Tyrrell, regarding their concerns that Montana was not receiving water to which it was entitled under the Compact. In 1987 through 1989, Montana notified Wyoming of shortages to Montana's pre-1950 rights both prior to and upon completion of its investigation in each year. *See* Tr. 2498:5-2499:1, 2572:14-2574:11 (Moy) (Mr. Moy recalls giving notice in all three years); Tr. 2572:14-2574:11 (Mr. Moy had completed an evaluation concerning lack of water and had asked Wyoming during the 1987-89 time period "to stop using post-'50 [water] so we could get some water across the border to help Montana water users"); *see also* Tr. 958:21-959:7, 972:2-8 (Kerbel). In fact, Mr. Moy and Mr. Stults testified that their calls during these

years were made during or before the irrigation season. Tr. 2548:20-24 (Moy); Tr. 906:14-907:23 (Stults).

Mr. Kerbel further testified that he made verbal calls for water on the telephone to Mike Whitaker, Sue Lowry, Bill Knapp and Carmine LoGuidice – all appropriate Wyoming officials – during the irrigation seasons of 1987, 1988, and 1989. Tr. 2700:16-2701:10 (Moy). Wyoming officials acknowledged that they communicated with Montana officials during these years. *See, e.g.*, Tr. 4323-4325 (testimony of Gordon Fassett that there was considerable communication with Montana during the irrigation season).

As explained in paragraphs 66-105, by the early 2000s, Montana was becoming increasingly concerned over expanding water use in Wyoming and corresponding shortages to Montana pre-1950 water users. For the years 2001 through 2003, DNRC officials were in contact with water users in Montana on the Tongue River, and were apprised of the water supply situation. *See* Ex. M142 (May 3, 2002 letter from Mr. Hayes to Mr. Stults expressing concern that “Wyoming is expanding its irrigation on the Tongue River yearly”); Ex. M144; Ex. W67; Ex. M141; Tr. 2542:13-20. Ms. Lowry acknowledged that she knew there were water shortages in these years and that there was insufficient water for pre-1950 rights in Montana. Tr. 5062:15-5065:8 (Lowry). Mr. Kerbel testified regarding his conversations in various meetings and at the YRCC, in which Montana officials advised Wyoming officials of water shortages to pre-1950 rights in Montana. Tr. 935:7-938:7 (Kerbel). He specifically recalled talking to Mr. Whitaker or someone on his staff in all three years and indicating that water was needed in Montana. Tr. 959:2-17. Because these discussions were ongoing, the notice they embodied was by definition given throughout the year, not just during the irrigation season. Tr. 946:9-12-951:20 (Kerbel).

Moreover, there is evidence tying these conversations to each of the three years. For 2001, Mr. Stults recalled that he made a request to Wyoming for water. Tr. 684:2-20 (Stults). The request was based on Mr. Stults' own knowledge that Montana rights were not receiving water. In response to cross examination regarding emails identified as Exhibit W64, Mr. Stults testified that he had knowledge of Montana's pre-1950 rights through administration of the Miles City Decree, filings in the adjudication, and communications with water users. Tr. 801:6-13 (Stults). He further testified that he "conveyed to Wyoming in 2001 and 2002 that that (sic) post-1950 irrigation shouldn't be happening when the pre-1950 rights in Montana were not satisfied." Tr. 904:14-19 (Stults). Mr. Stults was convinced that in 2001 Wyoming officials understood what he was requesting. Tr. 909:10-19 (Stults). Mr. Kerbel also testified that he talked to a Wyoming official, likely Mr. Whitaker, in Wyoming in 2001. Tr. 960:7-17 (Kerbel). See Exhibit W61 (email dated March 2, 2001 indicating communication between Mr. Kerbel and Wyoming officials regarding water shortages).

With respect to 2002, Mr. Stults' testimony was generally that he had the same sources of knowledge about the continuing drought as he had had in 2001. Tr. 668:2-669:12 (Stults). He testified to his recollection that, as in 2001, he was aware of the drought conditions and communicated this information to Wyoming officials. The testimony shows that communication between Montana and Wyoming was ongoing, beginning prior to 2002:

Q. So in 2002, did you communicate to Wyoming the similar message from 2001, meaning that Montana was short on its pre-'50 rights and needed more?

A. Yeah, it was continuing. The discussion was continuing. If I remember, we were starting to get into more talk about the reservoirs and more talk about technical issues and having some technical analysis done by our staff.

Q. That was done cooperatively between the two states?

A. Yes.

Q. Do you know if Mr. Kerbel would have communicated that same message in 2002 to any Wyoming officials?

A. I'm certain of it.

Q. When you mentioned you communicated it, do you recall specifically who you would have communicated that to in Wyoming?

A. It would have been in the same circumstances with the same people: Mike Whitaker, Sue Lowry, and Pat Tyrrell. But at different times in different --- at different occasions.

Tr. 691:2-23 (Stults). Ms. Lowry acknowledged a meeting she had with Montana water officials in January of 2002. Tr. 5078:7-21 (Lowry).

Finally, in 2003, communications with Wyoming continued. *See, e.g.*, Tr. 886:13-23 (Kerbel). Mr. Moy and Mr. Kerbel attended meetings with Wyoming officials regarding water issues. Tr. 2541:22-2542:3 (Moy). Mr. Stults also testified that his requests of Wyoming officials during those years for water to serve pre-1950 rights during this time period were clear, and that there was no doubt in his mind that the Wyoming officials knew exactly what he was asking for. Tr. 778:23-779:5 (Stults).

3. Montana Gave Notice to Wyoming Prior to the End of the Irrigation Season in 2000

In his Memorandum Order of December 22, 2012, the Special Master determined that Montana could claim damages for 2000 following the end of the irrigation season, and could claim damages for that year during the irrigation season to the extent Montana could prove that it acted diligently in learning of deficiencies to its pre-1950 rights and notified Wyoming of the deficiencies. As explained in III.b.4, paragraphs 66-106, the evidence presented at trial demonstrates diligence on the part of Montana.

The YRCC Forty-Ninth Annual Report confirms that 2000 was a low flow year. *See* Ex. J50 at iii. As in all the other years, Montana was actively monitoring the water supply conditions that developed throughout the season. Tr. 950:8-15 (Kerbel); Tr. 667:6-669:8 (Stults). Montana irrigators were in communication with Montana officials that year. Tr. 2611:17-23; 2656:16-22; 2705:21-2706:24 (Moy) (describing numerous meetings in 2000 with Mr. Hayes and with Mr. Muggli, both Montana irrigators). In turn, Montana officials testified that they were in communication with Wyoming officials regarding insufficient water supplies in 2000. Tr. 960:7-17 (Kerbel); Tr. 667:6-669:8, 778:23-779:5 (Stults); Tr. 2706:25-2707:14 (Moy). All of these Montana officials had proper authority to communicate with Wyoming officials regarding water supply and drought conditions.

4. The Notices Given on May 18, 2004 and on July 28, 2006 Entitle Montana to Maintain Its Claims for 2004 and 2006 in Their Entirety

The Special Master held that proper notice was given on May 28, 2004, for calendar year 2004 and on July 28, 2006, for calendar year 2006. These notices were diligently given, and the notice provided should allow for damage claims dating back to the beginning of each year.

As in the previous years, the evidence shows that Montana was carefully monitoring water supply conditions prior to sending the call letter in 2004. Tr. 713:13-22, 721:9-722:3 (Stults); Tr. 2626:9-15 (Moy). Further, there were ongoing conversations between Montana and Wyoming officials about Montana's need for water prior to Montana's sending the May 28 letter. Tr. 716:2-7 (Stults); Tr. 960:2-17 (Kerbel).

Similarly, in 2006, Montana officials and the Montana Drought Advisory Committee were actively monitoring water supply conditions on the Tongue River early in the year. Tr. 765:10-20, 765:25-766:6 (Stults). In early July, conditions looked favorable and Montana predicted that the Tongue River Reservoir would fill. Ex. M193 at MT01425. However,

conditions deteriorated rapidly as the month progressed, and by the end of July it was apparent that the Reservoir would not fill. Tr. 768:9-23; 775:25-778:10 (Stults); Ex. J68 (affidavits of Mr. Hayes and Mr. Kepper describing lack of water during the irrigation season of 2006). Prior to sending the call letter, Montana officials were in contact with Wyoming officials to discuss the shortage problem. Tr. 769:13-23 (Stults). Thus, Montana was diligently monitoring the situation on the Tongue River in 2006 and promptly notified as soon as they understood that there was a problem.

In sum, Montana should be able to claim damages for the entire year in every one of the years at issue.

III. Montana's Pre-Compact Rights Went Unsatisfied

Montana has two kinds of Pre-Compact rights that are protected under the Compact, the storage rights in Tongue River Reservoir and the direct flow rights for direct diversion and immediate use from the Tongue River. This section of the brief will consider first the storage right and then the direct flow rights.

A. Tongue River Reservoir

Tongue River Reservoir failed to fill in 2001, 2002, 2004 and 2006, leaving its right to store unsatisfied in those years. The following section will discuss the Tongue River Reservoir water right and its operation during the years in question. The evidence demonstrates that the Reservoir was operated reasonably within its water right and should be protected under the Compact.

1. The Reservoir Water Right

Like all Montana water rights affected by the Compact, the contours of the water right associated with Tongue River Reservoir, and thus the extent of protection that right receives

under the Compact, are determined in the first instance pursuant to Montana law. See Memorandum Opinion of the Special Master on Montana's Motion for Summary Judgment on the Compact's Lack of Specific Intrastate Administration Requirements at 3 ("Sept. 16 Mem. Op.") ("Article XVIII reflects the drafters' general intent to allow states to administer their own water rights as they see fit within the confines of the Compact's obligations and requirements.").

Impounding and storing water in reservoirs for beneficial use has long been recognized as a valid means of appropriation in Montana, and other prior appropriation states, and is encouraged as a way to increase the beneficial use of water. See, e.g., *Donich v. Johnson*, 250 P. 963, 965 (Mont. 1926) ("The construction and maintenance of secure reservoirs for the conservation of these waters, therefore, is of very high public importance"); *Anaconda Nat'l Bank v. Johnson*, 244 P. 141, 142 (Mont. 1925); *Antero & Lost Park Reservoir Co. v. Lowe*, 194 P. 945, 953 (Colo. 1920). The Montana State Water Conservation Board (now the State Water Projects Bureau ("SWPB") of the Water Resources Division of DNRC), see Ex. M232 (organizational chart), was authorized by statute to build reservoirs for the purpose of conserving and storing water for sale to third parties for beneficial use. See Mont. Code. Ann. § 349.1, RCM (1935) (repealed) ("It is hereby declared that the public interest, welfare, convenience and necessity require the construction of a system of works, in the manner hereinafter provided, for the conservation, development, storage, distribution and utilization of water."). In order to meet the demands of this charge, the Board was provided with exceptionally broad statutory authority to obtain a water right:

In acquiring the rights and administering the terms of this act herein prescribed and established, the board shall not be limited to the terms of the statutes of the State of Montana relating to water rights heretofore inactive; but, in addition thereto, may initiate a right to the waters of this state by executing a declaration in writing of the intention to store, divert or control the unappropriated waters of a particular body, stream or source, designating and describing in general terms

such waters claimed, means of appropriation and location of use, and cause said notice to be filed in the office of the county clerk and recorder of the county where the major portion of the means of diversion or control will be located, which right shall vest in such board on the date of the filing of such declaration . .

* * *

The priority of right shall date and continue from the time of such filing or recording, provided the means of actual appropriation shall be commenced by actual work of construction within two (2) years from the date of original recording.

§ 348.18, RCM (1935) (repealed). By statute, the appropriations for these projects were defined as follows:

Extent of water right of board. The right of the board to the waters within the state of Montana so acquired as hereinbefore provided for the purpose defined in this act shall attach at and from their source and while flowing in the stream travelling to the means of control as well as when actually confined by such means. That the authority and jurisdiction of the board shall continue over said waters after they are released for purposes of use and continues to such places of use and through and by officers and agents acting under its authority may continue to exercise and assert actual possession over the corpus of such waters and prevent the diversion thereof without permission first obtained. The board may reclaim and possess all waters furnished or supplied by it seeping or overflowing from the previous place of use.

§ 349.19, RCM (1935) (repealed).

Based upon these statutes, the Montana Water Court has determined the purpose of use for SWPB reservoirs includes storage for sale. *See* Ex. M319, *In Re Adjudication of Existing Rights to the Use of All Water Within South End Sub Basin of Bitterroot River Drainage Area*, Case No. 76HE-166, 2000 WL 36119359 (Mont. Water Ct. 2000) (“Painted Rocks” decision) (holding that purpose of state-owned water right is the sale of water, rather than the secondary purpose to which the water is ultimately applied by purchasing parties); Ex. M529, *In Re Adjudication of Existing Rights to the Use of All Water Within Jefferson Drainage Area* Case No. 41G-109, 1993 WL 13756228 (Mont. Water Ct. 1993) (“Willow Creek” decision) (indicating

that statutes authorized SWPB to store water to be put to later beneficial use, regardless of whether specific use, was contemplated when the initial declaration was filed); Tr. 1379:17 – 1386:12 (Smith) (discussing Painted Rocks and Willow Creek decisions and their application to Tongue River Reservoir with respect to beneficial use, perfection of right, and amount).

Indeed, sale of water has long been recognized as a beneficial use in Montana. Its 1889 Constitution declared: “The use of all water now appropriated, or that may hereafter be appropriated for sale . . . shall be held to be a public use.” 1889 Mont. Const., art. 3, § 15, *quoted in Donich*, 250 P. at 965. This declaration was continued in Montana’s 1972 Constitution. *See* 1972 Mont. Const., art. IX, § 3(2).

Thus, a water right associated with a SWPB reservoir such as the Tongue River Reservoir encompasses the right to all unappropriated water from its source to the means of control or impoundment, while under direct control or confinement, throughout conveyance and delivery to the ultimate place of use, including the reuse of return flows. Mont. Code. Ann. § 89-122 (1947) (repealed). Such a right is perfected to its full extent at the time construction of the reservoir is complete and storage begins; it is not dependent on the water being put to the ultimate uses by those to whom it has been marketed. As the Montana Supreme Court explained in *Bailey v. Tintinger*, 122 P. 575, 582-83 (Mont. 1911):

[U]pon a consideration of our statutes, the history of the law of appropriation, and the public policy of this state, we base our conclusion that, as to a public service corporation, its appropriation is complete when it has fully complied with the statute and has its distributing system completed and is ready and willing to deliver water to users upon demand, and offer [sic] to do so.

See also Anderson v. Spear-Morgan Livestock Co., 79 P.2d 667, 670 (Mont. 1938) (citing *Bailey* for the proposition that statutory appropriation is perfected when the diversion works are completed with due diligence).

The Montana State Water Conservation Board filed the right for the Tongue River Reservoir on April 21, 1937. Ex. M558A. Consistent with the statutory scheme outlined above, the right was for all of the unappropriated water in the Tongue River, with the primary purpose of selling water to downstream agricultural users. The initial filing was supplemented on January 28, 1938, and February 28, 1938. See. Exs. M558B, 558C. The filing sought to appropriate "all the unappropriated water of Tongue River and tributaries," and sought to put the water to the following uses:

To irrigate lands which can be irrigated by waters herein appropriated, and for other useful and beneficial purposes, in the vicinity of the dam and storage reservoir above referred to, in an along the entire water shed of the said Tongue River and its tributaries and in and along the water shed of the Yellowstone River for a distance of 150 miles below the point where the said Tongue River flows into the said Yellowstone River, and also lands which may hereafter be found to be subject to irrigation from waters retained in the storage reservoir described herein."

This declaration is made and filed under the provisions of Section 349.18 of the Revised Codes of Montana.

Ex. M558C.

Construction of the Reservoir was completed in 1939, with an original capacity of 72,500 acre-feet. See Ex. M557; Tr. 1812:5 – 1813:4 (Aycock); Tr. 1021:19 – 1023:3, 1035:8 – 1036:9 (Smith). Thus, DNRC's water right in the Tongue River Reservoir is based on that original capacity. See *Donich*, 250 P. at 972-73 (recognizing that enlargements of reservoirs do not constitute new appropriations except to extent they exceed original capacity); Tr. 1057:25 – 1058:8 (Smith) (stating that water right for Tongue River Reservoir was perfected for full capacity at the time "the project was built and we started to fill and we had an association already formed for marketing the water"); Tr. 1131:10-21, 1035:14 – 1036:9 (Smith); Tr. 1816:9-23 (Aycock) (stating that reservoir rights are typically based on original capacity).

In the 1990s, the Tongue River Reservoir became part of the settlement of the reserved water rights of the Northern Cheyenne Tribe of the Northern Cheyenne Reservation ("NCT" or "Tribe"). Montana is unique across the West in that it has a Reserved Water Rights Compact Commission (RWRCC), which was established to negotiate rather than litigate the quantification of the reserved water rights of both the Federal Government and Indian Tribes. Tr. 1584:5-7 (Tweeten); Mont. Code Ann., Title 85, ch. 2, pt. 7. Chris Tweeten, Chairman of the RWRCC and NCT Negotiating Team Member explained the process at trial. Tr. 1584-1596 (Tweeten). The RWRCC has been very successful, negotiating 17 water rights compacts, six of which are with Tribal Nations. See Mont. Code Ann. tit. 85, pt. 20. These compacts were accomplished through hard-fought, government-to-government negotiations among three sovereigns, in the case of Tribal compacts, including the State of Montana, the Federal Government, and the particular Tribal Nation. Tr. 1591:14-25; 1592:1-3 (Tweeten). The negotiating teams were staffed by scientists and experts who performed legal and technical work for the negotiating teams. Tr. 1583:13-21, 1588:15-25 (Tweeten). Extensive technical and legal work was performed for the NCT Compact. Tr. 1589 – 1591, 1593:10 – 1596:22 (Tweeten). The backdrop to the negotiations of the NCT Compact was federal court litigation initiated by the Tribe and the United States to determine the tribal reserved rights.

The Tribe's senior reserved water rights were settled through the NCT Compact, which led to the stipulated dismissal of the then-pending federal court litigation, and entry of a Decree by the Montana Water Court in September 1995 confirming the Tribe's reserved rights. Mont. Code Ann. § 85-2-301; Tr. 1610:19-25 – 1611:1-13 (Tweeten). The Tribe had claims to reserved water rights in both the Tongue River and Rosebud Creek to the west. A potential priority date for the reserved water right considered in the negotiation was 1881, based on a federal Executive

Order, and other potential dates were around the turn of the twentieth century. Tr. 1600:9-20 (Tweeten). The first proposal from the Tribe included the recognition of a right for approximately 85,000 acre-feet of direct flow from the Tongue River. Tr. 1601:1-4 (Tweeten). The Tribe ultimately settled for 20,000 acre-feet of water in the Tongue River Reservoir and 12,500 acre-feet of direct flow from the Tongue River. As a result of the stored water component, the operation of the Tongue River Reservoir was critical to the Tribe to ensure that it received wet water. Tr. 1609:15-25, 1610:1-18 (Tweeten). Consequently, the Compact included provisions on operation of the Reservoir. *Id.*

The Reservoir was rehabilitated in 1999 as part of the implementation of the 1992 Act. At that time, the original capacity of the Reservoir was restored and increased to 79,071 acre-feet. The additional storage was constructed specifically to implement the NCT Compact which provided the Tribe with a 20,000 acre-foot storage right.⁴ Ex. M527

The 20,000 acre-foot storage right in the Tongue River Reservoir carries a priority date “equal to the senior-most right for stored water in the Tongue River Reservoir[.]” Ex. M362, *In the Matter of the Adjudication of Existing and Reserved Rights to the Use of Water, Both Surface and Underground, of the Northern Cheyenne Tribe of the Northern Cheyenne Indian Reservation Within the State of Montana in Basins 42A, 42B, 42C, 43KJ, & 43P*, Cause No. WC-93-1, Montana Water Court, Order Entering Decree (Sept. 26, 1995), as amended October 17, 1995.

The senior-most right for water stored in the Tongue River Reservoir when the Tribal decree was entered was the right belonging to the DNRC, denominated as Statement of Claim No. 42B 119280-00, which has a priority date of April 21, 1937. Amended Stipulation settling objection to RTT right, Ex. M526 at 2-3. The Tribe and the Federal Government have agreed

⁴ This is not to say that the additional storage capacity is solely the Tribe’s. Rather, as discussed below, the Tribe’s and the DNRC’s rights in the entire reservoir are commingled.

that the separate NCT Compact right to storage is commingled with, and therefore encompassed in, the DNRC storage right in the Reservoir with the 1937 priority date. Thus, as provided in the NCT Compact and the Montana Water Court's Decree of September 1995, and protected under Article VI of the Yellowstone River Compact, the Tribe's water right in the Reservoir has an April 21, 1937 priority date.

Although a final decree for the DNRC's Tongue River Reservoir water right (Statement of Claim No. 42B 1119280-00) has not issued, the right is included in the Montana Water Court's preliminary decree for the Tongue River Basin Above and Including Hanging Woman Creek (Basin 42B), and the parties who objected to that right have entered and filed an amended stipulation agreeing on attributes of the water right, including its commingling with the water right already finally decreed by the Water Court in Cause No. WC-93-1. Ex. M526 at 3, ¶ 6. The objection period has now closed, and the claim is presumed valid under Montana law until the final decree is issued. *See* Mont. Code Ann. § 85-2-227. Among the parties that agreed to the attributes of the water right in the amended stipulation were the United States and the Tribe. Ex. M526 at 8, 10. Under the Amended Stipulation, the priority date of the DNRC's right to store water with a reservoir capacity of 79,071 acre-feet is April 21, 1937. Ex. M526, Ex. A attached thereto. Thus, as determined by the Montana Water Court, with the participation of the Tribe and the United States, the commingled rights of the Tribe and DNRC in the Reservoir have a 1937 priority date. *See* Ex. M526; Tr. 502:17 – 507:1 (Davis) (discussing adjudication of Tongue River Reservoir right, amended stipulation settling objections to the claim as between Tribe, Bureau, TRWUA, and DNRC).

The commingled storage water rights of the State of Montana and the Tribe are administered conjunctively pursuant to the NCT Compact. Both storage rights are dependent on

the State of Montana's ability to fill and refill the reservoir subject to physical and legal water availability and capacity in the reservoir. *See* Tr. 507:14 – 508:12 (Davis).

Thus, every subpart of the water stored in Tongue River Reservoir is commingled, including water stored in the enlarged capacity. There is no horizontal fill of the Reservoir according to different priority dates or different water right ownership. In light of the rights recognized in the NCT Compact and the 1992 Act (rights protected under Article VI of the Yellowstone River Compact), Montana must store water to the 79,071 acre-foot level to enjoy its pre-1950 storage right in Tongue River Reservoir. If it is not able to store to that level it will not have available to it the water it had available prior to ratification of the Yellowstone River Compact. Accordingly, water stored in the enlarged capacity is necessarily protected by Article V(A) of the Compact.

Contrary to the position Wyoming has taken in this litigation, the Compact's protections are not limited to the pre-1950 capacity of the reservoir, but rather extend to the full current capacity of 79,071. The NCT Compact was a bargained-for compromise of senior water rights with a priority date clearly prior to 1950. Under no interpretation can the Tribe's reserved water rights be considered to be post-1950 rights. Fundamental and well settled law holds that Tribal reserved water rights exist as of the date of the reservation of the land from the public domain. *Winters v. United States*, 207 U.S. 564 (1908); *Cappaert v. United States*, 426 U.S. 128, 138 (1978). Quantification of the rights was left to state adjudications under the McCarran Amendment. *See San Carlos Apache Tribe v. Arizona*, 463 U.S. 545, 569 (1983); *State ex rel. Greely v. Confederated Salish and Kootenai Tribes*, 712 P.2d 754, 765-66 (Mont. 1985); 66 Stat. 560, 43 U.S.C. § 666. The fact that the settlement of the reserved rights was concluded after 1950 does not change the fact that the underlying rights are "[a]ppropriative rights to the

beneficial uses of water of the Yellowstone River system existing in [Montana] as of January 1, 1950.” YRC Art. V(A). The NCT rights existed unquantified at least by the turn of the twentieth century, and certainly prior to 1950.

More importantly, Article VI of the Compact provides that “[n]othing contained in [the Compact] shall be so construed or interpreted as to affect adversely any rights to the use of the waters of Yellowstone River and its tributaries owned by or for Indians, Indian tribes, and their reservations.” This language was included in the Compact specifically to account for and ensure the protection of the rights of Indian tribes to waters in the Yellowstone River System. When the Reservoir does not fill, the Tribe’s rights under the NCT Compact are not met in full. The Yellowstone River Compact cannot be interpreted to subordinate the Tribe’s rights to Wyoming’s pre-1950 water rights. Likewise, the Yellowstone River Compact cannot be interpreted to mean that the NCT lost the protection of this provision because it chose a path of settlement rather than litigation.

Moreover, even if the Court were inclined to differentiate between the original capacity of the Reservoir (72,500 acre-feet) and the enlarged capacity (an additional 6,571 acre-feet), and to treat the enlarged capacity as a post-1950 right, Montana’s pre-1950 reservoir right would still not have been satisfied in the years at issue. As Mr. Aycock explained, reservoir rights with different priorities are administered from the top down, with the earlier priority occupying the space at the top of the reservoir:

Q: As you did [your] analysis, what did you recognize as the full storage level for Tongue River Reservoir?

A: The 79,071 acre-feet.

Q: And would it have made a difference in your analysis if you had used a lower capacity, say 72,500 or 69,400?

A: No, it wouldn't because it's a common accepted practice to manage your water rights in a way that will provide the most efficient use of your water supply. And in doing that, when you fill a reservoir, of course you fill under your first right. If you had a reservoir with two priorities in it, two separate priorities . . . you would fill your first priority. And if water was available, you'd fill that second priority.

So in the better years, and in 2003 and 2005, the reservoir would have completely filled. And those are the years preceding the next drought year. So you would fill to that level, and then the water that you released would come out of the early priority first. And the reason you do that is because that pool would be the easiest to refill in the spring.

So basically what that does is it's just as if the later priority water is sitting on the bottom of the reservoir and you're operating up in this early-priority pool. So unless the reservoir is drawn down to such an extent that you get down into that later-priority pool . . . you're never going to get into that late-priority water.

So all of the water is carried over into the next year. And then to refill, you have to fill up to the full 79,000 to refill that early priority space. The later priority is sitting on the bottom, and you've got to bring that early priority back up to a full level.

* * *

Q: So, again, would it have made any difference in your analysis if you had used a lower capacity than [79,000 acre-feet], one of the lower figures [of 72,500 or 69,400 acre-feet?]

A: No, it wouldn't. In either case, the original space would not refill for those drought years.

Tr. 1891:7 – 1893:20 (Aycock). Thus, regardless whether the added capacity of the Reservoir and the Tribe's right are viewed as having a pre- or post-Compact priority, Montana's water right in Tongue River Reservoir was not satisfied in any of the years at issue. This is consistent with the approach Wyoming takes toward reservoirs having more than one priority. *See* Tr. 1742:22-25 (Whitaker); Tr. 5415:15-5416:5 (Fritz).

2. The Reservoir Has Been Operated Prudently

As explained in depth by Montana's reservoir witnesses, Kevin Smith, Art Hayes, and Gordon Aycock, there are a number of factors that affect the operations of Tongue River Reservoir. These include upstream and downstream water rights, the hydrology and physical

characteristics of the basin, climate patterns, and safety considerations. *See* Tr. 1015:10 – 1018:19, 1036:23 – 1039:19 (Smith) (describing characteristics of the Tongue River Basin that impact reservoir operations). Such factors influence operational decisions and criteria such as the fill period of the reservoir, winter bypass flows, and winter storage restrictions. *See* Tr. 1171:13 – 1172:14 (Smith) (discussing reservoir operations factors considered in the drafting of the Tongue River Dam Manual for Operation and Maintenance, Ex. M524). As discussed below, the evidence and testimony at trial demonstrate that Montana's operations of Tongue River Reservoir during the years at issue were reasonable and were consistent with the doctrine of appropriation in Montana, including the historical pattern of use of the reservoir water right, both pre- and post-Compact. *See* Tr. 1848:6-16 (Aycock) (past operations of Tongue River Reservoir were conducted in a reasonable and practical manner).

To the extent that Wyoming claims Montana's reservoir operations were inconsistent with the Compact and the doctrine of appropriation, Wyoming bears the burden to show as much. *See Archer v. LaMarch Creek Ranch*, 571 P.2d 379, 383 (Mont. 1977) ("The burden of proving an affirmative defense rests on the defendant."); *see also Parshall v. Cowper*, 143 P. 302, 304 (Wyo. 1914) (adjudication of quantity of water is as conclusive upon water distributor as the determination of priorities, and the burden was on defendant water regulators to show that plaintiffs were not entitled to the full maximum amount of water granted them by the adjudication); *Matter of Clark Fork River Drainage Area*, 908 P.2d 1353, 1355 (Mont. 1995) (party claiming that user abandoned right carries the "initial burden of proving that a water right has not been used for a sufficiently long period of time to raise a rebuttable presumption of an intent to abandon that right"). The Special Master recognized that it is Wyoming's burden to prove that Montana's practices waste water or are otherwise inconsistent with beneficial use

under the doctrine of appropriation. *See* Sept. 16 Mem. Op. at 4 (“[T]he initial presumption is that Montana’s existing regulation and administration are acceptable under the Compact.”); Wyoming has conceded that it bears the burden to establish waste. *See* Wyoming’s Final Pretrial Memorandum at 5 n.3 (Sept. 23, 2013).

a. Fill Period

The fill period of the Reservoir is largely determined by the hydrological characteristics of the basin, as well as climate and weather patterns, and the needs of downstream irrigators. The Tongue River Basin has a steep hydrograph, meaning that flows pick up rapidly in the spring due to precipitation events and runoff from snowmelt, and then fall off rapidly in mid-summer, remaining at relatively steady base flows for the remainder of the year. *See* Tr. 1037:15 – 1038:16 (Smith). Thus, the Reservoir’s fill period is during the spring runoff season, typically April through June. It is during this time that most of the annual volume of water in the system flows down across the state line. Following the spring runoff, when the natural flow of the river declines rapidly, outflows from the Reservoir are set during the summer months to satisfy downstream contract deliveries. Then, at the end of the irrigation season, beginning in October and into November, the Reservoir is maintained at levels below the parts of the dam that can be damaged by ice. Tr. 1038:22 – 1039:19, 1097:23 – 1098:22. 1105:16 – 1106:1 (Smith).

b. Releases During the Irrigation Season

Releases from Tongue River Reservoir during the irrigation season typically begin when downstream rights, particularly the T&Y Irrigation District, begin calling for their storage water. The dam operations to deliver the water called for from storage must take into account the long travel distance (some 190 miles to the T&Y) and travel time (up to seven days) and antecedent and intervening hydrologic and precipitation conditions. Mr. Aycock, the Montana reservoir

operations expert, testified that the reservoir was operated during the irrigation season in an efficient manner without unnecessary waste. *See* Ex. M7, App. C, at 38-44; *Id.* at 39 (“For each of the years in question I carefully reviewed these daily flow records and concluded that the manager for the Tongue River Dam made every reasonable effort to prudently manage the Tongue River Dam to deliver water to the senior water right holders and those having contracts for stored water.”). *See also* Tr. 1835:14–1841:8 (Aycock) (discussing considerations in managing releases and stating that, with regard to river management in the four years at issue, “it was about as good of a job as you can expect. I really couldn’t see that they could do a lot more if they tried to tighten it up any more, they would end up with more shortage.”).

c. Winter Bypass Flows

The Tongue River Reservoir is an onstream reservoir, meaning that it is a dam structure built on the stream. *See* Tr. 588:20 – 589:1 (Davis). Thus, outflows from the reservoir are either releases of stored water or “bypass flows,” meaning natural flows that are passed through the reservoir without being stored.⁵ Winter operations entail allowing the river to flow through the Reservoir at a certain level. These winter flows are necessary for two primary purposes. First, downstream stock water rights require water throughout the year for large numbers of cattle and sheep. There are 48 filed pre-1950 stock water rights on the Tongue River, and numerous other stock water rights that have not been filed. *See* Tr. 501:11 – 502:16 (Davis); Tr. 1423:18 – 1424:9, 1467:15 – 1468:22, 1470:21 – 1471:4 (Hayes); Mont. Code Ann. § 85-2-222 (claims for existing rights for livestock and individual uses based on instream flow or groundwater sources are not required to be filed in adjudication). Sufficient water must pass through the system to satisfy those stock water rights, as well as to carry that water down to where the livestock take it

⁵ Because some natural flows need to pass through the onstream reservoir, water rights associated with onstream reservoirs in Montana do not identify a flow rate. *See* Tr. 586:15 – 587:10 (Davis).

and prevent the system from freezing up such that livestock cannot access the water. Tr. 1114:13 – 1115:9, 1240:2 – 1241:3 (Smith); 1871:15 – 1872:5 (Aycock); 1876:18 – 1877:10 (Aycock) (discussing need for 167 cfs for stock water rights).

Second, a certain level of outflows from the Reservoir must be maintained in order to prevent damage and safety problems arising out of ice formation on the river. As Mr. Smith testified, there is not much gradient between the Tongue River Reservoir and Miles City, making for a river with a steady, uniform flow. Tr. 1114:3-12. Thus the river requires some amount of flow to keep it flowing during the winter to prevent the system from icing up. Mr. Smith explained the concern with river icing in his testimony at trial:

Well, this is Montana, and eastern Montana at that. Its – it can get fairly cold in the minus 20-, minus 30-degree sections and is at risk, when you have a river that the base level in the summertime for irrigation is 400 cfs, give or take, it seems. And spring runoff puts water through there approximately between 2000 and 5000 cfs. The river channel is a developed, wide channel.

In wintertime flows, there needs to be sufficient depth to prevent ice from forming from the bed of the river coming up. So it's very desirable to get, what I would call, an ice shelf formed for the initial part of the cold season at a higher level if you can, so if you need to adjust flows, you can adjust flows without freezing up the river. Because once you do freeze up the river, restrict the flows, if we have to pass additional flows to deal with flood issues and mitigation, it's very likely you end up creating ice jams and/or putting the river on top of your river ice, which then, in turn, ends up flooding out at the banks and going through your farm fields and taking out bridges and whatnot.

Tr. 1155:4-25 (Smith).

It's a very steady state of flow which allows for the – there's not as much energy in the system to resist ice formation. So when you get to the very low flows, it's easier for ice to form. And the other issue with it, once ice forms – once ice forms – and typically, if you are driving down the road you'll notice when you're coming through areas, the areas that are getting damaged the most from ice are places where you have constrictions, such as bridge abutments and other locations. That's where ice breaks up and flows down, it can get caught up at those locations, and it starts jamming up or backing up water. And that's where you'll see typically – not always, but typically you'll see more of your ice jams and the first formation of the ponds behind them and flooding issues.

So, having enough flow to maintain the river channel and maintain an ice shelf is very important. Especially in a system that has the wide range of temperature fluctuations that we do.

Tr. 1241:12 – 1242:6 (Smith); *see also* Tr. 1920:5 – 1921:22 (Aycock) (discussing mechanics of river icing, necessity of winter flows). Confirming Mr. Smith's testimony, Mr. Hayes testified regarding the need to guard against river icing to protect against damage to livestock and damage from ice jams. *See* Tr. 1472:16 – 1473:10 (Hayes) (describing dangerous conditions that can develop if a sufficient winter release from the Reservoir is not maintained). As an example, Mr. Hayes testified to specific instances of ice jams that occurred in the winter of 2012. Tr. 1468:23 – 1472:14 (Hayes). Other long-time residents along the Tongue River testified regarding the devastating effects of ice and ice jams. *See* Tr. 3801:22-25, 3802:1-4, 1803:21-23 (Nance); Tr. 3644:2-23 (Hamilton). Mr. Aycock also testified based on his research and experience that prevention of icing downstream is a critical part of Reservoir operations and maintaining a healthy river, and that the Miles City area has a history of chronic problems with ice jams, the minimization of which is an important function of the Tongue River Reservoir. Tr. 1877:2 – 1887:1 (Aycock) (discussing historical ice jams, problems with ice jams in Montana, need to manage Tongue River Reservoir to address icing problems).

The need for winter bypass flows is recognized and codified in the Operating Manual and Operating Plan for the Reservoir, which provides for minimum winter flows of 175 cfs. Ex. M316. The Operating Plan was developed by the Tongue River Advisory Committee, established in the NCT Compact. Under Federal and State law, the Committee includes the United States and the NCT. Mont. Code Ann. § 85-20-301, Art. III. D; Pub. L. No. 102-374, 106 Stat. 1186. Both parties approved the Operating Plan. As described in the Rebuttal Report of Kevin Smith and in Figures 1-3 of the Report, the current winter flows through the Reservoir are

similar, if not less than, the winter flows through the Reservoir during the pre-Compact era. Ex. M4 at 11-12. This pattern of operation thus was in effect at the time the Compact was negotiated and executed.

As demonstrated by the Montana witnesses, the 175 cfs minimum winter flow level is based on long-term operational experience, taking into account the unique attributes of the Tongue River Reservoir, the particular physical characteristics of the basin, the affected water rights, and structural and safety concerns. Mr. Smith, Mr. Hayes, and Mr. Aycock testified that this minimum flow level was reasonable, and was based on long-term experience with the particular characteristics of this basin and reservoir. *See* Tr. 1239:5 – 1240:1 (Smith); Tr. 1254:20 – 1257:6 (Smith) (explaining why flow levels of 50 cfs or 75 cfs are not reasonable for winter operations); Tr. 1467:15 – 1468:3 (Hayes) (stating that 175 cfs is the ideal minimum winter flow rate); Tr. 1843:3 – 1845:11 (Aycock) (explaining why it is risky, irresponsible, and wasteful to operate a reservoir to maximize storage at all times); Tr. 1886:21 – 1887:1 (Aycock) (stating that an important function of the Reservoir is to minimize icing); Tr. 1887:2-21 (Aycock) (testifying that deciding on an appropriate winter flow level should be based on long-term experience of reservoir managers with the particular reservoir); 1920:5 – 1922:9 (Aycock) (stating that the flows should not go below 75 cfs at an absolute minimum, and that 175 cfs is the optimal minimum for preventing ice problems downstream and maintaining a healthy river).

Cold winter temperatures, combined with large amounts of low elevation snow, provides a prime example of the need to operate Tongue River Reservoir to manage downstream ice conditions while providing storage space to control runoff during the spring ice breakup. The proper management of Tongue River Reservoir prevents most of the ice jam flooding that would otherwise occur. The winter release of near 175 cfs prevents the river from completely icing in.

When temperatures warm in early March and the ice begins to move and break up, the reservoir is able to store the upstream snowmelt runoff and prevent this water from causing major ice-jam flooding. The storage of the large snowmelt runoff by the Tongue River Reservoir reduces downstream flows significantly. If the reservoir were operated to maximize storage as suggested by Wyoming, the reservoir would have been full by early March. The snowmelt runoff would have been passed downstream rather than stored, potentially resulting in major flooding, especially in the Miles City area. This flooding can result in significant property damage and the need to evacuate many of the homes along the river.

Wyoming did not provide any testimony from anyone experienced with reservoir operations to contradict the extensive testimony provided by Montana witnesses Smith, Hayes, and Aycock.

d. Winter Storage Limitation

Another operational constraint on the Reservoir related to winter bypass flows is the winter storage limitation of 45,000 acre-feet. Such limitations are not unique to the Tongue River Reservoir, and are typically set at levels necessary to protect the reservoir structure and facilities from damage, and to ensure sufficient capacity during the spring runoff season to prevent flood damage downstream. *See* Tr. 1263:4-9 (Smith) (stating that all 21 state reservoir projects in Montana have winter maximum storage levels); Tr. 1853:18 – 1855:5 (Aycock) (discussing winter storage restrictions for reclamation reservoirs); Tr. 1749:5-1749-11 (Whitaker) (discussing wintertime releases from Kearney, Willow Park and Park reservoirs to prevent water from getting up on the concrete structures).

With respect to protecting the structure and facilities of Tongue River Reservoir, Mr. Smith testified:

As discussed and described in the operating plan and the maintenance manual, the desire is to not have ice on the concrete wall structures and to have the ice either set at or not fluctuate too much on the reservoir surface to prevent moving the armoring, the rock, the riprap protection on the dam face. If you have a fluctuating lake surface during freeze-up, you'll start moving rock around and riprap around. And that can – leaves long-term maintenance issues, repair issues that have to be repaired and taken care of.

Tr. 1242:11-21 (Smith); *see also* Tr. 1186:17 – 1187:8 (Smith). Mr. Hayes likewise testified:

Q. Is another part of your winter operation maintaining a maximum level on the reservoir to . . . prevent damage to the reservoir during the winter months?

A. During the winter months the ideal is 45,000 acre-feet. This keeps the water off of the concrete. During these drought years, the water users' board has recommended risking damage to the dam that we will have to repair if it's damaged, to go to 55,000. And just to give us a little hedging thing, we don't like to do it. We like – if the snowpack and everything looks good, we would like to keep it at 45,000 during the winter.

Tr. 1474:11-23 (Hayes).

Sufficient river flow must also pass through the auxiliary outlet works (the primary outlet works prior to the rehabilitation) to prevent freezing. Wyoming recognizes this same issue with its own reservoirs. Mike Whitaker, former Hydrographer for Division II in Wyoming, testified with respect to Wyoming's Kearney, Park and Willow Park reservoirs that they had "winter releases to maintain the elevation in the wintertime rather than fill the reservoir" because they "don't want anything getting up there on the concrete structures." Tr. 1749: 3-14 (Whitaker). Likewise Tom Koltiska testified that Kearney Reservoir in Wyoming is operated with a winter release to prevent ice from building up on and plugging the spillway. Tr. 2466:11-24 (Koltiska). DNRC and the TRWUA learned that if sufficient flows were not permitted through the auxiliary outlets works, it resulted in a lot of slaking and peeling of the concrete 100 to 150 feet up the conduit due to freeze-thaw damage. Tr. 3646:15-3647:2 (Hamilton).

Protection of the physical structure is important not just from a cost standpoint, but also from a safety standpoint. Tongue River Reservoir is classified as a high hazard dam, meaning that failure of the dam could result in loss of life downstream. *See* Tr. 1134:8 – 1137:7 (Smith); Tr. 1850:12-20 (Aycock). Operations must therefore ensure that the dam structure is safely maintained. Further, the winter maximum storage level also ensures that there is sufficient capacity in the Reservoir to allow flows to be mitigated and regulated as needed to prevent flood damage downstream. *See* Tr. 1136:8 – 1137:1, 1243:18 – 1244:7, 1367:7 – 1368:7 (Smith); Tr. 1848:22 – 1849:9 (Aycock).

These safety considerations must be taken into account when operating the Reservoir for its designated purposes. The winter storage limitation is a key operational component with respect to protecting the physical structure of the Reservoir and ensuring that the Reservoir can carry out flood control, which is one of its central purposes. The Montana reservoir experts testified that a winter storage limitation of 45,000 acre-feet is reasonable and properly calculated to address the issues discussed above. *See* Tr. 1869:14-24 (Aycock) (winter storage maximum is a reasonable restriction that also has counterparts in reclamation reservoirs for the same reasons); Tr. 1474:15-23 (Hayes) (45,000 acre-feet is the preferred winter maximum, as a higher amount risks damage to the structure); Tr. 1186:3 – 1195:6 (Smith).

e. Need for Flexibility in Operations

The operating parameters set forth in the Operating Plan and Operating Manual are designed to allow flexibility in operations necessary to accommodate the complex conditions and situations faced by Tongue River Reservoir as an onstream reservoir with multiple purposes in a basin with highly variable climactic conditions that dictate water availability for storage. Operators must balance a number of often competing concerns, and make real-time decisions

based on projections regarding future conditions. *See, e.g.,* Tr. 1019:3-13 (Smith); Tr. 1525:9 – 1527:15 (Hayes); Tr. 1832:5 – 1835:1 (Aycock) (discussing operational issues and considerations for multiple-purpose reservoirs); Tr. 1832:10 – 1835:1 (Aycock) (discussing uncertainty of data that reservoir operators have to work with going into the winter). Thus, operational criteria need to be sufficiently flexible to allow for adjustment of operations in response to real world variables and events. *See* Tr. 1019:3 – 1021:11, 1185:9 – 1186:2 (Smith).

The purposes of the Reservoir for both flood control and storage for irrigation can sometimes come into conflict, requiring the reservoir operator to make operational decisions as to which purpose should take priority. The steep hydrograph entails both a need for adequate space in the reservoir at the beginning of the spring runoff to control the high flows and prevent flooding downstream, as well as the need to store as much water as possible throughout the year, particularly in dry years. With respect to flood control, Mr. Smith testified regarding the flood of May 1978, and the importance of having sufficient space in the reservoir to prevent dangerous flood conditions during spring runoff and precipitation events. *See* Tr. 1093:25 – 1094:24 (Smith). Mr. Smith also described the flexibility needed to address unexpected upstream precipitation events, using an example from 2013 where a large precipitation event required that October flows be adjusted upward above the normal 175 cfs to try to bring the reservoir down to a manageable level for winter conditions. Tr. 1205:13-1206:12 (Smith).

Flexibility is also a necessary aspect of winter operations with respect to bypass flows and storage limits. As Mr. Smith explained, it is imperative for reservoir operators to have flexibility in winter operations to adjust for river icing, including preventing the formation of anchor ice and ice jams. Tr. 1156:18 – 1157:5 (Smith). Further, flexibility is required during the winter to allow for additional bypass flows required to ensure sufficient capacity for high

springtime flows, or reduced bypass flows and additional storage to address projections of a dry year ahead. Tr. 1205:10 – 1206:12, 1307:5 – 1308:16 (Smith); Tr. 1847:5 – 1848:2, 1849:23 – 1850:11 (Aycock).

Thus, reasonable operations of Tongue River Reservoir include flexibility to deviate from typical operating criteria to address changing circumstances and ensure that the various purposes of the Reservoir are properly balanced. Montana's reservoir experts testified that, overall, the Tongue River Reservoir was operated within a reasonable range of flexibility in the years at issue. See Tr. 1525:9 – 1527:15 (Hayes). As Mr. Aycock testified based on his review of the past operations of Tongue River Reservoir:

I thought overall that the reservoir had been managed in a very practical, reasonable manner. They were operating to meet their water supply, but also recognizing the other need, the need to have a winter flow that was needed for the stock and use on the river and also manage the ice. And manage to have some space for regulating high flows in the spring.

Tr. 1848:6-16. (Aycock)

f. Wyoming's One-Fill Rule Does Not Apply to the Tongue River Reservoir in Montana

Unlike Wyoming, Montana does not have the so-called "one-fill rule," as demonstrated by Montana statutes, water rights in the statewide adjudication, case law, and the testimony of multiple witnesses at trial. See A. Dan Tarlock, *Law of Water Rights and Resources* §5:39 (noting that Colorado and Wyoming allow a reservoir to be filled once a year, but that the status of the rule is unclear in other states, and observing that the rule thwarts rational operation). Thus, pursuant to the Special Master's determination that water rights and administration in each state are determined by state law, application of a one-fill rule to Montana's operations of the Tongue River Reservoir is not appropriate in determining the extent to which Wyoming interfered with Montana's pre-1950 rights in violation of the Compact.

Statutory law in Montana indicates that there is no one-fill rule. When the Tongue River Reservoir right was filed and perfected, there was no statutory provision limiting an appropriation to one fill of the capacity of a reservoir. Nor does such a statute exist currently. Instead, under the Montana Water Use Act ("MWUA"), as under prior law, appropriation is limited only by that amount of water put to "beneficial use." Mont. Code Ann. §§ 85-2-102(1), 85-2-301, and 85-2-311; Mont. Code Ann. § 89-802 1947 (repealed). The MWUA recognizes that the amount of water put to beneficial use can exceed the capacity of a reservoir. *See, e.g.*, Mont. Code Ann. § 85-2-306(6) (providing for permit for "stock pit" for livestock with a maximum capacity of 15 acre-feet and annual appropriation not to exceed 30 acre-feet).

Water right claims in the statewide adjudication also demonstrate that Montana law allows a reservoir to have more than one fill for beneficial use. For instance, the decision of the Montana Water Court regarding the Painted Rocks Reservoir in western Montana recognized a water right in the amount of 45,720 acre feet of water per year for the reservoir, which has a storage capacity of 31,706 acre-feet. *See* Ex. M319, Master's Report Case No. 76HE-166. Notably, the United States, through the Bureau of Indian Affairs, was a party to the Painted Rocks case, and agreed to the characterization of the water right for the project. *See* Ex. M319 at 6-7. Other state water projects have likewise been decreed water rights in excess of the capacity of the project reservoir. *See* Ex. M539. Even the current preliminary decree for the Tongue River Reservoir lists a volume of 134,316 acre-feet for the 79,071 acre-feet reservoir. *See* Ex. M526, Amended Stipulation, proposed abstract; Tr. 537:19 – 538:19 (Davis) (testifying regarding original capacity listed for Tongue River Reservoir and stating that it is typical for reservoir rights to list a volume greater than the capacity in the reservoir "to allow for carryover capacity as well as the ability to fill").

Further evidence that there is no one-fill rule in Montana can be found in the Montana Supreme Court Water Right Claims Examination Rules, Exhibit M32. These rules are applied to water right claims filed in the statewide adjudication to adjudicate water rights as they were perfected under the laws existing prior to July 1, 1973. Rule 10 applies to *Reservoirs*. Rule 10(b) *Reservoir Data*, specifically asks about, under subsection 4(x), “the *number* of fills per year.” (Emphasis added). Rule 15, regarding the “Summary Report” provided to the Montana Water Court detailing the results of the claims examination, similarly recognizes that a reservoir may have more than one fill in its explanation of when a remark is necessary for reservoir volume. Rule 15 states in relevant part:

Rule 15(h). Summary report. In the summary report to the water court, the department shall provide on each abstract the following data and facts concerning the volume: ...

(5) remarks concerning unresolved issues or questions about the claimed volume, such as the following situations...

(ii) when a claimed volume to be decreed is greater than two times the capacity of the reservoir or exceeds a reasonable number of fills

Thus, the volume claimed for a reservoir is not even identified as a potential issue until it exceeds twice the capacity of the reservoir. *See* Tr. 538:15-19 (Davis). If Montana indeed had a one-fill rule, a claim for a volume exceeding the capacity of the reservoir would be identified as an issue. This is particularly true given the Water Court’s exclusive authority to adjudicate pre-1973 water rights. *Weinheimer Ranch, Inc. v. Pospisil*, 299 P. 3d 327, 328 (Mont. 2013) (Water Court possesses exclusive authority to adjudicate existing water rights under Mont. Code Ann. § 85-2-216).

Case law in Montana further supports that an appropriator is not limited to one fill of a reservoir so long as the amount stored is beneficially used. The court in *Montana Power Co. v. Broadwater-Missouri Water Users' Ass'n*, 50 F. Supp. 4, 8 (D. Mont. 1942), *rev'd on other*

grounds, 139 F.2d 998 (9th Cir. 1944), found that the large reservoirs on the Missouri River then owned by the Montana Power Company could be filled and refilled to generate hydropower.

Specifically, the Court held:

The reservoir rights herein decreed to the Plaintiff are limited to an amount of water sufficient to fill any given reservoir to which the right is appurtenant at any time when such reservoir shall contain less water than its maximum usable storage capacity.

Id. Although the case was reversed on other grounds, it is still relied upon in the statewide adjudication to describe the water rights for those large reservoirs.

Likewise the Montana Supreme Court held in *Bagnell v. Lemery*, 657 P.2d 608, 611-12 (Mont. 1983), that the defendant appropriator was entitled to more than one fill of his reservoir under his 1917 priority date water right. The issue of multiple fills was specifically raised by the plaintiff, and the Court explained:

The District Court decreed that defendants shall have the right to use the water from the Mahle Springs at the rate of 110 gallons per minute. Plaintiff contends this rate is excessive in that it allows defendants multiple fillings of their reservoir. We disagree. The defendants have shown the prudence to catch the spring run-off to fill their reservoir. After the reservoir has been filled in the spring, defendants have a decreed right to retain the incoming spring water at the rate of 110 gallons per minute. This does not constitute a double filling of the reservoir. Any excess over 110 gallons per minute must be allowed to pass through the reservoir and onto plaintiff's property. This is the essence of the District Court's decree and we find no error in such a ruling.

Id.

Importantly, the *Bagnell* court cited *Federal Land Bank v. Morris*, 116 P.2d 1007 (Mont. 1941), for the proposition that storage of water for beneficial use is favored, yet still held that the defendant appropriator was entitled to more than one fill. Wyoming has cited *Federal Land Bank* for the proposition that there is a one-fill rule in Montana. But that case does not support Wyoming's reading of it. *Federal Land Bank* addressed a straight-forward claim for

adjudication of water rights between competing appropriators; a refill of a reservoir was never at issue. Rather, the court held that an appropriator was entitled to store more water than could be beneficially used in one year for carry over for use in a subsequent year. The reference to one-fill in *Federal Land Bank* was dicta addressing a statute discussed in a Colorado case. *Windsor Reservoir & Canal Co. v. Lake Supply Ditch Co.*, 98 P. 729 (Colo. 1908) (the statute which provides for these decrees forbids the allowance of more than one filling on one priority in any one year). As noted above, there is no analogous statute in Montana. Further, as stated by the Montana Supreme Court, “[d]ictum is not binding upon this Court as controlling precedent, and it is not persuasive authority for this Court in resolving the issue before us.” *State v. Otto*, 2012 MT 199, ¶17, 285 P.3d 583; see also *State v. Marble*, 119 P.3d 88, 92 (Mont. 2005); *United States v. Crawley*, 837 F.2d 291, 292 (7th Cir. 1988); *Clevenger v. Bolingbrook Chevrolet, Inc.*, 401 F. Supp. 2d 878, 883 (N.D. Ill. 2005). Given all the other indications that Montana does not follow a one-fill rule, the Court in *Bagley* did not find the dicta in *Federal Land Bank* to be controlling or persuasive.

Moreover, Colorado, the State on which Wyoming relies for its one-fill rule, allows a reservoir a second fill when permitted by a separate refill permit. Thus in *City of Grand Junction v. City and County of Denver*, 960 P.2d 675, 683 n.6 (Colo. 1998), the Colorado Supreme Court held that the City of Denver can refill its Dillon Reservoir under a subsequent junior priority. Thus, Wyoming is the odd man out when it comes to the one-fill rule. The normal rule in Western prior appropriation States would appear to be to allow multiple fills, and Wyoming is the exception. Based on his “35 years of experience managing reservoirs in the western States,” Mr. Aycock confirmed that Montana does not follow the one-fill rule. Ex. M7 at 17 (“Wyoming uses the ‘one fill’ but Montana does not.”).

Finally, four of the most knowledgeable officials of the State of Montana provided uncontroverted testimony that Montana does not have a one-fill rule akin to that of Colorado or Wyoming. Timothy Davis is the Water Resource and Commission Administrator at DNRC, the chief water official of the State of Montana. Mr. Davis testified that reservoir rights in Montana are not limited to a volume equal to the capacity of the reservoir. *See* Tr. 537:19 – 538:19 (Davis). Kevin Smith is Chief of the State Water Project Bureau of the Water Resources Division of DNRC, and is ultimately responsible for overseeing the more than 21 state-owned water projects. He testified in both his Rebuttal Expert Report, Ex. M4, and at trial that Montana does not have a one-fill rule for reservoirs. *See* Tr. 1261:20 – 1262:5 (Smith). Similarly, Millie Heffner, Chief of the Water Rights Bureau of the Water Resources Division of DNRC, testified at trial to the same. *See* Tr. 613:10-22, 623:14 – 626:4 (Heffner). Ms. Heffner is responsible for overseeing the appropriation and permitting of all water rights in the State. Finally, Gordon Aycock provided further confirmation, based on his experience operating reclamation reservoirs in several states, that Montana, unlike Wyoming, does not restrict reservoirs to a single annual fill. Tr. 1856:1-25.

Wyoming offered no testimony or authority to support a one-fill rule in Montana. No witness testified for Wyoming that there was a one-fill rule in Montana. Wyoming offered only the *Federal Land Bank* dicta, which is not credible for the reasons discussed above. In fact, Wyoming does not appear to apply its own one-fill rule as inflexibly as it would have such a rule apply to the Tongue River Reservoir. *See* Tr. 1858:5 – 1861:22 (Aycock). Wyoming Water Commissioners have discretion to determine when a reservoir owner must begin to fill. Ex. M519 at 5; Ex. W290. The Water Commissioners have to “interpret each situation as they exist” when making that determination. Tr. 2018:9 – 2019:24 (LoGuidice). Based on applicable

regulations, Ex. M519, the Water Commissioners issue a Notice to Appropriator to Begin Reservoir Storage that informs the reservoir owner when he or she must begin to fill. “All water allowed to flow past the reservoir after receipt of [a] notice [is] chargeable to the storage in said reservoir for [a] season.” Ex. W290. While it is supposedly “standard practice” to issue a Notice to the Appropriator to Begin Reservoir Storage for every reservoir, Tr. 2031:15-16 (LoGuidice), there is no evidence that a Notice was ever issued for any of the reservoirs located in the Tongue River Basin in Wyoming in any of the years at issue. Tr. 2032:16-23 (Kaste); Tr. 2091:7-10 (Knapp). Thus, the discretion granted to Wyoming’s commissioners, and the fact that Wyoming did not issue notices to fill during the years at issue, demonstrates that Wyoming does not strictly apply the one-fill rule.

Thus, the one-fill rule should not be applied to Montana’s operations of the Tongue River Reservoir in evaluating Wyoming’s liability for Compact violations based on the failure of the Reservoir to fill in the years at issue.

g. Historic Pattern of Use

In Montana and other prior appropriation states, historic operational practices and patterns of use are part of a reservoir water right under the doctrine of appropriation. *See McDonald v. State*, 722 P.2d 598, 609 (Mont. 1986) (noting that calculation of reservoir carryover turns “on the physical facts and historical use patterns unique to each water right”); *Quigley v. McIntosh*, 103 P.2d 1067, 1074 (Mont. 1940); *Allen v. Petrick*, 222 P. 451 (Mont. 1924); *Hohenlohe v. DNRC*, 2010 MT 203, ¶43, 240 P.3d 628.; *Manhattan v. DNRC*, 276 P.3d 920, 922 (Mont. 2012); *Town of Minturn v. Tucker*, 293 P.3d 581, 592 (Colo. 2013) (“Established practice in water adjudication proceedings makes historical use a significant or controlling factor in the determination of parties’ water rights.”); Tr. 1095:6 – 1096:18 (Smith).

Historic pattern of use serves two important purposes in administration of the prior appropriation doctrine. First, it protects a senior water user's right to divert a quantity of water consistent with historic timing of diversions, means/manner of diversion and conveyance, and the needs of the underlying beneficial use. *McDonald*, 722 P.2d at 605-06 (as against subsequent water users, a senior is entitled to the amount of water that he has historically diverted for beneficial use under reasonable means of diversion) (citing *Tulare Irr. Dist. v. Lindsay-Strathmore Irr. Dist.*, 45 P.2d 972, 977 (Cal. 1935)); *Crowley v. 6th Jud. Dist. Ct.*, 88 P.2d 23 (Mont. 1939) (the prior appropriation doctrine protects not only a quantity of water but also the historic means of diversion so long as it is reasonable). Second, a senior water user's pattern of use establishes the conditions on a source at the time a subsequent water user initiates his appropriation. The junior appropriator is both on notice of the conditions established by the senior appropriator's historic pattern of use, and entitled to maintenance of those conditions. *Quigley*, 103 P.2d. at 1073-74 (the extent of water right is subject to historic pattern and timing of diversions of water for beneficial use and may not be changed to the detriment of subsequent appropriators).

The historic pattern of use inquiry focuses in large part on the timing of diversions and the amount of water needed to accomplish a contemplated beneficial use. The determination is informed by particularized evidence regarding water availability, the nature of the water user's diversion and conveyance facilities, regional and climactic factors, and the beneficial use. *McDonald*, 722 P.2d at 609; *Worden v. Alexander*, 90 P.2d 160, 163-63 (Mont. 1939) (court relied upon water user's testimony regarding reasonableness of historic use based upon climactic conditions, soil characteristics, conveyance losses, and crop needs specific to the appropriation).

Kevin Smith provided testimony regarding the basis for the historical pattern of use of the Tongue River Reservoir water right:

[T]he practice of the operations of the reservoir has been developed . . . over time. That project was built in 1939 and put into service in 1939 and has gone through, so about 74 years of service to date.

The historical operations that were developed is [sic] based on the basin characteristics. This basin, it's a large basin, and it is prone to large runoff events. And the volume of water that is available for storage for filings, especially with our priority date of 1937, while it's a pre-1950 right, it is a junior right to most of the rights on the Tongue River below us. So we have to fill during that historical runoff time frame.

So for that matter, the historical practice becomes the water right because that's how that system works well.

Tr. 1239:6-22 (Smith).

Thus, based on the law of appropriation in Montana and other states, the extent and timing of storage under Tongue River Reservoir's water right are defined by the historic operations and pattern of use, and do not require storage according to arbitrary dates labeled a "storage season," or storage of every drop of water that flows into the reservoir after a certain date. The extensive evidence and testimony at trial regarding historic pattern of storage and use for Tongue River Reservoir, demonstrated that the operations in the years at issue, including the fill season, the winter bypass flows, and winter storage levels, were established prior to the Compact and carried through over the life of the Reservoir. *See* Tr. 1038:22 – 1039:19, 1096:19 – 1098:10, 1152:7 – 1153:3 (Smith) (discussing historical operations); Tr. 1390:13-25 (Smith) (Montana did not store more water in 2001, 2002, 2004, and 2006 than it did prior to the Compact). As such, Montana's operations of the Reservoir were part of the conditions existing at the time of the ratification of the Compact, conditions of which Wyoming was on notice. *See* Ex. M16, Tr. 2426:12 – 2441:18 (Littlefield) (testifying to the awareness of the Compact negotiators of the existence of Tongue River Reservoir and how it operated based on the

historical documents). These operations are both reasonable and protected from interference by post-1950 water users in Wyoming.

With respect to the fill period, Montana law does not set a specific storage season. Rather, the timing of storage associated with an appropriator's water right is defined by the historic pattern of use particular to the storage facility and needs of the appropriator. The fill period of the Tongue River Reservoir is dictated primarily by climate conditions in the basin, and has always been during the spring runoff season, as demonstrated by the testimony of Mr. Smith and Mr. Hayes:

[The Tongue River Reservoir] water right allows us to divert and fill year-round. Historically, the primary climate conditions down here basically dictate that we fill in the spring runoff. That's when we have the snowmelt runoff, and that's when we have, typically, the more wetter weather patterns for rainstorms coming through the State of Montana. And many times we will get the rain on snow events that will bring down 3000 to 6, 7000 CFS flows into our reservoir during that time period.

Tr. 1098:13-22 (Smith).

Q. During the early years of the dam's operation prior to . . . the compact and prior to the enlargement, based on your knowledge and your long history as president [of the TRWUA], do you know whether the operations of the dam have changed in some substantial way since the pre-Compact period, based on your knowledge of those sources?

A. We have not changed that much. I think we are – now that we have a new structure, we're a little more aggressive. But our outflows in the wintertime are pretty much the same or less than what we had before. But it did not change the operation that terribly much. But once we got a new structure, we could be a little more aggressive in the spring filling.

Tr. 1478:5-19 (Hayes); *see also* Tr. 1097: 3 – 1098, 1107:14 – 1108:7 (Smith) (fill period was same before the Compact, climate conditions have not changed much in last 70 years); Tr. 1888:12-24 (Aycock) (fill period in pre-Compact era was April through June).

Winter bypass flows in the years at issue were also consistent with – and in fact even more conservative than – such flows in the pre-Compact period. As Mr. Book testified:

Q. And so what does the comparison shown in this graph tell you?

A. This demonstrates that the wintertime bypass or pass-through the reservoir since the year 2000 has resulted in comparable quantities of water passing through the reservoir in the winter months as had occurred prior to 1950.

Q. So it's a comparison of the period in question here versus the pre-Compact period?

A. Yes.

Q. And what is your conclusion about that comparison?

A. That the operations in this post-2000 period are comparable to the operations that were occurring during the winter prior to the Compact at the reservoir, as it related to pass-through.

Tr. 119:4-19 (Book); *see also* Tr. 281:1-19 (Book); *see also* Tr. 1048:25 – 1049:16 (Smith) (by 1969 there was a well-established historical practice of having winter bypass flows); Tr. 1220:18-25, 1267:10 – 1268:5, 1349:5-15 (Smith) (explaining that winter bypass flows in recent years have been less than such flows prior to the Compact, and reservoir operations after the rehabilitation have been more conservative). Mr. Smith testified that the winter flows specified by the Board in the Operating Manual are based on the historical pattern of use established over time to keep the river flowing. *See* Tr. 1115:15 – 1116:10 (Smith). Historic winter bypass flows have been at least 175 cfs, and periodically larger. *See* Tr. 1152:7 – 1153:3, 1239:23 – 1240:1 (Smith).

Finally, the testimony at trial established that, in the pre-Compact period, the Reservoir was consistently operated below a storage level of 45,000 acre-feet during the October through March season. Tr. 1154:7-16 (Smith). This historical pattern of operation is consistent with operations in the years at issue.

In sum, the evidence at trial demonstrated that Montana's operations of the Tongue River Reservoir, including during the years at issue, are reasonable and consistent with the historical pattern of use of the reservoir water right. The operational decisions made in the years at issue have been part of the Tongue River Reservoir's operation since it was constructed and thus are part of the water right protected under the Compact. Accordingly, post-1950 Wyoming uses cannot compel Montana to store all water passing into the Reservoir beginning on October 1 when the historic pattern of storage establishes that the fill period for the Reservoir is the spring runoff season, that the Reservoir has maintained a level of winter bypass flows at or above 175 cfs, and that it has operated at a winter storage level at or below 45,000 acre-feet. Overall, Montana's operations of Tongue River Reservoir in the years at issue were consistent with historic practice, reasonable, and did not constitute a waste of water such that Wyoming can escape liability for its Compact violations based on the failure of the Reservoir to fill in those years.

3. The Reservoir Did Not Fill in the Years at Issue

As described above, Tongue River Reservoir begins storing in the fall up to the winter storage level of 45,000 acre-feet, and continues or resumes storing during the spring fill period to its full capacity or until such time during the irrigation season when the flow in the river will no longer support direct flow demands. When the Tongue River Reservoir does not fill in a given year, the amount of water each shareholder receives is reduced in proportion to their pro rata share in the Reservoir. Tr. 1440:22 – 1441:15, 1511:3-18 (Hayes). This forces Montana irrigators to use less water, reduce their irrigated acreage, grow different crops, and make difficult decision regarding how and when to use their stored water. Thus, all those contracting for storage in the Reservoir suffer the impacts of the Reservoir's failure to fill.

The evidence and testimony at trial established that Tongue River Reservoir, being operated reasonably and consistently with its water right under Montana law, did not fill in the years 2001, 2002, 2004, and 2006, which indicates that pre-1950 storage rights were not satisfied. *See* Tr. 248:23 – 254:3 (Book); Tr. 1227:5 – 1236:25 (Smith) (describing reservoir operations in years at issue); Tr. 1481:9 – 1490:23 (Hayes).

B. Montana's Direct Flow Rights Went Unsatisfied in the Years at Issue

At trial, Montana provided extensive evidence supporting its claim that its pre-1950 water rights went unsatisfied in the years at issue, which include 1981, 1987-1989, 2000, 2001, 2002, 2004, and 2006. *Supra* at I.C.2-3. As explained below, the record contains undisputed evidence of Montana's rights being unsatisfied in all of the foregoing years, as well as many others.

1. There Is Overwhelming Direct Evidence that Montana's Pre-1950 Direct Flow Rights Went Unsatisfied in the Years 2001, 2002, 2004, and 2006

Montana presented direct evidence at trial that specific pre-1950 direct flow rights were in need of water and went unsatisfied in 2001, 2002, 2004 and 2006. Many of the Montana water users who irrigate under direct flow rights on the Tongue River also have purchased shares of stored water in the Tongue River Reservoir. When there is insufficient water to meet direct flow demands, the TRWUA begins releasing stored water purchased by irrigators. *See* Tr. 135:13-21 (Book); Tr. 1438:17-24, 1439:21-25 (Hayes). Thus, when the Reservoir begins releasing stored water, it means that there is insufficient water in the river to satisfy Montana's direct flow rights. Montana's water users all testified that in the years at issue, there was insufficient water during the irrigation season to satisfy their direct flow rights, and they were therefore required to use stored water.

For example, Art Hayes testified that during the dry years of 2001, 2002, 2004, and 2006, he was forced to irrigate only his most productive acreage or to purchase supplemental water from the Northern Cheyenne Tribe, because there was not enough water to satisfy either his pre-1950 direct flow rights or his storage rights in the Tongue River Reservoir. *See* Tr. 1483:11-1484:6, 1487:19-25 (Hayes). Mr. Hayes was also forced to sell off part of his cattle herd as a result of the lack of available water. *Id.* The lack of water during these years caused Mr. Hayes and other water users in the Tongue River Basin to suffer serious economic losses. Tr. 1487:19-25 (Hayes). Mr. Hayes also testified that in the years at issue, most TRWUA members used their entire allotment of storage water. Tr. 1516:11-18 (Hayes).

Les Hirsch, another Montana Tongue River water user, testified that during these years he was forced to idle lands, use storage water from the beginning of the irrigation season, and lease water from the Northern Cheyenne Tribe. Tr. 3689:19-3690:4 (Hirsch). The conditions were so severe that Mr. Hirsch, along with all other TRWUA members, received only 55% of their storage water in 2002. Tr. 3691:7-24 (Hirsch). The lack of water also forced Mr. Hirsch to reduce the size of his cattle herd during these years and to lease land in northern Montana for supplemental hay. Tr. 3693:21, 3692:2-3693:17 (Hirsch).

The water supply conditions were so dire during these years that the two most senior direct flow rights were not satisfied. Jay Nance, who holds the most senior right on the river, testified that at times the water level was so low he was unable to get sufficient water through his diversion to satisfy his direct flow right. Tr. 3810:8-14 (Nance). Further, Mr. Nance testified that during most summers there is only enough water to satisfy his right and the T&Y Irrigation District's right. Tr. 3811:3-8 (Nance).

Roger Muggli, the managing director of the T&Y Irrigation District, the second most senior and largest direct flow right on the river, testified that the T&Y relies on storage water every year. Tr. 3894:20-3895:17, 3858:3-10 (Muggli). He also testified that during these dry years, conditions got so bad that at times there was only 20 to 30 cfs of direct flow at the 12 Mile Dam, which is not nearly enough to satisfy the T&Y's 187.5 cfs right. Tr. 3861:5-16 (Muggli). Mr. Muggli testified that the T&Y ran out of stored water in 2001, 2002, 2004, and 2006. Tr. 3921:4-10, 3925:15-25, 3926:1-20, 3989:16-18 (Muggli); Ex. M377; Ex.M343. Further, Mr. Muggli testified that the T&Y purchased supplemental water from the Northern Cheyenne Tribe in 2001, 2002, and 2006. Tr. 3923:1-25, 3925:1-3, 3928:2-6 (Muggli); Ex. 378A; Ex.M343; Ex. M394, Ex. M399. However, due to the high cost of purchasing water from the Tribe and the T&Y's limited operating budget, purchasing this water was difficult for the T&Y. Tr. 3927:1-13 (Muggli). In regards to Mr. Muggli's personal farming operation, the lack of water during these years forced him to irrigate less acreage, and his farm produced only 30-40% of its normal production. Tr. 3865:4-12 (Muggli). In 2006, Mr. Muggli was forced to lease 490 acre feet of stored water from other users for his personal operation. Ex. M399 at MT 15546.

Additionally, the evidence establishes that generally, if there is less than 200 cfs flowing at the stateline, there is insufficient water to satisfy the T&Y's right. Tr. 1438:17-24 (Hayes); Tr. 3330:14-18 (Kepper). Mr. Book's expert report establishes that there was less than 200 cfs reaching the stateline during the majority of the irrigation season of the years at issue. See Ex. M5 at 35 (Table 5). Moreover, as set forth above, there are 77 pre-1950 direct flow rights in Montana. Yet the testimony of Mr. Hayes, Mr. Muggli, and Mr. Nance established that during the years at issue, there was insufficient water to fully satisfy even the second most senior direct

flow right, the T & Y, and the T&Y was forced to use storage water to meet its users' demand.

Supra.

Further, Montana's water commissioners testified that they strictly regulated all rights on the Tongue River according to priority and that during most of the irrigation season, Mr. Nance and the T&Y were the only pre-1950 rights receiving any direct flow. Tr. 3316:2-14, 3335:24-3336:19, 3367:17-24 (Kepper); Tr. 3545:10-16 (Gephart); Tr. 3587:6-24 (Fjell). During these periods, the remaining 75 pre-1950 rights received no direct flow, and were entirely reliant on their stored water rights in the Tongue River Reservoir. *See* Tr. 3545:10-16 (Gephart); Tr. 3587:6-24 (Fjell). All of the testifying Montana water users confirmed that Mr. Nance and the T&Y were the only two direct flow rights that received direct flow water after the spring runoff during the years at issue. *See, e.g.,* Tr. 3811:3-8 (Nance); Tr. 3894:20-3895:17 (Muggli); Tr. 1438:17-24, 1440:14-21, 1505:10-17 (Hayes); Tr. 3637:3-6, Tr. 3655:4-23 (Hamilton); 3689:15-3690:4 (Hirsch). Accordingly, the fact that there was only enough water to partially satisfy the two most senior pre-1950 rights during these years necessarily supports a finding that there was insufficient water to satisfy the direct flow demands of the 75 other pre-1950 rights.

Thus, the testimony of these Montana water users with pre-1950 direct flow rights establishes that there was a substantial demand for direct flow water in the Tongue River Basin during 2001, 2002, 2004, 2006, that Montana's pre-1950 direct flow rights went unsatisfied at that time, and that Montana users suffered significant adverse economic consequences as a result.

2. Mr. Book's Demand Analysis Accurately Represents the Demand of Montana's Pre-1950 Direct Flow Water Rights

In order to determine how much water Wyoming was required to deliver to the state in order to satisfy Montana's pre-1950 direct flow water rights, Montana's expert witness Dale E. Book

compiled relevant data from available sources and created a detailed model. First, Mr. Book used several sources of data to compile the total amount of acreage irrigated under pre-1950 water rights. Mr. Book used aerial photography from 2009 to document the Montana acreage upstream of the T&Y Canal that is currently irrigated by direct flow from the Tongue River. Tr. 68:18-69:10 (Book); *see also* Ex. M5 at 68 (Appendix A), 27 (Table 2). Mr. Book calculated this amount to be 14,380 acres in 2009. Tr. 70:11-19 (Book). To calculate the amount of acreage irrigated out of the T&Y Canal, Mr. Book used the 1914 Miles City Decree and the water resources surveys completed by the State of Montana in 1947 and 1948, Exhibit M16 (“County Surveys”), which showed that between 9,705 and 10,075 acres are irrigated out of the T&Y Canal. Tr. 70:20-71:4 (Book). Thus, approximately 24,000 acres in Montana are irrigated out of the main stem of the Tongue River. Of these approximately 24,000 acres, Mr. Book relied upon the County Surveys to determine that approximately 20,000 acres were irrigated at the time the Compact was entered into in 1950—9,908 acres between the stateline and the T&Y Canal and 10,075 acres out of the T&Y Canal. Tr. 110:7-111:1 (Book); Ex. M5 at 8. *See generally* Ex. M16.

In response to criticisms from Wyoming’s expert Bern Hinckley, Mr. Book undertook further detailed evaluations of the pre-1950 acreage in Montana, comparing the aerial photography with information from Montana’s water rights database. Based on his additional evaluations, Mr. Book determined that his initial pre-1950 acreage quantifications were valid. Tr. 212:12-214:11 (Book); Ex. M6 at 14-16, 28-29 (Table 4-A). Documentation of Montana’s pre-1950 water rights supporting Mr. Book’s conclusion is set forth in Appendix D of his rebuttal report. Tr. 215:10-216:20 (Book); Ex. M6 at 120 *et seq.* (Appendix D). This

documentation includes the 77 pre-1950 direct flow water rights on the mainstem of the Tongue River between the stateline and Miles City, Montana. Tr. 216:21-217:3 (Book).

Next, Mr. Book calculated the amount of water needed at the stateline to fulfill Montana's pre-1950 direct flow rights. Mr. Book testified:

[T]he full demand for pre-1950 water rights includes the T&Y Canal diverting near Miles City, which has a specified water right of approximately 187 cfs for the 9900 acres that are irrigated under that canal, plus the direct flow rights for the . . . water rights that exist between the state line and the T&Y Canal. For the purposes of this analysis I used the duty of water on those water rights that I obtained from the Miles City decree, which was a 1914 decree of water rights in Montana which had set water rights at the rate of 1 cfs per 40 acres.

Tr. 120:12-23 (Book). In calculating the demand of Montana's pre-1950 rights, Mr. Book did not simply add up the total cfs decreed under each right. Tr. 121:1-8, 122:25-125:2 (Book); Ex. M5 at 265-81 (Appendix E). Rather, Mr. Book took into account return flows and reduced demand during May, June, and September. Tr. 121:1-20 (Book). Mr. Book explained:

The analysis considered the consumptive use demand for the acreage between the reservoir and the T&Y Canal, to estimate based on a diversion rate the amount of water that would be returned to the stream. . . . Another component of the analysis was to compute the lagged effect of return flows to the stream, so that return flows were determined to occur over a schedule that is delayed from the time when the diversions occur. . . .

Tr. 122:5-22 (Book); *see also* Ex. M5 at 265-81 (Appendix E). Mr. Book also described in great detail the basis of his return flow calculation. Tr. 122:25-125:2 (Book).

In response to Mr. Hinckley's critique of Mr. Book's return flow analysis, Mr. Book recalculated Montana's pre-1950 direct flow right demand using Mr. Hinckley's suggested sensitivity analysis. Tr. 240:16-243:23 (Book); Ex. M6 at 17-19, 32-36 (Tables 5-A, 5-B, 6-A, 6-B, 6-C). However, even with the incorporation of Mr. Hinckley's return flow criticism, Mr. Book found that his original conclusions "regarding the frequency and time when the direct flow demands exceed the stateline flow remain[ed] intact." Tr. 246:20-22 (Book). Thus, based on this

information, and considering and incorporating the critiques of Wyoming's experts, Mr. Book calculated the amount of water needed at the statelineto in order to satisfy Montana's pre-1950 water rights. Tr. 127:11-129:13 (Book); Ex. M5 at 11, 35 (Table 5); Ex. M6 at 32-36 (Tables 5-A, 5-B, 6-A, 6-B, 6-C). Mr. Book's demand model is conservative and relies on reasonable calculations. Montana has thus carried its burden in demonstrating the amount of water Wyoming was obligated to deliver to the stateline to satisfy the demand of Montana's pre-1950 direct water rights in all of the years at issue. See Ex. M5 at 11, 35 (Table 5); Ex. M6 at 32-36 (Tables 5-A, 5-B, 6-A, 6-B, 6-C). As explained below, Montana demonstrated that its pre-1950 water rights went unsatisfied in these years as well.

3. Montana's Pre-1950 Direct Flow Water Rights Went Unsatisfied in One or More Months in Most Years

Having established the amount of water needed at the statelineto satisfy Montana's pre-1950 water rights, Mr. Book compared the demand with the amount of water Wyoming actually delivered to the state line. Using data from the USGS gage at the statelinenear Decker, Montana, Mr. Book compared the amount of water actually delivered to the amount needed to satisfy Montana's pre-1950 direct flow rights. Tr. 132:3-136:17 (Book); Ex. M5 at 35 (Table 5). Mr. Book's calculations reveal that between 1961 and 2007, "in about half of the time during July and in most years in August and September, the stateline flow is insufficient to satisfy direct flow rights in Montana" Tr. 139:6-10 (Book). Mr. Book explained that Montana's pre-1950 direct flow water rights

typically have water available to them during May and June, and in most years the river flow drops off usually during July, and then in the late season there is not enough water in the river to satisfy the direct flow, which results in the use of the storage from the reservoir.

Tr. 257:6-13 (Book). Thus, Mr. Book's analysis showed that in each of the years at issue, among others, insufficient water reached the stateline to satisfy Montana's pre-1950 direct flow water rights during the irrigation season. Ex. M5 at 35 (Table 5); Ex. M6 at 32-36 (Tables 5-A, 5-B, 6-A, 6-B, 6-C).

The testimony of Montana water users supports Mr. Book's conclusion that Wyoming failed to deliver sufficient water to satisfy Montana's pre-1950 direct flow rights.

4. Administration of Water Based on Contemporaneous Demand Is Unworkable in the Tongue River Basin

As set forth above, Montana's pre-1950 direct flow rights went unsatisfied during all of the years at issue. Wyoming has argued that Montana is not entitled to relief in this case unless it can show "actual contemporaneous demand." See Wyo. Motion for Summary Judgment at 38-39 (July 3, 2013). However, such a system is not required by the doctrine of appropriation and would prove unworkable in the Tongue River Basin. For example, Mr. Hirsch testified that it takes five days for water to reach his points of diversion once it is released from the Tongue River Reservoir. Tr. 3714:11-20 (Hirsch). Similarly, it takes seven days for water to reach the T&Y Canal. Tr. 1459:15-17 (Hayes). It takes additional time for water to travel from points within Wyoming to the stateline. Thus, Montana users would have to anticipate their demand for water days in advance.

Additionally, irrigating out of the Tongue River is a complex process affected by many different, constantly changing factors, including high temperatures, rain storms, and wind. Tr. 1460:1-25 (Hayes); Tr. 3717:18-3719:15 (Hirsch). Furthermore, releases from the Tongue River Reservoir are controlled by very heavy gates that do not allow for precise adjustments. Tr. 1466:14-1467:7 (Hayes). Thus, as recognized by the Special Master, Wyoming's suggestion that Montana be required to monitor demand on a real-time, field-by-field basis is simply unrealistic

and unworkable given the realities of water administration in the Tongue River Basin. *See* Sept. 16 Mem. Op. at 31 (“The complexities and difficulties of administering a significant river system, including the impossibility of instantaneous deliveries of water from reservoirs or locations that can be several days of ‘river time’ away, require the beneficial use doctrine to be applied in a practical and implementable fashion, designed to ensure that senior appropriators receive the water to which they are entitled and have a need without unreasonably wasting water that could be used elsewhere.”).

Importantly, Wyoming itself does not require its water users to demonstrate actual contemporaneous demand before making water available for diversion. In fact, Wyoming relies on a “trigger flow” method of administration similar to the approach advanced by Montana. Wyoming water commissioner Bill Knapp explained that he monitors diversions and streamflow, and when he sees that the streamflow is near a certain range, he begins the process of regulating off junior water rights. *See generally* Tr. 2067:5-2070:3 (Knapp). Former Wyoming commissioner Carmine LoGuidice testified that when he was a commissioner on the Powder River, he monitored flow levels and put streams in regulation without a call. Tr. 2009:15-20 (LoGuidice).

Similarly, Wyoming commissioner David Schroeder confirmed that he relies at least in part on certain flows to trigger regulation. Tr. 2274:6-11 (Schroeder). Mr. Schroeder testified that in order to provide the 32 cfs needed to satisfy senior rights downstream of Prairie Dog Creek, he monitors the stream flow at the Kearney gage. Tr. 2323:1-17 (Schroeder). When the streamflow at the Kearney gage gets down to around 22 cfs, Mr. Schroeder proactively notifies junior users that they should begin ordering reservoir water. Tr. 2324:22-2325:3 (Schroeder). Further, Mr. Schroeder acknowledged that while currently Wyoming requires a verbal or written

call to begin regulation, in the past he has regulated based on certain flows and without a call. Tr. 2333:1-11 (Schroeder). Wyoming water user Tom Koltiska also confirmed that the Wyoming Board of Control begins releasing water from Kearney Lake when flows at Wakeley drop to a certain point. Tr. 2513:15-2516:14 (Koltiska)

Wyoming's expert Doyl Fritz explained how this approach works with respect to regulation in the Piney Creek drainage:

Many years of regulation have shown that about 22 cfs must be flowing past the Kearney gage in order to satisfy approximately 32 cfs of senior (i.e., senior to the water rights in the Prairie Dog and Mead-Coffeen ditches) downstream rights before any water can be exported out of the Piney Creek drainage above this gage. When the flow drops below 22 cfs at this gage, these two ditches typically go into regulation.

See Ex. W2 at 56 (Expert Report of Doyl M. Fritz).

Thus, given the impossibility of administering water on a real-time "contemporaneous demand" basis, and the fact that Wyoming itself does not engage in such administration, Wyoming failed to prove that Montana's method of water administration is unreasonable or results in waste of water. Rather, Montana has conclusively established that its pre-1950 water rights were in need of water and went unsatisfied during the years at issue.

5. Montana Demonstrated Contemporaneous Demand

In any event, Montana demonstrated that during the years at issue its pre-1950 water rights went unsatisfied at the same time that Wyoming's post-1950 rights were diverting. Lack of water during those years forced Montana water users irrigating under pre-1950 rights to idle acreage, purchase supplemental water from the Northern Cheyenne Tribe, and reduce their cattle operations. *See* Tr. 3693:21 (Hirsch); Tr. 1483:11-1484:6 (Hayes); Tr. 3865:4-12 (Muggli). This testimony establishes that had water been available to satisfy pre-1950 direct flow rights, it would have been put to beneficial use, *i.e.*, these users would not have idled acreage and would

not have reduced their cattle operations. Thus, evidence at trial satisfies any arguable required showing of “actual contemporaneous demand.” Put simply, Montana’s expert and lay witness testimony demonstrated that had Wyoming delivered sufficient water to the stateline , it would have been put to beneficial use.

6. There Was No Intrastate Means to Satisfy Montana’s Pre-Compact Rights

During the years at issue, there was no intrastate means to satisfy Montana’s pre-1950 direct flow rights. The testimony and evidence at trial established that early in the irrigation season, in each of the years at issue, all direct flow rights junior to the T&Y were shut down. *See* Tr. 3689:19-3690:4 (Hirsch); Tr. 3316:2-14, 3335:24-3336:19, 3367:17-24 (Kepper); Tr. 3545:10-16 (Gephart); Tr. 3587:6-24 (Fjell). Furthermore, the testimony and evidence established that of Montana’s pre-1950 direct flow rights, only the two most senior rights, those of Mr. Nance and the T&Y, were even partially satisfied. Tr. 3894:20-3895:17, 3858:3-10 (Muggli); Tr. 3810:8-14 (Nance). Montana’s water commissioners testified that after the spring runoff, there was only enough water to satisfy Mr. Nance’s and the T&Y’s direct flow rights. Tr. 3328:23-3329:7, 3329:13-3330:13 (Kepper); Tr. 3587:6-24, 3595:12-21 (Fjell). Thus, because all direct flow rights junior to the T&Y were shut down for the majority of the irrigation season during the years at issue, including 2001, 2002, 2004, and 2006, there was no intrastate means for Montana to satisfy its pre-1950 rights.

7. Administration of Water in Montana Is Reasonable and in Accordance with the Doctrine of Appropriation

At trial, Montana established that its system of administration is reasonable and complies with the Compact and the doctrine of prior appropriation. The Special Master has already held that Montana is not bound to follow any specific system of water administration so long as it

complies with the Compact. Mem. Op at 2 (Sept. 17, 2013) (“So long as it does so, the state is otherwise free to design, adopt, and implement whatever intrastate procedures and rules it believes are best.”). Importantly, it was Wyoming’s burden to show that Montana engaged in water use or administered its system of regulation in a manner that is inconsistent with the Compact. See *Parshall v. Cowper*, 143 P. 302 (Wyo. 1914); Sept. 16 Mem. Op. at 32 n.5 (“An open issue for trial is who has the burden on the issue of beneficial use. The only relevant case that I have found to date would seem to suggest that the burden of proof should be on Wyoming.”); see also *In re Gen. Adjudication of All Rights to Use Water in Big Horn River Sys.*, 48 P.3d 1040, 1056-57 (Wyo. 2002) (“It is well established that the burden of proof is on the party asserting the affirmative of any issue.”) (internal quotation marks, brackets, and citations omitted)). Wyoming failed to establish that Montana engaged in waste or that its system of administration is unreasonable.

The testimony of Montana’s water commissioners and state officials established that Montana’s system of administration is reasonable and in accordance with the doctrine of appropriation. During the years at issue, water commissioners were appointed to ensure that both decreed water rights and Tongue River Reservoir storage rights were exercised within priority and in appropriate amounts. Tr. 3307:12-19 (Kepper); Tr. 3576:13-16 (Fjell); Ex. M380A, Ex. M380B; Tr. 3514:24-3515:8 (Gephart); Ex. M394. These water commissioners were appointed by the Montana Water Court and ordered to administer the Tongue River in accordance with Montana’s statutes and regulations, and the TRWUA’s bylaws. Tr. 3309:9-3310:6 (Kepper). The orders appointing the water commissioners specifically directed that “[n]o water users shall use any water flowing in the Tongue River except as distributed by the water commissioners.” Ex. M394. Moreover, the water commissioners were informed that if they

failed to properly administer their duties, they could be held in contempt of court. Tr. 3320:2-15 (Kepper); *see also* Mont. Code Ann. § 85-5-109 ("If a commissioner fails to perform any of the duties imposed upon the commissioner by the order of the judge of the district court, the commissioner is guilty of contempt of court.").

After being appointed, the water commissioners received extensive training from the DNRC on Montana water law and how to use different types of meters to measure different types of diversions. Tr. 3310:16-24, 3311:14-3312:18 (Kepper); Tr. 3517:11-18 (Gephart); 576:23-3577:20 (Fjell); Tr. 3325:4-3326:4 (Roberts); *see also* Exs. M230, W285, M229A. In carrying out their duties, the water commissioners physically visited every point of diversion on the river. Tr. 3321:14-21 (Kepper). Every point of diversion had a suitable headgate or other method to shut off water diversions. Tr. 3590:9-10 (Fjell).

Additionally, the commissioners monitored flows at the stateline and flows coming out of the Tongue River Reservoir and physically recorded diversions of direct flow water and stored water on a daily basis. Tr. 33317:16-3318:12, 3321:14-21 (Kepper); 3522:1-10, 3538:10-20 (Gephart); Tr. 3587:3-5 (Fjell). The commissioners were on the river measuring diversions seven days a week during the irrigation season, including holidays. Tr. 3346:25-3347:5 (Kepper). In doing so, the commissioners remained in constant communication with the water users. Tr. 3331:1-3332:3 (Kepper). The water commissioners compiled their records of daily diversions and provided biweekly reports to the court. Tr. 3347:20-3348:17, 3374:9-12 (Kepper); Tr. 3588:23-3589:12 (Fjell); *see also* Exs. M381, M382, M396, M399, M400.

The commissioners were also provided with a copy of the 1914 Miles City decree, and they testified that they administered direct flow rights in priority according to that decree. Tr. 3315:9-3316:14 (Kepper); Tr. 3587:3-5 (Fjell). However, given the severe drought conditions,

Jay Nance and the T&Y were the only direct flow rights that received any water after the spring runoff during 2001, 2002, 2004, and 2006. Tr. 3328:23-3329:7, 3329:13-3330:13 (Kepper); 3595:12-21 (Fjell). If Jay Nance shut down his diversion, his 10.48 cfs went to the T&Y. Tr. 3615:22-3616:7 (Kepper).

Further, the types of pumps used by Montana water users permitted the commissioners to accurately monitor each user's diversions. When Mr. Kepper was appointed in 2001, there were only five ditch diversions, two of which were subsequently taken out, and approximately five diesel powered pumps. Tr. 3323:5-3324:10, 3324:11-25 (Kepper). The commissioners measured the ditches with a Marsh-McBirney device. Tr. 3349:1-10 (Kepper). The commissioners used an ultrasonic meter to measure the diesel powered pumps and relied on an "honor system" whereby the user reported to the commissioner when he shut the pump off. Tr. 3593:21-3594:14 (Fjell). Mr. Fjell testified that these users were always truthful. *Id.* The remaining diversions were all electric pumps that were measured using an ultrasonic meter and a Doppler machine, which permitted the commissioners to accurately measure these diversions. Tr. 3592:7-3593:8 (Fjell); Tr. 3324:11-25, 3349:23-25 (Kepper).

In order to receive their purchased stored water from the Tongue River Reservoir, water users were required to call one of the commissioners and request that a certain flow be released for a certain amount of time. *See* Ex. M397; Tr. 3520:7-21 (Gephart); Ex. M388; Tr. 3356:17-3357:6 (Kepper). The commissioner receiving the call would then call Art Hayes and order the release of the requested amount. Tr. 3356:17-3357:6 (Kepper). Through this system, during the years a commissioner was on the river, no water was released except under the direction of the commissioner. Tr. 3439:2-5 (Kepper). The commissioners testified that under this system, the water users knew how much water they were entitled to and tracked their remaining storage

water. Tr. 3343:7-17 (Kepper); Tr. 3539:4-6 (Gephart). The commissioners testified that generally water users did not take water that they were not entitled to, but that on occasion, the commissioners were forced to order users to cease taking water or to physically shut down their diversions. Tr. 3522:1-10, 3539:4-6 (Gephart); 3342:11-24 (Kepper); 3605:25-3606:4 (Fjell).

Finally, the commissioners testified that during these dry years they did not observe any waste of water or substantial return flows. Tr. 3372:14-25 (Kepper); Tr. 3540:2-10 (Gephart); Tr. 3599:15-3600:2 (Fjell). As Mr. Kepper explained, given the scarcity and expense of the water, all of the water users used their water efficiently. Tr. 3372:14-25 (Kepper). Montana water users confirmed that the commissioners measured and regulated their water use, checked and measured when users were not there, told them when they were running out, and ensured that no one except Mr. Nance and the T&Y used direct flow water. *See, e.g.*, Tr. 3786:21-3789:6 (Nance); Tr. 1439:10-14; 1440:4-9; 1444:22-1445:4; 1461:2-14; 1505:18-1506:1, 20-24; 1523:9-22 (Hayes); Tr. 3639:20-22; 3640:12-3641:6, 3655:4-9 (Hamilton); 3711:23-3713:2; 3716:6-3717:1 (Hirsch).

Accordingly, Montana established at trial that the water commissioners diligently monitored and recorded all direct flow and stored water diversions during 2001, 2002, 2004 and 2006. In doing so, they also administered Montana's pre-1950 direct flow rights according to priority. Under its system of administration, there was no waste of water. Wyoming failed to carry its burden of proving that Montana's system of administration was unreasonable or resulted in waste. Thus, there is no basis for allowing Wyoming to avoid liability for its violations of the Compact in the years at issue..

IV. Wyoming Allowed Use of Its Post-Compact Rights

A. Article V(A) Protects Montana's Pre-1950 Rights from Post-1950 Uses in Wyoming

Article V(A) of the Compact “requires Wyoming to *ensure on a constant basis* that water uses in Wyoming that date from after January 1, 1950 are not depleting the waters flowing into Montana to such an extent as to interfere with pre-1950 appropriative rights in Montana.” FIR at 29 (emphasis added). As further explained in the First Interim Report:

Article V(A) . . . clearly and unambiguously protects pre-1950 appropriative rights in Montana from new diversions or withdrawals in Wyoming that prevent sufficient water from reaching Montana. As Article V(A) states, pre-1950 appropriative rights “shall continue to be enjoyed in accordance with the laws governing the acquisition and use of water under the doctrine of appropriation.”

FIR at 37. Wyoming has violated Article V(A) by allowing storage and diversion of water under post-Compact uses while Montana's pre-Compact rights went unsatisfied. *See Montana v. Wyoming*, 131 S. Ct. at 1772 (2011) (“Montana's pre-1950 users can therefore ‘insist that [Wyoming's pre-1950 users] confine themselves strictly within the rights which the law gives them, that is, to the amount of water within the extent of their appropriation which they actually apply to some beneficial use’”) (quoting 2 C. Kinney, *Law of Irrigation and Water Rights* §784, at 1366 (2d ed. 1912)).

B. Wyoming Failed to Regulate, Monitor, or Keep Records of Storage and Diversion Under Post-1950 Water Rights

Wyoming does not routinely regulate, monitor, or keep records pertaining to either the storage of water in non-Compact reservoirs or to the diversion of direct flow by particular users under post-1950 water rights. *See* Tr. 3472:2-9 (Benzel); Tr. 2243:15-25 (Boyd); Tr. 5497:25-5498:3 (Fritz); *see also* Tr. 1950:7-10 (Aycock). Wyoming's failure to regulate, monitor, and keep records has made it difficult for Montana to establish the extent of Wyoming's violations of

the Compact. As recognized by the Wyoming Supreme Court in 1978, the procedure for supervision of water laws and the allocation of manpower and equipment in Wyoming makes “detection of water law violations difficult.” *Basin Elec. Power Co-op v. State Bd. Of Control*, 578 P.2d 557, 565 (Wyo. 1978) (quoting Michael V. McIntire, *The Disparity Between State Water Rights Records and Actual Water Use Patterns*, Wyo. Land & Water L. Rev. 23, 26-27 (1970), which described the vast disparity between the actual practices of water users in Wyoming and information recorded by Wyoming as “enormous and . . . apparently statewide”).

This enormous problem is exacerbated by Wyoming’s “call system of administration,” under which “no control is exercised upon most streams unless a call for control is made, so that in the absence of a call, there are generally no records available even to indicate the rate of diversion.” *Id.* (quoting McIntire).

The passage of time has resulted in little headway in resolving Wyoming’s failure to regulate, monitor, or keep records regarding water use. *See, e.g.*, McIntire at 24 (“The discrepancies have apparently compounded with the passage of time, due to increased competition for the water and changes to water uses, which have gone unrecorded in the State Engineer’s records.”); Tr. 4301:11-4306:16 (Fassett, discussing 77 unpermitted reservoirs brought to Wyoming’s attention in 1988 by Montana). Nonetheless, Montana has conclusively established that Wyoming allowed the storage of water and diversions of direct flow under post-1950 rights during 2001, 2002, 2004, and 2006. *See infra* at IV.C-D.

C. Wyoming Allowed Storage Under Post-1950 Water Rights to Montana’s Detriment

Wyoming is prohibited from diverting water for storage for post-1950 uses if those diversions result in an inadequate water supply for pre-1950 rights in Montana. FIR at 42. Wyoming cannot store water for beneficial uses on new land or for supplemental water supplies

on existing acreage if such use interferes with Montana's pre-1950 water rights. *Id.*; *see supra* at Statement of Claims.

The evidence at trial shows that Wyoming has a long history of storing post-1950 water, in both wet and dry years. *See, e.g.*, Ex. M5 at 37, Table 7. Montana's expert Dale E. Book quantified Wyoming's post-1950 storage in six "Compact" reservoirs and other non-Compact reservoirs. *See* Ex. M5 at 12-16, 39. His analysis shows that Wyoming's storage of post-1950 water reduced the amount of water at the state line and prevented Montana from receiving sufficient water to satisfy its pre-1950 rights.

1. Wyoming's Post-Compact Storage

Various reservoirs in the Tongue River Basin regularly store water under post-Compact rights, and this storage has had a negative effect on water availability in Montana. Mr. Book identified three categories of reservoirs that store post-1950 water. The first category includes six reservoirs with post-1950 capacity that are reported to the Compact Commission and for which records of use are maintained by the State of Wyoming ("Compact Reservoirs"). Ex. M5 at 12. The second category includes three post-Compact reservoirs, identified as the Wagner, Fivemile and Padlock Recovery reservoirs, which serve the Padlock and Sheeley ranches ("Padlock Reservoirs"). The third category includes post-Compact reservoirs for which no records are kept ("Other Reservoirs").

a. Compact Reservoirs

The Compact Reservoirs are managed by private owners, who report to the State of Wyoming. *See* Tr. 2013:12-2014:2 (LoGuidice). These reservoirs typically fill in the spring runoff. Tr. 2013:4-7 (LoGuidice). In performing their job responsibilities, the Wyoming water

commissioners do not distinguish between pre-1950 and post-1950 storage in any reservoir. Tr. 2199:2-23 (Knapp).

To quantify post-1950 storage in the Compact Reservoirs, Mr. Book first allocated storage to pre- and post-1950 water rights. Ex. M5 at 12-13. Mr. Book determined that the six Compact Reservoirs have post-1950 capacity totaling 9,386 acre feet ("af"). Ex. M5 at 12. Mr. Book allocated storage water by reviewing the annual hydrographer's reports in regard to carry-over storage, maximum content reached or available supply, if and when the fill was complete, the date for initiation of releases, and the amount of water released for the owners or contract users. *Id.* at 13. *See generally* Ex. M5 at App. F, MT-14759 to MT-14796. Mr. Book then credited Wyoming for return flows resulting from irrigation from releases of post-1950 stored water. Ex. M5 at 13-14. He made a further reduction by deducting transit loss from depletions in Wyoming, using a rate of 10%, which is used by Wyoming water officials when delivering releases in the Goose Creek Basin. *Id.* at 14. Consequently, he determined the net effect of Wyoming's post-1950 storage by calculating 90% of the difference between post-1950 storage and return flows. *Id.* at Table 12, MT-14520.

Mr. Aycock, Montana's reservoir expert, refined Mr. Book's analysis by looking at storage, return flows, and evaporation on a monthly basis. In his analysis, Mr. Aycock addressed the timing issues raised by Wyoming's expert Bern Hinckley. Ex. M7 at 1; *see* Tr. 1924:25-1947:12 (Aycock, answering the Special Master's questions). In particular, Mr. Aycock limited his analysis of storage in Wyoming to only the storage that occurred during the Tongue River Reservoir fill period. *See* Tr. 1894:9-1897:8 (Aycock); Ex. M7 at 3, 17-22, Appendix A. Also, certain return flows were eliminated because they did not occur during that same fill period. *See*

Ex. M7 at 20; *id.* at 22, Table 3. Mr. Aycock's conclusions are summarized in Point VI.C.2. *infra.*

b. The Padlock Reservoirs

The Padlock Reservoirs have a total capacity of 1,200 to 1,250 acre-feet of post-1950 rights. Ex. M5 at 14-15. As noted by Gregory Benzel, farm manager of the Padlock Ranch, Ex. M5 at 14, the water stored in the Padlock Reservoirs is used to irrigate approximately 2,000 acres on the Padlock Ranch, in the area known as Fivemile Flats. Ex. M5 at 14; Tr. 3455:20-3456:2 (Benzel). Padlock Ranch relies exclusively on storage in the Padlock Reservoirs to irrigate in Fivemile Flats. Tr. 3466:13-3467:4 (Benzel). The Padlock Reservoirs are normally emptied every year. Ex. M5 at 14-15.

Wyoming does not regulate the Padlock Reservoirs. Ex. M5 at 15. Wyoming has never required a release of water from the Padlock Reservoirs or required a shutdown of water use. Tr. 3472:2-9 (Benzel). Wyoming does not collect or report records of use for these reservoirs. Ex. M5 at 15. Nor does it routinely monitor any of these reservoirs. Tr. 5511:3-15 (Fritz).

The Padlock Reservoirs are filled each year, beginning in October, with water diverted from the Wyoming and Fivemile ditches. Ex. M5 at 15. The Fivemile Reservoir is filled first, which usually occurs in March. *Ibid.*; Tr. 3468:4-12 (Benzel). Water is stored in the Wagner Reservoir until the beginning of the irrigation season, when the Sheeley ranch begins irrigating. Ex. M5 at 15; Tr. 3487:1-5 (Benzel). The Wagner Reservoir usually fills by May. Tr. 3468:4-12 (Benzel). The third Padlock reservoir is the Waste Water Reservoir, also known as the Recovery Reservoir or Padlock Waste 104, which has a post-1950 water right of 50.67 af. *See* Tr. 3479:13-16 (Benzel); Ex. M5 at 14-15. The Waste Water Reservoir fills twice a year by

capturing rain and "waste water runoff" from surrounding irrigation. Tr. 3479:22-3480:12 (Benzel).

All of the reservoir water is used to irrigate Padlock Ranch's irrigated acreage in Fivemile Flats, except for 62 acre-feet owned by the Sheeleys, which is used for watering in the winter. Tr. 3470:8-23 (Benzel). Some of the Fivemile irrigated acreage also has assigned direct-flow rights. Tr. 3481:9-3483:7 (Benzel). However, the Sheeleys do not use the direct flow-rights, and the only source of supply for all of the pivots in the Fivemile area is the Padlock Reservoirs. Tr. 3481:2-14 (Benzel). Moreover, the total irrigated area with existing pivots that have no direct-flow rights is 830.5 acres. Tr. 3482:25-3483:6 (Benzel).

The reservoirs did not fill prior to the irrigation season in 2004 or 2006. Ex. M5 at 15; Tr. 3469:15-22 (Benzel). One other year in which the reservoirs did not fill is either 2001 or 2002. Tr. 3469:23-3470:7 (Benzel).

Mr. Book's analysis shows that the total post-1950 water supply stored in 2004 in the Padlock Reservoirs was approximately 720 af. Ex. M5 at 15; M6 at 27, Table 3; Tr. 3784:20-21 (Nance). Depletion is 85% of the amount delivered, with return flows of 15%. Ex. M5 at 15; Ex. M6 at 27, Table 3. The resulting depletion for 2004 is 610 af. Ex. M5 at 15; Ex. M6 at 27, Table 3. Allowing for 10% transit allowance, the net effect at the stateline is 551 acre-feet in 2004. Ex. M5 at 15; Ex. M6 at 27, Table 3.

Mr. Book's analysis further shows that the total post-1950 water supply stored in 2006 in the Padlock Reservoirs was approximately 990 af. Ex. M5 at 15; Ex. M6 at 27, Table 3; *see* Tr. 3487 (Benzel) (stating that the Wagner stored 428 acre-feet and the Fivemile stored 577 af); *see also* Tr. 3486:20-21 (Benzel). The resulting depletion based on 85% is 840 af. Ex. M5 at 15; Ex. M6 at 27, Table 3. Allowing for 10% transit loss, the net effect at the stateline is 757 af. Ex.

M5 at 15; Ex. M6 at 27, Table 3. Thus, Mr. Book's analysis shows that in both 2004 and in 2006, there were significant depletions associated with storage in the Padlock Reservoirs.

Wyoming agreed with Montana's analysis of depletions associated with the Padlock Reservoirs, except for a challenge based on a claim that 127 acre-feet of water rights associated with Wagner Reservoir are pre-1950 rights. Ex. W2 at .66. Of the pre-1950 storage right, Padlock Ranch owns 65 acre-feet and Padlock Ranch's neighbor, Sheeley, owns 62 af. Ex. M6 at 4. However, Montana's expert took the pre-1950 water rights into consideration in conducting his analysis related to capacity. In calculating the net effects of storage in 2004 and 2006, Montana relied on Mr. Benzel, who testified that the Padlock Ranch had access to all of the water stored in the Padlock Reservoirs, except for 62 acre-feet attributable to the Sheeleys, and that the amount of water supply available to them was understood to be limited to their interest. Ex. M6 at 4. Thus, Montana's initial calculations are correct and the parties agree that storage under post-1950 rights in the Padlock Reservoirs resulted in less water reaching the statelineto satisfy Montana's pre-1950 rights.

c. Other Reservoirs

In addition to the effects of the Compact Reservoirs and Padlock Reservoirs described above, other post-1950 reservoirs in Wyoming have an effect on water available to Montana for its pre-1950 water rights. See Ex. M5 at 15-16, 39, Table 9. No records regarding the filling and use of these Other Reservoirs are available. Ex. M5 at 16. Montana's expert therefore conservatively estimated the impact of the additional post-1950 reservoirs by determining the annual evaporation that occurs and that is subsequently replaced by filling. Ex. M5 at 16. Actual depletions due to filling would have been larger, to the extent that water was released for irrigation. *Ibid.* Thus, Montana's estimate establishes a minimum amount of water that was

consumed by Wyoming's storage under post-1950 water rights in reservoirs for which no information is collected or records kept. *Ibid.*

In making this estimate of depletions in the Other Reservoirs, Mr. Book developed a list of post-1950 reservoirs by extracting the post-1950 storage water rights from the Tongue River tabulation of adjudicated water rights. Ex. M5 at 16. Mr. Book then excluded storage facilities with water rights less than 20 af. *Ibid.* Reservoirs that were not evident on the 2006 aerial photograph and certain onstream ponds were also excluded. *Id.* at 16, 63, Figure 11.

Mr. Book determined the surface water area by reviewing 2006 aerial photography and applied a net evaporation rate based on the difference between the total reservoir evaporation and recorded precipitation. Ex. M5 at 16; Ex. M6 at 5. In response to Wyoming's expert's comments, Mr. Book adjusted his estimations to reach the final conclusion that the evaporation attributable to the additional post-1950 reservoirs was 313 acre-feet per year based on 179 acres of surface area. Ex. M6 at 5. Thus, 313 acre-feet would be the minimum depletive impact on water available at the stateline, assuming that the reservoirs would be refilled in the years at issue when the storage rights do not interfere with senior downstream users. Ex. M5 at 16.

One of the Other Reservoirs, the Windy Draw Reservoir, also known as the Rice Reservoir, has a post-1950 storage right of approximately 533 af. Ex. M5 at 39; *see* Tr. 3491:10-3492:3, 3493:10-14, 3494:12-19 (Benzel). Information regarding the use of water released from Windy Draw Reservoir was not available to Montana's expert. Ex. M5 at 16. ("Two reservoirs which appear to be used for irrigation, but for which information was not available are the Bear Claw Reservoir on Smith Creek and Windy Draw Reservoir under the Grinnell Livestock Co. Ditch on Big Goose Creek.") However, the Padlock Ranch farm manager testified that the Windy Draw Reservoir fills continuously throughout the year, Tr. 3494:12-19 (Benzel) and that

water from the Windy Draw Reservoir is used every year for two pivots that irrigate 275 acres. Tr. 3494:3-11, 3495:9-11 (Benzel). Therefore, the Windy Draw Reservoir is an example of a substantial post-compact storage and irrigation use in Wyoming that was not possible to include in Montana's quantification of Compact violations. As a result, Montana's quantification of Compact violations is understated.

2. Wyoming Stored Water that Would Have Been Stored in the Tongue River Reservoir

The post-1950 water stored by Wyoming would have been stored by Montana in the Tongue River Reservoir had that water been allowed to flow to the stateline as required by the Compact. Tr. 138:20-139:4 (Book). Wyoming stored water primarily in the spring runoff season. *Supra* at Point IV.C.1.a. The TRR has historically relied heavily on the April through June runoff to fill. Ex. M7 at 16 (Aycock Rebuttal Report); Tr. 1888:16-21 (Aycock). Consequently, in recent drought years, including 2001, 2002, 2004, and 2006, Wyoming's post-1950 water use, including storage, has impacted the TRR's pre-1950 storage right. Ex. M7 at 20-21, 26-27 (Appendix A). *See generally id.* at 25-32 (Appendix A). This occurs in years when the TRR does not fill to its normal full pool level of 79,071 af. *Id.* at 21. Wyoming's post-1950 use resulted in depletions of water available to satisfy the TRR by 1,530 acre-feet in 2001; 2,795 acre-feet in 2002; 2,166 acre-feet in 2004; and 3,232 acre-feet in 2006. *Id.* 22 (Table 3).

3. Wyoming's Expert Concurs that Post-Compact Storage Occurred in Wyoming in 2001, 2002, 2004, 2006

Wyoming's experts agree that post-1950 storage occurred in 2001, 2002, 2004, 2006. The conclusions of Wyoming's experts can be found in Mr. Fritz's expert report of April 2, 2013 and in Mr. Hinckley's expert report of April 2, 2013. *See* Exs. W2, W3. Notably, Wyoming did not dispute that the Wyoming reservoirs identified Montana contain post-1950 storage; nor did

Wyoming dispute the amounts of post-1950 storage. *Compare* Ex. W2, Attachment 2, Table 8 (revised) at column (1) (WY043173), *with* Ex. M5 at 38, Table 9 at column (1); *compare also* Ex. W2, Attachment 5, Table 9 (not revised) (WY043187 and MT-14516), *with* Ex. M5 at 39, Table 9. Wyoming's only objection to Montana's analysis regarding post-1950 storage relates to Kearney Lake and its impacts on the net effect of Wyoming's undisputed storage of post-1950 water. This objection is addressed below. *See infra* at IV.C.5.b.

4. Wyoming's Expert Concurs that Mr. Book's Methodology Was Reasonable

Wyoming's expert Doyl Fritz did not take issue with or alter the methodology used by Mr. Book in determining net evapotranspiration. Tr. 5440:18-22 (Fritz). In fact, Mr. Fritz used the same methodology to conduct his analysis. Tr. 5440:23-5441:3 (Fritz). Similarly, Mr. Fritz used Mr. Book's methodology to calculate the net effect of post-1950 storage on the statelineflow. Tr. 5468:19-5470:8 (Fritz). Likewise, Mr. Fritz used Mr. Book's methodology to assess post-1950 irrigated acreage. Tr. 5470:21-5471:5 (Fritz).

5. Winter Return Flows From Imported Storage Water Did Not Offset the Impact at the Stateline

Wyoming asserts that "return flows from post-1950 Kearney Lake imports" should offset the undisputed impacts from post-1950 storage in the Compact Reservoirs. *See* Ex. W2 at 65. This is an affirmative defense, and Wyoming therefore bears the burden of proof. As explained below, however, Wyoming has failed to establish that return flows resulting from the import of post-1950 Kearney Lake would reach Montana.

a. Wyoming Bears the Burden of Establishing that Return Flows Should Offset Its Compact Violations

Wyoming bears the burden to establish any affirmative defense, including any claimed offset for return flows attributable to imported water. *See City of Superior v. Ripley*, 138 U.S.

93, 98 (1891) (stating that in a claim for payment, whether payment had been made was a “matter of defense, and the burden of proof was upon the defendant”); *In re Gen. Adjudication of All Rights to Use Water in Big Horn River Sys.*, 48 P.3d 1040, 1056-57 (Wyo. 2002) (“It is well established that the burden of proof is on the party asserting the affirmative of any issue.” (internal quotation marks, brackets, and citation omitted)); *see also* 27 Fed. Proc. § 62:79, L. Ed. (Mar. 2014) (“An affirmative defense is . . . a defendant’s assertion raising new facts and arguments that, if true, will defeat the plaintiff’s . . . claim, even if all allegations in the complaint are true.”); Defense Against a Prima Facie Case § 19:23 (Rev. ed., March 2014) (“Issue of setoff is affirmative defense; and party claiming reduction in judgment therefore has burden of proof on matter.”).

Case law regarding augmentation of water supply and the applicable burden of proof further supports the conclusion that Wyoming must carry the burden to establish the impact of imported water. The general rule is that a person who intends to use water from an augmented stream must prove that she produced and contributed to the stream such water and that without her efforts, such water would not have reached the stream. *See, e.g., Kelly Ranch v. Se. Colo. Water Conservancy Dist.*, 550 P.2d 297, 306 (Colo. 1976) (“[T]he burden is upon the proponent of a proposed plan for augmentation to prove the amount of return flow from in-house use of water withdrawn from wells on the property”); *Leadville Mine Dev. Co. v. Anderson*, 17 P.2d 303 (Colo. 1932) (requiring proof “by clear and satisfactory evidence”). Thus, Wyoming must establish the amount and timing of return flows that it claims should be attributed to imported water.

b. Wyoming Has Not Presented Sufficient Evidence to Establish that Imported Water Reaches Montana

Wyoming failed to establish that return flows attributed to imported water reaches Montana for use during the irrigation season. Wyoming relies on Mr. Fritz's analysis regarding return flows of imported water in an attempt to reduce Montana's already conservative estimate of impacts on Montana's pre-1950 water use resulting from Wyoming's post-1950 uses. Wyoming contends that the quantification of impacts on water available at the stateline for Montana's pre-1950 rights should be reduced by return flows attributable to water imported into Prairie Dog Creek from Kearney Lake. However, Mr. Fritz's analysis is flawed for at least two reasons.

First, Mr. Fritz used only the annual Hydrographer's reports in his analysis and resulting estimate of return flows. Ex. M6 at 4. In turn, the Hydrographer's reports contain only annual amounts of use and storage content and a list of approximately 120 shareholders. Ex. M6 at 4. No other records were provided. *Ibid.* Mr. Fritz had no information regarding amounts or timing of actual use by particular water users on Prairie Dog Creek. *Ibid.*; Tr. 5516:11-19 (Fritz). He did not rely on measurement devices on diversions from Prairie Dog Creek. Tr. 5514:21-23 (Fritz). He had no information that allowed him to trace the stored water to any particular owners. Tr. 5514:24-5515:1 (Fritz). He had no records of water use in Prairie Dog Creek, Tr. 5516:14-16 (Fritz); or records indicating a call for Kearney Lake water. Tr. 5516-17-19 (Fritz); *see also* Tr. 2348:3-23 (Schroeder, stating that there is no measuring device for water released from Kearney Lake). He did not talk with any of the Prairie Dog water users. Tr. 5517:2-17 (Fritz). Thus, Mr. Fritz's analysis fails to establish that water imported from Kearney Lake reached the Stateline. *See Kelly Ranch*, 550 P.2d at 306; *see also McIntire* at 26 ("Without records which accurately show the nature and extent of actual water uses, neither the water users

themselves nor the state water commissioners can readily detect deviations or identify the cause of a depleted water supply in the source.”)

Second, Mr. Fritz made a number of assumptions in his analysis that are unsupported. For example, Mr. Fritz’s analysis assumed that all water reported as released from Kearney Lake, as reflected in the annual Hydrographer’s report, was diverted to the Tongue River Basin. Ex. W2 at 65. However, at trial, Wyoming’s expert Mr. Fritz conceded that twenty percent of the water released from Kearney Lake actually goes to the Powder River Basin. Tr. 5520:14-5521:17 (Fritz). Similarly, Wyoming’s analysis assumed without support that deliveries for irrigation amounted to 90% of water released and that return flows were 54% of the amount delivered. Ex. M6 at 4; *see* Ex. W2 at Appendix F-35 (WY043181) (defining “Release and Headgate Delivery” as Release less 10% loss).

Further, Wyoming’s analysis failed to account for conditions in the Prairie Dog Basin. Information indicates that the transit loss on deliveries of reservoir releases to the ditches may be 20%. Ex. M6 at 4. In addition, transit loss should include ditch loss in conveying the releases into the Prairie Dog Basin, as well as ditch loss on Prairie Dog Creek. Ex. M6 at 4. Moreover, the amount of water assumed to be delivered appears to have included evaporation loss, which is estimated in the Basin Plan report as 5% of the active reservoir capacity. Ex. M6 at 4. The analysis is further flawed because it failed to reflect the use of sprinklers and the difference between conveyance systems in Prairie Dog Creek and the longer ditch systems common in Goose Creek. Ex. M6 at 4.

For all of the foregoing reasons, Mr. Fritz’s analysis is flawed and should be disregarded. Consequently, Wyoming failed to satisfy its burden to establish that return flows from Kearney Lake imported water reaches Montana.

Even if Wyoming's analysis were considered reliable, which Montana denies, the amount of the impact asserted by Wyoming cannot be sustained. The amounts must be recalculated by using parameters that account for conditions in the Prairie Dog Basin. At a minimum, an appropriate analysis would assume a transit loss of at least 20%, to account for evaporation loss, conveyance ditch loss, and higher losses in Prairie Dog Creek. Ex. M6 at 4; *see* Tr. 5526:13-5527:11 (Fritz, admitting that Mr. Schroeder reported 25% shrink at the lower end of Prairie Dog and that Wyoming's analysis did not take this shrink into account). In addition, return flows must reflect the use of sprinklers and the difference between conveyance systems. Ex. M6 at 4. An inventory of sprinklers in the Prairie Dog Basin and application of a 10% ditch loss results in a computed return flow factor of 38%. Ex. M6 at 4. Montana's expert adjusted Wyoming's estimated return flows to determine that the average annual return flow at the Stateline for the non-irrigation season should be adjusted from 576 acre-feet to 363 acre-feet for 2001, 2002, 2004, and 2006. Ex. M6 at 4 & 117-19. Finally, the adjusted amounts are overstated because all of the Kearney Lake releases were assumed to be delivered to the Tongue River Basin. As explained above, it is likely that approximately 20% was delivered to the Powder River Basin. Ex. M6 at 4. Thus, even if Wyoming's analysis were otherwise valid, the amount of return flows determined by the computed return flow factor (38%) must be reduced by 20%.

D. Wyoming Allowed Post-1950 Direct Flow Rights to Divert at the Expense of Montana's Pre-1950 Rights

During the years at issue, Wyoming allowed post-1950 direct flows rights to divert water which would have otherwise been delivered to the statelineto satisfy Montana's pre-1950 rights. In the Tongue River Basin, Wyoming's post-1950 water rights encompass approximately 4,320 acres. Ex. M5 at 17-19, & 40 (Table 10); *see id.* at Appendix G-2 (listing Wyoming's post-1950 rights). These rights are associated with the mainstem of the Tongue River, Big Goose Creek,

Little Goose Creek, the Interstate Ditch and their tributaries, Ex. M5 at Appendix G, MT-14798 to MT-14816. They also include original supply and supplemental supply for lands with other primary water rights.

Montana lacks adequate information to quantify all post-1950 depletions because of Wyoming's failure to adequately monitor its water use and record and maintain data. *See, e.g.*, M5 at 17, 21. Moreover, to the extent records exist, they do not adequately distinguish between water diverted for pre-1950 water rights and water diverted for post-1950 water rights. When records did not reflect the necessary allocations, Montana assumed that the water use was not for post-1950 water rights. For example, although Wyoming had no records of use of original supply water from Youngs Creek, Montana did not assume that the original supply water was not available. Rather, Montana assumed that post-1950 supplemental supply permits did not result in additional post-1950 depletions. Ex. M6 at 6. In addition, the conclusions of Montana's expert do not consider unaccounted-for depletions that are associated with the use of post-1950 water rights. Ex. M6 at 11. As a result, Montana's estimations of depletions associated with post-1950 direct flow diversions in Wyoming are conservative and understated. Nonetheless, as demonstrated below, Montana established at trial that Wyoming's diversions for post-1950 direct flow rights resulted in an inadequate supply of water to satisfy Montana's pre-1950 water rights.

1. Wyoming's Direct Flow Use Under Post-1950 Rights

Montana's expert Mr. Book determined the net depletive effect of Wyoming's post-1950 direct diversions for irrigation. *See generally* M5 at 17-19; M6 at 5-11, 27 (Table 3). In conducting his evaluation, Mr. Book first extracted information regarding the post-1950 water rights that are documented in Wyoming's water rights tabulation as water rights permitted for original irrigation with priority dates later than 1950. Ex. M5 at 17 & Appendix G. Tr. 164:10-

165:7 (Book). *See generally* Ex. M20. Thereafter, Mr. Book compared the mapping of the USBR for pre-Compact conditions with the Basin Plan mapping prepared in 2002 to identify the expansion of irrigated acreage in Wyoming post-Compact. Ex. M5 at 17. Mr. Book ultimately determined that diversion under post-1950 direct flow water rights situated on the Tongue River or northside tributaries and on Prairie Dog Creek impacted Montana in 2001, 2002, 2004, and 2006 and that irrigation on the related lands, which totaled 363 acres excluding acreage irrigated by CBM water, would directly affect flows into Montana. Ex. M5 at 18-19; M6 at Table 3; Tr. 179:15-23.

Mr. Book evaluated the post-1950 permitted rights by checking the irrigation status for these lands, considering their location in the basin, and tabulating METRIC results for each permit. Ex. M5 at 19. Tr. 167:21-160:9. He then subtracted the background evapotranspiration ("ET") rate from the total ET to determine net ET attributed to irrigation. Ex. M5 at 18; Tr. 170:11-171:10. The depletions associated with the irrigated acreage were calculated by assessing a 10% reduction for transit loss. *Id.* at 19; Tr. 185-6-24.

Wyoming's expert Mr. Fritz disputed Mr. Book's conclusions in his initial report by with respect to the amounts of acreage actually irrigated by diversion of direct flow under specific permits. *See* Ex. W2 at 70-87. Mr. Fritz asserted that the amount of irrigated acreage should be reduced for various reasons, including a lack of actual irrigation, *see, e.g.*, Ex. W2 at 74 (Permit 6206E, Johnson et al., and Permits 6550E and 22879D, Stroup); irrigation by CBM water rather than direct diversions, *see, e.g., id.* at 75 (Permit 6226E, DeLapp); and higher background ET. *See, e.g., id.* at 72-73 (Permit 5798E, Barbula). In response, Mr. Book carefully considered the issues raised by Mr. Fritz and revised Montana's conclusions accordingly. *See* Ex. M6 at 5-12 & 27 (Table 3); Tr. 194:13-198:20. In his rebuttal report, Mr. Book concluded that Wyoming's

irrigation of post-1950 acreage resulted in net depletions of 327 acre-feet in 2004 and 473 acre-feet in 2006. Ex. M6 at 27 (Table 3). METRIC data was unavailable for 2001 and 2002. Cf. Ex. M5 at 21. Mr. Book used the average net depletions in 2004 and 2006 to estimate depletions in 2001 and 2002 of 400 acre-feet for each year. Ex. M6 at 27 (Table 3); Tr. 209:20-25.

Thus, Montana has definitively established that Wyoming's diversions for direct flow rights resulted in a minimum total of approximately 1,600 acre-feet in net depletions at the stateline for 2001, 2002, 2004, and 2006. See Ex. M6 at 27 (Table 3).

2. Wyoming Did Not Engage in any Regulation of the Mainstem of the Tongue River, Columbus Creek, Five-Mile Creek, Prairie Dog Creek, or the Interstate Ditch in the Relevant Years

It is presumed that Wyoming water users are using their adjudicated amounts of water, absent a showing by Wyoming of regulation or lack of actual historic beneficial use. See *Basin Elec. Power Co-op. v. State Bd. of Control*, 578 P.2d 557, 563 (Wyo. 1978) (recognizing that the decreed amount of water is prima facie evidence of an appropriator's entitlement); *Quinn v. John Whitaker Ranch Co.*, 92 P.2d 568, 571-72 (Wyo. 1939) (“[A] decree adjudicating water rights and priorities, as well as a certificate of appropriation, must be regarded as prima facie evidence of the right to take the water as decreed.” (internal quotation marks and citation omitted)); *Kaiser Steel Corp. v. W.S. Ranch Co.*, 439 P.2d 714, 716-17 (N.M. 1968) (stating that an adjudication decree is conclusive proof of beneficial use); see also *Parshall v. Cowper*, 143 P. 302, 304 (Wyo. 1914) (stating that adjudication of the quantity of water is as conclusive upon a water distributor as the determination of priorities and that the burden was on defendant water regulators to show the plaintiffs were not entitled to the full maximum amount of water granted them by the adjudication). It is undisputed that Wyoming did not regulate the mainstem of the Tongue, Columbus Creek, Fivemile Creek, Prairie Dog Creek, or the Interstate Ditch during the

years at issue. If there is no regulation, water is diverted as available and needed without being curtailed by post-1950 priority dates. Ex. M5 at 5; Tr. 2231:2-19 (Boyd). Evidence at trial supports the conclusion that the Wyoming water users take as much water as they can get when there is no regulation. Tr. 2244:13-19 (Boyd).

Testimony at trial confirmed that Wyoming never regulated the lower part of the mainstem of the Tongue River or Columbus Creek. See Tr. 3471:14-3472:1 (Benzel), 5496:9-14 (Fritz), 5507:25-5508:2 (Fritz); Tr. 5282:13-20 (Tyrrell); *see also* Tr. 2012:13-15 (LoGuidice, stating that he's never "known of a call for regulation on the Tongue"); Tr. 5255:16-5256:11 (Tyrrell, explaining that Wyoming ordered measuring devices to be installed on the mainstem of the Tongue because they had none on the Tongue at that point and "had to have a better understanding of our own diversions and use on the Tongue River, the main stem"); Tr. 5282:13-20 (Tyrrell). Even after Montana's formal written calls in 2004 and 2006, Wyoming never directed the water commissioner to take any action between Ranchester and the stateline. Tr. 2224:10-15, 2226:20-25 (Boyd). In fact, Wyoming has regulated the mainstem of the Tongue River only once, in 2006, when regulation occurred up from the York Ditch between Dayton and Ranchester. Tr. 2159:10-30 (Knapp, stating that 2006 was "the first year that [Wyoming] did any official type of regulation on the main stem"); Tr. 2239:12-2240:19 (Boyd).

The same is true for the tributaries of the mainstem. It is undisputed that Wyoming does not regulate Fivemile Creek or Columbus Creek. Tr. 2250:23-2251:5 (Boyd). On Prairie Dog Creek, approximately 13,000 acres are irrigated. *Ibid.* However, water use on Prairie Dog Creek is not regulated; instead, the distribution of water to various points of diversion is managed by the water users. *Ibid.*

Indeed, Wyoming's expert Doyl Fritz testified that he is aware of no Wyoming right that has ever been regulated for the benefit of Montana or a Montana user. Tr. 5497:25-5498:3 (Fritz); *see* Tr. 2000:6-11 (LoGuidice, stating that he received no direction from the State Engineer with regard to taking action in response to Montana's written calls in 2004 or 2006). Mr. Fritz testified that he was aware of only one measuring device for diversions on the mainstem of the Tongue River that was in place prior to 2007. Tr. 5501:21-5502:8 (Fritz). Mr. Fritz was unaware of any measurement devices for diversions from Prairie Dog Creek. Tr. 5514:21-23 (Fritz). Mr. Fritz is unaware of any time when water rights were regulated on Prairie Dog Creek. Tr. 5516:11-8-13 (Fritz). He was also unaware of any records indicating a call for reservoir water for water users on Prairie Dog Creek. Tr. 5516:17-19 (Fritz).

Wyoming further acknowledged at trial that it has not engaged in any regulation of the Interstate Ditch. *See* Tr. 2243:22-25 (Boyd). The Interstate Ditch is one of the post-Compact rights located on the northern end of the mainstem of the Tongue River in Wyoming, and it is one of the last diversions in Wyoming. Ex. J58 at Technical Memorandum for Task 2A (Powder/Tongue River Basin Irrigation Diversion Operation and Description Memo), pg. 82; Tr. 2243:15-25 (Boyd). Notably, Wyoming admitted that the Interstate Ditch has never been in regulation. Tr. 2243:15-25 (Boyd). Instead, the Ditch "take[s] whatever [it] can get and as much as [it] can get." Ex. J58 at Technical Memorandum for Task 2A (Powder/Tongue River Basin Irrigation Diversion Operation and Description Memo), pg. 81. Furthermore, "the size of the ditch governs the diversion, allowing for approximately 120 percent of the total rights to be diverted." *Ibid.* On June 17, 2004, Mr. Boyd estimated that the Interstate Ditch was diverting 30 to 50 cfs. Ex. W35 at June 17th; Tr. 2248:14-2249:12 (Boyd). Additionally, Mr. Boyd testified that every time he has visited the Interstate Ditch there was active irrigation. Tr. 2249:20-23

(Boyd). Importantly, it was not until 2007, after this litigation was initiated, that there was a functional measuring device on the Interstate Ditch. Tr. 2246:21-2247:18 (Boyd). Thus, on the Interstate Ditch, a ditch just upstream of the stateline, Wyoming has allowed post-1950 water rights to divert as much water as they can get without any regulation, limited only by the physical capacity of the ditch. See Tr. 2244:1-19 (Boyd) (“So long as the water is available, they’re taking it”).

Finally, trial testimony confirmed that Wyoming water commissioners do not regulate down the ditch. See, e.g., Tr. 2032:4-14 (LoGuidice), 2227:21-2228:3 (Boyd), 2337:2-6 (Schroeder). Moreover, there are no diversion records for structures diverting from the ditches. Ex. M5 at 5.

3. Wyoming’s “Free River” Lack of Administration Exacerbates Compact Violations

Wyoming’s “free river” policy results in a per se Compact violation when the Tongue River Reservoir does not fill. See, e.g., Tr. 5282:21-5283:5 (Tyrrell, agreeing that Wyoming users can store post-Compact water if they are not being regulated). Wyoming irrigators are utilizing post-1950 water rights when Montana has insufficient water to satisfy its pre-1950 water rights, including its pre-1950 rights to store in the TRR. See Ex. M5 at 11. If Wyoming’s water users did not divert under post-1950 rights, approximately 90% of the water would reach Montana. *Id.* at 14. Wyoming’s use of post-1950 water must be prevented in order to protect pre-1950 water rights in Montana. *Ibid.*

For example, most of Wyoming’s post-1950 rights are on tributaries to Big Goose Creek. Ex. M6 at 12. The total acreage for post-1950 original supply in Goose Creek Basin is 1,913 acres. *Ibid.* Post 1950-supplemental water rights exist for 4,997 acres in the Goose Creek Basin. *Ibid.* Although Goose Creek Basin is regulated at times, Wyoming water users are permitted to

take as much water as they need prior to such regulation. *See id.* at 5500:7-12 (Fritz); *see also* Tr. 2211:16-20 (Knapp). In other words, there is a “free river” prior to regulation. *See, e.g.,* Tr. 5499:24-5500:3 (Fritz); Tr. 2340:2-4, 2344:2-3 (Schroeder). Wyoming’s “free river” practice applies state-wide. *See* Tr. 5162:25-5163:2 (Tyrrell). The only limitations are practical constraints, such as ditch or pump capacity. Tr. 5500:7-12 (Fritz). Thus, there are post-1950 water rights in the Tongue River Basin in Wyoming that have used water and have not been regulated. Ex. M5 at 5.

Regulation on Big Goose Creek and Little Goose Creek does not begin until streamflows at the gaging stations upstream of most diversions drop below the key flow rate of 65 cfs and 80 cfs, respectively. Ex. M6 at 11. Records of flow rates and records of releases of water from storage indicate when regulation begins. *Ibid.*

In 2001, regulation began on Little Goose Creek in mid-May and releases from storage began around June 1. *Ibid.* Regulation did not begin on Big Goose Creek until June 19, and a call was placed in early August. *Ibid.* In 2002, flow rates did not indicate a need for regulation until mid-June for Little Goose Creek and July 1 for Big Goose Creek. *Ibid.* Reservoir storage did not cease until the end of June, at about the time that releases began on June 26. *Ibid.*

In 2004, the flow rate on Little Goose Creek was below the key flow rate effectively the entire season. *Ibid.* However, on Big Goose Creek, the flow rate did not drop below 65 cfs until July 21, when releases began from Park Reservoir. *Id.* at 12. Finally, in 2006, streamflows did not reach the key flow rates until June 12 on Little Goose Creek and June 24 on Big Goose Creek. *Ibid.*; *see* Tr. 2149:6-22 (Knapp)

In sum, water users in the Goose Creek Basin were unrestricted in their use of post-1950 water rights until regulation began in accordance with the timing of key flow rates discussed

above. *See, e.g.*, Tr. 2154:1-20 (Knapp). The "free river" circumstances existing prior to regulation undoubtedly contributed to additional depletions at the stateline, which cannot be quantified due to Wyoming's failure to adequately monitor and record information related to its post-1950 water users in the Goose Creek Basin and elsewhere. *See, e.g.*, Tr. 2191:19-2192:3 (Knapp).

4. Wyoming's Regulation Only to the Calling Right Exacerbates Compact Violations

In the few instances where Wyoming regulates post-1950 water rights, such regulation addresses only the calling right. *See, e.g.*, Tr. 5281:25-5282:20 (Tyrrell). Consequently, post-1950 water right users located below the calling rights can continue using water that would otherwise go towards satisfying Montana's pre-1950 water rights. For example, on Big Goose Creek, the Alliance Ditch is typically the calling right. Tr. 2256:2-6 (Boyd). When the Alliance Ditch calls for more water, the PK Ditch, which is above the Alliance Ditch, is regulated. Tr. 2256:8-12 (Boyd). Normally, there is no regulation on Big Goose Creek below the Alliance Ditch. Tr. 2256:13-23 (Boyd). In fact, post-1950 rights below the Alliance Ditch have never been regulated. Tr. 2256:24-2257:11 (Boyd).

Wyoming's expert recognizes this practice in his testimony at trial regarding his Opinion No. 4, which states that "diversions are generally restricted to appropriations, with priorities dating from the early 1900s and earlier." Tr. 5497:4-8 (Fritz). Mr. Fritz agreed that restriction only occurs to the place where the calling right is located on the tributary and that generally there is no regulation unless there's a call for it by a specific water right holder. Tr. 5497:9-20; Tr. 2211:22-25 (Knapp). Notably, Mr. Fritz admitted that he is unaware of any Wyoming rights that have ever been regulated for the benefit of Montana or a Montana water user. Tr. 5496:25-5497:3 (Fritz).

The manner in which Wyoming determines whether regulation is necessary further illustrates the limitations of Wyoming's regulation. Water commissioner Knapp discussed the process he uses to determine whether water should be reduced by priority in order to satisfy the senior rights. *See generally* Tr. 2067:5-2070:3. In particular, Mr. Knapp explained that before regulation, he checks his diversions, checking stream flows. Tr. 2067:8-10 (Knapp). When he sees that the streamflow is near a certain range, such that he knows it is starting to become short, he pays more attention to the headgates. Tr. 2067:10-12 (Knapp). At that point, he talks to the ditch rider, president, or senior water right owner. Tr. 2067:13-2068:9 (Knapp). If the water right owner acknowledges that the supply is short and indicates that he or she would like to have more water, Mr. Knapp construes that indication as a call. *Ibid.* However, if the water right owner indicates otherwise—that additional water is not needed—then no regulation occurs. *Ibid.*; *see* Tr. 2108:17-2109:2 (Knapp). Thus, even when a Wyoming water commissioner knows that senior water rights users are being shorted by junior users, regulation does not occur if a Wyoming senior user indicates there is no need for the water. The needs of senior water users in Montana are never considered.

5. Wyoming's Expert Agrees that There Were Post-Compact Direct Flow Diversions in Wyoming in 2001, 2002, 2004, and 2006

Wyoming's experts agree that Wyoming diverted water for post-1950 water rights in 2001, 2002, 2004, and 2006. Notwithstanding Wyoming's assertion of various theories in an attempt to reduce its liability for post-1950 diversions, the final conclusions of Wyoming's experts reveal impacts of post-1950 irrigated acreage of at least 144 acre-feet in 2001, 144 acre-feet in 2002, 106 acre-feet in 2004, and 181 acre-feet in 2006. W3 at 33 (Table 6-C) (report of Wyoming's expert B. Hinckley) as corrected during trial; *accord* Ex. W2, Table 12 (WY043170).

6. Wyoming's Use of Post-1950 Water Rights Prevented Satisfaction of Montana's pre-1950 Direct Flow Rights in Other Years

As discussed, Wyoming had notice that its use of post-1950 water caused shortages to Montana's pre-1950 rights in the remaining years at issue, including 1981 and surrounding years, 1987, 1988, 1989, and 2003. *See, e.g.*, Ex. M136 (In 1981, Wyoming rejected a request from Montana to regulate Wyoming water rights for the benefit of the Tongue River Reservoir and other post-Compact rights); *supra* at Point II.C.2-3. When Montana was communicating with Wyoming regarding shortages in the early 1980's, Montana was concerned about its direct flow rights, as well as its storage rights. Tr. 2578:22-2579:19 (Moy). Statelineflow during the irrigation season in each of the foregoing years, *inter alia*, was insufficient to satisfy Montana's demand for its pre-1950 direct flow rights. Ex. M5 at 35 (Table 5); *see* Tr. 2671:12-18 (Moy, explaining, in the context of issues in 1988, why late season flows were as important as early season flows and that direct flow downstream had to be met); Tr. 2678:10-2679:23 (Moy, explaining why Montana was concerned about Montana's pre-1950 direct flow when it was communicating with Wyoming in the 1980's and that Montana water users expressed concern about their direct flow rights). Moreover, Wyoming knew as early as 1981 that its use of post-1950 water rights reduced the Statelineflow by a minimum of 20 cfs. *See* Ex. M136 at WY048190. Thus, Montana demonstrated that diversion under post-1950 rights in Wyoming deprived Montana's pre-1950 rights of needed water in all of the years at issues.

E. Coalbed Methane Pumping in Wyoming Contributes to Wyoming's Compact Violations

Wyoming has allowed widespread coalbed methane ("CBM") pumping to deplete streamflow that would otherwise be available to satisfy Montana's pre-1950 rights. CBM pumping involves the pumping of groundwater for the purpose of reducing fluid pressures in

coal zones in order to release the methane in the coal zones for capture and production. *See* Tr. 2760-2762 (Larson); Ex. M43, Fig. 1, at 9. CBM is sometimes referred to as coalbed natural gas ("CBNG").

In his First Interim Report, the Special Master concluded as follows with respect to application of the Compact to groundwater pumping such as CBM pumping:

7. The Compact protects Montana's pre-1950 uses from interference by at least some forms of groundwater pumping that dates from after January 1, 1950 where the groundwater is hydrologically interconnected to the surface channels of the Yellowstone River and its tributaries. The question of the exact circumstances under which groundwater pumping violates Article V(A) is appropriately left to subsequent proceedings in this case.

FIR at 90. In its Motion for Summary Judgment, Wyoming again took the position that CBM pumping is not subject to the Compact, claiming that the hydraulic connection between the pumping and Tongue River stream flows is "too tenuous." *Amicus* Anadarko Petroleum also argued that CBM pumping should be excluded because neither State regulated such pumping and for other reasons. *See* Sept. 16 Mem. Op. at 17-18. The Special Master, however, refused to carve out a flat exemption for CBM groundwater production from Article V(A) of the Compact. *Id.* at 24.

1. The Modified BLM Model Used by Mr. Larson Accurately Represents the Impact of CBM Pumping

Steven P. Larson was Montana's expert on the impacts of CBM pumping. Mr. Larson has extensive experience in groundwater hydrology, hydrology generally, modeling and water resources engineering. Mr. Larson's experience includes leading the initial development of the MODFLOW groundwater flow model program at the United States Geological Survey and extensive testimony in interstate water cases before the United States Supreme Court. *See* Ex. M9 at 2, App. A; Tr. 2753-56 (Larson).

In conducting his analysis, Mr. Larson compiled the hydrologic data related to CBM pumping for the years 1999 through part of 2012. *See* Ex. M9 at 5-6, Table 1 and 2; Tr. 2758:7-2759:18, 2762:5-2764:10 (Larson). Mr. Larson then analyzed the impact of CBM pumping in Wyoming in both the Tongue and Powder River basins on the Tongue River in Montana using a groundwater model developed for the United States Bureau of Land Management ("BLM Model"). *See* Ex. M38; Tr. 2767:20-2768:11 (Larson). The BLM Model was prepared by expert modeling experts to the BLM for purposes other than this litigation to evaluate hydrologic impacts of CBM development, and thus could be considered particularly impartial. *See* Ex. M38 at 1-1; Tr. 2768:12-25 (Larson). Further, the BLM Model includes the area in question in this case within the model domain. *See* Ex. M9, App. B, at B-1. Among other things, the Model was prepared to quantify the impact of CBM pumping on the Tongue River. *See* Ex. M38 at 2-2 (Table 2-1), 4-18; Tr. 2771:17-2772:7.

Mr. Larson determined the BLM Model to be appropriate for adaptation to the purpose in this case of analyzing the effects of CBM pumping on the Tongue River, and made adjustments to certain parameters used in the BLM Model in order to better replicate measurable hydrologic data that had become available since the development of the Model in 2002. *See* Ex. M9 at 6-8; Tr. 2767:20-2769:23 (Larson). Mr. Larson also reviewed the calibration of the BLM Model and found it sufficient. Tr. 2774:21-2776:9. Mr. Larson explained that, where, as here, calibration data are sparse, it is important to rely upon the judgment of the groundwater hydrologist. *See* Tr. 2860:15-2862:2; *accord*, Ex. M559 at 23. Mr. Larson was the only groundwater hydrologist who testified on CBM impacts. Wyoming's expert is not a hydrologist, has never received a degree in hydrology or been certified as a professional hydrologist, nor is he a member of the American Institute of Hydrology. Tr. 3045:3-12 (Schreüder).

The BLM Model quantitatively reflects the fact that there is a hydrologic connection between Wyoming CBM pumping in the Powder and Tongue River basins and the Tongue River in Montana. Importantly, Wyoming does not dispute the existence of a hydrologic connection. *See Wyoming's Memorandum in Support of Motion for Summary Judgment at 36 (July 3, 2013)* ("Both States recognize that this groundwater is connected to the surface to some degree"). Based on Mr. Larson's vast experience in groundwater modeling, he concluded that the BLM Model looked like a "reasonable representation of the Powder River Basin including the Tongue River Basin" for the purpose of determining impacts of CBM pumping on the groundwater system. Tr. 2774:11-20 (Larson). His conclusions on the depletions of the Tongue River by Wyoming pumping, based on the BLM Model, are shown in Ex. M9, Fig. 2.

Mr. Larson also then incorporated into his analysis the impact of return flows from CBM pumping to the groundwater system. Ex. M9 at 10-12; Tr. 2780:10-2783:6 (Larson). The impact of the return flows was to offset the depletions caused by of CBM pumping on the Tongue River streamflow. In some years, there was a even net positive impact on the Tongue River quantitatively because the estimated return flows exceeded the pumping depletions in those years. *See Ex. M9 at 11-12, Figs. 3, 4*, Mr. Larson provided his results to Mr. Book. Mr. Book then incorporated Mr. Larson's results in his overall conclusions regarding the quantity of depletions in 2001, 2002, 2004 and 2006. *See Ex. M5, at 21, Table 12*. In addition to impacts in those four years, Mr. Larson's analysis showed effects extending many years into the future even assuming no future CBM pumping. Ex. M9 at 11-12.

In his analysis of the effects of produced water from CBM wells that is returned to the groundwater system via seepage from infiltration/evaporation ponds or surface drainages, Mr. Larson relied on the estimates used in the BLM Model. That modeling assumed that the actual

amount of produced water that returned to the groundwater system varied from about 15 to 30% in the primary alternatives considered by the BLM and their modelers. *See* Ex. M9 at 10; Tr. 2780:10-2783:6 (Larson). As a result, Mr. Larson made the assumption that 25% of the CBM produced water returned to the groundwater system. *See* Ex. M9 at 11-12.

Mr. Larson also submitted a rebuttal report, Ex. M10 and testimony primarily with regard to why certain criticisms by the Wyoming expert were unfounded. Tr. 2794-2824:19 (Larson). In response to questions by the Special Master, Mr. Larson explained in detail why the criticisms were unfounded. Tr. 2855:8-2885:12 (Larson). Thus, Mr. Larson's reports and testimony at trial established that the BLM Model used in Mr. Larson's analysis accurately represents the impact of CBM production on streamflow in the Tongue River.

2. Mr. Larson's Analysis Likely Overestimates the Amount of CBM Produced Water that Returns to the Regional Aquifer System

Mr. Larson's assumptions regarding infiltration rates were confirmed by a witness called by Wyoming, Mr. John Wheaton, Senior Hydrologist with the Montana Bureau of Mines and Geology ("MBMG"). Mr. Wheaton manages the Groundwater Investigation Program for MBMG, and was in charge of the CBM well monitoring program for potential drawdown from 1991 to 2009. Tr. 4075:7-15; 4083:9-12 (Wheaton). While Wyoming took issue with Mr. Larson's assumptions regarding infiltration as being too low, on direct examination by Wyoming, Mr. Wheaton testified that MBMG's monitoring program showed drawdown in Montana wells from CBM pumping in Wyoming. Tr. 4117:9-11 (Wheaton).

Mr. Wheaton testified that based on his studies of specific CBM ponds in Wyoming, the ponds typically seal after a relatively brief period of infiltration Tr. 4130:14-17 (Wheaton); Ex. W236 at 13. Furthermore, Mr. Wheaton explained that, with rare exception, once the pond seals, there is no more infiltration during the life of a pond, as the sealing essentially blocks infiltration.

Tr. 4125:20-25; Tr. 4126:1-15 (Wheaton); Ex. W237. More specifically, Mr. Wheaton confirmed that while initial infiltration rates for CBM ponds may approach 50% temporarily, after the pond seals, there is no infiltration at all except in rare instances. Tr. 4125:15-4126:15 (Wheaton). Finally, Mr. Wheaton testified that, in his experience, he had never found discharge to surface streams of infiltrated CBM produced water. Tr. 4130:18-4131:14 (Wheaton).

In discussing Exhibit W237, a presentation given by Mr. Wheaton that set forth the findings of a study on Coal Creek, Mr. Wheaton explained how the hydraulic conductivity in an unlined pond went to zero after a short period of infiltration during initial saturation of the pond floor. *See* Ex. W237 at slide 7; Tr. 4132:5-4133:8 (Wheaton). The result of the vertical hydraulic conductivity going essentially to zero meant that very little infiltration occurred, no matter how long the pond was used. Ex. W237 at slide 6; Tr. 4133:9-4134:1 (Wheaton). Mr. Wheaton testified that, based on his experience, low vertical hydraulic conductivity would be maintained over the life of an infiltration pond and that he would not expect to see infiltration increase over time. Tr. 4137:11-4138:3 (Wheaton).

The phenomenon by which the floor of unlined ponds in the study area become sealed was described as "flocculation." *See* Tr. 4129:6-4130:17; 4144:2-19 (Wheaton). The result of this phenomenon, Mr. Wheaton testified, was that in his work he had not seen "indications that there was any infiltration to the regional aquifer system." Tr. 4154:10-12 (Wheaton). When asked whether 25% was a reasonable assumption for the amount of CBM produced water returning to the regional aquifer system, Mr. Wheaton testified that he had never seen any water getting back to the regional aquifer system. Tr. 4154:13-23 (Wheaton). Notably, the BLM modelers also considered infiltration of produced water from CBM pumping, and concluded: "Negligible infiltration would be anticipated where containment ponds or reservoirs constructed

in upland areas would be used to handle CBM-produced water.” Ex. M38, Section 6.5.2, at 6-76. Based on Mr. Wheaton’s testimony, testifying as a witness called by Wyoming, Mr. Larson’s assumption that 25% of CBM produced water returns to the regional aquifer system is far too high. Thus, Mr. Larson’s assumption of 25% is very conservative and likely overestimates the offsetting effect of return flows on the depletive effects of CBM pumping.

3. CBM Pumping Depleted Streamflow Needed to Satisfy Montana’s Pre-1950 Rights and Wyoming May Not Rely on a Materiality Defense

The law of appropriation, as applied in both Montana and Wyoming, does not recognize “materiality” as a defense available to a junior water user impairing a senior right. The Supreme Court of Wyoming has held that “there is no provision in the law that exempts a relatively small (de minimus) junior water right from regulation if a senior water right places a legitimate call for delivery of the senior appropriation.” *Snider v. Kirchhefer*, 115 P.3d 1, 13 (Wyo. 2005). The Supreme Court of Montana has similarly held that the law of appropriation does not permit a junior water right to impair a senior right, no matter how small the impairment. *See Bostwick Properties, Inc. v. Montana Dep’t of Natural Res. & Conservation*, 296 P.3d 1154, 1162 (Mont. 2013) (“Any additional depletion of water, even one as minimal as 39 acre-feet per year, potentially would adversely affect senior appropriators’ water rights.”). Thus, no depletion of streamflow is too small when the purpose is to protect a senior water right from unauthorized interference by a junior water user. Likewise, no depletion of the Tongue River in Montana is too small when the purpose is to protect Montana’s Compact allocation from unauthorized interference by water users in Wyoming.

CBM pumping in Wyoming depleted streamflow that would otherwise have been available to satisfy Montana’s pre-1950 rights in 2004 and 2006. In 2001 and 2002 the effects of

return flows as analyzed by Mr. Larson showed a net positive impact, which offset other depletions of stateline flows. See Ex. M9 at 12 (Figure 4); Ex. M5, Table 12; Ex. M6, Table 3. In 2004 and 2006, the net depletions due to CBM pumping, including return flows, amounted to 413 acre-feet and 666 acre-feet, respectively. Furthermore, Mr. Larson testified that the impacts from CBM pumping on the Tongue River will continue for "a very, very long time" after the water production has stopped. Tr. 2766:1-2767:19 (Larson). Thus, Montana demonstrated that its pre-1950 rights were impaired by CBM pumping in Wyoming in 2004 and 2006.

4. Wyoming Did Not Carry its Burden of Proving that Return Flows of CBM Produced Water Offset Depletions

In general, each party has the burden of proof with regard to the assertions that it makes. *In re Gen. Adjudication of All Rights to Use Water in Big Horn River Sys.*, 48 P.3d 1040, 1056-57 (Wyo. 2002) ("It is well established that the burden of proof is on the party asserting the affirmative of any issue." (internal quotation marks, brackets, and citation omitted)). Thus, as to the overall effects of CBM pumping, Montana has the burden to prove those ultimate impacts by a preponderance of the evidence. However, as to specific arguments or positions asserted in opposition to Montana on this issue, Wyoming has the burden of proof.

The appropriate standard for showing a violation of the Compact as a result of groundwater extraction is the preponderance standard. Although the Court has refrained from formally deciding the proper burden of proof for a well-pumping claim under an interstate compact, *Kansas v. Colorado*, 514 U.S. 673, 693-94 (1995), the Court's Special Master recommended adoption of the preponderance standard. *Kansas v. Colorado*, No. 105, Orig., 1 Report of the Special Master 65-70 (1994). The Court overruled the exception by Colorado seeking the higher clear-and-convincing standard because Kansas had satisfied both standards. It

noted, however, the Special Master's reliance on *Nebraska v. Wyoming*, 507 U.S. 584, 592 (1993), which suggested that the burden of proof for enforcing a previous allocation of an interstate river by a decree of the Court would be the preponderance of the evidence. The Yellowstone River Compact is just such a previous allocation of an interstate river. Therefore, there can be little doubt that the burden of proof in this case should be the preponderance standard. Montana has met the preponderance burden in this case by relying on an impartial groundwater model developed by the Federal Government and applied in this case, with appropriate adjustments to calibrate the model to the most recent data, by an expert, Mr. Larson, with vast modeling experience.

Conversely, Wyoming did not carry its burden of showing that return flows from CBM pumping offset the depletions associated with CBM pumping. In fact, Wyoming's own witness, Mr. Wheaton, undercut Wyoming's assertions by testifying that in his estimation no CBM produced water returns discharges to surface streams or to the regional aquifer system. *See* Tr. 4130:18-4131:14, 4154:13-23 (Wheaton). Thus, Montana demonstrated that during the years at issue Wyoming violated the Compact by permitting CBM pumping to deplete water that would otherwise have been available to satisfy Montana's pre-1950 rights.

V. The Amount of Wyoming's Violations

A. All Expert Analysis Shows Postcompact Uses in Wyoming Caused Net Depletions to Stateline Flows in 2001, 2002, 2004, and 2006

Wyoming cannot dispute that post-1950 water use in Wyoming caused net depletions to Stateline flows in 2001, 2002, 2004, and 2006. Wyoming's post-1950 water use resulted in a net impact to the Stateline of 1,530 acre-feet in 2001; 2,795 acre-feet in 2002; 2,166 acre-feet in 2004; and 3,232 acre-feet in 2006. Ex. M7 at 22 (Table 3). The average impact was 2,431 acre-feet per annum. *Ibid.* As further discussed herein, Wyoming does not dispute that depletions

occurred; rather, it simply disputes the amount of the impact. *Supra* at IV. 6.3 and IV.D.5. For all of the reasons stated, Montana's quantification of depletions is reasonable. Indeed, it is highly likely that Montana's quantification is understated, as it is conservative in light of the assumptions made by Montana, which were required in part due to the inadequacy of Wyoming's records. *See e.g., supra* at IV.D.

B. Wyoming's Compact Violations Are Significant to Montana and Montana Is Entitled to a Remedy

In CMO No. 14, the Special Master asked the States to address whether there might be some level of violation that might be so insignificant that it does not warrant a remedy, and whether such might be the case with respect to Wyoming's Compact violations in this case.

The judicial system is animated by the fundamental principle that for every wrong there should be a remedy. *See, e.g., Marbury v. Madison*, 5 U.S. 137, 163 (1803) ("It is a general and indisputable rule, that where there is a legal right, there is also a legal remedy by suit or action at law, whenever that right is invaded.") (internal citations and quoted authority omitted). The Court has further held that in original actions to enforce equitable apportionment decrees or interstate water compacts, a violating state cannot defend against liability by claiming that the downstream state was not injured. Thus, even if the amount of a violation is not significant enough to cause injury, it is still sufficient to warrant intervention by the Court. This principle reflects the difficulty inherent in drawing the line between insignificant and significant violations, particularly when, as here, the violation is quantifiable and quantified. Where would such a line lie? How many acre-feet of water must a downstream state be deprived of, or dollars in losses due to such deprivation, before the Court would deem those losses "significant" enough to warrant a remedy? Moreover, it would be antithetical to the entire notion of a compact to allow a state that violates that compact to escape any consequence simply because the amount of

the violation is deemed too small; such an approach would incentivize non-compliance and sanction small violations that, over time, would produce significant harm.

In any event, Wyoming's Compact violations are significant to Montana and its water users, and justify a remedy in both damages and prospective relief. Montana has been complaining about Wyoming's failure to comply with its obligations under the Compact for decades. The water users of Montana depend on water subject to the Compact, and, as the evidence shows, suffer significant losses when Wyoming fails to deliver on its Compact obligations. Montana Attorney General Timothy Fox explained the significance of this case to Montana in his remarks at the beginning of trial:

[This case] is important because the water of the Tongue River and the Tongue River Reservoir mean everything to the farmers and ranchers along the Tongue, to the people of Birney and Miles City, and to the members of the Northern Cheyenne Tribe. I have heard members of the Wyoming trial team tell this court that the amount of water in dispute is small and insignificant, and I have even heard them use the phrase, a monumental waste of time and much ado about nothing in characterizing Montana's claims.

Well, the amount of water isn't small to the rancher who is irrigating 200 acres of alfalfa, trying to raise enough hay to get his cattle through the winter. It isn't small to the farmer who is raising corn and melons and alternative crops trying to diversify agriculture in this state. It isn't small to the Amish community that works day and night to continue a traditional way of life. And it isn't small to me or to my predecessors, who have invested . . . thousands of hours and millions of dollars over the past six years in this case. And to individual and very real Montanans this case is not much ado about nothing, and to some it's much ado about their very livelihoods and well-being.

Tr. 12:8 – 13:10.

Wyoming's violations are significant and can be quantified sufficiently to allow for damages. Further, Montana is entitled to a workable method for administering the Compact that will assure that Montana and its water users receive the water they are entitled to going forward. There is no question that the dispute between Montana and Wyoming is an ongoing

controversy. For this reason alone, the Court should address the issues and provide a remedy that will resolve the controversy. *See Oklahoma v. New Mexico*, 502 U.S. 221, 241 (1991).

CONCLUSION

For the foregoing reasons, Montana's claims should be accepted.

Respectfully submitted,

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No. 137, Original

In The
Supreme Court Of The United States

STATE OF MONTANA,

Plaintiff,

v.

STATE OF WYOMING

and

STATE OF NORTH DAKOTA

Defendants.

Before the Honorable Barton H. Thompson, Jr.
Special Master

CERTIFICATE OF SERVICE

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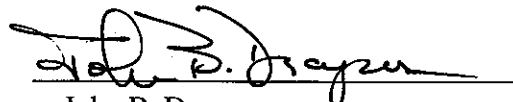
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